FINAL
PROGRAM ENVIRONMENTAL IMPACT REPORT

FOR THE

OPTIMUM BASIN MANAGEMENT PROGRAM

VOLUME I

Prepared for:

Inland Empire Utilities Agency
9400 Cherry Avenue, Bldg. A
Fontana, California 92335

Prepared by·

Tom Dodson & Associates
2150 North Arrowhead Avenue
San Bernardino, California 92405

July 2000

TOM DODSON & ASSOCIATES
2150 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92405
TEL (909) 882-3612 • FAX (909) 882-7015
E-Mail tda@tstonramp.com

MEMORANDUM

TO: Richard Atwater

FROM: Tami Fincher

DATE: July 26, 2000

SUBJECT: Submittal of Final Program Environmental Impact Report for the Optimum Basin Management Program

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On behalf of everyone at Tom Dodson and Associates (TDA), I am pleased to submit to you the final draft of the OBMP PEIR. This document is being submitted to you as a single sided reproducible copy for you use and distribution purposes. This document completes the final task outlined in our contract, and fulfills all of TDA's obligations to Inland Empire Utilities Agency for this project.

It has been a true pleasure to work with you and all of your staff on this project. In particular, I would like to extend a special thank you to Garth Morgan, Neil Clifton, Harlan Delzer, Kathy Beckley, Ben Pak, Barbara Kruells, Patti Bonavitz, and April Woodruff for their skillful and professional efforts in helping to complete the requirements of the CEQA review process in such a timely and efficient manner. You have an incredibly capable staff, and their assistance has been invaluable to us over the course of the past year. Thank you.

We deeply appreciate the opportunity that IEUA has afforded TDA in working on this OBMP project. All of us here at TDA look forward to working with you and your staff in the future, as you continue to implement projects under the program document adopted for the OBMP. I believe that this PEIR establishes a clear and effective framework for the development of future water supply facilities to meet demands in the Chino Basin. Congratulations to everyone at IEUA on the successful adoption of the OBMP, the certification of the Peace Agreement, and the approval of the OBMP Implementation Plan. Best wishes for the smooth implementation of projects under this program, and I commend you on your commitment to a promising future legacy for the water supply in the Chino Basin.

Very Respectfully Yours,

Tami Fincher

/tcf

Attachments: Volume I and Volume II of Final Program EIR for the OBMP

INLAND EMPIRE UTILITIES AGENCY
NOTICE OF DETERMINATION

To: Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814
and
San Bernardino County
Clerk of the Board
385 North Arrowhead Avenue
San Bernardino, CA 92415

From: Inland Empire Utilities Agency
9400 Cherry Avenue, Bldg. A
Fontana, California 92335

Subject:
Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

Project Title

Chino Basin Optimum Basin Management Program

SCH#2000041047	Mr. Richard Atwater	(909) 357-0241
State Clearinghouse Number	**Lead Agency Contact Person**	**Telephone Number**

Project Location

The OBMP will be implemented within the Chino Basin which is bounded on the north by the San Gabriel Mountains and the Cucamonga Basin; on the east by the Rialto-Colton Basin, Jurupa Hills and the Pedley Hills; on the south by the La Sierra area, the Santa Ana River and the Temescal Basin; and on the west by the Chino Hills, Puente Hills, and the Pomona and Claremont Basins. The Chino Basin is one of the principle subbasins contributing flow to the Santa Ana River which flows approximately 69 miles from the San Bernardino Mountains to the Pacific Ocean.

Project Description

The Optimum Basin Management Program (OBMP) implements a groundwater management program for the Chino Basin that is designed to enhance the safe yield and the water quality of the basin, enabling all groundwater users to produce water from the basin in a cost-effective manner. To carry out this purpose, the OBMP consists of four primary management goals. Goal number one is to enhance basin water supplies. Goal number two is to protect and enhance water quality. Goal number three is to enhance management of the basin. Goal number four is to equitably finance the OBMP. The OBMP will be implemented as a program with future specific projects over the next 20-30 years.

This is to advise that the Inland Empire Utilities Agency approved the above described project on July 12, 2000 and has made the following determinations regarding the above described project:

1. The project [☑ will ☐ will not] have a significant effect on the environment.
2. A Program Environmental Impact Report (PEIR) was prepared for this project, and the Agency determined that the project has a potential to cause significant adverse environmental effects with implementation of proposed mitigation measures. The PEIR was certified by the Agency Board.
3. Mitigation measures identified in the PEIR were made a condition of the approval of the project.

This is to certify that the PEIR and record of project approval are available to the general public at the Inland Empire Utilities Agency office in Fontana.

Richard Atwater

Signature Date Title

Date received for filing:

STATE OF CALIFORNIA-THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
ENVIRONMENTAL FILING FEE CASH RECEIPT
DFG 753.5a (6-91)

9208

Lead Agency: Inland Empire Utilities Agency Date: 7/12/00

County/State Agency of Filing: County of San Bernardino Document No.:

Project Title: Chino Basin Optimum Basin Management Program.

Project Applicant Name: Inland Empire Utilities Agency Phone Number: 909-357-0241

Project Applicant Address: 9400 Cherry Ave., Bldg. A, Fontana, CA 92335

Project Applicant *(check appropriate box)*: Local Public Agency [X] School District [ ] Other Special District [ ]
State Agency [ ] Private Entity [ ]

CHECK APPLICABLE FEES: Check #055193

(X)	Environmental Impact Report	$850.00	$ 850.00
( )	Negative Declaration	$1,250.00	$
( )	Application Fee Water Diversion *(State Water Resources Control Board Only)*	$850.00	$
( )	Projects Subject to Certified Regulatory Programs	$850.00	$
(X)	County Administrative Fee	~~$25.00~~	$ 35.00
( )	Project that is exempt from fees		
	TOTAL RECEIVED		$ 885.00

Signature and title of person receiving payment: John Rangola Deputy Clerk

FIRST COPY-PROJECT APPLICANT SECOND COPY-DFG/FASB THIRD COPY-LEAD AGENCY FOURTH COPY-COUNTY/STATE AGENCY OF FILING

RESOLUTION NO. 2000-7-1

A RESOLUTION OF THE BOARD OF THE INLAND EMPIRE UTILITIES AGENCY* CERTIFYING THE FINAL PROGRAM ENVIRONMENTAL IMPACT REPORT FOR THE OPTIMUM BASIN MANAGEMENT PLAN AND ADOPTION OF FINDINGS AND STATEMENT OF OVERRIDING CONSIDERATIONS

Whereas, the California Environmental Quality Act (CEQA) of 1970, as amended, requires that prior to approval of any project, the Lead Agency shall consider the potential impacts and effects of said project, consider alternatives to the project, and identify mitigation measures necessary to reduce or eliminate the impact of the project on the environment; and

Whereas, the Inland Empire Utilities Agency* (IEUA) is the Lead Agency for the Optimum Basin Management Plan (OBMP) and has caused to be prepared a Program Environmental Impact Report (PEIR) for the OBMP in accordance with CEQA and its implementing guidelines; and

Whereas, the IEUA prepared and circulated a Notice of Preparation (NOP) to the public, responsible agencies and other interested parties for their review and comment, pursuant to CEQA Guidelines Section 15083; and

Whereas, pursuant to comments received on the scope and content of the PEIR in response to the NOP document, IEUA prepared and circulated a draft PEIR assessing the project's environmental impact for public review; and

Whereas, IEUA issued the Notice of Completion for the draft PEIR on May 5, 2000 and the draft PEIR was available for public review and comment from May 5, 2000 through June 23, 2000; and

Whereas, IEUA received 18 letters with comments and concerns regarding the content of the draft PEIR for the OBMP; and

Whereas, the Draft EIR determined that the majority of potential adverse environmental impacts are either non-significant without mitigation or can be reduced to a level of insignificance with mitigation, including the following: land use, population and housing, geologic resources/constraints, water resources/water quality, air quality construction impacts, transportation and circulation, biological resources, energy, hazards and risk of upset, noise, public services, utilities, cultural resources, and aesthetics and visual resources; and

Whereas, the draft PEIR for the OBMP identified a single significant adverse environmental impact relating to air quality from emissions due to electricity consumption in support of OBMP projects; and

Whereas, IEUA provided a copy of the Responses to Comments to all Responsible Agencies on June 30, 2000, in accordance with CEQA; and

Whereas, the Final OBMP PEIR will be available for use as the base environmental document by any Responsible Agency proceeding to implement future site-specific projects under the OBMP in accordance with programmatic procedures outlined in the State CEQA Guidelines Sections 15162 and 15168; and

Whereas, the IEUA Board has received and has reviewed the Final OBMP PEIR, consisting of the draft PEIR, all Responses to Comments, the Mitigation Monitoring and Reporting Program, Findings of Fact and Statement of Overriding Considerations, and all other material in the administrative record; and

Whereas, pursuant to duly given public notice, the IEUA Board has held a full and fair public hearing on June 28, 2000 concerning the OBMP and the PEIR and has considered all written and oral comments and testimony relating thereto and is fully advised thereon.

NOW, THEREFORE, BE IT RESOLVED, DETERMINED AND ORDERED BY THE INLAND EMPIRE UTILITIES AGENCY* AS FOLLOWS:

Section 1. A full and fair public hearing having been held on the PEIR prepared in connection with the OBMP, as stated in the recitals herein, the IEUA hereby approves and certifies the PEIR for the Optimum Basin Management Plan as before the IEUA Board at this time which incorporates the written comments incorporated herein by reference, and all as more fully described in the Final OBMP PEIR, and adopts the Mitigation Monitoring and Reporting Program and Facts, Findings and Statement of Overriding Considerations.

The IEUA further finds that changes or alterations have been required in connection with the adoption of the OBMP and have been incorporated in conjunction with the OBMP which avoid or substantially lessen the significant environmental effects identified in the PEIR.

Pursuant to Public Resources Code Section 21081 (b), the IEUA further finds that where the responsibility for implementation of mitigation measures has been assigned to participating agencies, such mitigation measures are within the responsibility and jurisdiction of such other agencies and such changes can and should be adopted by such agencies when they carry out future site-specific projects under the OBMP.

Section 2. The IEUA hereby authorizes and directs the filing and posting of a Notice of Determination as required by Section 21152 of the Public Resources Code, and that filing required by pursuant to Section 21089 (b) of the Public Resources Code by the General Manager with the Clerk of the Board of Supervisors of San Bernardino County and the State Clearinghouse, Governor's Office of Planning and Research, as soon as possible after the adoption of this Resolution.

Section 3. The IEUA hereby adopts the mitigation measures recommended as conditions of project approval in Sections 1 and 4 of the Final OBMP PEIR, and the Mitigation Monitoring and Reporting Program prepared for the purpose of monitoring the changes which have been adopted or made a condition of project approval as described in Section 1 of this Resolution and all as more fully described in the Mitigation Monitoring and Reporting Program.

Section 4. This Resolution shall take effect upon adoption

ADOPTED, this 12th day of July, 2000.

John L. Anderson

President of the Inland Empire Utilities Agency* and of the Board of Directors thereof.

ATTEST:

Anne Deniche

Secretary of the Inland Empire Utilities Agency* and of the Board of Directors thereof.

(SEAL)

* A Municipal Water District

STATE OF CALIFORNIA)
)SS
COUNTY OF)
SAN BERNARDINO)

I, Anne Dunihue, Secretary of the Inland Empire Utilities Agency*,

DO HEREBY CERTIFY that the foregoing Resolution being No. 2000-7-1,

was adopted at an adjourned regular Board Meeting on July 12, 2000, of said Agency by the following vote:

AYES:	Dunihue, Troxel, Catlin, Koopman, Anderson
NOES:	None
ABSTAIN:	None
ABSENT:	None.

Anne Dunihue

Secretary

*A Municipal Water District

RESOLUTION NO. 2000-7-2

RESOLUTION OF THE BOARD OF DIRECTORS OF INLAND EMPIRE UTILITIES AGENCY*, SAN BERNARDINO COUNTY, CALIFORNIA, TO ADOPT THE GOALS AND PLANS OF THE PHASE I REPORT, THE OPTIMUM BASIN MANAGEMENT PLAN (OBMP), AND THE OBMP IMPLEMENTATION PLAN, AND TO APPROVE THE PEACE AGREEMENT – CHINO BASIN ("PEACE AGREEMENT")

WHEREAS, the Judgment in the Chino Basin Adjudication, Chino Basin Municipal Water District v. City of Chino, et al., San Bernardino Superior Court No. 16437, created the Watermaster and directed it to perform the duties as provided in the Judgment or ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction; and

WHEREAS, the Judgment directs Watermaster to develop an OBMP subject to the limitations contained in the Judgment; and

WHEREAS, Watermaster has prepared and submitted a Phase I Report regarding the OBMP to the Court; and

WHEREAS, the Court has ordered the Inland Empire Utilities Agency (IEUA) to act as "lead agency" for the purposes of preparing any applicable environmental review for the OBMP in the form of a Program Environmental Impact Report (PEIR), and the Court is exercising continuing jurisdiction over this matter; and

WHEREAS, the parties to the Judgment have developed a Memorandum of Principles which articulated a framework of an agreement which the Watermaster Board of Directors approved unanimously on May 26, 2000; and

WHEREAS, the parties to the Judgment have rendered the Memorandum of Principles into a more definitive agreement known as the Peace Agreement and into an OBMP Implementation Plan; and

WHEREAS, the goals and plans in the Phase I Report, implemented consistent with the OBMP Implementation Plan and the Peace Agreement, constitute the OBMP; and

WHEREAS, the IEUA has prepared and circulated a draft OBMP PEIR and held a public hearing to receive public comment regarding the OBMP on June 28, 2000; and

WHEREAS, the parties to the Peace Agreement and the parties to the Judgment have requested that IEUA approve the Peace Agreement, adopt the OBMP and OBMP Implementation Plan, and implement the goals and plans presented in the OBMP Phase I Report as they apply to IEUA, in a manner consistent with the Peace Agreement and the OBMP Implementation Plan.

NOW THEREFORE, the Board of Directors of the Inland Empire Utilities Agency* does hereby RESOLVE, DETERMINE, AND ORDER as follows:

Section 1: The goals and plans in the Phase I Report and their implementation as provided in, and consistent with, the Implementation Plan and the Peace Agreement are in furtherance of the physical solution set forth in the Judgment and Article X, Section 2 of the California Constitution.

Section 2: Subject to the satisfaction of all conditions precedent set forth in the Peace Agreement by the Parties thereto, the IEUA Board supports and approves the Peace Agreement negotiated by the parties thereto, including, but not limited to, Article VII thereof.

Section 3:

a. IEUA hereby adopts the OBMP and OBMP Implementation Plan.

b. IEUA approves the goals and plans of the Phase I Report, consistent with the OBMP Implementation Plan and the Peace Agreement.

c. IEUA supports Watermaster's proceeding in accordance with the OBMP Implementation Plan and the Peace Agreement.

d. IEUA supports Watermaster's compliance with the conditions described in Article V of the Peace Agreement labeled, "Watermaster Performance" in order to implement the provisions set forth in Article V as specified in the OBMP Implementation Plan and the Peace Agreement.

Section 4: The IEUA Board authorizes the President to execute the Peace Agreement on behalf of the Inland Empire Utilities Agency.

Section 5: In approving this Resolution, IEUA is not committing to carry-out any project, within the meaning of CEQA, unless and until environmental review and assessments, as required by CEQA for that defined "project", have been completed. Any future actions that meet the definition of a project under CEQA shall be subject to environmental review as required under the California Environmental Quality Act, utilizing the OBMP PEIR as appropriate.

ADOPTED, this 12th day of July 2000.

John L. Anderson
President of the Inland Empire Utilities Agency* and of the Board of Directors thereof

ATTEST:

Anne Dunihue
Secretary of the Inland Empire Utilities Agency* and of the Board of Directors thereof

(SEAL)

* A MUNICIPAL WATER DISTRICT

STATE OF CALIFORNIA)
)SS
COUNTY OF)
SAN BERNARDINO)

I, Anne W. Dunihue, Secretary of the Inland Empire Utilities Agency*, DO HEREBY CERTIFY that the foregoing Resolution being No. 2000-7-2, was adopted at an adjourned regular Board Meeting on July 12, 2000, of said Agency by the following vote:

AYES:	Dunihue, Troxel, Catlin, Koopman, Anderson
NOYES:	None
ABSTAIN:	None
ABSENT:	None.

Anne Dunihue
Secretary

(SEAL)

* A MUNICIPAL WATER DISTRICT

INLAND EMPIRE UTILITIES AGENCY
MAIN OFFICE - BOARD ROOM

FOR THE

REVIEW AND CERTIFICATION OF FINAL PROGRAM EIR OF THE OBMP

AT THE ADJOURNED REGULAR MEETING OF THE IEUA BOARD OF DIRECTORS

JULY 12, 2000 - 9:00 AM

John Anderson **CALL FOR ITEM #4**

Item #4 is the certification of the Final Program EIR of the OBMP. Rich Atwater will lead the discussion.

Rich Atwater **OVERVIEW OF THE Program EIR**

OBMP support issues
Groundwater storage and conjunctive use
Recycling and Recycled Recharge Projects
Water Quality and the Future Economic Development

INTRODUCTION OF TOM DODSON

Tom Dodson **Lead discussion of action items**

Briefly review the Program EIR process and benefit
Facts, Findings, and Statement of Overriding Considerations
Mitigation Monitoring and Reporting Program

BACK TO RICH ATWATER - closing comments, thank you(s) for Mr. Tom Dodson, Ms. Tami Fincher, and the rest of the TDA staff

John Anderson **Comments from the PUBLIC** (if needed)

John Anderson **Comments from the Board Members** (if needed)

John Anderson **Call for motions**

Approve the Facts, Findings, and Statement of Overriding Considerations
Approve the Mitigation Monitoring and Reporting Program

CERTIFICATION of the Program EIR of the OBMP

AGENDA

BOARD OF DIRECTORS ADJOURNED REGULAR MEETING
INLAND EMPIRE UTILITIES AGENCY*
AGENCY HEADQUARTERS, FONTANA, CALIFORNIA
WEDNESDAY, JULY 12, 2000
9:00 A.M.

CALL TO ORDER

FLAG SALUTE

PUBLIC COMMENT

Members of the public may address the Board on any item that is within the jurisdiction of the Board; however, no action may be taken on any item not appearing on the agenda unless the action is otherwise authorized by Subdivision (b) of Section 54954.2 of the Government Code. Those persons wishing to address the Board on any matter, whether or not it appears on the agenda, are requested to complete and submit to the Board Secretary a "Request to Speak" form which are available on the table in the Board Room. Comments will be limited to five minutes per speaker. Thank you.

ADDITIONS TO THE AGENDA

In accordance with Section 54954.2 of the Government Code (Brown Act), additions to the agenda require two-thirds vote of the legislative body, or, if less than two-thirds of the members are present, a unanimous vote of those members present, that there is a need to take immediate action and that the need for action came to the attention of the local agency subsequent to the agenda being posted.

1. CONSENT CALENDAR

NOTICE: All matters listed under the Consent Calendar are considered to be routine and non-controversial and will be acted upon by the Board by one motion in the form listed below. There will be no separate discussion on these items prior to the time the Board votes unless any Board members, staff or the public requests specific items be discussed and/or removed from the Consent Calendar for separate action.

A. TREASURER'S REPORT

1. Vouchers List
2. Investments

B. RP-1 CHEMICAL FEED IMPROVEMENTS CONTRACT, PROJECT NO. EN98013, PROJECT ACCEPTANCE

It is recommended that the Board accept the work performed by Coons Construction as complete under the construction contract for the RP-1 Chemical Feed Improvements Contract, Project No. 98013; and Authorize the Chief Executive Officer/General Manager to execute the Notice of Completion.

C. <u>KIMBALL INTERCEPTOR AND CHINO INTERCEPTOR DIVERSION LINE CONTRACT, PROJECT NO. EN97004, PROJECT ACCEPTANCE (PHASE I, KIMBALL INTERCEPTOR, SEGMENT II)</u>
It is recommended that the Board accept the work performed by Murray Company as complete under the construction contract for the Kimball Interceptor and Chino Interceptor Diversion Line, Phase I, Segment II, Project No. EN97004; and authorize the Chief Executive Officer/General Manager to execute the Notice of Completion.

D. <u>RP-1 AUTOMATED OUTALL DIVERSION TO STORAGE POND IMPROVEMENTS CONTRACT, PROJECT NO. EN99014, PROJECT ACCEPTANCE</u>
It is recommended that the Board accept the work performed by DenBoer Engineering and Construction, as complete under the construction contract for the RP-1 Automated Outfall Diversion to Storage Pond Improvements, Project No. EN99014; and authorize the Chief Executive Officer/General Manager to execute the Notice of Completion.

E. <u>CONSTRUCTION CONTRACT AWARD, CARBON CANYON WASTEWATER RECLAMATION FACILITY CHLORINE CONTRACT TANK SLIDE GATES REPLACEMENT, PHASE II, PROJECT NO. EN98006</u>
It is recommended that the Board award a construction contract for the CCWRF Chlorine Contact Tank Slide Gates Replacement, Phase II, Project No. EN98006, to Coons Construction, for their low bid of $42,900; and authorize the Chief Executive Officer/General Manager to execute the contract.

2. <u>MONTHLY REPORT OF FINANCIAL AFFAIRS</u>
Staff will present the Monthly Report of Financial Affairs for the month ending May 31, 2000.

C. **KIMBALL INTERCEPTOR AND CHINO INTERCEPTOR DIVERSION LINE CONTRACT, PROJECT NO. EN97004, PROJECT ACCEPTANCE (PHASE I, KIMBALL INTERCEPTOR, SEGMENT II)**
It is recommended that the Board accept the work performed by Murray Company as complete under the construction contract for the Kimball Interceptor and Chino Interceptor Diversion Line, Phase I, Segment II, Project No. EN97004; and authorize the Chief Executive Officer/General Manager to execute the Notice of Completion.

D. **RP-1 AUTOMATED OUTALL DIVERSION TO STORAGE POND IMPROVEMENTS CONTRACT, PROJECT NO. EN99014, PROJECT ACCEPTANCE**
It is recommended that the Board accept the work performed by DenBoer Engineering and Construction, as complete under the construction contract for the RP-1 Automated Outfall Diversion to Storage Pond Improvements, Project No. EN99014; and authorize the Chief Executive Officer/General Manager to execute the Notice of Completion.

E. **CONSTRUCTION CONTRACT AWARD, CARBON CANYON WASTEWATER RECLAMATION FACILITY CHLORINE CONTRACT TANK SLIDE GATES REPLACEMENT, PHASE II, PROJECT NO. EN98006**
It is recommended that the Board award a construction contract for the CCWRF Chlorine Contact Tank Slide Gates Replacement, Phase II, Project No. EN98006, to Coons Construction, for their low bid of $42,900; and authorize the Chief Executive Officer/General Manager to execute the contract.

2. **MONTHLY REPORT OF FINANCIAL AFFAIRS**
Staff will present the Monthly Report of Financial Affairs for the month ending May 31, 2000.

3. **EXECUTION AND DELIVERY OF A TAX AND REVENUE ANTICIPATION NOTE**

It is recommended that the Board of Directors adopt Resolution 2000-7-1, authorizing the execution and delivery of a Tax and Revenue Anticipation Note (TRAN) to support the Commercial Paper Program.

4. **CERTIFICATION OF THE FINAL PROGRAM ENVIRONMENTAL IMPACT REPORT (PEIR) OF THE OPTIMUM BASIN MANAGEMENT PLAN (OBMP)**

It is recommended that the Board of Directors adopt the Facts, Findings, and Statement of Overriding Considerations for the Optimum Basin Management Plan Program Environmental Impact Report; adopt the Mitigation Monitoring and Reporting Program established in the Final Program Environmental Impact Report; and certify the Final Program Environmental Impact Report as complete.

5. **ADOPTION OF PEACE AGREEMENT - CHINO BASIN**

It is recommended that the Board of Directors adopt the Peace Agreement - Chino Basin dated the 29th day of June, 2000; and authorize the Board President to execute the Agreement.

6. **LEGISLATION UPDATE**

A. Status Report on Congressional Activities
B. Status Report on California Legislative Bills
C. Public Information Officer Activities Status

7. **CHIEF EXECUTIVE OFFICER/GENERAL MANAGER'S REPORT**

A. Miscellaneous Agency Matters

8. DIRECTORS' COMMENTS

This is the time and place for the Members of the Board to report on prescheduled Committee/District Representative Assignment meetings, which were held since the last regular Board meeting, and/or any other items of interest.

9. CLOSED SESSION

A. **PURSUANT TO GOVERNMENT CODE SECTION 54956.9 (a), CONFERENCE WITH LEGAL COUNSEL - EXISTING LITIGATION**
CBMWD vs. City of Chino et al., Case No. RCV 51010
Orange County Water District vs. City of Chino, et al., Case No. 117628
Superior Court, County of Orange

ADJOURN

*A Municipal Water District

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Board Secretary (909/357-0241 x201), 48 hours prior to the scheduled meeting so that the Agency can make reasonable arrangements.

Declaration of Posting

I, Patti Bonawitz, Board Secretary of the Inland Empire Utilities Agency*, A Municipal Water District, hereby certify that a copy of this agenda has been posted by 5:30 p.m. in the foyer at the Agency's main office, 9400 Cherry Avenue, Building A, Fontana on Thursday, July 6. 2000.

Patti Bonawitz

CANDIDATE FACTS, FINDINGS, AND STATEMENT OF OVERRIDING CONSIDERATIONS REGARDING THE ENVIRONMENTAL EFFECTS FROM IMPLEMENTING THE OPTIMUM BASIN MANAGEMENT PROGRAM

A. INTRODUCTION

The Inland Empire Utilities Agency (IEUA or Agency), in approving Optimum Basin Management Plan (OBMP), makes the findings described below, based on the facts summarized in this document, and adopts the statement of overriding considerations presented at the end of the findings. Hereafter, the following document (Final Program Environmental Impact Report for the Optimum Basin Management Plan, SCH #2000041047) will be referred to as he "PEIR" for the term Program Environmental Impact Report. The total action that may be implemented by approval of the OBMP by IEUA consists of all of the actions outlined in the OBMP to achieve hydrologic control of the Chino Basin to achieve the goal of meeting future water demands within the Basin while protecting safe yield and water quality.

Adoption and implementation of the OBMP constitutes the "proposed project" that will be evaluated in this Program Environmental Impact Report (PEIR). To carry out this proposal, the Chino Basin Water Master, including IEUA and other participating jurisdictions, compiled the OBMP to achieve the goals outlined above. It is the total program outlined in the OBMP, including the Peace Agreement Chino Basin and OBMP Implementation Plan, that constitutes the proposed project evaluated in the PEIR.

B. PROJECT SUMMARY

B.1 PROJECT LOCATION

The OBMP will be implemented within the Chino Basin which is bounded on the north by the San Gabriel Mountains and the Cucamonga Basin; on the east by the Rialto-Colton Basin, Jurupa Hills and the Pedley Hills; on the south by the La Sierra area, the Santa Ana River and the Temescal Basin; and on the west by the Chino Hills, Puente Hills, and the Pomona and Claremont Basins. The Chino Basin is one of the principle subbasins contributing flow to the Santa Ana River which flows approximately 69 miles from the San Bernardino Mountains to the Pacific Ocean.

B.2 PROJECT CHARACTERISTICS

The Optimum Basin Management Program (OBMP) occurs in the Chino Groundwater Basin and is intended to develop a groundwater management program that enhances the safe yield and the water quality of the basin, enabling all groundwater users to produce water from the basin in a cost-effective manner. To carry out this purpose, the OBMP consists of four primary management goals. Goal number one is to enhance basin water supplies. Goal number two is to protect and enhance water quality. Goal number three is to enhance management of the basin. Goal number four is to equitably finance the OBMP.

In order to administer water-usage for the long-term beneficial use of all component members of Watermaster, an OBMP consisting of two phases has been developed. Phase I of the OBMP consists of defining the state of the Chino Groundwater Basin, establishing goals concerning major issues identified by stakeholders, and affirming a management plan for the achievement of said goals. Phase 2 of the OBMP is intended to be the physical implementation plan for the installation and operation of OBMP facilities. The major OBMP facilities consist of monitoring wells, extensiometers, pipelines, desalters, possibly an ion exchange facility, recharge basins (both existing and new), pump stations, production wells and production monitoring devices.

The aforementioned facilities are examples of the necessary types of physical structures that will be implemented to achieve the project objectives that are outlined in the form of nine Program Elements. The detailed list of proposed facilities that may be implemented under the umbrella of the OBMP is provided in Table 4.2-3 of the PEIR. This list of Program Elements comprises the ultimate focus of Watermaster's future actions, agendas, and policies. The elements contained in the OBMP are as follows:

- Program Element 1 – Develop and Implement Comprehensive Monitoring Program
- Program Element 2 – Develop and Implement Comprehensive Recharge Program
- Program Element 3 – Develop and Implement Water Supply Plan for the Impaired Areas of the Basin
- Program Element 4 – Develop and Implement Groundwater Management Plan for Management Zone 1
- Program Element 5 – Develop and Implement Regional Supplemental Water Program
- Program Element 6 – Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region (Regional Board) and Other Agencies to Improve Basin Management
- Program Element 7 – Develop and Implement Salt Management Program
- Program Element 8 – Develop and Implement Groundwater Storage Management Program
- Program Element 9 – Develop and Implement Conjunctive-Use Programs

It is the implementation of the listed program elements where the potential occurs for the OBMP to cause physical changes in the environment and to produce potential adverse impacts to the environment.

C. ENVIRONMENTAL REVIEW

The entire administrative record, including the OBMP, the PEIR, public comments and responses, IEUA Staff reports, and these facts, findings and statement of overriding considerations, serve as the basis for the IEUA Board's environmental determination. The Board's environmental determination is that the PEIR addresses all of the potential impacts from implementing the OBMP as outlined above. The detailed environmental impacts and proposed mitigation measures for the future development projects are presented in Chapter 4 of the PEIR and in the responses to comments (under separate cover) which are part of the PEIR. Alternatives to the proposed project are discussed in Chapter 5 of the PEIR. Evaluations of growth inducement, cumulative impacts, and irreversible commitment of resources are provided in Chapter 6, Topical Issues, of the PEIR. The following findings contain a summary of the facts used in making determinations for each environmental issues addressed in the PEIR.

1. Consideration of the EIR: The Final Environmental Impact Report, PEIR, dated July 12, 2000 has been presented to the Board of Directors of the Inland Empire Utilities Agency. The Board makes the following certifications pursuant to the California Environmental Quality Act Guidelines section 15090. The Board finds and certifies that the PEIR has been completed in compliance with CEQA. The Board certifies that all voting members have reviewed and considered the PEIR prior to approving this proposal. In addition, all voting Board members have reviewed and considered the additional information presented at or prior to the public hearing on June 28, 2000. The Board further finds and certifies that the PEIR reflects the independent judgement and analysis of the Board and is adequate for this proposed project.

2. Full Disclosure: The Board finds and certifies that the PEIR constitutes a complete, accurate, adequate and good faith effort at full disclosure under CEQA.

3. Location of Record Proceedings: The documents and other materials which constitute the record of proceedings upon which this decision is based are in the custody of the IEUA located at 9400 Cherry Avenue, Bldg. A, Fontana, California. This information is provided in compliance with Public Resources Code §21081.6(a)(2).

4. Inland Empire Utilities Agency as Lead Agency Under CEQA: The Inland Empire Utilities Agency has been designated as the "lead agency" as defined by CEQA Guidelines section 15050 by order of the Hon. Judge Michael Gunn of the San Bernardino Superior Court. In compliance with this judicial order, IEUA has prepared the draft and Final PEIR for the OBMP, prepared these findings in accordance with the CEQA Guidelines and the Public Resources Code, and will carry out all other duties and responsibilities required of a lead agency under the Public Resources Code and the CEQA Guidelines.

D. FINDINGS

Presented below are the environmental findings made by the IEUA after its review of the documents referenced above; and consideration of written and oral comments on the proposed project at a public hearing, including all other information provided during the decision-making process. These findings provide a summary of the information contained in the PEIR, related technical documents, and the public hearing record that have been referenced by the IEUA Board in making its decision to approve the OBMP as the first step in achieving hydrologic control of the Chino Basin.

The PEIR prepared for the OBMP addresses the consequences of implementing nine program elements and a large number of potential site specific projects in the future. This PEIR evaluated 14 major environmental issue categories for potential significant adverse impacts. These major environmental issue categories, in the order presented in the PEIR, are: land use, population and housing, geologic resources/constraints, water resources/water quality, air quality, transportation and circulation, biological resources, energy, hazards/risk of upset, noise, public services, utilities, cultural resources, and aesthetics and visual resources. When all impact categories are included, the PEIR reached a total of 28 findings on environmental issues. Short- and long-term impacts and project-specific and cumulative impacts were evaluated for implementation of the proposed project. Some of the issue categories contained several subissues which are summarized below. Of these 14 major environmental categories, the Board concurs with the findings in the PEIR that the issues and subissues discussed below can be mitigated below a significant impact threshold; or for those issues which cannot be mitigated below a level of significance, that overriding considerations exist which make those impacts acceptable.

Those environmental issue categories identified in the PEIR as having no potential for significant adverse impact, with or without mitigation, are described below in Section E. The discussion in Section E summarizes the findings contained in the PEIR for the nonsignificant issues, including those for which mitigation has been identified to reduce impacts below a significant level. Unavoidable (unmitigable) significant adverse impacts of the project are described in Section F of this document. An analysis and comparison of the alternatives to the proposed project are described in Section G of this document. Project benefits are described in Section H. The balancing of benefits and impacts and the statement of overriding considerations are described and evaluated in Section I of this document.

Several additional mitigation measures were identified for modification and implementation in the Responses to Comments on the PEIR and these changes have been incorporated into the Final PEIR. All of these changes in mitigation measures remain within the scope of the performance standards outlined in the Draft PEIR. Mitigation measures referenced in this document are also contained in the mitigation monitoring and reporting program which is attached to the PEIR. The agent responsible for implementation and monitoring is identified in the monitoring program. The mitigation measures were carried forward into the Mitigation Monitoring and Reporting Program prepared by the IEUA for implementation. Based on the analysis in this document, many of the identified mitigation measures are the responsibility of IEUA; however, individual participating agencies (Responsible Agency) will be responsible for projects that they initiate under the OBMP's auspices. The monitoring program ensures that the measures identified in the PEIR are implemented in accordance with discussions in the PEIR.

E. <u>NONSIGNIFICANT IMPACTS IDENTIFIED IN THE PEIR</u>

The following issues were identified in the PEIR as having no potential to cause significant impact or were capable of having impacts reduced below a significant level by implementing the identified mitigation measures. In the following presentation, each resource issue is identified; it is followed by a summary description of the potential significant adverse environmental effect and a short discussion of the findings and facts in the administrative record, as defined above.

The Board hereby finds that all mitigation measures identified in the Final PEIR that will be implemented to mitigate the impacts of this project will be incorporated into, or will be required of, the project to avoid or substantially lessen potentially significant environmental impacts to a level of insignificance. Public Resources Code Section 21081 states that no public agency shall approve or carry out a project for which an environmental impact report has been completed which identifies one or more significant effects unless the public agency makes one, or more, of the following findings:

a. Changes or alterations have been required in, or incorporated into the project which mitigate or avoid the significant environmental effects thereof as identified in the completed environmental impact report;

b. Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such agency or can and should be adopted by such other agency; and/or

c. Specific economic, social or other considerations make infeasible the mitigation measures or project alternatives identified in the environmental impact report.

The Board hereby finds, pursuant to Public Resources Section 21081, that the following issues are nonsignificant because they have no potential to cause a significant impact or because mitigation measures will be implemented as outlined below. The Board further finds that no additional mitigation measures or project changes are required to reduce the potential impacts discussed below to a level of nonsignificance. These issues and the measures adopted to mitigate them to a level of insignificance are as follows:

1. Land Use:

a. Conflicts with current zoning: Development of the project has the potential to cause conflicts with adjacent land uses. Mitigation measures, including but not limited to the selection of alternative sites for construction of future desalters where desalter operations can create significant incompatibilities with adjacent uses and/or the preparation of technical reports that identify specific measures that reduce potential incompatible activities or effects below thresholds established in the general plan for the jurisdiction where the facility will be located, have been found to mitigate this impact to an insignificant level.

b. Agricultural resources: The Chino Basin contains very significant agricultural resources, primarily dairy ranches that are located in the southern portion of the basin. At the project-specific level, the OBMP has the potential to adversely affect agricultural resources and/or operations. Mitigation measures, including but not limited to the selection of alternative sites where future project facilities are proposed for locations that support active agricultural operations on important farmlands, have been found to mitigate this impact to an insignificant level.

c. Disruption of established communities: At the project-specific level, the OBMP has the potential to disrupt the continuity of established communities through the installation of pipelines and recharge facilities. Mitigation measures, including but not limited to the selection of alternative sites and/or the preparation of technical reports that identify specific measures that will be utilized to reduce potential incompatible activities or effects below thresholds established in the general plan for the jurisdiction where the facility will be located, have been found to mitigate this impact to an insignificant level.

d. Loss of development acreage: Construction of the project facilities has the slight chance to impact the developable acreage in the Chino Basin. The facilities that may potentially effect development include pipelines and recharge basins. The proposed desalters, production and monitoring wells and other project facilities are considered to have a non-significant adverse impact in this regard. Mitigation measures, including but not limited to the selection of alternative sites and/or the preparation of technical reports identifying specific measures to reduce potential incompatible activities or effects below thresholds established in the general plan for the jurisdiction where the facility will be located, have been found to mitigate this impact to an insignificant level.

2. Population and Housing:

It is remotely possible that the development of specific facilities, such as desalters, production wells or recharge basins, could adversely impact existing homes. Mitigation measures, including but not limited to ensuring that short- and long-term housing of comparable quality and value are made available to homeowners prior to initiating construction of the project facility, have been found to mitigate this impact to an insignificant level.

3. Geologic Resources/Constraints:

a. Fault rupture: No known faults occur within the project area; therefore, the potential for fault rupture is considered to be low. Mitigation measures, including, but not limited to, requiring adherence to seismic engineering construction, land use, and development standards, have been found to mitigate this impact to an insignificant level.

b. Seismic ground-shaking: The project site may be subject to significant ground-shaking caused by earthquakes along portions of the fault systems within the vicinity of the project over the life of the proposed project. Mitigation measures, including but not limited to the application of current and appropriate seismic design and construction criteria to all structures subject to significant seismic shaking, have been found to mitigate this impact to an insignificant level.

c. Liquefaction: Liquefaction results when water-saturated, sandy, unstable soils are subject to intense shaking, such as that caused by an earthquake. A portion of the project area may be prone to liquefaction. Mitigation measures, including but not limited to the requirement that each site within identified Liquefaction Hazard Zones be evaluated by a licensed engineer prior to design and/or land disturbance/construction have been found to mitigate this impact to an insignificant level.

d. Erosion and grading: The project may result in erosion and/or unstable soil conditions due to grading activities. With the exception of the recharge basins, all ground disturbing activities will affect small areas that can be designed to minimize the amount of ground disturbance. Mitigation measures, including but not limited to use of protective coverings, limiting the amount of area disturbed and the length of time slopes and barren ground are left exposed, construction of diversion dikes and interceptor ditches, and planting of windbreaks, have been found to mitigate erosion and grading impacts to an insignificant level.

e. Subsidence hazards: A portion of the project area has been identified as experiencing land subsidence impacts within a former artesian area of the valley. A variety of mitigation measures have been adopted to address this impact. The proposed goals of the project include further study of this phenomena as part of a regional monitoring program. Whatever future pumping patterns are implemented in support of the project, desalters will not be allowed to increase subsidence in any way within pre-existing subsidence zones. To ensure that pumping impacts in the vicinity of the desalter well field do not have an adverse impact on water levels and subsidence issues, the following performance standards shall be used to evaluate the desalters. First, the water level declines in areas surrounding the desalter pumping locations will not be allowed to decline to the extent that pumping capabilities for surrounding wells are impacted. If surrounding wells and producers are impacted by declines in water levels, alternative access to equivalent quantity and quality of water will be provided to the affected surrounding parties. Second, if desalter well fields are demonstrated to cause or exacerbate impacts to subsidence areas measurable by a decline of over six (6) inches in ground level at a quarter (1/4) mile radius, or at the radius of the nearest non-project participating structure, then pumping patterns for the desalters shall be modified to reduce impacts to cause no more than six (6) inches of decline in ground level at the smallest of the two radii. Mitigation measures, including but not limited to those mentioned above, have been found to mitigate this impact to an insignificant level.

4. Water Resources/ Water Quality:

a. Changes in absorption rates, drainage patterns and surface runoff: Implementation of the project may impact absorption rates, drainage patterns and surface run-off. Actions under the project affecting these areas include, but are not limited to, the installation of three desalters, construction of new recharge basins and modifying ground water production. Mitigation measures for this impact will include but not be limited to (i) installation of equipment within or along existing disturbed easements or rights-of-way or otherwise disturbed areas, (ii) the covering of all areas not covered by structures with hardscape, native vegetation and/or human-made landscape areas, and (iii) collection and retention of surface runoff at desalter facilities. Mitigation measures, including but not limited to those listed above, have been found to mitigate this impact to an insignificant level.

b. Water-related hazards, flooding: The utilization of flood control basins for purposes for recharge has the potential to cause increased risks to people and property for flood-related hazards. Mitigation measures have been adopted to address this impact. By establishing an order of priorities for the basin, along with the specific management plans to be created for each basin prior to initiation of recharge operations, potential conflicts between flood control operations and recharge operations will be minimized. The Watermaster or other agencies will define the amount of water that can be set aside as a conservation pool within existing flood control basins and specific operational parameters. This will ensure that recharge activities do not conflict with flood control operations at any flood control basin. Variable pooling and recharge schedules will ensure that flood-related hazards remain less than significant. Project participants will also assist with the control and restoration of any environmental damage that may occur due to an accidental release from the SARI line. Mitigation measures, including but not limited to those set forth above, have been found to mitigate this impact to an insignificant level.

c. Discharge of pollutants and alteration of surface water quality: The installation of monitoring wells will create ground disturbances and entail drilling activities that could result in release of pollutants, including eroded sediment. In addition, the potential for accidental releases of petroleum products does exist during well construction activities. Abandonment of wells can also result in the discharge of pollutants. Mitigation measures to address this impact include but are not limited to the following:

(i) inclusion of the estimated amount of water lost from the Basin due to rising water at the low end of the Basin in the compilation of local and *in lieu* groundwater storage balances;

(ii) sampling of well sites prior to refurbishment or capping to ensure that the discharge does not contain any contaminants exceeding regulatory thresholds;

(iii) generally prohibiting the discharge of recycled water into streams that are transporting storm flows, unless modeling verifies that the volume of recycled water and total dissolved solids (TDS) will not cause the TDS of the storm flow to exceed the project objective for TDS at the location where the recycled water is discharged into the storm flow; and

(iv) preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) for all project construction sites and the posting of a performance bond.

Mitigation measures, including but not limited to those listed above, have been found to mitigate this impact to an insignificant level.

d. Rate of groundwater flow: The installation and operation of the wells to support desalters will result in a substantial quantity of water being pulled out of the lower portions of the Basin. While the quantity of water produced may be unchanged, the pumping will be occurring in a concentrated location, and thus has the potential to impact groundwater flow patterns in this area. Mitigation measures, including but not limited to the adoption of mandatory performance standards which compensate for possible water level decline and potential subsidence impacts, have been found to mitigate this impact to an insignificant level.

e. Groundwater quality: The installation of monitoring wells will create ground disturbances and entail drilling activities which can result in release of pollutants. Additional activities under the project may also impact ground water quality. Mitigation measures to mitigate this impact include but are not limited to the following:

(i) the identification of Best Management Practices that will minimize the potential for accidental releases of any chemicals or materials that could degrade water quality;

(ii) identification of all chemicals that will be used at the drilling site prior to authorization of drilling contracts under the project;

(iii) submittal of a SWPPP prior to the commencement of drilling;

(iv) monitoring of recharge wells to identify the volume and rate of recharge that can be conducted without causing the project's water quality objective for TDS and TIN to be exceeded;

(v) providing specific data to the Department of Health Services when recharge of recycled water is proposed; and

(vi) establishment of a management plan that is satisfactory to the SBCFCD for any recharge project.

Mitigation measures, including but not limited to those set forth above, have been found to mitigate this impact to a level of insignificance.

5. Air Quality:

The project is located within the Chino Basin, which, in turn, is located within the South Coast Air Basin (SCAB). The South Coast Air Quality Management District has jurisdiction over air quality issues within the SCAB. Impacts to air quality under the project can be divided into two categories: construction impacts and operational impacts.

a. Construction Impacts: Construction of the project may cause temporary adverse effects to the air quality of the project area, particularly with respect to dust and airborne particulate. Mitigation measures, including but not limited to the application of non-toxic soil stabilizers, replacement of ground cover or pavement immediately after construction is complete, watering grading sites, and suspending grading activities when wind exceeds 25 miles per hour, have been determined to mitigate the impact of construction activities on air quality to an insignificant level.

b. Operational Impacts: The Final EIR for the OBMP has found the operational impacts of the project to be potentially significant, despite the imposition of all feasible mitigation measures. Operational impacts to air quality are discussed in Section F and are the subject of a Statement of Overriding Considerations in Section I, as required by CEQA Guidelines Sections 15091 and 15093.

6. Transportation and Circulation:

During the construction of the project, there may be short-term detours, disruptions of traffic flow, and the potential creation of traffic hazards as a result of construction within the road rights-of-way. For long-term operational facilities, the potential exists that a facility, such as a desalter, may create localized traffic hazards. Mitigation measures, including but not limited to the preparation of traffic studies for any project which increases traffic generation, requirements that each construction contractor provide adequate traffic management during construction and that no open trenches or traffic safety hazards be left in the roadways when construction personnel are not present, repair of roads to their pre-construction status, and a requirement that roadway improvements for project facilities be provided that will eliminate traffic hazards associated with access to the facility in accordance with standard agency requirements or prudent circulation system planning requirements, have been found to mitigate this impact to an insignificant level.

7. Biological Resources:

Implementation of the project has the potential to impact biological resources depending on the site(s) selected for project facilities and the amount of site disturbance required to install the project facilities. It is possible, depending on the location of the project facilities and improvements, that the project may impact candidate, sensitive, or special status species and other sensitive natural communities. Since several endangered species occur in the Chino Basin, including the Arroyo Toad, Least Bell's Vireo, Southwestern Willow Flycatcher, Quino Checkerspot Butterfly, San Bernardino Kangaroo Rat, and the Coastal California Gnatcatcher, the possibility that these species will be impacted must be considered. Some individuals of the species may be displaced or succumb due to direct construction impacts or otherwise be impacted due to competition for limited adjacent holding capacities. Several unique plant communities occur within the project area, including chaparral, coastal sage scrub, deciduous woodlands, grasslands and wetlands. In addition, the project area contains the California Sycamore Series, the Arroyo Willow Series and Delhi Sands. Depending upon the siting of project facilities and improvements, these plant communities could be impacted by the project.

a. Special status species: Due to the numerous endangered, threatened and special status species found throughout the project area, the mitigation measures set forth below have been adopted. Prior to facility construction or installation, project specific biological resource surveys will be conducted on site when any previously undeveloped area may be disturbed by project implementation. If any sensitive species have the potential to occur on the site where project facilities are proposed, or if previous environmental studies have not been conducted, surveys will be conducted in accordance with all established state, federal and generally accepted biological survey protocols for each potential species that may be located onsite. Further, all mitigation measures recommended by jurisdictional agencies will be implemented. Project facilities will be designed to protect habitat values and to preserve significant, viable habitat areas. Within designated habitat areas of rare, threatened or endangered species, disturbance of protected biotic resources will be prohibited. Impacts and disturbances to individuals and species considered sensitive by jurisdictional agencies will be avoided, whenever feasible. With respect to the continued preservation of the Least Bell's Vireo, an endangered species, the amount of water taken from or added to the Santa Ana River will ensure that the water level is maintained between the 505' and 498' elevation mark. Mitigation measures, including but not limited to those listed above, have been found to mitigate the project's impact on special status species to an insignificant level.

b. Vegetation communities: Due to the numerous vegetation communities present throughout the project area and the potential impact the project may have on these communities, the mitigation measures set forth below have been adopted. Conservation or open space easements, granting of development rights, or other similar protections for biological habitats which are to be preserved in their natural state will be required. To maximize habitat protection, primary emphasis will be placed on the preservation of large, unbroken blocks of natural open space and wildlife habitat area as well as protecting the integrity of habitat linkages. Preservation of sensitive habitat areas will be emphasized. Landscaping adjacent to areas containing important biological resources will be designed to avoid invasive species which could negatively impact the value of the preserved resources. The preservation of individual oak, sycamore and walnut trees within proposed development sites will be maximized. Buffer zones will be required adjacent to areas of preserved biological resources. Mitigation measures, including but not limited to those discussed above, have been found to mitigate the impact on vegetation communities to an insignificant level.

8. Hazards and Risk of Upset:

The project may pose certain hazards and risks, ranging from construction activities to operation of facilities such as wells, desalters and other facilities. The project may also require the transportation and handling of hazardous materials. Mitigation measures for this impact include but are not limited to the following:

(i) incorporation of Best Management Practices for all project facilities that handle hazardous materials to reduce the potential for the accidental release of hazardous chemicals;

(ii) for project facilities handling hazardous materials, preparation of a business plan which assesses potential accidental release scenarios and identifies equipment and response capabilities required to provide immediate containment, control and collection of any released material;

(iii) preparation of reports modeling pathways of release and secondary containment for the storage of any acutely hazardous material at a project facility;

(iv) delivery of all contaminated material to a licensed treatment, disposal or recycling facility that has the appropriate systems to manage the contaminated material without significant impact on the environment;

(v) specific contaminant thresholds will be established, and sufficient sampling to ensure attainment of these thresholds will be conducted before determining that an area contaminated by an accidental release is fully remediated,;

(vi) preparation and implementation of a road operation management plan during construction activities within existing road rights-of-way or other easements where continuous access is required;

(vii) to the extent feasible, construction activities in support of the project will not be located in major evacuation or emergency response routes;

(viii) where available, selection of alternative treatment systems that reduce potential health risks at project facilities;

(ix) preparation of reports defining potable water production requirements and aquifer areas to be removed from water production prior to approving specific recycled water recharge facility locations and volumes;

(x) preparation of hydrogeologic studies for each recharge site defining the recharge impacts on existing known contaminated plumes;

(xi) termination or modification of recycled recharge operations if impacts that were not forecast to occur demonstrate that the recharge operations are causing significant adverse impacts on the groundwater aquifer.

Mitigation measures, including but not limited to those discussed above, have been found to mitigate this impact to an insignificant level.

9. Energy:

Substantial energy resources will be required to support OBMP projects in the future, particularly desalter facilities and pumps to move poor quality water, recycled water and storm water throughout the Basin. Adequate energy resources were determined to be available, and no mitigation measures were included under this issue discussion. Specific mitigation measures are recommended to further insure that impacts of the project on electrical and natural gas utilities remain insignificant. These measures are summarized below in the utility discussion on each of these energy resource providers.

10. Noise:

The project has the potential to generate short- and long-term changes in the noise environment of the project area. The project may also contribute to the cumulative increase in noise that accompanies urban growth and development.

a. Short-term noise: Construction noise would be generated by any of the project facilities and would include trucks, construction equipment, portable generators and concrete mixers. Since construction noise is of a temporary nature, most jurisdictions do not require such noise to be mitigated to specific threshold levels. Mitigation measures, including but not limited to restricting construction hours to the hours of 7 a.m. to 7 p.m. on Monday through Friday and 9 a.m. to 6 p.m. on Saturday, equipping all construction vehicles with properly operating and maintained mufflers, providing adequate hearing protection for construction employees, and installing portable noise barriers where appropriate, have been found to mitigate the short-term noise impact to an insignificant level.

b. Long-term noise: Operation of several facilities contemplated under the project could result in noise levels greater than the 60-65 dBA CNEL values that are considered acceptable for noise sensitive uses. Noise generation from the project facilities will come not only from the facilities themselves, but also from traffic to and from the facilities and from equipment used at the facility. Mitigation measures for this impact include:

(i) requiring all production wells and booster pump noise levels attenuated to 50 dBA CNEL at 50 feet from the wellhead;

(ii) including adequate measures in the project design of all facilities so that interior noise levels are consistent with Title 25 (California Noise Insulation Standards);

(iii) requiring all parking for desalter uses adjacent to residential areas be enclosed within a structure or separated by a solid wall with quality landscaping as a visual buffer; and

(iv) requiring that desalters are constructed and operated so that noise levels from operations do not exceed 50 dBA during night hours and 65 dBA averaged over the twelve hours of daytime when located adjacent to existing or future sensitive land uses.

Mitigation measures, including but not limited to those listed above, have been found to mitigate this impact to an insignificant level.

11. Public Services:

The implementation of the project could increase the demand for police protection services, specifically with respect to potential trespass upon project facilities. Mitigation measures, including but not limited to the installation of fences or some other form of controlled access to project facilities, have been found to mitigate this impact to an insignificant level.

12. Utilities:

The utility issues of concern are increased demand for utility capacity without existing capacity or comparable increases in capacity from implementing the project. The project, as proposed, will not significantly impact utilities in the project area. However, the following mitigation measures are recommended to further insure the insignificance of the project related impacts upon utilities:

a. Electricity: The following mitigation measures are recommended to further insure that impacts of the project on electrical utilities are insignificant. Developers in the proposed project area should coordinate with Southern California Edison and other power companies regarding the location and phasing of required on-site electrical facilities. Proposed building construction should comply with Title 24 of the California Administrative Code. On-site electrical lines should be installed underground. Project planners and architects should consult with Southern California Edison regarding current energy conservation techniques. Architectural planning and design, to the extent feasible, should take full advantage of such concepts as natural heating and/or cooling through sun and wind exposure and solar energy collection systems.

b. Natural Gas: The following mitigation measures are recommended to further insure that impacts of the project on natural gas utilities are insignificant. The thermal insulation installed in walls and ceilings should meet the standards established by the State of California. Windowless walls for western exposures and sill orientation of buildings to use solar heating systems and efficient heating-cooling systems should be installed whenever feasible. Landscaping should be used to moderate building heat gain. Use of energy conservation methods that can be readily incorporated into project design.

c. Wastewater: The following mitigation measures are recommended to further insure that impacts of the project on wastewater capacity within the project area are insignificant. Wastewater treatment facilities/distribution system improvements and expansion projects should precede or be concurrent with growth generating projects as required to maintain adequate system capacity levels. Future developers should be assessed a sewer capacity and connection fee by the appropriate serving agency. All industrial and commercial users should take on-site measures to reduce the load strength of their sewage.

d. Solid Waste: The following mitigation measures are recommended to further insure that impacts of the project on solid waste capacity within the project area are insignificant. All proposed development/redevelopment projects within the proposed project area that will generate solid waste should be reviewed on a project-by-project basis by the permitting jurisdictional agencies in coordination with County landfill officials to determine the degree of impact upon remaining landfill capacity. Projects should be approved only after it is determined that the additional solid waste generated can be disposed of within existing landfill facilities.

e. Water Supplies: The following mitigation measures are recommended to further insure that impacts of the project on water supply within the project area are insignificant. All project related development/redevelopment that includes exterior landscape elements should employ xeriscape plant design and water conservation concepts. The xeriscape requirements should include use of drought tolerant species, drip irrigation, soil moisture sensors and automatic irrigation systems. Mulch should be used extensively in all landscaped areas to reduce erosion and evaporation. Lawns should be kept to a minimum and warm-season grasses used.

13. Cultural Resources. A large portion of the project area contains sensitive cultural sites. Activities requiring the excavation or movement of soil material at any location within the project area have the potential to adversely effect cultural resources. Cultural resources within the project area include prehistoric food processing sites and campsites, village sites, historic privy pits, barns, foundations and dams. While a large portion of the project area has been surveyed for cultural resources, many potential project area sites have not. Mitigation measures for this impact include but are not limited to the following:

(i) preparation of a basic archeological inventory of any proposed project site and an assessment of the cultural resources present;

(ii) monitoring by an archeological monitor and a Native American observer/consultant in situations where cultural resources are potentially subject to direct or indirect impact and testing or where data recovery is not proposed;

(iii) data recovery when an archeological resource is found to be significant and no other preservation option is available; and

(iv) the siting of future projects outside the highly sensitive cultural resource areas depicted in the Final EIR when feasible.

Mitigation measures, including but not limited to those discussed above, have been found to mitigate the impact on archeological resources to an insignificant level.

In addition to the above-mentioned mitigation measures, the following mitigation measures should be considered by agencies proposing to construct project facilities: conducting a comprehensive historic building survey, adopting a preservation ordinance, ensuring that other planning programs, plans and ordinances are compatible with historic preservation goals, developing a public appreciation of cultural resources program, and redesigning project facilities as appropriate to comply with these measures. While these measures are not necessary to mitigate the project impacts to a level of insignificance, these measures will enhance the protection and preservation of cultural resources throughout the project area.

14. Aesthetics and Visual Resources:

Visual resources include natural and human-made features that give a particular environment its aesthetic qualities. These resources include remote and pristine environments, landscapes with unique land forms or vegetation patterns, and water bodies or rock formations with unusual or outstanding qualities. All of the cities within the project area provide protection for aesthetic and visual resources within their respective general plans. The project area includes several important visual and aesthetic resources including, but not limited to, views of the San Gabriel Mountains, numerous scenic routes and highways, and scenic vistas. The construction and implementation of project facilities may adversely impact these resources. Potential impacts include lights and glare from new facilities and vehicles traveling to and from these facilities and blockage of views of and from existing neighborhoods. Mitigation measures for this impact include but are not limited to the following:

(i) revegetation of all surface areas disturbed by project construction;

(ii) conformance with design requirements of jurisdictional agencies when project facilities are proposed adjacent to scenic highways, corridors or other scenic features identified by planning agencies;

(iii) where facilities will disrupt views from occupied areas with significant scenic vistas, performance of a visual simulation analysis. If the analysis identifies a significant aesthetic or visual impact, the proposed facility will be relocated, redesigned to reduce the impact to an insignificant level, or a subsequent environmental evaluation will be prepared;

(iv) adherence to local agency design guidelines for above-ground facilities; and

(v) placement of all utilities underground, unless not technically feasible.

Mitigation measures, including but not limited to those mentioned above, have been determined to mitigate these impacts to an insignificant level.

This concludes the summary of environmental impacts that are considered nonsignificant or that can be mitigated below a significant level.

F. SIGNIFICANT UNAVOIDABLE EFFECTS OF THE PROJECT

The IEUA Board finds that despite the incorporation of extensive changes and alterations into the proposed project, approving and implementing the OBMP will allow one impact to remain unavoidably significant because this impact cannot be mitigated to a nonsignificant level. This unavoidable significant adverse environmental impact is air quality, where emissions associated with electrical consumption will exceed the South Coast Air Quality Management District's thresholds of significant for nitrogen oxides. This impact and the measures identified to minimize it to the extent feasible are summarized below. Thus, the potential for significant effects to occur for this issue would continue to exist regardless of whether or not participating agencies implement the project changes and mitigation measures contained in the PEIR.

The potential impact to the above listed resource and existing background conditions were concluded to be significant based on the whole record which demonstrated that this impact could not be reduced below thresholds of significance by the proposed project changes to the OBMP (alternatives, mitigation measures, or design changes). To the extent that future site spécific projects implemented under the OBMP generates the emissions forecast from electricity consumption, approval of the OBMP contributes to the significant impact summarized and described below. Thus, despite the incorporation of changes to the proposed project outlined in the PEIR, and summarized below, the following impact caused by the proposed project cannot be fully mitigated to a level of insignificance and a statement of overriding consideration is thereby included herein.

1. Air Quality:

The PEIR for the OBMP discusses air quality impacts at pages 4-270 through 4-295 of the Draft PEIR. Air pollution emissions, specifically nitrogen dioxide emissions, are considered to be adverse, unavoidable, and unable to be fully mitigated to insignificance. Changes or alterations have been incorporated into the project which substantially lessen the significant environmental air quality impact, as set forth below, although these changes and alterations have not reduced the impact to a level of insignificance. To the extent these impacts remain significant and unavoidable, such impacts are acceptable when weighed against the overriding social, economic, legal, technical, and other benefits provided by the project, as stated in the Statement of Overriding Considerations presented below.

The OBMP Final EIR describes air quality impacts associated with operation of project facilities as an unavoidable significant impact. The construction and operation of new wells, desalters and booster pumps required to move poor quality water, recycled water and storm water will exceed the South Coast Air Quality Management District's (SCAQMD) threshold of significance for NOx. Mitigation measures including but not limited to compliance with SCAQMD rules, regulations and permit conditions have been identified in the OBMP Final PEIR. No other feasible mitigation measures are identified by the OBMP Final PEIR, nor are other feasible mitigation measures known, which could avoid or further lessen this impact.

This concludes the discussion of all potential significant unavoidable adverse impacts attributable to the implementation of the proposed project.

G. ALTERNATIVES TO THE PROPOSED ACTION

The California Environmental Quality Act (CEQA) requires discussion of reasonable project alternatives that could feasibly attain the project's objectives (14 CCR §15126(d)). CEQA requires that an EIR evaluate a reasonable range of alternatives to the project, or to the location of the project that: (1) offers substantial environmental advantages over the proposed project, and (2) may be feasibly accomplished in a successful manner and within a reasonable period of time considering the economic, environmental, legal, social, and technological factors involved.

The basic objectives of the OBMP is to implement a groundwater management program that enhances the safe yield and the water quality of the basin, enabling all groundwater users to produce water from the basin in a cost-effective manner. To carry out this purpose, the OBMP consists of four primary management goals. Goal number one is to enhance basin water supplies. Goal number two is to protect and enhance water quality. Goal number three is to enhance management of the basin. Goal number four is to equitably finance the OBMP.

The PEIR considered a total of three alternatives to the proposed action. These alternatives were defined based on mandatory requirements and alternatives designed to reduce the identified significant impacts of the project as previously identified. The three alternatives that were subject to evaluation in the PEIR with the proposed action are:

a. No Project/No Implementation of the OBMP
b. Conjunctive Use Alternative
c. SAWPA Alternative

The purpose in analyzing alternatives to a proposed project is to determine if an alternative is capable of eliminating or reducing potential significant adverse environmental effects, "even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly" (State CEQA Guidelines, Section 15126(d)(3)). The following discussion summarizes the PEIR evaluation of each of these alternatives in determining whether they are feasible alternatives to the proposed action (State CEQA Guidelines, Section 15126(d)) and whether an alternative can eliminate or substantially lessen significant impacts described in this document for the proposed action. Each of these alternatives specified below is infeasible or less desirable than the proposed project, and therefore is rejected, for the reasons set forth below.

a. No Project Alternative: Under this alternative, the management of the Chino Basin would revert to the water serving agencies. This alternative would result in a violation of the Chino Basin Judgement Ruling of February 19, 1998, which directed the development and implementation of the

Optimum Basin Management Program. In addition, this alternative cannot be considered the environmentally superior alternative to the proposed project from a total environmental standpoint because the environmental damage from implementing the water supply on a case-by-case basis is forecast to be substantially more significant than that arising from implementing the OBMP. In addition, the project goals of safe yield and water quality improvement cannot be insured under the no-project alternative. Therefore, this alternative would not provide an overall environmental benefit, would achieve none of the project objectives, and would forego all project benefits. For these reasons, the no project alternative is infeasible and, therefore, is rejected.

b. Conjunctive Use Alternative. This alternative would create a conjunctive use plan for the Chino Basin. Under such a plan, Watermaster would develop a regional conjunctive-use program to store supplemental water. The ability to attain the project goals and objectives would be maintained under this alternative. However, this alternative cannot be considered the environmentally superior alternative. The potential environmental risks of a conjunctive use alternative are much higher than those associated with the proposed project. The Conjunctive Use Alternative would pose an increased threat to local water quality through the mobilization of water quality anomalies, the increased number of recharge sites required, and the likelihood that overall salt balance would be disturbed. Most importantly, the conjunctive use alternative may cause additional water in the aquifer to rise to a sufficient elevation which would encroach into the vadose zone where existing contaminants could further pollute the basin. For these reasons, the conjunctive use alternative is deemed infeasible and less desirable than the proposed project and, therefore, is rejected.

c. Santa Ana Watershed Project Authority (SAWPA) Alternative. As with the proposed project, this alternative is watershed based, proposing a regional program to assure a sustainable water supply for the future, while at the same time seeking to enhance the environment. However, this alternative would have comparable impacts to the proposed project and is therefore not a superior environmental alternative. In addition, the SAWPA Alternative includes numerous projects outside the project area, which could slow the implementation of the SAWPA Alternative, whereas the proposed project is focused solely on the Chino Basin area. The SAWPA Alternative also produces a lower level of new groundwater storage than does the proposed project, thereby failing to achieve an important project goal. For these reasons, the SAWPA Alternative is considered infeasible and less desirable than the proposed project and, therefore, is rejected. In comments on the PEIR, SAWPA indicated that its program should not be considered an alternative, but a program to be implemented in conjunction with the OBMP. This was concluded to be a valid comment, but the additional programs in the SAWPA alternative were considered to be an alternative means of achieving goals and objectives similar to the OBMP. They can still be implemented in conjunction with the OBMP, but will not accomplish the full scope of hydrologic control that could be achieved with the OBMP, or the OBMP in conjunction with the SAWPA projects.

Based on the analysis contained in the OBMP PEIR, the OBMP was identified.as the environmentally superior alternative, along with the SAWPA alternative which would have comparable environmental impacts.

This concludes the discussion of alternatives to the proposed project and the Board findings regarding each of the alternatives evaluated for the project in the EIR.

H. PROJECT BENEFITS

The benefits from approving the proposed project are related to the enhanced water supply and water quality that will result from the implementation of the OBMP. The project benefits outlined below were considered by the IEUA Board in performing the balancing test with those unavoidable significant adverse impacts presented earlier in this document.

1. Benefits of Implementing the Proposed Project

The four primary (general) benefits that will accrue to the future residents of the Chino Basin from implementation of the OBMP include:

1 - Enhance Basin Water Supplies
2 - Protect and Enhance Water Quality
3 - Enhance Management of the Basin
4 - Equitably Finance the OBMP

Specific benefits that can be achieved under the first general benefit (enhanced water supply) include:

a) Maintenance or increase of groundwater production in the southern portion of the Basin with treatment and service of contaminated groundwater in the southern third of the Basin.
b) Location of new recharge facilities in the upper half of the Basin.
c) Location of new recharge facilities in the lower half of the Basin when recovery of recharged water can be ensured.
d) Development and implementation of a comprehensive basin-wide ground level, groundwater level, quality, and production monitoring program.
e) Development and implementation of a comprehensive plan of stormwater recharge.
f) Development of a comprehensive stormwater flow and quality monitoring program in partnership with other agencies charged with flow and quality monitoring.
g) Development of new stormwater recharge projects at existing and future flood control facilities.
h) Maximization of recharge capacity at existing recharge facilities through improved maintenance.
i) Development of methods to account for losses from storage accounts; and the setting of limits on storage if necessary.
j) Development of a comprehensive ground level, groundwater level, and quality monitoring program in Management Zone 1.
k) Development of an immediate groundwater management program for Management Zone 1, followed by management programs for Management Zones 2, 3, 4, & 5.
l) Creation of new assimilative capacity through the development of offset programs and through other mitigation programs.
m) Maximization of the direct use of recycled water.
n) Development of new sources of supplemental water from the Bunker Hill Basin, the Santa Ana River and other outside Basin sources.

Specific benefits that can be achieved under the second general benefit (enhanced water quality) include:

a) Development and implementation of a comprehensive groundwater quality monitoring program.
b) Coordination with regulatory agencies to share monitoring and other information to detect and define water quality problems.

c) Participation in projects of mutual interest including the RWQCB watershed management efforts within the Chino Basin.
d) Development and implementation of programs to address problems posed by specific contaminants.
e) Exportation of manure, enhanced manure management, or facilitation or support of salt removal efforts.
f) Treatment of dairy sewage and the elimination of discharge to groundwater, or exportation of dairy sewage.
g) Development of programs to pump and treat degraded groundwater and to put the treated water to direct beneficial uses.
h) Development and implementation of a comprehensive stormwater recharge plan.
i) Development of a comprehensive stormwater flow and quality monitoring program in partnership with other agencies charged with flow and quality monitoring.
j) Development of new stormwater recharge projects at existing and future flood control facilities.
k) Maximization of recharge capacity at existing recharge facilities through improved maintenance or operational and/or structural improvements.
l) Periodic assessment of the salt balance of the Basin.
m) Development of new TDS export facilities and/or finding means of using the Non-Reclaimable Wastewater System and the Santa Ana Regional Interceptor with less cost.
n) Establishment of financial incentives to ensure that when existing groundwater is pumped, it is replaced with high quality water to replenish the Basin over time.
o) Increasing the groundwater recharge volume in excess of production to cause an increase in the storage volume without an increase in rising water (discharge from the Basin.
p) Promote public education.

Specific benefits that can be achieved under the third general benefit (enhanced basin management) include:

a) Development of methods to account for losses from storage accounts; setting of limits on storage if necessary.
b) Development and implementation of a comprehensive Basin-wide ground level, groundwater level, water quality, and production monitoring program (Same as with Goal No. 1).
c) Development of new production patterns that optimize yield and beneficial use; and the development of incentive programs and policies that encourage (or rules that enforce) new production patterns.
d) Development of programs to pump and treat degraded groundwater and to put the treated water to direct beneficial uses (Same as with Goal No. 2).
e) Development of conjunctive-use policies and programs that take into account water quantity and quality.

Specific benefits that can be achieved under the fourth general benefit (equitable financing) include:

a) Identification of an equitable approach to spread the cost of OBMP implementation either on a per acre-foot basis or by some other equitable means.
b) Identification of ways to recover value from utilizing Basin assets including storage and rising water leaving the Basin.
c) Evaluation of the project and management components and a ranking of the components with equal consideration given to water quantity, water quality and cost and based on their ability to meet the goals of the OBMP.

I. OVERRIDING CONSIDERATIONS

This section of the findings addresses the requirements in Section 15093 of the California Environmental Quality Act Guidelines. Section 15093 requires the Lead Agency to balance the benefits of a proposed project against its unavoidable significant adverse impacts, and to determine whether the project related significant impacts can be acceptably overridden by the project benefits when the two are compared and balanced. As outlined in Section F above, the proposed project is forecast to contribute to cumulative, unavoidable significant adverse environmental impacts in one environmental category: air quality.

The IEUA Board finds that the previously stated benefits of the proposed project, contained in the proposed action and as will be implemented by IEUA and the participating agencies through implementation of the OBMP outweigh the cumulative, unavoidable significant adverse environmental effect to air quality that has been outlined above. In a region where water resources are limited and poor water quality makes access to good quality water more difficult, the Board concludes that these benefits outweigh the indirect cumulative effects to the region's air quality.

The Board's findings set forth in the preceding sections have identified all of the adverse environmental impacts and the feasible mitigation measures which can reduce impacts to insignificant levels where feasible, or to the lowest achievable levels where significant unavoidable impacts remain. The findings have also analyzed three alternatives to determine whether they are reasonable or feasible alternatives to the proposed action or whether these alternatives might reduce or eliminate the two significant impacts of the proposed action.

The Final OBMP PEIR presents evidence that implementing the proposed project will contribute to significant adverse impact which cannot be substantially mitigated to insignificant levels. This significant impact has been outlined above and the Board finds that all feasible alternatives and mitigation measures have been adopted or identified for implementation by IEUA and other agencies (specifically the participating agencies of the Chino Basin Watermaster). The IEUA does have responsibility for implementing many of the mitigation measures contained in the PEIR or discussed in this document when it directly carries out specific future projects under the OBMP. Other participating agencies will serve as CEQA Responsible Agencies for their own projects and will be required to implement mitigation measures outlined in the Final OBMP PEIR, as is appropriate for the specific project being considered by the agency under the OBMP umbrella (program).

The Board finds that the project's benefits are substantial as outlined in Section H of this document and summarized above and that these benefits justify overriding the unavoidable significant adverse impacts associated with the proposed project. This finding is supported by the fact that many of the benefits listed above result in the project fulfilling an important role for IEUA and the Watermaster participating agencies by allowing these agencies to implement their urban water master plans and meet essential water supply requirements of their customers. The Board further finds that the benefits outlined above, when balanced against the unavoidable significant adverse environmental impacts, outweigh the impacts because of the environmental, social and economic values which accrue to IEUA, the Chino Basin Watermaster and the participating agencies as outlined in Section H of this document.

As the CEQA Lead Agency for the proposed action, the Board has independently reviewed the applicable sections of this document and the OBMP PEIR, and fully understands the scope of proposed project. Further, the Board finds that all potential adverse environmental impacts and all feasible mitigation measures to reduce these impacts have been identified in the PEIR, public comment, and public testimony. These impacts and mitigation measures are discussed in Sections

E.1 and F and the Board concurs with the facts and findings contained in those sections. The Board also finds that a reasonable range of alternatives was considered in the PEIR, as summarized in Section G of this document and that no feasible alternatives which substantially lessen project impacts are available for adoption.

The Board concurs with the extensive environmental, economic and social benefits identified above which will accrue to the IEUA, Chino Basin Watermaster, participating agencies and the customers that are served essential water resources from implementing the proposed project. The Board has balanced these substantial social and economic benefits against the unavoidable significant adverse effect of the proposed project. Given the substantial social and economic benefits that will accrue to the Chino Basin from implementing the proposed project, the IEUA Board hereby finds that these benefits identified herein, collectively and individually, outweigh the unavoidable significant adverse air quality impact, and hereby override this unavoidable environmental effects to obtain the social and economic benefits listed in Section H.

FINAL
PROGRAM ENVIRONMENTAL IMPACT REPORT

FOR THE

OPTIMUM BASIN MANAGEMENT PROGRAM

VOLUME I

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ABBREVIATIONS AND ACRONYMS

AAQS	Ambient Air Quality Standards
acre-ft/yr	acre-feet per year
afy	acre-feet per year
ADT	Average Daily Traffic
APCD	Air Pollutation Control District
AQAP	Air Quality Attainment Plan
AQMD	Air Quality Management District
ARB	Air Resource Board
BACT	Best Available Control Technology
BLM	U.S. Bureau of Land Management
BMP	Best Management Practice
BNSF	Burlington Northern Santa Fe Railway
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAL-EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CARB	California Air Resource Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CCWD	Cucamonga County Water District
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CHP	California Highway Patrol
CIM	California Institute for Men
CIP	Capital Improvement Program
CMP	Congestion Management Plan
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
COE	U.S. Army Corps of Engineers
CTP	Comprehensive Transportation Plan

ABBREVIATIONS AND ACRONYMS (continued)

dB	decibels
dBA	A-weighted decibels
DHS	California Department of Health Services
DOF	Department of Finance
DOT	Department of Transportation
DTSC	Department of Toxics and Substance Control
DWR	Department of Water Resources
EDU	equivalent dwelling unit
EIR	environmental impact report
EMP	Evaluation Monitoring Program
EPA	U.S. Environmental Protection Agency
g	gravity
gpd	gallons per day
gpm	gallons per minute
HAP	hazardous air pollutants
HOV	high occupancy vehicle..
IEUA	Inland Empire Utilities Agency
JCSD	Jurupa Community Services District
JPA	Joint Powers Authority
kWh	killowatt hour
LACSD	Los Angeles County Sanitation District
Leq	Equivalent Noise Levels
LF	lineal feet
Ldn	Day-Night Noise Levels
LOS	Level of Service
MAF	million acre-feet
MG	million gallons
MGD	million gallons per day
mg/L	milligrams per liter
mph	miles per hour
MSDS	Material Safety Data Sheets
MSL	Milliken Sanitary Landfill

ABBREVIATIONS AND ACRONYMS (continued)

NAAQS	National Ambient Air Quality Standards
NDDB	Natural Diversity Data Base
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NIH	National Institute of Health
NOP	Notice of Preparation
NPDES	National Pollution Discharge Elimination System
NPS	National Priorities Lis
NRC	Nuclear Regulatory Commission
OBMP	Optimum Basin Management Program
OCWD	Orange County Water District
OSHA	Occupational Safety and Health Act
PEIR	Program Environmental Impact Report
RCPG	Regional Comprehensive Plan and Guide
RFD	reference dose
RMP	Regional Mobility Plan
ROC	Reactive Organic Compound
ROG	Reactive Organic Gas
RO	reverse osmosis
RO/IX	reverse osmosis/ion exchange..
RTP	Regional Transportation Plan
RWMP	Regional Water Master Plan
RWQCB	Regional Water Quality Control Board, Santa Ana Region
SANBAG	San Bernardino Associated Governments
SBCFCD	San Bernardino County Flood Control District
SCAB	South Coast Air Basin
SCAG	Southern California Associated Government
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCGC	Southern California Gas Company
SCS	Soil Conservation Services
SIP	State Implementation Plan
SMARA	Surface Mining and Reclamation Act

ABBREVIATIONS AND ACRONYMS (continued)

SR	State Route
SWP	State Water Project
TAC	toxic air contaminants
T-BACT	Best Available Control Technology for Toxics
TCE	trichloroethylene
TDA	Tom Dodson & Associates
TDS	Total Dissolved Solids
TIN	Total Inorganic Nitrogen
tpy	tons of pollutants per year
UBC	Uniform Building Code
UFC	Uniform Fire Code
UP	Union Pacific Railroad
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USL	Upland Sanitary Landfill
VMT	vehicle miles traveled
VOC	Volatile Organic Compound
WRCOG	Western Riverside Council of Governments
WRP	Water Reclamation Plant
WSA	water serving agencies

CHAPTER 1
EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Optimum Basin Management Program (OBMP) encompasses the Chino Groundwater Basin (the Basin), located in southern California. The Basin is located primarily in San Bernardino County, with a lesser proportion of the project area overlying Riverside County and a very small section located in eastern Los Angeles County. The project area consists of an alluvial valley that is relatively flat from east to west and slopes from north to south at a one to two percent grade. Valley elevation ranges from about 2,000 feet in the foothills below the San Gabriel Mountains to about 500 feet near Prado Dam. The principal drainage course for the Basin is the Santa Ana River. While still considered to be a single basin, the Chino Groundwater Basin has been divided into five management zones, based upon similar hydrologic conditions, and into three subbasins, as defined in the 1995 Water Quality Control Plan for the Santa Ana Watershed (Region 8).

The Basin is one of the largest groundwater basins in southern California, containing about 5,000,000 acre-feet of water in storage, with an additional, unused storage capacity of about 1,000,000 acre-feet. Cities and other water supply entities produce groundwater for all or part of their municipal and industrial supplies from the Basin. The average safe-yield of the Basin is approximately 140,000 acre-feet. An additional 300 to 400 agricultural users also produce groundwater from the Basin.

To manage the Basin for the long-term benefit of all producers in the area, an Optimum Basin Management Program has been developed pursuant to a Judgement entered in the Superior Court of the State of California on February 19, 1998. The overseeing body for guidance in the development and implementation of the OBMP is the Chino Basin Watermaster (Watermaster). This body was effectively established on July 1, 1977. The Inland Empire Utilities Agency (IEUA or the Agency) has agreed to serve as the California Environmental Quality Act (CEQA) Lead Agency for the preparation and administration of the Program Environmental Impact Report (PEIR).

In order to administer water-usage for the long-term beneficial use of all component members of Watermaster, an OBMP consisting of two phases has been developed. Phase I of the OBMP consists of defining the state of the Chino Groundwater Basin, establishing goals concerning major issues identified by stakeholders, and affirming a management plan for the achievement of said goals. Phase 2 of the OBMP is intended to be the physical implementation plan for the installation and operation of OBMP facilities. The major OBMP facilities consist of monitoring wells, extensometers, pipelines, desalters, possibly an ion exchange facility, recharge basins (both existing and new), pump stations, production wells and production monitoring devices.

The aforementioned facilities are examples of the necessary types of physical structures that will be implemented to achieve the project objectives that are outlined in the form of nine Program Elements. This list of Program Elements comprises the ultimate focus of Watermaster's future actions, agendas, and policies. The elements are as follows:

- Program Element 1 – Develop and Implement Comprehensive Monitoring Program
- Program Element 2 – Develop and Implement Comprehensive Recharge Program
- Program Element 3 – Develop and Implement Water Supply Plan for the Impaired Areas of the Basin
- Program Element 4 – Develop and Implement Groundwater Management Plan for Management Zone 1
- Program Element 5 – Develop and Implement Regional Supplemental Water Program
- Program Element 6 – Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region (Regional Board) and Other Agencies to Improve Basin Management
- Program Element 7 – Develop and Implement Salt Management Program
- Program Element 8 – Develop and Implement Groundwater Storage Management Program
- Program Element 9 – Develop and Implement Conjunctive-Use Programs

It is the implementation of the listed program elements where the potential occurs for the OBMP to cause physical changes in the environment and to produce potential adverse impacts to the environment. The purpose of this PEIR is to evaluate potentially significant adverse environmental impacts from implementing all of the OBMP facilities required to support the program, and to provide means for the minimization of adverse impacts to both the natural and manmade environment.

1.2 SUMMARY OF ENVIRONMENTAL ANALYSIS

Because the proposed project encompasses variety of potentially similar facility types for implementation, a decision was made to prepare a PEIR. The procedures for program EIRs are outlined in Section 15168 of the State CEQA Guidelines. In accordance with these procedures, IEUA chose to prepare and circulate a Notice of Preparation which determined that all standard issues contained in the CEQA Environmental Checklist Form would be examined in the PEIR prepared for the OBMP.

A copy of the Notice of Preparation for the proposed project is provided in this document as Appendix 8.1 of Chapter 8 of this PEIR. The following issues were evaluated in the PEIR and a determination was made that less than significant impacts would occur to the natural resources and man-made systems if the project is implemented as described in the Chapter 3, Project Description of this PEIR, and if adverse environmental impacts are mitigated to a less than significant level as provided in Table 1.2-1. The only environmental issue with impacts identified to be potentially significant and unavoidable was air quality. The issues where less than significant impact are forecast to occur after mitigation include:

Land Use/Planning	Transportation and Circulation	Public Services
Population and Housing	Biological Resources	Utilities
Geologic Resources/Constraints	Energy	Cultural Resources
Water Resources/Water Quality	Hazards and Risk of Upset	Aesthetics and Visual Resources
Air Quality	Noise	

Please refer to discussions in Chapter 4 of this PEIR for a detailed discussion of these issues and the substantive basis for concluding that implementation of the proposed project will or will not cause any significant adverse impacts that cannot be mitigated to a less than significant level.

A summary of the environmental findings and mitigation measures in this Environmental Impact Report is contained in Table 1.2-1 which begins on the following page. The summary shows that the proposed project cause few significant unavoidable adverse environmental impacts if implemented as described in the this document. Most environmental impacts caused by the project are non-significant without any mitigation. A few of the impacts described in the following table and the analysis in Chapter 4 are required to be mitigated to less than significant levels with implementation of recommended mitigation measures.

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Land Use	Cause significant conflict with the General Plan or zone designations; a significant conflicts with applicable environmental plans or policies adopted by agencies with jurisdiction over the project; and/or incompatibilities with existing land use in the vicinity. Affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses). Disrupt or divide the physical arrangement of an established community (including a low-income or minority community). Cause significant displacement or loss of acreage that could be used for development; and/or cause or contribute to significant growth inducement.	Following selection of alternative sites for construction of future desalters, each site shall be evaluated for potential incompatibility with adjacent existing or proposed land uses. Where desalter operations can create significant incompatibilities (lighting, noise, use of hazardous materials, traffic, etc.) with adjacent uses, an alternative site shall be selected, or a technical report shall be prepared that identifies the specific measures that will be utilized to reduce potential incompatible activities or effects to below thresholds established in the general plan for the jurisdiction where the facility will be located. Where future OBMP facilities are proposed on locations that support agricultural operations on important farmlands, alternative sites shall be selected that do not occupy such acreage (unless agricultural operations have already been terminated). Prior to implementing each proposed water facility, the land use compatibility of the proposed facility with both existing and future potential adjacent uses will be evaluated for consistency relative to general plan goals. This evaluation will examine the specific activities associated with the proposed facilities and determine whether specific incompatibilities, such as noise, fugitive dust, hazards or risk, or aesthetics would conflict with adjacent uses. Measures identified in the Subchapter of the OBMP PEIR will be used to mitigate potential incompatibilities where they are identified, or alternative locations will be selected.	Less than significant impact
	Cumulative Impacts	See above mitigations.	Less than significant impact
Population and Housing	Substantially increase the Chino Basin population above that identified in regional population forecasts and planned for in the local jurisdiction general plans; increase the demand for housing above the regional population forecasts.	If future facilities must be located on parcels occupied by existing housing, the proponent of the facility will ensure that short- and long-term housing of comparable quality and value are made available to the home owner(s) prior to initiating construction of the facility.	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
	Displace a substantial amount of housing, especially affordable housing. Have a potential to induce substantial growth in an area either directly or indirectly (e.g. through projects in an undeveloped area or extension of major infrastructure).		
Geologic Resources / Constraints	Subject to fault rupture Subject to seismic groundshaking. Subject to seismic ground failure, including liquefaction. Subject to seiche, tsunami, or volcanic hazards. Subject to landslide or mudflow hazards. Subject to erosion or unstable soil conditions from grading activities, or cause significant changes in topography Subject to subsidence hazards. Subject to expansive soil hazards. Contain any unique geologic or physical features.	<u>Soils</u> Add protective covering of mulch, straw or synthetic material (erosion control blankets, tacking will be required). Limit the amount of area disturbed and the length of time slopes and barren ground are left exposed. After pipeline installation, soil will be compacted to a level similar to pre-construction conditions. Construct diversion dikes and interceptor ditches to divert water away from construction areas. Install slope drains (conduits) and/or water-velocity-control devices to reduce concentrated high-velocity streams from developing. Construction of facilities and structures areas with high liquefaction potential will be limited without further geologic and hazard-related studies conducted by a qualified geologist or geotechnical firm. Such studies will provide guidelines to minimize the risks to humans and to capital-intensive facilities. If a conjunctive use program might be implemented that would bring water levels up to a level that significantly increases the risk of liquefaction, a more detailed monitoring and geologic study focused on this issue will be conducted to determine whether or not liquefaction poses a hazard to surface structures and to human safety. If such a study finds the impacts to be significant, the volume of water permitted to be stored in the basin will be decreased sufficiently until a water level is achieved that does not pose any significant hazard to surface structures or people.	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Geologic Resources / Constraints (continued)		<u>Geology</u> Mitigate the risks from geological hazards through a combination of engineering construction, land use and development standards. Require each site within identified Liquefaction Hazard Zones to be evaluated by a licensed engineer prior to design or land disturbance/construction. Apply appropriate design and construction criteria to all structures subject to significant seismic shaking. Prohibit critical, essential, and high risk land uses near earthquake special studies areas shown on the Hazard Overlay Maps developed by the County of San Bernardino and Riverside. Require stability analysis for Landslide Hazard areas designated "Generally Susceptible" and "Mostly Susceptible" on the Hazards Overlay Maps. Institute restrictions on construction in high landslide potential and steep-slope areas to ensure safe development. Continue to identify and study subsidence hazards and susceptible areas, and propose mitigation technology that is appropriate to the findings of the monitoring study. The implementation of OBMP facilities will *not* in any way contribute to subsidence conditions in *pre-existing subsidence zones* (as shown in Figure 4.4-16). The OBMP will not cause or contribute to any new, significant subsidence impacts greater than a total of six inches in magnitude over the planning period. Impacts less than 6 inches in new areas are considered to be less than significant.	Less than significant impact
Geologic Resources / Constraints (continued)		If modeling and/or additional studies conducted for the expanded OBMP SAWPA desalter wellfield demonstrates that such pumping will contribute to subsidence in the existing subsidence area, then a potentially significant impact can occur, and a subsequent environmental document will be prepared. No OBMP activities allowed under this document will be permitted to cause or contribute to the subsidence within the pre-existing subsidence area defined in the OBMP Phase I	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		Report and Figure 4.4-16.* To ensure that pumping impacts in the vicinity of the desalter well field do not have an adverse impact on water levels and subsidence issues, the follow performance standards will be used to evaluate the desalters: a. Water level declines in areas surrounding the desalter pumping locations will not be allowed to decline to the extent that pumping capabilities for surrounding wells are impacted. If surrounding wells and producers are impacted by declines in water levels, alternative access to equivalent quantity and quality of water will be provided to affected surrounding parties. This water may be provided through distribution of funding to affected parties for the deepening of existing wells, or may be provided through the delivery (paid for by the implementing agency) of comparable or improved quality and quantity of water from other sources. b. If desalter well fields are demonstrated to cause or exacerbate impacts to subsidence areas measurable by a decline of over six inches in ground level at a 1/4 mile radius, or at the radius of the nearest non-OBMP-participating structure, then pumping patterns for the desalters will be modified to reduce impacts to cause no more than six inches of decline in ground level at the smallest of the two radii.	
Geologic Resources / Constraints (continued)		c. If an engineering study is prepared prior to installing a well or well field by a qualified geologist and hydrologist and demonstrates that subsidence greater than six inches can be permitted without causing significant subsidence hazards, then the investigation will define the new threshold for the specific location and it will be observed as the alternative threshold of significant subsidence. Require site-specific geotechnical investigations of proposed development to include an assessment of potential impacts and mitigation measures related to expansive and reactive soils and liquefaction. Under the OBMP, Watermaster will continue to monitor the areas with potential liquefaction hazards and will work with local jurisdictions to ensure that any future structures are constructed with	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		the appropriate foundations to address increased liquefaction potentials apropos to the specific area. This mitigation measure will reduce impacts to a less than significant level. Apply provisions of hillside erosion and sediment control that reduce volume and velocity of flows and content of sediment to levels that do not cause significant rill or gully erosion in susceptible areas. In addition, provide for restoration of areas that do become eroded. Prevent unnatural erosion in erosion-susceptible areas by tailoring grading, land clearance, and grazing, and by prohibiting use of off-road vehicles. <u>Seismicity</u> When determined necessary by the affected jurisdictions, geotechnical and soils engineering reports will be prepared in conjunction with the preparation of preliminary design layouts and grading plans for all new development projects implemented within the proposed Project Area. These studies will verify the presence or absence of hazardous soil conditions. If necessary, these reports will provide specific mitigation measures for the treatment of *potential* geologic and soils hazards.	
Geologic Resources / Constraints (continued)		Comprehensive geotechnical investigation will be required prior to engineering and design development or structural and/or substantial rehabilitation of structures identified under Risk Class I & II, e.g., public facilities, as identified below: *Risk Class I & II, Structures Critically Needed after Disaster:* Structures which are critically needed after a disaster include important utility centers, fire stations, police stations, emergency communication facilities, hospitals, and critical transportation elements such as bridges and overpasses and smaller dams. Acceptable Damage: Minor non-structural; facility should remain operational and safe, or be suitable for quick restoration of service. *Risk Class III:* High occupancy structures; uses are required after disasters, i.e., places of assembly such as schools and churches.	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		Acceptable Damage: Some impairment of function acceptable; structure needs to remain operational. *Risk Class IV, Ordinary Risk Tolerance:* The vast majority of structures in urban areas; most commercial and industrial buildings, small hotels and apartment buildings, and single family residences. Acceptable Damage: An "ordinary" degree of risk should be acceptable. The criteria envisioned by the Structural Engineers Association of California provide the best definition of the "ordinary" level of acceptable risk. These criteria require that buildings be able to: a. Resist minor earthquakes without damage; b. Resist moderate earthquakes without structural damage, but with some non-structural damage; or	
Geologic Resources / Constraints (continued)		c. Resist major earthquakes, of the intensity or severity of the strongest experienced in California, without collapse, but with some structural, as well as non-structural damage. *Risk Class V, Moderate to High Risk Tolerance:* Open space uses, such as farms, ranches and parks without high occupancy structures; warehouses with low intensity employment; and the storing of non-hazardous materials. Acceptable Damage: Not applicable. All structures previously identified in categories III through V will be designed in accordance with the applicable multiplier factor seismic design provisions of the Seismic Safety Report to promote safety in the event of an earthquake. The direct impacts of faults upon proposed projects will be considered during preliminary planning processes, and the engineering design phases. All rehabilitation and new development projects implemented as a	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		result of the proposed Project will be built in accordance with current and applicable Uniform Building Code (UBC) standards and all other applicable City, County, State and Federal laws, regulations and guidelines, which may limit construction and site preparation activities such as grading, and will make provisions for appropriate land use restrictions, as deemed necessary, to protect residents and others from potential environmental safety hazards, either seismically induced or those resulting from other conditions such as inadequate soil conditions, which may exist in the proposed Project Area. Local grading and building codes should reflect measures to minimize possible seismic damage.	
Geologic Resources / Constraints (continued)		<u>Optional</u> Utilize geologic and seismic data in land planning so that identified risk areas, if any, are avoided, or structures and landforms treated and designed to reflect local site conditions. Inspect older facilities and improve earthquake design features when possible. Maintain a disaster preparedness plan.	Less than significant impact
Water Resources / Water Quality	Cause changes in absorption rates, drainage patterns or the rate and amount of surface runoff. Cause the exposure of people or property to water-related hazards, such as flooding. Discharge pollutants into surface waters or cause alterations to surface water quality.	To minimize potential ground disturbances associated with installation and maintenance of proposed monitoring equipment on existing wells, the equipment will be installed within or along existing disturbed easements or right-of-way or otherwise disturbed areas, including access roads and pipeline or existing utility easements. The Watermaster or other agencies implementing recharge programs will confer with the San Bernardino County Department of Transportation and Flood Control and for each flood control basin that is proposed to be utilized for recharging water to the Chino Basin, to define the amount of water that can be set aside as a conservation pool within existing flood control basins and specific operational parameters (such as time and volume of water that can be diverted into each basin). This will ensure that recharge activities do not conflict with flood control operations at any flood control basins. Variable pooling and	Less than significant impact

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		recharge schedules that are coordinated with storm forecasting to halt deliveries during storm events will ensure that flood-related hazards remain less than significant.	
Water Resources / Water Quality (continued)	Change the amount of surface water in any water body. Cause change in currents, or the course or direction of surface water movements. Cause the change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations, or through substantial loss of groundwater recharge capability. Alter the direction or rate of flow of groundwater. Have an impact on groundwater quality.	Within each desalter site, surface runoff will be collected and retained (for use onsite) or detained, and treated when released by passing the runoff through a "first-flush" treatment system, which may include onsite riparian area, detention basin with filtration system at the outlet, or other system that removes the majority of urban storm runoff pollutants, such as petroleum products and sediment. The purpose of this measure is to remove the onsite contribution to cumulative urban storm runoff and ensure the discharge from the desalter sites is treated to reduce contributions of urban pollutants to downstream flows. In compiling local and *in lieu* groundwater storage balances, the Watermaster will include the estimated amount of water lost from the Basin due to rising water at the low end of the Basin and adjust storage salt balance accounts accordingly. For each OBMP construction site, regardless of size, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared and implemented. Each plan will identify the best management practices (BMPs) that will be used for that site to minimize the potential for accidental releases of any chemicals or materials on the site that could degrade water quality, including solid waste and require that any spills be clean-up, contaminated material properly disposed of and the site returned to pre-discharge condition, or in full compliance with regulatory limits for the discharged material. The portion of the SWPPP that addresses erosion and related sediment discharge will specify the percentage of pollutant removal, as illustrated in the attached Figure 4.5-56 which was abstracted from Supplement A to the "Riverside County Drainage Area Management Plans, Attachment" publication. At a minimum BMPs will achieve 60 percent removal of sediment and other pollutants from disturbed sites.	Less than significant impact
Water Resources / Water Quality (continued)		For long-term mitigation of site disturbances at OBMP facility locations, all areas not covered by structures will be covered with hardscape (concrete, asphalt, gravel, etc.), native vegetation and/or man-made landscape areas (for example, grass). Revegetated or	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		landscaped areas will provide sufficient cover to ensure that, after a two year period, erosion will not occur from concentrated flows (rills, gully, etc.) and sediment transport will be minimal as part of sheet flows. These measures and requirements will be applied to closure of abandoned well site disturbed areas. Prior to cleaning out, refurbishing or capping a well, samples will be obtained and chemically analyzed to ensure that the discharge does not contain any contaminants exceeding regulatory thresholds. If contaminants are discovered, then they will be removed or lowered below the regulatory threshold prior to discharge to the environment. Discharge of non-stormwater into storm drains will require a NPDES permit. Recycled water will not be discharged to streams that are transporting storm flows for subsequent groundwater recharge (except as authorized by existing discharge permits issued by the Regional Board), unless mitigation as identified in mitigation measure 4.5-12 is provided. If the storm water component of the combined flow is a part of the total sub-basin assimilative capacity, which is fully allocated, then mitigation pursuant to mitigation measure 4.5-12 for recharge of the recycled water will be the same as if the recycled water had been directly recharged. However, if the assimilative capacity of the storm water has not been allocated, then mitigation will be based on the quality of the of the commingled storm flow and recycled wastewater.* OBMP participants do not have responsibility and control over the SARI line, but they do interact with the agencies that would respond to an accidental release from the SARI line (or the Los Angeles County Nonreclaimable Wastewater Line). OBMP participants will provide support, as required or appropriate, and assist with control of and restoration of the environment damaged by an accidental release from the line.	
Water Resources / Water Quality (continued)		Prior to authorizing contracts for drilling monitoring or production wells under OBMP auspices, the entity funding the well drilling effort will require the well driller to identify all chemicals that will be used at the drilling site and require the submittal of a SWPPP for review and approval before allowing the drilling to commence. A performance bond will be provided by the driller to ensure that any residual contamination from well drilling can be corrected. Further, the	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		implementing agency will construct wells in a manner that will reduce the risk of movement of groundwater between zones of different quality , as required under California well standards.* When closing abandoned wells in the Chino Basin the entity closing the well will, where technically feasible determine whether the groundwater in the well is contaminated. This will be accomplished by sampling and analyzing the well water. If contamination is identified, the entity will report the discovery to the appropriate parties, including the owner (if known) and the regulatory agencies. The Watermaster will monitor the status of the well until residual contamination is remediated. When recharge of State Project Water (SPW) or recycled water with TDS greater than the background groundwater TDS or the Basin Plan water quality objective is utilized at a recharge site, the entity conducting the recharge will conduct additional analysis including modeling to identify the volume and rate of recharge that can be conducted without causing the Basin Plan water quality objective for TDS to be exceeded. In addition, the amount of additional salt added to the Basin above the background groundwater quality condition will be calculated and the greater of the two amounts will be offset, either by blending with lower TDS water (storm water) provided that the assimilative capacity of the sotrm water has not already been allocated as more thoroughly described in mitigation measure 4.5-8. The program could utilize SWP water for recharge when such water is available and when such water is better in quality than recycled water (i.e. lowest TDS). Under no circumstance will discharge of SPW or recycled water cause or contribute to a	
Water Resources / Water Quality (continued)		cumulative violation of Basin Plan water quality objectives or interfere with a designated beneficial use for a water or groundwater body.* When recharge of recycled water is proposed for a specific location, the entity proposing such recycling will provide the following data to DHS: the area encompassed by the minimum six months detention period before use and the area encompassed by the long-term equilibrium concentration of 20 percent recycled water within the aquifer. Based on these area estimates, the entity will determine whether any existing WSA production wells or water supply aquifers will be impacted by these pumping constrained areas. If impacts will affect existing wells	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		or water supply aquifers, the entity proposing to discharge recycled water will fund the provision of a comparable quality and quantity of potable water to the WSA [this can be done through installing new wells, direct water deliveries (for example from desalters), etc.].* When recharge of recycled water with TIN greater than the background groundwater TIN or the Basin Plan objective at a recharge site is utilized, the entity conducting the recharge will conduct modeling and/or additional studies to identify the volume and rate of recharge that can be conducted without causing the Basin Plan water quality objective for TIN to be exceeded. Under no circumstance will discharge of SPW or recycled water cause or contribute to a cumulative violation of Basin Plan water quality objectives or interfere with a designated beneficial use for a water or groundwater body.* When recharge of water is proposed within the vicinity of an existing or known groundwater quality anomaly (contaminated groundwater plume), modeling and/or additional studies will be conducted to determine whether recharge of the recycled water will increase the local hydraulic gradient and cause more rapid spread of the existing plume. If existing domestic water production wells will be impacted by the plume a minimum of one year earlier than under pre-existing conditions, or if significant quantities of additional groundwater (more than 5,000 acre-feet) will become contaminated within a five year period due	
Water Resources / Water Quality (continued)		to the recharge of water, an alternative location for recharge will be selected to avoid not only the loss of the recharged water due to contamination, but also additional high quality groundwater due to more rapid expansion of the contaminated plume. Whenever possible and feasible, OBMP projects that are highly capital intensive, or that employ workers who are onsite for more than just maintenance activities, will consider Figure 4.5-47 when siting specific project locations for OBMP facilities. Areas defined on this map that potentially may be affected by flood-hazards will be avoided, unless conjunctive use and flood-control operations demand that facilities must be located within these areas. If facilities are constructed in a flood zone, the facility will be brought to a level above flood hazards, or hardened against flood related impacts. Additionally, if facilities	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		must be located within flood plains or hazard areas, a flood management program to minimize impacts to people and surrounding property will be created and implemented for each facility that may occur within these hazard areas. Prior to implementation of any recharge projects as either existing or new basins, a management plan will be established to the satisfaction of SBCFCD. This plan will be created specifically for each individual basin to ensure the safety of surrounding property and people from undue risks associated with water-related hazards (i.e. flooding). The management plan will firmly establish a priority of flood-control functions over and above recharge-related operations. Weather fore-casts of upcoming storm events will be carefully monitored and in the event of a significant forecasted storm-event, recharge deliveries the basins will be ceased until further notice is received from SBCFCD that it is safe for deliveries to resume. Additionally, no more than three days' percolative capacity of water will be allowed to sit in a basin at a time if such basin is also used for flood control activities. Additionally, each SBCFCD basin will have a specific management plan developed, so as to coordinate flood control with recharge. This mitigation measure will ensure	
Water Resources / Water Quality (continued)		that people and property are not subject to additional risk associated with water-related hazards in the Basin, and will allow SBCFCD to make full utilization of the basin's flood control capacity in the event of a storm. In order to offset salt additions above the objective for the appropriate Subbasin defined in the Basin Plan, desalters will be constructed. Recharge of water with TDS concentrations above the Basin Plan objectives will not occur until it can be adequately demonstrated that the users of pumped groundwater which are adversely affected by such recharge will be appropriately compensated or will receive sufficient amounts of high quality water to offset the adverse effects of the high TDS pumped groundwater at an overall cost no greater than that which would have been incurred by the adversely affected producers in the absence of the recharge. Desalters may be the source of higher quality water needed for mitigation. If water with TDS in excess of water quality objectives is recharged in such close proximity to the desalter extraction wells that other producers are unaffected, then mitigation	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		will be accomplished when it is demonstrated that the salt leaving the basin, as a result of the OBMP desalter capacity that has been allocated to mitigate the TDS impacts of recycled water recharge is equal to or greater than the increment of additional salt above established Basin Plan water quality objectives. Desalters will be designed to capture any increase in rising water.* Among the alternatives available to reduce or control adverse effects caused by recharge is the use of injection of water of higher quality to resident poor quality groundwater to serve as a barrier against the migration of the poor quality gorundwater.	
Air Quality	Construction Impacts	Water active grading sites at least twice daily and when dust is observed migrating from the site. The project will comply with SCAQMD Rule 403 requirements where applicable. Rule 403 prohibits visible dust emissions beyond the property boundaries. Suspend all grading and excavation operations when wind speeds exceed 25 mph. Apply non-toxic chemical soil stabilizers according to manufacturers specifications to inactive construction areas (previously graded areas inactive for 10 days or more). Replace ground cover or pave disturbed areas immediately after construction is completed in the affected area. Sweep streets once a day and when soil material is observed on traveled roadways.	Less than significant impact
	Operation Impacts	See discussion in Subchapter 4.6, Section 4.6.5.	Potentially significant
Transportation and Circulation	Cause an increase in vehicle trips or traffic congestion. Cause hazards to safety from design features, such as sharp curves, or dangerous intersections.	For each development project that will increase traffic generation relative to current traffic generation, the IEUA will prepare a traffic study that identifies the net number of trips, the effect on levels of service to maintain a LOS "E". The IEUA will require the construction contractor to provide adequate traffic management resources during construction (signing protective	Less than significant

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
	Cause inadequate emergency access or inadequate access to nearby uses.	devices. flag persons. etc.) to maintain safe traffic flow, particularly emergency access, on local streets at all times.	
Transportation and Circulation (continued)	Cause insufficient parking capacity onsite or offsite. Cause hazards for pedestrians or bicyclists. Cause conflicts with adopted policies supporting alternative transportation, such as bus turnouts and bicycle racks. Cause adverse impacts to rail, waterborne or air traffic.	During construction the IEUA will require traffic hazards for vehicles, bicycles, and pedestrians be adequately identified and such traffic controlled to minimize hazards. The IEUA will require the contractor to ensure no open trenches or traffic safety hazards be left in roadways during periods of time when construction personnel are not present (nighttime. weekends. etc.). The IEUA will require all roads be repaired adequately after pipeline installation to ensure that traffic can move in the same manner as before construction without damage to vehicles. Emphasize transportation demand management or non-motorized transportation alternatives for OBMP project related employees, where feasible, to reduce demand for roadway capacity. Future OBMP facility ingress/egress will be reviewed with the agency having jurisdiction or the roadway providing access, and roadway improvements required to eliminate any traffic hazards associated with access to a facility in accordance with standard agency requirements or prudent circulation system planning requirements.	Less than significant impact
Biological Resources	Have a substantial adverse direct or indirect effect on any species identified as a candidate, sensitive, or special status species. Have a substantial adverse effect on riparian habitat or other sensitive natural community. Have a substantial adverse effect on federally protected wetlands.	Place primary emphasis on the preservation of large, unbroken blocks of natural open space and wildlife habitat area, and protect the integrity of habitat linkages. As part of this emphasis, incorporate programs for purchase of lands, clustering of development to increase the amount of preserved open space, and assurances that the construction of pipelines and other facilities or infrastructure improvements meet standards identical to the environmental protection policies applicable to the specific project.	Less than significant impact
Biological Resources	Substantially interfere with the movement of native fish or wildlife species, migratory wildlife corridors, or impede the use of	When determining which portion of a facility sit should be retained in open space, give emphasis to the preservation of habitat areas and linkages, avoiding destruction of viable, sensitive habitat areas and	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
	native wildlife nursery sites. Conflict with local policies or ordinances protecting biological resources. Conflict with provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved habitat conservation plan. Substantially impact candidate, sensitive or special status species of riparian or other sensitive natural communities.	linkages as a trade-off for preserving open space for purely aesthetic purposes. Further, whenever feasible, avoid impacts and disturbances to individuals and species considered sensitive by jurisdictional agencies. Require facility designs to be planned to protect habitat values and to preserve significant, viable habitat areas and habitat connection in their natural conditions. a. Within designated habitat areas of rare, threatened or endangered species, prohibit disturbance of protected biotic resources. b. Within riparian areas and wetlands subject to state or federal regulations (e.g. blue line streams); riparian woodlands, oak and walnut woodland, and habitat linkages, require that the vegetative resources which contribute to habitat carrying capacity (vegetative diversity, faunal resting sites, foraging areas, and food sources) are preserved in place or replaced so as no to result in an measurable reduction in the reproductive capacity of sensitive biotic resources. c. Within habitats of plants listed by the CNDDB or CNPS as "special" or "of concern," require that new facilities not result in a reduction in the number of these plants, if they are present. Maximize the preservation of individual oak, sycamore and walnut trees within proposed development sites. Prohibit the use of motorized vehicles within sensitive habitat areas and linkages except for crucial maintenance and/or construction activities.	
Biological Resources (continued)		Require the establishment of buffer zones adjacent to areas of preserved biological resources. Such buffer zones will be of adequate width to protect biological resources from grading and construction activities, as well as from the long-term use of adjacent lands. Permitted land modification activities with preservation and buffer areas are to be limited to those that are consistent with the maintenance of the reproductive capacity of the identifies resources. The land uses and	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		design of project facilities adjacent to a vegetative preservation area, as well as activities within the designated buffer area are not to be permitted to disturb natural drainage patterns to the point that vegetative resources receive too much or too little water to permit their ongoing health. In addition, landscape adjacent to areas of preserved biological resources will be designed so as to avoid invasive species which could negatively impact the value of the preserved resource. Require conservation or open space easements, granting of development rights, or other similar protections over biological habitats, and habitat linages being preserved in their natural state. Prior to facility construction or installation, project specific biological resource surveys will be conducted onsite when any previously undeveloped areas may be disturbed by project implementation. If any sensitive species have the potential to occur on the site where OBMP facilities are proposed, or if previous environmental studies have not been conducted, IEUA will conduct all surveys in accordance with all established state, federal and generally accepted biological survey protocols for each potential species that may be located onsite. Further, IEUA will implement all mitigation measures recommended by jurisdictional agencies. Mitigation measures should be determined on a project by project basis. Potential mitigation measures may include avoidance or minimization of impacts. One means of minimizing impacts to sensitive plants, for example, has included transplanting individuals out of harm's way.	
Biological Resources (continued)		The amount of water taken from or added to the Santa Ana River will be coordinated where possible to maintain the water level below the 505' elevation mark but above the 498' mark. If weather and hydrologic forecasts and reservoir conditions indicate that the pool elevation may exceed 505' because of a projected disparity between inflow and outflow, the water control manager at the Reservoir Operation Center shall take all steps necessary (including immediate release of water at the maximum possible rate to prevent the pool elevation from exceeding 505', or to reduce the amount of time the pool is above 505' (if, in fact, the maximum possible release rate does not succeed in keeping the pool elevation below 505'). This mitigation measure will help to ensure the preservation of critical habitat for the least Bell's	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		vireo, and preservation of associated riparian resources.* Mitigation must be designed so that development of a given project will effectively benefit the species. The 2081 and 10(a) permits should be complimentary of one another to avoid conflicts between state and federal mitigation requirements. These permits will likely require land purchase, endowment funds, fencing funds, and mitigation measures. Section 7 consultations also usually include a land acquisition component.*	
Energy	Construction and operation impacts.	No mitigation is proposed.	Less than significant impact
Hazards and Risk of Upset	Create a risk of accidental explosion or release of hazardous substances, including, but not limited to oil, pesticides, chemicals or radiation. Have a possibility to interfere with an emergency response plan or emergency evacuation plan.	For OBMP facilities that handle hazardous materials or generate hazardous waste the Business Plan prepared and submitted to the county or local city will incorporate best management practices designed to minimize the potential for accidental release of such chemicals. The facility managers will implement these measures to reduce the potential for accidental releases of hazardous materials or wastes.	Less than significant impact
Hazards and Risk of Upset (continued)	Create any health hazards or potential health hazards. Cause exposure of people to existing sources of potential health hazards. Increase fire hazards in wildland areas or in the Project Area.	The business plan will assess the potential accidental release scenarios and identify the equipment and response capabilities required to provide immediate containment, control and collection of any released material. Adequate funding will be provided to acquire the necessary equipment, train personnel in responses and to obtain sufficient resources to control and prevent the spread of any accidentally released hazardous or toxic materials. For the storage of any acutely hazardous material at an OBMP facility, such as chlorine gas, modeling of pathways of release and potential exposure of the public to any released material will be completed and specific measures, such as secondary containment, will be implemented to ensure that sensitive receptors will not be exposed to significant health threats based on the toxic substance involved. All contaminated material will be delivered to a licensed treatment, disposal or recycling facility that has the appropriate systems to	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		manage the contaminated material without significant impact on the environment. Before determining that an area contaminated as a result of an accidental release is fully remediated, specific thresholds of acceptable clean-up will be established and sufficient samples will be taken within the contaminated area to verify that these clean-up thresholds have been met. During construction activities within existing road rights-of-way or other easements where continuous access is required, a road operation management plan will be prepared and implemented. At a minimum this plan will define how to minimize the amount of time spent on construction activities; how to minimize disruption of vehicle and alternative modes of traffic at all times, but particularly during periods of high traffic volumes; adequate signage and other controls, including flagpersons, to ensure that traffic can flow adequately during construction; the identification of alternative routes that can meet the traffic flow requirements of a specific area,	
Hazards and Risk of Upset (continued)		including communication (signs, webpages, etc.) with drivers and neighborhoods where construction activities will occur; and at the end of each construction day roadways will be prepared for continued utilization without any significant roadway hazards remaining. To the extent feasible, installation of pipelines or other construction activities in support of the OBMP will not be located on major evacuation or emergency response routes within any communities in the Chino Basin. Where construction on such routes is necessary, local emergency response providers will be contacted and emergency access and evacuation requirements will be maintained at a level sufficient to meet their needs. Where alternative treatment systems are available to reduce potential health risks at OBMP facilities, such alternatives will be selected if they meet defined technical, logistical and economic requirements for operation of such facilities. Prior to approving specific recycled water recharge facility locations and volumes, the extent of the aquifer area that would be removed from	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		water production to meet potable water production requirements (6-month detention and 20% concentration in groundwater) will be defined. If it conflicts with significant water production wells (existing or proposed), an alternative recharge location will be selected, or wells will be closed and a new supply developed. Hydrogeologic studies, including modeling, will be doen for each recharge site to define the recharge impacts on existing known contaminated plumes. If modeling demonstrates that the rate of contaminated plume expansion or secondary effects associated with such expansion will adversely impact groundwater or water production capabilities, the recharge facility will be moved to an alternative location where such impacts will not occur or impacted production facilities will be replaced.	
Hazards and Risk of Upset (continued)		All recycled water recharge operations will be monitored, and if impacts that were not forecast to occur demonstrate that the recharge operations are causing a significant adverse impact on the groundwater aquifer, the recycled recharge operations will be terminated or modified to eliminate the adverse impact.	Less than significant impact
Noise	Increase noise exposure for sensitive receptors from new noise sources. Expose people to severe noise levels.	Construction will be limited to the hours of 7 a.m. to 7 p.m. on Monday through Friday, and between 9 a.m. to 6 p.m. on Saturday, and will be prohibited on Sundays and federal holidays. All construction vehicles and fixed or mobile equipment will be equipped with properly operating and maintained mufflers. All employees that will be exposed to noise levels greater than 75 dB over an 8-hour period will be provided with adequate hearing protection devices to ensure no hearing damage will result from construction activities. If equipment is being used that can cause hearing damage at adjacent noise receptor locations (distance attenuation will be taken into account), portable noise barriers will be installed that are demonstrated to be adequate to reduce noise levels at receptor locations below hearing damage thresholds.	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		All production wells or booster pumps will have their noise levels attenuated to 50 dBA CNEL at 50 feet from the well head. Project design will include measures which assure adequate interior noise levels as required by Title 25 (California Noise Insulation Standards).	
Noise (continued)		Require that all parking for desalter uses adjacent to residential areas be enclosed within a structure or separated by a solid wall with quality landscaping as a visual buffer. Desalters will be constructed and operated so that noise levels from operations do not exceed 50 dB during night hours and 65 dB averaged over the 12 hours of day time when located adjacent to existing or future sensitive land uses. This can be achieved by siting desalters a sufficient distance from sensitive noise receptors; by incorporating attenuation features in the facility or designing attenuation features at the boundary of the property.	Less than significant impact
Public Services	Cause a significant demand for police protection services; a significant demand for fire protection services; a significant demand for school room capacity; and a significant demand for library capacity.	OBMP facilities will be fenced or otherwise have access controlled to prevent illegal trespass to attractive nuisances, such as construction sites or recharge sites.	Less than significant impact
Utilities	Cause a significant demand for electricity and natural gas services. Cause a significant demand for communication system services. Cause a significant demand for wastewater collection or treatment system capacity. Cause a significant demand for solid waste disposal capacity. Cause a significant demand for water supply	Electricity Developers in the proposed Project Area should coordinate with SCE regarding the location and phasing of required on-site electrical facilities. Proposed building construction should comply with Title 24 of the California Administrative Code. Onsite electrical lines should be installed underground. Project planners and architects should consult with SCE regarding current energy conservation techniques.	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
	capacity.	Project planners and architects should also consider the use of energy-efficient architecture and landscape design concepts which will work to reduce the long-term demands for fossil fuels. Such measures should include the following:	
Utilities (continued)		· Architectural planning and design, to the extent feasible, should take full advantage of such concepts as natural heating and/or cooling through sun and wind exposure and solar energy collection system opportunities when practical; and · Landscape design should be tailored, where feasible, to the use requirements of individual structures, with the intent to minimize heat gain in summer, maximize heat gain in winter, and promote air circulation for heating and cooling purposes. <u>Natural Gas</u> Natural gas service to the proposed Study Area should be in accordance with the appropriate purveyors policies and extension rules as required. These are on file with the California Public Utilities Commission. In addition, the following general measures are recommended: · The thermal insulation installed in walls and ceilings should meet the standards established by the State of California. · All buildings should be constructed in conformance with Title 24, Part 6, Division T-20, Chapter 2 of the California Administrative Code. · Windowless walls for western exposures and sill orientation of buildings to use solar heating systems and efficient heating-cooling systems should be installed whenever feasible. · The use of landscaping to moderate building heat gain, such as the use of deciduous trees in parking areas and on the southern and western exposures of buildings to provide shade during the summer, yet allow maximum light and heat	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		during the winter, should be encouraged.	
Utilities (continued)		· Energy conservation methods that could be readily incorporated into a development should be conceived during the design phase of Plan related development projects. Consultation with the appropriate purveyors during the design phase will facilitate the process of adapting the project's architectural design to maximize efficient energy use. <u>Wastewater</u> Wastewater treatment facilities/distribution system improvement/expansion projects will precede or be concurrent with all growth generating projects as required to maintain adequate system capacity levels. Measure 4.13-8 was determined to not apply to the OBMP, the measure has been deleted. The deletion of the measure will not have any significant effect on the implementation of the OBMP since it only applied to developer capacity fees that are in no way related to the OBMP. All industrial and commercial users should take on-site measures to reduce the load strength of their sewage. <u>Solid Waste</u> All proposed development/redevelopment projects within the proposed Study Area that will generate solid waste, will be reviewed on a project-by-project basis by the permitting jurisdiction in coordination with County landfill officials to determine the degree of impact upon remaining landfill capacity. Projects should be approved only after it is determined that the additional solid waste generated can be disposed of within existing landfill facilities. <u>Water Supplies</u> All Plan-related development/redevelopment projects including exterior landscape elements will employ xeriscape plant design and	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		water conservation concepts. At a minimum xeriscape requirements will include the following:	
Utilities (continued)		a. The use of drought-tolerant species, drip irrigation systems, soil moisture sensors, and automatic irrigation systems, when appropriate. b. Extensive use of mulch in all landscaped areas. Use of mulch will improve water holding capacities of the soil by reducing evaporation and erosion. c. A minimal use of lawn, except to accommodate-lawn dependent uses such as playing fields. Warm-season grasses will be used. d. The use of gray water separation storage and transmission systems when feasible for irrigation purposes. The conservation of water should be of significant concern to all citizens in Southern California, and some conservation proceedings are presently mandated by state legislation. As such, the following measures should be implemented for all Plan related construction projects when appropriate to comply with state legislation: · Plumbing fixtures that reduce water usage should be utilized (i.e., low-volume toilet tanks, flow-control devices for faucets and shower heads) in accordance with Title 24 of the California Administrative Code. · The use of drought-tolerant plant species and drip irrigation systems should be considered in order to reduce water usage. · Installation of ultra-low flush toilets in all new construction should occur. · Installation of low-flow showers and faucets in accordance with California Administrative Code, Title 24, Part 6, Article 1, T20-1406F should occur.*	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Utilities (continued)		Recommendations to be implemented where applicable: <u>Interior</u> · Supply line pressure: recommend water pressure greater than 50 psi be reduced to 50 psi or less by means of pressure-reducing valve. · Flush valve operated water closets: recommend three gallons per flush. · Drinking fountains: recommend installation of self-closing valves. · Pipe insulation: recommend all hot water lines in dwelling units be insulated to provide hot water quickly with less water and to prevent hot pipes from heating cold pipes. <u>Exterior</u> · Preserve and protect existing trees and shrubs. Established plants are often adapted to low water conditions and their use saves water needed to establish replacement vegetation. · Group plants of similar water use to reduce over-irrigation of low-water-using plants. · Provide information to occupants regarding benefits of low-water-using landscaping and sources of additional assistance. · Use pervious paving material whenever feasible to reduce surface water runoff and to aid in ground water recharge. · Grade slopes so that runoff of surface water is minimized.	Less than significant impact
Cultural Resources	Disturb, damage, or destroy cultural resources.	<u>Archaeology</u> Inventory: A required basic archaeological inventory should encompass the following guidelines:	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		a. Literature and Records Search - Existing maps, site reports, site records, and previous EIRs in the region of the subject area should be researched to identify known archaeological sites and works completed in the region. All maps, EIRs, historical maps and documents, and site records should be cited in text and references. Local historical societies should also be contacted and referenced. State Information Centers will provide the bulk of this information. The San Bernardino County Archives or the Eastern Information Center at UC Riverside should be contacted. b. Field Reconnaissance - Conduct a surface survey to obtain comprehensive examination of current status of the area and gather general understanding of the kinds of cultural and related phenomena present. At a minimum, all ground surfaces chosen for survey should be walked over in such a way that every foot of ground can be visually scanned. All previously recorded cultural resources should be revisited to determine their current status, and all newly discovered sites should be recorded on either State Form 422 or 523 and supplements, as appropriate. Trinomial designations will be obtained from the Information Center. For the inventory process, a compilation of all historical resources, including archaeological and historic resources older than 50 years, using appropriate State record forms, following guidelines in the California Office of Historic Preservation's handbook should be completed for all new discoveries.	
Cultural Resources (continued)		Two copies should be submitted to the San Bernardino County Archeological Information Center for the assignment of trinomials if discovered within San Bernardino County. Otherwise, the appropriate comparable agency in Riverside County will be the recipient of these reports. c. Report - A technical report should be prepared which fully describes both the methods and results of all efforts. Research sources should be listed, and the information summarized. The field work should be presented in detail, with all appropriate maps and graphics. Any areas not inspected with full intensity should be specified, preferably	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		using clear, easily understood maps, and the reasons for the deficiency presented. Site records should be prepared for all new discoveries, and amendments prepared to update old records where necessary; since locational data are shielded from public access, the actual forms should be provided in the separable appendix, but the sites should be described in the main text. Each resource description should include a professional opinion of significance, with reference to the qualities or research potential which make it worthy of further consideration. Archaeological sites which need test excavation to confirm significance, integrity, and boundaries should be identified, and a sampling program recommended. For each potentially significant cultural resource, possible impacts should be listed and mitigating measures developed. All standards for compliance with the CEQA requirements and those of the lead agencies should be addressed.	
Cultural Resources (continued)		Assessment: Properties will be evaluated using a well-understood cultural context that describes the cultural development of an area and identifies the significant patterns that properties represent. This same historic context is used to organize all identification, registration, and preservation decisions within the planning framework. To be useful in subsequent stages of the planning process, evaluation decisions must make clear the significance of the property with the historic context. Potential preservation treatments should not influence the evaluation of significance. The nature and type of assessment will depend on the particular resource(s) and level of information for a particular region. Consequently, it is not possible to prescribe specific methods to be utilized. However, there are certain basic elements that should be included and are as follows: a. Preparation of a Research Design - Archaeological documentation can be carried out only after defining explicit goals and a methodology for reaching them. The goals of the documentation effort directly reflect the goals of the preservation plan and the specific needs identified for the relevant historic contexts.	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		b. Field Studies - The implementation of the research design in the field must be flexible enough to accommodate the discovery of new or unexpected data classes or properties, or changing field conditions. An important consideration in choosing methods to be used in the field studies should be assuring full, clear, and accurate description of all field operations and observations, including excavation and recording techniques and stratigraphic or inter-site relationships.	
Cultural Resources (continued)		c. Report - The assessment report should evaluate the significance and integrity of all historical resources within the project area, using criteria established in Appendix K of the CEQA Guidelines for important archaeological resources and/or CFR 60.4 for eligibility for listing on the National Register of Historic Places. The report should contain the following information and should be submitted to the San Bernardino county Archaeological Information Center or to the Eastern Information Center at UC Riverside for permanent archiving: (1) Description of the study area; (2) Relevant historical documentation/background research; (3) The research design; (4) The field studies as actually implemented, including any deviation from the research design and the reason for the changes; (5) All field observations; (6) Analysis and results, illustrated as appropriate with tables, maps, and graphs; (7) Evaluation of the study in terms of the goals and objectives of the investigation, including discussion of how well the needs dictated by the planning process were served; (8) Information on where recovered materials are curated and the satisfactory condition of those facilities to protect and to preserve the artifacts and supporting data. The County of San Bernardino requests that	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		historical resource data and artifacts collected within this project area be permanently curated at a repository within the County.	
Cultural Resources (continued)		d. In the event that a prehistoric or historic artifact over 50 years in age is encountered within the project area, especially during construction activities, all land modification activities in the immediate area of the finds should be halted and an onsite inspection should be performed immediately by a qualified archaeologist. This professional will be able to assess the find, determine its significance, and make recommendations for appropriate mitigation measures. Further, if human remains of any kind are encountered on the property, the San Bernardino or Riverside County Coroner's Office must be contacted within 24 hours of the find, and all work should be halted until a clearance is given by that office and any other involved agencies. Monitoring: In situations where resources are potentially subject to direct or indirect impact and testing or data recovery is not proposed, an archaeological monitor and Native American observer/consultant should be present during subsurface work. One circumstance under which this might occur would be if a known resource was close to a area of impact and the site boundaries were ambiguous. Monitors help insure that exposed data or materials are collected and that if potentially significant cultural materials or features are encountered, they will be preserved either by realignment of the proposed facilities or by prompt evaluation and recommendations for any necessary mitigative measures. Data Recovery: If an archaeological resource is found to be significant and no other preservation option is possible, mitigation of adverse effects by scientific data recovery, including analysis and reporting is the method of last resort. Such a mitigation program is usually only developed after an assessment test has been completed to identify physical parameters and cultural complexity, and formulate a research design. Each specific program would have to be developed in response to the site and potential impact, with the concurrence of the appropriate agencies and in consultation with Native American representatives.	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
Cultural Resources (continued)		Future Project Siting: Future project will be located, whenever possible or feasible, outside of the highly sensitive cultural resource areas depicted in Figures 4.14-1. Before any projects are located, and before any construction activities begin, any proposed project that will result in ground disturbance to any area that does not have a complete cultural resource survey on record with either the AIC or the EIC offices will conduct a site specific cultural resource evaluation and report prior to any ground breaking activity. Further, if cultural resources have been identified on the site, a qualified archeologist or paleontologist will be retained to devise an excavation and/or curation plan for the resources, and a qualified cultural resource monitor will be present onsite during all construction-related activities that could potentially uncover previously undiscovered resources. This monitor will examine excavated soils and have the authority to cease construction activities if resources are un-earthed. <u>Architectural Resources</u> Based solely upon this level of investigation and at this stage of project planning, it would be premature to propose specific mitigation measures. However, certain options can be presented presupposing a general level of knowledge regarding impacts. These options can be utilized to avoid impacts upon the cultural resources - the preferred result - or to lessen adverse effects. It should be emphasized that these options are not the only ones that may be applied. As such, these measures are not recommended as conditions of Project approval but are included for the Authority's consideration and implementation as appropriate. a. Conduct a comprehensive historic building survey which is integrated with economic development programs; b. Adopt a preservation ordinance and create a preservation board;	Less than significant impact
Cultural Resources (continued)		c. Ensure other planning programs, plans, and ordinances are compatible to the historic preservation goals and policies; d. Direct existing funding sources and loan programs to historic neighborhoods in need of revitalization;	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		e. Provide incentives and direction encouraging preservation and revitalization; and f. Develop ongoing programs for enhancing public appreciation of historic resources. g. Project Redesign A proposed project may be redesigned in either of two ways: (1) Outside of site boundaries, thus avoiding impact to the site; or (2) Restricting impacts to those areas of a site where previous impacts have already destroyed the integrity and research potential. Other options may also apply and may include capping of the site, relocation of structures, and integration of extant buildings into project design.	
Aesthetics and Visual Resources	Have a significant affect on a scenic vista or scenic highway. Have a demonstrable negative aesthetic effect. Create light or glare.	All surface areas disturbed by OBMP construction activities, except those area used structures or hardscapes) will be revegetated, either with native vegetation in natural landscapes or in accordance with a landscape plan in man-made landscape areas (note that native vegetation is also eminently suited to man-made landscapes and requires less maintenance). Once construction is completed, revegetation will begin immediately and, where a formal landscape plan is being implemented, it will be coordinated with the local agency and the local design guidelines for consistency.	Less than significant impact
Aesthetics and Visual Resources (continued)		Where facilities are proposed to be located adjacent to scenic highways, corridors or other scenic features identified in local agency planning documents, OBMP facility implementation will conform with design requirements established in these planning documents. Where facilities will disrupt views from occupied areas with significant scenic vistas, a visual simulation analysis will be performed of the facility's impact on the important view. If the analysis identifies a	Less than significant impact

Environmental Category/Issue	Impact Description	Mitigation Measures	Impact After Mitigation
		significant impact on a scenic vista, the facility will be relocated, redesigned to reduce the impact to a non-significant level, or a subsequent environmental evaluation will be prepared. When OBMP above ground facilities are constructed in the future, the local agency design guidelines for the project site will be followed to the extent that they do not conflict with the engineering and budget constraints established for the facility. All utilities for OBMP facilities will be placed underground unless such undergrounding is not technically feasible. Future project review and implementation will implement the following: · Use of low pressure sodium lights where security needs require such lighting to minimize impacts of glare. · Height of lighting fixtures will be lowered to the lowest level consistent with the purpose of the lighting to reduce unwanted illumination. · Directing light and shielding will be used to minimize off-site illumination. · No light will be allowed to intrude into sensitive light receptor areas.	

CHAPTER 2
INTRODUCTION

2.1 BACKGROUND

By way of history, the Chino Basin Watermaster was established by a Judgment entered by the Superior Court of California in 1978. The Judgment provides for Watermaster to develop a management program for the Chino Groundwater Basin that includes both water quality and water quantity related considerations. The Watermaster was also recently directed by the court to develop an Optimum Basin Management Program (OBMP) for the Chino Basin. The OBMP Phase I Report, written in accordance with the Court's ruling, includes tasking towards a comprehensive groundwater monitoring program and management plan, both of which are identified as mandated requirements in the Chino Basin Judgment. Management goals for the OBMP consist of maintaining groundwater quality, water supply and production at an acceptable level for long-term beneficial and conjunctive uses.

Specifically, Watermaster was created on January 27, 1978 by the San Bernardino County Superior Court after extensive negotiations. The negotiations occurred primarily among three different interest groups or pools: the Appropriative Pool (municipal), the Overlying (non-agricultural) Pool (industrial) and the Overlying (agricultural) Pool (agricultural). These groups agreed to a stipulated settlement or physical solution, commonly called "the Judgment", which was entered to provide for administration of the Basin's adjudicated water rights and to provide a Basin-wide governing body for management of groundwater resources. The Judgment also established an "Advisory Committee", which has representatives from all three pools as members. Items of interest or commonality to all pools are considered by the Advisory Committee and by the Watermaster Board in addition to being considered at the Pool level. The Judgment (including the Rules and Regulations for the Watermaster and the Committees) is the document that formally establishes the Pools, the Advisory Committee, the Watermaster and the procedural framework to implement and enforce the physical solution among the several hundred parties who rely on the Chino Groundwater Basin as a water source.

Since the Judgment was entered, it has been amended several times. The most substantive of these amendments is the land use conversion amendment, which was done in November of 1995. This amendment simplifies the method used to calculate the amount of water an appropriator will receive when land which was previously used for agricultural purposes is converted to urban purposes.

For the first 20 years under the adjudication, the Chino Basin Municipal Water District Board of Directors served as "the Watermaster Board". In 1996, at the request of the producers, a motion to appoint a new nine-member Watermaster Board that is more representative of the Basin was filed with the Court. On February 19, 1998, the Court ruled to establish the new nine-member Watermaster Board, effective March 1, 1998. Pursuant to the Judgment, the new Watermaster is charged with development of an OBMP.

For joint power authorities or agencies comprised of a number of participating entities, such as the Watermaster, any member of the authority can serve as the lead agency on a project under the California Environmental Quality Act (CEQA). By mutual agreement, Inland Empire Utilities Agency (IEUA or the Agency) has agreed to serve as the lead agency for the CEQA environmental review process for the adoption and implementation of the OBMP.

In this instance, the process by which the OBMP will be adopted is similar in nature to the workings of a joint powers authority (JPA). Watermaster has designated IEUA as the lead agency for this OBMP project. As the CEQA Lead Agency, IEUA must conduct the environment, review process in accordance with CEQA guidelines and requirements. This process requires the IEUA to evaluate and minimize potentially negative impacts to the environmental prior to project approval and implementation. The course of action that was determined to be most appropriate by the IEUA for compliance with CEQA was the preparation of a Program Environmental Impact Report (PEIR). Prior to starting work on the PEIR, a Notice of Preparation (NOP) was distributed to 192 potentially impacted parties and agencies. Comments were solicited via written responses to the NOP and oral comments were received at a scoping meeting that occurred on December 9, 1999. All comments received prior to December 30, 1999 have been incorporated into the scoping process for this document, and a summary of comments is provided in Appendix 8.1 of Chapter 8 to this PEIR.

Prior to initiation of the PEIR process, a series of debates occurred over whether or not the OBMP falls within the jurisdiction of CEQA, or if the OBMP can be considered exempt under the provisions regarding "Feasibility and Planning Studies" in CEQA Guidelines Section 15262 or "Information Collection," in CEQA Guidelines Section 15306. It appears, however, that the OBMP qualifies as a "project" under CEQA (Public Resources Code Section 21065, and by the State CEQA Guidelines in 14 California Code of Regulations, Sections 15357,15377, and 15378), and it can not be clearly demonstrated that the OBMP falls entirely within the definition of the aforementioned existing CEQA exemptions. Thus, the Watermaster and its constituent agencies have decided to prepare a PEIR for the OBMP, since the OBMP cannot be definitively excluded as a project and may not qualify for a categorical exemption.

A PEIR has been selected for the OBMP based on the definition of a program document contained in Section 15168 of the State CEQA Guidelines which states:

> "A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either: (1) Geographically, (2) As a logical part in the chain of contemplated actions,..."

If IEUA chooses to certify this PEIR, and to approve the OBMP, then other constituent Watermaster parties also have the option to adopt the OBMP. As CEQA responsible agencies listed in this document, each constituent agency, following their own review and approval of the OBMP Final EIR document, can implement specific projects under the OBMP in the future. A responsible agency, as defined by CEQA is, "a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or has prepared an EIR." A responsible agency is not obligated to implement or fulfill the project elements set forth in an EIR. A responsible agency is simply a party that may have follow-on actions which relate to the proposed project and fall within the scope of the certified EIR. Thus, the requirements and responsibilities for lead and responsible agencies differ in nature. Watermaster constituent agencies, therefore, qualify as responsible agencies; however, they are not legally obligated to, but may choose to independently approve or adopt the OBMP and certify the PEIR to implement projects within the scope of the OBMP.

A future project implemented under the umbrella of the OBMP PEIR may not need any additional documentation, depending upon the project being within the scope of the certified OBMP PEIR in accordance with State CEQA Guideline Sections 15162 (Subsequent EIRs and Negative Declarations) and 15168 (Program EIR). IEUA envisions the following procedure for future site specific projects that it may implement on a case-by-case basis. The first step will be to prepare an Initial Study to determine if the specific project falls "within the scope of the program approved earlier" and the "program EIR adequately describes the activity for the purposes of CEQA" (Section 15168 (e) (1) and (2) of the State CEQA Guidelines). In preparing the Initial Study, a determination would be made regarding which, if any, of the identified mitigation measures should be brought forward from the OBMP PEIR to mitigate impacts for the specific project. If the specific project is adequately addressed in the OBMP EIR, then the process permits the implementing agency to publish a notice of this finding, adopt the finding at the hearing where the project is funded by the agency, and a Notice of Determination can be filed.

Because of concerns expressed by other agencies commenting on the OBMP PEIR, IEUA intends to afford other agencies that may have an interest in a project an opportunity to review the documentation (such as engineering reports or investigations and the Initial Study) with adequate time to effectively participate in the IEUA decision on the project. However, each agency that adopts the OBMP and certifies the OBMP PEIR retains the right to comply with CEQA in any fashion that meets the requirements of the statute and the State CEQA Guidelines. This would include the use of exemptions where appropriate, adoption of Negative Declarations for projects, and preparation and certification of an Addendum to an EIR, or of a Supplemental or Subsequent EIR. The procedures for making these decision are outlined in detail in Articles 18 and 19 and Sections 15180 through 15168 of the State CEQA Guidelines. Each agency must select the appropriate review process for future specific projects, but the availability of the OBMP PEIR provides an additional processing mechanism, and identifies general mitigation measures that can be used by the agency where such mitigation is required.

A flow chart outlining the proposed IEUA CEQA review process and a sample initial study evaluation form are included at the end of this Final OBMP PEIR for information.

If the potential environmental impacts fall outside of the impact forecasts contained in the OBMP PEIR, after implementing the mitigation measures outlined in this document, then a new impact will occur, or an identified impact will be worsened, i.e. made more significant. Under such circumstances a new environmental document (Negative Declaration, Supplemental or Subsequent EIR) must be prepared and circulated in the same manner as the OBMP PEIR. IEUA believes that the CEQA process is fully protective of the environment as a result of these requirements, including the groundwater resources upon which many appropriators and producers rely to meet water supply demands.

The CEQA process is not the only forum that will be available for review of future specific projects being implemented under the OBMP umbrella. The Watermaster is finalizing a draft "Peace Agreement Chino Basin" which outlines a process for implementing OBMP projects that is designed to ensure participation by all of the participating agencies. It is anticipated that all projects that may affect hydrologic control in the Chino Basin, or where water credits and financing alternatives will be at issue, will undergo peer review under the framework established in the "Peace Agreement".

Further, in recognition of concerns expressed during the DEIR comment period regarding adequate opportunity to participate in an open review process, IEUA makes a commitment to provide all parties interested in a future specific project with a minimum of 30 days to review the engineering investigation documents and the Initial Study prepared for a project that has been found to be within the scope of the OBMP PEIR. Of course, for projects undergoing additional review for a Negative Declaration or a Supplemental or Subsequent EIR, public review periods are dictated by CEQA and these requirements will be followed. With the Watermaster review process combined with IEUA's commitment to provide adequate time for interested parties to review future specific project proposals in detail, IEUA concludes that adequate review procedures are in place to ensure effective participation by interested parties in the CEQA process. Since many future projects (for example groundwater monitoring wells, pipelines, small recharge projects, etc.) are expected to fully comply with CEQA by relying on the OBMP PEIR, IEUA does not believe it is necessary to restrict the available processing options for complying with CEQA. Please note that as each future specific project is considered and then approved by the IEUA Board, a new Notice of Determination will be filed which provides a backstop provision for any interested party if it does not believe that full compliance with CEQA has been achieved.

As stated before, CEQA requires that the Lead Agency consider the environmental information in the project record, including this PEIR, prior to making a decision on the proposed project. The decision that will ultimately be considered by the governing board of the IEUA is whether or not to certify the Final PEIR (FEIR) as adequate to address the environmental effects of implementation of the OBMP. The Final PEIR was certified and approved by the IEUA Board of Directors on July 12, 2000, following all appropriate public review and comment requirements established in the CEQA Guidelines.

This PEIR has been prepared by Tom Dodson & Associates (TDA) under contract to the Inland Empire Utilities Agency in accordance with Section 21151 of CEQA. The Agency retained TDA, with the consent and approval of the Chino Basin Watermaster Board, to assist in performing the independent review of the project required by CEQA prior to releasing the PEIR as a draft for public review. IEUA has reviewed the content of the Draft PEIR and concurs with the evaluations, conclusions and findings contained herein. The Board certified the Final PEIR on July 12, 2000.

2.2 SCOPE AND CONTENT OF THIS PEIR

As the Lead Agency, IEUA initially concluded that the proposed project could result in one or more potentially significant adverse impacts to the environment and, therefore, a PEIR should be prepared. In accordance with Sections 15063 and 15082 of the State CEQA Guidelines, the IEUA prepared a Notice of Preparation of a PEIR to solicit comments identifying the environmental resources and manmade systems that could experience significant environmental impact if the proposed project is implemented. Additionally, a public scoping meeting was held for the same purpose.

Comments on the scope of the PEIR received during the NOP process and public meeting process are summarized in Appendix 8.1 and have been considered and evaluated in this document.

In addition to evaluating the specific environmental issues, this PEIR contains all of the sections mandated by the State CEQA Guidelines. Table 2.3-1 provides a listing of the contents required in an EIR along with a reference to the chapter and page number where these issues can be reviewed in the document. This PEIR is contained in two volumes.

2.3 PEIR FORMAT AND ORGANIZATION

This PEIR contains eight chapters which, when considered as a whole, provide the reviewer with an evaluation of the potential significant adverse impacts from implementing the proposed project, the construction and operation of the project proposed by IEUA and associated applications. The following paragraphs provide a summary of the content of each chapter of this PEIR.

Chapter 1 contains the executive summary for the PEIR. This includes an overview of the proposed project and a tabular summary of the potential adverse impacts and mitigation measures.

Chapter 2 provides the reviewer with an introduction to the document. This chapter of the document describes the background of the proposed project, its purpose, and its organization. The CEQA process to date is summarized and the scope of the PEIR is identified. Technical evaluations prepared for the PEIR are discussed and the format and availability of the PEIR are described.

Chapter 3 contains the project description used to forecast environmental impacts. This chapter describes for the reviewer how the existing environment will be altered by the proposed project.

This chapter sets the stage for conducting the environmental impact forecasts contained in the next several chapters.

Chapter 4 presents the environmental impact forecasts for the issues considered in this PEIR. For the environmental issue identified in Chapter 1, the following impact evaluation is provided for the reviewer: the project's existing environmental setting; the potential impacts forecast to occur if the project is implemented; proposed mitigation measures; unavoidable adverse impacts; and cumulative impacts.

Chapter 5 contains the evaluation of alternatives to the proposed project. Included in this chapter is an analysis of the no project alternative and other project alternatives.

Chapter 6 presents the topical issues that are required in a PEIR. These include: any significant irreversible environmental changes, and growth inducing effects of the project. As of January 1, 1995, the assessment of short-term benefits relative to long-term impacts is no longer required because it is considered redundant to other sections in a PEIR. This change was adopted as part of SB 749 (Thompson) which became law in January 1995.

Chapter 7 describes the resources used in preparing the PEIR. This includes persons and organizations contacted; list of preparers; and bibliography.

Chapter 8 contains those materials referenced as appendices to the PEIR, such as the Notice of Preparation, comment letters, distribution list, and other materials referred to in the PEIR.

Volume II contains Comments to Draft PEIR, Responses to Comments, Attachments, Peace Agreement and Implementation Plan

Table 2.3-1
REQUIRED EIR CONTENTS

Required Section (CEQA)	Section in EIR	Page Number
Table of Contents (Section 15122)	same	ii
Summary (Section 15123)	Chapter 1	1-1
Introduction	Chapter 2	2-1
Project Description (Section 15124)	Chapter 3	3-1
Significant Environmental Effects of Proposed Project (Section 15126a); Environmental Impacts	Chapter 4	4-1
Unavoidable Significant Environmental Effects (Section 15126b)	Chapter 4	4-1
Mitigation Measures (Section 15126e)	Chapter 4	4-1

Required Section (CEQA)	Section in EIR	Page Number
Cumulative Impacts (Section 15130)	Chapter 4	4-1
Alternatives to the Proposed Project (Section 15126f)	Chapter 5	5-1
Growth-Inducing Impacts (Section 15126d)	Chapter 6	6-1
Irreversible Environmental Changes (Section 15126c)	Chapter 6	6-1
Effects Found Not to be Significant (Section 15128)	Chapter 4	4-1
Organizations and Persons Consulted (Section 15129)	Chapter 7	7-1
Initial Study, Notice of Preparation, and Comment Letters	Chapter 8	8-1
Volume II - Comments to OBMP Draft PEIR, Responses to Comments, Attachments, Peace Agreement, and Implementation Plan	Volume II	--

2.4 AVAILABILITY OF THE OBMP PEIR

The Draft PEIR for the OBMP has been distributed directly to all public agencies and interested persons identified on the NOP mailing list (see Appendix 8.1 of Chapter 8), as well as the State Clearinghouse, and any other requesting agencies or individuals. All reviewers will be provided 30-days to review the Draft PEIR and submit comments to the IEUA for consideration and response. The Draft PEIR is also available for public review at the following locations during the 30-day review period:

Chino Branch Library
13180 Central Avenue
Chino, CA 91710

Chino Hills Branch Library
2003 Grand Avenue
Chino Hills, CA 91709

Fontana Branch Library
8334 Emerald Street
Fontana, CA 92335

Ontario City Library
215 East "C" Street
Ontario, CA 91764-4198

Rancho Cucamonga Public Library
7368 Archibald Avenue
Rancho Cucamonga, CA 91730

2.5 INCORPORATION BY REFERENCE

The following documents are cited throughout this Draft PEIR and are hereby incorporated by reference as permitted by State CEQA Guideline Section 15150, and are available at Inland Empire Utilities Agency at the following address:

Inland Empire Utilities Agency
9400 Cherry Avenue, Building A

Fontana, CA 92335

1. *Chino General Plan*, City of Chino, 1993
2. *Chino Hills General Plan*, City of Chino Hills, 1994
3. *Fontana General Plan*, City of Fontana, 1989
4. *Montclair General Plan*, City of Montclair, 1983
5. *Norco General Plan*, City of Norco, 1985
6. *Ontario General Plan*, City of Ontario, 1992 and *New Model Colony Amendment*
7. *Pomona General Plan*, City of Pomona, 1977
8. *Rancho Cucamonga General Plan*, City of Rancho Cucamonga, 1994
9. *Rialto General Plan*, City of Rialto, 1985
10. *Upland General Plan*, City of Upland, 1992.

Please note, all future references to the City of Ontario's Sphere of Influence area should be treated as references to the New Model Colony General Plan Amendment adopted on November 30, 1999.

All EIR documents related to the aforementioned General Plans are hereby included as reference and supporting informational materials for this PEIR.

- *Chino Basin Municipal Water District Final Report on Reclaimed Water Master Plan,* Montgomery Watson, April 1993.
- *Chino Basin Watermaster Optimum Basin Management Program Phase 1 Report*, Wildermuth Environmental, October 1999.
- *Chino Basin Water Resources Management Study Final Summary Report,* Montgomery Watson *et al.,* September 1995.
- *Chino Basin Water Resources Management Study Model Calibration Results*, Montgomery Watson Americas, Inc., August 26, 1993.
- *Chino Basin Water Resources Management Task Force Final Task 1 Memorandum: Water and Wastewater Planning Environment,* James M. Montgomery, Consulting Engineers, Inc. *et al.*, March 1993.

- *Chino Basin Water Resources Management Task Force Final Task 2 Memorandum: Develop Management Planning Elements,* James M. Montgomery, Consulting Engineers, Inc. *et al.*, June 1992.

- *Chino Basin Water Resources Management Task Force Final Task 3 Memorandum: Description of Economic Procedures to be Used for Evaluating Planning Alternatives,* CH2M Hill, July 5, 1995.

- *Chino Basin Water Resources Management Task Force Final Task 4 Memorandum: New Planning Model Implementation Plan,* James M. Montgomery, Consulting Engineers, Inc. *et al.*, May 1992.

- *Chino Basin Water Resources Management Task Force Final Task 5 Memorandum: Chino Basin Conceptual Model,* James M. Montgomery, Consulting Engineers, Inc. *et al.* September 1992.

- *Chino Basin Water Resources Management Task Force Final Task 6 Memorandum: Development of Three Dimensional Groundwater Model,* Montgomery Watson *et al.* March 1994.

- *Chino Basin Water Resources Management Task Force Final Task 7 Memorandum: Water Resource Planning Module User's Manual,* Diba Consulting Software Engineers (under contract to Montgomery Watson *et al.*) December 1995.

- *Chino Basin Water Resources Management Study Final Task 9 Memorandum: Evaluate Legal, Institutional and Regulatory constraints,* Camp Dresser & McKee, Inc., March 1996.

- *Chino Basin Water Urban Water Management Plan,* Metropolitan Water District of Southern California, 1995.

- *Draft Water Supply Plan Facilities Report Alternative 6A – Phase 1*, Black and Veatch Corporation, November 9, 1999.

- *Integrated Water Resources Plan,* Metropolitan Water District of Southern California, 1996.

- *Phase 1 Final Report Chino Basin Recharge Master Plan*, Wildermuth *et al.,* January 1998.

- *Regional Urban Water Management Plan,* Metropolitan Water District of Southern California, 1995.
- *Santa Ana Watershed Project Authority Water Resources Plan*, June 1998, prepared by SAWPA Planning Depatment.

2.6 REVIEW PROCESS

In summary, after receiving comments on the Draft PEIR, the IEUA will prepare a Final PEIR for review by the IEUA Board of Directors prior to their making a decision about the project. The IEUA Board of Directors will review the Final PEIR for adequacy and when determined adequate, the PEIR can be used as the informational document for compliance with the CEQA. As described previously in Section 2.1, other responsible agencies may also choose to review and approve the PEIR document and to adopt the OBMP. Information concerning the PEIR public review schedule for this project can be obtained by contacting:

Mr. Neil Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Building A
Fontana, CA 92335
(909) 357-0241

The aforementioned process was completed and the Final PEIR for the OBMP was certified and approved by the IEUA Board of Directors on July 12, 2000. At this hearing the *Peace Agreement Chino Basin* and the *OBMP Implementation Plan* were also adopted by the Board of Directors.

3

CHAPTER 3
PROJECT DESCRIPTION

Note: All Chapter 3 figures are located at the end of this chapter, not immediately following their reference in the text.

3.1 INTRODUCTION

The Optimum Basin Management Program (OBMP) focuses on the Chino Groundwater Basin (Chino Basin or the Basin) as shown on the vicinity map in Figure 3.1-1. Figure 3.1-2 illustrates the boundary of the Chino Groundwater Basin as it is legally defined in the stipulated Judgment in the case of Chino Basin Municipal Water District *vs.* the City of Chino *et al.* Figure 3.1-2 also shows the hydrologic boundary of the Chino Groundwater Basin, which is slightly different from the adjudicated boundary. The Chino Basin consists of an alluvial valley that is relatively flat from east to west, sloping from north to south at a one to two percent grade. Basin elevation ranges from about 2,000 feet in the foothills to about 500 feet near Prado Dam.

3.2 LOCATION

Figure 3.2-1 depicts the Chino Basin adjudicated boundaries relative to USGS 7.5 Minute Series Quadrangles. Chino Basin is bounded:

- on the north by the San Gabriel mountains and the Cucamonga Basin;
- on the east by the Rialto-Colton Basin, Jurupa Hills and the Pedley Hills;
- on the south by the La Sierra area, the Santa Ana River and the Temescal Basin; and
- on the west by the Chino Hills, Puente Hills, and the Pomona and Claremont Basins.

The principal drainage course for the Basin is the Santa Ana River. It flows sixty-nine miles across the Santa Ana Watershed from its origin in the San Bernardino Mountains to the Pacific Ocean. The Santa Ana River enters the Basin at the Riverside Narrows and flows along the southern boundary to the Prado Flood Control Reservoir where it is eventually discharged through the outlet at Prado Dam. The Basin is traversed by a series of ephemeral and perennial streams that include: Chino Creek, San Antonio Creek, Cucamonga Creek, Deer Creek, Day Creek, Etiwanda Creek and San Sevaine Creek. These creeks, flowing primarily north to south, carry significant flows only during, and for a short time after, intermittent storms that typically occur from October through April. Year-round flow occurs along the entire reach of the Santa Ana River due to year round surface inflows at Riverside Narrows, discharges from municipal water recycling plants that intercept the SAR between the narrows and Prado Dam, and rising groundwater. Rising groundwater occurs in Chino Creek, in the Santa Ana River at Prado Dam, and potentially at other location on the Santa Ana River, depending on climate and season.

While still considered to be a single basin, the Chino Groundwater Basin has been divided into five management zones based upon Basingeo-physical characteristics (shown in Figure 3.2-2), and into three different subbasins (shown in Figure 3.2-3) based on the Santa Ana Regional Water Quality Control Plan (Basin Plan). Presently, the Basin Plan subbasin boundaries and objectives are under review by the Santa Ana Regional Water Quality Control Board (RWQCB). New boundaries similar to the management zones shown in the OBMP are being considered for adoption by the RWQCB.

The five management zones described in the OBMP, shown previously in Figure 3.2-2, are based on the observation of five distinct groundwater flow systems that are characterized by similar hydrologic characteristics, which allow the potential for each region to be individually managed (OBMP Phase I Report, Section 2-3). The water resource management activities that occur in each flow system have little to no impact on the other systems. These management zones are used to characterize the groundwater level, storage, production, and water quality conditions within the Chino Basin. These management zones, in addition to the hydrologic boundary of the Basin itself, are not intended to represent absolute barriers or isolation mechanisms, rather these divisions have been made based on observed flow characteristics and general patterns that can be elucidated from existing groundwater flow data. The groundwater flow model, shown in Figure 3.2-4, is the basis from which observations were made to establish the management zone boundaries.

Water in Management Zone 1 flows generally south with some localized flows to the west in response to groundwater production. Sources of water to Management Zone 1 include direct percolation of precipitation, returns from irrigation, recharge of storm flows and imported water in spreading basins, and subsurface inflow from the Pomona, Claremont Heights and Cucamonga Basins. Discharge is through groundwater production, and as rising groundwater in Chino Creek and the Santa Ana River.

Water in Management Zone 2 flows generally in a southwesterly direction in the northern half of the zone, and then due south in the southern half of the zone. Sources of water to Management Zone 2 include direct percolation of precipitation, returns from irrigation, recharge of storm flows and imported water in the spreading basins, and subsurface inflow from the part of the Rialto Basin northwest of Barrier J and the Cucamonga Basin. Discharge is mainly through groundwater production and potentially small amounts of rising groundwater in the Prado Reservoir area.

Water in Management Zone 3 flows primarily in a southwesterly direction. Sources of water include direct percolation of precipitation, returns from irrigation, and subsurface inflow from the part of the Rialto Basin southeast of Barrier J. Discharge is mainly through groundwater production and potentially small amounts of rising groundwater in the Prado reservoir area.

Water in Management Zone 4 flows in a westerly direction. Sources of water to Management Zone 4 include direct percolation of precipitation, and returns from irrigation. Discharge is through groundwater production.

Water in Management Zone 5 has sources of water including streambed percolation of the Santa Ana River, direct percolation of precipitation, returns from irrigation and subsurface inflow from the Temescal Basin. Discharge is through groundwater production, consumptive use by phreatophytes and rising groundwater in the Prado Reservoir area, and potentially in other locations along the Santa Ana River, depending on climate and season.

The Basin is one of the largest groundwater basins in southern California, containing a capacity of about 5,000,000 acre-feet (acre-ft) for water storage, with an additional, unused storage capacity of about 1,000,000 acre-ft (Department of Water Resources Bulletin 118, "California Groundwater Basins"). Cities and other water supply entities produce groundwater for all or part of their municipal and industrial supplies from the Chino Basin. An additional 300 to 400 agricultural users also produce groundwater from the Basin.

3.3 PROJECT CHARACTERISTICS

In order to ensure a continuing water supply for the long-term beneficial use of all Watermaster parties, an OBMP consisting of two phases is being developed for implementation. Phase I of the OBMP consists of defining the state of the Chino Groundwater Basin, establishing goals concerning major issues identified by stakeholders, and affirming a management plan for the achievement of said goals. Phase I also provides a process that facilitates periodic reviews, public comments, and necessary updates.

Section 2 of the OBMP Phase I Report includes the identification of the physical state of the Chino Groundwater Basin, the predicted future water demands, and the determination of problematic issues associated with the management of the Chino Groundwater Basin.

Section 3 of the OBMP Phase I Report establishes the goals of the OBMP. A mission statement combined with a listing of values, issues, needs and interests deemed important by parties is also contained within this section of the OBMP. The mission statement for the OBMP is as follows:

> *The purpose of the Optimum Basin Management Program is to develop a groundwater management program that enhances the safe yield and the water quality of the basin, enabling all groundwater users to produce water from the Basin in a cost-effective manner.*

Section 4 of the OBMP Phase I Report describes the Management Program and Program Elements for implementation under the OBMP.

Phase II of the OBMP is the development of the specific implementation plans that will effectively allow for the physical construction, operation, management and monitoring of OBMP facilities. This Phase will consist of a series of Memoranda of Agreements, Technical Memoranda, Facility Reports, Policy Documents, and development of Water Supply Plans, Recharge Master Plans, Joint Powers

Authority Agreements, Safe Yield and other related documents will be completed during implementation of the OBMP over the 20-year planning period. When complete, these documents will provide detailed plans for the implementation of Program Elements and the achievement of OBMP Goals listed below. Collectively these documents will facilitate successful implementation of Phase II of the OBMP. It is intended that the OBMP be flexible enough that changes in future demands, and situations can thus be dealt with accordingly.

As a result of the finalization of the Peace Agreement and Implementation Plan during the review process of the DEIR, and in response to comments received on the DEIR, the following statement has been included to reference these documents in the Final PEIR approved July 12, 2000.

The Goals, Management Program, and Program Elements are to be implemented as set forth in the OBMP Implementation Plan, consistent with the Peace Agreement, and supplemented by the rEvised Draft Water Supply Plan Phase 1 Desalting Project Facilities Report attached to this document as an Appendix and incorporated herein by this reference.

3.3.1 Goals

Four primary management goals for the OBMP were developed during a series of meetings to address the issues, needs and interests of the producers. The set of goals are listed below:

Goal No. 1 - Enhance Basin Water Supplies
Goal No. 2 - Protect and Enhance Water Quality
Goal No. 3 - Enhance Management of the Basin
Goal No. 4 - Equitably Finance the OBMP

The first goal applies not only to local groundwater, but also to all sources of water available for the enhancement of the Chino Groundwater Basin. Fourteen actions were identified in Section 3 of the OBMP Phase I Report that will assist in the satisfaction of Goal No. 1. The activities are as follows:

1) Maintenance or increase of groundwater production in the southern portion of the Basin with treatment and service of contaminated groundwater in the southern third of the Basin.
2) Location of new recharge facilities in the upper half of the Basin.
3) Location of new recharge facilities in the lower half of the Basin when recovery of recharged water can be ensured.
4) Development and implementation of a comprehensive basin-wide ground level, groundwater level, quality, and production monitoring program.
5) Development and implementation of a comprehensive plan of stormwater recharge.
6) Development of a comprehensive stormwater flow and quality monitoring program in partnership with other agencies charged with flow and quality monitoring.
7) Development of new stormwater recharge projects at existing and future flood control facilities.

8) Maximization of recharge capacity at existing recharge facilities through improved maintenance.
9) Development of methods to account for losses from storage accounts; and the setting of limits on storage if necessary.
10) Development of a comprehensive ground level, groundwater level, and quality monitoring program in Management Zone 1.
11) Development of an immediate groundwater management program for Management Zone 1, followed by management programs for Management Zones 2, 3, 4, & 5.
12) Creation of new assimilative capacity through the development of offset programs and through other mitigation programs.
13) Maximization of the direct use of recycled water.
14) Development of new sources of supplemental water from the Bunker Hill Basin, the Santa Ana River and other outside Basinsources.

Goal No. 2, to protect and enhance water quality, will be accomplished by implementing activities that capture and dispose of contaminated groundwater, treat contaminated groundwater for direct high-priority beneficial uses, and encourage better management of waste discharges that impact groundwater. The following seventeen activities are envisioned to protect and enhance water quality (OBMP Phase I Report, Section 3). Cross Referencing with Program Elements described starting in Section 3.3.2 is provided in parentheses following each activity description.

1) Development and implementation of a comprehensive groundwater quality monitoring program. (PE1)
2) Coordination with regulatory agencies to share monitoring and other information to detect and define water quality problems. (PE6, PE7, PE9)
3) Coordination of action regarding the Watermaster priorities of mutual interest. (PE8, PE9)
4) Participation in projects of mutual interest including the RWQCB watershed management efforts within the Chino Basin. (PE6, PE3)
5) Development and implementation of programs to address problems posed by specific contaminants. (PE4, PE5, PE6, PE7)
6) Exportation of manure, enhanced manure management, or facilitation or support of salt removal efforts. (PE7)
7) Treatment of dairy sewage and the elimination of discharge to groundwater, or exportation of dairy sewage. (PE7)
8) Development of programs to pump and treat degraded groundwater and to put the treated water to direct beneficial uses. (PE3, PE5)
9) Development and implementation of a comprehensive stormwater recharge plan. (PE2, PE8, PE9)
10) Development of a comprehensive stormwater flow and quality monitoring program in partnership with other agencies charged with flow and quality monitoring. (PE6, PE9)
11) Development of new stormwater recharge projects at existing and future flood control facilities. (PE2, PE6, PE9)

12) Maximization of recharge capacity at existing recharge facilities through improved maintenance or operational and/or structural improvements. (PE2, PE9)
13) Periodic assessment of the salt balance of the Basin. (PE7)
14) Development of new TDS export facilities and/or finding means of using the Non-Reclaimable Wastewater System and the Santa Ana Regional Interceptor with less cost. (PE3, PE5)
15) Establishment of financial incentives to ensure that when existing groundwater is pumped, it is replaced with high quality water to replenish the Basin over time. (PE2, PE3, PE5, PE8, PE9)
16) Increasing the groundwater recharge volume in excess of production to cause an increase in the storage volume without an increase in rising water (discharge from the Basin). (PE2, PE3, PE5, PE7, PE8, PE9)
17) Promote public education. (All Program Elements)

The third goal, to enhance management of the Basin, will be achieved by implementing activities that will lead to optimal management of the Chino Basin. Five activities have been identified to assist in accomplishing this goal (OBMP Phase I Report, Section 3).

1) Development of methods to account for losses from storage accounts; setting of limits on storage if necessary. (PE8, PE9)
2) Development and implementation of a comprehensive Basin-wide ground level, groundwater level, water quality, and production monitoring program (Same as with Goal No. 1). (PE1, PE3, PE4, PE5, PE7)
3) Development of new production patterns that optimize yield and beneficial use; and the development of incentive programs and policies that encourage (or rules that enforce) new production patterns. (PE1, PE3, PE5, PE8)
4) Development of programs to pump and treat degraded groundwater and to put the treated water to direct beneficial uses (Same as with Goal No. 2). (PE3, PE5)
5) Development of conjunctive-use policies and programs that take into account water quantity and quality. (PE2, PE3, PE5, PE9)

The last goal is to equitable finance the OBMP. Three actions items have been identified to accomplish this goal (OBMP Phase I Report, Section 3). They are the following:

1) Identification of an equitable approach to spread the cost of OBMP implementation either on a per acre-foot basis or by some other equitable means. (PE3, PE9)
2) Identification of ways to recover value from utilizing Basin assets including storage and rising water leaving the Basin. (PE8)
3) Evaluation of the project and management components and a ranking of the components with equal consideration given to water quantity, water quality and cost and based on their ability to meet the goals of the OBMP. (All Program Elements)

3.3.2 Program Element 1 Develop and Implement Comprehensive Monitoring Program

There have been six types of monitoring identified within the OBMP to support water resources management in the Chino Basin. The first program that is currently being evaluated and implemented is the Groundwater Level Monitoring Program. In the spring of 1998, the Watermaster began a two-part process of developing a comprehensive groundwater level monitoring program. The initial step consists of a survey to collect groundwater level data at all wells in the Basin from which groundwater level measurements can be obtained from the spring of 1999 through fall 2002. The data from this initial survey will be mapped and reviewed.

Based on the review and the Watermaster management needs, a long-term monitoring program will be developed and implemented beginning in the fall of 2002. Watermaster staff expects that they will measure groundwater levels in the initial survey at about 400 wells overlying agricultural pool and about 100 other wells from the other pools and unassigned monitoring wells. The long-term monitoring program will use about half of the wells used in the initial survey plus all wells in the other pools and unassigned wells monitored under the direction of the RWQCB and others. Key wells located in agricultural areas will be replaced as necessary if the original well must be destroyed when the agricultural land surrounding the well is converted to other use.
The next type of monitoring activities are those currently being undertaken as part of the Groundwater Quality Monitoring Program. In July 1999, Watermaster began a similar process to the one identified for the groundwater level monitoring program, consisting of an initial survey and a long-term monitoring effort. The initial survey efforts will involve the collection of all water quality data from appropriators' wells that are tested by appropriators, the collection of all water quality data from the RWQCB for water quality monitoring efforts that are conducted under their supervision, and collection and analysis of at least one water quality sample at all (or a representative set of) other production wells in the Basin.

The assumed maximum number of wells to be sampled by Watermaster staff in the initial survey is 600. These data will be mapped and reviewed. Based on this review and Watermaster management goals in the OBMP, a long-term monitoring program will be developed and implemented in the fall of 2003. The long-term monitoring program will contain a minimum set of key wells that can be periodically monitored to assess water quality conditions in the Basin over time. Water quality data for all operable wells in the other pools will be provided by the well owners in those pools.
The third type of monitoring will be an enhanced Production Monitoring Program. At least 50 percent of wells that produce more than 10 acre-feet per year (acre-ft/year) will have in-line totalizing flow meters. To accomplish this, about 300 agricultural wells will be equipped with in-line totalizing flow meters. Production records from wells owned by appropriators and overlying non-agricultural pool members will report quarterly as has been done in the past.

If necessary, Watermaster staff will read the meters of wells owned by agricultural pool members at least once a year during the period of mid-May through June. Watermaster staff will ender all production records in Watermaster's database and use this information in the administration of the Judgment. In addition, Watermaster will ascertain the sources of water used by each producer and how that water is disposed of after use. This information is to enable accurate salt budget estimates as described in Program Element 6 to be developed and for other water resources management investigations that may be undertaken by Watermaster in the future as part of the OBMP.

The fourth type of monitoring, Surface Water Discharge and Quality Monitoring, is currently in operation to measure water quality at all existing recharge basins. Water level sensors will be installed in all recharge and retention basins that contribute significant recharge to the Chino Basin. A total of 16 new water level sensors will be required. Additionally, the Watermaster needs to assess the existing surface water discharge and associated water quality monitoring programs for the Santa Ana River and its Chino Basin tributaries to determine the adequacy of the existing monitoring programs for characterizing historical ambient conditions and their utility in detecting water quality impacts from future Chino Basin management activities. It is anticipated this will be complete in early fiscal year 2000-2001.

The fifth type of monitoring involves a Ground Level Monitoring Program in which ground level surveys are proposed as an offshoot of the subsidence issues in Management Zone 1. The stake-holders are interested in determining if and how much subsidence has occurred in the Basin. Watermaster will continue to conduct an analysis of historical ground level survey and remote sensing data to make this determination. The analysis consists of the three tasks:

- Historical survey data collected and/or on file by federal, state, and local agencies will be compiled, mapped, and reviewed to estimate total subsidence for as long a period as possible. This activity will be completed in early fiscal year 2000-2001.

- Synthetic aperture radar (SAR) imagery will be used to assess the time history of subsidence in the Basin for the period 1993 though 1999. This was completed in FY 1999-2000.

- Based on the above information, a network of ground elevation stations in subsidence-prone areas will be developed and periodic surveys of these stations will be done. The frequency of periodic surveys will be established for the Basin as a whole with more frequent surveys done for some areas of the Basin. This activity will be completed in early fiscal year 2000-2001.

The sixth and last type of monitoring activity is that of Well Construction, Abandonment and Destruction Monitoring. Watermaster maintains a database on wells in the Basin and Watermaster staff makes annual well inspections. Watermaster sometimes finds a new well during routine well inspections. The near-term frequency of inspection is expected to increase due to the groundwater level, quality and production monitoring programs. Watermaster needs to know when new wells are constructed as part of its administration of the Judgment. Watermaster will develop cooperative agreements with the counties of Los Angeles, Orange, Riverside, and San Bernardino to be informed as to when a new well has been constructed. The presence of abandoned wells is a threat to groundwater supply and a physical hazard. Watermaster staff will review its database, make appropriate inspections, consult with well owners, and compile a list of abandoned wells in the Chino Basin. The owners of the abandoned wells will be requested to properly destroy their wells following the ordinances developed by the county in which the abandoned well is located. Watermaster staff will update its list of abandoned wells annually and provide this list to the counties for follow-up and enforcement.

3.3.3 Program Element 2 Develop and Implement Comprehensive Recharge Program

The safe yield of the Chino Basin was established in the 1978 Judgment to be 140,000 acre-ft/year. The basis for this estimate is described by William J. Carroll in his testimony on December 19 and 20, 1977, during the adjudication process. Table 3.3-1 lists the hydrologic components developed by Mr. Carroll to estimate the safe yield of the Chino Basin. These recharge and discharge components were developed for the period 1965 to 1974, a period that Carroll referred to as the base period. The safe yield was determined using the average production and change in storage during the period 1965 to 1974. Therefore, any recharge source that contributed recharge to the Chino Basin during this period is part of the safe yield. Since 1975, some of the recharge components may have changed. For example, the recharge of recycled water at RP-1 was discontinued in 1974 and the returns from use by irrigated agriculture may have declined as irrigated agriculture was replaced by dairies. Storm flow recharge has also declined as additional channels have become concrete lined. It is difficult to compute a reliable safe yield and to numerically estimate the impacts from the changes in land use and water use on safe yield until Watermaster can develop good estimates of production and storage through the monitoring program described in Program Element 1.

Table 3.3-1
COMPONENTS OF SAFE YIELD
ADOPTED IN THE CHINO BASIN JUDGMENT

Hydrologic Component	Annual Average	
	Acre-ft/year	Percentage
Inflows to Chino Basin		
Deep Percolation		
Precipitation and Surface Inflow	47,500	33%
Imported Water	7,000	5%
Irrigation		
Domestic	9,800	7%
Agriculture	51,900	36%
Artificial Recharge	3,900	3%
Recharge of Recycled Water	18,200	13%
Subsurface Inflow	7,000	5%
TOTAL Inflow	145,300	100%
Outflows from Chino Basin		

Subsurface Outflow Extractions	7,200 180,000	4% 96%
TOTAL Outflow	187,200	100%
Hydrologic Balance		
Estimated Annual Average Change in Storage 1965-1974	-40,000	
Safe Yield (equal to average annual extraction plus annual average change in storage)	140,000	

Watermaster is currently gathering information to compute a new safe-yield, however, it will take approximately 13 years to obtain enough data of sufficient quality to develop this new estimate. In the meantime, there is still debate as to how to treat new storm water recharge developed as part of the OBMP. One option being considered proposes that appropriators share in the new recharge, based on initial shares of safe yield, and pay the Watermaster through the assessment of actual costs for the resulting new yield. Assessment may also be used to pay for facilities to improve storm water recharge over the next 10 years.

It has also been proposed that after 2013, and every 10 years thereafter, Watermaster will recompute the safe yield and the appropriators' volumetric shares will be adjusted to account for the loss in historical recharge and the gains in new recharge.

The Draft Recharge Policy and Memorandum of Agreement is only one element of a comprehensive recharge program. As water demand in the Chino Basin area continues to grow, and as the reliability of Metropolitan Water District of Southern California (MWDSC)as a supplier of imported water becomes uncertain, new recharge of storm flow could offer substantial benefits to Basin producers by offsetting some of the new imported water costs. Recharge of stormwater can be implemented by means of spreading and percolation at both existing and new facilities throughout the Basin, or by means of direct injection into the aquifer. The OBMP Phase I Report estimated that Watermaster's average annual replenishment obligations for ultimate demands on the Chino Basin will be approximately 55,000 afy by the year 2020. Since the present mode of in-lieu replenishment operates primarily on an ad hoc basis, the safest and most conservative way to ensure that recharge capacity will be available is for Watermaster to develop new recharge capacity that will meet ultimate requirements. Watermaster estimates that it will need an estimated 88,000 afy recharge capacity by the year 2020 to safely meet its requirements. For this reason, the development of a comprehensive recharge master plan is essential for the continuance of Basin production patterns. In the OBMP Phase I Report, the estimated capacity for recharge was listed as 80,000 afy. Recent information from Wildermuth Environmental, Inc. has reevaluated this quantity to reflect updated estimates that yield the 88,000 afy capacity being evaluated in this document.

The most current thinking is to make available up to 88,000 acre-feet per year (afy) of recharge capacity for future utilization. Table 4.2-3 identifies an existing total recharge capacity in eleven basins of approximately 69,500 afy. These basins could be modified to accept delivery of water for recharge from a variety of sources, including recycled water, imported water, and stormwater. To achieve sufficient recharge capacity, new recharge basin(s) will be required to handle an additional 10,500 acre-feet of water per year. Assuming a each acre has the ability to percolate one acre-foot of water per day for 210 days of water deliveries, an additional 50 acres of recharge basins will have to be constructed. For forecasting purposes, it is assumed that up to 30,000 acre-feet of stormwater can be recharged into the Basin aquifer (currently up to 12,000 acre-feet are recharged) with a TDS value of 120 mg/l; up to 62,500 acre-feet of SPW can be recharged with TDS values ranging between 250 and 400 mg/l; and up to 40,000 acre-feet of recycled water can be recharged with an average TDS value of 420 mg/l. The actual mix will vary annually depending upon water availability and infrastructure in place to deliver water to recharge basins.

The inclusion of the three additional basins (Wineville, Jurupa, and the RP-3 site) for recycled water recharge will also be analyzed in this document, as 40,000 afy of recycled water is being proposed for recharge under the OBMP. The fact that the locations where this recharge may occur has been expanded to include these three additional basins does not change the impact conclusions in a programmatic document such as this one; especially since site specific impacts from recharging recycled water must be evaluated in the future when specific recharge proposals are proposed with sufficient information to support site specific evaluations.

For clarification purposes in response to comments received in comment letter 10, it should be noted that there is enough capacity in existing basins to allow for the replenishment obligation to be met, but this does not necessarily preclude the construction of new recharge basins for purposes of better managing the Chino Basin. Thus the terms "new," "proposed" and/or "future" are adjectives used throughout the document to clarify the context in which recharge basin types are being discussed.

Additional information regarding the proposed recharge basins has been included as an attachment in the form of Table 1 in the comments and responses to comments section of this document.

At one time, 41 percent of the safe yield was estimated to come from irrigation returns. Since that time, irrigated agriculture has declined, and is expected to be almost completely converted to urban uses by 2020, except possibly for the land utilized by the State of California. Also, as more and more flood control projects are constructed that efficiently capture and convey storm flows to the Santa Ana River, groundwater recharge that took place in the stream channels and floodplains of the Chino Basin has been eliminated to a great extent without proposed mitigation for impacts to the Basin's safe yield.

In addition to quantity-related recharge considerations and maintenance of groundwater levels, the location of both existing and proposed future recharge/injection facilities could have an affect on the numeric water-quality values in an area. If high quality stormwater is delivered and recharged into impaired areas, it may be possible to improve water quality through dilution with stormwater having lower Total Dissolved Solids (TDS) and nitrate concentrations than existing groundwater supplies.

Groundwater recharge using both recycled and stormwater flow can also be used to help offset loss of production, surface ruptures and subsidence in areas that have been subjected to long-term overdraft prior to the Judgment. Areas such as the City of Chino, City of Chino Hills and the California Institute for Men located in Chino may have all been affected, among other things, by the pre-Judgment overdraft in the Basin. Additional recharge in the west side of the Basin by groundwater injection or by shifting replenishment from east-side basins to west-side basins is one way of potentially improving production capability in Management Zone 1, and specifically in the deeper aquifers. The zone currently appears to be in balance.

A three-phase Recharge Plan has been described in a June 6, 1999 Program Element 2 Memorandum by Wildermuth Environmental, Incorporated (see all Task Memoranda in the technical appendices). Of this three part plan, Phase 1 for this program element involves the initial screening and assessment of various potential recharge sites, and it has been completed. Phase 2 involves the engineering assessments of promising sites (percolation rate monitoring, etc.), along with the assessment of institutional issues such as cost, ownership, management, and, if necessary, Basin Plan amendments. Phase 2 is scheduled to be completed by 2002. Phase 3 of the Recharge Plan involves the development of a specific implementation plan to develop, construct, and manage spreading basins during the years 2002-2011. A list of prospective basins, along with lists of potentially required modifications for use, has been prepared by Wildermuth Environmental as part of an "Initial Draft Memorandum of Agreement for the Maximization of Recharge in the Chino Basin Phase 2 -- Optimum Basin Management Program." The table and initial draft MOA are included in this document's technical appendices.

Ultimately, the comprehensive recharge plan will coordinate recycled water recharge with percolation of surface runoff from the mountains, urban stormwater runoff, and State Water Project sources and other imported sources, so as to minimize future dependency on uncertain imported water supplies during future droughts (MWDSC Integrated Water Resources Plan, 1996). This comprehensive recharge plan is consistent with MWDSC's April, 1999 adopted Water Surplus and Drought Management Plan (WSDM). The plan will also seek to locate new recharge facilities in the upper half of the Basin to ensure recovery of this water for subsequent beneficial use, and to increase Basin yield. The proposed plan will only locate new recharge facilities in the lower half of the Basin when recovery of recharged water can be assured, and when water quality in the lower portion of the Basin will not be adversely affected. Some locations that may potentially be used as recharge facilities are shown in Figure 3.3-1.

3.3.4 Program Elements 3 and 5

Program Element 3 consists of the development and implementation of a water supply plan for the impaired areas of the Basin. The areas that typically have the highest concentrations of TDS and nitrates are located in the southern portion of the Basin. A water supply plan for the Basin must seek to provide impaired areas with high quality water. Thus, the plan will focus on the development of regional and local groundwater treatment systems/programs to treat degraded groundwater for subsequent direct beneficial use, the development of programs to improve groundwater quality (by decreasing TDS and nitrate concentrations), and the means by which safe yield can be maintained or increased into the future. The combination of these elements will help to minimize Basin outflow, stop the spreading of degraded quality water, and improve Santa Ana River water quality.

Program Element 5 consists of developing and implementing a regional supplemental water program. This element closely relates to Program Element 3 since the extraction and treatment of impaired water must be carefully balanced with use and recharge of supplemental water sources. Also, in some cases delivery and beneficial use of supplemental water sources could be used in place of continued production in an impaired area, or in place of costly pumping and treating options. Although supplemental water sources typically are considered less expensive, they do not solve the water quality problem itself for areas high in nitrates and TDS. In this light, the water supply plan and supplemental water program are best viewed together in a comprehensive manner that will allow for a balanced use of all available options to ensure that adequate supplies of high quality water will be available to meet future demands and that impaired groundwater supplies will be able to be beneficially used in the future. For this reason, desalination facilities are also included as elements of the water supply plan.

Municipal and industrial demands are projected to increase as much as 30 percent between 2000 and 2020. Several agencies will experience increases in demand exceeding 30 percent over the next 20 years, including the cities of Chino, Chino Hills, Norco, and Ontario, and Cucamonga County Water District, Fontana Water Company, Jurupa Community Services District, and the West San Bernardino County Water District. Forecasts from municipal and industrial entities indicate that water supply sources for the Basin in 2020 will consist predominantly of Chino Basin wells through direct use or treatment and use, imported groundwater, and treated surface water from other Basins and MWDSC supplies. The demand in 2020 is projected to be approximately 404,000 afy, of which approximately 364,000 afy is from secure water sources. The remaining 40,040 afy will then be met through the implementation of the water supply plan to follow, most likely through desalters. This volume of water production in the southern end of the Basin must be maintained for the appropriators to ensure the Basin maintains the existing safe-yield, especially when agricultural pumping eventually diminishes in the future.

The means by which the water supply plan and supplemental water program can be implemented include a variety of options. After considering 6 water supply alternatives and 15 sub-alternatives, the consensus of the OBMP stakeholders was to further evaluate Subalternative 6A as the preferred water supply plan (Draft Water Supply Plan Facilities Report -- Alternative 6A, Black and Veatch, November 9, 1999). Subalternative 6A is comprised of two options for the implementation of a Regional Desalting Program and the expansion of the SAWPA Desalter. Although only Alternative 6A options are described herein, due to the fact that the general consensus at the time of document preparation leaned towards these options, this does not preclude modification to the proposed alternatives or further consideration of other alternatives described in the OBMP Phase I Report and in the Water Supply Facilities Plan prepared by Black and Veatch.

Key Elements for the Reverse Osmosis (RO) and RO/Ion Exchange (IX) options under Alternative 6A are shown in Figures 3.3-2 and 3.3-3. The plans involve the construction of east and west regional desalters, possibly an ion exchange facility, expansion of the SAWPA Desalter, and construction of water transmission pipelines, brine disposal pipelines, and pump stations. In addition, wells could be constructed in two distinctive well fields, east and west, which could supply the desalters with raw water via a common source water conveyance system. Since one of the goals of the OBMP is to preserve the yield of the Basin by reducing the loss of groundwater to the Santa Ana River, the well fields could be located north of the Santa Ana River along the southern portion of the Basin. The controlling criteria for determining the locations of the groundwater treatment facilities include the following: close proximity to the proposed well fields and purveyor delivery points, and near access to the Santa Ana Regional Interceptor (SARI pipeline) for brine disposal, ability to capture rising water that is poor quality, and maintenance of safe yield.

Figures 3.3-4 and 3.3-5 illustrate the approximate locations for Phase 1 groundwater treatment facilities assuming reverse osmosis (RO) only and reverse osmosis/ion exchange (RO/IX), respectively. The East Desalter could be located at the northwest corner of the intersection of Hamner Avenue and Cloverdale Road. This location provides a central location along the proposed eastern well field. The IX facility could be located near Jurupa Community Service District Well No. 8 on Van Buren Boulevard between Etiwanda Avenue and Bain Street. The expansion of the SAWPA Desalter will take place at the existing SAWPA site, which is west of the intersection of Kimball and Euclid Avenues. Facility capacities for both RO and RO/IX are based on the assumption that approximately 40,000 afy of poor quality groundwater will need to be pumped and treated in the southern portion of the Basin in order to maintain the current safe yield value and to prevent approximately 40,000 afy of poor quality groundwater from overflowing or surfacing from groundwater and discharging into the Santa Ana River, when agricultural production decreases, resulting in a decrease in the safe yield of the appropriators. The location of the desalter well field is the most important facility component for the desalter from an environmental impact standpoint. The well field is shown on figures 3.3-4 and 3.3-5 for the two location options being considered.

As agricultural areas convert to urban land uses, groundwater production in the southern part of the Basin must be maintained in order to maintain the safe yield of the Basin, to protect the water quality of the Santa Ana River, and to meet the emerging water demands of the area for urban uses. Currently the groundwater in the southern portion of the Basin has high levels of total dissolved solids (TDS) and nitrate. Both of these contaminants make much of the existing groundwater non-potable without advanced treatment. The suspected source of these contaminants are irrigation return flows from agriculture, dairy waste, municipal waste and industrial discharge, and groundwater pumping patterns.

The Santa Ana River, downstream of the Chino Basin, is the primary drinking water supply, through groundwater replenishment, for most of Orange County. Therefore, adverse impacts to the municipal water supplies of Orange County could be caused if groundwater is not pumped and treated in the southern portion of the Chino Basin. The water that would overflow into Orange County, if not pumped in the Chino Basin, could have an average TDS concentration of about 1,300 mg/L (more than twice the Basin Plan objective at Prado Dam) and nitrate as nitrogen concentration of 30 mg/L (three times the Basin Plan objective).

The groundwater quality in the southern part of the Basin should begin to improve in the future as agricultural land uses transition to urbanization and the groundwater treatment facilities become operational. As the groundwater is withdrawn, treated, and used within the southern part of the Basin, that portion of the water which will return to the groundwater table will be of higher quality than that which was previously produced.

In considering the following treatment options, there is a distinction between the reverse osmosis and ion exchange treatment processes. RO facilities treat the water for both total dissolved solids and for nitrates, while the ion exchange facility would treat only for nitrates and does not reduce the overall salts in the water. The input water quality for a reverse osmosis facility is assumed to have about 1,300 mg/L of TDS and 130 mg/L of nitrate as nitrate. Purveyors of drinking water typically strive to provide customers with water that has a TDS concentration less than 500 mg/L (a secondary drinking water standard, U.S. Environmental Protection Agency) and the Department of Heath Services requires that drinking water have a nitrate concentration less than 10 mg/L as nitrogen.

The treatment process for reverse osmosis removes both total dissolved solids and nitrates from the water. The ion exchange treatment process effectively eliminates only nitrates from the water supply.

The Phase 1 design capacity is presented in Table 3.3-2, followed by expected purveyor demands and future phasing capacities in Table 3.3-3 for the alternative involving RO only. In addition to the facilities listed below, this alternative will require approximately 32,000 feet of pipeline ranging in size from 12 to 24 inches in diameter. The East Desalter will also require an approximately 450 HP pump station, and the SAWPA desalter expansion will require the installation of an approximately 250 HP pump station.

The expected capacities and phasing for the combination RO and IX facilities are shown in Tables 3.3-4 and 3.3-5. In addition to the facilities listed below, approximately 32,000 feet of pipeline ranging in size from 12 to 20 inches in diameter will need to be installed as part of project implementation. Additionally, the East desalter will require an approximately 200 HP pump station to be constructed. The expansion of the SAWPA desalter facility will require the construction of a an approximately 250 HP pump station.

Estimated pipeline diameters and horsepower values for the two alternatives may differ as the facility components for each treatment process may differ. Please refer to the *Revised Draft Water Supply Plan Phase 1 Desalting Project Facilities Report* (June, 2000) for the most current project description available regarding the desalination facilities.

With the selection of one of the aforementioned alternatives, the water supply plan and the subsequent distribution of supplemental water sources can then be better defined for project implementation. The cost allocation can also be broken down in more detail once one of the alternatives is agreed upon as the focus of future studies.

Table 3.3-2
RO ALTERNATIVE DESIGN CAPACITY

Treatment Facility	Design Capacity	Average Production / Nominal Capacity[1]
East OBMP Desalter		
Finished Water Flow Rate, acre-ft/year		29,110
MGD	28.9	26.0
cfs	44.8	40.3
Brine Flow Rate, acre-ft/year		5,140
MGD	5.1	4.6
cfs	7.9	7.1
SAWPA Desalter Expansion		
Finished Water Flow Rate, acre-ft/year		1,700
MGD	1.7	1.5
cfs	2.6	2.3
Brine Flow Rate, acre-ft/year		300
MGD	0.4	0.3
cfs	0.6	0.5
West OBMP Desalter (or further SAWPA Expansion)		
Finished Water Flow Rate, acre-ft/year		3,190
MGD	3.2	2.9
cfs	5.0	4.5
Brine Flow Rate, acre-ft/year		560
MGD	0.6	0.5
cfs	0.9	0.8
Total Finished Water Flow Rate, acre-ft/year		34,000
MGD	33.8	30.4
cfs	52.4	47.1
Total Brine Flow Rate, acre-ft/year		1,500
MGD	6.1	5.4
cfs	9.4	8.4

[1] Includes 90 percent plant availability factor.

Table 3.3-3
PHASING AND EXPECTED PURVEYOR DEMANDS FOR THE RO ALTERNATIVE

Facility	Estimated Purveyor Demands, acre-ft/year			
	2005	2010	2015	2020
East OBMP Desalter				
JCSD	3,740	5,790	7,810	9,850
Swan Lake	350	350	350	350
SARWC	1,180	1,460	1,650	1,850
City of Norco	1,530	2,140	3,330	4,350
Ontario	3,200	4,500	8,530	12,710
East Desalter Subtotal:	10,000	14,240	21,670	29,110
SAWPA Desalter Expansion				
City of Chino Hills	1,700	2,400	2,800	3,000
West OBMP Desalter				
City of Chino	0	1,060	2,130	3,190
Total OBMP Deliveries	11,500	17,000	25,500	34,000
Total Chino Basin Well Production[1]	10,000	20,000	30,000	40,000

[1] Assumes 85 percent desalter recovery.

Table 3.3-4
PHASING AND EXPECTED PURVEYOR DEMANDS FOR THE RO/IX ALTERNATIVE

Facility	Estimated Purveyor Demands, acre-ft/year			
	2005	2010	2015	2020
East OBMP Desalter				
SARWC	1,280	1,540	1,730	1,920
City of Norco	1,660	2,2,50	3,490	4,500
Ontario	0	4,690	8,870	13,150
JCSD	0	0	0	1,480
East Desalter Subtotal:	2,940	8,480	14,090	21,050
SAWPA Desalter Expansion				
City of Chino Hills	1,700	2,400	2,800	3,000
OBMP Ion Exchange Plant				
JCSD	4,050	6,150	8,180	8,720
Swan Lake	350	350	350	350
Ion Exchange Subtotal:	4,400	6,500	8,530	9,070
West OBMP Desalter				
City of Chino	0	1,120	2,230	3,300
Total OBMP Deliveries	9,040	17,800	26,550	35,120
Total Chino Basin Well Production[1]	10,000	20,000	30,000	40,000

[1] Assumes 85 percent desalter recovery.

Table 3.3-5
RO/IX FACILITY DESIGN CAPACITY

Treatment Facility	Design Capacity	Average Production / Nominal Capacity[1]
East OBMP Desalter		
Finished Water Flow Rate, acre-ft/year		21,050
MGD	20.9	18.8
cfs	32.4	29.1
Brine Flow Rate, acre-ft/year		3,750
MGD	3.8	3.4
cfs	5.9	5.3
OBMP Ion Exchange Plant		
Finished Water Flow Rate, acre-ft/year		9,070
MGD	9.0	8.1
cfs	14.0	12.6
Brine Flow Rate, acre-ft/year		280
MGD	0.4	0.3
cfs	0.6	0.5
SAWPA Desalter Expansion		
Finished Water Flow Rate, acre-ft/year		1,700
MGD	1.7	1.5
cfs	2.6	2.3
Brine Flow Rate, acre-ft/year		300
MGD	0.4	0.3
cfs	0.6	0.5
West OBMP Desalter (or further expansion of SAWPA Desalter)		
Finished Water Flow Rate, acre-ft/year		3,300
MGD	3.2	3.0
cfs	5.1	4.7
Brine Flow Rate, acre-ft/year		550
MGD	0.6	0.5
cfs	0.9	0.8
Total Finished Water Flow Rate, acre-ft/year		35,120
MGD	34.9	31.4
cfs	54.1	48.7
	5.2	
	8.0	
Total Brine Flow Rate, acre-ft/year		4,880
MGD	5.2	4.5
cfs	8.0	7.1

[1] Includes 90 percent plant availability factor.

3.3.5 Program Element 4 Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1

In recent years, the piezometric groundwater levels of the deep aquifers of Management Zone 1 have continued to decline, adding to the potential for additional subsidence and fissuring, lost production capability and water quality problems in the area. There is a history of localized subsidence and fissuring within the City of Chino, and a potentially larger and similar problem in the southern end of Management Zone 1 in the former artesian area. In some areas producers have reported stable and/or increased water levels. Further studies to be conducted during implementation of the OBMP will analyze this issue in-depth, and will determine the extent to which this is still a problem since the inception of the Judgment. This study will also provide insight into mitigation options contemplated to address any continued problems in the area. The study mitigation options are anticipated to include recharge, injection, and/or changes in production patterns.

This part of the Basin contains a higher fraction of fine grained materials that originated from sedimentary deposits in the Chino and Puente Hills. This area also consists of a multiple aquifer system. The upper aquifer(s) are moderately high is TDS and are often very high in nitrates. The City of Chino Hills has drilled a series of wells into the deeper aquifer to obtain better quality water, however the storage and hydraulic properties of the deeper aquifers are quite limited relative to the upper aquifer. According to Wildermuth Environmental Inc., the correlation of recent groundwater production in deep aquifers with the timing of the subsidence and fissuring, and a review of the hydrogeologic data from the area very strongly suggests that there is a correlation between the deep aquifer production and the subsidence problem. The Management Zone 1 (MZ1) Management Plan currently consists of an interim plan with several components including development of a long-term plan which will arise from data to be obtained in the near future. The goals of the Interim Plan are as follows: (a) minimize subsidence and fissuring in the short-term; (b) collect the information necessary to understand the extent and causes of subsidence; and (c) formulate an effective long-term management plan.

The Interim Plan consists of a series of activities. The first element of the Interim Plan is a voluntary modification of deep aquifer groundwater production by some agencies in MZ1 for a 5-year period to see if there is a reduction or elimination of subsidence and fissuring in the area. Another element is that any increase in pumping should be matched by increased recharge in the same general area. Additionally, gaps in existing knowledge must be filled. Primarily, there is a lack of understanding of MZ1 hydrogeology, of the nature and extent of subsidence and fissuring, and of the exact causes of subsidence and fissuring. A process must be implemented to fill the gaps in this knowledge base, including investigations of hydrogeologic, geophysical and remote sensing investigations, as well as monitoring programs. Finally, once this information has been obtained, it can be used to formulate an effective long-term management plan.

Water producers in the area with subsidence and fissuring (including California Institution for Men (CIM) and California Institute for Women and the City of Chino) may voluntarily evaluate pumping and recharge patterns and cooperate with all agencies to implement such a management plan. Additionally, producers such as Chino Hills, Ontario, Pomona, Upland, Monte Vista Water District, San Antonio Water Company, and Southern California Water Company must also be part of the management plan since the problems mentioned previously could potentially be of concern to a greater general area. As for recharge entities in the area, Watermaster will serve as a coordination agency for members, however other agencies in the area that may implement the recharge projects for the OBMP include the Chino Basin Water Conservation District and the San Bernardino County Flood Control District. The implementation schedule and a discussion of the subsidence and hydrogeologic characteristics in this area are included with the other task memoranda in the technical appendices to this document *(Program Element 4 – Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1).*

3.3.6 Program Element 6 Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region (Regional Board) and Other Agencies to Improve Basin Management

Program Element No. 6 deals with working cooperatively with the Santa Ana RWQCB towards their Watershed Management Efforts in addition to working with other agencies to improve Basin Management. The goal is to establish a working relationship with regulatory agencies, to share monitoring responsibilities and to facilitate information distribution and sharing so that coordinated action may be taken to define and address water quality issues, and to allow for improved timeliness in clean-up efforts. Currently, the Watermaster does not have sufficient information to determine whether point and non-point sources of groundwater contamination are being adequately addressed. Watermaster's past monitoring efforts have been largely confined to mineral constituents in the southern half of the Basin and to available monitoring data supplied by municipal and industrial producers. According to Section 4 of the OBMP Phase I Report, the RWQCB has limited resources to detect, monitor and implement the clean up of point and non-point water quality problems in the Chino Basin. The Regional Board commits its resources to enforce remedial actions when it has identified a potential responsible party. The RWQCB does not take action when the sources are not easily identified or when the sources are diffuse, such as non-point sources. Notable examples include the mercury problem in the east Ontario area and some solvent plumes in the lower Chino Basin. It is not a question of Regional Board willingness in this area; it is the availability of limited RWQCB resources for allocation. Watermaster can improve water quality management in the Basin by committing resources to:

- Identify water quality anomalies through monitoring;
- Assist the RWQCB in determining sources of the water quality anomalies;
- Establish priorities for clean-up jointly with RWQCB; and
- Remove organic contaminants through its regional groundwater treatment projects in the southern half of the Basin.

Additionally, coordination of efforts to blend recycled water, imported water and natural stormwater, facilitating better management of TDS and nitrate in flushing/cleaning-up the groundwater Basin is being studied by the Watermaster. The RWQCB is interested in establishing legal contracts with Watermaster and/or contributing agencies to include discussions and conditions for salt offsets from R/O for water reclamation programs, and to allow percolation of state project water without offsets if hydraulic isolations is achieved by the desalters.

Program Element 6 is closely related to Program Element 7 and thus for consideration in the OBMP and for analysis purposes theses two elements will be jointly addressed in the water resources discussion (Chapter 4, Subchapter 4.5 of this document).

3.3.7 Program Element 7 Develop and Implement Salt Management Program

Salinity management is a significant problem throughout southern California. The MWDSC and U.S. Bureau of Reclamation sponsored a study (*Salinity Management Study*, June 1999) to identify possible strategies and actions to manage salinity in all the watersheds within coastal plan of southern California.

There is a legacy of contamination in the vadose zone from past agricultural activities (TDS and nitrogen loading), possibly compounded by other activities, that is forecast to continue degrading groundwater long into the future. As of yet, Watermaster does not have sufficient information to determine whether point and non-point sources of groundwater contamination are being adequately addressed. A TDS and nitrate study currently being conducted through SAWPA by Wildermuth Environmental is to be used to provide the baseline data for the development of new Basin Plan objectives.

Program Element 7 also happens to be relevant to conjunctive use issues. One of the main goals of a conjunctive use program is to put inexpensive sources of water to maximum beneficial use. Potential benefits to a conjunctive use program include the following:

- Potential seasonal storage long term replenishment deliveries to appropriators;
- Higher water levels (reduced pumping costs);
- Expanded recharge facilities to capture stormwater (translating into improved water quality and increased yield);
- Increased water quality monitoring;
- Improved modeling of the basin;
- Increased emergency back-up capability; and
- Basin safe yield maintenance.

The primary goal of a conjunctive use program includes optimum use of surface water and ground-water storage capabilities. Other objectives of the conjunctive use program are to increase the amount of water available for delivery to appropriators so that additional water may be provided to minimize shortages and to delay the implementation of drought management procedures. To achieve the goals of the conjunctive use program, water entities must seek to store water that would not be stored under other currently available programs (i.e. water that would otherwise be lost out of the Basin). An initial volume of approximately 150,000 acre-ft of storage may be established by Watermaster to implement the conjunctive use program subject to potential review and storage increase at a later date. Further, a financial incentive may be provided to help shift demand for surface deliveries to the winter months. The water present in the storage capacity could then be pumped in lieu of surface deliveries by supplemental water supply sources. A fundamental precept of this conjunctive use program is that recharge and other activities geared towards using storage in the Basin must not exceed the Basin Plan salinity objectives that will be finalized by the RWQCB in the near future. A storage program such as this has the potential to cause increases in rising groundwater volumes, if hydraulic isolation using the desalters is not appropriately phased with the storage program. The desalter's pumping requirements will exceed estimated storage losses, or else the Watermaster could potentially be required to pay mitigation fees to downstream agencies to treat water in the Santa Ana River. The framework for this mitigation program is already in place under the Judgment and will effectively provide for the coordination of recharge and pumping systems in the Basin.

Some of the TDS and nitrogen challenges in the Chino Basin are caused by agriculture and safe yield management practices in the past, and in the present. The TDS and nitrogen impacts from agriculture are fully described in Section 2 of the OBMP Phase I Report. The major considerations are summarized as follows:

- As irrigation efficiency increases, the impact of consumptive use on TDS in groundwater also increases. For example, if source water has a TDS concentration of 250 mg/l, and the irrigation efficiency is about 50 percent (flood irrigation), the resulting TDS concentration in the returns to groundwater will be 500 mg/l, exclusive of the mineral increments from fertilizer. If the irrigation efficiency were increased to 75 percent, the resulting TDS concentration in the returns to groundwater will be 1,000 mg/l, exclusive of the mineral increments from fertilizer. For modern irrigated agriculture, the TDS impacts of consumptive use are more significant than mineral increments from fertilizers.

- There was a steady buildup of the dairy cattle population in the southern Chino Basin between 1949 and 1989. In one study, the total amount of TDS from manure discharged to the southern half of the Basin that will reach groundwater is estimated to be about 1,200,000 tons through 1989 and averages about 29,000 tons per year. Other studies indicate that these salt loading numbers could be even higher. These numbers assume that half of the manure was hauled out of the Basin after 1973, which was a requirement of the Santa Ana Watershed Water Quality Control Plan enacted in 1973. The amount of manure exported out of the Basin was never verified until the late 1990's, so the TDS loading to the groundwater could be greater than estimated, especially if initial estimates of stockpiled manure are significantly different. Similarly, existing nitrate concentrations in the Basin are not quite as high as those forecasted in some studies, so salt loading impacts could also be slightly lower than forecasted, however, the impacts are still significant and nitrate concentration levels downgradient of previous agricultural regions are still above potable drinking water standards for use.

- TDS concentrations in groundwater have increased slightly or remained relatively constant in the northern parts of Management Zones 1, 2, and 3. TDS concentrations are significantly higher in the southern parts of Zones 1, 2, and 3, and all of Management Zone 5 where they typically exceed the recommended 500 mg/l drinking water standard, and frequently exceed the secondary upper limit of 1,000 mg/l.

- Nitrate is regulated in drinking water according to Title 22 standards defined in the California Code of Regulations by the Department of Health Services. The maximum concentration allowed in drinking water for consumptive use is 10 mg/L as nitrogen. Nitrate measured in the surface water flows that come in from the San Gabriel Mountains, and in groundwater near the foot of these mountains are generally less than 0.5 mg/l (OBMP Phase 1 Report, Section 2). Nitrate concentrations in excess of 0.5 mg/l indicate degradation from overlying land use. Similar to TDS, areas with significant irrigated land use or dairy waste disposal histories overlie groundwater with elevated nitrate concentrations. The primary areas of nitrate degradation are the areas formerly or currently overlain by citrus in the norther parts of Management Zones 1, 2, and 3, and dairy areas in the southern parts of the same zones plus Management Zone 5. Nitrate concentrations within these areas have increased significantly over the period from 1960 to the present.

If current rates of agricultural loading were to continue indefinitely, TDS and nitrate concentrations in groundwater could continue to rise. TDS projections for the Chino Basin that were made during the Chino Basin Water Resources Management Study (CBWRMS) suggested that the TDS concentrations would continue to rise in groundwater throughout most of the 15-year planning horizon of 1990 through 2004. In actuality, the observed rate at which the TDS has increased is much less than the study projected. Findings show that the average TDS values are significantly lower than those that were projected for 2000, however, the existing concentrations are still above potable water standards in these areas. In the future, as the land use in the area transitions to urban uses, the source water TDS levels served to the new urban areas will be less than 400 mg/l, and the mineral salts from the source water will be mostly discharged in recycled water discharges to the Santa Ana River and brine line discharges (potentially from a new desalter). The TDS concentration in groundwater will, after some period of time, decline slowly, but should still remain significantly higher that can be utilized as a municipal supply.

Several alternatives are available to Watermaster for assessing progress towards improving groundwater quality. It is apparent that with the salt loading that has occurred and the likelihood that water quality will remain relatively the same for a number of years despite construction of desalters and export of wastes, a simple monitoring program may not successfully reflect a significant improvement in water quality in the near future. Instead a method that combines monitoring and establishment and management of a salt budget appears to be a more practical approach. The salt budget approach consists of a salt mass balance accounting of the Basin as a whole by inflows and outflows. The magnitude of each inflow and outflow can be estimated and the TDS and nitrogen concentration of each inflow and outflow component can be estimated. Watermaster has committed to reduce the salt loading currently occurring by increasing the quantity of salt currently leaving the Basin and/or by improving the quality of improved or recharged water.

The salt budget will be computed for existing conditions to assess the current balance as the baseline case. Then, future water quality improvements measurements will be made by changing the water and waste management assumptions in the baseline case to reflect OBMP implementation. Later, during OBMP updates, the salt budget may be re-computed based on the then current water quality (from monitoring programs) and the then current water and waste management plans, if at the time, water quality becomes substantially worse than predicted. A different, but more costly, alternative is to refine and utilize a comprehensive set of complex tools for the Chino Basin that is capable of assessing the impact of past and future water resource management activities on groundwater levels, streamflow and water quality.

Additional cooperative efforts with the RWQCB will be necessary to better mange the Basin and to:

- Identify water quality anomalies through monitoring;
- Assist the Regional Board in determining sources of water quality anomalies;
- Establish priorities for clean-up jointly with RWQCB; and
- Remove organic contaminants through regional groundwater treatment projects in the southern half of the Basin(such as the one related to the solvent plume from the Chino Airport area).

TDS and nitrate management in the Basin will require minimizing TDS and nitrogen additions by fertilizers and wastes, treatment of groundwater in the southern part of the Basin, and maximizing the artificial recharge of stormwater.

New dairy waste discharge requirements already adopted by the Regional Board include the following:

- Each dairy will develop and implement an engineered waste management plan that will contain dairy process water and on-dairy precipitation runoff for up to a 25 year-24 hour storm.
- Manure must be scraped from corrals and exported from the dairy within 180 days.
- All manure stockpiled in the Chino Basin as of December 1, 1999 must be exported from the Basin by December 1, 2001.

- No manure may be disposed of in the Chino Basin.
- Some manure can be applied to land at agronomic rates if and only if in the opinion of the Executive Officer of the RWQCB there is reasonable progress toward the construction of a new desalter in the Chino Basin.

The urban land use that will replace agriculture will require low TDS municipal supplies that in turn will produce lower TDS irrigation returns to groundwater than those generated by agriculture. The construction of desalters in the southern part of the Basin will extract and export huge quantities of salt from the basin. By 2020 the salt removal capacity of the desalters may reach over 56,000 tons per year. The dairy contribution of salt is currently about 30,000 tons per year. It is premature to set salt reduction goals until the salt budget method described earlier is developed and the salt budget is assessed. However, it seems reasonable to expect that the salt budget will be impacted favorably by desalters and future land use conversions.

Of the two alternatives mentioned under Program Elements 3 and 5 for water treatment facilities, the alternative involving only reverse osmosis will ultimately (by 2020) result in the removal of 56,000 tons of salt per year. The reverse osmosis coupled with ion exchange will only remove 43,000 tons of salt per year.

The implementation schedule to complete the proposed salt budget evaluation can be seen in Section 4 of the OBMP Phase I Report.

Program Element 6 is closely related to Program Element 7 and thus for consideration in the OBMP and for analysis purposes theses two elements will be jointly addressed in the water resources discussion (Chapter 4, Section 5 of this document).

3.3.8 Program Element 8 Develop and Implement Groundwater Storage Management Program

The Watermaster is concerned about the magnitude of water lost from the Chino Basin from rising groundwater when groundwater is stored in the local storage, cyclic, conjunctive use and other storage accounts. Program Element 8 deals with the development of methods to account for losses storage accounts and setting limits on storage if necessary. The accumulation of groundwater in storage without an increase in groundwater production is assumed to cause the baseflow to increase in the Santa Ana River and some of its tributaries (Chino Creek and Mill Creek). Investigations conducted by Watermaster in 1995 concluded that losses from water in storage accounts are about two percent per year of the water in storage. These losses could reach over four percent in the future if groundwater production patterns are not managed in the southern part of the Basin. Based on this analysis, or a large scale conjunctive use program, the total water lost from local storage and cyclic storage accounts for the 20-year period of 1978 through 1997 could be as much as 50,500 acre-ft. If the water in these storage accounts is produced without accounting for the losses then the Basin will

be overdrafted by an amount equal to the water lost from storage if the safe yield is 140,000 afy or less.
There is currently no existing aggregate limit for local storage accounts. Watermaster's Uniform Groundwater Rules and Regulations (UGRR) contains an aggregate threshold storage value of 100,000 acre-ft above which losses to rising water are to be computed and allocated to the storage parties on a pro rata basis if the losses are increased. The UGRR does not specify whether the loss is to be computed for the increment of storage above 100,000 acre-ft or total storage. The 100,000 acre-ft threshold value is an arbitrary number. Some loss will occur when water is placed into local storage. Using 100,000 acre-ft as a threshold value ensures that up to 2,000 afy of unaccounted-for-losses from storage will occur every year. This water will not be in the Basin when the storage parties attempt to recover the stored water.

The Watermaster has had a number of workshops to discuss losses from and setting limits on storage accounts. An aggregate "safe storage" volume of 500,000 acre-ft was tentatively agreed upon. Losses would still apply to all water in storage, but little if any significant water quality impacts are anticipated if the aggregate amount of water in storage is less than 500,000 acre-ft. Watermaster discussed four possible alternative methods to establish storage limits, if necessary. It is anticipated, however, that setting storage limits will not be necessary once losses begin to be applied to the accounts. A brief discussion of several of the potential methods to set storage limits, if necessary, follows.

The Watermaster may choose to deduct the rising water losses from planned storage for all local storage accounts and for the storage accounts of non-Judgment parties. There are several different ways to develop upper limits on the individual local storage accounts. The OBMP Phase I Report lists four different possibilities. The first being a limit based on the ability to use. In this concept, an upper limit is based on the storage party's ability to store and recover all the water in its account over a fixed period such as five years. The storage party would have to demonstrate that it has enough production capacity to recover all the water in storage over a five-year period. The fixed period would be the same for all storage parties. In this concept each storage party would have to demonstrate to Watermaster that they have the ability to put a specific volume of water into storage and be able to recover that water, adjusted for losses, over a fixed period of time. Thus, the storage party will have the facilities in place for groundwater production. This type of limit ensures that the water can be put to a reasonable beneficial use. The five-year period used is arbitrary as the Watermaster would need to determine the length of the fixed period as part of its ongoing management effort.

The second method is establishment of arbitrary limits. In discussions regarding storage limits in prior years, Watermaster considered setting storage limits based on a multiple of safe yield for Overlying Non-Agricultural pool and a multiple of operating safe yield for the Appropriative Pool. Parties that have historically over-produced and that will continue to over-produce may not ever be able to use such a local storage account. Parties that under-produce will fill their accounts and may hold water in these accounts for long periods of time and incur large storage losses. This has been the trend with the past operation of the local storage accounts. Upper limits based on this concept are arbitrary and may not provide for reasonable beneficial use of Chino Basin water. Storage limits based on a multiple of prior years production, an arbitrary volume equal for all parties, or any other arbitrary volume suffer from the same limitations. Setting arbitrary upper limits without providing a means to utilize the water would cause economic hardship for both under and over producers.

The next storage limit method discussed in the OBMP Phase I Report is a limit based on the time that water is in storage. In this concept, no volume limit would be set. Water could not be kept in storage for more than some fixed period of time, say ten years, regardless of the amount of water in storage. Water transferred from the local storage account for use by the storage party would be taken from the earliest water put into the local storage account. The storage party would be required to recover a volume of groundwater from its local storage account, sell or transfer a similar volume to another party, or sell a similar volume to Watermaster in order to reduce the quantity in its storage account by an amount equal to the water stored prior to the fixed period, less losses to rising water. Unused water from the first year would either be used or sold to Watermaster or a producer in the eleventh year, unused water from the second year would either be used or sold in the twelfth year, and so on if a ten year time limit is used.

The fourth method is the upper limit based on total storage and time water is in storage. This is a composite of the “ability to use” and “time in storage” concepts. In this case a volumetric upper limit would be set for each storage party based on the storage party's ability to store and recover water over a fixed period of time. A time constraint would be added such that water would not be kept in storage more than some fixed period of time.

In all the above storage limit concepts, the storage parties would sell their current year under-production to Watermaster or other parties to the Judgment each year if their local storage accounts are full. Watermaster, or parties to the Judgment, would then use this water to meet current replenishment obligations.

Program Element 8 is closely related to Program Element 9. Thus for consideration in the OBMP and for analysis purposes theses two elements will be jointly addressed in the water resources discussion (Chapter 4, Section 5 of this document).

3.3.9 Program Element 9 Develop and Implement Conjunctive-Use Programs

The ninth Program Element focuses on the development of conjunctive use programs that account for water quantity and quality and will assist in balancing production and recharge in the Basin. The Watermaster will develop regional conjunctive-use programs to store supplemental water for MWDSC, and other entities that can cause supplemental water to be stored in the Basin. The regional conjunctive-use programs will provide benefits to all producers in the Basin, the people of California and the nation. Watermaster's conjunctive-use programs will take priority over conjunctive-use programs developed by others. Storage committed to conjunctive-use programs may consist of two parts, storage within a safe storage capacity and storage in excess of safe storage. Storage in excess of safe storage capacity will automatically require mitigation. The initial target storage for Watermaster's conjunctive-use program will be 150,000 to 300,000 acre-ft within the safe storage capacity. Cyclic storage will be folded into conjunctive-use storage. The Watermaster's conjunctive-use program tentatively consists of the following elements:

- Complete the existing short-term conjunctive-use project;
- Seasonal peaking program for in Basin use and dry year yield program to reduce the demand on various water supply entities to 10 percent of normal summer demand (requiring 150,000 acre-ft of storage);
- Dry-year export program; and
- Seasonal peaking export program.

This chapter summarizes the various components of this project that have the potential to result in physical changes to the environment.

The Program Element 9 conjunctive use discussion is a conservative program that could be implemented under the existing environmental conditions without significant facility augmentation, however, a more substantial conjunctive use program than the one previously described above is outlined as an Alternative to the OBMP program proposal. Both the "Conjunctive Use Alternative" and a second, more regional, conjunctive use program labeled as the "SAWPA Alternative" are described and analyzed in the Alternatives section of this document, in addition to the No Project Alternative that is required for consideration under State CEQA guidelines. These alternatives, how they differ from the aforementioned program, and the forecasted environmental impacts resulting from each alternative are all fully addressed in Chapter 5 of this PEIR.

Program Element 8 is closely related to Program Element 9. Thus for consideration in the OBMP and for analysis purposes theses two elements will be jointly addressed in the water resources discussion (Chapter 4, Section 5 of this document).

3.4 USES OF THIS ENVIRONMENTAL IMPACT REPORT

As previously stated, the Inland Empire Utilities Agency Board of Directors must approve and certify the PEIR before any of the proposed development will be allowed to proceed and cause the corresponding changes to the physical environment. This PEIR will be used as the information source and CEQA compliance document for the following discretionary actions or approvals by the Inland Empire Utilities Agency, and subsequently by Watermaster and any constituent agencies should they also decide to adopt the OBMP. Responsible agencies for this PEIR may include:

- Chino Basin Watermaster
- Metropolitan Water District of Southern California
- Three Valleys Municipal Water District of Southern California

- Western Municipal Water District
- Various agencies of the State of California, including Department of Justice, Department of Fish and Game, Department of Toxic Substances Control, and Department of Transportation
- County of San Bernardino (including San Bernardino County Flood Control District)
- Regional Water Quality Control Board
- Department of Health Services
- Other various cities and water supply agencies

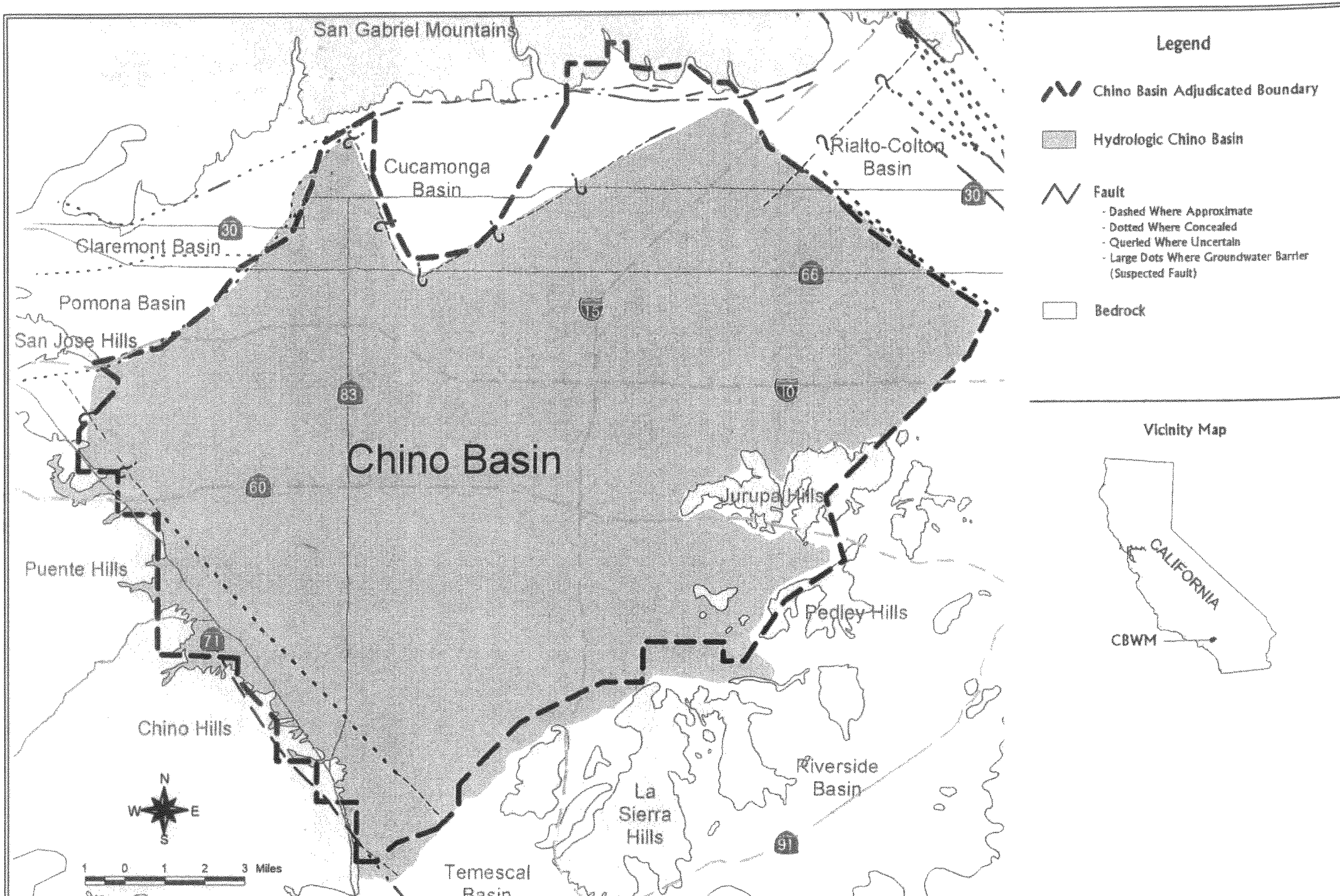
Other public agencies not listed here may also choose to utilize this PEIR to evaluate discretionary actions for compliance with CEQA guidelines and regulations.

VICINITY MAP SHOWING CHINO BASIN

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 3.1-1

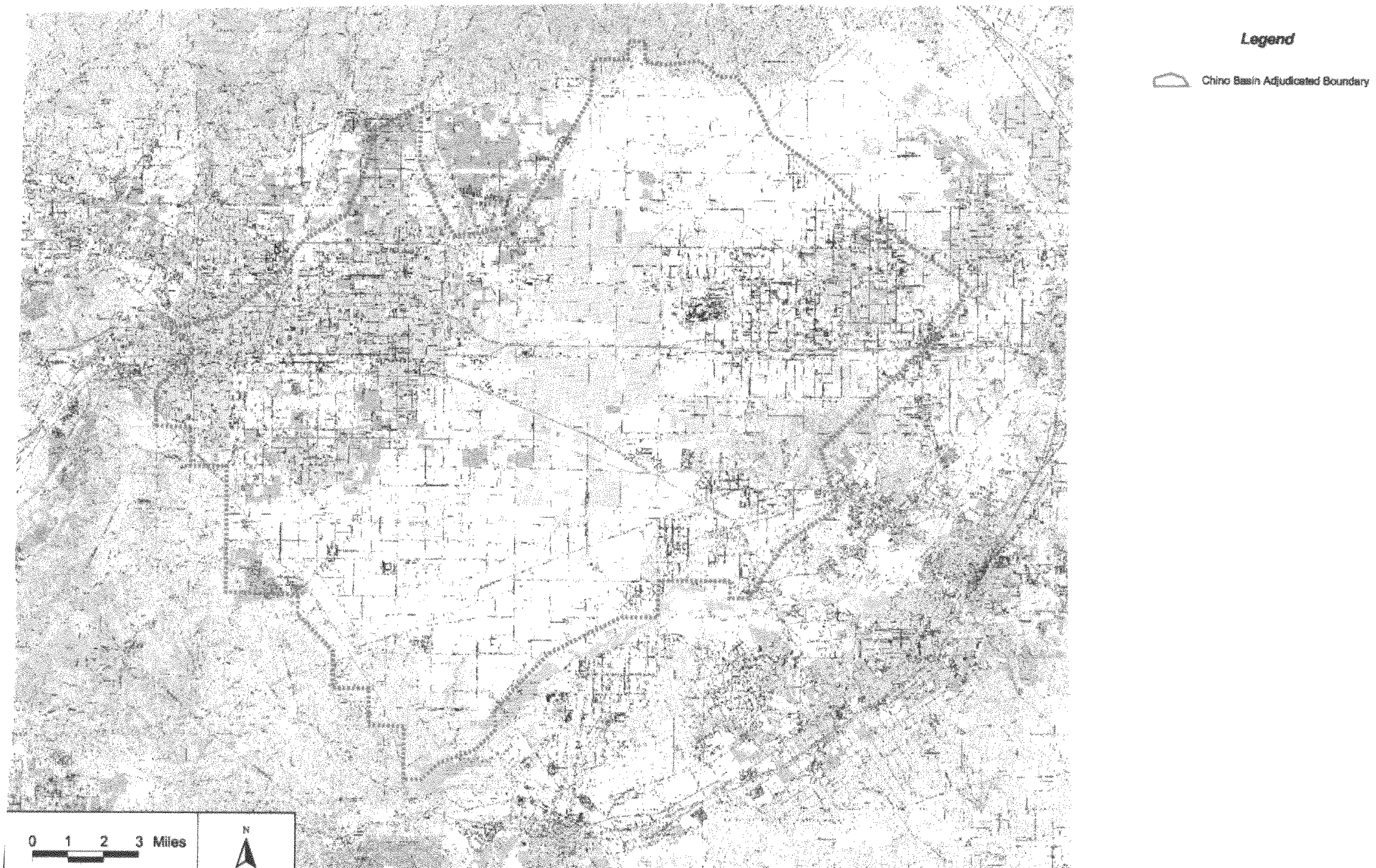


CHINO GROUNDWATER BASIN LEGAL AND HYDROLOGIC BOUNDARIES

Source: OBMP Phase I Report, Figure 1-1

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 3.1-2

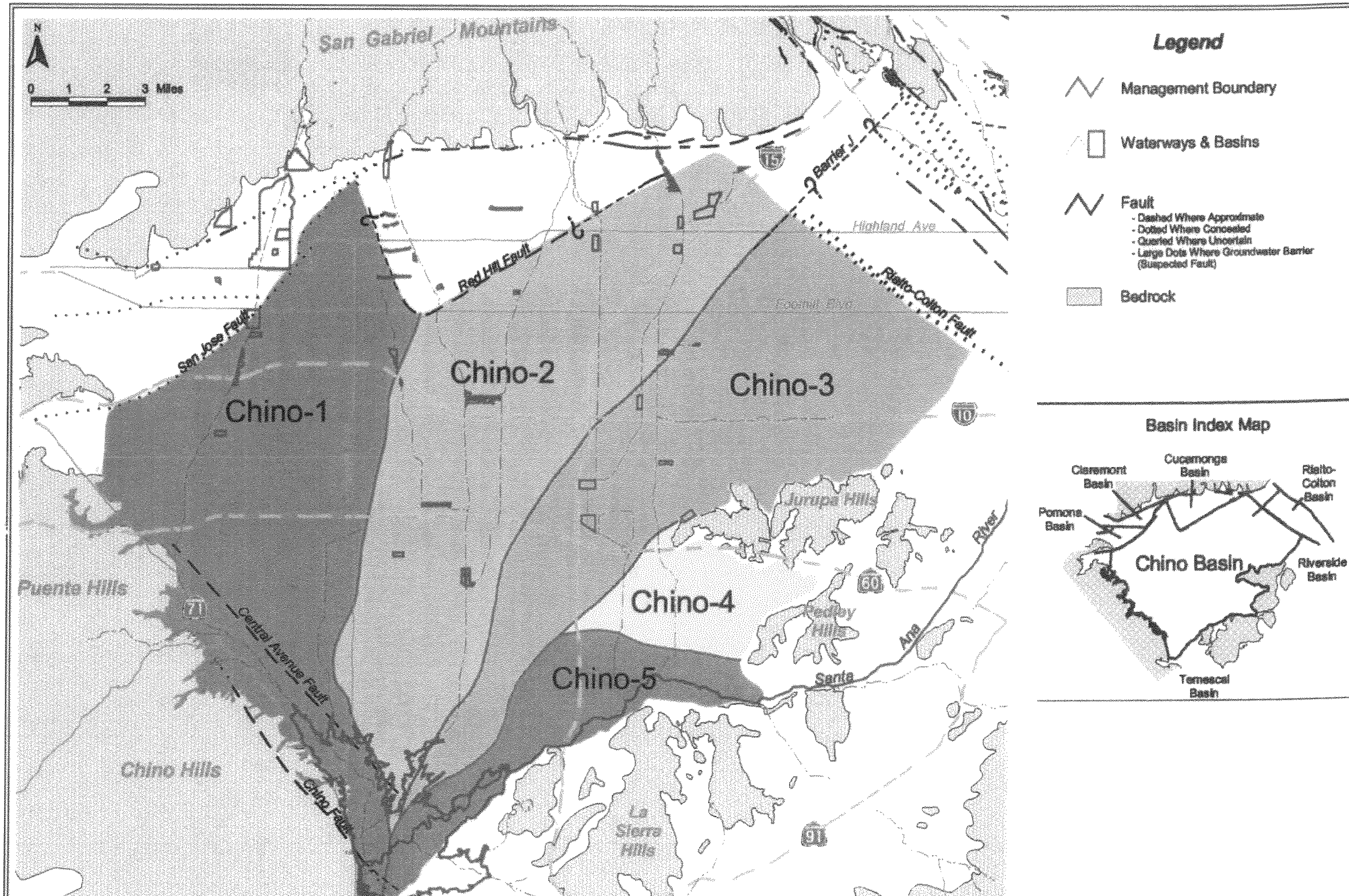


CHINO BASIN LEGAL BOUNDARIES RELATIVE TO USGS 7.5 MINUTE SERIES QUADRANGLES

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 3.2-1

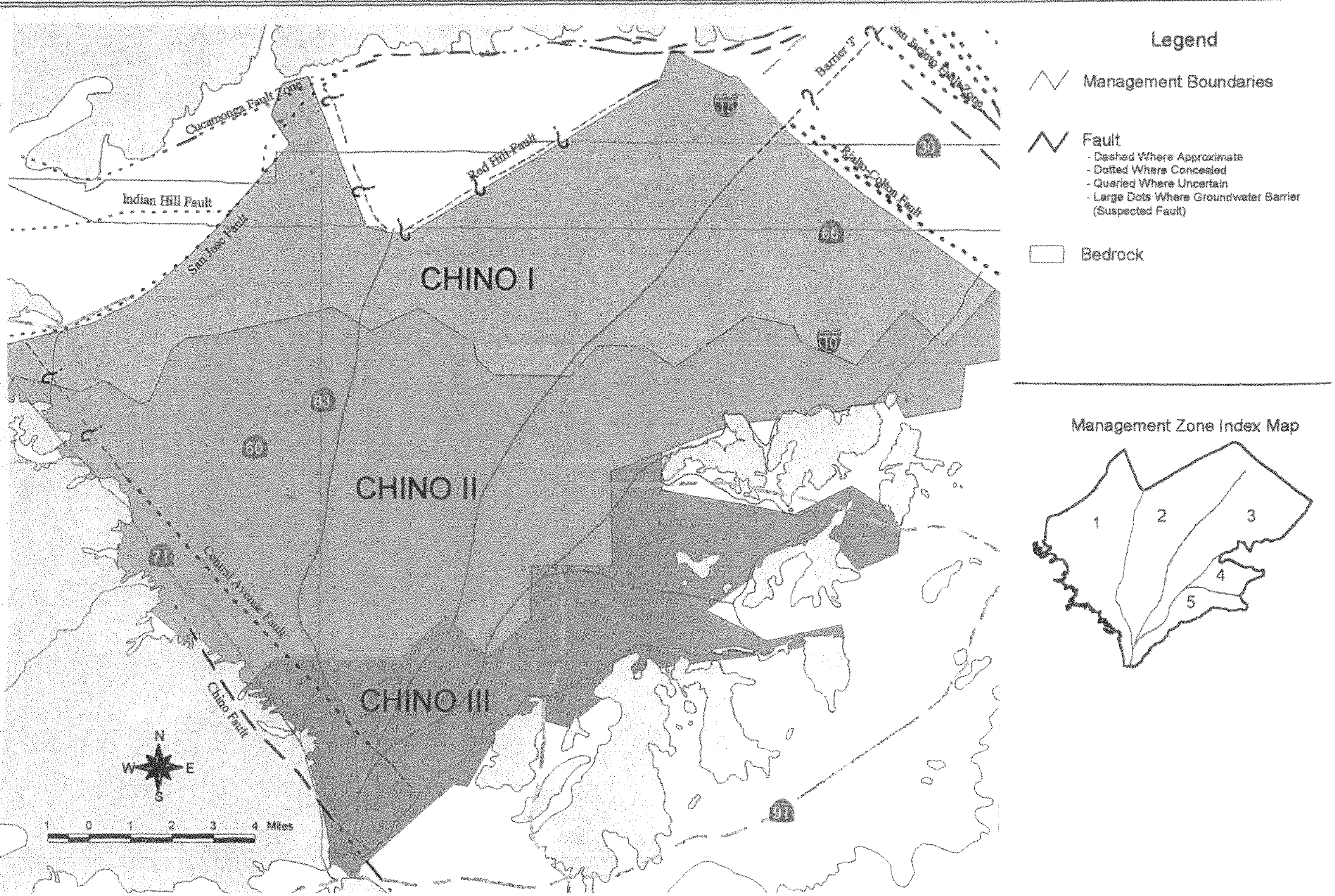


CHINO BASIN MANAGEMENT ZONES

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 3.2-2



CHINO SUBBASINS DEFINED IN THE 1995 BASIN PLAN

Source: OBMP Phase I Report, Figure 2-6

TOM DODSON & ASSOCIATES
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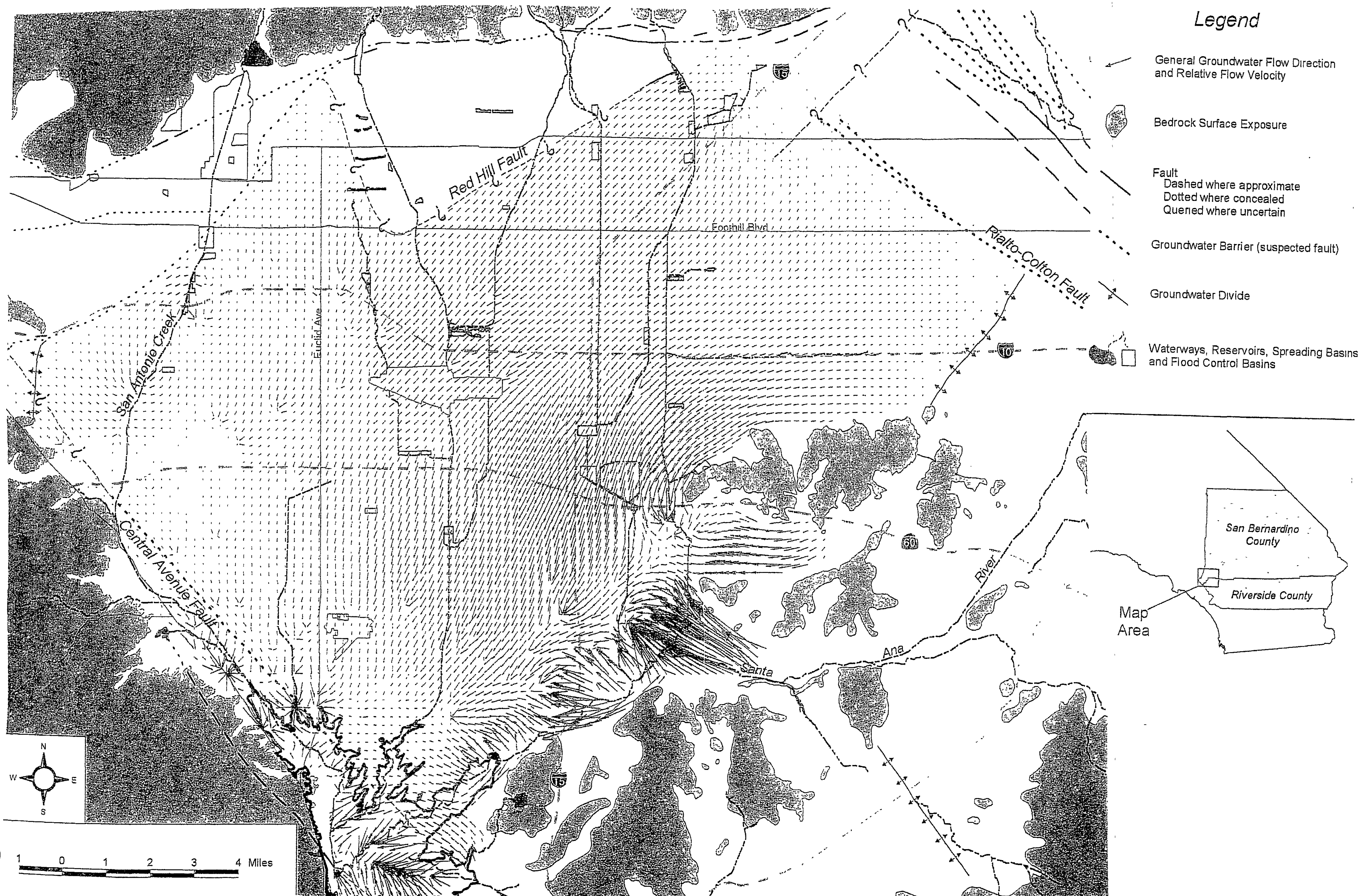
FIGURE 3.2-3



CHINO BASIN GROUNDWATER FLOW MODEL

Source OBMP Phase I Report, Figure 4-4

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 3.2-4

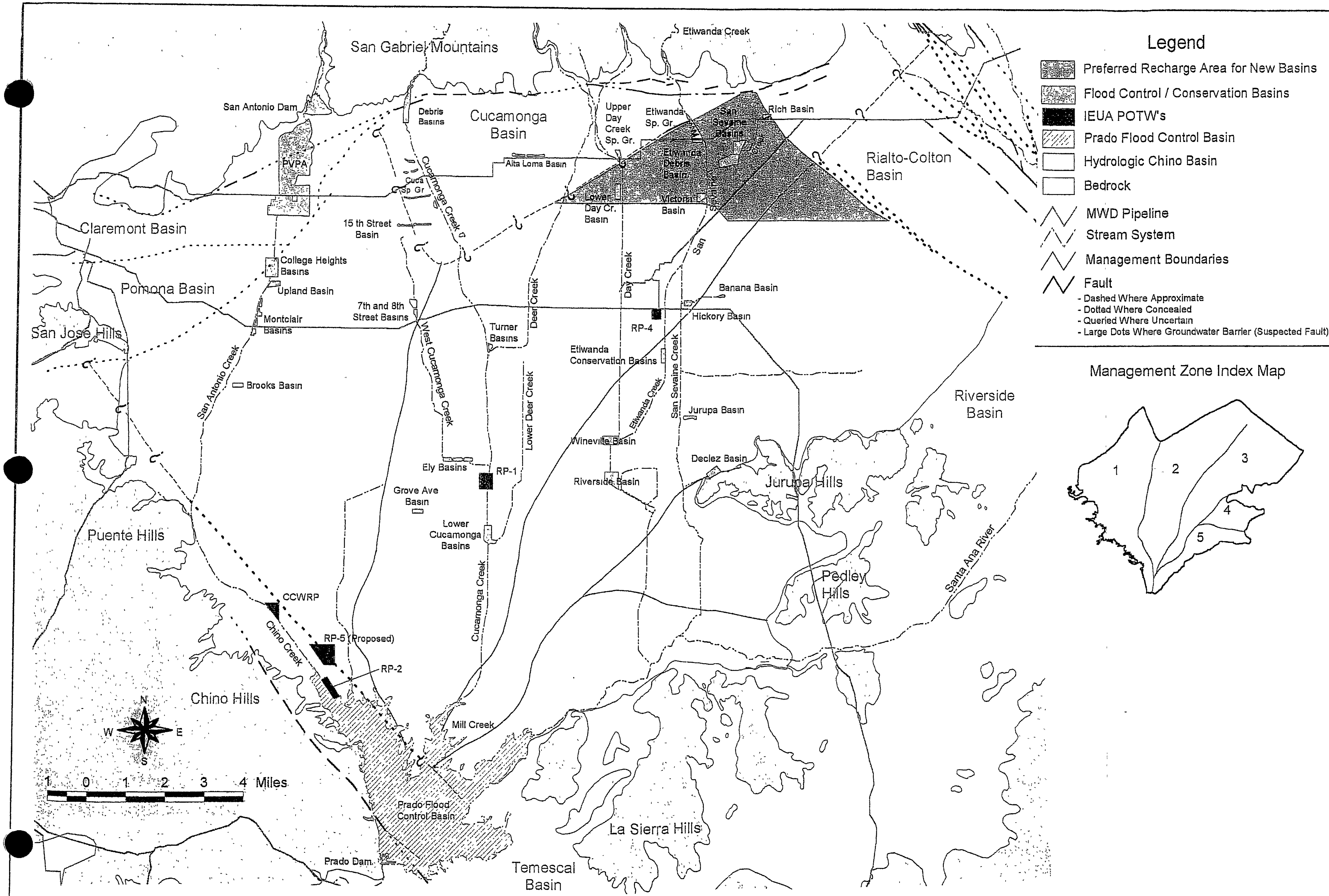


FIGURE 3.3-1

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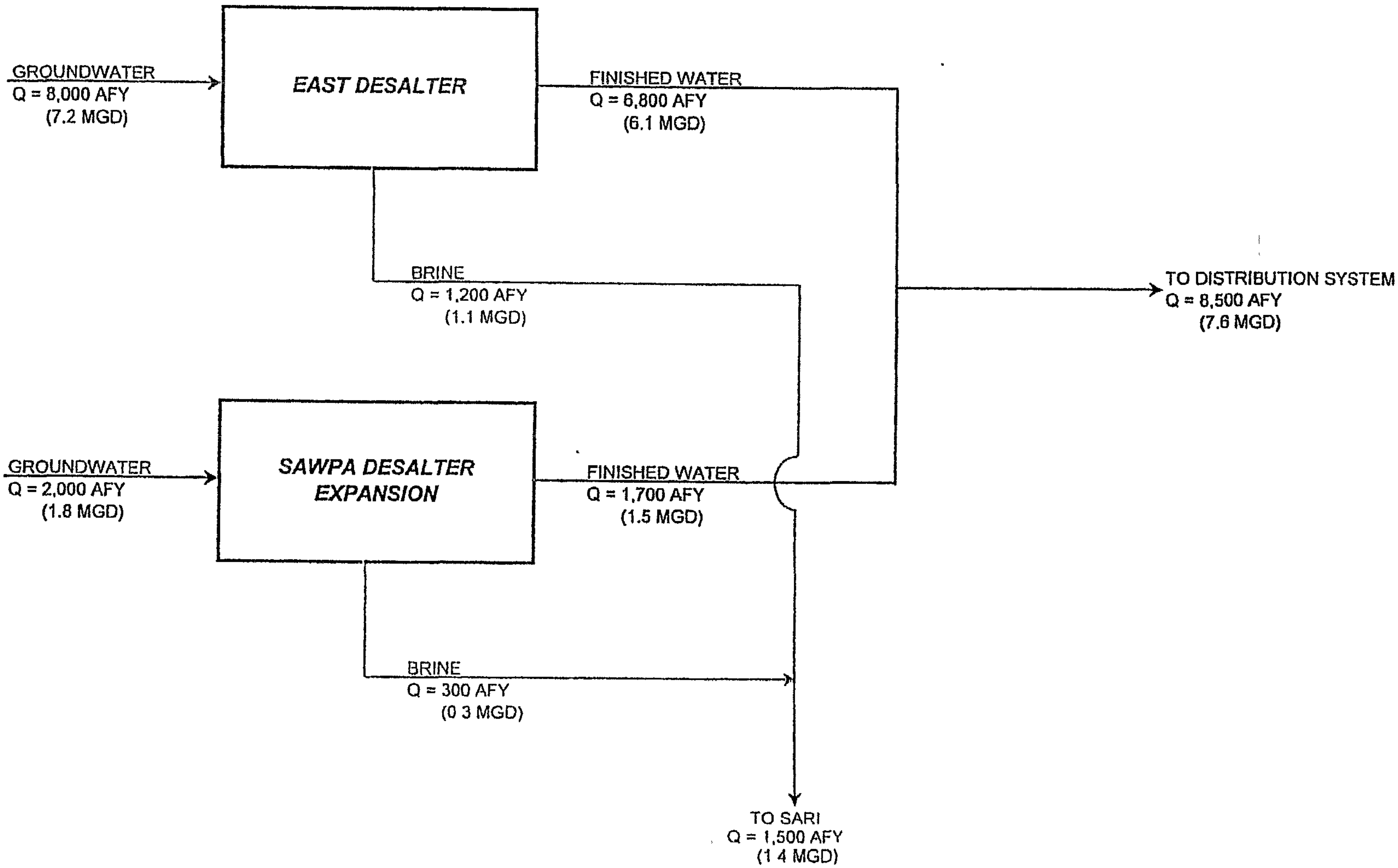
OBMP PROPOSED EXISTING RECHARGE BASINS

Source: OBMP Phase I Report, Figure 4-1

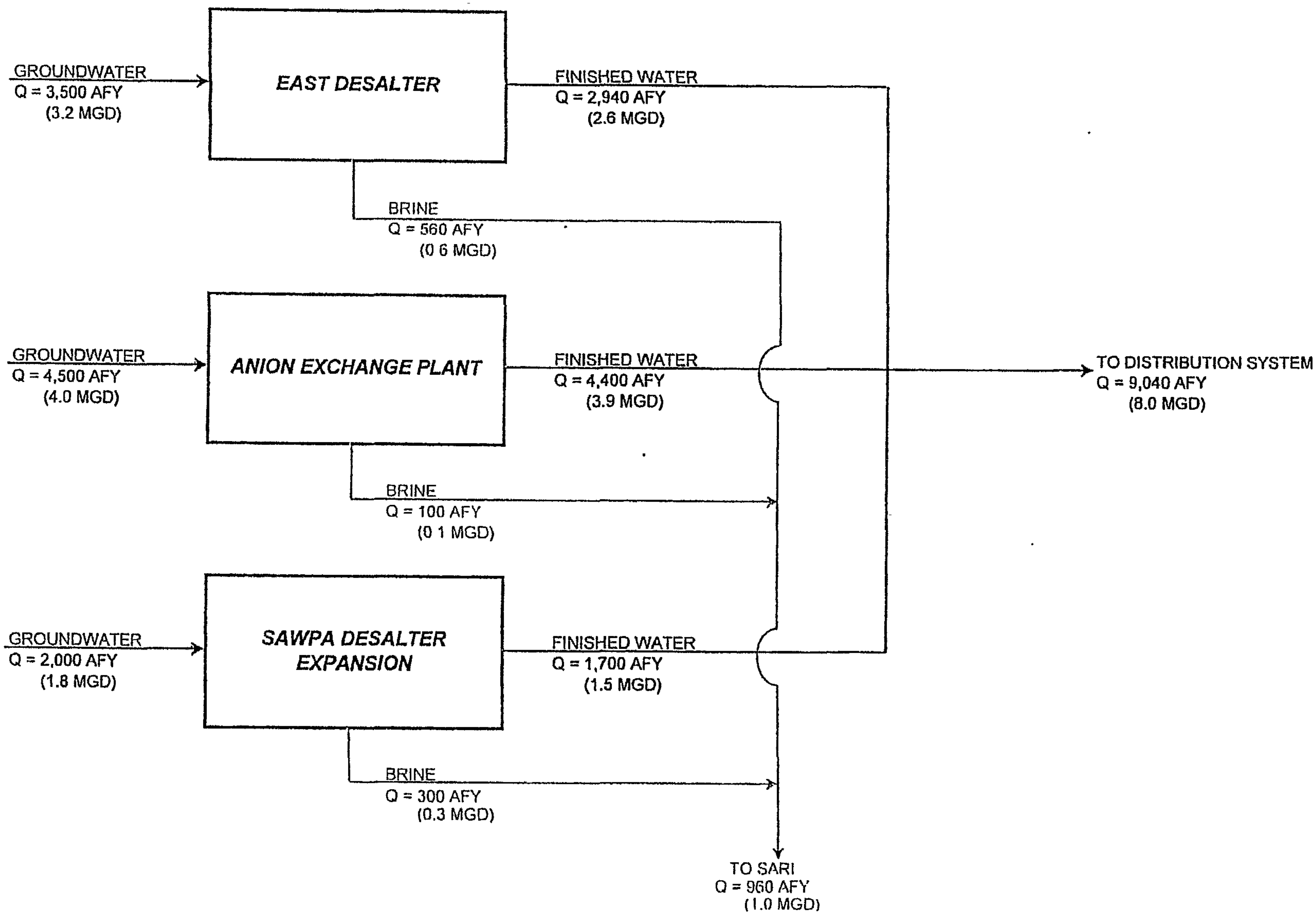


RO ALTERNATIVE: KEY ELEMENT PROCESSES

Source Black & Veatch, Water Supply Facilities Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 3.3-2



RO/IX ALTERNATIVE: KEY ELEMENT PROCESSES

Source. Black & Veatch, Water Supply Facilities Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 3.3-3

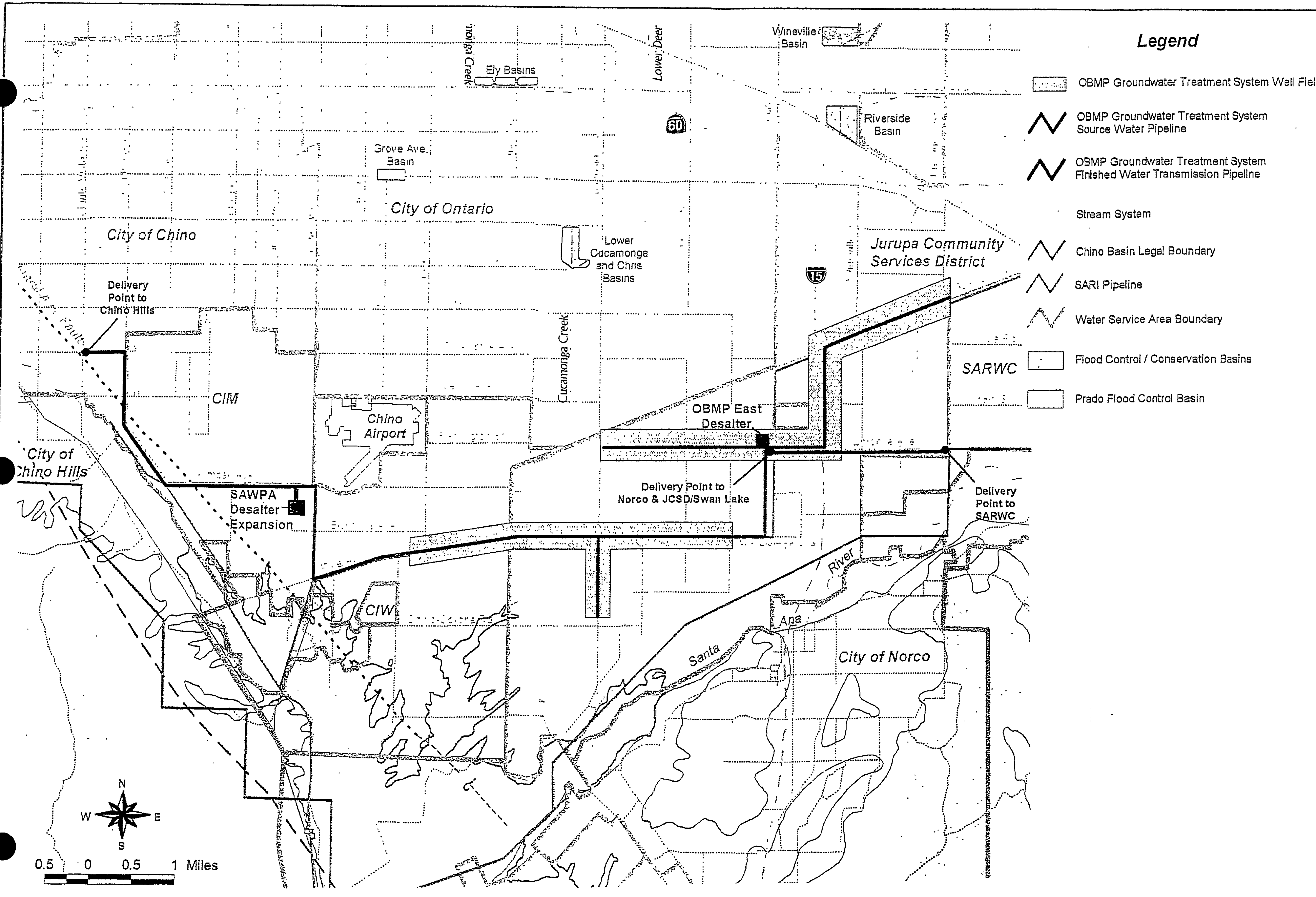


FIGURE 3.3-4

TOM DODSON & ASSOCIATES
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RO ALTERNATIVE: PROPOSED FACILITIES LOCATIONS

Source: Black and Veatch, Water Supply Facilities Plan

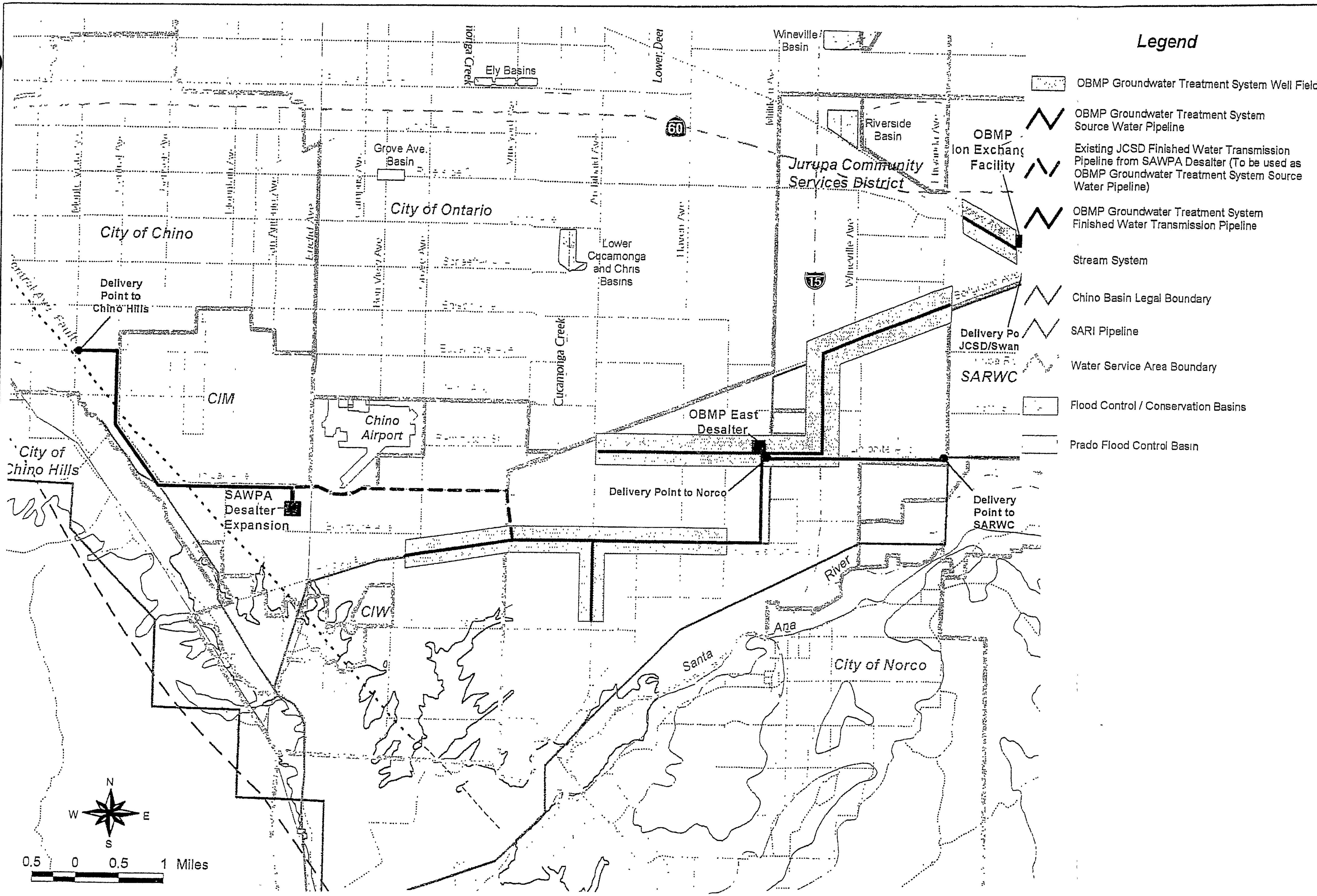

FIGURE 3.3-5

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Environmental Consultants

RO/IX ALTERNATIVE: PROPOSED FACILITIES LOCATIONS

Source: Black and Veatch, Water Supply Facilities Plan

4

CHAPTER 4
ENVIRONMENTAL IMPACT EVALUATION

Note: All Chapter 4 figures are located at the end of their subchapter, not immediately following their reference in the text.

4.1 INTRODUCTION

This chapter of the Program Environmental Impact Report (PEIR) provides the detailed information used to forecast the type and significance of potential adverse environmental impacts that implementation of the Optimum Basin Management Program (OBMP) and subsequent specific project approvals can cause if the Program is implemented as proposed. In the following subchapters each of the environmental topics identified in the Notice of Preparation (NOP) and scoping meeting as having a potential to cause significant impact is evaluated. The environmental impact analysis section for each environmental topic is arranged in the following manner:

a. An introduction that summarizes the specific issues identified in the NOP and the scoping process as issues of concern for the specific environmental topic;

b. A summary of the current or existing environmental setting for each physical resource or human infrastructure system is presented as the physical baseline for the environment from which impacts will be forecast;

c. Based on stated assumptions, the potential impacts without applying any mitigation are forecast and the significance of impacts is assessed using identified criteria or thresholds of significance;

d. Recommended measures that can be implemented to substantially lessen potential adverse environmental impacts are identified, and their effectiveness in reducing impacts to non-significant levels is evaluated;

e. Potential cumulative adverse environmental impacts are assessed under each environmental topic, where applicable; and

f. Unavoidable adverse environmental impacts, including significant unavoidable impacts, are identified, and any adverse impacts that may be caused by implementing mitigation measures are addressed.

In order to provide the reviewer with a criterion or set of criteria with which to evaluate the significance of potential adverse impact, this document provides issue specific criteria, i.e., thresholds of significance, for each topic considered in this PEIR. These criteria are either standard thresholds established by law or policy (such as ambient air quality standards) or project-specific evaluation thresholds that are developed and used specifically for this project. After comparing the forecasted physical changes in the environment that may be caused by the proposed project with the significance threshold criterion or criteria, a conclusion is reached on whether the proposed project has the potential to cause a significant adverse environmental impact for the issue being evaluated.

Measures to reduce adverse environmental impacts are identified and described in this chapter of the PEIR. Over that past several years, mitigation has evolved in scope and complexity. As society responds to environmental issues that affect whole communities, last year's mitigation measures are integrated into rules and regulations, such as the Uniform Building Code or Water Quality Control Plans. Measures incorporated into rules and regulations become mandatory requirements (not discretionary) and they no longer need to be identified as project specific mitigation measures. Land use jurisdictions, such as the cities or county within the project area, similarly incorporate former mitigation measures into the agency's "standard conditions of approval" for projects under their purview.

Finally, as developers and planners become more sophisticated, they integrate sound environmental mitigation into their project design. As a result, the boundary between regulatory requirements, standard conditions, proponent design guidelines and mitigation measures identified in environmental documents, all designed to reduce significant environmental impacts, gets blurred. The discussion of mitigation measures under each environmental topic summarizes all of the various measures anticipated to be incorporated into the OBMP to reduce potential significant adverse environmental effects, either to the extent feasible or to a level of non-significance. After determining the degree of mitigation that can be achieved by the proposed measures and after identifying any adverse impacts that the mitigation measures can cause, a conclusion is provided regarding the significant and/or unavoidable adverse impact for each environmental topic.

This document utilizes conservative (worst case) assumptions in making impact forecasts based on the assumption that the impact forecasts should over predict (if they cannot be absolutely quantified) consequences, rather than under predict them. The information used and analyses performed to make impact forecasts are provided in depth in this document to allow reviewers to follow a chain of logic for each impact conclusion and to allow the reader to reach independent conclusions regarding the significance of the potential impacts described in the following subchapters. Reviewers are encouraged to comment on the analyses, conclusions and the thresholds of significance used to make the forecasts of adverse environmental impacts in this PEIR.

4.2 LAND USE

4.2.1 Introduction

Land use issues were included as a topic for evaluation in this PEIR because implementation of the OBMP will result in the installation of water management facilities throughout the project area. These facilities will be constructed to minimize incompatibilities with existing and prospective future uses on adjacent land. Although water supply facilities are not required to comply with land use designations of general plans, whenever feasible, efforts will be made to ensure that the proposed water supply facilities are generally supportive of overall goals and policies presented in the General Plan for the area in which facilities are proposed. The NOP and scoping processes identified several land use issues that are evaluated in this subchapter of the PEIR. The following land use issues have been identified as having a potential to experience significant impact:

- Land use conflicts (construction and operation impacts),
- Growth inducement,
- Inconsistencies between proposed project and applicable general plans and regional plans,
- OBMP proposals for dealing with transition of agricultural operations to urban uses in the southern end of the Basin,
- General plans and master facility plan consistency with OBMP, and
- Effect of implementing OBMP projects on acreage that could be used for development, i.e., displacement or loss of development potential.

This subchapter of the PEIR addresses the above issues and has been compiled by relying primarily upon data contained in a previous planning document prepared in support of the Chino Basin Water Resources Management Study and the general plans and other pertinent planning documents for the project area. These planning documents include the “Final Task 1 Memorandum, Water and Wastewater Planning Environment” (1993) and the general plans for the following agencies: cities of Chino Hills, Chino, Fontana, Ontario, Montclair, Norco, Pomona, Rancho Cucamonga, and Rialto; the counties of Riverside and San Bernardino; and the Southern California Association of Government publications: Regional Comprehensive Plan and Guide (RCPG) and Regional Mobility Plan (RMP). One issue examined in this subchapter is growth inducement. It is a key issue of concern related to implementation of the OBMP and by examining it in this first chapter of the PEIR, the stage is set to include the implications for growth in all subsequent sections of this document.

4.2.2 Environmental Setting

4.2.2.1 Existing Land Use Designations

In order to forecast potential land use impacts, data on existing land uses is required at two different scales. The first level of analysis is to provide land use data (existing land uses and general plan land use designations) at the broadest scale within the project area. To accomplish this it was necessary to compile information regarding the total area (acreage) that may be impacted by implementing the OBMP and the general land use patterns within the area of potential impact. The second level of analysis is to assess the land uses (existing and designated) within the immediate vicinity of proposed OBMP or related facility/infrastructure improvements. This brings the land use focus down to the project specific level where individual facility land use compatibility issues can be addressed.

The boundary of the Chino Basin, as illustrated in Figures 3.1-2, encompasses all or a portion of each of the jurisdictions identified above. A decision has been made in this document to address the land use impacts for each city within the Basin. This decision is based on two factors. First, water from within the Basin can be used to support development throughout a city's boundaries, which means that existing and future land uses in areas adjoining the Basin may be dependent upon water resources in the Chino Basin. Second, the physical boundaries of the Chino Basin do not coincide with the arbitrary boundaries of cities. As a result of these poorly defined overlapping boundaries, it is almost impossible to segregate the land uses within a city between those in and those out of the Basin. Therefore, the evaluation of land use issues which follows addresses the total land within each city that in some manner overlies the Chino Basin.

The "Final Task 1 Memorandum" (Memorandum) was prepared in 1993 by a team led by James M. Montgomery, Consulting Engineers (now Montgomery Watson). This document establishes a baseline for land uses within a "Study" area that will be used in this PEIR. Table 4.2-1 lists the planning areas and agencies included within the Study area. Figure 4.2-1 illustrates the boundaries of the areas included within the Study area. Using land use data from the 1990 Southern California Association of Governments (SCAG) Land Use Survey and reviews of the pertinent city and county general plans, the planning and land use data for the Study area were compiled in the document. Although 1990 data were used in this document, it remains representative for the general evel of land use evaluation conducted- in this PEIR. This is because the land use patterns were essentially established, either existing or planned, by 1990 and with the exceptions noted below. No major changes in land use have occurred during the 1990s. Where major changes in land use have occurred, such as the annexation of unincorporated agricultural lands to the Cities of Ontario and Chino, these changes are discussed separately in the following text.

The Study area defined in the Memorandum encompasses an estimated 225,937 acres, extending from Pomona on the west to portions of City of Rialto and Jurupa Community Services District (JCSD) on the east and Rancho Cucamonga on the north and Corona on the south (see Figure 4.2-1). The western portion of the study area is fully urbanized, with very little remaining areas to be developed within the cities of Pomona, Claremont, Upland and Montclair. For example, according to the Montclair General Plan (1981) about 12 percent of that city remained undeveloped in 1981 (467 acres out of 3,894 acres). Within these developed communities redevelopment of existing urbanized land is more common than conversion of open space or agricultural land to urban uses.

Table 4.2-1
STUDY AREA DEFINITION AND PLANNING AGENCIES

Planning Area	Planning Agency
Bloomington / Fontana	San Bernardino County
California Institute for Men, Chino	State of California
California Institute for Women, Frontera	State of California
Chino	City of Chino
Chino Airport	San Bernardino County
Chino Hills	City of Chino Hills
Chino Hills State Park	State of California
Claremont	City of Claremont
Corona[1]	City of Corona
El Prado Park and Golf Course	San Bernardino County
Fontana	City of Fontana
Jurupa	Riverside County
La Verne	City of La Verne
Montclair	City of Montclair
Norco	City of Norco
Ontario	City of Ontario
Pomona	City of Pomona
Rancho Cucamonga	City of Rancho Cucamonga
Rialto[1]	City of Rialto
Riverside Agricultural Preserve[2]	Riverside County
San Antonio Heights (included with Upland)	San Bernardino County
San Bernardino Agricultural Preserve	San Bernardino County
Upland	City of Upland

1 Portion of area included in study area.
2 Included in Jurupa Community Services District Plan.

In contrast the City of Fontana General Plan (1989) indicated that out of 33,623 acres within its City and Sphere of Influence boundaries, 19,756 acres or 58.7 percent of the area within the City remained undeveloped in 1989. Thus, the western half of the Basin is more intensely urbanized than the eastern half of the Basin, but the whole Study area is rapidly becoming a fully urbanized region of southern California. New development is rapidly converting historic agricultural and open space areas in the eastern and southern portion of the Study area, while the existing urbanized areas in the western portion of the Study area have their land uses established and the future consists of redevelopment, not new development, in a manner consistent with the established land use pattern. Overall, the structure has been established for the conversion of agricultural uses to urbanized uses in the future, yet to date, the actual uses have not changed significantly.

Within the Study area the existing land uses in 1990 were dominated by residential development (~29%) and vacant areas and agricultural land (~43%). Table 4.2-2 summarizes the current and future land use within the Study area. The pattern of land uses in 1990 is depicted on Figure 4.2-2. The vacant land within the Study area occurs primarily in the southern, northern and central portion of the Study area. Open space areas in the southern portion of the Study area are dominated by Chino Hills State Park (recreational open space), Prado Basin (Santa Ana River flood control and riparian woodland/wildlife habitat) and agricultural lands. Open areas to the northeast consist of privately owned land that has substantially transitioned or is in transition to residential land uses. The Jurupa Hills form an open space island in the central eastern portion of the Study area.

Table 4.2-2
SUMMARY OF CURRENT AND FUTURE LAND USE

Code	Land Use Type	Current (acres)	2020 (acres)
1100	Residential	65,078	99,389
1200	Commercial and Services	13,250	19,404
1300	Industrial	15,836	39,224
1400	Transportation, Communications, and Utilities	11,794	15,046
1500	Mixed Commercial and Industrial	213	872
1600	Mixed Urban (residential, commercial and industrial)	18	20,241
1700	Under Construction	4,020	0
1800	Open Space and Recreation	3,864	24,791
1900	Urban Vacant	9,478	0
2100	Cropland and Improved Pasture Land	19,211	2,387
2200	Orchards and Vineyards	3,963	0
2300	Nurseries	708	0
2400	Dairy and Intensive Livestock	8,335	55
2500	Poultry Operations	222	0
2600	Other Agriculture	1,539	237
2700	Horse Ranches	962	0
3100	Vacant Undifferentiated	61,725	49
3200	Abandoned Orchards and Vineyards	2,107	0
3300	Vacant With Limited Improvements	225	0
4100	Water, Undifferentiated	888	0
4400	Water Within a Military Installation	37	0
4500	Area of Inundation (flood control and reservoirs)	0	4,242
9000	Undefined	2,466	0
	TOTAL	225,937	225,937

Note: Current land use is based on 1990 SCAG Land Use Survey. Future land use is based on city and county general plans.

The acreage allocated to water infrastructure and facilities within the Study area is not summarized because it is too difficult to abstract from the broad land use categories. Land Use Code 1400 (see

Table 4.2-2) identifies that amount of acreage allocated to transportation, communication and utility infrastructure. The majority of the acreage under this category consists of roads and electricity transmission corridors, often underlain by water and wastewater pipelines. Water facilities, consisting of reservoirs, treatment plants, and recharge basins are part of the 11,794 acres assigned to this land use code within the Study area. This represents about 5.2 percent of the total land area within the Study area. This percentage utilization for utility infrastructure is consistent with an allocation of approximately 5 percent of total land areas to such uses. Much of the water infrastructure consists of subsurface pipelines which do not conflict with overlying uses, such as roads, residential, commercial or other uses.

Figure 4.2-3 illustrates the future pattern of land uses within the Study area. In 1990, the 2020 land uses within the Study area were envisioned to effectively eliminate agriculture, from about 10 percent current to about one percent ultimate. Residential uses account for 44 percent of the ultimate land use and industrial uses expand by about 250 percent to about 17.3 percent of ultimate land development. The greatest change in land use forecast at ultimate development is the effective elimination of the "Vacant Undifferentiated" land use category in the future land use forecast. The land use pattern expected to evolve in the future is essentially an extension or duplication of the level of urban development, which currently exists in the western portion of the Study area, throughout the Study area, with some exceptions. The exceptions include the large open space associated with Prado Basin flood control activities and agricultural land that will be maintained in the southernmost portion of the Study area.

The ultimate land use shown in Figure 4.2-3 did envision the gradual transition of the San Bernardino County Agricultural Preserve to urban uses. In 1994, the San Bernardino County Local Agency Formation Commission allocated the total preserve area (about 15,400 acres) to the cities of Chino and Ontario. That portion of the preserve north of Merrill Avenue was assigned to Ontario's Sphere of Influence (8,200 acres) and the portion south of Merrill Avenue to the San Bernardino County Line was assigned to Chino's Sphere of Influence (7,200 acres). The Ontario Sphere of Influence is formally designated by the City as the "New Model Colony" area and was annexed on November 30, 1999. These Sphere areas are shown in Figure 4.2-4. Since allocation of the Spheres to the cities, the City of Ontario has annexed the whole 8,200 acre area (1999). Proposed uses are consistent with those portrayed in Figure 4.2-3 and include 5,200 acres of residential uses, 504 acres of commercial uses, 338 acres of industrial and business park uses, 500 acres of educational uses, 888 acres of parks and trails and 776 acres of other public and infrastructure uses. A few hundred acres of agricultural uses are expected to remain.

The City of Chino has annexed 1,810 acres of its expanded Sphere known as Subarea 1 (see Figure 4.2-5). Within Subarea 1 the land use designations include: 605 acres of industrial; 320 acres of agriculture; and 885 acres of greenspace (area within the Prado Flood Control Basin subject to inundation. Additional annexations within the assigned Sphere are under consideration, but no other annexation have yet been completed. Due to a substantial amount of acreage in Chino's Sphere being located within Prado Basin, a substantial portion of greenspace will be retained, comparable to the open space shown in the southern portion of Figure 4.2-3.

Other annexations have occurred since the Montgomery report was published, but these annexations have been consistent with the land use designations contained in each city's general plans and as generally shown in Figure 4.2-3.

4.2.2.2 Discussion of Regulations Controlling Water Facility Infrastructure Development

California Government Code Section 53091 specifies that water supply facilities, such as those associated with the OBMP, are exempt from zoning restrictions. Specifically, the text of the Section 53091 states: ***Zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage or transmission of water....*** The purpose of this section is to ensure that water system infrastructure can be installed to meet the demand by all water consuming land uses and it recognizes the universal role that water supply plays within our society.

The majority of general plans within the Study area contain Infrastructure Elements or otherwise discuss water supply in only the most general terms. For example, the Ontario General Plan states: ***Infrastructure means underpinnings - the basic urban systems and services that keep a community functioning. Although historically citizens have not paid much attention to infrastructure systems unless they weren't working properly, as freeways become more congested and landfills are closed, infrastructure capacities will command more public attention in the future.*** This statement is followed by two goals: ***Goal 1.0: Ensure an adequate supply of safe water for Ontario residents and businesses*** and ***Goal 2.0: Ensure that the use and consumption of water is properly managed.*** These two themes, adequacy of supply with sufficient delivery infrastructure and managing consumption and use of water, are key issues of discussion within all of the general plans affecting the Study area, regardless of whether the water purveyor within the City is operated independently or by the City. Based on the above referenced California Government Code section and the general support for water system infrastructure contained in the general plans, there are very few land use regulation constraints that will limit the future development of adequate water system infrastructure to support the OBMP. It should be noted that most agencies carefully coordinate the implementation of water system infrastructure, particularly storage reservoirs which have a substantial visual presence, to ensure that individual facilities meet the overall goals and objectives of the general plans, not just the water supply and management goals and objectives, whenever possible.

4.2.3 Project Impacts

Implementation of the OBMP will result in direct physical change to existing land uses within the Study area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study area. Thus, the potential environmental impacts from implementing the OBMP can be divided into those specific projects that the Watermaster and individual water serving agencies (WSA) will construct and operate and any indirect responsibility for future growth that may be assigned to OBMP implementation within the Study area. Table 4.2-3 contains a list of potential projects and the estimated acreage that will be required to support their development in the future as they are funded by the Watermaster or individual WSA. Figure 4.2-6 shows the water service area and lists the WSA that deliver municipal water within the Study area. The information contained in this table and figure will be used to discuss environmental impacts throughout much of this subchapter and the remainder of the document.

Table 4.2-3
PROPOSED FACILITIES RELATED TO THE OBMP

Recharge Facility Description (MOA List of Facilities)	Quantity	Facility Area (in acres)	Is Facility Pre-Existing?	Location (of Chino Basin)	Comments
Upland Basin	5,000 afy	14.6	Yes	Northern portion	
Pipeline		0.6	No	Northern portion	Assumes a 500' connection pipeline and a 50' easement
College Heights SW Basin	4,500 afy	12.9	Yes	Northern portion	
Pipeline		9.1	No	Northern portion	Assumes 7,920' connection pipeline and a 50' easement
College Heights SE Basin	6,500 afy	18.0	Yes	Northern portion	
Pipeline		0.6	No	Northern portion	Assumes a 500' connection pipeline and a 50' easement
Brooks Street Basin	4,000 afy	15.0	Yes	Middle portion	
Pipeline		0.8	No	Middle portion	Assumes a 660' connection pipeline and a 50' easement
Eighth / Seventh Street Basins	2,500 afy	27.0	Yes	Northern portion	
Pipeline		2.3	No	Northern portion	Assumes a 1,980' connection pipeline and a 50' easement
Etiwanda Conservation Area	22,000 afy	40.0	Yes	Middle portion	
Pipeline		1.1	No	Middle portion	Assumes a 1,000' connection pipeline and a 50' easement
Lower Day Basin	8,000 afy	17.7	Yes	Northern portion	

Table 4.2-3
PROPOSED FACILITIES RELATED TO THE OBMP

Recharge Facility Description (MOA List of Facilities)	Quantity	Facility Area (in acres)	Is Facility Pre-Existing?	Location (of Chino Basin)	Comments
Pipeline		3.8	No	Northern portion	Assumes a 3,300' connection pipeline and a 50' easement
Victoria Basin	4,000 afy	15.0	Yes	Northern portion	
Pipeline		0.6	No	Northern portion	Assumes a 500' connection pipeline and a 50' easement
San Sevaine Basins 1-5	6,000 afy	86.0	Yes	Northern portion	
Pipeline		4.6	No	Northern portion	Assumes 4,000' connection pipeline and a 50' easement
Turner Basin	1,500 afy	19.0	Yes	Middle portion	
Pipeline		7.6	No	Middle portion	Assumes 6,600' connection pipeline and a 50' easement
Hickory Basin	1,500 afy	11.0	Yes	Northern portion	
Pipeline		0.6	No	Northern portion	Assumes a 500' connection pipeline and a 50' easement
Etiwanda Percolation Ponds	4,000 afy	10.0	Yes	Middle portion	
Pipeline		9.1	No	Middle portion	Assumes a 7,920' connection pipeline and a 50' easement
Jurupa Basin	3,600 afy	60.0	Yes	Northern portion	
Pipeline		3.0	No	Northern portion	Assumes 2,700' connection pipeline and a 50' easement
RP-3 Plant Facility	3,000 afy	50.0	No	Middle portion	
Pipeline		12.0	No	Middle portion	Assumes a 10,000' connection pipeline and a 50' easement
Wineville Basin	4,500	75.0	Yes	Middle portion	
Pipeline		12.0	No	Middle portion	Assumes a 10,000'connection pipeline and a 50' easement

Table 4.2-3
PROPOSED FACILITIES RELATED TO THE OBMP

Recharge Facility Description (MOA List of Facilities)	Quantity	Facility Area (in acres)	Is Facility Pre-Existing?	Location (of Chino Basin)	Comments
Total (New Pipelines and New Basins)		117.8			
Total	80,600 afy	539.0			

OBMP Desalter Alternative 6A (Reverse Osmosis Only)	Quantity	Facility Area (in acres)	Is Facility Pre-Existing?	Location (of Chino Basin)	Comments
Transmission pipelines	32,000 ft	36.7	No	Southern portion	This estimate of 32,000 is sized for ultimate capacity
East Desalter	34.0	17.0	No	Southern portion	
Pump Station for East Desalter	1.0	1.0	No	Southern portion	
New Wells for East Desalter	24.0	12.0	No	Southern portion	Possibly more wells will be needed if actual production is less than expected
SAWPA Desalter Expansion	2.0 MGD	1.0	No	Southern portion	
Pump Station for SAWPA Desalter Expansion	1.0	1.0	No	Southern portion	
New Wells for SAWPA Desalter	2.0	1.0	No	Southern portion	Possibly more wells will be needed if actual production is less than expected
West Desalter	3.8 MGD	1.9	No	Southern portion	
Pump Station for West Desalter	1.0	1.0	No	Southern portion	
New Wells for West Desalter	3.0	1.5	No	Southern portion	Possibly more wells will be needed if actual production is less than expected
TOTAL		74.1			

Table 4.2-3
PROPOSED FACILITIES RELATED TO THE OBMP

OBMP Desalter Alternative 6A (Reverse Osmosis with Loan Exchange)	Quantity	Facility Area (in acres)	Is Facility Pre-Existing?	Location (of Chino Basin)	Comments
Transmission pipelines	32,000 LF	36.7	No	Southern portion	This estimate of 32,000 is sized for ultimate capacity
East Desalter	24.6 MGD	12.3	No	Southern portion	
Pump Station for East Desalter	1.0	1.0	No	Southern portion	
New Wells for East Desalter	18.0	9.0	No	Southern portion	Possibly more wells will be needed if actual production is less than expected
SAWPA Desalter Expansion	2.0 MGD	1.0	No	Southern portion	May be combined with East Desalter expansion
Pump Station for SAWPA Desalter Expansion	1.0	1.0	No	Southern portion	
New Wells for SAWPA Desalter	2.0	1.0	No	Southern portion	Possibly more wells will be needed if actual production is less than expected
West Desalter	3.9 MGD	2.0	No	Southern portion	
Pump Station for West Desalter	1.0	1.0	No	Southern portion	
New Wells for West Desalter	3.0	1.5	No	Southern portion	Possibly more wells will be needed if actual production is less than expected
Ion Exchange Plant	9.3 MGD	4.7	No	Southern portion	This plant will use JCSD wells, no new wells would be constructed
TOTAL		66.5			

Table 4.2-3
PROPOSED FACILITIES RELATED TO THE OBMP

OBMP Monitoring Plan Wells, and Other Projects	Quantity	Facility Area (in acres)	Is Facility Pre-Existing?	Location (of Chino Basin)	Comments
Ultimate Number of New Monitoring Wells	50.0	11.5	No	Throughout Basin	Assumes 100' x 100' construction easement. The actual number of wells necessary may be considerably less, but this is a worst-case scenario.
San Antonio Water Company Future Production Wells	2.0	1.0	No	Northern portion	Assumes 0.5 acre/well
Baseline Feeder Western Extension			No		
Expansion of Lloyd Michael Water Treatment Plant	45 MGD expansion	22.5	No	Northern portion	Assumes 0.5 acre/MGD
CCWD transmission / distribution pipelines			No		
CCWD storage facilities			No		
CCWD spreading facilities			No		
CCWD Blending Stations and Treatment Facilities			No		
CCWD Booster stations			No		
CCWD Production Wells and Manifold System			No		
CCWD Connection to MWDSC Facilities			No		
State of California Production Wells	2.0	1.0	No	Southern portion	Assumes 0.5 acre/well
State of California Exchange Treatment Plant			Yes	Southern portion	
City of Chino New Production Well	1.0	0.5	No	Middle portion	More wells may be constructed in the future but exact details are not yet known
City of Chino Nitrate Removal Facility	11,000 AF				

Table 4.2-3
PROPOSED FACILITIES RELATED TO THE OBMP

OBMP Monitoring Plan Wells, and Other Projects	Quantity	Facility Area (in acres)	Is Facility Pre-Existing?	Location (of Chino Basin)	Comments
City of Chino Construction of Recycled Water Distribution System		> 30 acres	No	South portion	
Baseline Feeder Extension					
Pipeline	40,000 LF	45.9	No	Middle portion	50 feet easement
Appurtenances	1,000 ft	0.02	No		10 appurtenance x 100 sq ft each
Reservoir	1	1.0	No		
New Pump Station	1	1.0	No		
Modifications to Existing Pump	1	1.0	Yes		
TOTAL		115.5			

4.2.3.1 Threshold of Significance

There are no formal standards or thresholds for evaluating the significance of land use impacts. Even when evaluating a potential for land use conflicts, a number of factors must be considered (such as noise, different activity patterns of land uses, odors, etc.) in determining the significance of potential conflicts. Since there are no formal thresholds that define significant land use impacts, the following thresholds will be utilized in evaluating the significance of potential land use impacts from implementing the OBMP:

- The project causes an unavoidable conflict with a general plan land use designation or zoning classification;
- The project conflicts with, or is inconsistent with, applicable environmental plans or policies adopted by agencies with jurisdiction over the project to the extent that the conflict is unavoidable and unresolvable;
- The project is incompatible with existing land use in the vicinity;
- The project results in an unavoidable disruption or division in the physical arrangement of an established community (including a low-income or minority community; and
- The project induces significant growth within the project area or in the region.

Each of these significance thresholds will be applied to the potential land use impacts forecast to occur from implementing the OBMP, and a conclusion regarding the significance of potential land use impacts will be clearly presented in the following analysis.

a. Can implementation of the OBMP cause significant conflict with the General Plan or zone designations?

The four main treatment of facilities that will be implemented in support of the OBMP include recharge basins, desalting facilities, monitoring wells and pipelines. Specific locations for these facilities (other than rehabilitation and use of existing recharge basins) have not been selected at this point in time. Therefore, the location of these facilities will be determined on a case-by-case basis in the future. Each of these facilities is designed to enhance the safe yield of the Basin and improve water quality, which is consistent with the statement in California Government Code Section 53091 that such facilities are not subject to zoning ordinances. Each of these facilities is also consistent with the general goals, objectives and policies of general plans within the Study area that an "adequate supply of safe water" be provided for residents and that use and consumption of water is properly managed. With the possible exception of direct conflicts with adjacent land uses, discussed below, implementation of the OBMP is not forecast to cause any significant conflicts with general plans or zoning designations in for those jurisdictions within the Study area. This conclusion is based on the findings outlined above and the recognition in the general plans for communities in the Study area that adequate water system infrastructure is an essential component of future growth, just as are adequate roads, utilities, wastewater and other infrastructure systems.

With regard to potential conflicts with regional plans, the regional population forecasts contained in the SCAG publications, particularly the RCPG, are all based on the adopted general plans of the jurisdictions located within the Study area. The OBMP does not contain any policies or propose any activities that would modify or affect any general plan; it simply provides a program to manage the Chino Basin's safe yield and enhance future water quality for the Study area's water purveyors as they provide water to meet the future water demands envisioned in these general plans. The activities that will be supported by the OBMP are one level removed from the actual design, construction and operation of the water systems required to meet the demand from future growth within the Study area communities. As such, the implementation of the OBMP is consistent with the RCPG population forecast and has no potential to modify this forecast in any manner.

In SCAG's March 1996 RCPG, the Metropolitan Water District of Southern California (MWDSC) prepared an evaluation of water resource issues as they affect most of the southern California region and all of the Study area. The planning horizon utilized in this evaluation was the year 2010. The following conclusion regarding the balance between water supply and water demand is included in this document:

The projected yield from existing and potential supplies is estimated to total 5.02 MAF, which will meet consumptive demands of 4.54 MAF and have water stored in surface reservoirs and ground-

water basins for use in drier years. The supply augmentations and water management programs (such as development of reclaimed water, development of storage strategies including conjunctive use of imported surface and local groundwater supplies, and water conservation) are consistent with mitigation measures for water supplies proposed in SCAG's 1989 Growth Management Plan Environmental Impact Report.

In the year 2010, regional consumptive demand with BMP implementation is expected to increase from 4.54 MAF to 4.85 MAF under drought condition due to the hotter and drier weather. At the same time, water supplies are expected to decrease. Under a record drought such as 1991, existing water supplies could dwindle to 2.40 MAF as shown in Table 10-9. Recognizing that it is too expensive to plan for no shortages under extreme drought conditions, MWDSC's reliability goal for its service area allows for a 10 percent reduction in water demand beyond BMPs at a frequency of one in 50 years. Hence, the water supply augmentation and water management programs being pursued are expected to yield 4.35 MAF to meet 90 percent of the region's consumptive demands (see Figure 10-5). (MAF = million acre feet and BMPs = Best Management Practices)

The OBMP is a water management program specifically designed to provide supply augmentation by implementing use of recycled water, implementation of storage strategies (such as stormwater runoff conservation), conjunctive use of the local groundwater supply in the Chino Basin, and treatment of poor quality water. Therefore, its implementation will serve as one program designed to meet the goals outlined in the discussion of water resources within the RCPG. The OBMP is, therefore, considered to be fully consistent with the regional plan addressing this issue for southern California, including the Study area.

b. Will the project create a significant conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project?

The agency with jurisdiction over adoption and implementation of the OBMP is the Chino Basin Watermaster and the individual WSA that serve water customers or manage wastewater within the Study area. The applicable environmental policies that affect the Study area are contained in the local jurisdiction general plans and the agencies with oversight regarding the proposed activities contained in the OBMP. These agencies include the California Department of Health Services (DHS) that regulates the reuse of recycled water and the Santa Ana Regional Water Quality Control Board and the Water Quality Control Plan Santa Ana River Basin (1995 Basin Plan), which establishes beneficial uses and water quality objectives for water resources in the Chino Basin.

Regarding the environmental plans and policies contained in general plans of local land use agencies within the Study area, implementation of the OBMP has a potential for significant conflicts with certain policies or general plan elements. However, each of these environmental plan/policy issues are discussed separately in this PEIR and the following summarizes the conclusions reached in these evaluations regarding potential for significant conflicts with such plans:

1. Geology/Seismic Hazards: Because the OBMP management activities may raise or lower the water table in certain locations, potential geologic or seismic constraints may be increased within the Study area which would conflict with goals, objectives and policies in general plans. The evaluation of these issues in the PEIR indicates that such a potential does exist from implementing the OBMP, but it can be managed on a site-by-site basis in the future to prevent the significant expansion of liquefaction zones or subsidence zones within the Study area.

2. Flood Hazards: The OBMP envisions the use of flood control basins and the use storm flows for recharge which could alter the potential for downstream flood hazards. Evaluations in the hydrology discussion of this document indicate that the potential for significant conflicts with flood management goals outlined in general plans can be managed on a case-by-case basis to ensure that adequate capacity is maintained in flood control basins and that diversions from storm runoff do not create adverse flood hazards downstream of such facilities.

3. Fugitive Dust Hazards: Some of the general plans and the South Coast Air Quality Management District (SCAQMD) Air Quality Management Plan (AQMP) address high wind conditions and fugitive dust control policies. Some OBMP projects will result in disturbing areas with exposure to high wind conditions (Santa Ana winds) or that will generate fugitive dust. Specific fugitive dust/wind erosion control measures are outlined in the AQMP and these measures will be implemented for OBMP projects to ensure that fugitive dust generating activities do not conflict with control plans.

4. Environmental Risks: Many of the general plans identify policies for addressing the potential risks associated with utilizing hazardous materials or transporting fluids by pipeline that could degrade the environment through accidental releases. These activities are also addressed as part of the San Bernardino County Hazardous Waste Management Plan. These issues are discussed in the hazards section of the PEIR and with implementation of mitigation measures to minimize risks from accidental releases and to restore any areas contaminated by such releases, implementation of the OBMP will not create a significant conflict with policies addressing hazardous materials use and management of potential contamination.

5. Noise: OBMP projects will result in creating short-term noise effects on the environment and facilities, such as wells and desalters, have a potential to cause noise during operation (long-term) because of pumps and other related facilities. Noise thresholds are established in local general plans. Implementation of the OBMP will be carried out in conformance with these noise thresholds or standards and as a result, the OBMP's Program's implementation is not forecasted to have significant conflicts with the goals and policies of the local jurisdiction general plans with regards to noise.

6. Mineral Resources: Because many of the best locations for percolating or recharging water to the Basin are located in areas that overlay aggregate mineral resources (coarse, young alluvial deposits), a potential exists for new recharge basins or recharge wells to conflict with policies

for retaining access to such mineral resources. This issue is addressed in the PEIR and based on the limited area of new recharge basins and the fact that they do not inherently conflict with mining operations, no significant conflict was identified between OBMP implementation and mineral resource policies in Study area general plans.

7. Cultural Resources: Cultural resources (Native American, prehistoric and historic) occur throughout most of the Study area and a potential exists for OBMP facilities to impact such facilities in conflict with plans and policies contained in Study area general plans. Specific mitigation measures have been identified to ensure that cultural resources are given adequate protection as individual facilities are developed in the future. With implementation of such mitigation measures, no significant conflicts with cultural resource goals and policies in Study area general plans is forecast to occur.

8. Aesthetic Resources and Values: Each general plan for Study area jurisdictions defines significant views and aesthetic resources within a community. Goals and policies are established in these general plans to minimize conflicts with views, to protect scenic vistas and to meet aesthetic or design guidelines for new facilities. A potential exists for OBMP facilities to conflict with plans and policies contained in the Study area general plans. Specific mitigation measures have been identified to ensure that aesthetic resources are given adequate consideration and protection as individual facilities are developed in the future. With implementation of such mitigation measures, no significant conflicts with aesthetic or visual goals and policies in Study area general plans is forecast to occur.

9. Recreational and Open Space Resources: Each general plan for the Study area also identifies the type and extent of recreational facilities and open space resources that will be protected or established within a community. Goals and policies are established in these general plans to protect and minimize conflicts with recreational and open space resources. A potential exists for OBMP facilities to conflict with plans and policies contained in the Study area general plans. Specific mitigation measures have been identified to ensure that recreational and open space resources are given adequate consideration and protection as individual facilities are developed in the future. With implementation of such mitigation measures, no significant conflicts with recreational and open space goals and policies in Study area general plans is forecasted to occur.

With regard to DHS regulations related to use of recycled water and the Basin Plan beneficial use designations and water quality objectives for specific subbasins of the Chino Basin, a detailed analysis of water quality issues is provided in this document in the Water Resources/Water Quality subchapter. Fundamentally, the OBMP is designed to enhance water quality within the Chino Basin, but some specific activities, such as recharging recycled water, have a potential to conflict with the DHS regulations and the water quality objectives defined in the Basin Plan. Through a combination of managing future water production well locations, managing future recharge activities through blending and other measures, and extracting salt with desalters to increase salt removal or benefit for the Chino Basin, the DHS and Basin Plan objectives and policies can be fulfilled without implementation of the OBMP causing a significant conflict.

As with any project being implemented as part of a program extending over many years, a potential exists for plans and policies to change or for a specific project to result in a potentially significant conflict with existing plans and policies. Based on the type of projects envisioned for implementation under the OBMP and the measures available to control or avoid such conflicts, the analyses in this PEIR indicate that such potential conflicts, as outlined above, can be managed, or reduced, to below a significant level of conflict. However, the California Environmental Quality Act (CEQA) process does provide a fail-safe mechanism for future projects by ensuring that each proposed specific project will be reviewed in the context of the findings and mitigation measures outlined in this document. Under the programmatic concept, OBMP implementation will be carried out by ensuring that all future specific facility projects, or future OBMP modifications, are evaluated under Sections 15162 and 15168 of the State CEQA Guidelines (copy attached for information in Appendix 8.2 of Chapter 8). Under this review process, if a specific project is identified as causing a significant impact in one of the issue categories addressed in this document or as causing a significant conflict with the plans and policies discussed above, that define significance thresholds, then a subsequent EIR will be prepared. Thus, the combination of the measures identified in this document and the mandatory CEQA procedures discussed above will ensure that no specific OBMP project or future OBMP amendment or modification will result in significant conflicts with plans or policies, without this information be made available to the decision-makers prior to a decision being made on such specific projects or amendments. Mitigation measures for specific issues outlined above are identified in the subchapter where the issue is evaluated in this PEIR.

c. Will implementation of the proposed project cause incompatibilities with existing land use in the vicinity?

In the context of the two-tiered evaluation being conducted in this PEIR (general plan and specific project levels), the implementation of the OBMP will not cause any changes in existing land uses or existing land use designations as defined in the general plans of the local jurisdictions in the Study area. Fundamentally, each general plan assigns each parcel of land a specific land use and, in those limited instances where potentially incompatible land uses are located adjacent to one another, the general plans define those measures that must be implemented to ensure compatibility between such uses. Thus, where commercial uses and residential uses abut one another, specific lighting and noise incompatibilities posed by such juxtaposition are controlled by implementing controls on the intensity and direction of lighting and by implementing noise buffers that attenuate noise from commercial activities. Since the OBMP will not alter any existing general plans or land use designations, its implementation has no potential to cause any incompatibilities at the general plan level.

At the project specific level, future projects do have a potential to cause significant incompatibilities. However, specific incompatibilities cannot be defined until specific project locations are identified for individual projects implemented under the OBMP. As was outlined above in the discussion of potential conflicts with environmental plans and policies, mitigation measures have been identified for specific land use conflicts that may potentially cause incompatibilities. These measures are discussed at a general level for the type of projects and activities that will be implemented under the OBMP.

Thus, where an OBMP project will be located adjacent to a potentially conflicting use (such as a production well adjacent to residential uses), the location of the facility may be moved, thus totally avoiding the incompatibility, or specific measures may be implemented to attenuate an impact. For the example given, the well pump could cause an incompatibility between a production well and residential uses due to noise impacts. Instead of relocating the well, the pump motor could be placed in a structure that would provide sufficient noise attenuation to ensure that the pump noise would not conflict with the adjacent residential use. As discussed in the previous section of this subchapter, for each of the major environmental issues specific measures have been identified that can reduce the impacts from implementing future OBMP projects to a non-significant level of impact, using the thresholds of significance identified for that issue (i.e,. noise attenuation for residential uses to below 50 decibel (dB) Community Noise Equivalent Level (CNEL) during evening hours).

Potential production well incompatibilities have already been discussed for residential uses. But the same incompatibility may occur if a production well must be placed near a biologically sensitive site. Where significant biological resources occur, avoidance of siting a facility may be the best way to avoid creating an incompatibility between land uses, but again, mitigation by attenuating sound levels to at or near background conditions may be a viable alternative for a particularly important production well site. Regardless, mitigation is available to ensure that the potential incompatibilities are either avoided, prevented or controlled to less than significant levels of impact.

The construction of OBMP facilities will generate noise and fugitive dust during construction. Specific measures to control fugitive dust and noise have been identified in these respective issue subchapters so that a nuisance (incompatibility) will not be caused while construction is in progress. During operation, the activity of delivering and recharging water does not pose any known direct conflicts, even when recharge facilities are located adjacent to sensitive land uses. However, recharge basins do pose an inherent safety hazard for trespass once in operation, so access controls (fences, etc.)may be installed to ensure that trespass is controlled, particularly by children, to the maximum extent feasible, unless a recharge basin takes the form of a small lake, pond or golf cousre landscape water formation..

Pipelines are generally placed underground and do not pose any potential incompatibility with surface uses overlying their location or with adjacent uses. Installing pipelines can create the same potential incompatibilities with adjacent uses as identified above for reconstructing existing recharge basins or constructing new recharge basins. An additional incompatibility from constructing pipelines, which are commonly placed in road or other utility rights-of-way, is the short-term disruption of traffic flow and creation of traffic hazards. Again, mitigation measures are identified to ensure that pipeline construction activities do not create significant adverse impacts related to these conflicts in activities.

The desalters proposed for implementation are in essence, water treatment facilities that generate a modest amount of noise; that use hazardous materials; that serve to increase local traffic due to employment; and that are constructed in a manner to resemble a light industrial facility. Although desalter facilities and operations do not encompass activities typical of those associated with heavy industry or large commercial operations, the activities associated with a desalter would be considered incompatible where adjacent uses include residential uses or sensitive biological resource habitat. When desalters are considered for implementation in the future, part of the siting criteria will include avoidance of sensitive land uses that would result in placing incompatible land uses adjacent to one another, or to identifying the specific mitigation measures outlined in this document that will be implemented to reduce potential incompatibility to a non-significant level.

Mitigation is identified below for implementation with the OBMP when placing incompatible land uses adjacent to one another is considered. The implementation of a formal siting process for OBMP projects will either result in avoiding juxtaposition of incompatible land uses, or in the identification and implementation of sufficient mitigation to ensure that even when such uses are adjacent, no significant incompatibility will remain.

d. Will implementation of the proposed project affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses)?

The Chino Basin contains very significant agricultural resources, primarily dairy ranches that are located in the southern portion of the Basin. As described in the environmental setting discussion to this subchapter, actions have been taken (beginning in 1994) which have resulted in a large portion of the dairy ranches in San Bernardino County being annexed or available for annexation to the cities of Chino and Ontario. Agricultural uses are forecast to gradually shift to urban uses within the Study area, but there is no specific schedule for this transition to urban uses. The time period required for transition will depend upon future demand for urban development in the area, and the overall costs of operating, maintaining and closing the dairy ranches.

The first step in the transition to urban uses has been taken by most jurisdictions with agricultural areas (excluding some county areas) because new land use designations have been or are in the process of being assigned to the dairy ranch areas. As previously discussed, of the 8,200 acres recently annexed to the City of Ontario, 5,200 acres have been assigned residential designations, 504 acres commercial designations, 338 acres industrial, 500 acres for educational uses, and 776 acres are allocated to public and infrastructure uses. Thus, 89 percent of the recently annexed area are allocated to urban uses.

At the general plan level, the OBMP will not cause or contribute to the transition of agricultural land to urban uses. Increasing the safe yield of the Chino Basin and enhancing water quality through treatment of water in the lower portions of the Basin with high Total Dissolved Solids (TDS) concentrations will has no identifiable potential to cause or contribute to this transition in uses. Thus, at the Study area planning level, OBMP implementation is not forecast to have any adverse effect on the agricultural to urban land use transition.

At the project specific level, the OBMP may have a very small impact on agricultural operations. First, the recharge basins must be located in the upper to middle portion of the Chino Basin in order to make the percolated water available for utilization within the Basin. Any recharge in the lower portion of the Basin would be difficult to capture and due to poor water quality, recharged water in the lower portion of the Basin could only be made available through treatment (desalting). Therefore, the installation and operation of such facilities has little or no potential to have a direct adverse impact on agricultural operations.

Since most pipelines will be placed within existing rights-of-way (implying that these alignments are already disturbed) and if placed under agricultural land would allow most agricultural operations to continue, the installation and operation of pipelines is not forecast to cause any measurable loss of agricultural land.

Production wells, monitoring wells and desalters have a reasonable possibility of removing some agricultural land from operation. The total acreage of removal for desalter and wells footprints is forecast to be less than 100 acres (see Table 4.2-3). Given the approximate 11,000 acres of agricultural land scheduled for conversion to urban uses in San Bernardino County alone, the potential conversion of less than 100 acres in support of OBMP projects is not forecast to be a significant impact to agricultural lands or operations. The project's contribution to cumulative removal of agricultural operations could be considered significant as discussed in more detail below, but mitigation is provided that will allow OBMP implementation to avoid contributing to a cumulative significant loss of land currently dedicated to agricultural operations and to cumulative conversion of important farmlands and prime agricultural soils located in the southern portion of the Basin.

e. Will implementation of the proposed project disrupt or divide the physical arrangement of an established community (including a low-income or minority community)?

At the general plan level the OBMP will not affect any existing land use designations and, therefore, its implementation has no potential to contribute to area divisions of the physical arrangements of existing communities in the Study area.

At the project specific level, the only proposed OBMP facilities large enough to create any physical divisions in the physical arrangement of communities would be pipelines and recharge facilities. Pipelines will be placed underground and therefore have no potential to cause any long-term physical divisions in communities. Recharge basins will be located within areas of high percolation, usually adjacent to existing stream channels or in areas where aggregate mining of coarse alluvium has occurred and/or is underway. The limited acreage of recharge basins within or adjacent to stream channels or mining areas is not forecast to increase the physical division of communities beyond that which currently exists where such features are located. However, to ensure that no future recharge basins disrupt or divide the physical arrangements of established communities, project specific mitigation is identified below for implementation during the siting of such basins. Implementation of the recommended measure will ensure that established communities are not disrupted or divided by OBMP implementation.

f. Will implementation of OBMP projects cause significant displacement or loss of acreage that could be used for development?

The estimate for total acreage that could be utilized by OBMP facilities (see Table 4.2-3) is about 728 acres. This can be compared to the 225,937 acres included in the Study area, of which more than 75,000 acres were vacant in 1990 (see Table 4.2-2). Of the facilities proposed, the pipelines and recharge basins are unlikely to permanently remove developable land from uses designated on the Study area general plans. This is because pipelines will be placed underground and should not conflict with surface uses and most of the recharge basins will be located adjacent to or within managed floodplains. These facilities comprise approximately more than 500 acres of the total forecast OBMP ground disturbance, leaving about 200 acres that may be developed on land that could be developed for direct urban purposes.

The proposed desalters, production and monitoring wells, and other facilities constitute the remaining ~200 acres of OBMP related facilities. These facilities will mostly be located in the southern portion of the Basin where desalting is required. This acreage is so small relative to the amount of vacant or agricultural acreage in this portion of the Basin (~25,000 acres in San Bernardino-Riverside counties), that the loss of this small amount of acreage is considered to be a non-significant adverse impact. Note that Table 4.2-2 identifies an additional 3,252 acres of land that is forecast to be converted to public and infrastructure uses. The estimated 728 acres of OBMP related ground disturbance is approximately 15.6 percent of this 3,252 acres which is consistent with the finding of non-significant impact made above. No mitigation is required other than the siting procedure already described below.

g. Will implementation of the proposed project cause or contribute to significant growth inducement?

To understand the potential effect of the OBMP on future growth and growth inducement within the Study area, it is necessary to understand the role that the OBMP will play if it is implemented. The purpose of the OBMP is to provide an overall management strategy, tied to specific facilities and management actions, that will provide the Chino Basin with "***a groundwater management program that enhances the safe yield and the water quality of the Basin, enabling all groundwater users to produce water from the Basin in a cost-effective manner.***" (Page 3-1, OBMP Phase I Report). The OBMP is not intended to be directly involved in supplying municipal water supplies to customers. Thus, the Program and its implementation are one step removed from actual development and provisions of adequate water supplies in support of building-out each jurisdictions' general plan. Perhaps most the Basin's WSA have already planned to serve the build-out populations within their service areas. As a program, the OBMP may reduce costs and achieve a more reasonable mix of water supplies for these WSA's, but the program does not supplant the already existing requirement and planning efforts of the WSA's to provide the water supplies for the Study areas ultimate build-out population.

In this analysis of future growth and potential growth inducement, it is this document's contention that growth decisions have already been made by local agencies governing land use decisions, and further, that the OBMP does not remove any existing constraint on future development because existing WSA's have alternative means (perhaps not as cost or environmentally effective as the OBMP) to meet future water demands. This concept is embodied in policy principles adopted by the MWDSC's Board of Directors and restated as part of the RCPG's Water Resources evaluation for southern California. These policy principles state:

1. ***Water supply is not a reason in and of itself to limit or control growth in California. There are sufficient water resources to accommodate continued population and economic growth through better management, including conservation, voluntary transfers and additional storage and conveyance facilities. Water supply for urban, agricultural and environmental uses will be adequate and reliable.***

2. ***Growth management and the allocation and direction of development should be the responsibility of general purpose government. Utilities, including water purveyors, should provide adequate facilities to serve the project growth at the state, regional and local levels.***

3. ***For planning and infrastructure purposes, water supply should be treated as a utility not required to be a general purpose government plan element. However, water purveyors at the state, regional and local levels should be members of any proposed infrastructure planning structure to ensure optimum coordination and infrastructure resources investment...***

The net effect of these principles is to define water infrastructure as following, not leading or causing development. The question still remains as to whether the implementation of the OBMP causes or accommodates growth and the related environmental impacts caused by the increased population that can occupy the Study area in the future. The answer to this question can be found in the land use planning process which now determines the future vision of the region at build-out as defined by general plans for the Study area and the regional planning documentation which already indicates that adequate water supplies are available to meet this future demand. As noted above, the OBMP does not provide an overall increase in availability of water, it provides a management plan that will more efficiently utilize the existing water resources found within the Chino Basin.

The ultimate vision of future growth and development within the project area was established in the governing Study area general plans, and it is assumed in these general plans that the WSA's have identified the infrastructure required to support the population which will be in place as growth occurs in the future. The net effect of these general plans is to create a set of expectations regarding future land use and growth that may or may not occur depending upon the actual carrying capacity of the various utility and service resources required to meet future growth. It also seems clear that the established planning process and the overall growth pressures in southern California are the primary causes of future growth, i.e. they induce the actual growth that occurs, and the various utilities, such as the WSA's, are effectively forced to create urban water management plans that can accommodate such growth, at least within the limits of current or future resources that may be available. As the RCPG analysis of water resources indicates, there are sufficient water resources to meet future demand for the foreseeable future.

As noted above, the position taken in this document is that the utility planning process is more appropriately playing a passive (accommodating) role, not an active (inducing) role, in future growth that is dictated by local land use plans and the continuing growth of population throughout southern California. If communities within the project area chose to restrict growth and maintain a certain vision of the future as a static or slowly growing entity, the land use planning agencies (cities and counties) had the opportunity during the general planning process to establish such plans. Under such circumstances, the utility providers, including the WSA's would have designed their future service plans to accommodate a level of future growth consistent with available resources

In reality, however, the WSA's, acting as responsible water planning agencies, must plan for a level of future growth that appears to match available water resources with forecast growth through the 2010 planning horizon. At present the WSA water supply plans rely to a large extent on water importation. The OBMP provides an alternative management program for the Chino Basin that will reduce reliance on imported water and still allow the WSA to accommodate growth as envisioned in the Study area general plans. Based on this analysis, implementation of the OBMP is not considered to be a significant growth inducing action.

4.2.4 Mitigation Measures

The analysis above indicates that implementing the OBMP has only limited potential to cause significant adverse land use impacts. The following mitigation measures are recommended as actions that need to be implemented for individual projects proposed as part of the OBMP:

4.2-1 Following selection of alternative sites for construction of future desalters, each site shall be evaluated for potential incompatibility with adjacent existing or proposed land uses. Where desalter operations can create significant incompatibilities (lighting, noise, use of hazardous materials, traffic, etc.) with adjacent uses, an alternative site shall be selected, or a technical report shall be prepared that identifies the specific measures that will be utilized to reduce potential incompatible activities or effects to below thresholds established in the general plan for the jurisdiction where the facility will be located.

4.2-2 Where future OBMP facilities are proposed on locations that support agricultural operations on important farmlands, alternative sites shall be selected that do not occupy such acreage (unless agricultural operations have already been terminated).

4.2-3 Prior to implementing each proposed water facility, the land use compatibility of the proposed facility with both existing and future potential adjacent uses will be evaluated for consistency relative to general plan goals. This evaluation will examine the specific activities associated with

the proposed facilities and determine whether specific incompatibilities, such as noise, fugitive dust, hazards or risk, or aesthetics would conflict with adjacent uses. Measures identified in the Subchapter of the OBMP PEIR will be used to mitigate potential incompatibilities where they are identified, or alternative locations will be selected.

With implementation of these three measures, the only potentially significant land use issues related to OBMP implementation (incompatibility between a proposed specific facility or activity and sensitive land uses and cumulative contributions to removal of important farmlands) will be reduced below the significance thresholds outlined at the beginning of section 4.2.3.1. Originally the NOP scoping process identified six potentially significant impacts for further analysis. The analysis conducted for this PEIR, contained in Section 4.2, supports the conclusion that only two of these six issue are potentially significant and that with implementation of the mitigation measures listed above, impacts will be reduced to a less than significant level.

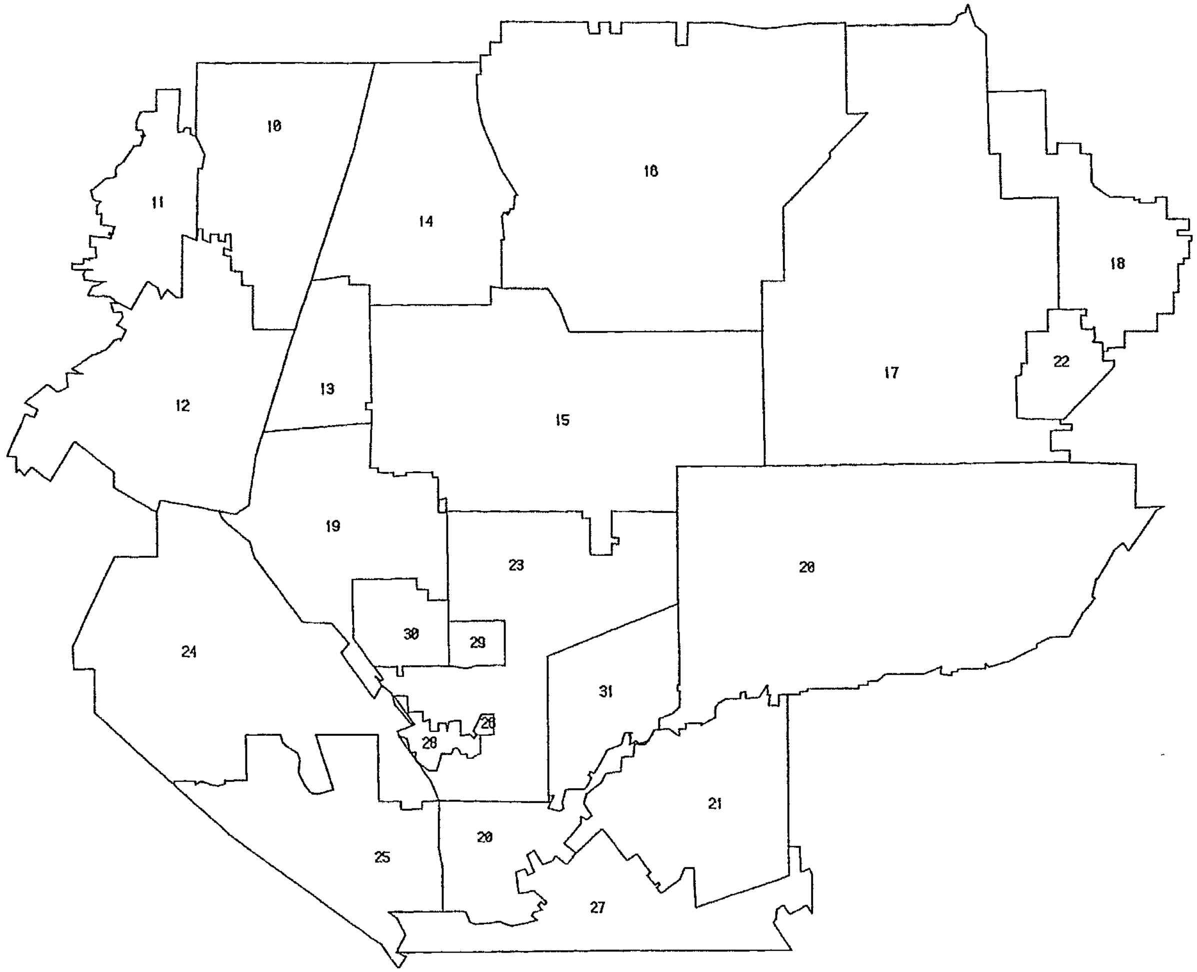
4.2.5 Unavoidable Adverse Impact

The land use impact evaluation presented above indicates that implementation of the proposed project will be consistent with the Study area general plan land use designations and environmental policies. Implementing the proposed project is not forecast to cause any direct or indirect significant adverse land use impacts after implementation of the two mitigation measures outlined above. Therefore, no significant unavoidable adverse land use impacts are forecast to occur if the OBMP is approved and implemented for the Chino Basin.

4.2.6 Cumulative Impact

The OBMP activities are specifically designed to provide a more efficient and effective program for managing all of the water resources that occur within the Chino Basin. The proposed project has been evaluated as being fully consistent with the Study area's general plans and the OBMP activities are not forecast to contribute to any land use incompatibilities with existing or future uses within the Study area based on implementing identified mitigation measures. The loss of agricultural land within the southern portion of the Chino Basin has been identified as an unavoidable cumulative impact from transition of the existing agricultural operations to urban uses. The OBMP could contribute to this loss of agricultural activity in a small, but cumulatively significant manner by converting up to 100 acres of agricultural acreage to OBMP program water resource uses. The project's potential contribution to this cumulative impact can be avoided by implementing the proposed mitigation outlined above.

Finally, the OBMP has been determined not to contribute to future growth as envisioned in the Study area general plans. This conclusion is based on two lines of reasoning: first, the OBMP replaces existing sources of water and water resources management that would have been used by individual WSA to meet future growth that is envisioned in the general plans and therefore, implementing the OBMP does not remove any constraint on growth; and second, the provision of water to meet future demand is determined to be growth accommodating, not growth inducing. The OBMP can be implemented without causing or contributing to future significant cumulative growth or development within the Chino Basin.



Legend

Area No	Planning Area Name
10	Claremont
11	La Verne
12	Pomona
13	Montclair
14	Upland (inlcuding San Antonio Heights)
15	Ontario
16	Rancho Cucamonga
17	Fontana
18	Rialto
19	Chino
20	Jurupa
21	Norco
22	Bloomington/Fontana
23	San Bernardino Agricultural Preserve
24	Chino Hills
25	Chino Hills State Park
26	California Institution for Women, Frontera
27	Corona
28	El Prado Park and Golf Course
29	Chino Airport
30	California Institution for Men, Chino
31	Riverside Agricultural Preserve

Scale: 1 inch = 15,000 feet

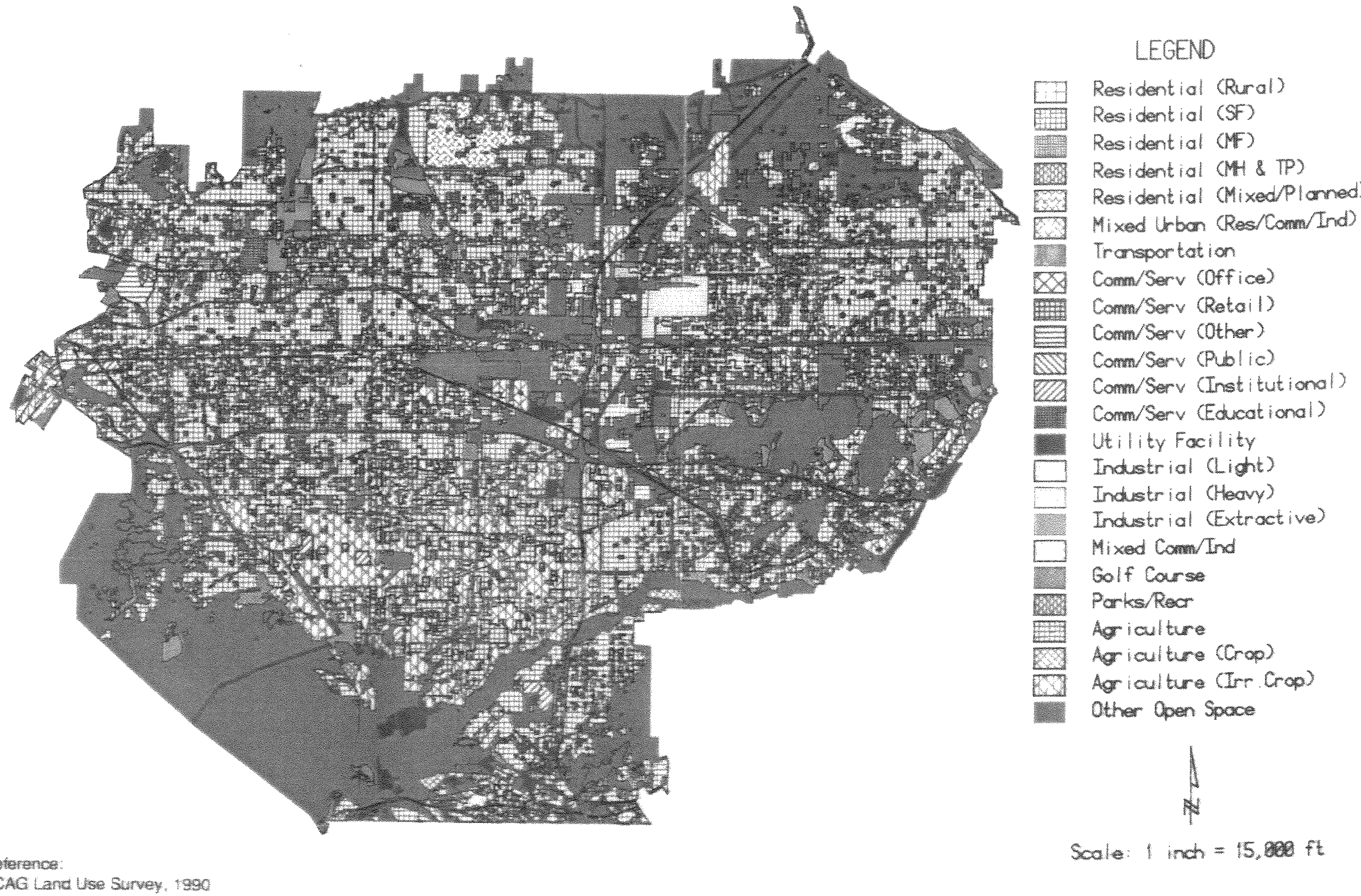
* Portions of Planning Area 23 have been annexed by the City of Ontario and are now part of Planning Area 15

PLANNING AREAS

Source. Chino Basin Water Resources Management Task Force, Final Task 1 Memorandum, Water and Wastewater Planning Environment, March 1993

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.2-1



1990 LAND USE

Source: Chino Basin Water Resources Management Task Force, Final Task 1 Memorandum, Water and Wastewater Planning Environment, March 1993

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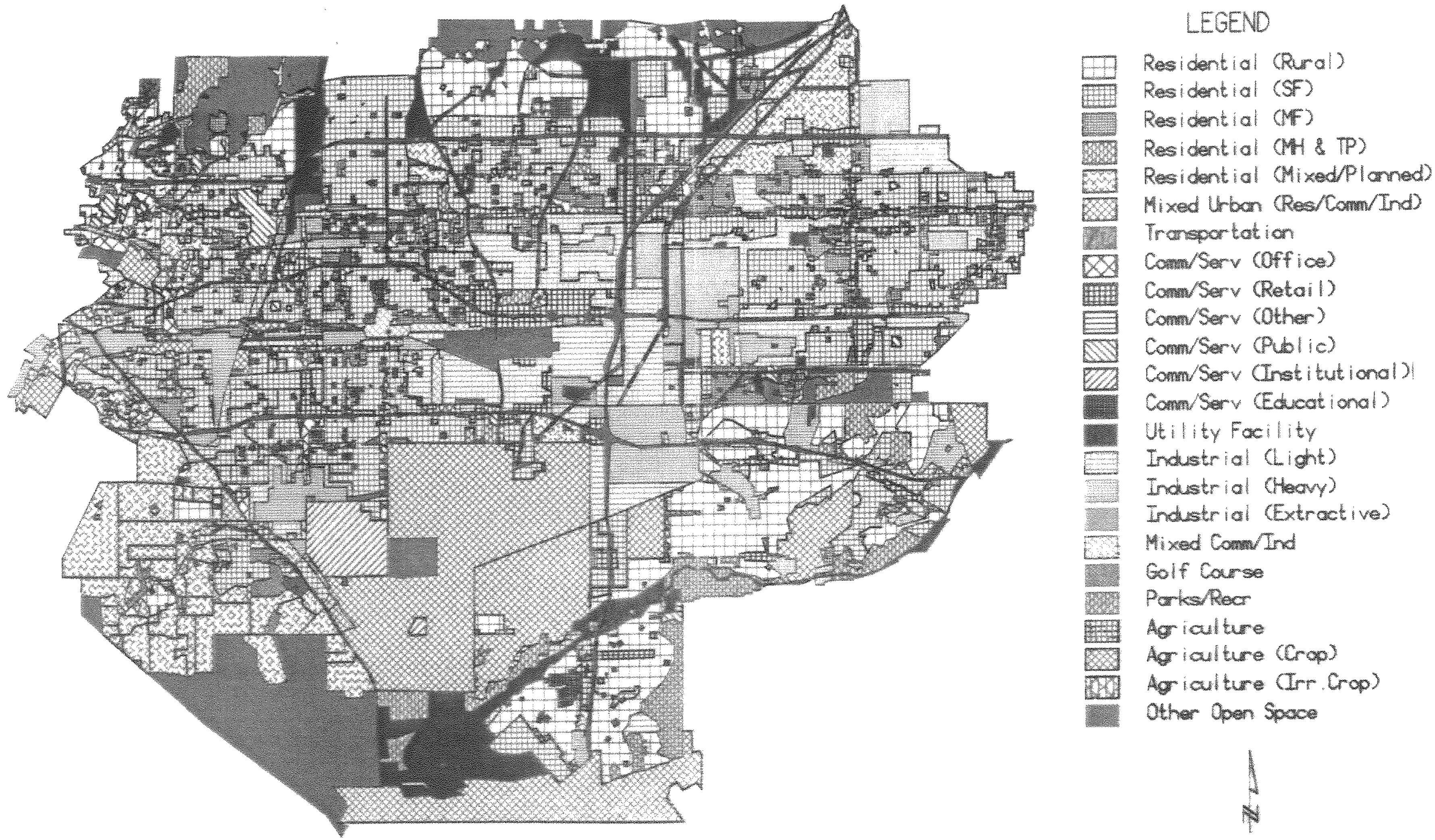
Environmental Consultants

FIGURE 4.2-2



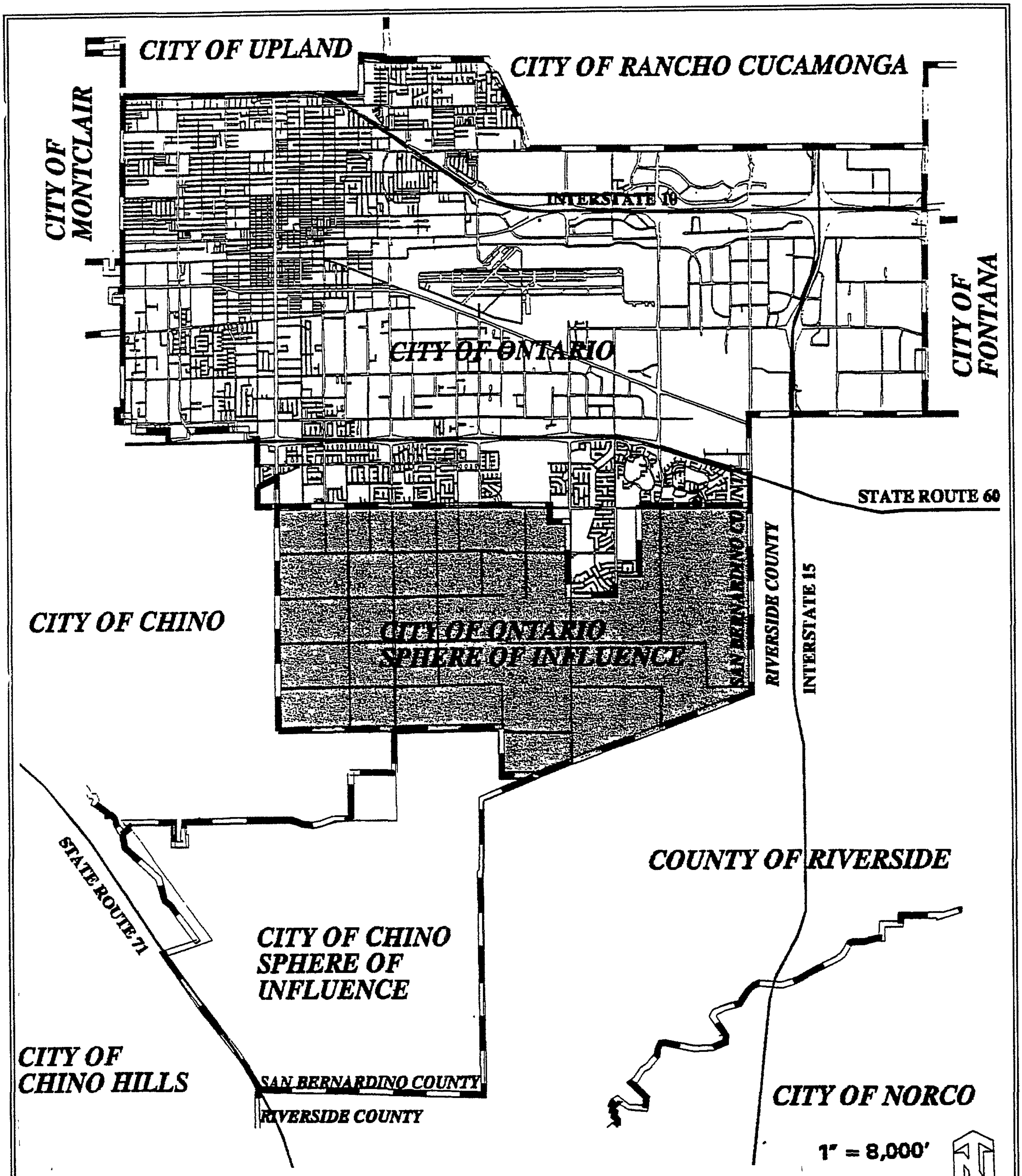
Reference:
Current City and County
General Plan Land Use Maps

ULTIMATE LAND USE

Source: Chino Basin Water Resources Management Task Force, Final Task 1 Memorandum, Water and Wastewater Planning Environment, March 1993

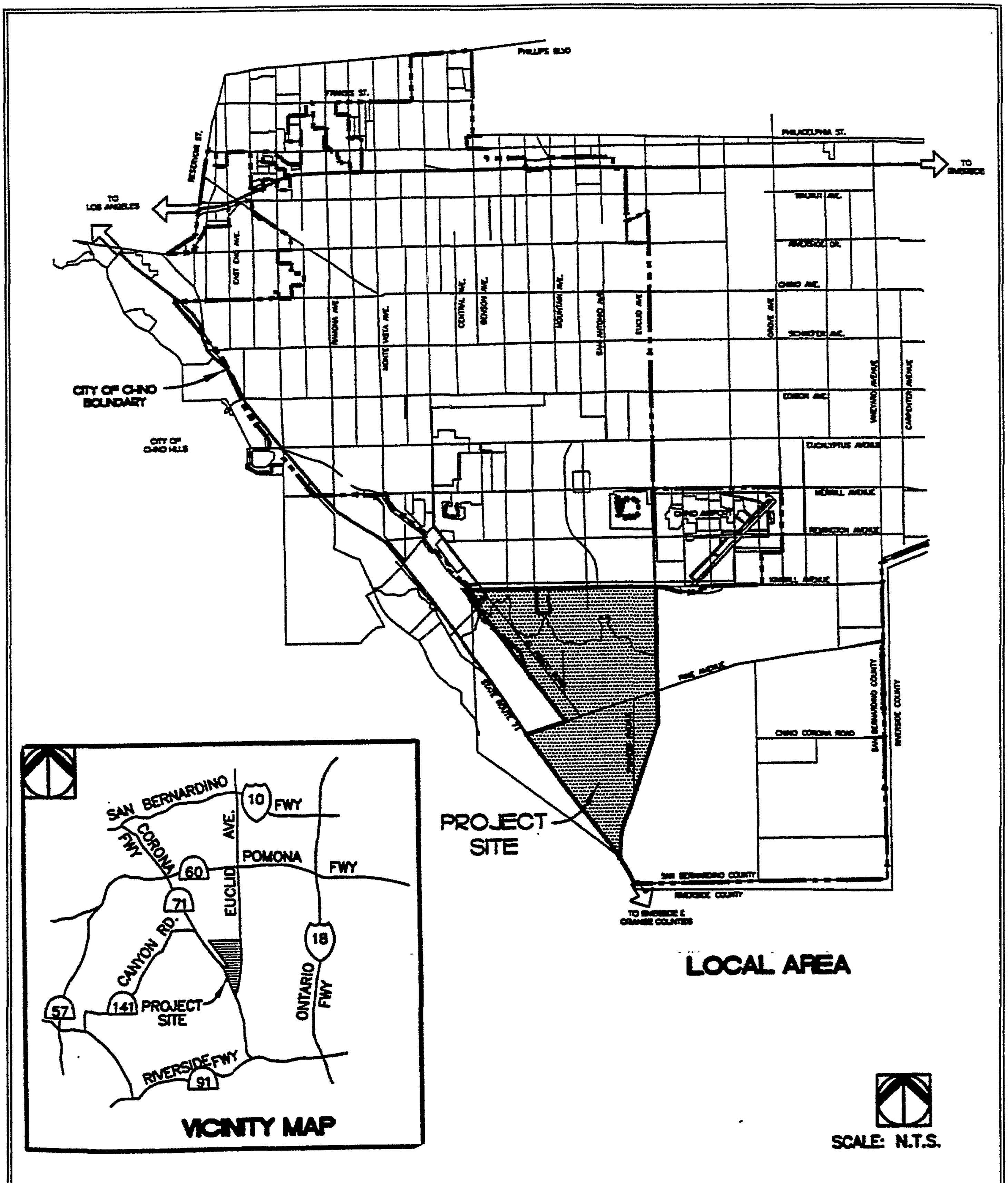
TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.2-3



City of Ontario Sphere of Influence is now called New Model Colony.

CITIES OF CHINO AND ONTARIO SPHERE EXPANSION AREAS Source: Ontario Sphere of Influence Final EIR, October 1997	TOM DODSON & ASSOCIATES Environmental Consultants	FIGURE 4.2-4



LOCATION MAP **CITY OF CHINO - SUBAREA 1** Source Chino Valley Dairy Preserve Final PEIR, August 1998	**TOM DODSON & ASSOCIATES** Environmental Consultants	**FIGURE 4.2-5**

4.3 POPULATION AND HOUSING

4.3.1 Introduction

The intent of Subchapter 4.3 is to present environmental impact forecasts associated with population and housing that may result from the implementation of the proposed OBMP project. This section will provide an analysis of the existing population for the affected cities and unincorporated areas of the counties of Riverside and San Bernardino that lie within the boundaries of the Chino Basin; compare the current population to the population forecasted for the Chino Basin; and assess the potential for the OBMP to effect or change this future population forecast. In addition to analyzing impacts to population, impacts to growth from implementing the OBMP that were analyzed in Subchapter 4.2 will be summarized from an inducement to growth and from a restriction to growth standpoint. Potential effects on housing resources will be addressed and the potential to displace housing, especially potential displacement of affordable housing within the Chino Basin.

Comment letters received on the NOP identified concerns regarding consistency with the affected cities and counties general plans. This issue is discussed in some detail in Subchapter 4.2. The analysis within this section will include a discussion on the population and housing projected by the jurisdictions in relationship to the ability to provide water service based on the anticipated growth within the Chino Basin.

To evaluate impacts to population and housing needs, reports compiled by the following agencies have been utilized:

- Cities of Chino, Chino Hills, Fontana, Montclair, Norco, Ontario, Pomona, Rancho Cucamonga, Rialto, and Upland;
- Counties of Riverside and San Bernardino;
- Southern California Association of Governments; and,
- California Department of Finance (DOF), Population and Demographics Research Unit.

Data has been abstracted from the city and county general plans and general plan environmental impact reports (EIRs) and discussions have been conducted with city, county and SCAG personnel in order to characterize the existing environmental setting and to make the impact forecast.

4.3.2 Environmental Setting

The Chino Basin consists of approximately 235 square miles of the upper Santa Ana watershed encompassing portions of Los Angeles, Riverside and San Bernardino Counties. There are ten cities and unincorporated areas of both Riverside and San Bernardino Counties either wholly or partially lying within the adjudicated boundary of the Chino Basin. Please refer to Figure 4.2-1. Jurisdictions with partial coverage within the Chino Basin boundaries, such as the City of Rialto, for analysis purposes, have been treated as if their entire corporate limits were contained within the Basin. Therefore, the existing population, forecasts and build out projects are based on the entire corporate boundaries rather than an extraction of the data based on a smaller subset. This assumption is considered reasonable since the water supplied to all of a city's water consumers could be extracted from within the Chino Basin and there is no known way to determine what portion of a city's population is being served by water extracted from within the Basin.

4.3.2.1 Population

The SCAG has estimated the population of the Chino Basin service area. These estimates are enumerated in Table 4.3-1 for the affected cities and portions of the Counties of Riverside and San Bernardino beginning with the base year 1994 and forecasting the current year and future years at 5-year intervals through year 2020. The current population estimate for the Chino Basin portion of the area shown in Figure 4.2-1 is approximately 1,070,481. The persons within the project area will increase by more than 11 percent over the next 5 years and will approach an estimated population of 1,666,498 people in the year 2020.

4.3.3.2 Housing

The Housing data contained within Tables 4.3-2 and 4.3-3 was derived from the following sources:

a. City of Chino General Plan, 1993 (Housing, 1989) – Population pg. IV-5 and Buildout pg. IV-7;
b. City of Chino Hills General Plan, 1994 – Population pg. 2-7 (Housing) and Buildout pg. 1-21 (Land Use);
c. Fontana General Plan, 1989 – Population pg. 4-8 (Housing) and Buildout pg. 2-5 (Land Use);
d. Montclair General Plan, 1983 (Amendments 1984-85; Housing Element Amended, 1991) – Population and Buildout pg. 9;
e. Norco General Plan, 1995 Housing Element - Housing Characteristics pg. 22;
f. Ontario General Plan, 1992 – Population pg. 9-5 and Buildout pg. 7-34
g. Pomona General Plan, 1973 (Volume One-Profiles) - People pg. 9 and Appendix VI pg. 33;
h. General Plan for the City of Rancho Cucamonga, 1981 (Amended 1984 and 1989) – Population and Buildout pg. III-37;
i. City of Rialto General Plan, 1992 – Population pg. IV-8 and Buildout pg. II-19;
j. City of Upland General Plan, 1982 (Updates compiled 1992) – Population pg. V-2 and Buildout pg. IV-11; and
k. Southern California Association of Governments.

Table 4.3-1
SCAG POPULATION FORECAST

Cities/Counties	1994	2000	2005	2010	2015	2020
Chino	62,800	66,100	69,400	72,900	76,700	80,400
Chino Hills	40,947	52,646	61,513	69,396	82,693	93,351
Fontana	103,100	119,900	136,800	154,400	173,500	192,600
Montclair	30,200	32,200	34,200	36,300	38,600	40,900
Norco	24,705	26,735	28,764	30,794	32,584	34,456
Ontario	144,000	149,500	155,100	161,000	167,300	173,700
Pomona	138,749	155,962	167,688	177,687	188,859	204,455
Rancho Cucamonga	115,000	128,300	141,800	155,900	171,000	186,300
Rialto	80,000	91,200	102,600	114,400	127,200	140,100
Upland	67,500	70,800	74,200	77,800	81,600	85,400
Unincorporated Riverside County	84,866	92,552	99,480	106,481	113,173	119,205
Unincorporated San Bernardino County	94,762	137,232	179,067	223,294	269,730	315,631
TOTALS	986,629	1,123,127	1,250,612	1,380,352	1,522,939	1,666,498

Source: SCAG, 1998 RTP Adopted Forecast, April 1998. Information for unincorporated San Bernardino County is based on RSA 28.

Along with the projected population increases, there will be a corresponding increase in the estimated number of dwelling units within the project area. Based upon information contained within the affected agency general plans, the estimated number of residential dwelling units at buildout is anticipated to be approximately 371,183 dwelling units, comprised of a combination of single family, multi-family and seniors units. Table 4.3-2 summarizes the expected dwelling units for the affected agencies based upon general plan data. Table 4.3-3 compares population to households within the Chino Basin area (year 1997).

Table 4.3-2
ESTIMATED DWELLING UNITS AT GENERAL PLAN BUILDOUT

Cities/County	Dwelling Units at General Plan Build Out
Chino	21,397
Chino Hills	26,815
Fontana	44,164
Montclair	12,259
Norco	5,900
Ontario	48,756
Pomona	46,299
Rancho Cucamonga	58,974
Rialto	32,619
Upland	74,000
TOTAL	371,183

4.3.3 Project Impacts

As described in detail in Subchapter 4.2, the population growth forecasts presented above and associated occupancy of dwelling units required to support this population represent assumed growth with or without implementation of the OBMP. Regional growth in southern California is driven by a combination of in-migration and recruitment (births over deaths) from the existing population. The analysis of growth in Subchapter 4.2 concluded that there are adequate water supplies available within the Basin and through imports to meet the future urban population growth within the Chino Basin. Therefore, water does not serve as a constraint to growth and by planning and expanding water system infrastructure to meet this future demand, WSA's are accommodating, not inducing growth.

Further, the implementation of the OBMP does not represent a new supply of water to meet future demands within the Chino Basin. If approved, the OBMP will provide a program to more efficiently and effectively manage all available water resources (high quality surface water and groundwater, poorer quality water in the southern portion of the Basin, imported water, imported groundwater, recycled water and storm water flows) to meet future water demands. The discussion on growth inducement in Subchapter 4.2 concluded that growth will occur and individual water purveyors will

Table 4.3-3
CITY AND COUNTY POPULATION ESTIMATES

City/County	Population[1]	Household[1]	Persons/HH[1]	Population/ 1990 Census[2]	Population/ City's GP[3]	Pop. Estimate @ Buildout[3]	Pop. Estimate/ City (4-98)[4]	Pop. Estimate/DoF DRU (1-1-98)[5]
Chino	62,671	54,911	3.331	59,682	56,136	70,551	62,671	64,536
Chino Hills	51,418	51,270	3.220	N/A	48,041	72,400 - 79,800	51,471	54,667
Fontana	104,201	103,715	3.458	77,971	69,657	193,018	104,201	107,590
Montclair	29,735	29,392	3.349	28,434	30,783	41,500	29,735	30,134
Norco	25,482	20,159	3.416	23,302	0	0	25,482	0
Ontario	141,082	139,949	3.353	124,260	124,260	134,038 *	142,497	143,799
Pomona	142,902	140,178	3.766	131,723	119,144	140,000	142,902	0
Rancho Cucamonga	116,045	113,563	3.066	101,408	115,010	158,071	116,043	118,432
Rialto	80,249	80,175	3.352	72,388	70,335	87,748 - 98,557	80,249	81,476
Upland	65,733	65,202	2.778	63,948	47,647	74,000	65,733	67,012
Unincorporated Riverside County	data not available							
Unincorporated San Bernardino Co.	data not available							
TOTAL	819,518	798,514						

Note: [1] City and County Population and Housing Estimates – January 1, 1997. Prepared by the California Department of Finance, Demographic Research Unit.
[2] 1990 Census (need to verify #)
[3] Population per City's General Plan
[4] Population estimates provided from City's Planning or Community Development Departments, April 1998
[5] Population estimates provided from the Department of Finance, Population and Demographic Research Unit, 1-1-98
* Additional population of 103,000 per the Ontario AG Preserve Sphere Area
** Information for unincorporated San Bernardino County based on RSA 28 data.

meet this growth through a less coordinated and less environmentally sound mix of available water resources. The population and housing discussion presented below is based on these assumptions.

4.3.3.1 Threshold of Significance

The following criteria will be used as the thresholds of significance in this evaluation of population and housing for the OBMP

- Substantially increase the Chino Basin population above that identified in regional population forecasts and planned for in the local jurisdiction general plans;
- Substantially increase the demand for housing above the regional population forecasts; and
- Displace a substantial amount of housing, especially affordable housing.

4.3.3.2 Population and Housing Impacts

a. Will the project cause official regional or local population projections to be exceeded?

As discussed in the introduction to this section, the implementation of the OBMP project has no potential to cause a substantial increase in population and, in and of itself, is not forecast to cause a cumulative exceedance of the official regional or local population projections. This is because the OBMP does not propose the construction of any human occupancy structures or generate the need for a large number of permanent employees to move to the area to implement the OBMP Program Elements. An estimated 100 people may be required to operate all of the proposed facilities and implement that OBMP Program Elements. Large numbers of people will only be present on-site for short periods of time during construction and maintenance activities. Otherwise the implementation of the OBMP is not forecast to add more than about 300 people to the Chino Basin population from its implementation.

SCAG forecasts steady growth in residential housing within the Chino Basin project area. The total occupied housing stock is expected to exceed 371,183 units within the next 20 years. Household occupancy size is correspondingly expected to increase from a current average of 3.3 persons per dwelling. The SCAG growth forecasts have been used in the preparation of the affected cities and counties General Plans and Housing Element updates and the affected water agencies Urban Water Management Plan projections. By providing an alternative method of meeting future water demand within the Chino Basin, the OBMP is consistent with, growth accommodating not growth inducing, in the context of these growth projections. The OBMP will also not alter the existing land use mix within the local agency general plans, except to convert up to 728 acres within the Chino Basin to water system infrastructure instead of alternative uses. This amount of area being dedicated to water system infrastructure is consistent with overall infrastructure acreage requirements set forth in the

1993 Montgomery Task 1 Land Use Memorandum for SAWPA and in local agency general plans. Therefore, if the OBMP is approved and implemented, it has no potential to increase the future Chino Basin population above that identified in SCAG's regional population forecasts and local jurisdiction general plans. No adverse impact to future population is forecast to occur and no mitigation is required.

b. Does the proposed project have a potential to induce substantial growth in an area either directly or indirectly (e.g. through projects in an undeveloped area or extension of major infrastructure)?

As previously discussed, the inducement of growth is in part based on the ability to meet water demands of the Chino Basin. Current water demands are estimated to be 348,000 acre-feet. Future water demand is anticipated to reach 418,000 acre-feet per year in 2020. Municipal water demand growth is expected as a result of the conversion of agricultural lands within the Cities of Chino, Chino Hills, Ontario and Norco and the remaining county jurisdiction in Riverside and San Bernardino counties to urban land uses and this growth has been committed and analyzed under separate review. The cities within the Chino Basin have evaluated water services requirements within their respective general plans based upon ultimate development (buildout) conditions. In addition, the water agencies within the Chino Basin have prepared Urban Water Management Plans, or otherwise prepared water supply plans, to assess the short-term and long-term water demands of their service areas. The WSA's cite the continued use of groundwater supplies, the provision for surface deliveries, the option of utilizing recycled water supplies and the importation of water through the Lloyd Michael Water Treatment Plant from MWDSC as primary sources for an adequate water supply to meet future water demand, as summarized in Subchapter 4.2. For future supplies, the WSA's are looking to continued development of water conservation programs and best management practices in addition to an expansion of water reclamation, increased ability for water exchanges and transfers, enhancement of groundwater quality, treatment of non-potable groundwater to potable standards and recycling standards. Each agency projects a continued reliance on imported water supplies to meet future supply needs.

Thus, regardless of whether the OBMP is implemented, individual WSA's have identified individual actions that they can implement to meet future water demands within the Chino Basin. The OBMP provides an alternative water supply plan that provides for more efficient and effective enhancement of safe yield and water quality that will fully comply with the Judgment that established the physical solution for the Chino Basin. In essence, the OBMP follows a similar path in forecasting future water supply needs and includes many of the practices and programs cited within the individual agencies Urban Water Management Plans. It is complimentary to numerous goals within the individual Plans. The OBMP, as an example seeks to promote utilizing recycled water supplies, developing water conservation programs and expanding recycling opportunities for the Basin.

The OBMP takes a more global approach to water demand and supply issues compared to the evaluations at a general plan or Urban Water Management Plan level and looks toward providing more effective and efficient ways to protect the viability of the entire Basin. Furthermore, emphasis is placed upon programs such as recycling of water, improving water quality and the extraction of salts. The OBMP functions as one path of fulfilling the water supply demands outlined in local jurisdiction general plans and Urban Water Management Plans. As such it is growth accommodating as outlined above and in Subchapter 4.2, but it does not in and of itself create opportunities for additional people to move to the region nor to construct additional facilities beyond those previously under consideration to accommodate the population that will locate in the area in accordance with adopted general plan visions of ultimate development within each community located in the Chino Basin. Based on this analysis, no potential exists for implementation of the OBMP to cause or contribute to significant adverse growth inducement within the Chino Basin.

c. Will the project displace existing housing or increase demand, especially affordable housing?

No housing is proposed to be displaced or eliminated by the proposed project. The goal of the project and the effect of the physical changes is to install certain water system infrastructure to enhance safe yield and water quality within the Chino Basin. It is remotely possible that development of specific facilities, such as desalters, production wells or even recharge basins could adversely impact existing housing. A mitigation measure is outlined below to ensure that such an impact is fully mitigated. With implementation of such mitigation, the proposed project is not forecast to cause a significant displacement of existing housing, increase demand for housing or to cause a loss of affordable housing.

4.3.4 Mitigation Measures

The only potential significant population/housing impact from implementing the OBMP might be the displacement of existing housing in support of specific OBMP facilities in the future. The following mitigation measure is recommended as an action that may need to be implemented for individual projects proposed as part of the OBMP:

4.3-1 If future facilities must be located on parcels occupied by existing housing, the proponent of the facility will ensure that short- and long-term housing of comparable quality and value are made available to the home owner(s) prior to initiating construction of the facility.

With implementation of this measure, the only potentially significant population/housing impact identified in this evaluation will be reduced below the significance threshold outlined at the beginning of section 4.3.3.

4.3.5 Unavoidable Adverse Impact

The population and housing evaluation presented above indicates that the proposed project has a potential to cause only one potentially significant adverse impact, i.e. impact to existing housing from constructing future facilities. Mitigation has been provided to eliminate or reduce this impact to a non-significant level. Since alternative housing is and can be made available in the future if required, the proposed project is not forecast to cause any adverse impacts, unavoidable or otherwise.

4.3.6 Cumulative Impacts

Based on the evaluation in this Subchapter, the OBMP can be implemented without causing or contributing to any cumulative significant adverse impacts on population and housing resources, as the exist or are forecast to occur within the Chino Basin. This includes potential growth inducing impacts for which the conclusion was reached that the OBMP will not cause any significant inducement to growth within the Basin.

4.4 GEOLOGIC RESOURCES / CONSTRAINTS

4.4.1 Introduction

This subsection of Chapter 4 will identify and evaluate various geologic, seismic and soil impacts and constraints related to the implementation of the OBMP, the proposed project. CEQA Guidelines (Section 15126.2, subd. (a)) require an analysis of potential safety problems that might be encountered as a result of implementing a proposed project. This analysis section contains an appraisal of geologic resource and constraint related impacts. Also, where appropriate, mitigation measures will be provided to minimize the exposure of people and property to geology-related hazards such as susceptibility to surface ruptures from faulting, groundshaking, ground failures (including subsidence and liquefaction), or effects of seismically induced water hazards (i.e., tsunamis and seiches).

To evaluate potential geologic constraints or impacts associated with this project, data from the following sources were utilized:

- City of Fontana, General Plan and General Plan EIR
- City of Rancho Cucamonga, General Plan and General Plan EIR
- County of San Bernardino, General Plan and General Plan EIR
- County of Riverside, General Plan and General Plan EIR
- Wildermuth Environmental Optimum Basin Management Program Phase I Report (OBMP)
- City of Ontario, General Plan and General Plan EIR
- City of Rialto, General Plan and General Plan EIR
- City of Chino, General Plan and General Plan EIR
- City of Chino Hills, General Plan and General Plan EIR
- City of Pomona, General Plan
- City of Upland, General Plan
- City of Norco, General Plan
- Final Task 5 Memorandum; Chino Basin Conceptual Model (WEI, JMM, CDM, CH2M Hill, September 1992)
- Industrial Minerals in California (USGS Survey, 1958, reprinted 1989)

Data are abstracted from these documents in order to characterize the existing environmental setting and to make the impact forecast.

4.4.2 Environmental Setting

The OBMP Phase I Report (2-2 to 2-5) and the TIN/TDS Study Phase 2A (3-25 to 3-32) Reports prepared by Wildermuth Environmental describe the underlying geology and hydrology of each management zone within the Chino Basin in detail. The following description of the existing geologic environment is intended to be a summary of the information presented in these documents, combined with data from the General Plans of cities located within the legal boundaries of the Chino Basin. The discussion provided below is intended to communicate with the non-technical reader/reviewer; thus, it is formatted as a simplified explanation/summary of the geology and seismicity of the area. Readers interested in the technical details of the data and reports are referred to the two aforementioned reports, along with the safety or geologic hazards sections of the general plans mentioned in the list of resources found in Section 4.4.1 of this chapter.

Chino Basin is primarily located within the southwestern portion of San Bernardino County, with a smaller portion of the Basin being located within the northwestern portion of Riverside County. The San Bernardino County General Plan Final EIR describes the geologic setting as follows:

> *San Bernardino County is located in a tectonically active region near the boundary of two major crustal plates. This boundary (between the Pacific and American Plates) is generally marked by the San Andreas Fault Zone, which extends through the southwestern portion of the County. The San Andreas system exhibits predominantly right strike-slip movement (i.e, horizontal displacement to the right when viewed across the fault), whereby the Pacific Plate moves relatively northwest with respect to the continent. This active tectonic environment has strongly influenced the geologic and physiographic history of the County...The extreme southwestern portion of the Valley is within the Peninsular Ranges Physiographic Province. This area is characterized by northwest-southeast trending longitudinal mountain ranges and valley with intervening faults. The San Andreas, San Jacinto, and Elsinore Fault zones constitute the primary structural features of the Peninsular Ranges Province, and extend through southwestern San Bernardino County in a generally northwest-southeast direction. These (and related) structures delineate a series of crustal blocks aligned in a stepped topography across the province. Elevations become progressively higher in these blocks away from the coast, culminating in the San Jacinto Peninsular Ranges Province in the Valley region includes the Chino and Puente hills (the northernmost extensions of the Santa Ana Mountains) and adjacent valleys. These areas incorporate rugged low lying highlands and alluviated basins at elevations of approximately 500 to 1,500 feet MSL. (VIII-3 to VIII-4)*

Also, the drainage pattern for the area is tributary to the Santa Ana River, and is primarily composed of intermittent drainage courses (San Bernardino County General Plan FEIR, VIII-5). Figure 4.4-1 shows the existing drainage pattern for the Chino Basin. The portion of the Chino Basin within the boundaries of Riverside County has the same general geologic characteristics as those described in the San Bernardino County General Plan.

Quaternary alluvial deposits and recent soils comprise the majority of the stratigraphy of San Bernardino County and northern Riverside County portions of the Chino Basin. Other strata may include Tertiary marine and non-marine sedimentary and volcanic units; Mesozoic marine sedimentary, metasedimentary, metavolcanic and plutonic rocks, Paleozonic sedimentary and metasedimentary units; and Precambrian igneous and metamorphic rocks (San Bernardino County General Plan FEIR, VIII-5).

The soils within the Valley areas of San Bernardino County and northern Riverside County (including Chino Basin), include generally deep well-drained sands, sandy loams, and silty loams on level alluvial basins and fans, and shallow to deep, well to excessively drained sandy loams on foothills and upland areas (San Bernardino County General Plan FEIR, VIII-5).

Specific geologic and hydrologic characteristics of the Chino Basin are described in the OBMP Phase I report as follows:

Chino Basin was formed when eroded sediments from the San Gabriel Mountains, the Chino Hills, Puente Hills, and the San Bernardino Mountains filled a structural depression...The bottom of the Basin - the effective base of the freshwater aquifer - consists of impermeable sedimentary and igneous rocks, the base of the aquifer is overlain by older alluvium of the Pleistocene period followed by younger alluvium of the Holocene period.

The younger alluvium varies in thickness from over 100 feet near the mountains to just a few feet, south of Interstate 10 and generally covers most of the northern half of the Basin in undisturbed areas. The younger alluvium is not saturated and thus does not yield water directly to wells. Water percolates readily in the younger alluvium and most of the large spreading basins are located in the younger alluvium.

The older alluvium varies in thickness from about 200 feet thick near the southwestern end of the Basin to over 1,100 feet thick southwest of Fontana, and averages about 500 feet thick throughout the Basin. Well capacities range between 500 and 1,500 gallons per minute (gpm). Well capacities exceeding 1,000 gpm are common, with some modern production wells test-pumped at over 4,000 gpm ...In the southern part of the Basin where sediments tend to be more clayey, wells generally yield 100 to 1,000 gpm. Three main water-bearing (hydrostratigraphic) units were identified by Montgomery Watson (1992) during the development of a three-dimensional groundwater model of the Basin. Figure [4.4-2] shows the locations of two (of seven generalized cross-sections through the Chino Basin. These generalized cross-sections illustrate these main aquifer units and are shown in figures [4.4-3] and [4.4-4].

Faults are one of the principal agents in the development of the landscape and restriction of groundwater flow in the Chino Basin. The Basin is bounded by major fault systems along which the mountains and hills have been uplifted. The location of fault and groundwater barriers, and displacements in the effective base of the aquifer at faults are shown in Figure [4.4-1]. The faults and groundwater barriers are significant in that they define the external boundaries of the Basin and influence the magnitude and direction of groundwater flow near the boundaries. (OBMP Phase I Report, 2-2 to 2-3).

Both active and inactive earthquake faults occur in the Chino Basin. As listed in Section 3-8 of the Rancho Cucamonga General Plan, the faults considered to have the greatest potential to generate seismic shaking in the Basin are:

- Cucamonga Fault
- Red Hill Fault
- San Jose Fault
- San Antonio Fault
- San Jacinto Fault
- San Andreas Fault
- Elsinore Fault.

Significant groundshaking could be caused by a major earthquake on one of the regional faults. Ground accelerations from a maximum credible earthquake on the San Andreas Fault could range as high as 1.0 g based on a magnitude 8.2 earthquake on this fault (Rancho Cucamonga General Plan, Section 3-8).

The general topography for the Chino Basin consists of slopes less than 10 percent for all areas except small regions of the Basin such as the Jurupa and Pedley hills. The OBMP does not propose to build structures within any areas having a slope greater than 10 percent.

4.4.2.1 Soils

Soils within the Chino Basin include generally deep well-drained sands, sandy loams, silty loams on level alluvial basins and fans; and shallow to deep well to excessively drained sandy loams on foothills and upland areas (San Bernardino County General Plan EIR, VIII-5). These types of soils are suitable to agricultural use.

The Chino Basin contains a number of soils which meet the criteria for Valuable agricultural soil based on capability classes and the three Important soil groups (County of San Bernardino, 1979). The greatest concentrations of these soils are in the vicinity of the cities of Chino and Ontario, and in the eastern Valley areas. Portions of nine separate soil associations are located within the Valley region (including Chino Basin). Six of these nine soil associations (making up approximately 80 percent of the Valley area) possess physical and chemical characteristics suitable for agricultural production (Soil Conservation Surveys, 1980). Table 4.4-1 lists the various soil classification units, along with a description of suitability for agricultural purposes. It should be noted that much of this area currently supports urban development, or is zoned for future urban development. Consequently, these areas are not currently available for agricultural use. Projected continuation of urban growth, as depicted in local agency general plans encompassing the Chino Basin, foster the continued conversion of agricultural land to urban uses. (San Bernardino County General Plan EIR, VIII-191 and Subchapter 4.2 of this PEIR)

The following soil analysis will utilize the San Bernardino and Riverside County soil surveys and data contained in a “Final Task 5 Memorandum: Chino Basin Conceptual Model” (WEI, JMM, CDM, CH2M-Hill, 1992).

General soil associations in the Chino Basin Project area are shown on Figure 4.4-2 (adapted from Task 5 Memorandum Plate 5). The study area is overlain by 78 alluvial soil types described for their top 60 inches of thickness. The soils tend to be sand, silt and clay loams with occasionally gravelly or cobbly sandy loams. Fifteen of the 78 soil types are prime agricultural soils and 20 are rated “suitable” for cultivation. The thirteen general soil association within the study area have been grouped into three major soil groups. These soil groups are described below.

> *Group 1 Soils are on recent (younger) alluvial fans and plains, and consist of deep, permeable soils with no development in the profile. The soils of Group 1 were formed by the transport of unconsolidated materials. These soils represent about 75 percent of the study area. Presented in decreasing order of frequency, the general soil associations contained in Group 1 soils are:*
>
> - *Tujunga-Delhi (3)*
> - *Tujunga-Soboba (4)*
> - *Hanford-Greenfield (2)*
> - *Foster-Grangeville (1)*

Table 4.4-1
SOIL CAPACITY GROUPING

Capability Class	Designation	Capability Subclass	Designation	Capability Unit	Designation
I	Few limitations to restrict agricultural use.	e	Erosion as the primary risk or limitation.	0.	Poor root penetration due to sand and gravel substratum.
II	Moderate limitations that reduce plant choice and/or require conservation measures.	w	High water content as the primary risk or limitation.	1.	Erosion hazard.
III	Severe limitations that reduce plant choice and/or require conservation measures.	s	Shallow, droughty or stony soil conditions as the primary risk or limitation.	2.	Poor drainage or flooding.
IV	Very severe limitations that reduce plant choice and/or require special management.	c	Excessively cold or dry climate as the primary risk or limitation.	3.	Slow permeability of the subsoil or substratum.
V	Soils with limitations which limit their use largely to posture, range, woodland, or wildlife habitat.			4.	Coarse texture or excessive gravel.
VI	Soils with severe limitations that are generally unsuitable for cultivation.			5.	Fine or very fine surface texture.
VII	Soils with very severe limitations which are largely unsuitable for cultivation.			6.	Excessive salt or alkali.
VIII	Soils and land forms unsuitable for commercial plants.			7.	Excessive cobbles, stones or rocks.
				8.	Impervious bedrock or hardpan within rooting depth.
				9.	Low fertility or toxicity.

Source: Soil Conservation Service, 1980

The number in parenthesis () corresponds to the soils location legend on Figure 4.4-2. Generally, the soils in Group 1 are found on slopes that range from zero to nine percent and consist of coarse textured soils developed in granitic alluvium, gravelly or cobbly alluvium, or weakly consolidated sandstone and shale. Runoff from these soils is usually low and infiltration is moderate to high (greater than 1 inch per hour). Soil depths are greater than 60 inches.

Group 2 soils occur on older alluvial fans and terraces and have a more developed profile than the soils of Group 1. Group 2 represents about 5 to 10 percent of the study area. Presented in decreasing order of frequency, the general soil associations contained in the group 2 soils are

- *Merrill-Chino (5)*
- *Placentia (6)*
- *Ramona-Arlington (7)*
- *Rincon-Zamora (8)*

These soils are developed on granitic or sedimentary alluvium and are moderately fine textured soils of silty loam or sandy loam in the surface layer with clay loam in the subsoils and substratum. These soils have a moderate to low infiltration rate (less than 1 to 2 inches per hour). The subsoils are more finely textured than the surface soils. A portion of these soils are found on zero to 2 percent slopes; these soils are moderately developed with clays in the subsoils and claypan in the lower horizon. Group 2 soils located on slopes ranging from 2 to 5 percent contain some hardpan 48 to 72 inches below the surface. Group 2 soils found on 5 to 9 percent slopes include the steep side slopes of alluvial fans and terraces.

Group 3 soils overlie crystalline, sedimentary or granitic bedrock. These soils are found in the Chino Hills, Puente Hills, the base of the San Gabriel and Jurupa mountains and in small areas near the San Bernardino-Riverside county line. Group 3 represents about 15 to 20 percent of the study area. Presented in decreasing order of frequency, the general soil associations contained in soil group 3 are:

- *San Benito-Soper (12)*
- *Altamont-Diablo (9)*
- *San Andreas-San Benito (11)*
- *Friant-Escondido (10)*
- *Vista Cienable (13)*

These soils are found on steep slopes ranging from 15 to 20 percent. The soils are predominantly pale brown loams, fine sandy loams, or clays. The substrate of parent materials of these soil associations are shales, schist, gneisses, coarse-grained sandstones, granodiorites and moderately high infiltration rates (1 to 2 inches per hour). The depth of these soils ranges from 20 to 40 inches.

The soils that comprise the Chino Basin have accumulated from the alluvium washed down from the San Gabriel and Santa Ana blocks during the latter part of the Quaternary epoch. The alluvium can be classified based on apparent age. Figure 4.4-3 shows the generalized location of stratigraphic column cross sections for water-bearing sequence in the Chino Basin area. Figures 4.4-4 and 4.4-5 show the actual cross-sections, themselves. In Figures 4.4-4 and 4.4-5 the Chino Basin has been divided into water-bearing and nonwater-bearing formations. "The latter are further differentiated as (a) consolidated stratified rocks, and (b) metamorphic and igneous rocks of the basement complex. Water bearing formations overlie nonwater-bearing formations. The alluvial formations of the Chino Basin are typically younger alluvium, older alluvium, terrace deposits and residuum" (Task 5 Memorandum, 2-1 to 2-2).

Younger alluvium consists of relatively unweathered sand, gravel, and silt deposits up to 150 feet thick, and occupies streambeds, washes, and other areas of younger or recent sedimentation. Oxidized particles tend to be flushed out of the sediments during transport. Recent alluvium is commonly light yellow, brown, or gray...The primary source for the origin and generation of younger alluvium within the chino Basin is the San Gabriel Mountains.

During transport, the largest of the fragments travel the least distance. The northern part of the Chino study area, close to the base of the San Gabriel Mountains, therefore, exhibits younger alluvium composed primarily of coarser material mixed with some clay and sand. Farther from the mountain front the slope of the land is gentler and the particles are of smaller size. The alluvium here is in layers of gravel, sand and silt. The finest particles are able to travel the greatest distances and settle out farthest from the mountains, near Prado Dam.

In most places the highly permeable younger alluvium is above the water table. Water percolated readily through the younger alluvium

Sand dunes in the east-central part of the valley floor were formed as a result of the "Santa Ana" wind storms, carrying sand winnowed from alluvial deposits lying tot he northeast of the dune area. The spread of irrigated agriculture and the planting of windbreaks in the valley, however, have probably acted to stabilize the dunes. The dune sand has been grouped with the younger alluvium because of its similar water bearing characteristics...

A thick section of stabilized, moderately to deeply weathered alluvium of Pleistocene Age unconformably underlies the younger alluvium. Older alluvium is typically distinguishable by its red-brown or brick-red color. Beneath the older alluvium are formations that range in age from Pleistocene to Precambrian, in an unconformable sequence. Around the edge of the Chino study area the base of the alluvial layers can be readily distinguished but in many places in the central part of the valley, the base of the older alluvium cannot be defined...the average thickness is estimated to be not more than 500 feet.

Older alluvium is made up of boulders gravel, sand silt and clay derived largely from basement rocks in the San Gabriel Mountains. The accumulation of the older alluvium began, probably in middle Pleistocene time, when the present valley first began to form south of the rising San Gabriel block.

The combined effects of sorting and weathering give the older alluvium in the central part of the area the lowest clay content and the highest well yields and transmissivity of the alluvium of this area...

The terrace deposits consist of dark red and red-brown alluvial material resting on planed-off bedrock surfaces above stream level...Because terrace deposits consist of alluvium resting on bedrock above stream level, they are mainly above the water table and do not store significant amounts of water.

In areas of low relief where there is little erosion, in-place, deep weathering of basement and consolidated sediments has resulted in extensive residual formations that locally store and yield water. Structures of the disintegrated and decomposed parent rock are preserved in the residuum and grade into those of the underlying bedrock. The residual materials are marked by oxidation colors of red and brown. Because of their relatively high clay content and generally thin and disconnected occurrence, they are inferior to transported and reworked alluvium as a source of water to wells. These soils are generally found in the Norco area and adjacent to the Santa Ana River near Pedley Hills.

The nonwater-bearing formations include continental deposits of late Pliocene to middle Pleistocene age, marine sedimentary and volcanic strata of late cretaceous to later Tertiary age, and crystalline igneous

> *and metamorphic rocks of the basement complex...San Timoteo beds in the easternmost part of the study area belong to the lover levels of ta thick sequence of deposits in which fossils of middle to late Pliocene age have been found. These beds resemble the older alluvium of the Chino study area, but are cut by numerous faults and are sharply folded as a result of mid-Pleistocene mountain building.*
>
> *In the western part of the Chino study area, consolidated sedimentary and volcanic rocks, ranging in age from late cretaceous to Pliocene consist of well stratified marine sandstones, shales and conglomerates and interlayered lava flows...*
>
> *The basement complex consists of deformed and re-crystallized metamorphic rocks that have been invaded and displaced in places by huge masses of granitic and related igneous rocks. The intrusive granitic rocks, which make up most of the basement complex, were emplaced about 110 million years ago in the late Middle Cetaceous (Larsen, 1958). These were subsequently uncovered by erosion, especially in the San Gabriel Mountains and in the uplands of the Perris block. They have been the major source of detritus to the younger sedimentary formations, in particular, to the water bearing deposits of the Chino study area.* (Task 5 Memorandum, 2-2 to 2-5)

A representation of the geologic time scale is included for reference purposes as Figure 4.4-6.

4.4.2.2 Mineral Resource

The San Bernardino County General Plan EIR (SBC GP EIR) describes the existing mineral resources and mining activities within the southwestern portion of the County, an area known as the Valley region.

Existing mineral production in the Valley region is limited to oil and gas and industrial minerals. Oil and gas production occurs from two small oilfields in the Chino Hills area (less than 200,000 bbl total reserves)" (SBC GP EIR, VIII-201). In 1989, eleven non-fuel mineral operations were conducted in the Valley region.

> *These production operations included extraction of industrial materials such as specialty sand, construction aggregate, limestone, concrete aggregate, clay, slag and portland cement. The majority of these materials come from alluvial fans and bedrock deposits exposed along the southern San Gabriel and San Bernardino mountains, and the northern San Jacinto and Jurupa mountains...All active industrial mineral sites within the Valley (as well as a number of additional nearby areas) are all designated for Resource Conservation (RCN) land uses, which include mining as an allowable activity ...The Valley also includes a number of MRZ-2 classifications, most of which are associated with existing mineral operations (and similar nearby deposits) along the southern flank of the San Gabriel and San Bernardino Mountains. . . The Valley region contains considerable deposits of a number of industrial minerals (e.g. sand, gravel, limestone) at least some of which will likely come into production over the next several years. This assumption is based on the projections for growth within the Valley, the necessity of large quantities of industrial minerals (e.g. aggregate) in urban construction, and the limited transportation capability of such low unit value minerals...the production of low unit value minerals is generally limited by transportation costs.* (SBC GP EIR, VIII-201 to 202)

A graphical representation of the mineral resources described for San Bernardino and surrounding counties is included for reference as Figure 4.4-7. This map shows the distribution of non-metallic mineral resource locations within southern California. The only significant mineral resources that occur within or near the project area are limestone, sand and gravel, crushed rock and rip rap. The location of these resources is primarily in the Jurupa and Pedley Hills, and also near the Santa Ana River.

The Riverside County General Plan contains a map of mineral resource locations within the northern portion of the county. This map of mineral resource distribution is included as Figure 4.4-8. Other than industrial minerals (i.e. sand, gravel, etc.), few mineral resources occur within the project area.

A map of generalized production aggregate resource locations and classifications is shown for southern California (Figure 4.4-9). The Chino Basin is primarily classified as PRZ-3, with localized areas designated PRZ-2, MRZ-1, and MRZ-3. PRZ-3 areas area areas containing construction aggregate deposits, the significance of which cannot be evaluated from preliminary data. PRZ-2 areas are those where preliminary data indicates that significant construction aggregate resources could be present. These PRZ-2 areas are located in the City of Fontana North of the Interstate 10 Freeway, and in areas surrounding the San Antonio Creek as it flows through the Chino Basin. Finally, the MRZ-3 classification indicates areas containing construction aggregate deposits, the significance of which cannot be evaluated from exiting data. The MRZ-3 area located within the Chino Basin is in the City of Chino west of Highway 71. A small portion of an area designated MRZ-1 is also located within the eastern extremes of the City of Chino. The MRZ-1 category can be described as an area where sufficient data exists to adequately determine no significant mineral resources are present.

The Fontana General Plan specifically identifies the location of mineral resource deposits and production operations within that City's planning area, as shown in Figure 4.4-10. The aggregate resources are generally located in the Lytle Creek area. This area has been identified under the Surface Mining and Reclamation Act of 1975 (SMARA), as a "Regionally Significant Construction Aggregate Resource Area." These areas are shown because of their "potential to provided needed mineral resources for future regional use" (Fontana General Plan, CE-2). Already, use of some of these resource areas is precluded by both urban and agricultural uses (Fontana General Plan, CE-1).

The PRZ-2 resource area surrounding the San Antonia Wash area is described in more detail in the Montclair General Plan. This area is

> *"located on an alluvial fan created by deposits brought down by water movement from the mountain ranges to the north. The material composition of the alluvium is generally gravelly cobbled, or stony, coarse granite and makes excellent sand and gravel resources. Several areas adjacent to the San Antonio Wash have, in the past, been utilized for surface mining operations restricted to sand and gravel excavation. All operations have subsequently become inactive...due to the poor economic return realized from current conditions. As extraction operations cut deeper into the earth, the quality of the material declines, thus requiring more costly processing. Mining operations have attained these depths, and have resulted in a negative cost/benefit relationship to the mining operation."*

The MRZ-3 area located in the City of Chino is depicted in Figure 4.4-11. The City of Chino General Plan discusses the resources in this area as follows:

> *Although sand and gravel deposits do exist, there is a lack of specificity to delineate mineral material suitable for construction use. As new information is learned about the quality of minerals n this zone, its usefulness for construction may increase. According to the DMG [Division of Mine and Geology], approximately 245 million tons of aggregate will be needed to satisfy demand in the Claremont-Upland P-C Region through the year 2031. However, current reserves...total approximately 55 million tons," and surrounding alluvial fan areas including the Deer, Day and San Dimas Washes do not contain sufficient reserves permitted for use to meet the forecasted demand. Thus, the City of Chino is "conscientious towards conserving aggregate use, whenever possible."* (Conservation/Open Space, V-31)

The MRZ-1 area located in the City of Chino is comprised primarily by shale, siltstone, carbonates and chlorite schist. These materials are considered unsuitable for use as aggregate. "Fine grained sedimentary deposits also exist in this zone which are also unsuitable for use as aggregate." (City of Chino General Plan, V-31)

None of the portion of Chino Basin overlying Riverside County is located within a MRZ-2 zone. This Riverside County area is classified as MRZ-3 and PRZ-3. A map showing the generalized aggregate resource classifications was previously included as Figure 4.4-10. A map with locations of existing resource extraction areas is also included for Western Riverside County as Figure 4.4-9. The only resources present are construction aggregate resources such as rock products, limestone, and clay.

4.4.2.3 Seismic Activity

The City of Rancho Cucamonga General Plan EIR contains a detailed analysis of potential seismic activity for all significant faults within the vicinity of the Chino Basin Planning Area (Rancho Cucamonga GP EIR, III-8 to III-13).

> *Southern California is a very active seismic region and is part of a larger, seismically active area known as the "Ring of Fire" which encompasses both sides of the Pacific Ocean. Numerous earthquakes have occurred in this region over the past 200 years. Significant seismic activity, greater than Magnitude (M) 5 on the Richter Scale, is clearly associated with known active faults.*

A map showing the location of major faults in the vicinity of Chino Basin is included as Figure 4.4-12.

> *In order to assess the potential risk they pose to the City, it is important to estimate the size of earthquakes associated with the faults in the area. Those faults most likely affecting the [project area] are described below with their estimated earthquake potential.*
>
> <u>San Andreas Fault</u> *Probably the most well known in California, this fault is the boundary between two huge crustal plates (Pacific and North American) which are moving relative to each other at the rate of a few inches per year. This fault is widely recognized as the longest and most active fault in the state. It has been mapped from Cape Mendicino in northern California to an area near the Mexican border. The fault is known to be active from historic earthquakes, some of which have caused surface rupture, and from abundant evidence of displacement of recent sediments. A reasonable estimate of a maximum credible earthquake along the San Andreas fault is M 8.25.*

> *<u>San Jacinto Fault</u> Like the San Andreas fault, the San Jacinto fault has been active for millions of years. Several historic earthquakes in Southern California have been associated with this fault. A maximum credible earthquake for the San Jacinto of M 7.5 has been assigned.*
>
> *<u>Elsinore Fault</u> The Whittier-Elsinore fault lies 20 miles to the southwest of the City. Displacements associated with this potentially active fault have been vertical, unlike the horizontal movements associated with the San Andreas and the San Jacinto. The Elsinore fault branches into the Whittier fault and the Chino fault. The latter is buried along most of its length and is the closest part of the Elsinore system to the City of Rancho Cucamonga. The Elsinore-Whittier alignment is estimated to produce a maximum credible earthquake of M 7.5, although this magnitude is probably high for the Chino branch.*
>
> *<u>Cucamonga Fault</u> This fault is considered potentially active, primarily because of scarps that indicate offset in recent alluvial deposits along the northern edge of the City. Although the length of the fault is not known for certain, it has been mapped from near Lytle Creek, 2.5 miles northeast of the City, to the north of San Antonio Canyon. Mapped traces of the fault vary from a single line near Cucamonga Creek to a zone a half mile wide south of East Etiwanda Canyon. A significant offset in the mapped traces occurs across the alluvial deposits of Deer Creek. A reasonable estimate of maximum credible earthquake for the Cucamonga fault is M 7.0.*
>
> *<u>San Jose Fault</u> Capable of producing a M 6.5 earthquake, this... [fault runs] southwest from a point near the San Antonio Canyon, the San Jose fault has displaced earth in the San Jose Hills.*
>
> *<u>San Antonio Canyon Faults</u> Potentially active and identified from several mapped traces in the canyon, the San Antonio Canyon fault is about 15 miles long. This fault may be capable of a M 6.5 earthquake.*
>
> *<u>Red Hill Fault</u> This fault is well known as the geologic divider between the Cucamonga and Chino groundwater basins. The northeast trend of this barrier corresponds closely with a prominent scarp in the alluvial fan south of Day Canyon and with the southern edge of Red Hill. Microseismic monitoring has shown that a large number of small earthquakes (M I to M 3) occur beneath the [City of Rancho Cucamonga] and that a few epicenters were located on or near the trace of the Red Hill Fault. A maximum credible magnitude of M 6.5 has been assigned to the fault.*
>
> *The northeastern end of the Red Hill fault has apparently displaced recent alluvial deposits and has also been included in an Alquist-Priolo Special Studies Zone. The remainder of its trace, however, did not meet state criteria, despite substantial evidence for its continuation to the southwest. In view of this, the City of Rancho Cucamonga has established its own special study zone along the most probable trace which is shown in the General Plan as an inferred fault.*
>
> *<u>Red Hill Trace</u> The geological study for a recent development (Rancho Cucamonga Tract 10035) discovered a possible 'finger" of the Red Hill Fault to the west of the main trace near Red Hill. Additional study indicated that although it was likely not a branch, it is possible that additional extensions of the fault may exist in this area.*
>
> *<u>Other Faults</u> Additional faults are known in the region, some of which exist within the City. However, these would not be expected to cause seismic shaking greater than those listed in Table 4.4-2. Possible local fault traces paralleling the Red Hill however, might be associated with future ground rupture or may have caused unusual distribution of near-surface sedimentary soils in the past.*

Table 4.4-2 (Rancho Cucamonga General Plan) summarizes the maximum credible earthquakes associated with each of the above described faults. There is little doubt that Rancho Cucamonga and the Chino Basin will experience strong seismic shaking in the future. Several of the nearby faults have the potential to generate large earthquakes that would be felt in the Basin. The Rancho Cucamonga General Plan describes the potential groundshaking, which would apply generally to the whole Chino Basin in the following manner:

> *The level of shaking that might occur can be estimated by first assuming that the maximum credible earthquake for a fault could occur at its nearest approach to the City. The ground response, developed from measurements of past earthquakes, can then be used to estimate expected bedrock accelerations. Fife and others (1976) mapped isoacceleration lines for southwest San Bernardino County, which might be expected from earthquakes on the San Andreas, San Jacinto, Cucamonga, and Whittier-Elsinore faults, based on attenuation relationships derived by Schnabel and Seed (1972). The ranges of these accelerations shown for the City are listed in Table 4.4-2. Also included are the Red Hill, San Jose, and San Antonio faults and calculated maximum expected acceleration for all seven faults, based on near-field attenuation relationships developed by Idriss and Power (1978).*

Table 4.4-2
MAXIMUM GROUND ACCELERATIONS ESTIMATED FOR SEISMIC EVENTS NEAR OR WITHIN THE CHINO BASIN AREA

Fault	Estimated Maximum Credible Earthquake[1]	Estimated Maximum Accelerations[2]
Cucamonga	7.0	.60 - .95
Red Hill	6.5	.70 - .80
San Jose	6.5	.50 - .75
San Antonio	6.5	.50 - .75
San Jacinto	7.5	.40 - .85
San Andreas	8.25	.35 - .70
Elsinore-Chino	7.5	.30 - .55

1 Richter Magnitude: Estimated based on Slemmons (1977) and Greenfelder (1974)
2 Accelerations are for bedrock as calculated by Idriss and Pong (1987)

Source: Summarized from Rancho Cucamonga General Plan EIR (1981)

The highest accelerations expected beneath the Project Area according to Fife and others (1976) would be about 75 percent of gravity (0.75g) adjacent to Cucamonga fault as a result of a maximum credible 6.5 earthquake. Based on more recent rupture length-magnitude and attenuation relationships (Slemmons, 1977; Idriss and Power, 1978), bedrock acceleration may be as high as 0.95g. This assumes that a Magnitude 7.0 event could occur on a plane dipping 45 degrees to the north and the center of energy release would be 5 km deep. Accelerations north of the surface trace, which would be the upthrown block, might be even higher.

The Red Hill fault, if the maximum credible earthquake occurs, could generate bedrock accelerations as high as 0.8g. Bedrock beneath the eastern edge of the City of Rancho Cucamonga might be expected to experience up to 0.85g from a large earthquake on the San Jacinto fault.

Values shown in Table 4.4-2 are for accelerations in bedrock. Seismologists consider bedrock to be material with a shear wave velocity faster than 2,000 feet per second. Seismic velocities beneath the City are not specifically known, but in general, these velocities are typically attained at a depth of about 500 feet in the valley alluvium (Fife and others, 1976). Areas with deep cohesionless soils, such as those underlain by recent fan deposits, might be expected to experience accelerations at the ground surface that are as low as 60 percent of those calculated for bedrock (after Seed and others, 1975). Areas with stiffer soils, such as older, clayey alluvium, would be expected to experience higher percentages of the calculated values. Predominant periods of shaking are expected to be shorter in bedrock than in areas covered by thick alluvial deposits.

Other faults near the Chino Basin include the Rialto-Colton Fault, the Indian Hill Fault, and the Lytle Creek Fault. According to the Geologic Map, these faults are not known to be active in the last 700,000 years. Additionally, the Chino Avenue Fault is located westerly of the City of Chino, however none of these faults are predicted to generate maximum accelerations greater than those contained in Table 4.4-2.

According to the Riverside County General Plan, the portion of the Chino Basin that is located in Riverside County does not overlie any Alquist-Priolo special studies zones, shown in Figure 4.4-13. A portion of the map of Alquist-Priolo special studies zones for San Bernardino County is included as Figure 4.4-14. A small portion of the special study area for the Cucamonga fault appears to be within the boundaries of the Chino Basin. The State of California requires additional geologic investigations prior to construction of facilities within this study area. This special studies zone occupies part of the area marked as high-priority for construction of groundwater recharge facilities, and more geologic investigations are necessary for facilities sited near this area.

4.4.2.4 Ground Rupture

Fracturing and displacement of the ground surface can occur as a direct result of movement along a geologically young fault (primary ground rupture), or as a result of sympathetic movement from intense groundshaking on weakened, older fault traces (secondary ground rupture). Primary ground rupture commonly results in greater surface displacements, while secondary ground rupture is commonly more widespread. Either type of ground rupture is destructive to surface improvements, and in 1972 the State of California legislated the Alquist-Priolo Special Studies Zone Act (now known as Alquist-Priolo Earthquake Fault Zones Act) to define and restrict areas of potential fault-related ground rupture. As of 1972, the faults listed for specialized study areas included the San

Andreas, San Jacinto and part of the Cucamonga fault zones. In 1974, however, a preliminary draft of the Proposed Seismic and Public Safety Element of the Environmental Improvement Agency (San Bernardino Planning Department) recommended that the County consider additional faults for special studies, including (in order of priority as listed):

- The branch of the eastern portion of the Cucamonga fault;
- The Red Hill fault (a branch of the Cucamonga fault);
- The Chino-Elsinore fault (northwesterly extension of the Elsinore fault).

The fundamental purpose of requiring further study in Alquist-Priolo zones is to prevent high-occupancy structures and important or potentially hazardous facilities from being constructed across an active earthquake fault, if avoidable.

The San Bernardino County General Plan EIR states that, "Known historic ground rupture in the Valley region is limited to minor fault creep along the San Jacinto Fault Zone near the city of Colton. ...Regionally, the potential hazards associated with ground rupture in the Valley are considered relatively low, due to the local nature of rupture related damage (i.e., along the fault traces themselves) and the provisions of the Alquist-Priolo Act" (SBC GP EIR, VIII-16). The only nearby special studies zone occurs adjacent to the northeastern portion of the Chino Groundwater Basin Boundary along a branch of the Cucamonga Fault.

Portions of the City of Norco and unincorporated Riverside County lie within specially designated County Hazard areas, however these are not part of the Alquist-Priolo Special Study Zones established by the State of California. A map showing Riverside County Fault Hazard Zones was previously included as Figure 4.4-13. This map also indicates areas with high potential for liquefaction hazards, discussed below.

4.4.2.5 Liquefaction Hazards

Liquefaction is a process that occurs during the shaking action of an earthquake. When loose granular materials (such as silt, sand or gravel) become saturated with water and are subjected to high levels of groundshaking, extreme damages to structures due to settling, tilting or floating of the foundation may result. Under such circumstances, when the soil and water mix, an unstable quicksand-like media forms. "Liquefaction of unconsolidated materials can be caused by strong vibratory motion resulting from seismic activity. Loose granular soils are most susceptible to these effects, while the stability of silty clay and clay materials is generally not as affected. Among granular materials, finer textured varieties are more susceptible to liquefaction than coarse graded materials. Additionally, liquefaction is generally restricted to saturated or near-saturated materials at depth of less than 50 feet" (SBC GP EIR, VIII-18).

One area of relatively high liquefaction potential occurs within the Valley region. This is an approximately 20 square-mile area located in the southwestern portion of the City of Chino and adjacent areas, such as the Prado Basin area. This area has relatively shallow groundwater table, and generally sandy alluvial soils. Figure 4.4-15 shows the approximate location of this area. The areas that are most susceptible to liquefaction correspond to former artesian areas of the Basin, and other areas with high groundwater levels, which existed before extensive groundwater pumping lowered the groundwater levels.

4.4.2.6 Settlement/Subsidence

Settlement is the localized lowering of the ground surface due to a decrease in the volume of the underlying soil or sediment. Various phenomena can cause settlement or subsidence, including consolidation, hydro-consolidation, and seismically induced settlement. The most common reason for subsidence in valley areas is the lowering of the groundwater table.

A common cause of ground fissuring within alluvial basins is the removal of subsurface fluids resulting in compaction of poorly consolidated aquifer materials and land subsidence (Fife et al., 1976; Galloway et al., 1998). A number of studies have attributed this process to the ground fissuring and apparent subsidence that has occurred in MZ-1 (Fife et al, 1976, Kleinfelder, 1993, 1996, 1999; Geomatrix, 1994). This section reviews the basic principles of aquifer system compaction; describes the general hydrogeology of the Chino Basin; [and] lists the evidence for groundwater withdrawal as the cause of land subsidence and fissuring in MZ 1" (Wildermuth Environmental, Task Memorandum: Program Element 4, 1999).

> *The Chino Basin Integrated Groundwater and Surface Water Model (CIGSM) model depicts the hydrogeologic geometry of the Chino Basin as a "layer-cake" of unconsolidated sediments within a basin of impermeable bedrock. The "layer-cake" consists of laterally extensive, sediment packages that alternate between high permeability aquifers and low permeability aquicludes. Aquifers that are located beneath an aquiclude (and are completely saturated) are considered to exist under confined conditions, where piezometric levels are higher than the bottom of the overlying aquiclude. The upper aquifer, where saturated, is considered to exist under unconfined conditions. The layer-cake model is a simplified description of the Chino Basin, and represents the essence of the hydrogeology. In reality, the stratigraphy is extremely complex, which is a reflection of a complex depositional history. The sediments accumulated in numerous terrestrial environments, including river channels, levees, floodplains, lakes and marshes. Terrestrial environments are notoriously unstable over geologic time – river channels migrate and cannibalize floodplain deposits, lakes fill up with sediments, etc. In addition, climate, sediment sources, and rates of tectonic subsidence/uplift vary over time, which further complicates the depositional/erosional history within the basin. While the aquifers in the Chino Basin are predominantly course-grained and commonly yield significant volumes of water to wells, they are not laterally extensive, homogeneous units of gravel and sand. They are heterogeneous in texture (both laterally and vertically) and sometimes consists of a high percentage of fine-grained sediments. For instance, a thick gravel bed penetrated by a well hole may pinch-out laterally and be encased within fine-grained sediments. This gravel bed may yield water initially, but lose capacity over time due to low seepage rates from the surrounding fine-grained sediments. The same heterogeneity concept applies to the aquicludes. Lateral discontinuity of sediment layers and textural heterogeneity are more the rule than the exception. The southern part of MZ 1 is an example of heterogeneity within the upper aquifer. While the CIGSM model designates the upper 200-300 feet of sediments as the upper aquifer, it is known that the upper 100 feet of sediments in this area is predominantly fine-grained (discussed below).*

A number of lines of evidence strongly suggest that ground fissuring within MZ 1 is related to regional land subsidence due to groundwater overdraft:

Ground fissures. *The most obvious evidence of land subsidence in MZ 1 is the appearance and propagation of land surface fissures in the area of California Institution for Men (CIM) and the City of Chino....A general north-south trend of fissuring located directly east of the main trough of subsidence that has been mapped by ground level surveying (discussed below). [See Figure 4.4-16]*

As stated previously, ground fissuring was first observed east of Central Avenue and crossing Edison Avenue in 1973 by a United State Geologic Survey geologist (Fife, et al., 1976). Beginning in 1991, a number of additional fissures appeared within the northwestern portion of CIM property. During following years, fissuring occurred to the north of and parallel to the CIM fissuring in the City of Chino and southward into the CIM Minimum compound where several structures have been damaged...

Geomatrix (1994) studied the ground fissures on CIM property and also reviewed case histories of fissuring throughout the southwestern United States. Their study noted similarities between the physical structure of the CIM fissures and the fissures described in the literature that were associated with areas of subsidence due to groundwater overdraft and aquifer system compaction. They also noted that this type of fissuring typically occurs along the edges of a subsidence trough. Geomatrix hypothesized that the CIM fissuring is a manifestation of east-west directed extensional stress associated with regional subsidence to the west.

Ground level surveys: *The City of Chino and CIM have conducted a number of ground level surveys in the southern part of MZ 1 as part of their ground fissuring investigations. Conclusions drawn from these ground level surveys state that:*

- *Land subsidence has occurred in this area since 1987 or earlier.*
- *The zone of subsidence is generally aligned north-south with the axis of maximum subsidence located about 1,500 feet west of the north-south trending zone of ground fissuring.*
- *Subsidence is likely due to groundwater overdraft and declining piezometric levels.*

The maximum observed subsidence is approximately 2.2 feet, and occurs along Central Avenue between Eucalyptus and Schaefer Avenues. The subsidence trough approximately extends from Pipeline Avenue on the west to Benson avenue on the east, and from Merrill Avenue on the south to the edge of the survey area on the north (Riverside Drive). The contours suggest that the subsidence trough extends further north of Riverside Drive, but the ground level surveys did not include benchmarks north of Riverside Drive.

Three significant findings of the latest Kleinfelder survey (1999) are:

- *Subsidence has apparently slowed during the 1995-1999 period.*
- *The axis of maximum subsidence is coincident with wells operated by the City of Chino Hills that are perforated through the deeper aquifers*
- *A potential error exists in the ground level surveys. The reference benchmark may be within the subsiding area and, hence, may have affected the magnitude of the calculated subsidence values. However, Kleinfelder believe this error is small (~0.1 feet).*

Geomatrix (1994) also conducted a ground level survey for CIM by comparing manhole cover elevations at the CIM Minimum and Central compounds from 1988 to 1994. The survey indicated that subsidence had occurred during the period with elevations lower by about 2.1 foot along Vernon Avenue. The survey also suggested that subsidence diminished to the east with elevations lower by about 0.25 to 0.5 feet *within the CIM Minimum compound. These findings are generally consistent with the Kleinfelder ground level surveys with respect to the magnitude and spatial distribution of subsidence.*

Geomatrix (1994) also noted that by comparing 1993 ground level survey data collected for the City of Chino with 1967 USGS topographic benchmark data, the area west and north of CIM experienced subsidence up 3 to 4 feet during this 26-year period. (Wildermuth Environmental, Task Memorandum: Program Element 4, 1999).

In 1999, synthetic aperture radar studies were conducted by Jet Propulsion Laboratory (JPL) under contract to City of Chino. A summary of this study follows:

This technique provides a measure of the distance between the radar antenna and the land surface, and by comparing images acquired at different time, changes in land surface elevation can be observed. From the three studies conducted from October 1993 to December 1995, and from January 1996 to October 1997, and from October 1997 to early 1999, a number of observations can be made, some of which are:

- *Land subsidence has occurred within MZ1 during the entire period from October 1993 through 1998.*
- *Both ground level surveys and SAR imagery both indicate a north-south aligned trough with the axis of maximum subsidence located along Central Avenue.*
- *Interferograms show a zone of diminishing subsidence extending north of Riverside Drive - possibly as far north as Interstate 10.*
- *The interferograms degrade south of Edison Avenue, prohibiting comparison with ground level survey south of Edison Avenue.*
- *Where SAR imagery and ground level surveys overlap, the magnitude of subsidence correlates favorably.*

These observations indicate that subsidence is occurring in MZ 1 and that such subsidence may be occurring further north than previously thought. (Wildermuth Environmental, Task Memorandum: Program Element 4, 1999) The existence of fine-grained aquicludes underlying MZ 1, coupled with historical decline in piezometric levels, are a typical combination leading to aquifer system compaction and land subsidence (Wildermuth Environmental, Task Memorandum: Program Element 4, 1999).

Several pieces of evidence suggest that MZ1 may be underlain by a fine-grained aquiclude. This evidence includes the fact that the southern part of MZ 1 is located on the outer margins of the alluvial fan at the base of the San Gabriel Mountains. These types of deposits are typically fine-grained. Further, the nearby Chino Hills are composed of fine-grained sedimentary rocks, and geophysical logs of wells and soil borings show predominantly fine-grained materials at depths less than 100 feet. At depths around 250 feet, a thick fine-grained unit exists beneath the area of subsidence (as defined by the ground level surveys described above). "Also, analysis of water levels and drawdown-recovery characteristics at wells perforated below this thick unit show that the fine grained unit acts as a confining layer, or aquiclude. During the 1900's much of the southern part of MZ 1 was an area of flowing artesian groundwater conditions (Mendenhall, 1908) - indicating the existence of fine-grained confining layers...This artesian condition also indicates that piezometric levels were above land surface. At locations where groundwater could seep upward through the confining layers, a marshy conditions would occur...meaning the sedimentary column in this area was completely saturated at this time. (Wildermuth Environmental, Task Memorandum: Program Element 4, 1999) This marshy area is also the area described under liquefaction issues as being potentially at risk for liquefaction to occur.

Groundwater levels eventually declined in these marshy areas to approximately 150 feet below ground surface from the mid-1940's to 1978.

> *This decline in groundwater levels coincided with (1) and extended period of below normal precipitation and (2) groundwater overdraft associated with accelerated human activities in the basin...Since 1978, groundwater levels have recovered by about 40 feet in the southern part of MZ 1. This recovery coincided with (1) wetter than normal periods form 1978 to 1983 and...(2) the adjudication of the Chino Basin in 1978 that resulted in management of groundwater production and the initiation of artificial recharge in forebay areas to the north.*
>
> *As previously stated, the upper 100 feet of sediments in this shallow zone are predominantly fine-grained. Dewatering of these fine-grained sediments since the 1940's likely increased effective stresses within the sediments (to levels greater than maximum past effective stress) and resulted in aquifer system compaction.*
>
> *Geomatrix (1994) agreed with this scenario and speculated that these long-term water level declined since the 1940s, and especially from 1960 to 1978, were responsible for the ground fissuring first observed in 1973 by the USGS.*
>
> *While water levels in the shallow aquifer zone have recovered somewhat since 1978, piezometric levels in the deep aquifers (below the thick fine-grained unit) have had a separate and distinct history. In the southern part of MZ1, little water level data exists prior to 1980 for the deep aquifers. However, in the late 1980's a number of wells were drilled in this area for municipal use - some perforated below the thick fine-grained unit. These wells are owned by the City of Chino Hills*
>
> *Geomatrix (1994) and Kleinfelder (1999) have speculated that pumping of the deep aquifer is the cause of recent subsidence and ground fissuring in the area. Their reasoning is as follows:*
>
> - *An accelerated occurrence of fissuring commenced in 1991, two to three years after the completion and initial operation of the deep aquifer wells.*
> - *The axis of maximum subsidence, as delineated by ground level surveys (1987-1994), is aligned with the locations of these deep aquifer wells.*
>
> (Wildermuth Environmental, Task Memorandum: Program Element 4, 9-11, 1999)
>
> *...As groundwater is extracted from the deep aquifer, piezometric head (i.e. pore fluid pressure) decreased within the aquifer, and attempts to equilibrate by drawing water from the pore spaces in the surrounding sediments. In the classical situation, the deep aquifer is in hydraulic continuity with the upgradient forebay area where water is recharged to the basin. If for some reason, the continuity between the forebay and deep aquifers is interrupted, then the pumped aquifer will attempt to equilibrate by drawing water from the surrounding fine grained sediments (e.g. the aquiclude). time.* (Wildermuth Environmental, Task Memorandum: Program Element 4, 9-11, 1999)

This situation may result in subsidence, and two potential causes relative to the observed areas of subsidence are as follows: (1) discontinuity in the geometry of the gravel/sand strata within the aquifers, and/or (2) groundwater production from areas upgradient and tributary to subsidence zones. (Wildermuth Environmental, Task Memorandum: Program Element 4, 11, 1999)

If local groundwater production is conclusively demonstrated to be the cause of subsidence in MZ1, a distinction must still be made between long-term Basin-wide overdraft prior to 1978 and recent local overdraft of deep aquifers. The OBMP Monitoring Plan is currently guiding the study of subsidence. The OBMP proposes to continue periodic studies of the subsidence issue throughout the 50-year planning period.

4.4.2.7 Seiche

Seiche is the oscillation of the surface of a landlocked water body that varies from a few minutes to several hours. Seiche can be seismically induced or be the result of material (rocks, landslide, etc.) falling into the water body. No major surface water body occurs in or near the proposed project sites. Lake Arrowhead is the nearest water body that could potentially be affected by seiche conditions, but it is not located in the Santa Ana River Basin. Big Bear Lake, which is in the Santa Ana River Basin, is not proximate enough to the OBMP project area to pose any seiche constraints or impacts.

4.4.3 Project Impacts: Geology and Soils

This project proposes a variety of new facilities in support of the OBMP, including the construction of structures that will be occupied during working hours. The other proposed new structures or facilities associated with this project are pipelines, wells, booster pumps, channel improvements, and retention/detention/percolation basins. For the latter facilities people typically will be present onsite for only short periods of time during construction and maintenance activities for the facilities. Only at the desalter facilities will people regularly be present for long durations, beyond the normal window of time required by routine maintenance activities.

The implementation of the OBMP within the project area would include installing new infrastructure systems, pipelines, wells, storage and treatment facilities consistent with OBMP policies and mitigation measures outlined in this document designed to reduce or eliminate potentially significant incompatibilities. Theoretically the facility components could be built in any type of land use jurisdiction, given that sufficient need can be demonstrated for a facility in support of the OBMP, and given that no other alternatives locations or type of facilities can accomplish the same objectives. The geology and soil issues of focus in this evaluation are examined at the level of constraints imposed on future activities proposed in support of the OBMP. These constraint issues are evaluated in the following text.

4.4.3.1 Significance Criteria

The following criteria will be used for determining potential significant impacts related to geology and soil issues:

- Expose people or structures to substantial geologic hazards, including the risk of injury or death to humans and the loss of structures due to ground rupture, strong seismic groundshaking or seismic related ground failures, including liquefaction and landslides

- Exposure of humans, structures or infrastructure to soil constraints, including soil characteristics that create a high risk of injury or death to humans and the premature loss of structures or infrastructure.
- Significant alterations in the site topography that can create a high potential for downstream erosion (such as loss of topsoil) and sedimentation
- The project could result in the loss or major alteration/damage to a unique geologic resource

4.4.3.2 Potential Impacts

a. Is the Project Area subject to fault rupture?

Based on all geologic studies and maps for the region discussed in subsection 4.4.2 above, no active faults are known to occur within the project area and no Alquist-Priolo Special Studies Zones have been designated within the Chino Basin. The Cucamonga Fault, which is considered active, is located just northeast of the Chino Basin proper. Therefore, the potential for fault rupture within the project area is considered to be low, and potential impacts can be mitigated to reduce impacts by implementing the mitigation measures listed in the following subsection. These measures will ensure that the proposed OBMP facilities are not subjected to fault rupture hazards in the event of future seismic activity. The mitigation measures are designed to deal with future projects on a case-by-case basis and will reduce impacts to levels that are less than significant.

b. Is the Project Area subject to significant seismic groundshaking?

Table 4.4-2 indicates that the project site may be subject to significant seismic ground-shaking over the life of the proposed project, caused by earthquakes along portions of the fault systems within vicinity of the project. As part of the OBMP proposed new infrastructure system, both existing and proposed additions and facilities will be constructed to ensure that they can meet current building code and safety requirements, including seismic standards. Any replacement or modification of existing structures with new facilities will include incorporation of current seismic design standards. Because of the identified potential for significant seismic shaking hazards within the Chino Basin, mitigation will be implemented to ensure that construction of new facilities meets safety requirements.

At the project specific level, future projects do have a potential to experience significant constraints, especially if constructed proximate to a fault zone, whether active or not. Aside from identifying known fault locations at this time (see Figure 4.4-12, geotechnical constraints associated with faults cannot be defined until specific project locations are identified for individual projects implemented under the OBMP. These impacts can still be managed on site-by-site basis by implementation of a number of mitigation measures which are outlined below. Such measures could include avoidance through relocation of a facility or conducting a geotechnical survey to define site specific design mitigation measures. If such design measures are not sufficient to reduce potential groundshaking impacts to a non-significant impact, selection of an alternative location may be the only measure available to reduce impacts to a non-significant level of impact.

With the implementation of the seismic groundshaking hazard mitigation measures in a project specific manner in the future, the potential impacts related to area seismic constraints will be reduced and can be classified as less than significant.

c. Is the Project Area subject to significant seismic ground failure, including liquefaction?

Liquefaction results when water-saturated, sandy, unstable soils are subject to intense shaking, such as that caused by an earthquake. These soils lose cohesiveness, causing structures to fail. Studies indicate the current location of liquefaction-prone soils in the proposed Project Area are the former artesian areas located in and around the Cities of Chino, Chino Hills (see Figure 4.4-15) The potential for liquefaction is either less than significant or nonexistent in all other areas within the Chino Basin. Liquefaction is typically only an issue when the water table is within 50 feet of the ground surface. Figure 4.4-15, in addition to depicting current areas of potential liquefaction, also shows potential liquefaction areas that are forecasted in the year 2020 for both OBMP and no OBMP conditions. The OBMP model forecasts that the areas where groundwater is within 50 feet of the ground surface will increase in size. This increase is substantially less with the implementation of the OBMP compared to the Baseline (i.e. No-OBMP) condition. However, if a conjunctive use program is implemented that would cause water levels to rise significantly within the liquefaction zone shown in Figure 4.4-15, potential for liquefaction to occur may increase. Thus, a mitigation measure is proposed to eliminate or minimize the potential for any future OBMP activities to create a new potential for liquefaction, should any OBMP activities be implemented which might substantially raise existing piezometeric levels.

d. Is the Project Area subject to significant seiche, tsunami, or volcanic hazards?

Based on all geologic studies and maps for the region, no surface water bodies are in the project area that could create seiche or tsunami and no volcanic hazards occur in the Project Area. Without the presence of any of these hazards in the area, no hazard exists that can adversely impact future OBMP activities or be impacted by these activities. No mitigation is required.

e. Is the Project Area subject to significant landslide or mudflow hazards?

The Project Area is not subject to significant landslide or mudflow hazards. Development on steep slopes can increase rates of erosion and exacerbate landslide hazards which may threaten structures. For the most part, no substantial amount of development is proposed for areas with steep slopes. To prevent increased risk of mudflows and landslides, development in areas where slopes exceed

15 percent will be restricted for OBMP projects; therefore, land-use impacts on hillsides are not anticipated to be significant. This measure is identified as mitigation in the discussion below.

Within the remainder of the Project Area, no slope areas exist that could result in significant landslides or mudslides, both due to the type of soils, degree of slope (less than 9% throughout most parts of the valley), and existing development covering much of the Chino Basin. Without the presence of any landslide or mudslide hazards within the project area, no such hazard exists that can adversely impact future redevelopment activities or be impacted by these activities. No mitigation is required.

f. Is the project area subject to significant erosion or unstable soil conditions from grading activities, or will the proposed project cause significant changes in topography?

The project area is not subject to significant erosion or unstable soil conditions from grading activities, nor will any of the activities proposed by the OBMP cause significant changes in topography. In general, the majority of project area is topographically compatible with all of the proposed project facilities outlined in the Project Description. With the exception of the recharge basins, all ground disturbing activities (pipelines, wells, pumps, etc.) will affect small areas that can be designed to minimize the amount of ground disturbance. For recharge basins, the amount of area disturbed may be substantial, but the basins are designed to contain surface runoff, including all runoff diverted into a basin, for percolation. Local effects on soils and geology would result primarily from the construction activities associated with the proposed action, such as grading, excavating, and recontouring the soils. These activities could alter soil profiles and the local topography and create a potential for significant erosion. To ensure that significant erosion and unstable soil conditions are not created during construction and operation of future specific projects, mitigation measures are identified to control such water related erosion. These measures will ensure that discharges of surface runoff will not exceed the erosive velocity for affected areas and that no unstable slopes are installed as part of future projects.

During construction, removal of vegetative cover and disturbance of existing topography by the exposure of cut slopes and grading activities could increase the potential for erosion by wind and water. Appropriate watering for fugitive dust controls and water erosion control measures to address non-point source water pollution will be necessary during construction of specific OBMP facilities in previously undeveloped areas.

Regional effects on geology and soils within the remaining portion of the Project Area could be significant. There are approximately 225,000 acres of land within the proposed project area. A substantial portion of that could, over the life of the OBMP, be developed into residential, commercial, and industrial uses. Alteration of natural surface and soil conditions will occur as a result of grading, trenching, and vehicular traffic across undeveloped land surfaces. These activities will cause degradation of naturally occurring geologic and topographic features, resulting in short-term exposure of underlying soils, all of which will create adverse conditions related to soil erosion by wind and water.

Mitigation measures are available to minimize erosion problems associated with wind and water, especially during the construction phase of projects. The measures below should be applied to all construction projects, to reduce erosion damage and eliminate creation of unstable slopes. However, the measures outlined below can only be applied to future specific OBMP projects. After the construction phase, long-term erosion control can be accomplished by keeping soils under vegetative cover and planting wind breaks. After construction, soils underlying facilities and pavements will not be subject to erosion. With implementation of all measures, erosion and unstable slope impacts attributable to future OBMP projects will be reduced to a less than significant level.

g. Is the Project Area subject to significant subsidence hazards?

Within the project area, a portion of the City of Chino and CIM has been identified as experiencing land subsidence impacts within a former artesian area of the valley (see Figure 4.4-16). These subsidence effects are described above and are assumed to be related to deep aquifer extractions within the area itself and within areas upgradient of the subsidence zone.

The proposed OBMP goals include further studies of this phenomenon as part of a regional monitoring program. Additionally, one of the OBMP goals listed in Chapter 3 is to attempt to minimize and abate future subsidence-related impacts through balanced Basin management practices that aspire to prevent localized overdraft by means of proposing prudent water supply and recharge options to help producers meet existing and future obligations in a way that does not cause a negative impact to the environment.

Further hydrogeologic investigations will be required for the expansion of the SAWPA desalters as the well field is partially located within the subsidence zone. Whatever future pumping pattern is implemented in support of the OBMP desalters will not be allowed to increase subsidence in any way within existing subsidence areas as shown in Figure 4.4-16. Mitigation is included that that sets the performance standard for no net contribution to subsidence in existing subsidence areas due to the implementation of OBMP activities. The recharge efforts are designed to provide additional water supplies and to assist in offsetting localized overdraft within the subsidence area. The only groundwater pumping proposed as part of the OBMP is that associated with future desalter construction and operation. This pumping will occur in the shallow aquifer, not the deep aquifer that is more intimately connected to the subsidence issue. The desalters being considered would be located to the east and south of the subsidence area in the City of Chino. Hydrogeologic studies including modeling will be conducted prior to initiating well extractions for the desalters proposed in the OBMP. In addition to ongoing monitoring to ensure that water extractions do not contribute to subsidence, the OBMP can provide mitigation through localized recharge (using either basins or infiltration wells) or change well pumping patterns. Based on the management goals and available management tools, the OBMP is forecast to have a beneficial impact to the existing area of subsidence. As discussed above, the siting of future OBMP facilities will take into consideration the subsidence potential in southwestern Chino, and in other areas within the subsidence zone described in the OBMP Phase I Report, and will not exacerbate the problem by increasing pumping in areas that are closely related (in a hydrological or geological sense) to the former artesian area (i.e. the existing subsidence trough). A hydrogeological study will be performed for the expansion of the SAWPA desalter. In areas where no subsidence currently exists, but where heavy future production as part of the OBMP (especially desalter well fields) may occur, the performance standard is established in the mitigation measures that determines impacts will be kept to a less than significant level. If modelling studies indicate that impacts may be greater than the thresholds set forth in the mitigation measures, subsequent environmental documentation will be required. If projects adhere to the mitigation measures set forth in this document, impacts related to this issue can be considered less than significant.

h. Is the Project Area subject to significant expansive soil hazards?

The soil associations present within the project area do not have any significant expansive soil characteristics. The relative shrink-swell potential for the soils in the project area are very low, and thus, does not pose a significant hazard or major constraint related to future OBMP projects. Potential impacts associated with expansive soils are not forecast to pose any significant constraint in developing future facilities and no mitigation is required.

i. Does the Project Area contain any unique geologic or physical features?

The project site is underlain by old and young alluvium, and river wash deposits. These are common geologic substrates within the San Bernardino Valley Area. Areas with steep slopes will have limited (if any) development associated with the OBMP; the integrity of the bedrock areas within the Project Area is not forecast to be disturbed by implementing the OBMP. Without the presence of any existing unique geologic or physical features within the Project Area, the proposed project cannot significantly impact such features. No mitigation is required.

4.4.4 Mitigation Measures

The following mitigation measures will be implemented for individual projects implemented under the OBMP. Implementation of this measures can reduce all potential impacts to a level that is considered to be less than significant with respect to the proposed thresholds.

4.4.4.1 Soils

Mitigation measures are available to minimize erosion problems associated with wind and water, especially during the construction phase when trenches and cut slopes are exposed. During construction, the length of time vegetation and other cover is absent should be minimized. When cut slopes are exposed, any of the following measures may be useful in limiting erosion.

4.4-1 Add protective covering of mulch, straw or synthetic material (erosion control blankets, tacking will be required).

4.4-2 Limit the amount of area disturbed and the length of time slopes and barren ground are left exposed. After pipeline installation, soil shall be compacted to a level similar to pre-construction conditions.

4.4-3 Construct diversion dikes and interceptor ditches to divert water away from construction areas.

4.4-4 Install slope drains (conduits) and/or water-velocity-control devices to reduce concentrated high-velocity streams from developing.

4.4-5 Construction of facilities and structures areas with high liquefaction potential shall be limited without further geologic and hazard-related studies conducted by a qualified geologist or geotechnical firm. Such studies will provide guidelines to minimize the risks to humans and to capital-intensive facilities.

4.4-6 If a conjunctive use program might be implemented that would bring water levels up to a level that significantly increases the risk of liquefaction, a more detailed monitoring and geologic study focused on this issue will be conducted to determine whether or not liquefaction poses a hazard to surface structures and to human safety. If such a study finds the impacts to be significant, the volume of water permitted to be stored in the Basin will be decreased sufficiently until a water level is achieved that does not pose any significant hazard to surface structures or people.

After the construction phase, long-term erosion control can be accomplished by keeping soils under vegetative cover, hardscape (pavement, gravel, or other hard cover) and planting wind breaks. The type of vegetation used as wind breaks must comply with SCAQMD's standards. After construction, soils underlying facilities and pavements will not be subject to erosion.

Mitigation measures identified above shall be employed within the proposed project area. In addition, mitigation measures dealing with seismic and geologic hazards as addressed in the General Plans/EIRs of the Participating Jurisdictions shall be implemented. Examples of measures which are designed to minimize the potential for damage, injury and loss of life resulting from geologic hazards include the following:

4.4.4.2 Geology

4.4-7 Mitigate the risks from geological hazards through a combination of engineering construction, land use and development standards.

4.4-8 Require each site within identified Liquefaction Hazard Zones to be evaluated by a licensed engineer prior to design or land disturbance/construction.

4.4-9 Apply appropriate design and construction criteria to all structures subject to significant seismic shaking.

4.4-10 Prohibit critical, essential, and high risk land uses near earthquake special studies areas shown on the Hazard Overlay Maps developed by the County of San Bernardino and Riverside.

4.4-11 Require stability analysis for Landslide Hazard areas designated "Generally Susceptible" and "Mostly Susceptible" on the Hazards Overlay Maps.

4.4-12 Institute restrictions on construction in high landslide potential and steep-slope areas to ensure safe development.

4.4-13 Continue to identify and study subsidence hazards and susceptible areas, and propose mitigation technology that is appropriate to the findings of the monitoring study. The implementation of OBMP facilities shall *not* in any way contribute to subsidence conditions in *pre-existing subsidence zones* (as shown in Figure 4.4-16). The OBMP will not cause or contribute to any new, significant subsidence impacts greater than a total of six inches in magnitude over the planning period. Impacts less than 6 inches in new areas are considered to be less than significant.

4.4-14 If modeling and/or additional studies conducted for the expanded OBMP SAWPA desalter wellfield demonstrates that such pumping will contribute to subsidence in the existing subsidence area, then a potentially significant impact can occur, and a subsequent environmental document will be prepared. No OBMP activities allowed under this document will be permitted to cause or contribute to the subsidence within the pre-existing subsidence area defined in the OBMP Phase I Report and Figure 4.4-16.*

4.4-15 To ensure that pumping impacts in the vicinity of the desalter well field do not have an adverse impact on water levels and subsidence issues, the follow performance standards shall be used to evaluate the desalters:

a. Water level declines in areas surrounding the desalter pumping locations will not be allowed to decline to the extent that pumping capabilities for surrounding wells are impacted. If surrounding wells and producers are impacted by declines in water levels, alternative access to equivalent quantity and quality of water will be provided to affected surrounding parties. This water may be provided through distribution of funding to affected parties for the deepening of existing wells, or may be provided through the delivery (paid for by the implementing agency) of comparable or improved quality and quantity of water from other sources.

b. If desalter well fields are demonstrated to cause or exacerbate impacts to subsidence areas measurable by a decline of over six inches in ground level at a 1/4 mile radius, or at the radius of the nearest non-OBMP-participating structure, then pumping patterns for the desalters shall be modified to reduce impacts to cause no more than six inches of decline in ground level at the smallest of the two radii.

c. If an engineering study is prepared prior to installing a well or well field by a qualified geologist and hydrologist and demonstrates that subsidence greater than six inches can be permitted without causing significant subsidence hazards, then the investigation will define the new threshold for the specific location and it will be observed as the alternative threshold of significant subsidence.

4.4-16 Require site-specific geotechnical investigations of proposed development to include an assessment of potential impacts and mitigation measures related to expansive and reactive soils and liquefaction. Under the OBMP, Watermaster will continue to monitor the areas with potential liquefaction hazards and will work with local jurisdictions to ensure that any future structures are constructed with the appropriate foundations to address increased liquefaction potentials apropos to the specific area. This mitigation measure will reduce impacts to a less than significant level.

4.4-17 Apply provisions of hillside erosion and sediment control that reduce volume and velocity of flows and content of sediment to levels that do not cause significant rill or gully erosion in susceptible areas. In addition, provide for restoration of areas that do become eroded.

4.4-18 Prevent unnatural erosion in erosion-susceptible areas by tailoring grading, land clearance, and grazing, and by prohibiting use of off-road vehicles.

The foregoing are general examples of appropriate mitigation measures. As development is proposed during Plan implementation, more detailed project-specific measures may be employed.

4.4.4.3 Seismicity

The following measures shall apply to OBMP projects proposed within the Chino Basin:

4.4-19 When determined necessary by the affected jurisdictions, geotechnical and soils engineering reports shall be prepared in conjunction with the preparation of preliminary design layouts and grading plans for all new development projects implemented within the proposed Project Area. These studies will verify the presence or absence of hazardous soil conditions. If necessary, these reports will provide specific mitigation measures for the treatment of *potential* geologic and soils hazards.

4.4-20 Comprehensive geotechnical investigation shall be required prior to engineering and design development or structural and/or substantial rehabilitation of structures identified under Risk Class I & II, e.g., public facilities, as identified below:

Risk Class I & II, Structures Critically Needed after Disaster: **Structures which are critically needed after a disaster include important utility centers, fire stations, police stations, emergency communication facilities, hospitals, and critical transportation elements such as bridges and overpasses and smaller dams.**

Acceptable Damage: Minor non-structural; facility should remain operational and safe, or be suitable for quick restoration of service.

Risk Class III: **High occupancy structures; uses are required after disasters, i.e., places of assembly such as schools and churches.**

Acceptable Damage: Some impairment of function acceptable; structure needs to remain operational.

Risk Class IV, Ordinary Risk Tolerance: **The vast majority of structures in urban areas; most commercial and industrial buildings, small hotels and apartment buildings, and single family residences.**

Acceptable Damage: An "ordinary" degree of risk should be acceptable. The criteria envisioned by the Structural Engineers Association of California provide the best definition of the "ordinary" level of acceptable risk. These criteria require that buildings be able to:

a. Resist minor earthquakes without damage;

b. Resist moderate earthquakes without structural damage, but with some non-structural damage; or

c. Resist major earthquakes, of the intensity or severity of the strongest experienced in California, without collapse, but with some structural, as well as non-structural damage.

Risk Class V, Moderate to High Risk Tolerance: **Open space uses, such as farms, ranches and parks without high occupancy structures; warehouses with low intensity employment; and the storing of non-hazardous materials.**

Acceptable Damage: Not applicable.

4.4-21 All structures previously identified in categories III through V shall be designed in accordance with the applicable multiplier factor seismic design provisions of the Seismic Safety Report to promote safety in the event of an earthquake.

4.4-22 The direct impacts of faults upon proposed projects shall be considered during preliminary planning processes, and the engineering design phases.

4.4-23 All rehabilitation and new development projects implemented as a result of the proposed Project shall be built in accordance with current and applicable Uniform Building Code (UBC) standards and all other applicable City, County, State and Federal laws, regulations and guidelines, which may limit construction and site preparation activities such as grading, and shall make provisions for appropriate land use restrictions, as deemed necessary, to protect residents and others from potential environmental safety hazards, either seismically induced or those resulting from other conditions such as inadequate soil conditions, which may exist in the proposed Project Area.

4.4-24 Local grading and building codes should reflect measures to minimize possible seismic damage.

Implementation of the above mitigation measures will lower the Project's impact to seismic safety to that of below significance. Impacts, however, must be considered significant and not mitigated until such time these measures are implemented through a final Mitigation Monitoring and Reporting Program.

The following measures are ***not*** recommended as conditions of project approval, but are provided for the consideration of decision-making bodies as a means to further reduce safety risks by fortifying existing seismic safety policies.

There are three related initial actions which the Participating Jurisdictions should follow to ensure mitigation of seismic-related hazards:

4.4-25 Utilize geologic and seismic data in land planning so that identified risk areas, if any, are avoided, or structures and landforms treated and designed to reflect local site conditions.

4.4-26 Inspect older facilities and improve earthquake design features when possible.

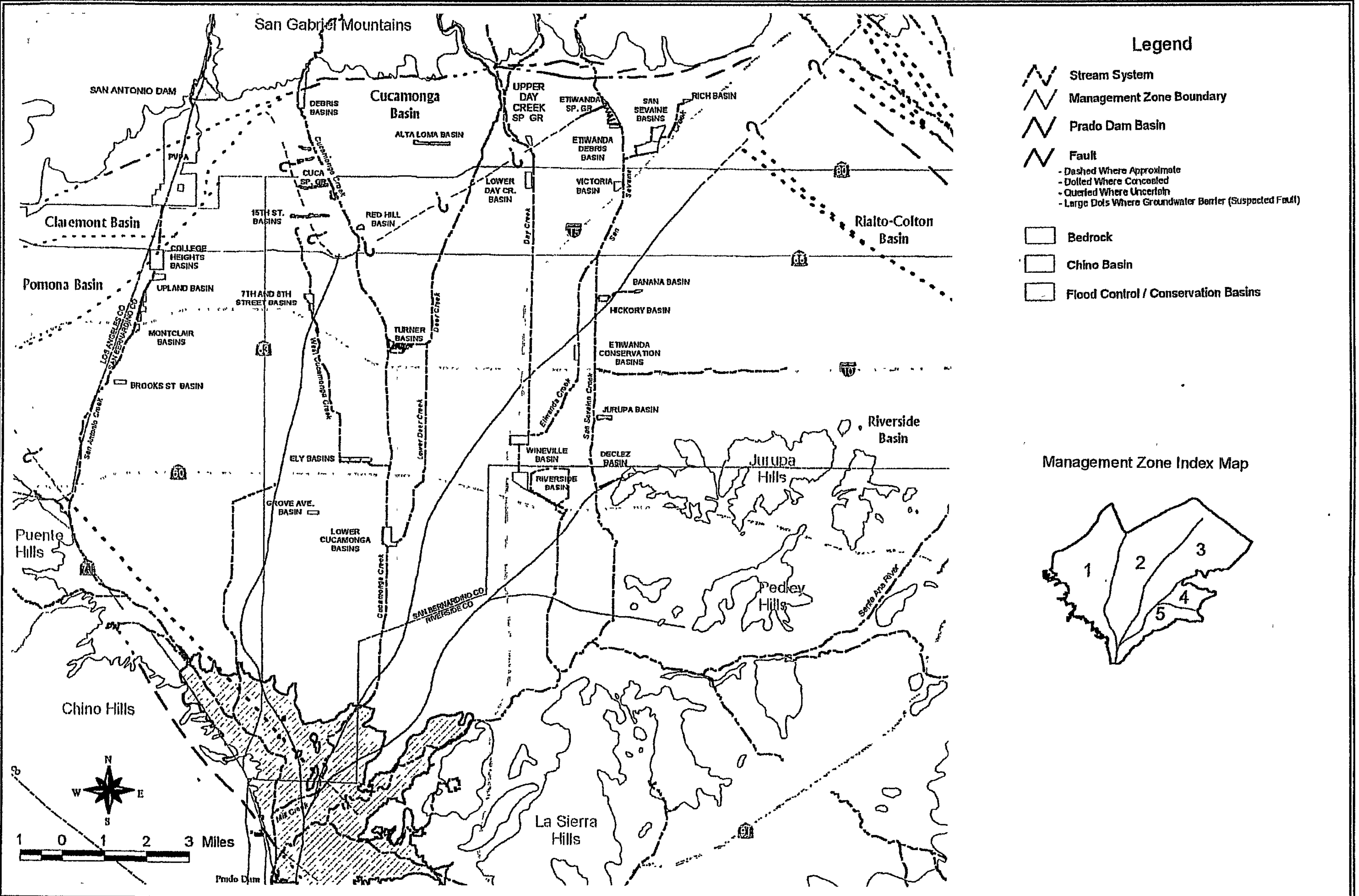
4.4-27 Maintain a disaster preparedness plan.

4.4.5 Unavoidable Adverse Impact

The geologic and soil resource impact evaluation presented above indicates that the proposed project, implementing the OBMP, has a potential to cause or be exposed to significant geotechnical impacts or constraints, but with proposed mitigation, implementing the OBMP will not cause any significant unavoidable adverse geologic and soil resource impacts or be exposed to significant geotechnical constrains. Therefore, no significant unavoidable adverse geologic or soil impacts are forecast to occur if the proposed project is implemented.

4.4.6 Cumulative Impact

Future development in accordance with the OBMP will not cause any significant adverse geologic or soil impacts. With implementation of the mitigation measures outlined above, the proposed project will not contribute to cumulative exposure of humans in occupied structures to seismic, liquefaction or subsidence hazards. Therefore, no additional mitigation measures are required to ensure that cumulative geologic and soil impacts remain below a significant impact threshold.



EXISTING DRAINAGE PATTERN FOR THE CHINO BASIN

Source. OBMP Phase I Report, Figure 2-1

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FIGURE 4.4-1

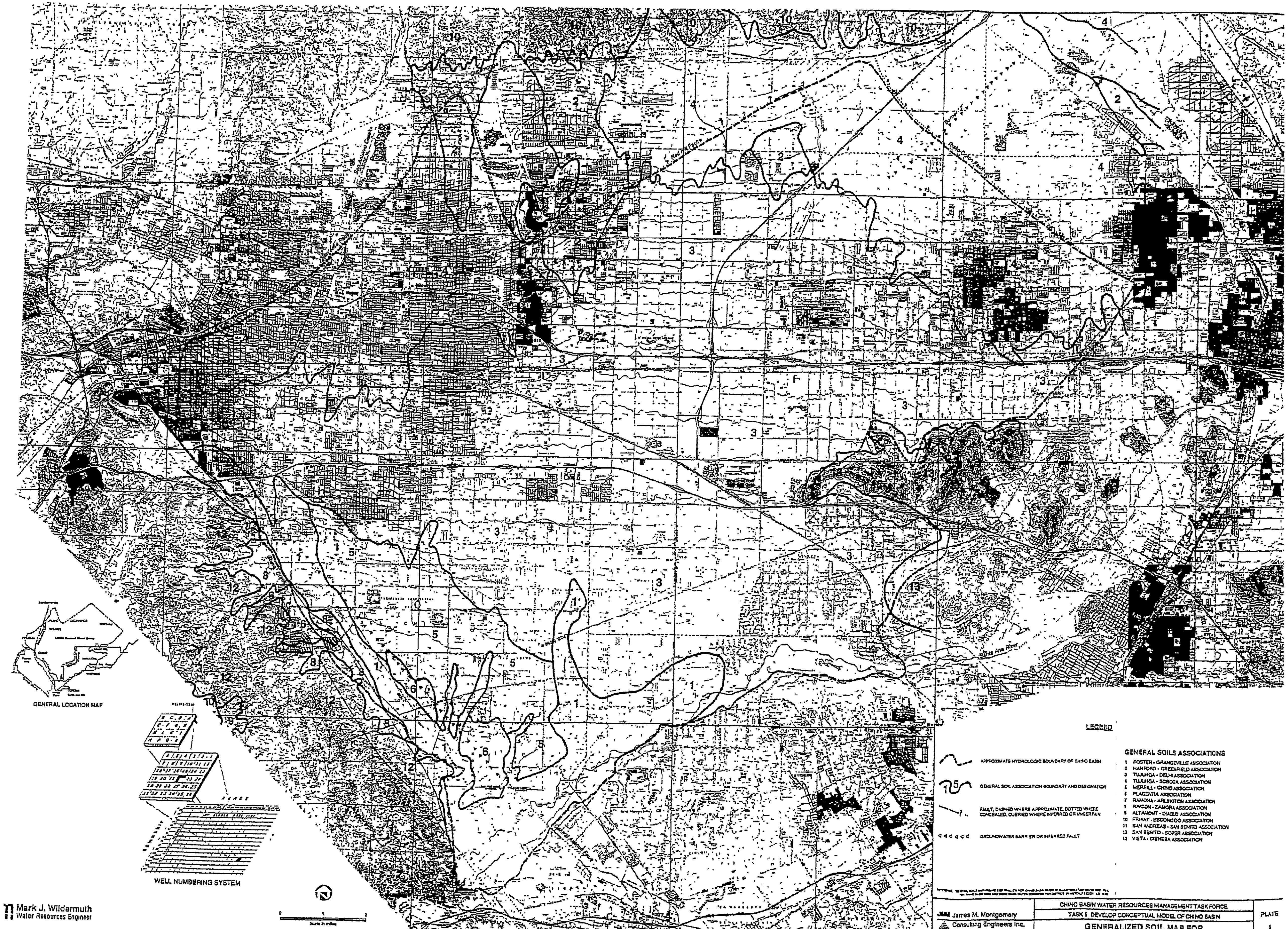

FIGURE 4.4-2

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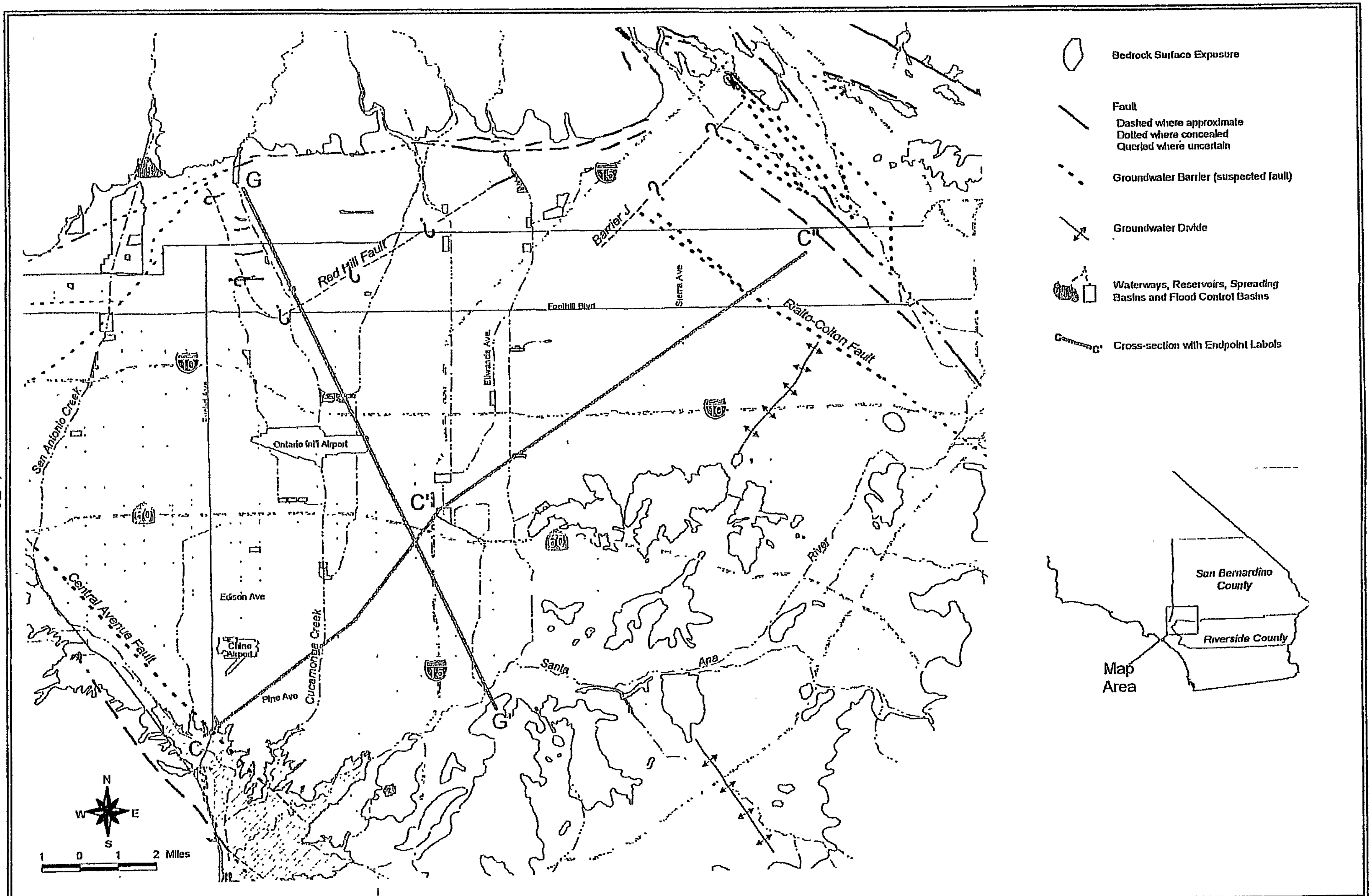
GENERAL SOIL ASSOCIATIONS IN THE CHINO AREA

Source: Task 5 Memorandum Plate 5



LOCATION OF TWO GENERALIZED CROSS-SECTIONS FOR THE CHINO BASIN

Source: OBMP Phase I Report, Figure 2-2

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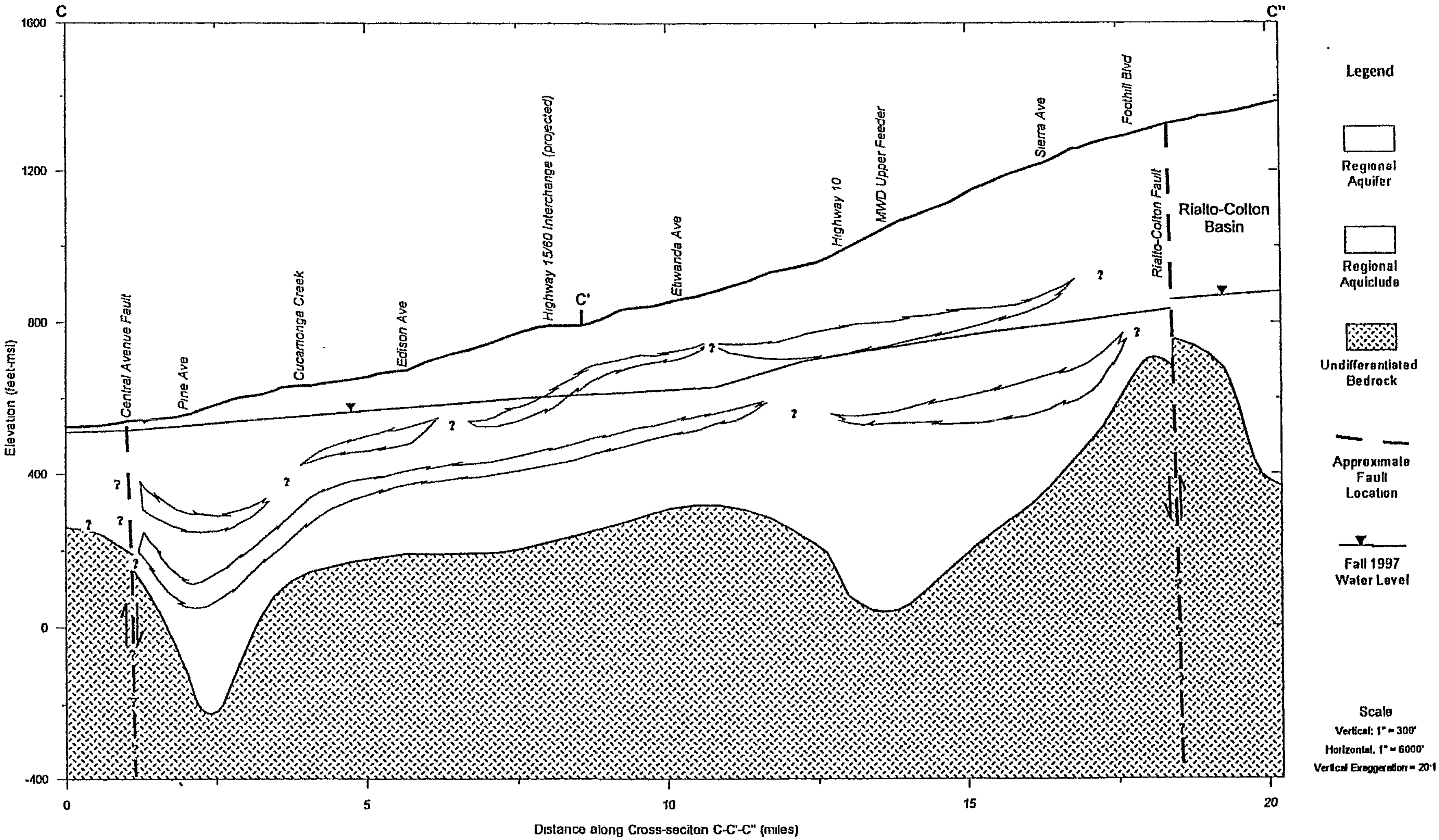
FIGURE 4.4-3



GENERALIZED CROSS-SECTION C-C'-C"

Source: OBMP Phase I Report, Figure 2-3

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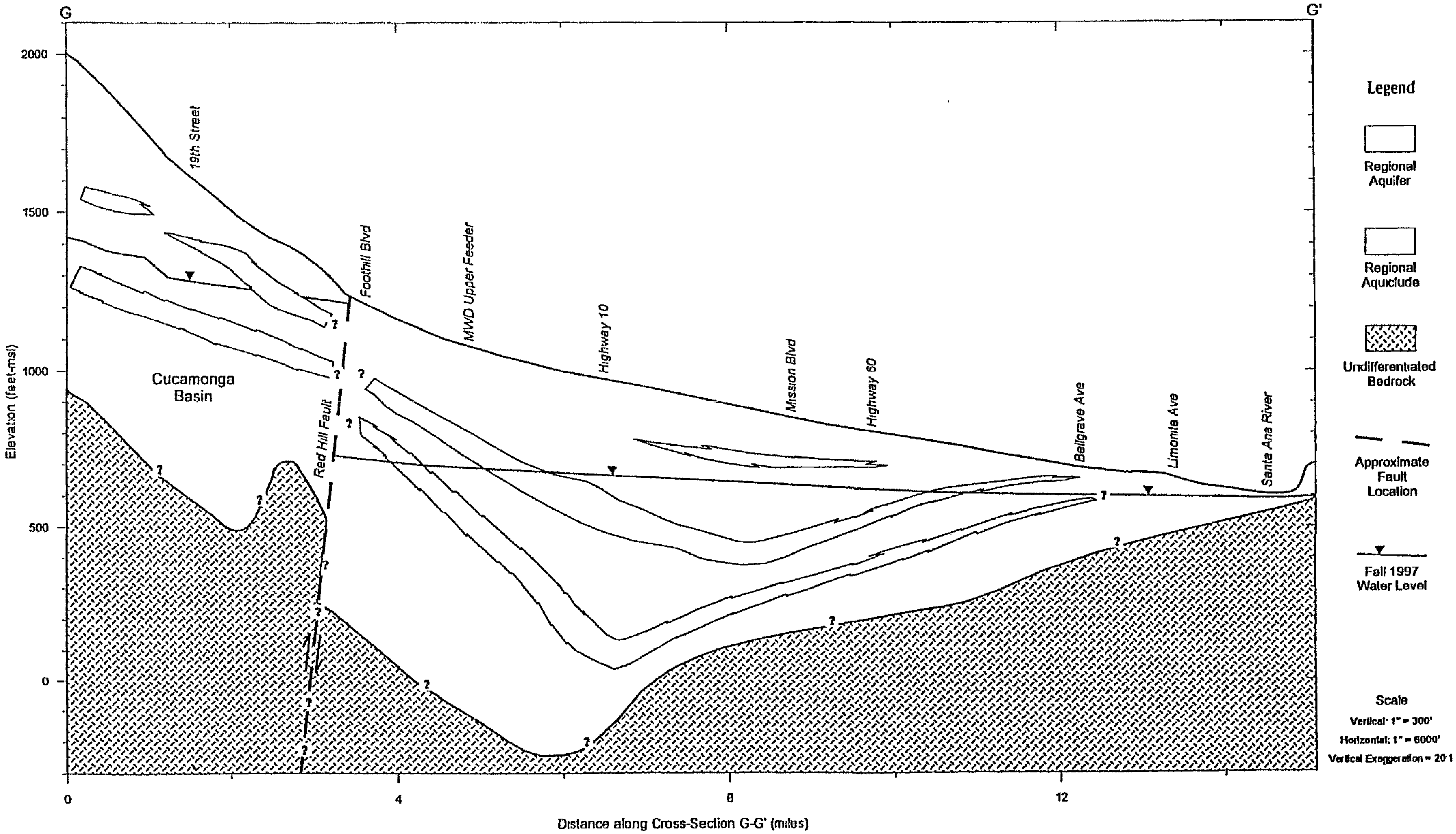
FIGURE 4.4-4



GENERALIZED CROSS-SECTION G-G'

Source: OBMP Phase I Report, Figure 2-4

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FIGURE 4.4-5

Relative duration of major geologic intervals
Cenozoic
Mesozoic
Paleozoic
Precambrian

Era	Period	Epoch	Approximate duration in millions of years	Millions of years ago
Cenozoic	Quaternary	Holocene	Approx. the last 10,000 years	
		Pleistocene	2.5	2.5
	Tertiary	Pliocene	4.5	7
		Miocene	19.0	26
		Oligocene	12.0	38
		Eocene	16.0	54
		Paleocene	11.0	65
Mesozoic	Cretaceous		71	136
	Jurassic		54	190
	Triassic		35	225
Paleozoic	Permian		55	280
	Carboniferous	Pennsylvanian	45	325
		Mississippian	20	345
	Devonian		50	395
	Silurian		35	430
	Ordovician		70	500
	Cambrian		70	570
Precambrian			4,030	

0 50 100 150 200 250 300 350 400 450 500 550 4,600

GEOLOGIC TIME SCALE

Source: Bolt, Bruce A., *Earthquakes: A Primer*, W.H. Freeman and Co., 1978

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FIGURE 4.4-6

LOCALITIES

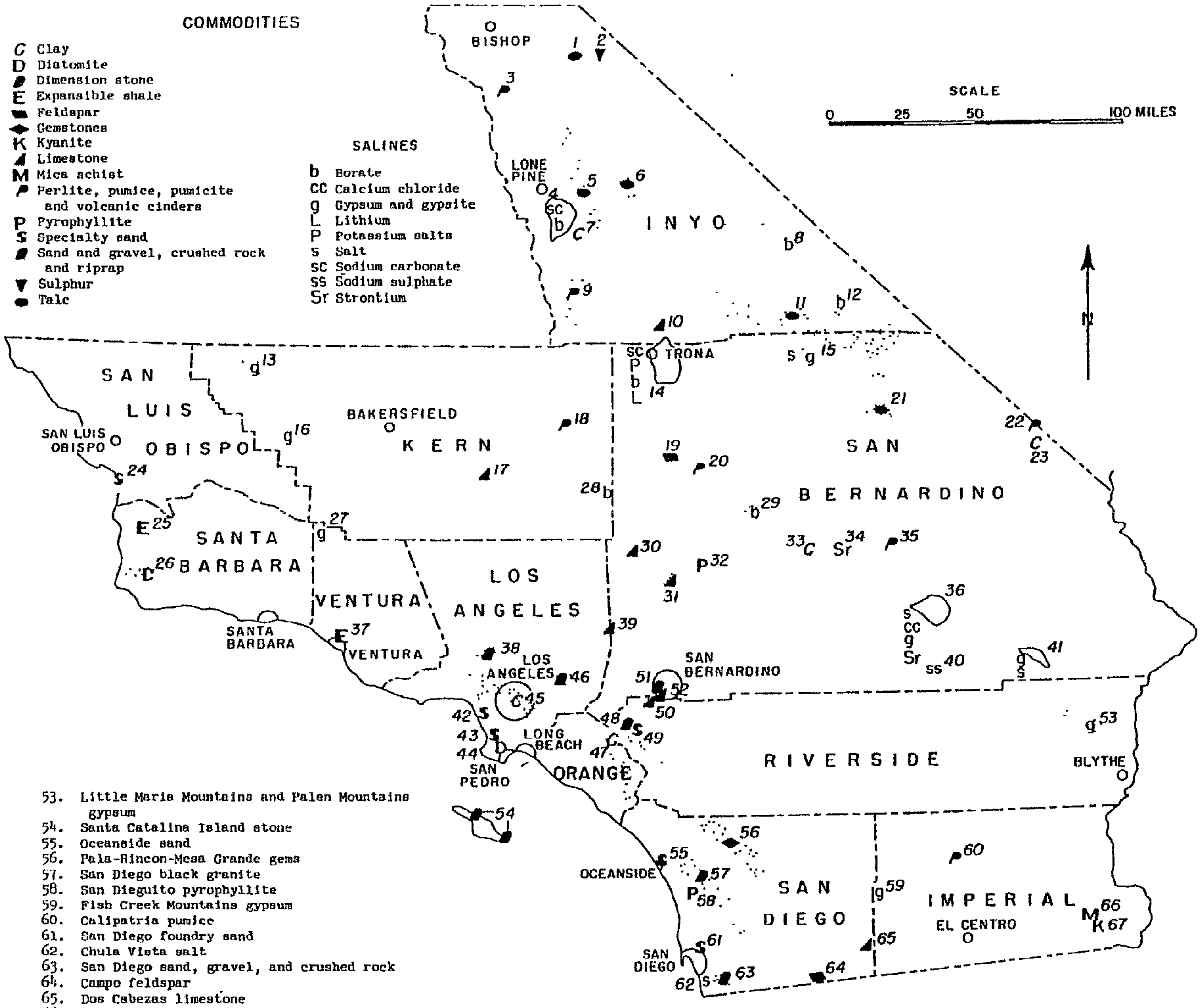
1. Eureka Valley talc
2. Last Chance Range sulphur
3. Fish Springs perlite
4. Owens Lake, source of sodium carbonate and borax
5. Inyo Range talc
6. Goldbelt Spring talc
7. Olancha adsorbent clay
8. Ryan-Furnace Creek borate
9. Coso Range-Little Lake pumice and volcanic cinders
10. Slate Range limestone
11. Southern Death Valley-Kingston Range talc
12. Shoshone-Zabriskie borate
13. Lost Hills gypsite
14. Searles Lake, source of soda ash, sodium sulphate, potassium salts, borax, boric acid, lithium salt, sodium chloride, and bromine
15. Avawatz Mountains salt, gypsum, strontium minerals
16. McKittrick gypsite
17. Monolith limestone
18. Last Chance Canyon pumice
19. White Butte feldspar
20. Coolgardie Camp pumice
21. Silver Lake-Yucca Grove talc
22. Castle Mountains perlite
23. Castle Mountains clay
24. Oceano Beach foundry sand
25. Casmalia expansible shale
26. Lompoc diatomite
27. Quatal Canyon gypsum
28. Kramer borate
29. Calico Mountains borate
30. Shadow Mountains limestone
31. Victorville-Oro Grande limestone
32. Stoddard Mountain pyrophyllite
33. Hector clay
34. Ludlow strontium
35. Bristol Mountains perlite
36. Bristol Lake, source of salt, calcium chloride, gypsum and strontium minerals
37. Ventura expansible shale
38. Tujunga Wash sand, gravel, and crushed rock
39. Wrightwood limestone
40. Dale Lake sodium sulphate
41. Danby Lake salt and gypsum
42. El Segundo sand
43. Torrance foundry sand
44. Palos Verdes diatomite
45. Los Angeles common clay
46. San Gabriel Wash sand and gravel
47. Alberhill-Santa Ana Mountains clay
48. Corona crushed rock
49. Corona glass sand
50. Riverside limestone
51. Santa Ana River sand, gravel, and crushed rock. Includes crushed rock quarries at Declezville
52. Colton limestone
53. Little Maria Mountains and Palen Mountains gypsum
54. Santa Catalina Island stone
55. Oceanside sand
56. Pala-Rincon-Mesa Grande gems
57. San Diego black granite
58. San Dieguito pyrophyllite
59. Fish Creek Mountains gypsum
60. Calipatria pumice
61. San Diego foundry sand
62. Chula Vista salt
63. San Diego sand, gravel, and crushed rock
64. Campo feldspar
65. Dos Cabezas limestone
66. Ogilby mica schist
67. Ogilby kyanite

COMMODITIES

C Clay
D Diatomite
Dimension stone
E Expansible shale
Feldspar
Gemstones
K Kyanite
Limestone
M Mica schist
Perlite, pumice, pumicite and volcanic cinders
P Pyrophyllite
S Specialty sand
Sand and gravel, crushed rock and riprap
Sulphur
Talc

SALINES

b Borate
CC Calcium chloride
g Gypsum and gypsite
L Lithium
P Potassium salts
s Salt
SC Sodium carbonate
SS Sodium sulphate
Sr Strontium



NON-METALLIC MINERAL RESOURCES IN THE CHINO BASIN VICINITY

Source: California Minerals, USGS Survey, 1958

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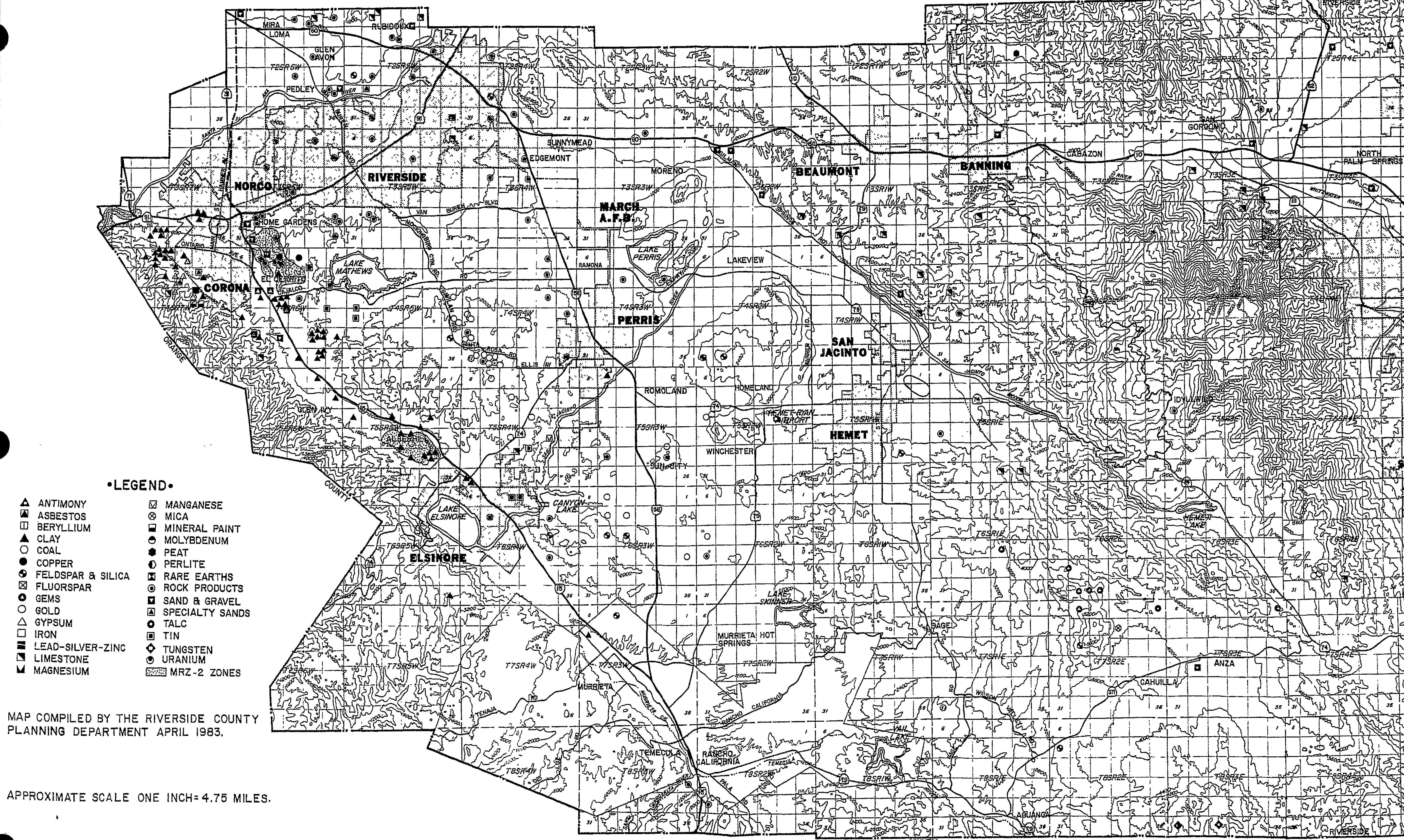
FIGURE 4.4-7



RIVERSIDE COUNTY MINERAL RESOURCES IN THE CHINO BASIN

Source: County of Riverside General Plan

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FIGURE 4.4-8

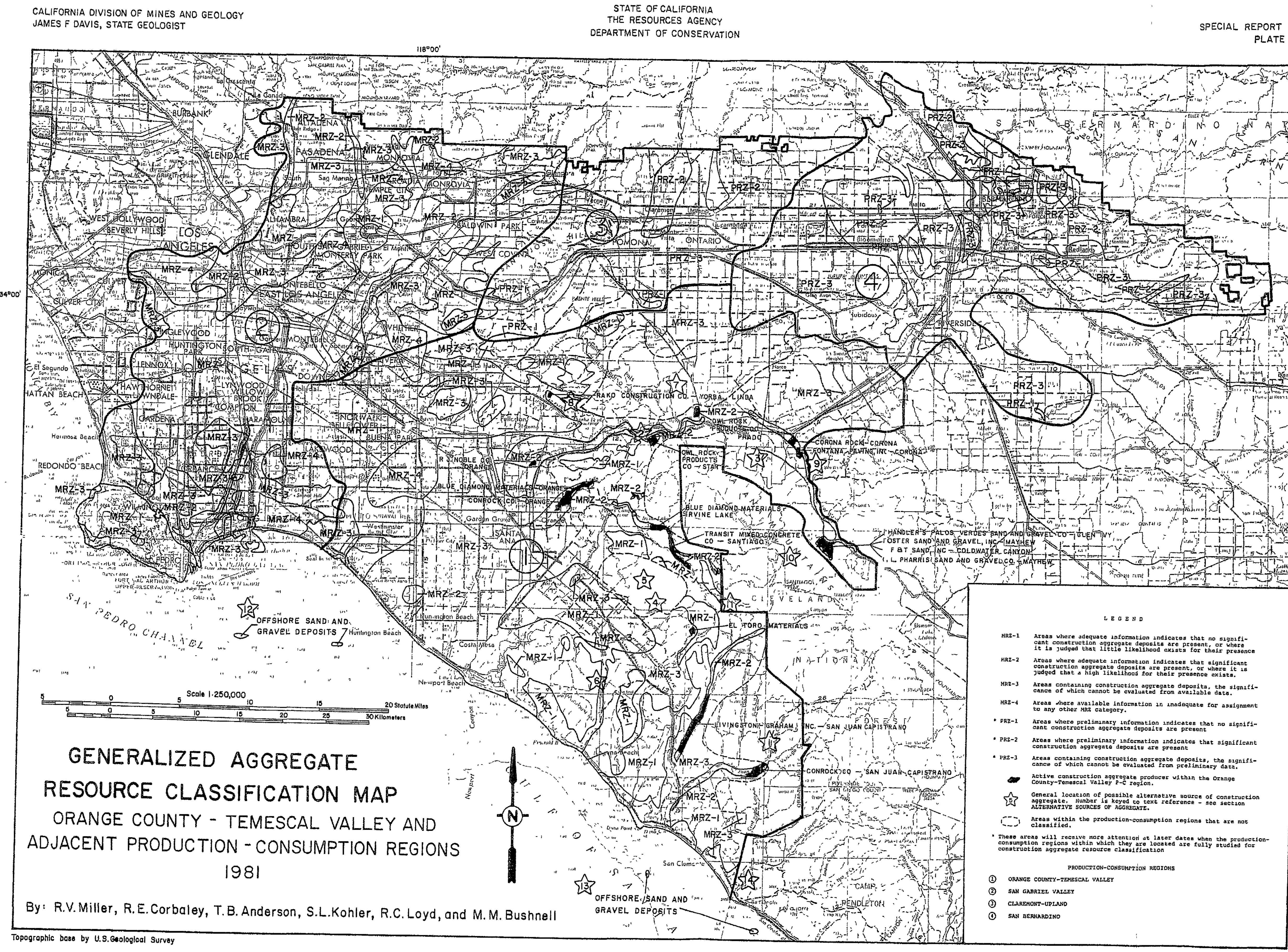

FIGURE 4.4-9

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GENERALIZED PRODUCTION AGGREGATE RESOURCES IN THE CHINO BASIN VICINITY

Source: USGS Department of Conservation

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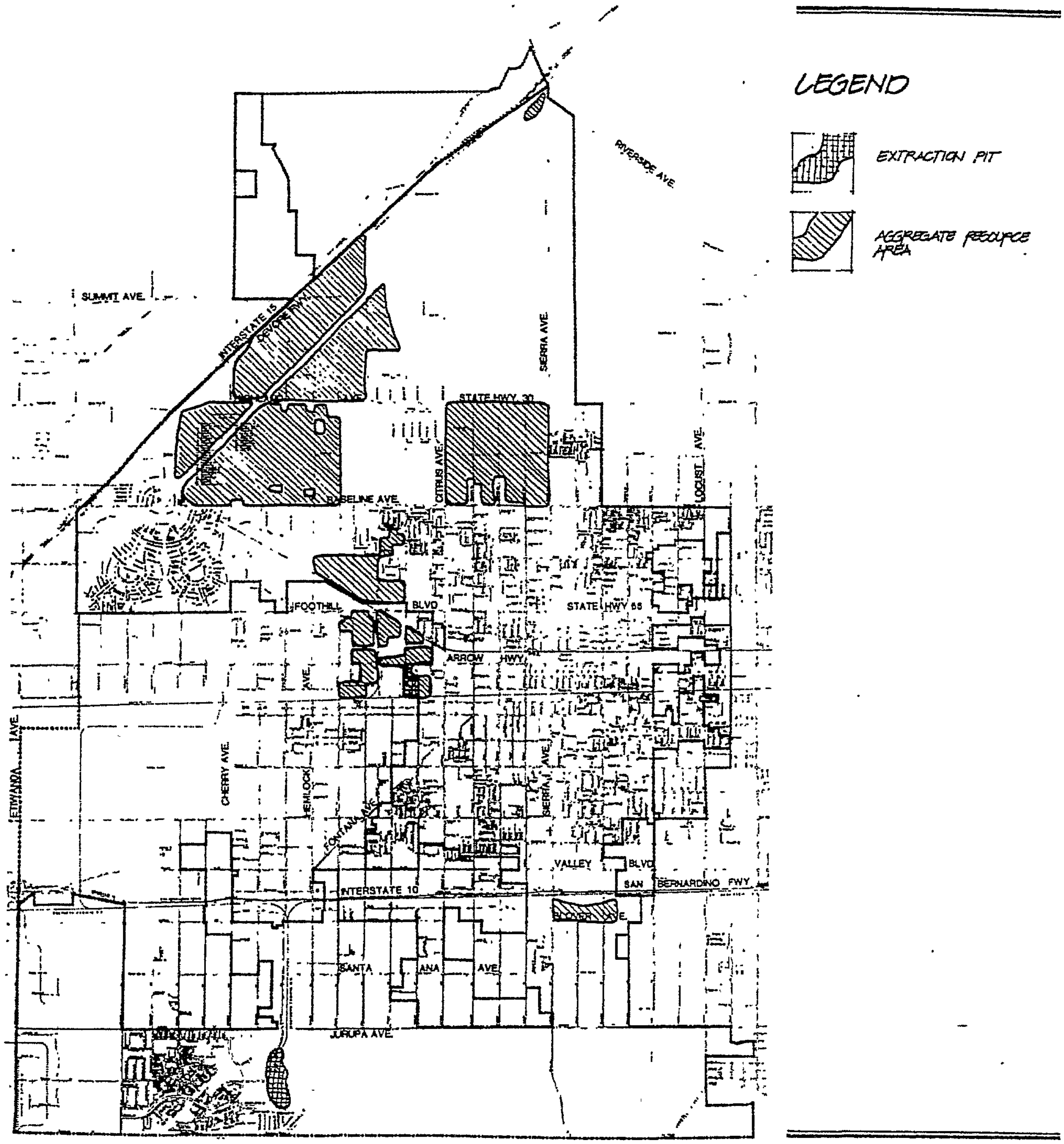
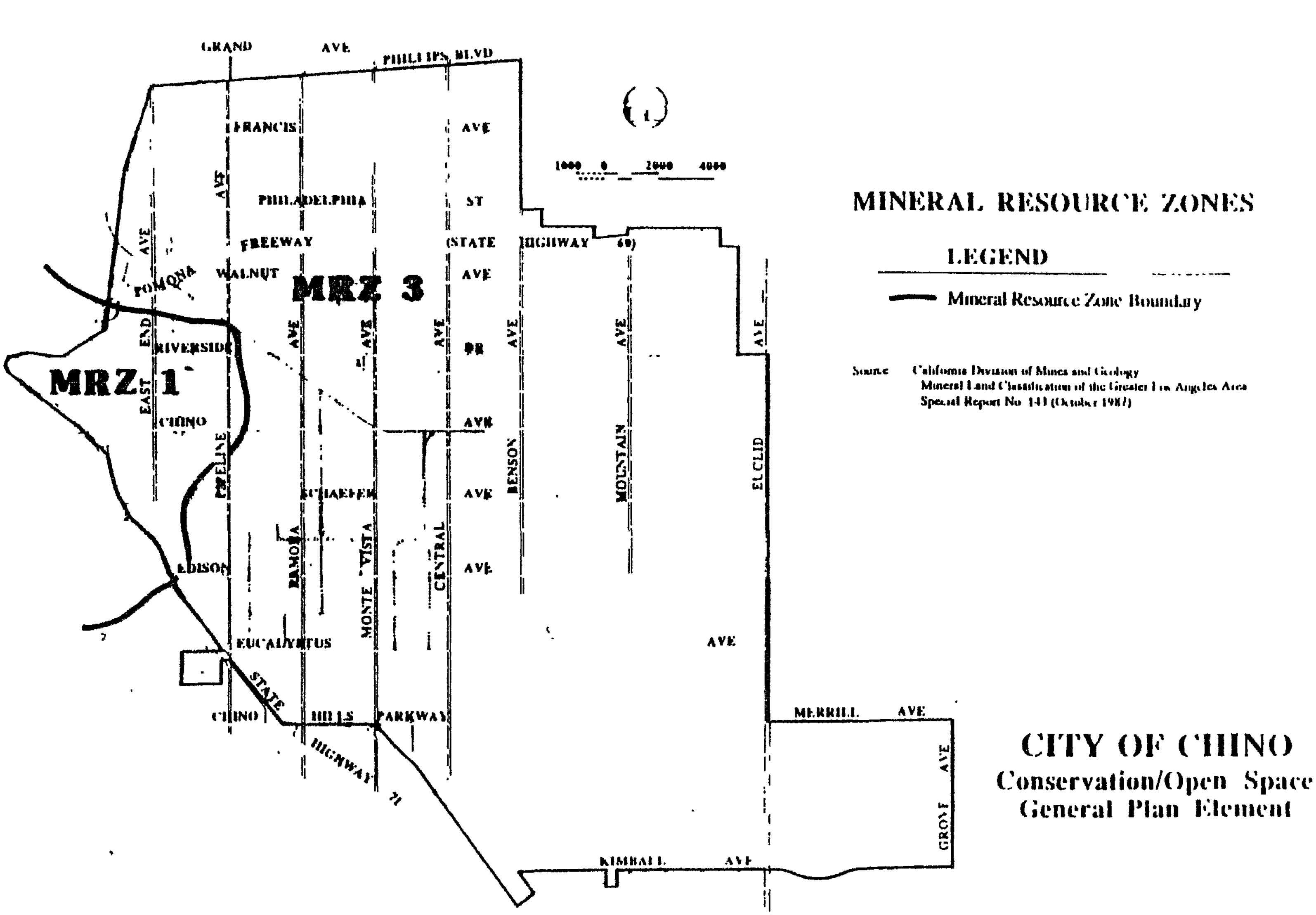


CITY OF FONTANA MINERAL RESOURCE AREAS Source: City of Fontana General Plan	TOM DODSON & ASSOCIATES Environmental Consultants	FIGURE 4.4-10



CITY OF CHINO MINERAL RESOURCE ZONES

Source: City of Chino General Plan

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FIGURE 4.4-11

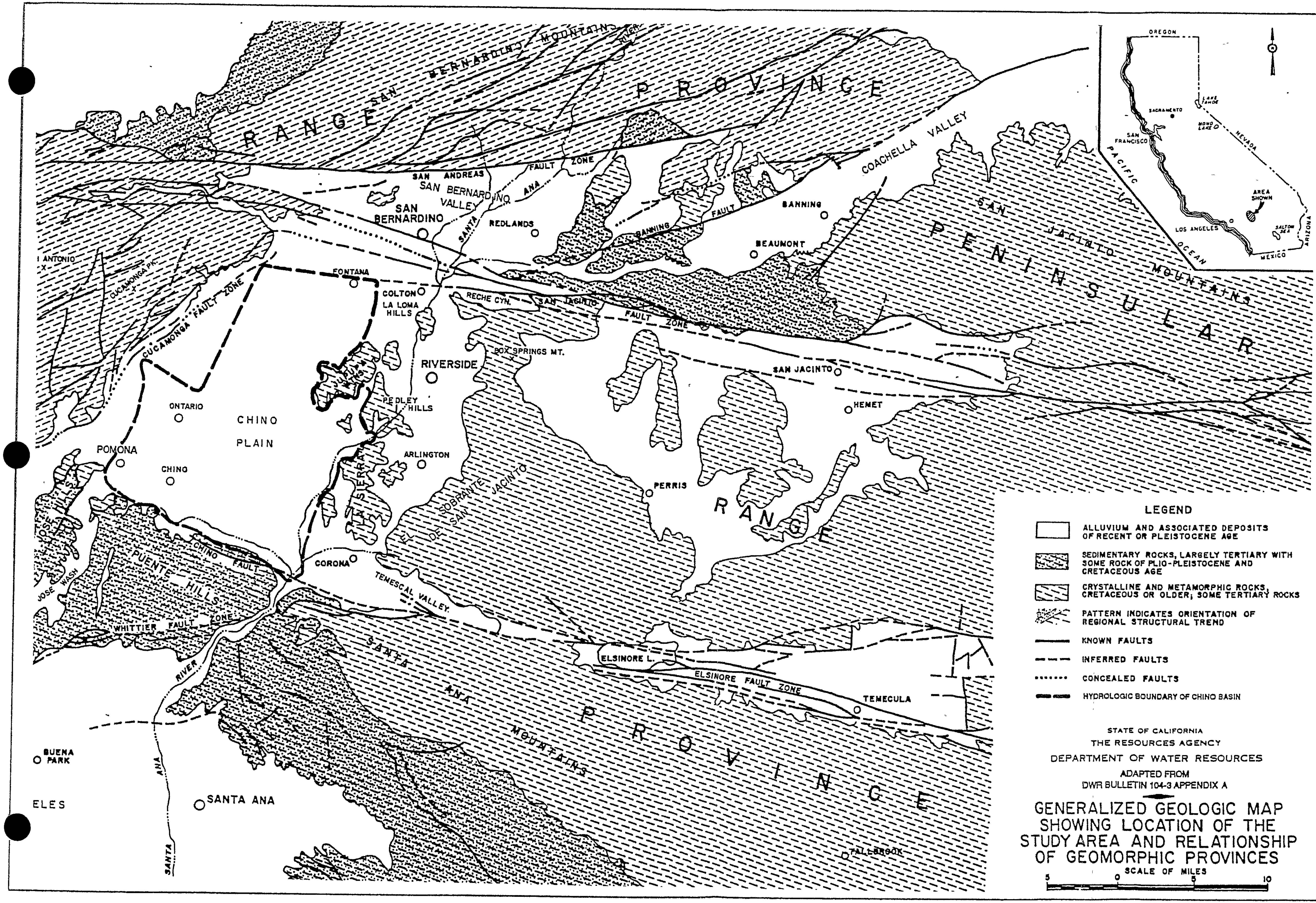

FIGURE 4.4-12

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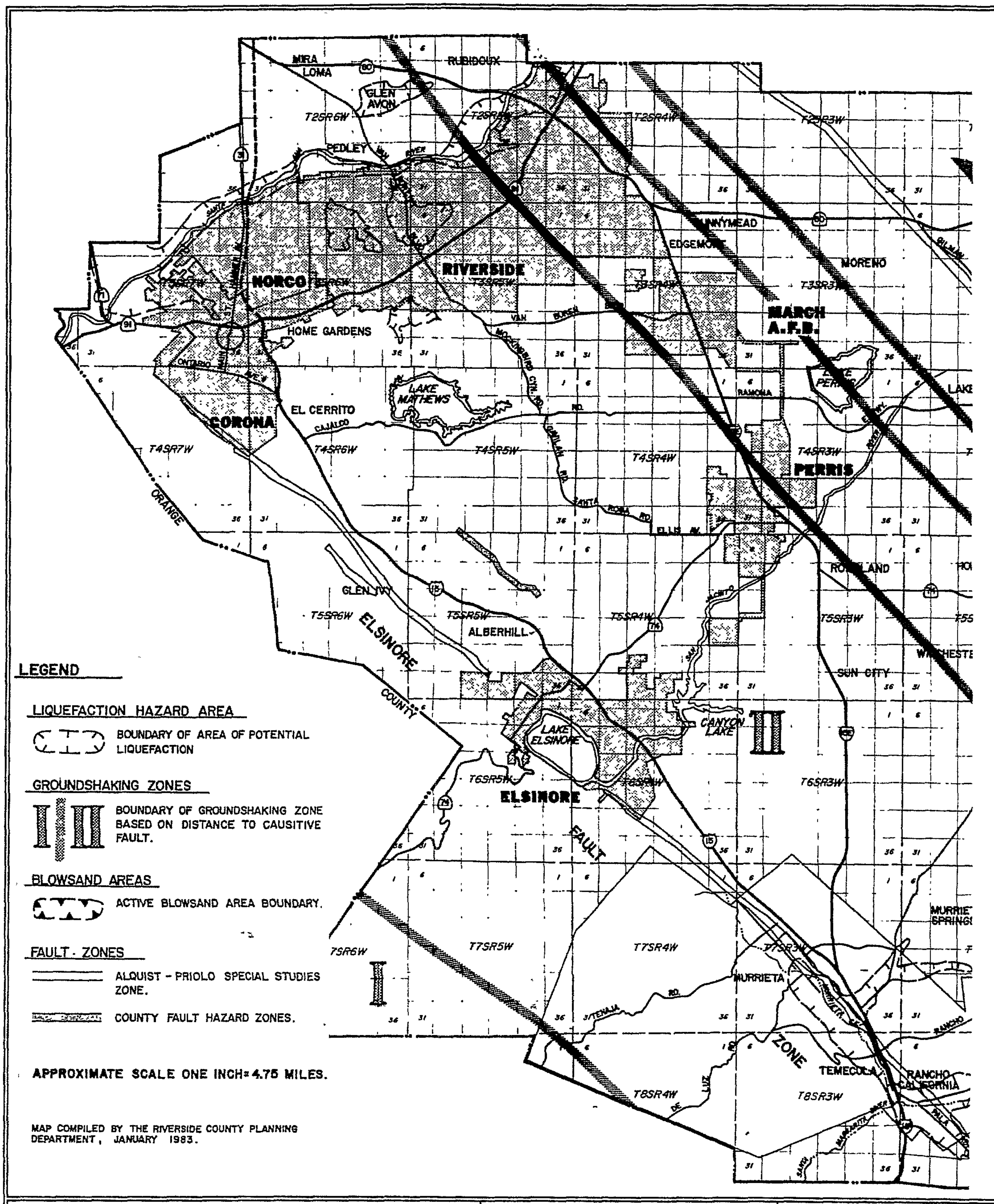
MAJOR FAULTS IN THE CHINO BASIN AND SURROUNDING AREAS

Source: Task 5 Memorandum Plate 1



RIVERSIDE COUNTY SEISMIC HAZARDS SHOWING NO ALQUIST-PRIOLO SPECIAL STUDIES AREAS IN CHINO BASIN

Source: Compiled by Riverside County Planning Department

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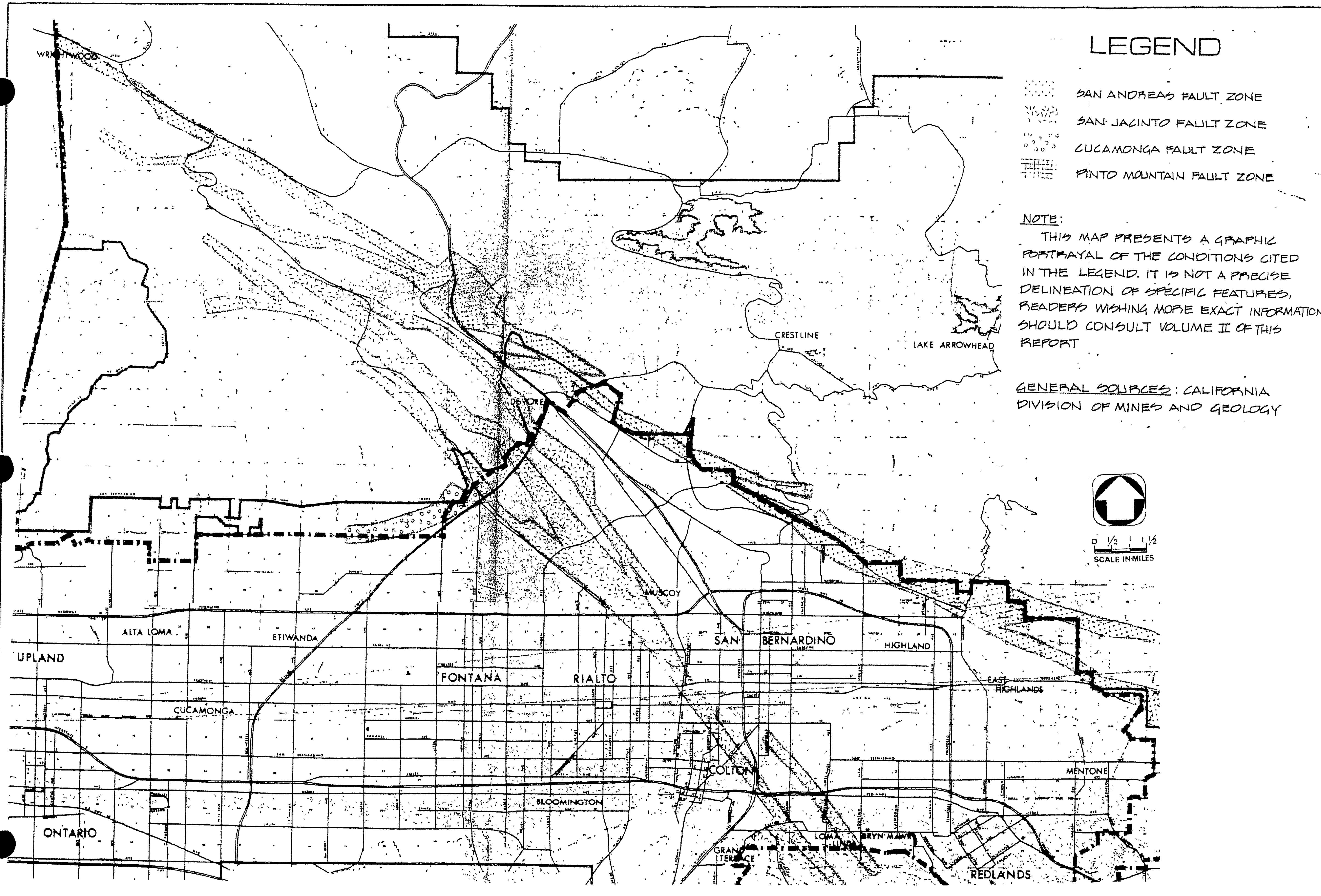
FIGURE 4.4-13



ALQUIST-PRIOLO SPECIAL STUDIES AREA IN SAN BERNARDINO COUNTY

Source: County General Plan Maps

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FIGURE 4.4-14

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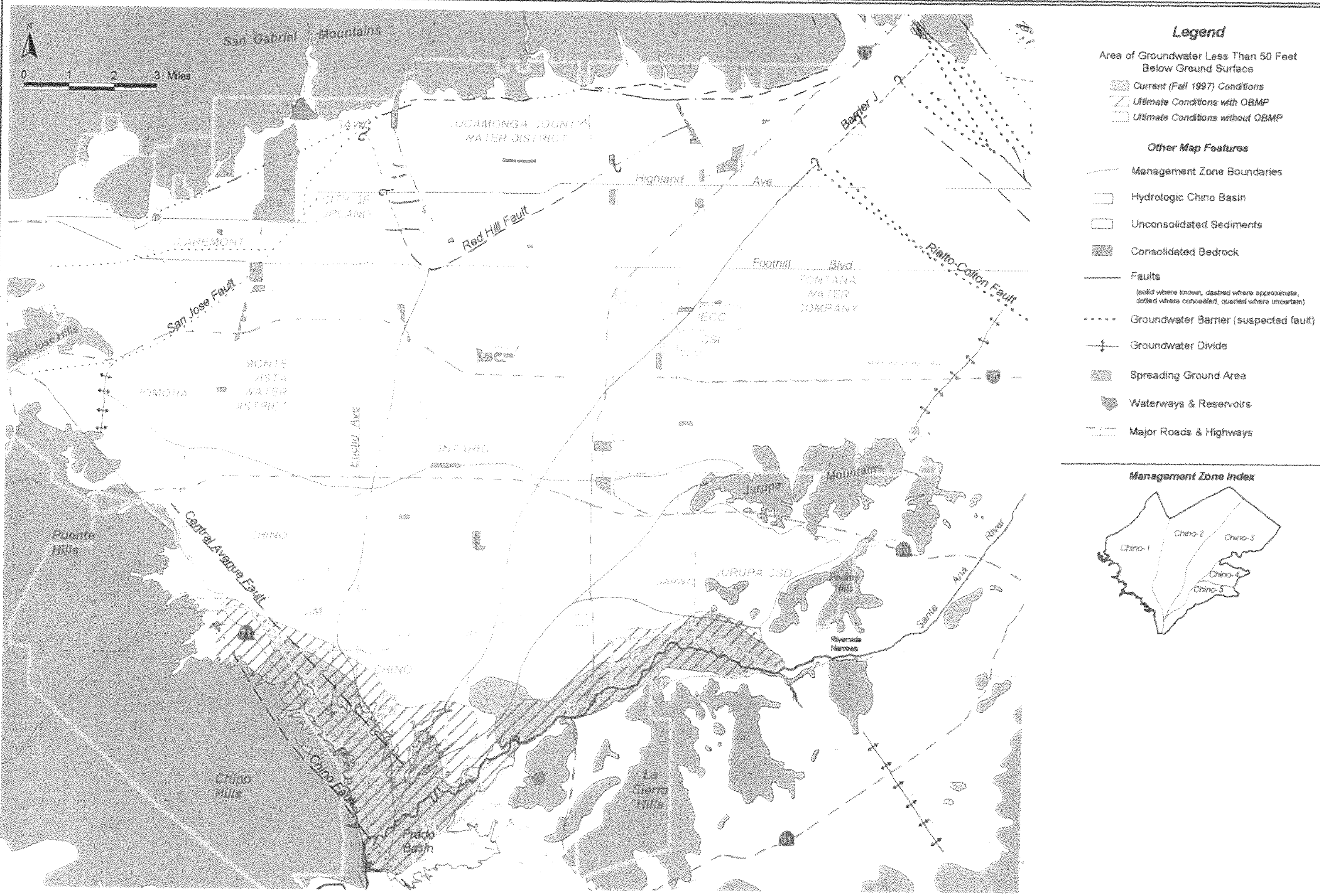

AREA IN SOUTHWEST CHINO BASIN (SAN BERNARDINO COUNTY) WITH HIGH LIQUEFACTION POTENTIAL

Source: Wildermuth Environmental, Inc.

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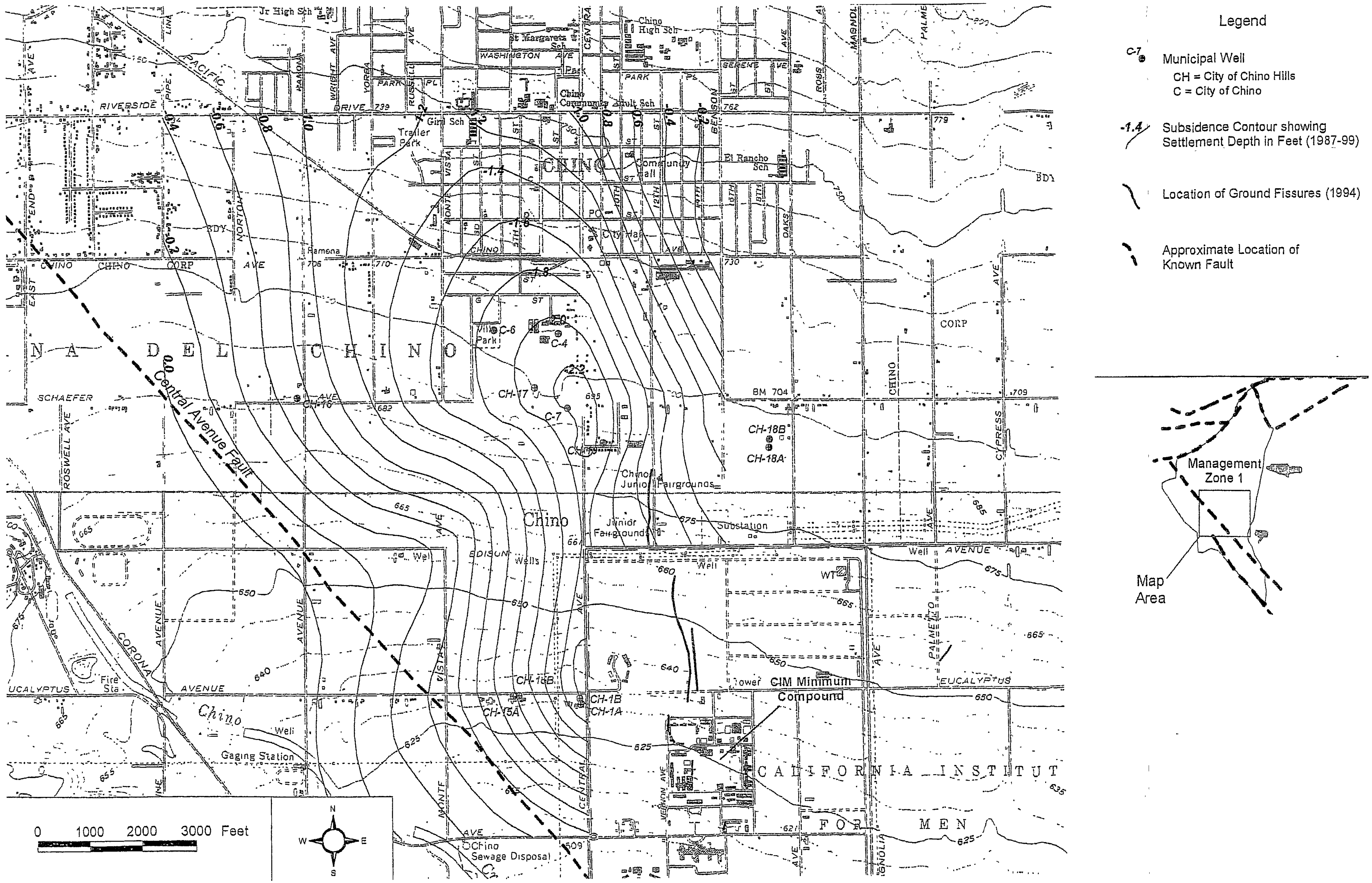
FIGURE 4.4-15



SUBSIDENCE CONTOURS AND GROUND FISSURES IN THE CHINO AREA

Source OBMP Phase I Report, Figure 2-24

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FIGURE 4.4-16

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4.5 WATER RESOURCES/WATER QUALITY

4.5.1 Introduction

The purpose of the Optimum Basin Management Program is to develop a groundwater management program that enhances the safe yield and the water quality of the Basin, enabling all groundwater users to produce water from the Basin in a cost-effective manner.

As the above mission statement for the Optimum Basin Management Program (OBMP) states, the intent of the OBMP is to implement those physical modifications to the Chino Basin that will lead to enhanced safe yield and better water quality, while being more cost effective than would occur if the individual water serving agencies (WSAs) implemented their own individual programs. Assuming this goal can be fulfilled and considering the OBMP in its broadest sense as a program, implementation of the OBMP would inherently result in a beneficial effect on the Chino Basin, i.e., enhanced safe yield and better water quality. However, even though our understanding of the science of hydrology is relatively sophisticated, the ability to physically modify a complex hydrologic system, such as the Chino Basin, and manage it to achieve such goals is not perfect, and individual actions taken to achieve an overall beneficial effect on the Basin may result in unintended consequences to the Basin's hydrology or in indirect adverse environmental effects (physical changes) to other environmental or man-made resources or systems within the Chino Basin.

The California Environmental Quality Act (CEQA) was adopted to ensure that decision-makers examine these potential unintended environmental consequences and indirect effects of implementing a program, such as the OBMP. CEQA's objective is to ensure that decision-makers are provided with sufficient information about all the potential environmental impacts of a proposed project so that they are fully informed of potential environmental consequences before proceeding to approve and implement a program, even when it will have otherwise beneficial consequences.

Water resource and water quality issues are included as a topic for evaluation in this Program Environmental Impact Report (PEIR) because implementation of the OBMP will result in the installation of water management facilities and activities throughout the project area. Implementation of the OBMP will intentionally modify many of the hydrologic characteristics of the Chino Basin and the focus of analysis in this subchapter of the PEIR is to assess the potential environmental consequences of these proposed physical changes to the Basin. Since the level of detail contained in the OBMP does not yet lend itself to site specific evaluations, a program environmental evaluation is carried out in this environmental document.

Under the programmatic concept, the focus is on the type of facilities and activities that will be implemented under the OBMP, and an examination of the general impacts that may result from implementing facilities and activities, instead of site specific impacts. However, when we know enough about the background environmental resources and systems, it is possible to forecast fairly accurately the type of impacts that may occur, and more importantly, to identify those mitigation measures that can ensure potential impacts from constructing and operating facilities and related activities will not reach a level of significant impact. If in the future, a specific OBMP project cannot be implemented within the threshold limits or performance standards established in this PEIR, the proponent for that facility or activity has the responsibility to prepare a subsequent environmental document (negative declaration or EIR) in conformance with Sections 15162 and 15168 of the State CEQA Guidelines. In any case, every future specific project proposed for implementation under the OBMP must undergo at least a preliminary analysis (Initial Study or its equivalent) to determine whether the analysis in this PEIR adequately characterizes the potential environmental impacts or whether subsequent environmental document is required.

The OBMP envisions a variety of facilities and activities that, when implemented as a whole, are intended to enhance the safe yield and water quality of the Chino Basin. These activities include: (1) additional recharge to the Basin groundwater aquifer, including use of stormwater, State Project Water (SPW), and recycled water (reclaimed treated wastewater effluent); (2) importation of potable water from the Bunker Hill Basin for direct use (Baseline Feeder); (3) installation of production and monitoring wells; (4) construction of desalters, possibly including deionizing equipment, to treat groundwater with high total dissolved solids (TDS) and nitrates for municipal and industrial uses; and (5) installation of pipelines to transfer water around the Basin as needed to meet OBMP objectives.

As described in Section 1 of the OBMP, the process that culminated in the preparation of the OBMP has been both complicated and controversial. Essentially, the various WSAs and other interested parties could not agree on the details of how the Judgment, entered in Superior Court in 1978 (Case No. RCV 51010), should be implemented. Much of that controversy still lingers and is characterized in the comments received from agencies when the Notice of Preparation (NOP) for preparing the OBMP PEIR was issued in November 1999. The NOP and scoping process (a scoping meeting was held for this project on December 9, 1999) generated an extensive list of concerns, most of which are evaluated in this PEIR. However, some of the issues raised in the comments are either not ripe for evaluation at this point in time (i.e., they can only be substantively addressed when a specific location(s) for a facility or activity is identified or when additional data regarding the Chino Basin become available) or they are not appropriate subjects for consideration in an EIR. The following text discusses the water resource and water quality issues raised during the comment period and describes how they are addressed, or not addressed as the case may be, and the rationale for the treatment of an issue in this PEIR.

The NOP comment letters and the scoping meeting issues are provided in subchapter 8, Appendix 8.1. A table summarizing the issues or comments raised in the comment letters and scoping meeting is also contained in Appendix 8.1. The following is a further summarization of the environmental concerns and issues from implementing the OBMP that will be evaluated in this subchapter of the PEIR.

- Consider beneficial projects that are being implemented to clean up existing groundwater contamination (commented by General Electric)

- Consider how extraction and recharge patterns may affect groundwater flow patterns and existing groundwater contamination (General Electric, Regional Board, Monte Vista Water District, and Western Municipal Water District)

- Address adverse effects of the OBMP on water quality and quantity (Fontana Water Company, Regional Board, and City of Pomona)
- Address adverse effects on water resource availability for domestic or other beneficial use purposes (Fontana Water Company, and Regional Board)
- Address the need for abatement of sources of groundwater contamination (Fontana Water Company)
- Address construction activity water quality effects (Regional Board)
- Address the regulatory requirements for OBMP operations, such as NPDES permits, DHS, California Department of Fish and Game (CDFG), dairy discharge requirements and manure removal standards, etc. (Regional Board and Cucamonga County Water District)
- Provide more detail on how the OBMP can mitigate existing yield and water quality problems (Monte Vista Water District)
- Define existing yield of each management zone and native recharge, compare to circumstances forecast to occur in 2020 and identify mitigation measures for imbalances and shortfalls (Monte Vista Water District)
- Define existing water quality of each management zone and native recharge, compare to circumstances forecast to occur in 2020 and identify mitigation measures for imbalances and degradation (Monte Vista Water District)
- Address the effects of financial assessment for mitigation measures (Monte Vista Water District)
- Address the impacts of in-lieu recharge vs. wet-water recharge (Monte Vista Water District)
- Address the financial effects of the OBMP phasing plan (Monte Vista Water District)
- Consider an alternative to subsidizing manure removal by shifting subsidy to water supply to benefit salt balance and dairy/agricultural operations (Monte Vista Water District)
- Address cumulative effects of various programs and projects that may degrade surface and ground water resources and cause non-compliance with the Basin Plan (Western Municipal Water District and Jurupa Community Services District)
- Address the effects from recharging recycled water lower in the Basin instead of SPW recharge higher in the Basin (Western Municipal Water District and Cucamonga County Water District)
- Address potential effects on State of California agency water facilities (existing wells and ability to drill new wells) in the Chino Basin (State of California Department of Justice)
- Address water storage impacts on degradation of water quality in the lower portions of Chino Basin (State of California Department of Justice)
- Address effects of recharging recycled water using local and regional methodologies (Jurupa Community Services District)
- Address impacts for individual agency wells using historical and current salt/nitrogen concentration levels (Jurupa Community Services District)

- Address the need for current groundwater quality mitigation instead of linking it to future TDS loading (Jurupa Community Services District)
- Address the balance between OBMP project benefits and negative impacts to exist water supplies (Jurupa Community Services District)
- Address potential indirect physical impacts of financing the OBMP to the extent that it may affect future OBMP project implementation (Cucamonga County Water District)
- Address financial effects of inequitable financing of OBMP costs on growth and land use if certain water users are unfairly saddled with higher costs (Cucamonga County Water District)
- Address the effect of over-extraction in the north end of the Basin and its effects on prevent high-quality recharge water from flowing south and flushing the basin (Cucamonga County Water District)
- Address the physical impacts of increased recharge or decreased pumping on subsidence and non-subsidence zones within Management Zone 1 (Cucamonga County Water District)
- Address the effects on water levels at Prado Dam due to increased capture and recharge in the upper portion of the Basin (Cucamonga County Water District)
- Address any increased in-stream flow appropriations and effects on natural riparian systems (California Department of Fish and Game)

This subchapter of the PEIR addresses as many of the above issues as is feasible at this stage of the review for the OBMP. The subchapter has been compiled by relying primarily upon data contained in a previously published documents including: the various elements of the OBMP, the Chino Basin Groundwater Storage Program EIR, TDS and Nitrogen Study, and the Santa Ana Region Water Quality Control Plan (1995). The next section of this document, the Environmental Setting, is abstracted from the Section 2, State of the Basin, in the OBMP and is presented in much of its entirety with minor editing for consistency.

4.5.2 Environmental Setting

4.5.2.1 Description of the Basin

The Chino Basin consists of about 235 square miles of the upper Santa Ana River watershed. Figure 3.2-1 illustrates the boundary of the Chino Basin as it is legally defined in the stipulated Judgment in the case of Chino Basin Municipal Water District vs. the City of Chino et al. Figure 3.2-1 also shows the hydrologic boundary of the Basin, which is slightly different from the adjudicated boundary. Chino Basin is an alluvial valley that is relatively flat from east to west and slopes from the north to the south at a one to two percent grade. Valley elevation ranges from about 2,000 feet in the foothills to about 500 feet near Prado Dam. Chino Basin is bounded: on the north by the San Gabriel Mountains and the Cucamonga Basin; on the east by the Rialto-Colton Basin, Jurupa Hills, and the Pedley Hills; on the south by the La Sierra area and the Temescal basin; and on the west by the Chino Hills, Puente Hills, and the Pomona and Claremont Basins.

The Chino Basin is one of the largest groundwater basins in southern California with about 5,300,000 acre-ft of water in the Basin and an unused storage capacity of about 1,000,000 acre-ft. Cities and other water supply entities produce groundwater for all or part of their municipal and industrial supplies; and about 300 to 400 agricultural users produce groundwater from the Basin. The Chino Basin is an integral part of the regional and statewide water supply system. Prior to 1978, the Basin was in overdraft. After 1978, the Basin has been operated as described in the 1978 Judgment in Chino Basin Municipal Water District vs. City of Chino et al. (Chino Judgment or Judgment).

4.5.2.2 Surface Water Resources

The principal drainage course of the Chino Basin is the Santa Ana River. It flows 69 miles across the Santa Ana Watershed from its origin in the San Bernardino Mountains to the Pacific Ocean. The Santa Ana River enters the Basin at the Riverside Narrows and flows along the southern boundary to the Prado Flood Control Reservoir where it is eventually discharged through the outlet at Prado Dam. Chino Basin is traversed by a series of ephemeral and perennial streams that include: Chino Creek, San Antonio Creek, Cucamonga Creek, Deer Creek, Day Creek, Etiwanda Creek and San Sevaine Creek. Figure 4.4-1 illustrates the stream system in the Chino Basin. San Antonio Creek joins Chino Creek and along with Cucamonga Creek, discharges directly into the Prado Reservoir. Cucamonga Creek has its name changed to Mill Creek just north of the Prado Reservoir. Deer Creek was realigned, and now discharges into Cucamonga Creek. Currently, Etiwanda Creek discharges into Day Creek at Wineville Basin. In the near future, Etiwanda Creek will be joined with San Sevaine Creek. Day Creek and San Sevaine Creek flow south and enter the Santa Ana River upstream of the Prado Reservoir.

These creeks carry significant flows only during, and for a short time after, passing frontal storms that typically enter southern California from November through March. Year-round flow occurs along the entire reach of the Santa Ana River due to year round surface inflows at Riverside Narrows, discharges from municipal water recycling plants that discharge in the River between the narrows and Prado Dam, and rising groundwater. Rising groundwater occurs in Chino Creek, in the Santa Ana River at Prado Dam, and potentially other locations on the Santa Ana River depending on climate and season. The rising groundwater in Chino Creek and the Santa Ana River contains high concentrations of total dissolved solids (TDS). Year-round discharges are sustained:

- in Chino Creek from the Inland Empire Utilities Agency (IEUA) Regional Plant No. 2 (RP2) to the Prado Reservoir, the source of which is from recycled water discharges from RP2; and

- in Cucamonga Creek from IEUA Regional Plant No. 1 (RP1) to the Prado Reservoir, the source of which is from recycled water discharges from RP1.

Significant nuisance flows have developed in Cucamonga Creek above RP1, the source of which is excess landscape irrigation and other outside urban uses. Some of the storm water runoff from the

San Gabriel Mountains and urban areas is diverted for recharge in flood retention and spreading basins. These basins are shown in Figure 4.4-1.
For a discussion of the geology of the Chino Basin, please refer to subchapter 4.4.2.

4.5.2.3 Major Flow Systems

While considered one basin from geologic and legal perspectives, the Chino Basin can be hydrologically subdivided into at least five flow systems that act as separate and distinct basins. Figure 4.5-1 is a groundwater elevation contour map for fall of 1997. It also shows the location of the five groundwater flow systems (Management Zones) developed during the *TDS and Nitrogen Study* (Wildermuth, 1999) of which the Watermaster, the Chino Basin Water Conservation District (CBWCD), and the IEUA are study participants. Each flow system has a unique hydrology, and water resource management activities that occur in each flow system have little or no impact on the other systems.

Each flow system can be considered a management zone. These management zones can be subdivided further if necessary to define and manage flow systems at a finer scale. These management zones are used to characterize the groundwater level, storage, production, and water quality conditions. Additionally, in the 1995 Regional Water Quality Control Plan (Basin Plan) for the Santa Ana Watershed, the Chino Basin was divided into three subbasins for management purposes (shown on Figure 4.5-2). The Regional Water Quality Control Board, Santa Ana Region (Regional Board) has established water quality objectives for these subbasins and writes waste discharge requirements for waste dischargers based in part on these objectives. Presently, the Basin Plan subbasin boundaries and objectives are being rigorously reviewed. New boundaries similar to the management zone boundaries have been proposed. Revised boundaries and water quality objectives should be adopted sometime in the near future.

Management Zone 1. Management Zone 1 is bounded: on the southwest by the Chino and Puente Hills; on the northwest by the San Jose fault that separates Chino Basin from the Pomona and Claremont Heights Basins; on the north by an unnamed non-echelon fault system associated with the Cucamonga and Red Hill faults and separates the Chino Basin from the Cucamonga Basin; and on the east by a line that stretches from the southern most edge of the Red Hill fault to Prado Dam.

Groundwater in Management Zone 1 flows generally south with some localized flows to the west in response to groundwater production. Sources of water to Management Zone 1 include direct percolation of precipitation, returns from irrigation, recharge of storm flows and imported water in spreading basins, and subsurface inflow from the Pomona, Claremont Heights, and Cucamonga Basins. Discharge is through groundwater production and as rising groundwater in Chino Creek and the Santa Ana River.

Management Zone 2. Management Zone 2 is bounded: on the west by Management Zone 1; on the north by the Red Hill fault that separates the Chino Basin from the Cucamonga Basin; on the northeast by a segment of the Rialto-Colton fault; and on the east by a segment of Barrier J and a line extending from Barrier J in a southwesterly direction to a point of convergence with other management zone boundaries near Prado Dam.

Groundwater in Management Zone 2 flows generally in a southwesterly direction in the northern half of the management zone and then due south in the southern half of the zone. Sources of water to Management Zone 2 include direct percolation of precipitation, returns from irrigation, recharge of storm flows and imported water in spreading basins and subsurface inflow from the part of the Rialto Basin northwest of Barrier J and the Cucamonga Basin. Discharge is mainly through groundwater production and potentially small amounts of rising groundwater in the Prado Reservoir area.

Management Zone 3. Management Zone 3 is bounded: on the west by Management Zone 2; on the northeast by the Rialto-Colton fault that separates the Chino Basin from the Rialto Basin; and on the southeast by the Bloomington divide, Jurupa Hills and a line projecting from the most western extension of the Jurupa Hills to a point of convergence with other management zone boundaries near Prado Dam.

Groundwater in Management Zone 3 flows generally in a southwesterly direction. Sources of water to Management Zone 3 include direct percolation of precipitation, returns from irrigation, and subsurface inflow from the part of the Rialto Basin southeast of Barrier J. Discharge is mainly through groundwater production and potentially small amounts of rising groundwater in the Prado Reservoir area.

Management Zone 4. Management Zone 4 is bounded: on the west by Management Zone 3; on the north by the Jurupa Hills; on the southeast by the Pedley Hills; and on the south by Management Zone 5.

Groundwater in Management Zone 4 flows west. Sources of water to Management Zone 4 include direct percolation of precipitation, and returns from irrigation. Discharge is through groundwater production.

Management Zone 5. Management Zone 5 is bounded: on the north and west by the Management Zones 3 and 4, and Prado Dam; on the east by the Riverside Narrows; and on the south by the La Sierra area and Temescal Basin.

Sources of water to Management Zone 5 include streambed percolation in the Santa Ana River, direct percolation of precipitation, returns from irrigation and subsurface inflow from the Temescal Basin. Discharge is through groundwater production, consumptive use by phreatophytes, and rising groundwater in the Prado Reservoir area, and potentially other locations on the Santa Ana depending on climate and season.

4.5.2.4 Groundwater Levels and Storage

Historical Groundwater Level Monitoring

Various entities have collected groundwater-level data in the past. Municipal and agricultural water supply entities have historically collected groundwater-level data in programs that range from irregular, study-oriented measurements to long-term periodic measurements. Groundwater-level measurements were made for specific investigations such as various California Department of Water Resources (DWR) studies, the 1969 Judgment on the Santa Ana River (Orange County Water District vs. City of Chino et al.), and the Chino Basin Judgment (Chino Basin Municipal Water District vs. City of Chino et al.). The spatial extent and temporal history of groundwater-level measurements south of State Route 60 have always been less than north of State Route 60. The DWR and the San Bernardino County Flood Control District (SBCFCD) were very active in collecting groundwater-level measurements in the Chino Basin prior to the settlement of the Chino Basin adjudication. After the Judgment was entered in 1978, the water level monitoring south of State Route 60 stopped almost completely except for the cities of Chino and Chino Hills, and the Jurupa Community Services District (JCSD).

Watermaster conducted its first mass groundwater-level monitoring program for the Chino Basin in the spring of 1986. In 1989, Watermaster initiated a more regular monitoring program for the Basin with groundwater-level measurements obtained in 1990, and periodically thereafter through 1997. Watermaster's program relies on municipal producers and other government agencies supplying their groundwater-level measurements on a cooperative basis. Watermaster staff supplements these data with groundwater-level measurements collected by staff, primarily south of State Route 60. In addition to Watermaster staff efforts, private contractors conducting well efficiency tests collect groundwater-level measurements and submit these measurements to Watermaster. Watermaster has digitized all of these recent measurements. Watermaster has combined digitized groundwater-level measurements from all known sources into a database structure that is maintained at Watermaster's office.

Watermaster began a process to develop a comprehensive groundwater-level monitoring program in the spring of 1998. The process consists of collecting groundwater-level data at all wells in the Basin from which groundwater-level measurements can be obtained for fall 1999, spring 2000, fall 2000, and spring 2001. These data will be mapped and reviewed. Based on this review and Watermaster management needs, a long-term water-level monitoring program will be developed and implemented in the fall of 2001.

Historical Groundwater Levels

This section describes the groundwater-level time histories in the Chino Basin by management zone and characterizes the differences between management zones. Figure 4.5-3 illustrates the location of wells whose groundwater-level time histories are discussed herein and the management zone boundaries described in Section 1. The wells were selected based on length of record, completeness of record, and geographical distribution. Wells discussed herein are identified by their state well number. The behavior of groundwater-levels at specific wells is compared to climate, to pre- and post-Judgment periods, and to other factors as appropriate.

Management Zone 1. Wells 01S07W08N01 (Figure 4.5-4) and 01S08W11R01 and 01S08W14A03 (Figure 4.5-5) illustrate typical groundwater-level time histories in the northern end of Management Zone 1. The accumulated departure from mean precipitation (ADFM) curve is plotted on Figures 4.5-4 and 4.5-5 to illustrate climatic conditions. Positive sloping lines on the ADFM curve imply wet years or wet periods. Negatively sloping lines imply dry years or dry periods. For example, the period between 1937 to 1944 and 1978 to 1983 are extremely wet periods, and are represented as positively sloping lines. The period 1945 through 1977 is a drought period and is represented as a negatively sloping line, punctuated with a few wet years (positively sloped in 1952, 1958 and 1969).

Short-term groundwater-level fluctuations shown in these figures are caused by including static and dynamic observations in the groundwater-level time histories. These time histories follow the climatic trends very closely with the 01S08W11R01 and 0S08W14A03 (westernmost wells) being slightly more sensitive to high rainfall years than 01S7W08N01 (eastern well). The groundwater-level response in well 01S7W08N01 lags the 1937 to 1944 and the 1978 to 1983 wet periods by about three to four years. By comparison, wells 01S08W11R01 and 0S08W14A03 responded to the 1978 to 1983 wet period within a year. The difference in response time is due to proximity of recharge to the area near the wells. Wells 01S08W11R01 and 0S08W14A03 are relatively close the Upland and Montclair Basins. Well 01S7W08N01 is two miles east of wells 01S08W11R01 and 0S08W14A03 with no significant recharge facilities nearby. In addition, the Metropolitan Water District of Southern California (MWDSC) recharged large quantities of State Water Project (SWP) water in the Montclair Basins during the period 1978 to 1983. The depth to water in the vicinity of these wells ranged from about 460 feet in the late 1920s to about 600 feet in 1996.

Wells 01S08W28E01 (Figure 4.5-6) and 01S08W31J01 and 01S08W33D01 (Figure 4.5-7) are about three miles south of wells 01S08W11R01 and 01S08W14A03 (Figure 4.5-5). These wells follow the general climatic trend, but show essentially no response to intermittent wet years in 1952, 1958, and 1969. The post-1977 groundwater-level increase is due to the 1978 to 1983 wet period, the reduction in overdraft following the implementation of the Chino Basin Judgment, the initiation of groundwater replenishment with imported water, and the reduction in pumping due to increased use of imported surface water. The groundwater-level response in these wells responded to the 1978 to 1983 wet period within a year. The depth to water in the vicinity of these wells ranged from about 130 to 160 feet in the late 1920s to about 150 to 280 feet in 1996 with well 01S08W28E01 showing the greatest depth to water. Well 01S08W28E01 is a municipal production well owned by the City of Pomona and is located in an area of regionally depressed groundwater levels.

Wells 02S08W04P01 and 02S08W12F01 (Figure 4.5-8) are located about two to three miles south of well 01S08W28E01 (Figure 4.5-10) and wells 01S08W31J01 and 01S08W33D01 (Figure 4.5-7). These wells follow the general climatic trend, but show essentially no response to intermittent wet years in 1952, 1958 and 1969. The groundwater-level responses in these wells lag the 1937 to 1944 and the 1978 to 1983 wet periods by about two to three years. The response to the 1937 to 1944 wet period is surprisingly subtle compared to most other wells with contemporaneous time histories in Management Zone 1. This suggests that recharge in the area is low and that production is high. The post-1977 groundwater level increase for 02S08W04P01 is due to the 1978 to 1983 wet period, the reduction in overdraft following the implementation of the Chino Basin Judgment, the initiation of groundwater replenishment with imported water, and the reduction in pumping due to increased use of imported surface water. The depth to water in the vicinity of these wells ranged from about 20 to 40 feet in the late 1920s to about 200 feet in 1982.

From north to the south, the following observations can be made regarding time histories of groundwater levels in Management Zone 1:

- groundwater levels are down from observed period of recorded highs in the late 1920s;
- the lowest groundwater levels were observed around 1977;
- groundwater levels have recovered slightly since 1977 due in part to the wet period of 1978 to 1983, reduction in overdraft after 1977, the initiation of groundwater replenishment with imported water, and the reduction in pumping due to increased use of imported surface water;
- a condition of long-term overdraft has occurred in this management zone with groundwater levels dropping by about 100 to 140 feet between the late-1920s to the present with most of the decline prior to 1977 and the Chino Basin Judgment (1978).

Management Zone 2. Figure 4.5-9 contains groundwater-level time histories for 01S07W14G01, 01S07W27D01, and 02S07W09M01. These wells are aligned north to south, approximately along a flow line. The groundwater-level time histories in Figure 4.5-9 show a general decline since before the 1937 to 1944 wet period, with little or no response to wet years until 1978. The post-1977 increase is probably due to the combination of 1978 to 1983 wet period, reduction in overdraft following the implementation of the Chino Basin Judgment, the start of artificial replenishment with imported water in the San Sevaine and Etiwanda flood control basins, and the increased use of imported surface water. The depth to water for 01S07W27D01 ranged from about 200 feet in the late-1920s to about 380 feet in 1974, a decline in groundwater levels of about 180 feet.

Management Zone 3. Figure 4.5-10 contains time histories for wells 01S06W11B01 and 01S05W-16C01 that are located in the most upgradient part of Management Zone 3. The groundwater-level observations in these wells follow the general climatic trend. The groundwater-level time history for well 01S06W16C01 shows a general decline since the 1920s and a general non-responsiveness to significant wet years or periods. For example, there is a slight response to the 1937 to 1944 and 1978 to 1983 wet periods and no response to wet years in 1952, 1958, and 1969. Well 01S06W11B01 behaves in a similar manner with slightly less responsiveness. The lack of responsiveness is attributable to the lack of significant sources of recharge.

There are no major streams or recharge basins in the upper part of Management Zone 3. There are three proposed recharge basins located centrally in this zone: Etiwanda recharge basins, plus Jurupa and Wineville basins. Regional Plant Site 3 is also being developed for groundwater recharge. The peak groundwater levels for both of these wells are lagged about three years behind the peaks in the ADFM curve for the 1937 to 1944 and 1978 to 1983 wet periods. The depth to water ranges from about 360 to 430 feet in the late 1920s to about 430 to 540 in 1978 for wells 01S05W16C01 and 01S06W11B01, respectively. The groundwater decline from the 1920s to the early-1990s is about 20 feet and 60 feet for wells 01S05W16C01 and 01S06W11B01, respectively.

Figure 4.5-11 is a similar plot for wells 01S05W30L01 and 01S06W23D01. These wells have similar response characteristics as 01S06W11B01 and 01S05W16C01 with about 60 to 70 feet of groundwater decline over the period from the late-1920s to the early-1990s.
The relative amount of decline from 1920s to 1977 is less in Management Zone 3 than in Management Zone 1. This is due to greater production in Management Zone 1 than in Management Zone 3 and because of the specific yield (fraction of usable groundwater per unit volume), which is greater in the eastern portion of Chino Basin than in the western portion. The alluvium in the eastern part of the Chino Basin is derived from granitic rocks of the San Gabriel Mountains. The alluvium on the west side of Chino Basin is derived in part from the San Gabriel Mountains and also from marine sedimentary rocks of the Chino and Puente Hills. The latter produce finer-grained alluvium with more clay and poorer storage properties.

Figure 4.5-12 contains time histories for wells 02S06W05B01 and 02S07W34H01. These wells are aligned northeast to southwest, approximately along a flow line. The groundwater-level time histories end in the late 1970s or early 1980s, as is typical for agricultural wells in the southern half of the Basin. These time histories follow the general climatic trend, however, there is trend among the wells of a decreasing climatic influence from northeast to southwest. The depth to water for 02S06W05B01 ranged from 130 feet in the late-1920s, to about 200 feet in 1978, a decline in groundwater levels of about 70 feet.

Management Zone 4. Management Zone 4 is bounded on the north by the Jurupa Hills, on the east by the Pedley Hills, on the south by Management Zone 5 and on the west by Management Zone 3. The only outflow from Management Zone 4 is by production. Figure 4.5-13 contains groundwater-level time histories for wells 02S06W16B02 and 02S06W14C02. These wells generally follow the climatic trend. The depth to water for 02S06W14C02 ranged from about 7 feet in 1945 to about 17 feet in 1993, corresponding to an overall decline in groundwater levels of about 10 feet for this period.

Management Zone 5. Management Zone 5 is bounded on the north and west by the Management Zones 3 and 4, on the east by the Riverside Narrows and on the south by various unnamed hills. Figure 4.5-14 contains time histories for wells 02S07W36H02, 02S06W26D02, and 03S07W03N01. Groundwater levels in these wells follow the general climatic trend. However, wells 2S07W36H02 and 03S07W03N01 are much less responsive than well 02S07W26D02 due to the stabilizing effects of being adjacent to the Santa Ana River. The depth to water for 02S07W26D02 ranged from about 24 feet in 1939 to about 28 feet in 1992, corresponding to an overall decline in groundwater levels of about 4 feet for this period.

For the most part, the response of groundwater levels in the Chino Basin to significant storms and wet climatic periods is small. There are two reasons for this. First, the mountain drainage areas tributary to the Chino Basin are relatively small compared to the size of Chino Basin (235 square miles) and the amount of water in storage (~5,000,000 acre-ft). The mountain drainage areas tributary to the Chino Basin areas are:

San Antonio Creek	17.7 sq mi
Cucamonga Creek	13.6
Deer Creek	6.4
Day Creek	7.7
Etiwanda Creek	6.7
San Sevaine Creek	9.7
TOTAL:	61.7 sq mi

San Antonio Creek is mostly diverted for direct use and recharge in the Claremont Heights and Cucamonga Basins. Cucamonga, Deer, and Day Creeks are diverted for direct use and recharge in the Cucamonga Basin. Large storm flows from these creeks can make it into the Chino Basin, however these channels are concrete-lined and consequently large amounts of storm flow are not recharged. In contrast, San Bernardino area groundwater basins (Bunker Hill and Lytle Basins) – located just to the east of the Chino Basin – consist of about 120 square miles of aquifer and with about 466 square miles of tributary areas in the San Gabriel and San Bernardino mountains. The groundwater level response in the Chino Basin due to wet years is small, on the order of a few feet to tens of feet. In contrast, the San Bernardino area groundwater-level response to significant wet years and climatic periods could range from 100 to 300 feet.

Regional Groundwater Level Changes

Figures 4.5-15 and 4.5-16 are groundwater elevation contour maps for the Chino Basin for 1997 and 1933, respectively. The 1997 map is based on data collected in Watermaster's ongoing monitoring programs and is representative of current conditions. The 1933 map is based on groundwater-level data compiled and mapped by the DWR. Figure 4.5-17 shows the change in groundwater level from 1933 to 1997 based on the groundwater elevation maps for 1933 and 1997. The regional groundwater decline over this time frame by management zone is:

Management Zone	Range
1	50 to 150 feet
2	50 to 100 feet
3	50 to 100 feet
4	less than 50 feet
5	less than 50 feet

Figure 4.5-18 is a map similar to Figure 4.5-17 with the water service area boundaries shown in place of management zone boundaries. The areas of greatest regional groundwater decline underlie the City of Pomona, the Monte Vista Water District, the City of Chino, and the western half of the City of Ontario.

Figure 4.5-19 shows the depth to water for fall 1997. Mendenhall surveyed the Basin in 1902 and found parts of the Chino Basin to be artesian as evidenced by springs and marshy areas (Mendenhall, 1904). This artesian area is also shown on Figure 4.5-19. In the artesian areas, the historical groundwater level or piezometric surface was at or exceeded the ground surface. Figure 4.5-19 suggests that the regional groundwater decline in the western Chino Basin is up to 200 feet since

1902. Groundwater levels appear to have stabilized since the Chino Basin Judgment was implemented and groundwater production has been managed within the Basin's safe yield. However, there may still be areas experiencing localized overdraft including the area overlain by the Cities of Chino, Chino Hills, Pomona, the western portion of the City of Ontario, and the Monte Vista Water District. Todd defines the safe yield of a groundwater basin as the amount of water that can be withdrawn annually without producing an undesirable result. Withdrawal or production is excess of safe yield is an overdraft. Domenico (1972) defines undesirable results to include not only the depletion of groundwater in storage but also intrusion of water of undesirable quality, contravention of existing water rights, and the deterioration of the economic advantages of pumping. Cherry (1979) includes subsidence in the list of undesirable results.

The significant issues related to large-scale regional groundwater declines in the Chino Basin include: decline in storage, higher pumping costs, loss of production capacity, water quality degradation, and subsidence.

In the mid-1970s, ground fissuring was identified in the southwestern portion of Chino Basin. Ground fissuring in this area has continued to the present, and subsidence has been documented and identified as the cause of ground fissuring (Kleinfelder, 1993; 1996). Kleinfelder documented regional subsidence through an analysis of topographic benchmarks from 1987 to 1993, 1993 to 1995, and from 1995 to 1999. The resulting contour maps of equal differences in elevation revealed a north-south trending, elongated area of subsidence underlying the City of Chino and California Institute of Men (CIM) (see Figures 4.5-19 and 4.5-20). Maximum subsidence over the period 1987-1995 was reported to be about 2 feet located along Central Avenue between Schaefer and Eucalyptus Avenues. However, about one foot (or 50 percent) of this subsidence occurred over the period from 1993-1995 – indicating that the rate of subsidence has increased. This was confirmed independently by scientists at the Jet Propulsion Laboratories using remote sensing (see www-radar.jpl.nasa.gov/sect323/InSar4crust/LosAngeles.html). Kleinfelder (1993; 1996) concluded that regional subsidence was caused by localized groundwater overdraft and declining groundwater levels. The reasoning to support this conclusion is four-fold:

- As shown in Figure 4.5-19, the area of regional subsidence and ground fissuring geographically coincides with the late 1800s artesian area mapped by Mendenhall (1904, 1908) – an area that has experienced extreme declines in groundwater levels.
- Subsidence is well documented in areas where underlying soils have experienced extensive fluid withdrawal. In saturated soils, buoyant conditions exist, where stresses between soil particles are low. But as the water level drops, the stresses between soil particles increase and overburden pressure causes soil consolidation.
- The initiation of ground fissuring temporally coincides with new groundwater production by the city of Chino Hills in the area of maximum subsidence. By 1975, groundwater levels had declined by a maximum of 200 feet in the former artesian area.
- Regional subsidence and ground fissuring is not attributable to other potential causes of subsidence. The area does not coincide with known faults or groundwater barriers and the area has not experienced significant petroleum extractions.

The OBMP report contains a detailed discussion of the methodology for estimating groundwater storage in the Chino Basin. The methodology is not repeated here since it is not essential to an understanding of the estimated groundwater in storage. Those persons interested in this methodology can obtain a copy from the IEUA or Watermaster office upon request.

The safe yield of a groundwater basin approximates the average annual recharge in a basin if the storage in the basin is large. The larger the storage, the more reliable the basin will be in dry period. The amount of water in storage in the Chino Basin is directly proportional to groundwater level. In most parts of the Chino Basin, unconfined aquifers overlie confined aquifers. Thus, the storage in some grid cells consists of the sum of water in storage in confined and unconfined aquifers. The volume of groundwater in storage in each grid cell was estimated in the OBMP. Not all the water in storage is available for production. A minimum volume of groundwater must be maintained in storage to ensure that groundwater can flow to wells. This minimum storage is included in the volume computations.

A maximum storage could also be defined, although it is more difficult to do so. The difficulties associated with maximum storage relate to defining which high groundwater-level impacts are acceptable and to whom. An across-the-basin increase of 50 feet would probably impact only those lands near the Santa Ana River with unknown water quality impacts everywhere.

Time History of Groundwater Storage for the Basin

Groundwater-level maps were prepared using all available data for 1933, 1965, 1969, 1974, 1977, 1983, 1991, and 1997. Aquifer geometry and storage properties were developed from the Chino Basin Water Resources Management Study (CBWRMS) (Montgomery Watson, 1995). Equations defined in the OBMP were used to estimate the groundwater in storage for these years. Figures 4.5-15 and 4.5-16 illustrate the spatial distribution of groundwater elevations within the Chino Basin for the fall 1997 and 1933, respectively. The estimated volume of groundwater in storage in the Chino Basin using this methodology and information was:

Year	Volume (acre-feet)
1933	6,300,000
1997	5,300,000

Groundwater storage decreased by about 1,000,000 acre-ft during the 64-year period of 1933 to 1997. Table 4.5-1 lists the estimated storage in each of the management zones shown in Figure 4.5-1 and aggregations of the management zones into the Lower Chino Basin (south of State Route 60), the Upper Chino Basin (north of State Route 60) and the Total Chino Basin. The storage estimates in Table 4.5-1 are shown graphically in Figures 4.5-21 and 4.5-22. The lowest level of groundwater storage during the period 1960 to the present occurred in 1977 at the end of a 33-year drought. Prior to 1977, groundwater storage was falling at a rate of about 25,500 acre-ft/yr. The decline in storage was due to drought and groundwater production in excess of sustainable yield. The period of 1978 though 1983 was an extremely wet period. The physical solution with the Chino Basin Judgment was implemented in 1978. The end of the drought and the elimination of basin-wide overdraft caused an increase in storage. Table 4.5-1 shows the change in storage relative to 1977 (the lowest level of storage) for the period 1965 to 1997. The losses in storage that occurred during the period 1965 to 1977 have been partially offset by gains in storage that occurred after 1977.

Figure 4.5-23 shows the time history of storage in the upper and lower parts of the Chino Basin. There was a decline in storage prior to 1977. After 1977, storage in the upper basin increases, however the rate of increase declines over time. This continued increase in storage after 1983 probably is due to:

- accumulation of unproduced safe yield rights in local storage accounts;
- lagged inflows from the deep unsaturated zone in the northern half of the Basin; and
- lagged subsurface inflows from the Lytle Basin north of Barrier J and the Riverside Basin through the Bloomington divide.

After 1977, storage in the lower part of the Basin appears to have stabilized and follows the general climatic pattern.

Table 4.5-2 and Figure 4.5-24 show a comparison of the time history of total Chino Basin storage to groundwater production, volume of water stored in cyclic and local storage accounts, and climate. As of fall 1997, the combined volume of water in cyclic and local storage accounts was about 274,000 acre-ft and is greater than the increase in total storage that occurred between 1977 (pre-Judgment) and the present. The increase in storage since 1977 is about 174,000 acre-ft. This is counter intuitive, that is, the change in total storage since 1977 should be greater than the volume of water in cyclic and local storage accounts – especially given that the Basin has experienced a wetter than average period since 1977. The discrepancy may be due in part to under reporting of production in the agricultural pool, storage losses to the Santa Ana River, and inaccuracies in the methods used to compute storage herein.

Losses From Storage

The surface water discharge in the Santa Ana River consists of storm flow and baseflow. Baseflow is divided into two components: wastewater discharged from publicly-owned treatment plants (POTWs) and rising groundwater. The rising groundwater component in the Santa Ana River can be divided into two components: short-term storage water from seasonal recharge along the river, and persistent rising water caused by the regional groundwater gradient towards the river. The short-term storage component of rising water will decrease when total groundwater storage is increased either naturally (wet years) or artificially. If total groundwater storage is maintained at higher levels, recharge of surface water from the Santa Ana River will decrease.

Because of the spatial distribution of storage, the rising groundwater response to increases in groundwater storage is often lagged and variable in time. For example, the baseflow at Riverside Narrows (the location where the Santa Ana River enters the Chino Basin) peaks about five to seven years after heavy recharge years in the upstream groundwater basins. Chino Basin groundwater discharge to the river also exhibits a slight lag time. The time history of baseflow at Prado consists of a complicated mix of rising water responses from the Bunker Hill, Riverside, Chino and Temescal Basins.

Analysis of the increase in rising water in the Chino Basin caused by an increase in groundwater storage requires the filtering out of these other sources of surface discharge from historical records and modeling results.
The accumulation of groundwater in storage will cause an increase in groundwater discharge in the Santa Ana River and its tributaries Chino Creek and Mill Creek – losses from storage that are not recoverable. The physics of the groundwater storage-baseflow relationship can be represented by linear reservoir theory where outflow is directly proportional to storage:

$$O = K * S \quad \text{(Equation 1)}$$

where:

O	is the outflow from storage (L3/T)
S	is volume of water in storage (L3)
K	is the linear reservoir coefficient (T -1)
L	denotes units of length and
T	denotes unites of time.

This formula can be calibrated to a specific range of storage and groundwater management conditions. The flow in the Santa Ana River in the Chino Basin was decomposed into rising water from the Chino Basin and other components. The rising water component was subdivided into short-term storage water from seasonal recharge along the river in Management Zone 5, and persistent rising water caused by the regional groundwater gradient towards the River from all management zones. This decomposition was done using simulation model results from the Chino Basin Integrated Groundwater and Surface Water Model (CIGSM) developed for the Chino Basin Water Resources Management Task Force (Montgomery Watson, 1995, and unpublished modeling results for calibration and planning simulations).

Historical Storage Losses to the Santa Ana River. Rising groundwater estimates were made for the period of model calibration 1960 to 1989, and the forecasting period of 1990 to 2040. Certain historical periods were studied to isolate the spatial effects of groundwater production patterns and hydrology on rising groundwater. For example, the period 1960 to 1977 represents the pre-Judgment period that has higher groundwater production than the period after 1978 that represents the period when the Basin was managed by Watermaster without basin-wide overdraft. Linear reservoir theory was used to develop a simple relationship of change in groundwater discharge to the Santa Ana River to incremental change in groundwater storage.

Hydrograph decomposition for the historical period was done using water balance tables from CIGSM for reaches of the Santa Ana River and its tributaries. Analysis of the hydrology of the period suggest that two periods could be used to develop a linear reservoir relationship:

- 1970 to 1977 representing a pre-Judgment period; and
- 1984 to 1989 representing a post-Judgment period.

The period 1970 to 1977 was a dry period following significant recharge along the river from the 1969 storms. The 1984 to 1989 period was also a dry period following the wet period from 1978 to

1983. Both of these periods exhibit recession flows typical of streams fed by groundwater systems. CIGSM model-estimated rising water was plotted against the model-estimated storage in the Chino Basin. The annual rising water estimates and respective storage estimates are shown graphically in Figures 4.5-25 and 4.5-26. Simple linear regressions were done for the 1974 to 1977 period and 1987 to 1989 period to estimate the linear reservoir coefficient (K) for the linear reservoir equation (Equation 1). The linear reservoir coefficient is the slope of the best-fit lines in Figures 4.5-25 andO4.5-26. The resulting linear reservoir coefficients are 0.0254 for the 1970 to 1977 period, and 0.0203 for the 1987 to 1989 period. Physically, the linear reservoir coefficient represents the fraction of the storage that annually becomes rising water. Thus, an increase in storage of 100,000 acre-ft in the 1987 will cause about 2,000 acre-ft of new rising water in the first year. Groundwater storage after the first year would be reduced to 98,000 acre-ft. In the second year, the storage would be reduced another 2.03 percent, or 1,970 acre-ft, and so on. The 0.0051 difference in linear reservoir coefficients for the pre- and post-Judgment periods is due in part to changes in groundwater production patterns, hydrology, and CIGSM modeling artifacts.

Future Storage Losses to the Santa Ana River. An estimate of the linear reservoir coefficient for the period 1990 through 2040 was estimated by comparing the total Santa Ana River flow at Prado Dam and groundwater storage for Alternatives 3 and 4 of the CBWRMS. Alternative 3 represents a specific groundwater management strategy that could be implemented. Alternative 4 is identical to Alternative 3 with the addition of a conjunctive use program and an increase in limits for local storage accounts. (Note the alternatives considered in the OBMP are similar to, but not precisely the same, as alternatives considered in the PEIR.) The conjunctive use program has three cycles of build up in storage to approximately 300,000 acre-ft and subsequent pump-out periods. The increase in storage in local storage accounts is gradual and incremental throughout the period. The rising water losses from the conjunctive use storage and the increase in local storage accounts are simply the difference in Santa Ana River flow between these alternatives. Table 4.5-3 lists the differences in groundwater storage and Santa Ana River flow. The linear reservoir coefficient for future conditions is estimated to be about 0.0408, or 4.1 percent of storage – about double that of the 1984 to 1989 period. The increase in the linear reservoir coefficient was caused by changes in groundwater production patterns, hydrology, and CIGSM modeling artifacts.

Computation of Storage Losses to Santa Ana River. The linear reservoir equation can be used to estimate losses from groundwater storage accounts to the Santa Ana River:

$$qt = K * (St + 0.5 * T *(It - Qt)) \quad \text{(Equation 2)}$$

where:

qt	is the annual loss from a storage account in period t to t+1 (acre-ft/yr)
K	is the linear reservoir coefficient
St	is water in a storage account at the end of period t (acre-ft)
It	is the water put into a storage account in period t to t+1 (acre-ft/yr)
Qt	is the water taken from the storage account for use in period t to t+1 (acre-ft/yr)
T	duration of time between t to t+1, assumed to be one year

The volume of water in storage accounts at the end of a period is equal to:

$$S_{t+1} = S_t + T * (I_t - Q_t - q_t) \quad \text{(Equation 3)}$$

Using a linear reservoir coefficient of 0.0201 and Equation 2, the total water lost from local storage accounts and cyclic storage since the Judgment became active in 1978 is estimated to be about 50,000 acre-ft or about 18 percent of the volume that Watermaster currently assumed was in storage. The time history of accumulating storage accounts and estimated losses to baseflow are listed in Table 4.5-4. Watermaster does not currently compute losses from storage accounts. This means that when water in storage accounts is produced, additional overdraft of the Basin will occur. Losses from conjunctive use projects could be very large. In the example in Table 4.5-3, three filling and withdrawal cycles were done over a 40-year period with each reaching a fill capacity of 300,000 acre-ft. The model estimated losses of over 300,000 acre-ft over three fill and extraction cycles – a loss of over one-third of the water stored. If these losses were not accounted for, the Basin would be overdrafted by 300,000 acre-ft over the 40-year period.

The losses described above were developed from modeling studies. Watermaster indicates that monitoring to verify these losses has not been done in the past nor is it practical in the future. The measuring errors associated with such a program would be larger than the probable losses from storage. IEUA staff believes that monitoring can accomplish identification of direction of flow by monitoring water quality in the wells; thus indicating interception of flows downgradient in the Basin for drawing water from the Santa Ana River. Watermaster concluded that the only practical ways to estimate such losses are to:

- Use a linear reservoir model as described above, or
- Calibrate a groundwater flow model over the period that water is held in cyclic, local, and conjunctive use storage and compare it to a simulation run with the same hydrology that did not have water in these storage accounts. The difference in groundwater discharge to the river would be the losses due to cyclic, local, and conjunctive use storage. Adjustments to storage accounts could be made retroactively or a new loss factor established for the next period.

4.5.2.5 Groundwater Production

Historical Groundwater Production Monitoring

Prior to 1975, groundwater production monitoring was not formally done by a single entity for the benefit of the Basin. Municipal and some industrial producers kept production records with some submitting annual production reports to the State Water Resources Control Board (SWRCB). Very few agricultural wells had meters and fewer kept records of production. During the period 1975 to 1978, production monitoring at agricultural wells improved slightly. Most of the agricultural production volumes for the period preceding 1978 are comprised of estimates provided by producers and are not based on direct measurements from in-line flow meters.

Since 1978, Watermaster has collected information to develop production estimates. Production estimates in the appropriative pool and overlying non-agricultural pool are based on totalizing in-line flow meter data provided to Watermaster on a quarterly basis by these producers. Watermaster aggregates these quarterly values to obtain annual production for these pools. Production estimates for the agricultural pool are based in part on totalizing in-line flow meter data, water duty methods, and hour-meter data combined with well efficiency tests. As with the other pools, reporting is done by the producers. However, not all agricultural pool producers provide Watermaster with estimates of their production. About one third of agricultural pool producers either did not file production reports or filed incomplete reports in fiscal year 1997/98 (telephone discussion with Jim Theirl, 1998).

Historical Groundwater Production

Table 4.5-4 contains estimates of annual groundwater production in the Chino Basin from three different sources: summaries of SWRCB filings and interviews with some producers; Watermaster estimates, and production estimates developed for calibration of CIGSM developed for the CBWRMS. The second column in Table 4.5-5 contains annual production estimates that were used to develop the safe yield in the Judgment. The third column contains Watermaster estimates of annual production that are based on production reports submitted to Watermaster by the producers. The fourth column contains annual production estimates that are based on SWRCB filings, production reports from producers, and water duty methods. In the latter case, water duty methods were used as a check on reported production and supplemented reported production data when production data was missing or under-reported at wells.

The safe yield of the Chino Basin was based on the hydrology of the period 1965 to 1974. The average annual groundwater production for that period from SWRCB filings and interviews was estimated at 152,100 acre-ft/yr. The engineer working on the historical production data knew there was unaccounted for production and assumed that actual production was 20 percent more than the estimate from SWRCB filings and interviews, or about 180,000 acre-ft/yr (Carroll, 1977). This estimate is close to the 189,400 acre-ft/yr average for the same period from the CBWRMS.

In Table 4.5-5, the period of Watermaster groundwater production estimates overlaps the period of CBWRMS production estimates. For their common period of record (1975 through 1989), the CBWRMS estimates are consistently higher. This occurs in part because some of the agricultural producers fail to report production or fail to provide production information to Watermaster. For the CBWRMS, water demands based on land use were compared to reported production. If the water demand for the land uses in a given area was greater than reported production, then reported production was increased to meet the demands based on land use. This method was validated in the CIGSM model calibration process (Montgomery Watson, 1993). In the latter years, the CBWRMS production estimates increasingly diverge from Watermaster estimates. For their common period of record, the average annual groundwater production was estimated at 147,900 acre-ft/yr by Watermaster and 174,000 acre-ft/yr by the CBWRMS – a difference of about 26,000 acre-ft/yr. Actual production is probably somewhere in between Watermaster and CBWRMS estimates.

Spatial and Temporal Changes in Groundwater Production

Table 4.5-6 lists Watermaster's estimates of Chino Basin production by pool for the period of fiscal year 1974/75 to 1997/98, and the relative amount of production by pool. Over this period, groundwater production has ranged from a high of 181,000 acre-ft/yr (1975/76) to a low of about 122,600 acre-ft/yr (1982/83), and has averaged about 147,100 acre-ft/yr. The distribution of production by pool has shifted since 1975 with the agricultural pool production dropping from about 55 percent in 1974/75 to 28 percent in 1996/97. During the same period, appropriative pool production increased from about 40 percent in 1974/75 to 68 percent in 1996/97. The increases in appropriative pool production have kept pace with decline in agricultural production. Production in the overlying non-agricultural pool declined from about 5 percent in 1974/74 to about 2 percent in the mid-1980s, rose to about 4 percent by 1990/91 and has remained at about 4 percent of total production thereafter.

Figure 4.5-27 is a plot that compares the change in total groundwater production in the Chino Basin to the change in urban and agricultural/other non-urban land uses. Prior to 1980, the decline in groundwater production appears proportional to the decline in agricultural and other non-urban land uses. After 1980, groundwater production appears to be relatively stable even though the decline in agricultural and other non-urban land uses is accelerating.

Figures 4.5-28 and 4.5-29 are similar to Figure 4.5-27 except they represent the Basin north of State Route 60 and south of State Route 60, respectively. North of State Route 60, the pattern of land use change is similar to the entire basin, but the groundwater production that was declining from 1960 to 1980 rose sharply after 1980. South of State Route 60, groundwater production was generally declining throughout the period of 1960 to 1990. The rate of decline in production in the southern half of the Basin after 1980 matches the rate of increase in production north of State Route 60, such that the total annual production in the Basin after 1980 is relatively constant (see Figure 4.5-27).

Figures 4.5-30 through 4.5-34 illustrate the location and magnitude of groundwater production at wells in the Chino Basin for years 1960, 1970, 1980, 1989 and 1997. These maps are based on production estimates developed in the Chino Basin Water Resources Management Study (Montgomery Watson, 1995) and by Watermaster. Two trends are evident in the period 1960 through 1998:

- In the southern half of the Basin there is an increase in the number of active wells and a decrease in the per well production. This is due to the land use transition from predominately irrigated agriculture uses to predominately dairy uses and due to a recent well inspection program, resulting in more wells of record.

- In the northern half of the Basin there is an increase in the number of wells producing over 2,000 acre-ft/yr. This is consistent with the land use transition from agricultural uses to urban uses and with the trend for increasing imported water costs.

Groundwater Production and Safe Yield

Recent and past studies have provided some insight into the influence of groundwater production in the southern end of the Chino Basin on the safe yield of the Basin. Three studies were done that quantified the impacts of proposed desalters in the lower Chino Basin on groundwater discharge to the Santa Ana River. The proposed desalters were first described in Nitrogen and TDS Studies, Upper Santa Ana Watershed (James M. Montgomery, Consulting Engineers, Inc., 1991). This study matched desalter production to meet future potable demands in the lower Chino Basin through the year 2015. The well fields were sited to maximize the interception of rising water and to induce streambed percolation in the Santa Ana River. The decrease in rising water and the increase in streambed percolation were projected to range from 45 to 65 percent of total desalter production.

Well field design studies for the SAWPA desalter provided estimates of the volume of rising water intercepted by the currently proposed desalter – scheduled for completion in March 2000 (Wildermuth, 1993). These studies used a very detailed model of the lower Chino Basin (rectangular 400-foot by 400-foot grid covering the lower Chino Basin) to evaluate the hydraulic impacts on rising water and groundwater levels at nearby wells. These studies showed the relationship of interception of rising water to well field location and well field capacity. The fraction of the desalter production composed of decreased rising water and the increased stream bed percolation water was estimated to range from 40 to 50 percent.

No formal studies and estimates of desalter well field interception of rising water were made during the Chino Basin Water Resources Management Study (Montgomery Watson, 1995). An informal estimate of the interception of rising water was made by Wildermuth (letter to Neil Cline, dated August 9, 1993). Wildermuth used the groundwater model developed in Chino Basin Water Resources Management Study for a well field similar to the SAWPA desalter well field and used the model calibration period of 1960 to 1989. This study estimated the interception of rising groundwater at about 80 percent of desalter production capacity.

These three studies suggest that the yield of the Basin could be increased by simply increasing the production near the river, and that for every two acre-ft of new, near-river production the safe yield could be increased by one acre-ft, that is the marginal change in safe yield with increased near-river production is about 0.5 acre-ft/yr per acre-ft/yr of production. The opposite is also true. That is, if production were to decrease in the southern half of the Basin, the safe yield will also decrease. Agricultural production is projected to decrease about 40,000 acre-ft/yr when current agricultural land use transitions to urban use. If the magnitude and spatial distribution of current agricultural production is not replaced with new production then the yield of the Chino basin will decrease by a comparable amount.

4.5.2.6 Historical and Current Groundwater Quality

Historical Groundwater Quality Monitoring

Various entities have collected groundwater quality data in the past. Municipal and agricultural water supply entities have collected groundwater quality data to comply with Department of Health Services requirements under Title 22 or for programs that range from irregular study-oriented measurements to long-term periodic measurements. Groundwater quality observations have been made by the DWR, by participants in the 1969 Judgment on the Santa Ana River (Orange County Water District vs. City of Chino et al.), by dischargers under order from the Regional Board, and by the County of San Bernardino. The DWR and the SBCFCD were very active in collecting groundwater quality data in the Chino Basin prior to the settlement of the Chino Basin adjudication. After the Judgment was entered in 1978, monitoring south of State Route 60 stopped almost completely except for the cities of Chino, Chino Hills, and Norco, and the Jurupa Community Services District (JCSD). Most of the pre-1978 measurements were digitized by the DWR. In 1986, Metropolitan Water District of Southern California (Metropolitan) conducted the first comprehensive survey of groundwater quality covering all constituents regulated in California Code of Regulations Title 22.

In 1989, Watermaster initiated a regular monitoring program for the Basin with groundwater quality data obtained in 1990 and periodically thereafter to the present. Watermaster's program relies on municipal producers and other government agencies supplying their groundwater quality data on a cooperative basis. Watermaster staff supplements this data with data obtained through a Watermaster sampling and analysis program in the area south of State Route 60. Water quality data are also obtained from special studies and monitoring that takes place under orders of the Regional Board. Watermaster has combined previously digitized groundwater quality data from all known sources into a database structure that is maintained at Watermaster's office.

Watermaster plans to begin the development of a new, more comprehensive water quality monitoring program to support the OBMP starting in July 1999. The program consists of two phases. The initial phase consists of collecting and analyzing groundwater quality samples at all producing wells in the over a three year period starting in July 1999. These data will be mapped and reviewed. Based on this review and Watermaster management goals in the OBMP, a long-term monitoring program will be developed The second phase consists of implementing the long term monitoring program and will start in July 2002.

<u>Water Quality Conditions</u>

Sources of water quality degradation can be classified into point and non-point sources. Point sources are confined to point discharges to the soil, groundwater, or stream systems. Examples include conventional wastewater and industrial discharges to streams or ponds, and leaky underground storage tanks. Non-point sources are areal discharges to soil, groundwater and surface waters, such as land application of waste and fertilizers and atmospheric deposition of contaminants to the soil and water bodies. The discussion below describes the water quality state of the Basin as it exists today for specific constituents of concern. The constituents described below are regulated for drinking water purposes in California Code of Regulations, Title 22 or are regulated in the 1995 Water Quality Control Plan for the Santa Ana River Basin (Basin Plan).

Figures 4.5-35 a-h illustrate land uses in the Chino Basin in 1933, 1949, 1957, 1963, 1975, 1984, 1990 and 1993. These land use maps were developed from DWR land use surveys for 1933 through 1984, and from Southern California Association of Governments surveys for 1990 and 1993. The maps show a steady, dramatic change over time from agricultural to urban land uses. An exception to this occurs in the southern Chino Basin where dairies have moved in to replace irrigated and non-irrigated agriculture. These maps are useful in characterizing water quality degradation associated with non-point source loading from agriculture. The land uses shown in these maps are quantified in Table 4.5-7.

Total Dissolved Solids (TDS). TDS is regulated as a secondary contaminant in Title 22. The recommended drinking water maximum contaminant level (MCL) for TDS is 500 mg/l, however the upper limit is 1,000 mg/l. For irrigation uses, TDS should generally be less than 700 mg/l. The Regional Board has established TDS limitations for all municipal wastewater plants that discharge recycled water to the Santa Ana River. A problem arises in that TDS concentrations increase through municipal use – typically by about 150 to 250 mg/l. The TDS limitations for water recycling plants that discharge to the Santa Ana River in the Chino Basin are listed below:

Plant	TDS Limit (mg/l)
IEUA RP1	540
IEUA RP2	610
IEUA Carbon Canyon	555
IEUA RP4	505
Western Riverside Regional	625
City of Riverside	650
Jurupa Indian Hills	650

The TDS in source (drinking) water generally must be kept well below 500 mg/l (preferably less than 300 mg/l) to ensure that recycled water discharged to the Santa Ana River and its tributaries meets Regional Board limitations. The treatment cost to remove TDS from water is very expensive – about $500 to $700 per ton.

Table 4.5-9 provides the average TDS concentrations by well for five-year periods from 1961 to 1995. These wells are grouped by management zones. Figures 4.5-36 through 4.5-38 show average TDS concentrations in groundwater measured at wells for the periods 1961 to 1965, 1971 to 1975, and 1991 to 1995. Historically, TDS has not been measured at wells on an annual basis. The choice of one year, say 1963 for example, might have only one-third as many TDS measurements at wells compared to a five-year period. Thus, averaging TDS over a five-year period was necessary to get adequate spatial coverage of measurements.

TDS concentrations in the northeast part of the Basin range from about 170 to about 300 mg/l for the period 1960 through 1990, with typical concentrations in the mid- to low-200s. TDS concentrations in excess of 200 mg/l indicate degradation from overlying land use. With few exceptions, areas with significant irrigated land use or dairy waste disposal histories overlie groundwater with elevated TDS concentrations. The exceptions are areas where point sources have contributed to TDS degradation, such as the former Kaiser Steel site in Fontana and the former wastewater disposal ponds near IEUA Regional Plant No. 1 (RP1) in South Ontario. The TDS anomaly from Kaiser is not shown on Figures 4.5-36 through 4.5-38 A TDS anomaly from former municipal wastewater ponds can be seen in the east central part of Management Zone 2.

The impacts of agriculture on TDS in groundwater primarily are caused by fertilizer use on crops, consumptive use, and dairy waste disposal. The TDS impacts from the dairies located in the southern half of the Basin is reflected at least partially in Figures 4.5-37 and 4.5-38. The intensity of the TDS loading from dairy waste to the Basin is illustrated in Table 4.5-8 (Table 2-1 from Final Task 6 Memorandum, Development of a Three-Dimensional Groundwater Model, Montgomery Watson, 1994). This table shows the steady buildup of the dairy cattle population in the southern Chino Basin between 1949 and 1989. The total amount of TDS from manure discharged to the southern half of the Basin that will reach groundwater is estimated to be about 1,200,000 tons through 1989 and averages about 29,000 tons per year. The dairy loading numbers in Table 4.5-8 assume that half of the manure was hauled out of the Basin after 1973, which was a requirement of the Santa Ana watershed Water Quality Control Plan enacted in 1973. The amount of manure exported out of the Basin was never verified until the late 1990's. The TDS loading to groundwater from dairy waste disposal activities could be far greater than estimated in Table 4.5-8.

As irrigation efficiency increases, the impact of consumptive use on TDS in groundwater also increases. For example, if source water has a TDS concentration of 250 mg/l, and the irrigation efficiency is about 50 percent (flood irrigation), the resulting TDS concentration in the returns to groundwater will be 500 mg/l, exclusive of the mineral increments from fertilizer. If the irrigation efficiency were increased to 75 percent, the resulting TDS concentration in the returns to groundwater will be 1,000 mg/l, exclusive of the mineral increments from fertilizer. For modern irrigated agriculture, the TDS impacts of consumptive use are more significant than mineral increments from fertilizers.

TDS concentrations in groundwater have increased slightly or remained relatively constant in the northern parts of Management Zones 1, 2, and 3. TDS concentrations are significantly higher in the southern parts of Management Zones 1, 2, and 3, and all of Management Zone 5 where they typically exceed the 500 mg/l recommended MCL and frequently exceed the upper limit of 1,000 mg/l.

Nitrate. Nitrate is regulated in drinking water in Title 22 with an MCL of 10 mg/l (as nitrogen). Table 4.5-10 provides the average nitrate concentrations by well for 5-year periods from 1961 to 1995. These wells are grouped by management zones. Figures 4.5-39, 4.5-40, and 4.5-41 show the average nitrate concentrations in groundwater measured at wells for the periods 1961 to 1965, 1971 to 1975, and 1991 to 1995. Nitrate measurements in the surface water flows in the San Gabriel Mountains and in groundwater near the foot of these mountains are generally less than 0.5 mg/l (Montgomery Watson, 1993). Nitrate concentrations in excess of 0.5 mg/l indicate degradation from overlying land use. Similar to TDS, areas with significant irrigated land use or dairy waste disposal histories overlie groundwater with elevated nitrate concentrations. The primary areas of nitrate degradation are the areas formerly or currently overlain by:

- Citrus in the northern parts of Management Zones 1, 2 and 3; and
- Dairy areas in the southern parts of Management Zones 1, 2 and 3 and all of Management Zone 5.

Nitrate concentrations in groundwater have increased slightly or remained relatively constant in northern parts of Management Zones 1, 2 and 3 over the period 1960 to the present. These are areas formerly occupied by citrus and vineyard land uses (see Figures 4.5-35 a-d), and nitrate concentrations underlying these areas rarely exceed 20 mg/l (as nitrogen). Over the same period, nitrate concentrations have increased significantly in the southern parts of Management Zones 1, 2 and 3, and all of Management Zone 5. These are areas where land use has progressively converted from irrigated/non-irrigated agriculture to dairy uses (see Figures 4.5-35 a-h), and nitrate concentrations typically exceed the 10 mg/l MCL and frequently exceed 20 mg/l by 1991-1995.

There are two stable isotopes of nitrogen: 14N and 15N. Within the nitrogen cycle, thermodynamic and kinetic processes occur which fractionate these isotopes in various nitrogen-bearing compounds. Most biologically-mediated reactions (e.g., assimilation, nitrification, and denitrification) result in 15N enrichment of the substrate and depletion of the product. Nitrogen isotope chemistry is a technique to help distinguish potential sources of nitrogen in the environment (Clark and Fritz, 1997). The enrichment of 15N relative to atmospheric nitrogen is expressed as δ15N and has units of parts per thousand (permil). The following table shows the ranges of nitrogen isotopes of potential sources of nitrate (Battaglin et al., 1997):

Source of Nitrate	$\delta^{15}N$ of Nitrate (permil)
Atmospheric Nitrate	-10 to 9
Nitrate Fertilizer	-5 to 5
Ammonium Fertilizer	-5 to 0
Animal Waste	10 to 20
Poultry Manure	7.9 to 8.6

As part of the 1997 groundwater-monitoring program, samples were collected from six wells for nitrogen isotope analysis:

State Well Number	Region	Nitrate-N (mg/l)	$\delta^{15}N$ of Nitrate (permil)
01S07W14D01	Cucamonga - Former Citrus	3.2	4.0
01S07W14D02	Cucamonga - Former Citrus	4.0	4.2
02S07W34D	Chino Agricultural Preserve	106.0	12.8
03S07W05G	Chino Agricultural Preserve	77.3	18.3
02S07W20A	Chino Agricultural Preserve	64.5	10.0
02S07W16D	Chino Agricultural Preserve	63.6	8.7
02S07W16D	Duplicate	63.6	9.0

The samples from the wells in areas where the antecedent land use was predominantly citrus had nitrate values that were significantly below the maximum contaminant level (MCL) of 10 mg/l. Nitrate values in samples from the Chino Agricultural Preserve all exceeded the MCL by at least a factor of six. In addition, the δ15N values for the Cucamonga wells were about 4 permil, while the δ15N values for the Chino Agricultural Preserve wells ranged from 8.7 to 18.3 permil. The nitrogen isotope results are compared graphically with ranges from known sources in the Figure 4.5-42.

The high nitrate concentrations shown in Figure 4.5-41 probably depict the nitrate impacts from the agricultural waste disposal areas located in the southern half of the Basin.

Other Constituents of Potential Concern. Tables 4.5-11a through 4.5-11c summarize inorganic and organic constituents that have been analyzed for and detected in groundwater samples from wells in the Chino Basin through July 1998. Table 4.5-12 summarizes the information in Tables 4.5-11a through 4.5-11c for the constituents detected at or above their MCLs. This is a synoptic analysis and includes all available data, including data from several monitoring programs and studies. The water quality data reviewed in this synoptic analysis are derived from production wells and monitoring wells. Hence, the data do not represent a programmatic investigation of potential sources nor do they represent a randomized study designed to ascertain the water quality status of the Chino Basin. The data do represent the most comprehensive information available to date.

A large subset of this data was extracted from the California Department of Health Services (DHS) database (current through July 1998). For each constituent, the tables lists:

- the number of measurements at or above one-half the applicable MCL;
- the number of wells with measurements at or above one-half the applicable MCL;
- the number of measurements at or above the applicable MCL;
- the number of wells with measurements at or above the applicable MCL; and
- the applicable MCL.

The tables are organized as follows:

- Table 4.5-11a: Inorganic constituents, total trihalomethanes (THMs) and radioactivity with primary MCLs;
- Table 4.5-11b: Organic chemicals with primary MCLs;
- Table 4.5-11c: Inorganic constituents and organic chemicals with secondary MCLs, lead and copper rule, and California DHS Action Levels.

Table 4.5-12 summarizes the constituents that were detected at concentrations greater than one-half their MCL, and are grouped by chemical type. These values represent a mixture of data from monitoring and production well samples. Monitoring wells targeted at a potential source will likely have a greater concentration than a municipal or agricultural production well. Wells with constituent concentrations greater than one-half the MCL represent areas that warrant concern and inclusion in a long-term monitoring program. Groundwater in the vicinity of wells with samples greater than the MCL may be impaired from a beneficial use standpoint.

Inorganic Constituents. Five inorganic constituents were detected at or above their MCL in more than 20 wells: TDS; nitrate; fluoride; iron; and manganese.

TDS and nitrate have been discussed in previous subsections. Fluoride, iron, and manganese naturally exist in groundwater. Their concentrations depend on mineral solubility, ion exchange reactions, surface complexations, and soluble ligands. These speciation and mineralization reactions, in turn, depend on pH, oxidation-reduction potential, and temperature. Fluoride occurs naturally in groundwater in concentrations ranging from less than 0.1 mg/l to 10-20 mg/l (Freeze and Cherry, 1979). Based on the available data, none of these constituents shows a spatial pattern throughout Chino Basin (see Figures 4.5-43 through 4.5-45). However, site-specific monitoring wells may reveal point sources (e.g., wells near landfills have shown relatively high concentrations of manganese).

The OBMP also includes an extensive discussion of other man-made pollutants, typically considered hazardous or toxic in character. The materials are discussed in subchapter 4.10, Hazards and Risk of Upset. The reader should refer to the discussion of contaminants such as perchlorate, volatile organic compounds, and pesticides and herbicides in that subchapter. Also discussed in subchapter 4.10 are point sources of pollution, typically industrial areas where contaminant plumes have been identified. Overall contamination for the Chino Basin is shown in Figure 4.5-46.

Role of the Vadose Zone in Future Water Quality

The vadose zone is the unsaturated part of the aquifer that lies between the water table surface and the land surface. The vadose zone has become larger and thicker over time as the groundwater levels in the Basin have declined due to overdraft. Some of the contaminants discharged to the land surface or into ponds remain in the vadose zone. The mechanisms for retention of contaminants within the vadose zone are complex, but are generally caused by sorption and precipitation. Some contaminants move down towards the saturated zone at much lower rates (a few feet per year) than they can move once they get to the saturated zone (a few feet per day). MWDSC completed a study of the TDS and nitrate impacts in the Chino Basin from a proposed 700,000 acre-ft storage program California (MWDSC, 1988). The outcome of this study suggested that the raising of groundwater levels associated with the increase in storage would mobilize TDS and nitrates in the vadose zone and cause serious water quality problems throughout the Basin. The proposed storage program did not add contaminants – it flushed contaminants already in the vadose zone into the saturated zone.

The Chino Basin Water Resources Management Study model conducted for a 300,000 acre foot conjunctive use program shows virtually no adverse impacts for utilization of this quantity of additional storage capacity in the basin. The model at this level is fully adequate to evaluate impacts associate with this 300,000 acre-foot volume. This model was not designed to be run for a 700,000 acre-foot program, thus it would not be appropriate to draw conclusions regarding such an expanded conjunctive use program unless a model had been designed and run, in order to verify whether or not contamination may occur from such a program.

If an expanded conjunctive use program is considered in the future, it is required that additional investigations be conducted before implementation, and another model with appropriate parameters, or some other investigations, will be necessary to fully address whether or not there is the potential for contamination in the vadose zone associated with a 700,000 acre-foot program. If adverse impacts are forecast to occur after such investigations, further environmental documentation will need to be prepared. As additional information for consideration with regards to this issue, it should be noted that in the past, the CBWRMS model has been successfully run and observed by Wildermuth Environmental to not show any significant increase in TDS concentrations by management zone, even when significant quantities of water with extremely high TDS values were utilized.

The proposed maximum quantity of water for conjunctive use considered in the Draft PEIR is approximately 300,000 acre-feet. Past historical practices were utilized to establish this threshold, namely the "mining" of the Basin that occurred prior to 1978, which was on the order of 500,000 acre-ft. Current safe-yield management of the Basin utilizes this capacity that was previously "mined" and has not demonstrated any further contamination of the saturated zone from such activity. To be even more conservative, a best engineering judgment was made to limit the conjunctive use capacity to 300,000 acre-ft, well within the previously demonstrated capacity of the Basin.

As the agricultural land uses in the Chino Basin convert, the loading of contaminants to the vadose zone will be significantly reduced, as will percolation at the land surface that drives the contaminants down towards the saturated zone. This will have the effect of reducing the rate of vadose zone loading to the saturated zone.

4.5.2.7 Safe Yield

The safe yield of the Chino Basin was established in the 1978 Judgment to be 140,000 acre-ft/yr. The basis for this estimate is described by William J. Carroll in his testimony on December 19 and 20, 1977, during the adjudication process. Table 4.5-13 lists the hydrologic components developed by Carroll to estimate the safe yield of the Chino Basin. These components were developed for the period 1965 to 1974, a period that Carroll referred to as the base period. The hydrologic components listed in Table 4.5-13 are described below.

Deep Percolation of Precipitation and Surface Inflow – consists of the deep percolation of precipitation and streamflow. Carroll developed the estimate of 47,500 acre-ft/yr based on an extrapolation of the early Chino Basin modeling results from the DWR.

Deep Percolation of Artificial Recharge – consists of the percolation of local runoff in spreading basins. Carroll estimated that the local runoff recharged in SBCFCD-controlled facilities to be about 2,800 acre-ft/yr during the base period. The Etiwanda Water Company also recharged about 1,000 acre-ft/yr of Deer and Day Creek water in the Chino Basin during the base period.

Deep Percolation of Chino Basin Groundwater Used for Irrigation (domestic and agricultural) – defined as the fraction of water applied for irrigation that percolates through the soil and recharges underlying groundwater. Carroll estimated that about 15 percent of the water used for domestic irrigation would percolate to groundwater; and that 45 percent of the water used for agricultural irrigation would percolate to groundwater. The volume of percolation of Chino Basin groundwater used for irrigation over the base period was estimated by Carroll to be about 61,700 acre-ft/yr.

Deep Percolation of Imported Water Used for Irrigation (domestic and agricultural) – same as deep percolation of Chino Basin groundwater except that the water used for irrigation is imported to and used over the Chino Basin. The volume of percolation of imported water used for irrigation over the base period was estimated by Carroll to be about 7,000 acre-ft/yr.

Recharge of Sewage – defined to be the percolation in ponds of wastewater discharged by municipal wastewater treatment plants. This component almost completely ceased during the base period and was known to be eliminated as a recharge source when the safe yield was estimated. The volume of sewage recharge over the base period was about 18,200 acre-ft/yr. The inclusion of recharge of sewage as a component of safe yield in the stipulated Judgment was therefore not hydrologically consistent with how the Basin was to be operated post-Judgment

Subsurface Inflow – defined to be the groundwater inflow to the Chino Basin from adjacent groundwater basins and mountain fronts including:

Bloomington Divide (Riverside Basin)	3,500 acre-feet/year (afy)
San Gabriel Mountain	2,500 acre-feet/year
Colton Rialto Basin	500 acre-feet/year
Cucamonga Basin	100 acre-feet/year
Claremont and Pomona Basins	100 acre-feet/year
Jurupa Hills	500 acre-feet/year
TOTAL	7,200 acre-feet/year (say 7,000)

Subsurface Outflow – defined as groundwater that rises to the ground surface in Prado Basin to become Santa Ana River flow. Estimates of subsurface outflow were based on studies by DWR, United States Geological Survey (USGS), and Carroll. Carroll estimated the subsurface outflow to average about 6,800 acre-ft/yr over the base period.

Extractions – consists of groundwater extractions from the Chino Basin. Carroll estimated the groundwater extractions to average about 180,000 acre-ft/yr during the base period.

In addition to these components, Carroll estimated the change in storage over the base period to be about 40,000 acre-ft/yr; that is, the groundwater in storage declined by about 400,000 acre-ft between 1965 and 1974. Carroll estimated the safe yield to be the equal to the average extraction over the base period minus the average annual overdraft during the base period:

$$\begin{aligned} \text{safe yield} &= \text{extraction - overdraft} \\ &= 180{,}000 - 40{,}000 \\ &= 140{,}000 \text{ acre-ft/yr} \end{aligned}$$

A more recent estimate the safe yield can be abstracted from the groundwater modeling work done for the Chino Basin Water Resources Management Study -- Task 6 Memorandum Develop Three Dimensional Groundwater Model (Montgomery Watson, 1994). The hydrologic components derived from the modeling results for a 30-year period -- October 1960 to September 1989 (water years 1961 to 1989) - are listed in Table 4.5-14. The safe yield based on the CBWRMS results (1961 to 1989) computed in a manner similar to Carroll is:

safe yield = extraction - overdraft
= 183,000 - 17,000
= 166,000 acre-ft/yr

The safe yield based on CBWRMS modeling results for the base period (1965 to 1974) used by Carroll would be:

safe yield = extraction - overdraft
= 189,000 - 20,000
= 169,000 acre-ft/yr

A more conceptually correct estimate of the safe yield would include a reduction for artificial recharge of imported water and other waters that are currently not part of the yield, such as recharge of recycled water. The adjusted estimates would then be:

Carroll's estimate 1965 to 1974	118,000 acre-ft/yr
CBWRMS estimate 1961 to 1989	151,000 acre-ft/yr
CBWRMS estimate 1965 to 1974	156,000 acre-ft/yr

Watermaster may decide to change the safe yield of the Basin based on new information such as that developed from the CBWRMS and subsequent studies. Safe yield is used to determine the need for replenishment obligation for individual parties to the judgment. New water from the capture and recharge of storm water, from induced recharge caused by increased southern basin production (or, conversely, the reduction of yield from reduced production in the southern Chino Basin), or from other sources will enhance the yield of the Basin and thereby reduce the cost of purchasing imported water for replenishment.

At the time the Chino Judgment was implemented (1978), about 41 percent of the safe yield was estimated to come from irrigation returns. Since that time, irrigated agriculture has declined and is projected to be almost completely gone by 2020. This will result in a decline in irrigation returns to groundwater and a potential decrease in the safe yield. In addition, San Bernardino County, Riverside County, and the U.S. Army Corps of Engineers (USACE) have constructed flood control projects that capture and convey runoff to the Santa Ana River - effectively eliminating the groundwater recharge that formerly took place in the stream channels and flood plains in the Chino Basin. This also may have resulted in a decrease in the safe yield of the Chino Basin.

Water harvesting opportunities exist that can be used to offset the yield lost to urbanization and flood control improvements. Water harvesting consists of capturing and recharging runoff caused by urbanization. Most of the precipitation falling on undeveloped land or land in agricultural uses is lost to evapotranspiration. Runoff increases dramatically with urbanization due to drainage improvements, increased impervious land cover, and decreased evapotranspiration of rainfall. The potential yield from this additional runoff is numerically equal to the increase in runoff that occurs when the land is converted to urban uses. The actual yield is equal to the additional runoff that is captured and put to beneficial use. In the Chino Basin, the best and least expensive way to put this yield to beneficial use is groundwater recharge.

Urbanization also creates reclaimed or recycled water from treated wastewater. Presently, most of this water is discharged to the Santa Ana River. IEUA currently plans to use some of their recycled water for direct uses, including non-potable industrial uses, irrigation, and groundwater recharge. Increasing the yield of the Chino Basin by increased capture of local runoff will improve the dilution of recycled water used for groundwater recharge and reduce the cost of mitigation requirements for such reclamation.

4.5.2.8 Water Demands and Water Supply Plans

Current and Future Water Demands

The purpose of this subsection is to describe the current and projected water demands and supplies for agencies that produce groundwater from the Chino Basin. This information provides some of the basic information required to make the impact forecast in the following section of this document. Updated forecasts of water demands and supplies were requested from each Chino Basin water agency and industrial producer. Requested data included demands, water supply plans by individual well or source, well construction and operating data, and water production and treatment costs. Many agencies provided updated information. Where responses were incomplete, previous information developed as part of the 1995 Chino Basin Water Resources Management Study (CBWRMS) was used. The planning period for this evaluation is 2000 to 2020.

Growth Projections. Subchapter 4.3 summarizes current growth forecasts based on the OBMP discussion, SCAG projections and ultimate buildout of local agency general plans in the Chino Basin. Substantial growth of population, housing, and employment are forecast to occur over the twenty year period from 2000 to 2020. Tables 4.3-1 and 4.3-3 provide a summary of population growth projections.

Water Demand Projections. Current water demands and supply projections form the basis for evaluating future water management programs in the Chino Basin area. Water demands are developed based on the water service areas shown in Table 4.5-15.

Water demand projections can be developed by several different methods. These include per capita, water duty and units of use approaches. The most frequently used methods are the per capita consumption method and the water duty method.

For this assessment, all water demands are based on information provided by the water agencies. In the absence of agency data, the assumptions in the CBWRMS have been used. These projections have been compared with the current SCAG projections. However, no adjustments to he demands have been made.

Projected water demands for the Chino Basin are presented in Table 4.5-16. This table indicates that Chino Basin area water demands will range from 348,000 acre-ft/yr in 2000 to 418,000 acre-ft/yr in 2020. Significant municipal water demand growth is expected to occur in the agricultural preserve area. This will result in increased demands for the Cities of Chino, Chino Hills and Ontario, and Jurupa Community Services District. Agricultural water demands are expected to decrease during the planning period as land is converted to urban uses.

Water Supply Plans

The principal water supplies in the Chino Basin area are groundwater pumped from the Chino Basin, other local groundwater and surface water, imported water purchased from Metropolitan and recycled water. The amounts of water utilized from each source are based on data provided by each water purveyor. If data was not provided, the supplies area based on projections developed for the Chino Basin Water Resources Management Study (1995). Each of these sources is discussed below. Table 4.5-16 summarizes the water demands by major source categories. Review of Table 4.5-17 shows that there will be about 40,000 to 70,000 acre-ft/yr of Chino Basin production that will incur a replenishment obligation. The replenishment obligation can be met by the recharge of imported and recycled water, in-lieu replenishment involving imported water, and from water in local storage accounts. In the long run, the replenishment obligation of about 40,000 to 50,000 acre-ft/yr will need to be met with imported and recycled water. Thus the imported and recycled water components in Table 4.5-18 should sum to a total of 40,000 to 50,000 acre-ft/yr higher.

Chino Basin Groundwater. The Chino Basin is the largest groundwater basin in the Upper Santa Ana Watershed. Water is reallocated from the Overlying Agricultural Pool to the Appropriative Pool when it is not put to use by the agricultural users. As agricultural production declines, the reallocations to the Appropriative Pool will increase. Total production from the Chino Basin is projected to range between 180,000 to 190,000 acre-ft/yr over the planning period. Production in excess of safe yield must be replaced through the purchase of replenishment water, which is imported into the Chino Basin through IEUA as a member agency of MWDSC, and approved by the Watermaster.

Other Local Supplies. Other local water sources provide a portion of the water supplies for Chino Basin water agencies. These supplies include surface water and groundwater.

Surface Water. A number of water supply agencies, which produce groundwater from the Chino Basin, obtain a portion of their water supplies from local surface water sources. These agencies include the: City of Pomona, City of Upland, Cucamonga County Water District, Fontana Water Company, San Antonio Water Company, West End Consolidated Water Company, and West San Bernardino County Water District. The principal surface water sources include San Antonio Canyon, Cucamonga Canyon, Day Creek, Deer Creek, Lytle Creek and several smaller surface sources. For the most part, these surface water sources are fully developed and no significant additional supplies are anticipated to be developed in the future. Usage is expected to remain at 16,000-17,000 acre-ft/yr.

Other Groundwater. Other local groundwater supplies represent a significant supplemental source of water for Chino Basin water agencies. Other groundwater supplies in the study area include the Claremont Heights, Live Oak, Pomona and Spadra Basins in Los Angeles County, the Riverside South and Temescal Basins in Riverside County, and the Colton-Rialto, Cucamonga, Lytle Creek Bunker Hill, and Riverside North Basins in San Bernardino County. Agencies using other local groundwater include: City of Pomona, City of Upland, Cucamonga County Water District, Fontana Water Company, San Antonio Water Company, Southern California Water Company, West End Consolidated Water Company, and West San Bernardino County Water District. These supplies may increase slightly in the future as additional wells are constructed. However, most of these sources are essentially fully developed. Descriptions of these groundwater basins were presented in the CBWRMS Final Report (1995). The aggregate supply from these basins is currently 63,000 acre-ft/yr and is projected to be 76,000 acre-ft/yr in 2020.

Imported Water. Two regional agencies are responsible for imported water deliveries within the study area: MWDSC and San Bernardino Valley Municipal Water District (SBVMWD). Metropolitan is a wholesale water agency serving supplemental imported water to 27 members (city and water agencies) in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of more than 16 million people. Approximately one-half of the total water used throughout the entire Metropolitan service area is imported water purchased from Metropolitan to supplement the local water supplies in its service area. Metropolitan obtains imported supplies from the Colorado River and the State Water Project (SWP). The demand for direct delivery of imported water for the Chino Basin purchased from Metropolitan is projected to increase from about 68,000 acre-ft/yr in 1997 to 129,000 acre-ft/yr by 2020, an increase of about 90 percent. The demand for replenishment water in the Chino Basin could reach 40,000 acre-ft/yr by 2020 if recycled water is not used for replenishment or direct uses and water in local storage accounts is not available for use as replenishment.

SBVMWD is a wholesale water purveyor in the easternmost portion of the study area and adjacent portions of San Bernardino County. SBVMWD is a SWP Contractor having an entitlement of 102,600 acre-ft/yr. In addition, SBVMWD is responsible for basin management in the Bunker Hill basin. The City of Rialto and West San Bernardino County Water District obtain water from SBVMWD through its Baseline Feeder that supplies Bunker Hill groundwater (included in other groundwater above).

Recycled Water. There are several existing sources of recycled water in use within the Chino Basin study area. These are the Pomona Water Reclamation Plant (operated by the Los Angeles County Sanitation Districts), Regional Plants 1, 2 and 4, and Carbon Canyon Water Reclamation Plant operated by IEUA, Upland Hills Water Reclamation Plant operated by the City of Upland, CIM Water Reclamation Plant operated by the California Institution for Men at Chino, and Indian Hills Water Reclamation Plant operated by Jurupa Community Services District. For this section, only existing and planned recycled water uses that will be implemented in the next two years are included in the water supply plans. This is about 11,500 acre-ft/yr.

Summary. The plans summarized in this section represent the current non-OBMP water supply plans of each individual water agency, as qualified previously. Future evaluation of these plans may indicate problems relative to their long-term feasibility. Availability of imported water supplies will have a significant effect on plan feasibility.

4.5.2.9 Wastewater Flows, Treatment and Disposal

Wastewater Flow Projections

Wastewater flow projections are made using a combination of methods similar to water demand projections. Depending on the planning data available, wastewater flow projections are made using per capita-based, equivalent dwelling units (EDU) based, area-based, and water consumption-based methods. The per capita method uses projected populations and average unit wastewater flows per person (90-110 gallons per day per person). EDU-based projections use unit flows per equivalent dwelling unit (EDU), where an EDU is the average amount of sewage generated by a single-family residential household (about 270 gallons per day). EDUs are estimated for commercial and industrial land uses using fixture unit counts or estimated wastewater flows. Flow projections are computed by projecting future EDUs and multiplying by the unit flow per EDU. Area-based methods typically use unit flow factors for each land use type. Flows are computed by multiplying the unit factor for each land use type by the corresponding acreage and totaling the individual flows for each land use type.

Water consumption-based methods compute wastewater flows based on the difference between water demand and water consumption. Water consumption is the amount of water that does not return to the sewer system and is a function of the particular land use type and water use group. Currently, most wastewater flow projections in the study area are based on either per capita or EDU methods.

LACSD Service Area. The Los Angeles County Sanitation Districts (LACSD) furnishes wastewater services for Pomona and Claremont. Using the SCAG-98 growth projections and a wastewater generation factor of 110 gpcd, the wastewater flows for this area are estimated to increase from 22,000 acre-ft/yr to 30,000 acre-ft/yr in 2020.

IEUA Service Area. IEUA develops ten-year wastewater forecasts for its service area in conjunction with its annual capital improvement plan (CIP). As part of its current CIP, IEUA also prepared a fifty-year projection of wastewater flows. These projections indicate wastewater flows will increase from 57,000 acre-ft/yr in 1997 to 112,000 acre-ft/yr in 2020. This represents an increase of 96 percent.

Riverside County Service Area. Wastewater collection for the portion of the study area in Riverside County is provided by several agencies including Jurupa Community Services District and Norco. Other portions are unsewered. Wastewater flows for the Riverside County area are estimated to increase from 10,000 acre-ft/yr in 1997 to 15,000 acre-ft/yr by 2020 based on projected population increases. This includes wastewater generated by unsewered areas. Additional wastewater from outside the study area is expected to be treated at the Western Riverside Regional Water Reclamation Plant. However, no estimates of these additional flows were received.

This completes the description of the existing environmental setting in which the OBMP is proposed to be implemented.

4.5.3 Project Impacts

As set forth at the beginning of this subchapter, the goal of the OBMP is to enhance safe yield and water quality from implementing a series of programs that include facilities and activities summarized in the OBMP. Most of these facilities and activities are generally defined at present, which of necessity has resulted in the preparation of a programmatic environmental document, rather than an evaluation of site specific facilities and activities. As the list of concerns and issues outlined in section 4.5.1 of this subchapter illustrates, the ability of the OBMP to fulfill its purpose remains controversial, and many of the water serving agencies within the Chino Basin have identified concerns regarding the effects of implementing the OBMP on water resources and water quality in the Chino Basin.

The key to forecasting the potential for adverse impact to water resource and water quality is to consider the activities associated with implementing the OBMP, which can perhaps be best described by considering each Program Element and first determining whether implementing the element has any physical consequences. A summary of the elements and an assessment of their potential for water resource/quality impacts is presented. For a summary of the acreage required for specific facilities please refer to Table 4.2-3.

Program Element 1: Develop and Implement Comprehensive Monitoring Program

This program has very little potential to adversely effect water resources or water quality. Groundwater levels and quality will be sampled; water production will be monitored; surface water discharge and quality will be monitored; ground level will be monitored (Management Zone 1). Some new wells will be installed (estimated to be 50 wells (see Table 4.2-3)) and some existing wells will be properly abandoned. All of these activities are not forecast to cause adverse impacts to water resources or monitoring. In fact, proper abandonment of wells should eliminate a potential source of pollution from illegal disposal activities. Installing wells, sensors and other such features can disturb previously undisturbed areas and create a potential for erosion and sedimentation that must be controlled to prevent water quality degradation.

Program Element 2: Develop and Implement a Comprehensive Recharge Program

The most current thinking is to make available up to 88,000 acre-feet per year (afy) of recharge capacity for future utilization. Table 4.2-3 identifies an existing total recharge capacity in eleven basins of approximately 69,500 afy. These basins could be modified to accept delivery of water for recharge from a variety of sources, including recycled water, imported water, and stormwater. To achieve sufficient recharge capacity, new recharge basin(s) will be required to handle an additional 10,500 acre-feet of water per year. Assuming a each acre has the ability to percolate one acre-foot of water per day for 210 days of water deliveries, an additional 50 acres of recharge basins will have to be constructed. For forecasting purposes, it is assumed that up to 30,000 acre-feet of stormwater can be recharged into the Basin aquifer (currently up to 12,000 acre-feet are recharged) with a TDS value of 120 mg/l; up to 62,500 acre-feet of SPW can be recharged with TDS values ranging between

250 and 400 mg/l; and up to 40,000 acre-feet of recycled water can be recharged with an average TDS value of 420 mg/l. The actual mix will vary annually depending upon water availability and infrastructure in place to deliver water to recharge basins.

Program Element 3 - Develop and Implement Water Supply Plan for the Impaired Areas of the Basin

Program Element 5 - Develop and Implement Regional Supplemental Water Program

These two elements are addressing the Basin safe yield issue. The objective is to increase the municipal and industrial groundwater production and operate desalters. It is estimated that the replenishment obligation will be 31,000 acre-feet in 2000 and 55,000 acre-feet in 2020. To meet this replenishment obligation the OBMP would use water in local storage, direct recharge of water, and in lieu exchange. It is assumed that the desalters would ultimately have a treatment capacity of 30 million gallons per day (MGD), of which approximately 20 percent would be need to discharged as concentrated TDS water to the Santa Ana Regional Interceptor (SARI) line.

Program Element 4 - Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1 (MZ1)

This element does not contain specific identified facilities at this time, but it envisions an interim plan that would voluntarily modify groundwater production in the area of subsidence within MZ-1. Under a proposed scenario this could include shifting production to the east and north into Management Zone 2 or 3 in a cooperative effort with adjacent water producers or the delivery of desalted water from the SAWPA desalter unit which is now in operation. The second goal in MZ-1 is to balance recharge and production within the zone as a whole. If required, additional recharge could be carried out at the Montclair basins or other recharge basins within MZ-1. The final component of this element is to establish monitoring to fill gaps in existing knowledge about the zone and utilize the data generated to prepare a long-term management plan.

Program Element 6 - Develop and Implement Cooperative Programs with the Regional Board and other Agencies to Improve Basin Management

Program Element 7 - Develop and Implement Salt Management Program

These elements focus more on planning and cooperative efforts than on activities that could change the physical environment. The first action is to create a working group (committee) to review water quality conditions and develop cooperative strategies and plans to improve Basin water quality. Additional monitoring and investigations will be established to detect and characterize water quality anomalies and other water quality problems in cooperation with the Regional Board. Funds will be sought to accelerate detection and cleanup effort for anomalies. An acceptable method of defining the salt budget and improvements in water quality will be developed. Once the salt budget methodology is established, it would be used to define future actions to ensure salt management goals are attained. At this point in time, the Watermaster is not proposing to subsidize the removal of manure from the Basin.

Program Element 8 - Development and Implement Groundwater Storage Management Program

Program Element 9 - Develop and Implement Conjunctive Use Programs

These elements involve completing the OBMP, preparing a storage management plan by determining operation storage requirements and safe storage capacity. Implement monitoring programs and complete a short-term conjunctive use pilot program that is not yet defined. Conjunctive use programs (seasonal peaking and dry-year) will be defined during this period. This latter action will require sufficient definition of a conjunctive use program to a level of detail that will allow detailed evaluation which would be speculative at this time. A general conjunctive use program is evaluated as one of the alternatives in this document.

The potential impacts from implementing each of the program elements will be evaluated in the following analysis.

4.5.3.1 Significance Criteria

The IEUA has not established any specific CEQA significance thresholds for water resource and water quality impacts. However, using the Santa Ana Regional Board's Basin Plan and other documentation, the following thresholds are proposed for assessing and determining significant drainage or water quality impacts from implementing the proposed project.

- Substantially degrade water quality in the Chino Basin
- Reduce the safe yield of the Chino Basin
- Violate any water quality standards or waste discharge requirements established in the Santa Ana Basin Water Quality Control Plan (1995).
- Substantially alter the existing drainage pattern of the area in a manner which would result in substantial erosion or sedimentation within or downstream of the Amended Project Area.
- Substantially alter the existing drainage pattern of the area or substantially increase the rate or amount of surface runoff in a manner which would result in flooding within or downstream of OBMP facilities
- Create or contribute runoff which would exceed the capacity of existing or planned storm water drainage systems.
- Place structures within a 100-year flood hazard area which would expose people or structures to significant risk of loss, injury or death.

Each of the above thresholds will be applied to the potential water resource and water quality impacts forecast to occur from implementing the OBMP, and a decision regarding the significance of potential hydrology impacts will be clearly presented in the following analysis.

a. Will the project cause changes in absorption rates, drainage patterns or the rate and amount of surface runoff?

Although the OBMP does not fit tidily into the standard format for evaluating water resource and water quality issues in an EIR, the following evaluation format does provide a structure for ensuring that each of the issues is fully considered. Implementing the OBMP is forecast to disturb approximately 728 acres if all of the facilities and activities being considered are implemented.

Implementing Program Element 1 is forecast to affect absorption rates, drainage patterns or the rate and amount of surface runoff in the following way:

1. The process of sampling groundwater levels and quality at existing and future wells is not forecast to alter absorption rates, alter drainage patterns or the rate and amount of any surface runoff. No adverse impacts to these water issues are forecast to occur from implementing groundwater level and quality monitoring, either directly or indirectly.

2. Installation and operation of water production monitoring systems on existing and future wells is not forecast to cause any direct or indirect measurable change in absorption rates, drainage patterns or the rate and amount of surface runoff. It is assumed that any electrical connections will be installed along existing access routes to wells or that remote sending devices will be utilized that do not require direct electrical connections. Therefore, the gathering of the water production data can be conducted without causing any potential for adverse impacts to these water issues.

3. Obtaining surface water discharge and quality data depends upon sampling within existing stream channels. According to SBCFCD, many sites for measuring flows within each major stream channel are already in place as part of the County Flood Control monitoring programs (personal communication with Randy Forbey, SBCFCD, May 4, 2000). When existing flow measuring stations do not exist, but are necessary to fulfill monitoring goals, they will be installed by Watermaster or by other contributing entities.

4. Ground level monitoring is conducted by both direct and indirect (including remote sensing) methods that do not require substantial changes in the physical environment which could cause changes in absorption rates, drainage patterns, or the rate and amount of any surface runoff. Only a small potential for increased impervious areas would be associated with these activities for extensometers and metering devices, but this acreage is so small relative to the project area that impacts are considered to be *de minimus* and less than significant.

5. Installing monitoring wells will create a minor (approximately 400 square feet based on a 20' x 20' well pad) increase in impervious surface (50 wells x 400 sq ft = ½ acre) within the Basin. This is a *de minimus* decrease in absorption rate within a Basin containing more than 225,000 acres. In addition, as wells are abandoned, any impervious areas surrounding the wells can be removed which will offset the loss due to new monitoring well construction.

Implementing Program Element 2 is forecast to affect absorption rates, drainage patterns or the rate and amount of surface runoff in the following way:

1. The process of modifying existing recharge basins to recharge water under the OBMP will entail enhancement of these basins for absorption of water to be recharged to the Chino Basin aquifer. Therefore, no adverse effect to absorption is forecast to occur from implementing this component of Program Element 2. For stormwater recharge, the drainage pattern may be altered to direct flows into recharge basins. For example, along San Sevaine Creek, diversion facilities already exist to direct flows into the Jurupa Basin. Also, the OBMP planners indicate that economics may justify collecting high quality stormwater flows in the lower portion of the basin and pumping them to the upper subbasins for recharge.

   Diversion facilities will not effectively change the fundamental drainage patterns in the Basin, but such facilities may alter the rate and amount of any surface runoff in stream channels during high flow conditions, to the extent that it does not interfere with flood control functions of certain basins, Regarding flood control functions, it will be necessary to establish a conservation pool for each flood control detention basin to ensure that use of such basins will not conflict with flood management objectives. This can be accomplished by defining conservation pool volumes for flood control basins, by not using flood control basins to recharge stormflows, or by ensuring that recharge of SPW or recycled water is conducted during periods when flood flows will not occur. Variable pooling and recharge schedules that are coordinated with storm forecasting to halt deliveries during storm events will ensure that flood-related hazards remain less than significant.

   Indirectly, the effect of reducing stormwater (flood) flows by diverting them into recharge basins is considered beneficial for downstream flood hazards. The volume of runoff being delivered to Orange County downstream from Prado Dam far exceeds mandated flows (approximately 250,000+ afy of average flow versus a requirement for 42,000 acre-feet). The increase in stormwater recharged to the Basin is forecast to be a maximum of 30,000 afy compared to an estimated 12,000 acre-feet of stormwater recharge at present. Under this assumption the potential exists for the project to affect the rate and amount of surface flows from implementing the OBMP by 18,000 acre-feet, but this effect is not forecast to be significant because the net change relative to obligations is so small.

2. The purpose for constructing new recharge basins is to increase absorption, so the effect of implementing the OBMP will be to increase absorption in those areas converted to recharge basins, which will be a beneficial effect. The effects of diverting stormwater to new recharge basins is the same for drainage patterns and rate and volume of flow as described for the remodification and use of existing basins as outlined above.

Implementing Program Elements 3 and 5 is forecast to affect absorption rates, drainage patterns or the rate and amount of surface runoff in the following way:

1. The installation of three desalters is forecast to disturb a total of approximately 75 acres. Of this acreage, about 10 acres is forecast to be converted to impervious surface with a comparable reduction in absorption rate. A ten-acre area of impervious surface is relatively small and likely to be ***de minimus*** within a basin of approximately 225,000 acres. However, the cumulative contribution to increases in absorption rate may be considered significant. Therefore, mitigation is provided below to contain all flows on desalter sites to be used to irrigate buffer landscaping on the desalter properties. With implementation of such a measure, the proposed project is not forecast to contribute to cumulatively significant increases in runoff due to increased impervious surface and decreased rate of absorption of precipitation.

2. Meeting the replenishment obligations, up to 55,000 afy, can be fulfilled with a mix of local water in storage, direct recharge of water or ***in lieu*** exchange. Adequate recharge capacity is available to meet this need as outlined in the previous discussion. Reliance on local water in storage or ***in lieu*** exchange water has an indirect effect on water resources that is not obvious at first glance. Specifically, reliance on water already stored in the Chino Basin has an adverse impact because a portion of the water in storage is lost to rising groundwater. Analysis presented in the section 4.5.2 indicates that about 18 percent of water stored is lost due to rising groundwater. This loss component must be taken into account if water in storage in the basin is to be used to meet replenishment obligations. A mitigation measure is included in this document to ensure that such estimated losses are taken into account as part of meeting replenishment obligations.

Implementing Program Element 4 is forecast to affect absorption rates, drainage patterns or the rate and amount of surface runoff in the following way:

1. Modifying groundwater production for Management Zone 1 has no potential to adversely impact absorption rates (even pipelines for transporting the water will be below ground), drainage patterns or the rate and amount of surface runoff. No adverse impact can affect these water issues from implementing this component of Program Element 4.

2. Meeting any additional recharge requirements in MZ 1 and MZ3 according to IEUA staff, can occur without any modifications to the physical environment. Little potential exists for recharge operations in MZ 1 to adversely impact the environment. If new recharge basins were constructed in this area, few impervious surfaces would be created, so there would be little alteration in the drainage, absorbtion rate or surface runoff. Impacts are forecast to be less than significant.

3. Collection of additional data to fill gaps in knowledge about the zone is not forecast to include any activities that will affect absorption rates, drainage patterns or the rate and amount of surface runoff.

Implementing Program Elements 6 and 7 is forecast to affect absorption rates, drainage patterns or the rate and amount of surface runoff in the following way:

1. The process of developing cooperative strategies and plans has no potential to change the physical environment; therefore, no potential effects to absorption rates, drainage patterns or rate and amount of surface runoff is forecast to result from implementing this component of Program Elements 6 and 7.

2. Seeking funds to speed up cleanup and restoration of contaminated sites does not, in itself, cause any adverse impacts to the environment. Prior to utilizing funds to conduct cleanup and restoration activities, these activities must completed additional environmental investigations to address issues, such as waste transport effects on local roads; potential public health risks from transporting the contaminated material; proper treatment, disposal or even recycling of the contaminated waste; etc.

Implementing Program Elements 8 and 9 is forecast to affect absorption rates, drainage patterns or the rate and amount of surface runoff in the following way:

1. The process of developing storage and conjunctive use programs and plans has no potential to change the physical environment; therefore, no potential effects to absorption rates, drainage patterns or rate and

amount of surface runoff is forecast to result from implementing this component of Program Elements 8 and 9.

2. Collection of additional data to fill gaps in knowledge about the water storage is not forecast to include any activities that will affect absorption rates, drainage patterns or the rate and amount of surface runoff.

3. Attempting to make impact forecasts for an undefined pilot conjunctive use program would be speculative and the State CEQA Guidelines (Section 15145) indicate that the public be informed of this conclusion and no further evaluation is necessary. Before a conjunctive use program is implemented, further detailed environmental evaluation will be necessary. A comparative evaluation with a conjunctive use program is provided in the alternative section.

b. Will the project cause the exposure of people or property to water-related hazards, such as flooding?

Implementing Program Element 1 is forecast to affect water related hazards in the following manner:

1. The process of sampling groundwater levels and quality at existing and future wells and extensometers is not forecast to cause any change in water-related hazards, such as flooding. No adverse impacts are forecast to occur with relation to this issue, either through direct or indirect impacts.

2. Installation and operation of water production monitoring systems on existing and future wells in not forecast to cause any change in circumstances regarding water-related hazards. No adverse impacts are forecast to occur with relation to this issue.

3. Water quality sampling is a passive activity and will not cause any adverse impacts, either directly or indirectly to water-related hazards.

4. Ground level monitoring procedures have no foreseeable impact on water-related hazards. No adverse impacts, either direct or indirect are forecast.

5. Installing monitoring wells will create a minor increase in impervious surface (a small portion of the 728 acres that may potentially be impacted as part of OBMP implementation). In actuality, most of this 728 acres will not be made impervious, or it is already impervious, so the net change in stormwater runoff from monitoring wells and the OBMP as a whole is not forecast to be a substantial enough quantity to cause a concern for flooding related issue. This 728 acre area in relation to the Basin as a whole (approximately 225,000 acres) will cause a *de minimus* increase in potential stormwater runoff, which is related to flooding hazards. However, this increase stormwater flows is small enough to be considered a less than significant impact when viewed in light of the Chino Basin's existing and proposed future drainage system.

Implementation of Program Element 2 is forecast to affect water related hazards in the following manner:

1. The construction of new, and the utilization of existing, basins for recharge purposes would not create any significant impervious surfaces that would alter stormwater runoff volumes, and consequently impact flood control capacities. However, the utilization for recharge of basins used for flood control

purposes by the San Bernardino County Flood Control District has the potential to cause increased risks to people and property for flooding related hazards if not properly mitigated. A mitigation measure is proposed below that would reduce the potential water-related hazards impact to a less than significant level by establishing the priority of flood-control functions over recharge-related functions for all basins that are operated for flood-control purposes. By establishing this order of priorities for the basin, along with the need for a specific management plan to be created for each basin prior to initiation of recharge operations, potential conflicts between flood control operations and recharge operations will be minimized and any potential adverse impacts will be reduced to a level that is less than significant. In basins that are not already used for flood control purposes, the possibility exists of creating new diversion works and turnout structures from flood control channels into these storage basins. Creation of these structures and utilization of these basins would actually reduce flooding hazards Additionally, stormwater flows could potentially be captured and pumped to the top portion of the basin for recharge purposes, however this is not forecast to have any adverse impacts to water-related hazards.

Implementation of Program Elements 3 and 5 have the potential to affect water related hazards in the following manner:

1. Other than to potentially create additional impervious surfaces due to desalter, well and extensometer installation (as previously discussed under Program Element 1) the development and implementation of a water supply plan for the impaired area of the Basin, and the development and implementation of a regional supplemental water program for the Basin do not have any potential to adversely impact flooding and water-related hazards. The increase in impervious surface area is ***de minimus*** with regards to the Basin size, and is well within the capacity of existing and planned flood control facilities.

2. The construction and operation of desalting, and possibly ion exchange facilities is part of this program element. To reduce exposure of people and property associated with this facility, the desalter either shall be constructed outside of any potential flooding hazard area, brought to a level above potential flood hazards, or constructed in manner that otherwise reduces flood-related hazards to a level of non-significance. Additionally, any wells that are located within a hazard area will be hardened against flood-related impacts. Figure 4.5-47 is a map of flood hazard areas within San Bernardino County and portions of Riverside County. This map will be used in siting current and future OBMP facilities in order to minimize impacts related to potential flooding hazards. This mitigation will reduce impacts to a less than significant level.

Program Element 4 has the potential to impact water-related hazards in the following manner:

1. This particular program element deals with potential shifting production from Management Zone 1 to Zones 2 and/or 3 to meet future water supply demands, or will require additional planned recharge beyond the recharge plan discussed in Program Elements 3 and 5, or the use of desalter and/or supplemental water to meet obligations in this area. Only the potential additional recharge to support potential increases in pumping within this zone have any potential to impact water-related hazards, and then only if such recharge occurs in a basin that is conjunctively utilized for flood control purposes. The impacts related to recharging in such multi-purpose basins can be mitigated to a level that is less than significant as discussed above under Program Element 2.

Program Elements 6 and 7 have the potential to impact water-related hazards in the following manner:

1. These program elements are more ministerial than physical in nature, thus the impacts related to cooperative efforts with RWQCB and the development and implementation of a Salt Management Program do not have many physical environmental consequences that are related to hazards such as flooding. For this issue, no adverse environmental impacts to water-related hazards are forecast to occur.

Program Elements 8 and 9 have the potential to impact water-related hazards in the following manner:

1. The development of a storage management program has little potential in itself of causing any adverse environmental effects. These program elements, as with Program Elements 6 and 7, are mainly ministerial in nature. Storage loss rates will be assessed, and new storage account management practices may be established by Watermaster in the future, but these activities will not substantially affect water-related hazard impacts. Impacts related to this issue are forecast to be less than significant.

2. The implementation of a conjunctive use program as part of Program Element 9 is only generally defined at this point in time. In the future, Watermaster will better outline the details and exact physical actions necessary to implement a comprehensive recharge, storage and extraction plan for volumes of water up to 500,000 afy in a basin-wide, and potentially regional, conjunctive use program. At this time, forecasted impacts regarding such a conjunctive use program would only be speculative, thus before a conjunctive use program is implemented, further environmental evaluation will be necessary.

c. Will the project discharge pollutants into surface waters or cause alterations to surface water quality?

Implementing Program Element 1 may result in the following discharges that could cause alterations to surface water quality:

1. The process of sampling groundwater levels and quality at existing and future wells is not forecast to generate any discharges of pollutants or cause any alterations to surface water quality. No adverse impacts to surface water quality is forecast to occur from implementing groundwater level and quality monitoring, either directly or indirectly.

2. Installation and operation of water production monitoring systems on existing and future wells is not forecast to cause the discharge of any pollutants that could degrade surface water quality. It is assumed that any electrical connections will be installed along existing access routes to wells or that remote sending devices will be utilized that do not require direct electrical connections. Therefore, the gathering of the water production data can be conducted without causing any potential for adverse impacts to surface water quality.

3. Obtaining surface water discharge and quality data depends upon sampling within existing stream channels. According to SBCFCD, many sites for measuring flows within each major stream channel are already in place as part of the County Flood Control monitoring programs (personal communication with Randy Forbey, SBCFCD, May 4, 2000). When existing flow measuring stations do not exist, but are necessary to fulfill monitoring goals, they will be installed by Watermaster or by other contributing

entities. In any case, stream runoff volume and water quality sampling is a passive activity that has no potential to cause discharges of pollutants that could degrade water quality.

4. Ground level monitoring is conducted by both direct and indirect (including remote sensing) methods that do not require many changes in the physical environment which could generate pollutant and cause degradation of surface water quality. No significant adverse impacts are forecasted for this issue.

5. Installing monitoring wells will create ground disturbances and entail drilling activities which can result in release of pollutants, including eroded sediment. Typically, well drilling involves setting up the drill rig and support equipment on an area between 1/4 and 1/2 acre. The site is cleared of vegetation (if not already clear), the rig moves onto the site, support equipment and material (pipes) are laid out on the site and drilling commences, which includes the preparation and utilization of drilling muds which lubricate the well. After the well is completed, the well bore is typically cleaned by pumping the well for a discrete period of time. This ensures that the water being sampled in monitoring wells will not be contaminated by drilling mud or other materials used to ready the well to serve for monitoring purposes over the long-term.

   Drilling and preparing a well to serve its monitoring role has a potential to cause the following discharges of pollutants and subsequent surface water quality degradation. As a result of clearing and preparing a site for well drilling, up to ½ acre of land may be exposed to erosion and generation of sediment which can reach surface water in the Chino Basin. With approximately 50 monitoring wells being considered for installation under the OBMP, cumulative disturbance for this activity may reach 25 acres. Although individual well sites may not disturb large areas, localized erosion and sediment discharges both during well installation could significantly impact a local water body. Therefore, in those instances where vegetation must be cleared from a site to drill a well (note that wells can be drilled on asphalt pads where clearing and/or grading is not required), mitigation will be implemented to prevent the discharge of eroded sediments from a site. The mitigation during site construction and drilling will include the implementation of best management practices designed to control erosion for each specific well location so that it will not cause significant discharge of sediment from OBMP well construction sites. Long-term mitigation will be accomplished by hardening wells sites or revegetating those portions of the site that will not be retained for future operations.

   The potential for accidental releases of petroleum products does exist during well construction activities. This issue is addressed under accidental releases which are evaluated in Subchapter 4.10. Mitigation is identified in Subchapter 4.10 that will ensure any accidental releases are controlled prior to the extent feasible through implementation of house keeping measures and, if an accidental release occurs, that the contaminant is collected, treated and disposed in a manner that does not adversely impact the environment. Further, any cleanup will reduce concentrations of any contaminants to at or below regulatory thresholds for the released contaminant. With implementation of the proposed mitigation measures, no potential exists for significant discharge of pollutants and subsequent significant degradation of surface water quality.

   Drilling muds/fluids will be retained in a lined pond or man-made container. Unless required for a specific purpose during drilling, no hazardous or toxic substances will be used in drilling fluids. At the end of drilling, the fluids will be removed from the site, by truck or other alternative transportation methods, for disposal at an appropriately licensed facility, or the fluid may be allowed to dry out and be graded into the site, if it is tested and verified not to contain any contaminants. If left on the property, it will be integrated into the final well pad in a fashion that will not allow it to be eroded from the property.

Well clean-out, development/rehabilitation, or flushing can also cause the discharge of pollutants and subsequent degradation of surface water quality. The groundwater pumped to the surface to clean the well will first be sampled and the estimated volume of groundwater that will be pumped estimated. Prior to pumping the well for clean-out the well driller will verify that the groundwater extracted and discharged does not contain any contaminants that could exceed discharge thresholds established by the Basin Plan or a direct waste discharge requirement as issued by the Regional Board. If discharges contain contaminants of concern, then the discharge will be exported from the site by truck or other method of transportation and delivered to a detention basin or holding tank and treated prior to discharge or transported to a treatment facility for treatment and disposal.

6. In addition to well drilling activities, the process of abandoning wells can result in discharge of pollutants. After an abandoned well is closed, the remainder of the site should be returned to a condition consistent with the surrounding environmental condition. Specifically, if a site is within an urban area, it should be paved or covered with appropriate materials consistent with adjacent property. In natural settings, the disturbed area around a well should be revegetated consistent with the adjacent native vegetation to prevent future erosion and sedimentation. Implementing such measures can ensure that well abandonment does not cause erosion and contribute to surface water quality degradation.

Implementing Program Element 2 may result in the following discharges that could cause alterations to surface water quality:

1. The process of modifying existing recharge basins and constructing new recharge basins (including diversion facilities) to recharge water under the OBMP will entail construction activities that have a potential to cause the same type construction related sediment and petroleum material discharges as identified and discussed for well sites above, excluding drilling mud/fluids. Because of the larger amount of acreage involved in recharge basin construction activities, the measures to control erosion and sedimentation and minimize and control accidental releases of pollutants must be incorporated into a Storm Water Pollution Prevention Plan (SWPPP) and a Notice of Intent (NOI) for the construction activities must be submitted to the State Water Resources Control Board (SWRCB) as part of the National Pollutant Discharge Elimination System (NPDES) control efforts for non-point pollution sources. Although the recharge sites are larger, the same general mitigation measures, site specific BMPs, must be applied to ensure that sediment and other pollutants are not discharged from the site into surface water supplies. No additional mitigation is required to reduce potential construction activity impacts to surface water quality to a non-significant level.

2. The issue of recharging substantial additional volumes of water to the Chino Basin is a key component of the OBMP. Recharge to the Chino Basin aquifer is integral to maintaining the safe yield of the Basin (as discussed below), but it also has potential direct and indirect consequences on water quality that is a major concern, particularly in relation to meeting the Regional Board's Basin Plan beneficial uses and water quality objectives. The following is an extended discussion of the issues outlined under the Program Element 2 summary discussion in the introduction to Subchapter 4.5.3. This material is adapted from the OBMP and additional information provided by Mark Wildermuth of Wildermuth Environmental, Inc., the Chino Basin Watermaster's hydrological engineering consultant.

   Planning Assumptions for OBMP

As part of the OBMP, two primary alternatives were defined for analysis - a baseline or no OBMP alternative and a with OBMP alternative. The baseline alternative is based on water supply plans provided by the producers and modified pursuant to the Judgment. The OBMP water supply plan is based on the facilities and operating plans in the Optimum Basin Management Program, Phase I Report prepared by Wildermuth Environmental, Inc., Draft Water Supply Plan Facilities Report, Alternative 6A - Phase I (November 1999) prepared by Black and Veatch, and the Draft Recharge Memorandum of Agreement (Recharge MOA) dated February 2000.

Based on evolving information regarding recharge issues, the need for supplemental recharge capacity has been revised to about 88,000 acre-ft/year, which is 8,000 acre-ft/yr higher than stated in the OBMP Phase I report and the draft Recharge MOA. This change is due to revised water supply plans submitted by producers and corrections in the procedure for estimating replenishment obligations in the out years. As an example, a hypothetical replenishment plan under the OBMP is presented in Table 4.5-17. The OBMP envisions new recharge of storm water and that this new recharge will be used to increase safe yield of the basin. Increases (or decreases) in safe yield are allocated to producers in the appropriative pool (appropriators) based on their initial share of safe yield. If the new recharge is allocated to the appropriators per the Judgment and the safe yield prior to the new recharge is assumed be 140,000 acre-ft/yr, then the need for supplemental recharge capacity is about 63,000 acre-ft/yr. Therefore the supplemental recharge capacity requirements for the OBMP can be described as a range of 63,000 to 88,000 acre-ft/yr. The OBMP alternative has two sub alternatives:

- OBMP Alternative A1- Local storm water recharge is increased from an existing level of about 13,000 acre-ft/year to 30,000 acre-ft year and that supplemental recharge capacity is increased from 29,000 acre-ft/yr to 63,000 acre-ft/yr.

- OBMP Alternative A2 - Local storm water recharge is increased from an existing level of about 13,000 acre-ft/year to 40,000 acre-ft year and that supplemental recharge capacity is increased from 29,000 acre-ft/yr to 53,000 acre-ft/yr.

- OBMP Alternative B - Local storm water recharge is not increased and supplemental recharge capacity is increased from 29,000 acre-ft/yr to 88,000 acre-ft/yr.

Associated with each alternative are water supply plans and related recharge and replenishment plans. The revised Chino Basin groundwater production plans associated with the baseline and OBMP alternatives in 2020 are shown in Tables 4.5-18a and 4.5-18b. Tables 4.5-19 and 4.5-20 contain the water supply plans for the OBMP and baseline alternatives, respectively. Tables 4.5-21 and 4.5-22 contain the storm water and supplemental water recharge plans for the OBMP Alternative A1 and the baseline alternative, respectively. The recharge estimates shown in Tables 4.5-21 and 4.5-22 are best estimates at this time and could vary plus or minus 50 percent after implementation. All plans are for the year 2020 conditions. Full build out of the agricultural areas is assumed to occur by the year 2020 and represents the foreseeable ultimate water demands for the Chino Basin area.

The water supply plan for the baseline alternative was developed with information supplied by the water supply agencies/companies in the Chino Basin area and was subsequently modified to reflect shortfalls in replenishment capacity and loss of safe yield associated with the baseline plan. For the baseline alternative, Chino Basin groundwater production was reduced due to an anticipated reduction in safe yield of about 40,000 acre-ft/yr. The safe yield will be reduced because the level of groundwater production in the southern part of the basin, currently produced by agriculture, is assumed to not be maintained under the no OBMP alternative after the land converts to urban uses and groundwater outflow to the Santa Ana River will increase to a level equal to the reduction in agricultural production (i.e., approximately 40,000 acre-ft/yr).

The reduction in safe yield and increased demand for Chino Basin groundwater in the remaining parts of the Basin will create a replenishment obligation greater than the supplemental water replenishment capacity in the Basin. For the baseline alternative, the Chino Basin groundwater production was reduced to a sustainable level of about 116,000 acre-ft/yr under the above assumption. The production reduction was allocated to producers in the overlying non-agricultural and appropriative pools on a pro rata basis based on their production goals for the year 2020. The Chino Basin groundwater production for the OBMP water supply plan is listed in Table 4.5-18a was modified to levels shown in Table 4.5-18b, and it was assumed that the shortfall will be made up with treated imported water. It was not possible to determine if the existing facilities for treatment and distribution of imported supplies have enough capacity to meet a new demand created by the loss of Chino Basin yield and recharge limitations.

Surface Water Quality Impacts in the Santa Ana River

One of the consequences forecast to result from implementing the OBMP is a continued volume of rising water into the Santa Ana River comparable that which currently occurs. This impact forecast is based on the assumption that the whole of the OBMP is implemented, including recharge into the Basin and installation of desalters to continue removing ground water is the lower portion of the Basin that is equivalent to that currently being pumped by the agricultural pool (estimated to be ~40,000 afy). Thus, under the OBMP surface water quality in the Santa Ana River is forecast to remain approximately the same as a result of maintaining a similar or comparable volume of rising water over the long-term.

In comparison to current conditions, groundwater discharge to the Santa Ana River for the baseline (no OBMP) alternative could increase about 40,000 acre-ft/yr. The average TDS and nitrate of this discharge is estimated to be about 1,300 mg/l and 30 mg/l nitrate as nitrogen, respectively, for this rising water. The Regional Water Quality Control Board - Santa Ana Region (Regional Board), has indicated that if this discharge were to occur, that it will require that this groundwater discharge be completely mitigated. This is because the quality of water being discharged would degrade the quality of the Santa Ana River to a level that may exceed the 700 mg/l TDS water quality objective for water being discharged through Prado Dam. The most likely form of mitigation required by the Regional Board under such a circumstance will be the demineralization of recycled water discharged to the River such that TDS and nitrogen concentrations in the River would not be adversely impacted by the increased in rising groundwater discharge. An estimate of the amount of new demineralization capacity that would need to be constructed at recycled water treatment plants that discharge to the Santa Ana River has not yet been calculated.
On the other hand, with the OBMP the groundwater discharge to the Santa Ana River and its tributaries will be either be the same as the current level of about 9,000 acre-ft/yr or reduced from current levels to negligible levels, which could improve surface water quality in the River. This will be accomplished by replacing current agricultural groundwater production with desalter production in the same geographical area. With the OBMP the desalter well fields are proposed to be sited and operated in such a way as to control groundwater discharge to the Santa Ana River and its tributaries.

Figure 4.5-48 shows the location of the Chino Basin relative to the Santa Ana River and the Orange County groundwater basin. Changes in Santa Ana River surface water discharge caused by actions in the Chino Basin including the recharge of recycled water and storm flows will impact the volume of water available for diversion and recharge in the Orange County groundwater basin. The OBMP includes the recharge of up to 40,000 acre-ft/yr of recycled water and 30,000 acre-ft/yr of storm water. The purpose of this recharge is to augment the natural yield of the basin and to replace some of the state project water that has been used for groundwater replenishment pursuant to the Judgment. In the absence of the OBMP, the recycled and storm water proposed for recharge will be discharged to the Santa Ana River. Table 4.5-23 summarizes the projected discharge and TDS impacts for the Santa Ana River below Prado.

<u>Impacts on Beneficial Uses of Surface Water in the Chino Basin</u>

The quality of Santa Ana River (SAR) water is function of the quality and quantity of the various sources of water that contributes to the SAR (RWQCB, 1995). The Santa Ana River Watermaster (Watermaster) has divided the discharge in the SAR into three components consisting of storm flow, base flow and non-tributary flow. Storm flow is discharge caused by direct runoff of precipitation and usually occurs in December through April. With some exceptions, the TDS and TIN of storm flows are generally very low - the exceptions being runoff from agricultural lands.

Base flow consists of rising groundwater and the direct discharge of recycled water to the SAR and its tributaries. The TDS and TIN of rising water is not well characterized, but is significantly higher in concentration than storm water. The TDS and TIN of the recycled water discharges varies among the treatment plants.

Non-tributary flows primarily consist of the direct discharge of imported water to the SAR and its tributaries. The Watermaster also distinguishes other non-tributary flows, such as groundwater that is pumped in the San Bernardino area and discharged to the SAR upstream of Prado and treated groundwater from the Arlington Desalter that is discharged to the SAR upstream of Prado.

The RWQCB has established TDS and TIN objectives for Reaches 2 and 3 of the SAR (Figure 4.5-48). Reach 3 runs from Prado Dam to the Mission Boulevard bridge in Riverside. The TDS and TIN objectives for Reach 3 are 700 mg/l and 10 mg/l, respectively, for base flow measured in the SAR above Prado in August. Non-point surface inflows (storm water and urban nuisance flows) and agricultural surface returns to the SAR are managed by Best Management Practices where appropriate.

The quantity and quality of base flow are most consistent in August (RWQCB, 1995). The RWQCB believes that the dominant source of water during August is recycled water discharged to the SAR. The purpose of the August-only objective is to verify the wasteload allocation and to determine if assimilative capacity exists (RWQCB, 1995). The RWQCB reviews water quality data from OCWD and the USGS, and conducts its own sampling program in the SAR below Prado in August. The RWQCB uses water quality models to develop wasteload allocations for the recycled water dischargers to the SAR. These models do not include storm flows. The volume of storm flows have increased due to urbanization in the SAR watershed upstream of Prado Dam. Urban storm water runoff has been shown by the Chino Basin Watermaster (Wildermuth, 1998) to be very low in TDS and TIN - generally less than 100 mg/l and 1 mg/l, respectively.

Reach 2 runs from 17th Street in Santa Ana upstream to Prado Dam. Surface water discharge from Reach 3 flows into Reach 2. The TDS objective for Reach 2 is 650 mg/l measured in the SAR below Prado - the same location that compliance with the Reach 3 objective is determined. The value of 650 mg/l is also the TDS objective of the Orange County Forebay subbasin in the 1995 Basin Plan. In contrast to Reach 3, the RWQCB computes a five-year moving average of TDS for the SAR below Prado based on Watermaster's annual average estimate of TDS in the total flow (excludes non-tributary discharges and groundwater that is pumped and discharged to the SAR upstream of Prado Dam). The use of this moving average allows the effects of wet and dry years to be smoothed out over the five-year period (RWQCB, 1995). The Basin Plan does not have a TIN objective for Reach 2. The Basin Plan assumes that TIN compliance in Reach 3 is protective of Reach 2.

The TDS objectives for Reaches 2 and 3 are measured at the same physical location - the SAR below Prado dam. The Reach 3 objective uses a portion of the data used to measure compliance for Reach 2 for TDS. The watershed upstream of Prado Dam is rapidly urbanizing and the storm runoff and recycled water discharges to the SAR have increased significantly. The increased use of recycled water upstream of Prado could lead to higher TDS concentrations in the SAR below Prado Dam in the summer. This would occur because the upstream agencies will preferentially reuse their lower TDS recycled water and will continue to discharge their higher TDS recycled water to the SAR It would be speculative to attempt to forecast the effect of such an impact, because over the 20 year planning period (2000-2020), the amount of recycled water discharged is actually forecast to increase, by several thousands of acre-feet due to population growth, even after taking into consideration a full 40,000 acre-feet of recycled water being recharged or otherwise reused in the upper portions of the Basin. When placed in this context, the potential for degradation of surface water quality downstream of Prado Dam is not considered to significant and adverse.

With the no-OBMP alternative, the TDS concentrations below Prado Dam should remain about the same or decrease based on the following assumptions: the increase in and regulation of storm water discharges in the Santa Ana River watershed, discharge limitations at water recycling plants that discharge to the River, and the demineralization of recycled water discharged to the River by Chino Basin recycled water plants. The TIN concentrations below Prado Dam should remain either about the same or improve due to: nitrogen discharge limitations at water recycling plants that discharge to the River, increases in and regulation of storm water discharges in the Santa Ana River watershed, the demineralization of recycled water discharged to the River by Chino Basin recycled water plants, and the de-nitrification capabilities at the Orange County Water District constructed wetlands in the Prado reservoir.

For the OBMP alternative, the TDS concentrations below Prado Dam should remain about the same or decrease due to: the increase in and regulation of storm water discharges in the Santa Ana River watershed, and discharge limitations at water recycling plants that discharge to the River. The TIN concentrations below Prado dam should remain either about the same or improve due to: nitrogen discharge limitations at water recycling plants that discharge to the River, increases in and regulation of storm water discharges in the Santa Ana River watershed, and the de-nitrification capabilities at the Orange County Water District constructed wetlands in the Prado reservoir. While not anticipated, should the with OBMP alternative threaten or cause the TDS and TIN concentrations to increase in the River below Prado and exceed their respective water quality objectives, the TDS and TIN discharge limitations at Chino Basin water recycling plants would have to be lowered to a level that would protect downstream beneficial uses. Thus, under the OBMP alternative and assumptions outlined above, no significant conflict with the Basin Plan surface water quality objectives is forecast to occur from implementing the proposed project.

A final issue of concern regarding surface water quality is the discharge of recycled water or SPW into stream channels as part of a recharge effort (for example to transport the recycled water from a point of discharge to a basin for recharge. The potential for this impact to occur is low because it would be unwise to discharge recycled water to a channel during storm flows. However, to prevent this potential degradation of storm flows from occurring, a mitigation measure has been incorporated in this PEIR that mandates no recycled water releases to channels that are carrying storm flows. The eliminates the potential for this surface water quality impact to occur.

Implementing Program Elements 3 and 5 is forecast to affect pollutant discharges and potential alterations to surface water quality in the following manner:

1. The installation of three desalters is forecast to disturb a total of approximately 75 acres. As outlined for disturbances associated with monitoring wells, recharge basins and pipelines, construction activities associated with desalter operations have a potential to cause the discharge of pollutants, particularly eroded sediment and accidental releases of petroleum products, and possible degradation of surface water quality. Previously identified mitigation measures for construction activities will also apply to construction of the desalters. With implementation of these measures, no significant surface water quality impacts are forecast to occur.

2. Meeting the replenishment obligations, up to 55,000 afy, can be fulfilled with a mix of local water in storage, direct recharge of water or *in lieu* exchange. Adequate recharge capacity is available to meet this need as outlined in the previous discussion. The potential environmental effects described under Program Element 2 for recharge basin effects on surface water also apply to the proposed replenishment program. No additional surface water quality impacts have been identified from meeting the replenishment obligations for the Chino Basin under the OBMP.

3. As part of the desalter operations, salt removed is concentrated and of 100 percent of the water taken into the desalter, there will be an approximate 15-16 percent rejection rate. Assuming an input of water with 750 mg/l TDS, the concentration in the rejected fluid is estimated to be approximately 5,000 mg/l. This fluid will be discharged to the Santa Ana Regional Interceptor (SARI) line. Assuming 40,000 afy of desalting capacity, an estimated 35,000,000 million gallons of water could be treated on a given day. With a 15 percent rejection rate, the amount of fluid discharged to the SARI line would be about 5.25 million gallons. With approximately 30 MGD disposal capacity, the SARI line is currently transporting approximately 9 MGD. Sufficient capacity exists in the SARI line to accept the volume of rejected fluid from the 40,000 acre-feet of desalinated water. The issue of concern is the accidental spill of this fluid which could adversely impact surface water quality.

   This issue was discussed with IEUA engineers, and information was provided that identifies the local discharge limits to the SARI line. There is no TDS limit, but since the 5,000 mg/l value is so far below sea water, no adverse effect to seawater is forecast to occur rom transporting this fluid to the ocean in an already permitted, and environmentally approved, wastewater disposal system. The discharge limits for the SARI line are shown on Table 4.5-23 (taken from Santa Ana Watershed Project Authority Ordinance No. 3) and these limits are placed on individual permits issued for discharge into the SARI line.

If an accidental release of the fluid in the SARI line occurred in the future, the potential damage would be similar to that when a major interceptor sewer line ruptures and releases wastewater. Ignoring the fact that a gravity flow line like the SARI line would probably pull in the soil around it and possibly plug itself, a major accidental release would require a standard series of steps to correct the problems and impacts: including stopping the discharge; containing the released fluid, providing an alternative by-pass line until the line is repaired; collection of the contaminated material (to the extent feasible); and restoration of areas contaminated by the release. The short-term damage from an accidental release might be significant (note that the SARI line carries discharges other than from the desalters), but the contribution from the desalters should not contain any significant contaminants since is will simply be concentrated salts from the local aquifer in the vicinity of the desalters. With the requirement to restore any areas contaminated by an accidental release from the SARI line (which would be required by the Regional Board), the potential significant surface water quality impacts to the environment, including surface water, would be mitigated to a non-significant level.

Implementing Program Element 4 is forecast to impact pollutant discharges and surface water quality in the following way.

1. Modifying groundwater production for Management Zone 1 (MZ 1) has no potential to adversely impact surface water quality. It may have a potentially beneficial effect. Data indicates that water from adjacent management zones or higher in MZ 1 is of better quality (except a localized nitrate plume) than that in the southern portion of MZ 1. Although the effect may be minor, the recycled water generated from the higher quality (less TDS and nitrate) water would be marginally better as a result of beginning which lower TDS water. Otherwise, no adverse impact can affect these water issues from implementing this component of Program Element 4.

2. Meeting any additional recharge requirements in MZ 1 can occur without any modifications to the physical environment. However, if construction impacts are incurred for construction of new recharge areas within MZ 1, the mitigation measures previously identified for construction activities will ensure that no adverse surface water quality impacts will result from implementing Program Element 4. No potential exists for recharge operations in MZ 1 to adversely impact the surface water environment.

3. Collection of additional data to fill gaps in knowledge about the zone is not forecast to include any activities that will cause discharge of pollutants or adversely affect surface water quality.

Implementing Program Elements 6 and 7 is forecast to affect pollutant discharges and surface water quality in the following way:

1. The process of developing cooperative strategies and plans has no potential to change the physical environment; therefore, no potential exists to cause the discharge of pollutants or to adversely impact surface water quality.

2. Seeking funds to speed up cleanup and restoration of contaminated sites does not, in itself, cause any adverse impacts to the environment. Prior to utilizing funds to conduct cleanup and restoration activities, these activities must complete additional environmental investigations to address issues, such as waste transport effects on local roads; potential public health risks from transporting the contaminated material; proper treatment, disposal or even recycling of the contaminated waste; etc. Since no specific

sites are referenced for speeding the remediation process, it would be speculative to assume that surface water quality impacts would occur from obtaining such grants.

Implementing Program Elements 8 and 9 is forecast to affect pollutant discharges and surface water quality in the following way.

1. The process of developing storage and conjunctive use programs and plans has no potential to change the physical environment; therefore, no potential exists to discharge pollutants or to adversely impact surface water from implementing this component of Program Elements 8 and 9.

2. Collection of additional data to fill gaps in knowledge about the water storage is not forecast to include any activities that will adversely affect discharge of pollutants or degradation of water quality.

3. Attempting to make impact forecasts for an undefined pilot conjunctive use program would be speculative, and the State CEQA Guidelines (Section 15145) indicate that the public be informed of this conclusion and no further evaluation is necessary. Note that a pilot conjunctive use program would be expected to use recharge basins to deliver the water for percolation into the Basin groundwater aquifer, and the surface water quality issues associated with such activities have already been addressed above. Before a conjunctive use program is implemented, further detailed environmental evaluation will be necessary. A comparative evaluation with a conjunctive use program is provided in the alternative section.

d. Will the project change the amount of surface water in any water body?

Implementation of Program Element 1 is forecast to affect surface water quantities in the following manner:

1. The process of sampling groundwater and measuring piezometric levels is a relatively passive action that does not pose any substantial adverse impact to the quantity of water present in any water body.

2. Installation and operation of water production monitoring systems has no substantial direct impact to the amount of surface water present in any water body. No adverse impact is forecast to occur as a result of this monitoring activity.

3. Ground level monitoring activities are typically remote or do not have direct impacts on water quantities in surface water bodies. Activities associated with ground level monitoring are not forecast to have any significant effect on the amount of water contained in surface water bodies.
4. Installation of new monitoring wells may create a minor increase in impervious surfaces that could contribute to a very small increase in stormwater runoff to surface water bodies within the Chino Basin, however, this increase will be ***de minimus*** in nature since the actual impervious surface will only increase by approximately up to 50 acres in a 225,000 acre basin.

Implementation of Program Element 2 is forecast of change the amount of surface water present in any water body in the following manner:

1. The process of modifying or utilizing existing and possibly new recharge basins for recharge purposes has the potential to affect the quantity of surface water in the water body at Prado Reservoir. The

recharge basins will be utilized to recharge approximately 40,000 afy of recycled water that normally would be discharged and reach the Prado Basin area. Last year, approximately 12,000 afy of stormwater was recharged into the Chino Basin. The recharge program identified in the OBMP could potentially recharge up to 30,000 afy in the Chino Basin. This would result in the net diversion of 18,000 afy of recharge from flowing surface water flowing into the Prado Reservoir. The baseflow, based on a 5-year moving average from 1992, through Prado Dam was measured to be around 250,000 to 310,000 afy. The diversion of a maximum total recharge quantity (for recycled water and stormwater elements of the recharge plan) of 58,000 afy would be cause a reduction along the order of one-fifth of the amount of the total base flow. Currently, the flow through Prado Dam is very high, and has to potential to raise water levels to a point that could threaten surrounding riparian areas. In a comment letter included in the FEIR for Regional Plant 5 from the U.S. Fish and Wildlife Service, it was reported that flows exceeded the maximum conservation pool limit of 505' (established in an April 1995 Cooperative Agreement involving the Army Corps of Engineers (COE)) for 7 days in 1995. Historically, the conservation pool level has been rising over the years since 1991. The conservation pool elevation limit (with appropriate mitigation measures for riparian habitat impacts) was increased from 494' in 1988 to 498' in 1995. In a later MOA between the COE and OCWD, the permanent water conservation pool was mitigated and increased to elevation 505 feet. The relocation of discharge and stormwater would have a beneficial impact on the future attempt to maintain water at or below this elevation. No adverse impact is forecast to occur as a result of the recharge program proposed under the OBMP.

2. The construction of diversion and turnout structures themselves do not have any direct impact on the water quantity in any water body; however, their operation will result in the delivery of recharge and stormwater, discussed above, to various basins throughout the project area. This relocation of water would theoretically decrease the amount of water that reaches Prado Dam; however, the as recharge water supplies are diverted, wastewater flow volumes will also be increasing, so the change in water volume due to recharge projects in the Chino Basin is not forecast to cause any significant adverse impact. Further, as water levels near Prado Dam have been relatively high of late, and could potentially adversely impact riparian areas should they continue to rise, the proposed project may have a beneficial effect on the circumstances at Prado Basin.

   The shift of 40,000 acre-ft/year of recycled water from discharge to recharge will be occurring gradually over the course of the OBMP timeframe. As this water is being diverted, wastewater flows will be increasing to the Prado Basin area. The following analysis provides data for both current and 2020 projected wastewater volumes. The Los Angeles County Sanitation district predicts an increase in wastewater discharge for the cities of Pomona and Upland from 22,000 to 30,000 acre-ft/year. The IEUA service area generation of wastewater flow will increase from 57,000 acre-ft/year to 112,000 acre-ft/year. Project areas within Riverside County are forecast to have increased wastewater generation by 5,000 acre-ft/year, an increase from 10,000 acre-ft/year to 15,000 acre-ft/year. In total, wastewater will increase, regardless of the proposed OBMP project, by approximately 68,000 acre-ft/year. Consequently, even with the diversion of 40,000 acre-ft/year of wastewater flows, there will still be a net increase in flows to Prado Dam, potentially on the order of 28,000 acre-ft/year (the relative amount will ultimately depend on the amount of direct beneficial use by industrial and irrigation users in the future). This ultimate increase of 28,000 is less than that which would otherwise occur by 40,000 acre-feet, however, the increase that will occur regardless of OBMP implementation can be partially offset and have a beneficial impact on riparian resources to help maintain water levels closer to existing water levels.

3. The construction of new basins for recharge purposes and the installation of diversion or turnout structures for water delivery to the basins will have the same types of effects as described under this program element in the previous two numbered analysis paragraphs.

4. The construction of pipelines and other related facilities may indirectly relate to surface water body quantities of water as pipelines facilitate transportation of water from one discharge location to another, however, the pipelines themselves are not the direct goal for water relocation. The true objective of the recharge program is outlined under the recharge basin impact evaluation discussed above, and pipelines are merely a component of this program. No significant adverse environmental effects are forecast to occur related to surface water bodies in conjunction with pipeline installation and operation.

5. The recharge of State Project Water (SPW) in the recharge basins will not affect the amount of water present in any local water bodies, and the environmental impacts of the source water supplies for the SPW have already been evaluated for CEQA compliance. OBMP use of SPW will not cause any additional adverse environmental impacts to the amount of surface water in any water body.

Program Elements 3 and 5 are forecast to affect surface water quantities in area water bodies in the following manner:

1. The implementation of desalters in the southern portion of the basin will effectively reduce or stop loss of safe yield capacity as rising groundwater to the Santa Ana River. According to an April 22, 2000 memorandum from Mark Wildermuth to Traci Stewart of Watermaster, "the groundwater discharge to the Santa Ana River and its tributaries will either be the same as the current level of about 9,000 afy or reduced from current levels to negligible levels. This will be accomplished by replacing current agricultural groundwater production with desalter production in the same geographical area. With the OBMP, the desalter well fields will be sited and operated in such a way as to control groundwater discharge to the Santa Ana River and its tributaries." Further, "In comparison to current conditions, groundwater discharge to the Santa Ana River for the baseline alternative will increase about 40,000 afy. The average TDS and nitrate of this discharge is estimated to be about 1300 mg/l and 30 mg/l nitrate nitrogen, respectively. The implementation of the OBMP will thus have the beneficial impact of potentially reducing poor-quality groundwater outflows from discharging into the Santa Ana River in the future.

2. The pipelines and desalter facilities themselves will not have any potential impacts related to surface water body volumes. The pumps that are installed for the desalters will result in the decrease in groundwater outflow as described in the previous paragraph, causing a beneficial impact to decrease poor-quality outflows from discharging into the Santa Ana River. This hydraulic control is a beneficial impact of implementing the OBMP versus the No Project Alternative.

Implementing Program Element 4 is forecast to impact surface water quantities in the following way.

1. Modifying groundwater production for Management Zone 1 (MZ 1) has no potential to alter the quantity of surface water in any water body. Therefore, no adverse impact can affect this water issue from implementing this component of Program Element 4.

2. Meeting any additional recharge requirements in MZ 1 can occur without any modifications to the physical environment. No potential exists for recharge operations in MZ 1 to adversely impact the surface water environment.

3. Collection of additional data to fill gaps in knowledge about the zone is not forecast to include any activities that will cause a change in the volume of water in any water body.

Implementation of Program Elements 6 and 7 have the potential to affect surface water body quantities of water in the following manner:

1. The implementation of Cooperative Programs with the Regional Board and other agencies to improve Basin Management is primarily an administrative activity focused on identification and remediation action planning for site-specific contamination plumes in the Basin. These clean-up activities and plans would only benefit the basin, and should not have any impacts on the quantity of water in any surface water body. No adverse effects are forecast to occur for this issue.

2. The development and implementation of a Salt Management Program involves the creation of a salt budget for the Basin. Under the OBMP alternative implementation, the groundwater outflow through the southern portion of the basin either would remain constant or decrease below the current loss of approximately 9,000 afy. This is considered to be a beneficial impact. If the OBMP was not implemented and the desalters (facilities for salt balance mitigation) were never constructed, up to 40,000 afy of poor quality water could be discharged into the Santa Ana River. Thus, beneficial, not adverse, impacts are forecast to occur from implementation of a salt management program that would utilize desalters.

Implementation of Program Elements 8 and 9 have the potential to affect surface water body quantities of water in the following manner:

1. Program Element 8 is primarily ministerial in nature. Thus, for this issue of analysis, no environment-altering activities are proposed under this element. No adverse environmental impacts are forecast to occur.

2. Program Element 9 involves a conjunctive use program for recharging, storing, pumping and transporting water throughout the Basin. This program element is not yet well enough defined that the environmental impacts can be reviewed at a non-speculative level. At this time, forecasting detailed impacts regarding such a conjunctive use program would only be speculative, thus before a conjunctive use program is implemented, further detailed environmental evaluation will be necessary. A comparative evaluation with a conjunctive use program is provided in the alternative section.

No mitigation is required for this issue since there are no significant environmental impacts resulting from substantial changes in the amount of surface water in any water body.

e. Will the project cause change in currents, or the course or direction of surface water movements?

Implementing Program Element 1 has the potential to change currents or the course or direction of surface water movements in the following way:

1. The process of sampling groundwater levels and quality at existing and future wells and extensometers is not forecast to change surface water currents, or the course or direction of surface water movements. No adverse impacts to these water issues are forecast to occur from implementing groundwater level and quality monitoring, either directly or indirectly.

2. Installation and operation of water production monitoring systems on existing and future wells is not forecast to cause any change in circumstances regarding surface water movement. No adverse impacts are forecast to occur with relation to this issue.

3. The action of obtaining surface water discharge and quality data depends upon sampling within existing stream channels. According to SBCFCD, many sites for measuring flows within each major stream channel are already in place as part of the County Flood Control monitoring programs (personal communication with Randy Forbey, SBCFCD, May 4, 2000). When existing flow measuring stations do not exist, but are necessary to fulfill monitoring goals, they will be installed by Watermaster or by other contributing entities. Locations for measuring flows within each major stream channel are assumed to be in place as a result of County Flood Control monitoring programs. In any case, stream runoff volume and water quality sampling is a passive activity that has no potential to cause changes in surface water currents, or the course or direction of surface water movements, either directly or indirectly.

4. The impact of installing up to 12 extensometers on less than 6 acres of land will have a *de minimus* impact on impervious surface area within the Basin. No adverse impacts from surface runoff, either direct or indirect, are forecast.

5. The installation of monitoring wells will create ground disturbances and entail drilling activities which are not anticipated to affect surface water currents or the course or direction of surface water movements, either directly or indirectly.

Implementation of Program Element 2 is forecast to affect surface water movements in the following manner:

1. The process of modifying existing recharge basins for stormwater recharge under the OBMP will entail enhancement of these basins by creating new diversion works and turnout structures to allow for redirection of stormwater flows from flood control channels into the recharge basins. For example, along San Sevaine Creek, diversion facilities already exist to direct flows into the Jurupa Basin. The OBMP planners have indicated that economics may justify collecting high quality stormwater flows in the lower portion of the basin and pumping them to the upper subbasins for recharge. The diversion facilities will involve the use of pipelines to accomplish the redirection of flows. Direction of surfaces flows will thus be altered, but this will not have a significant adverse impact, since the relative amount of surface water reaching Prado Dam will not change significantly due to increases in wastewater flows. In each instance where storm flows are diverted to basins for recharge (up to 30,000 acre-feet), the current, in terms of volume and perhaps velocity, will be reduced. This reduction serves to augment flood control activities and downstream impacts from such diversion are considered beneficial for flood control purposes and by reducing the volume of water stored behind Prado Dam, the riparian habitat will also benefit.

Implementation of Program Elements 3 and 5 have the potential to affect currents or the course or direction of surface water movements in the following way:

1. Other than to potentially create additional impervious surfaces due to desalter, well and extensometer installation (as previously discussed under Program Element 1) the development and implementation of a water supply plan for the impaired area of the Basin, and the development and implementation of a regional supplemental water program for the Basin do not have any potential to adversely impact surface water movements.

2. To meet the replenishment obligations, up to 55,000 afy, a mix of local water in storage, direct recharge of water or *in lieu* exchange is forecasted to occur. Adequate recharge capacity is available to meet this need and includes the basin enhancement as outlined in the previous discussion. No adverse impacts, either direct or indirect are forecast.

Program Element 4 has the potential to impact surface water movements in the following manner:

1. This particular program element deals with potential shifting production from Management Zone 1 to Zones 2 and/or 3 to meet future water supply demands, or will require additional planned recharge beyond the recharge plan discussed in Program Elements 3 and 5, or the use of desalter and/or supplemental water to meet obligations in this area. There is no potential impacts to surface water movement by shifting production between Management Zones. Transfers will be conducted by way of underground pipelines and will not impact surface water currents or the direction of flows. No adverse impacts, either direct or indirect are forecast.

Program Elements 6 and 7 have the potential to impact currents, or the course or direction of surface water movement in the following manner:

1. The process of developing cooperative strategies and plans has no potential to change the physical environment; therefore, no potential effects to currents or the physical direction of surface water flows is forecast to result from implementing this component of Program Elements 6 and 7.

2. Meeting any additional recharge requirements in MZ 1 can occur without any modifications to the physical environment. No potential exists for recharge operations in MZ 1 to adversely impact the environment.

3. Seeking funds to speed up cleanup and restoration of contaminated sites does not, in itself, cause any adverse impacts to the environment. Prior to utilizing funds to conduct cleanup and restoration activities, these activities must completed additional environmental investigations to address issues, such as waste transport effects on local roads; potential public health risks from transporting the contaminated material; proper treatment, disposal or even recycling of the contaminated waste; etc.

Program Elements 8 and 9 have the potential to impact surface water movement in the following manner:

1. The development of programs for storage management and conjunctive use have little potential in themselves of causing any adverse environmental effects. These program elements, as with Program

Elements 6 and 7, are mainly ministerial in nature. Impacts related to this issue are forecast to be less than significant.

2. Collection of additional data to fill gaps in knowledge about the water storage is not forecast to include any activities that will affect changes in currents, or the course or direction of surface water movements.

3. The implementation of a conjunctive use program as part of Program Element 9 is only generally defined at this point in time. In the future, Watermaster will better outline the details and exact physical actions necessary to implement a comprehensive recharge, storage and extraction plan for volumes of water up to 500,000 afy in a basin-wide, and potentially regional, conjunctive use program. At this time, forecasting detailed impacts regarding such a conjunctive use program would only be speculative, thus before a conjunctive use program is implemented, further detailed environmental evaluation will be necessary. A comparative evaluation with a conjunctive use program is provided in the alternative section.

f. Will the project cause the change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations, or through substantial loss of groundwater recharge capability?

Implementation of Program Element 1 has the potential to affect groundwater quantities in the following manner:

1. The construction and use of monitoring wells (to measure groundwater levels) and extensometers will not adversely impact the quantity of groundwater available in the basin. Although these facilities will result in the interception of the groundwater aquifer, the well and extensometers themselves are passive monitoring devices that will cause no substantial impact to the volume of water in the aquifer. Impacts are forecast to be less than significant for this issue.

2. Again, the installation of production monitoring devices and the activity of monitoring ground surface levels are both passive activities that will not have any substantial affect on groundwater quantities within the Basin.

Implementation of Program Element 2 has the potential to impact groundwater quantities in the following manner:

1. The recharge program that is a component of the OBMP has the potential to increase the quantity of water available for production in the basin. The safe yield prior to new recharge for the Basin is assumed to be 140,000 afy. The recharge program being analyzed in this document proposes to recharge a range of 63,000 to 88,000 afy (Memorandum from Mark Wildermuth to Traci Stewart, April 22, 1999). It is anticipated that this quantity is necessary in order to meet replenishment obligations, given the ability to recharge SPW and stormwater every 7 out of 10 years. In a one year period, the quantity of groundwater recharged into the basin due to the OBMP may increase the quantity of water in the Basin by a maximum of 88,000 afy. This recharge plan assumes that most of the recharge will occur above the Interstate-10 Freeway and that this water will be recaptured (i.e. pumped) before it has the ability to flow out the southern portion of the basin as rising groundwater into the Santa Ana River. The desalters that are also part of the OBMP will act as a hydraulic control mechanism to prevent the outflows of this recharged water from the basin. The 88,000 afy is the ultimate goal of the OBMP for recharge, however, pumping will also have increased by the time this goal is reached, so there will be no

additional outflows from the basin resulting from the recharge program. The general effect that is forecast to occur will be a beneficial increase in the safe yield quantity from the additional recharge of up to 88,000 afy.

2. The recharge basins, turnouts and pipelines are all the means by which to accomplish the recharge program, however the construction of the recharge facilities themselves has no potential to change groundwater quantities since the aquifer will not be encountered directly through any cuts or excavations during construction/operation of the recharge facilities.

Program Elements 3 and 5 have the potential to affect groundwater quantities in the following manner:

1. The development and implementation of a water supply plan for the impaired area of the basin involves the potential construction and operation of up to three desalter facilities in the southern (impaired) portion of the basin. The desalters will be synchronized to come online as agricultural production in the southern portion of the basin declines due to increasing urbanization of these areas. Agricultural production is expected to decrease by approximately 40,000 afy by 2020, and the desalters are phased to coincide with a proportional increase in their production by 40,000 afy in the year 2020. As a result of this water supply plan, the safe yield will be maintained and there is no net impact to groundwater quantities associated with this element of the water supply plan.

2. Although recharge within the basin may initially appear to cause an increase in the groundwater quantity, in fact the quantity will actually remain virtually the same since production will be increasing commensurately with increased recharge. No adverse impacts to groundwater quantity are forecast to occur under implementation of the OBMP. In fact, impacts to the basin safe-yield under the OBMP are only beneficial. If the OBMP is not implemented, there could be a substantial adverse change in the safe-yield of the basin by approximately 58,000 afy (40,000 afy of agricultural production loss plus loss of an additional 18,000 afy of stormwater recharge).

Implementation of Program Element 4 had the potential to affect groundwater quantities in the following manner:

1. This program element proposes that a comprehensive groundwater management plan be developed and implemented under the OBMP. Pumping may be shifted from one management zone to another management zone, or SPW may be used instead of pumping, or additional recharge may occur in Management Zone 1. None of these options, however, will directly cause a change in the safe-yield value for the whole Basin. These are primarily just different water accounting practices with no substantial ability to impact the total groundwater quantity in the basin. Thus, no impact to groundwater quantities is forecast to occur due to implementation of this Program Element. Only voluntary reductions in pumping, combined with recharge in excess of required replenishment in the area would cause an increase in groundwater quantities for this area. The purpose of the OBMP is to basically maintain the status quo for groundwater quantities within the Chino Basin over an extended period of time. If no OBMP alternative is implemented, there could be significant adverse impacts associated with the safe-yield loss, however the OBMP is firmly committed to maintaining or increasing Basin safe-yield. No adverse environmental impacts are forecast to occur for groundwater quantity is Program Element 4 is implemented.

Implementation of Program Elements 6 and 7 has the potential to affect groundwater quantities in the following manner:

1. Program Element 6 is primarily administrative in function to facilitate cooperative efforts with other jurisdictional agencies in the area. Such projects are not yet defined but focus primarily on Basin clean up operations and on maintaining or improving groundwater quality and quantity. Most actions associated with this element are passive in nature and do not have any adverse environmental impacts that can be forecast at this time. Future activities that may be implemented under this element may require additional environmental evaluation if there are any potential physical changes in the environment that may result.

2. Program Element 7 deals primarily with the development of a detailed salt budget and management program. Monitoring programs associated with this element have no substantial potential to adversely impact groundwater quantities. Salt management activities may include operation of the desalters, and this would have a beneficial impact on the salt budget of the basin since salt would be exported from the Basin via brine discharge to the SARI line. The impacts associated with the desalter have already been discussed under the analysis of impacts for Program Elements 3 and 5 in this section.

Program Elements 8 and 9 have the potential to affect groundwater quantities in the following manner:

1. The groundwater storage management program has the potential to slightly increase (relative to historic practices) groundwater quantities over the long-term as it proposes to assess approximately a three percent loss to storage accounts that do not produce their stored quantities within a certain time frame. In the past, this increment was not included in Watermaster accounting practices, and some of the water was lost as it migrated south, and flowed out of the Basin. In the future, as this loss is accounted for in new storage practices, these losses will not continue, and the basin will not be overproduced by the amount equal to storage losses that leave the basin. This will not cause an overall increase in safe-yield, rather it will help to better maintain the existing safe-yield and prevent overdraft. There are no adverse groundwater quantity-related impacts associated with implementation of Program Element 8.

2. Evaluated at a very general level, Program Element 9 has a vast potential to impact groundwater quantities in the Basin. A large conjunctive use program would substantially increase water levels and total volumes of groundwater within the Basin. This program is only roughly defined at this point in time. The program which could possibly increase storage up to a total quantity of 500,000 afy (a net addition of 300,000 afy on top of approximately 200,000 afy which is currently in storage already). More detailed impact evaluation is necessary before such a conjunctive use plan is implemented. General impacts related to this issue may include an increase in groundwater quantities in the basin may cause adverse water quality and potentially liquefaction impacts if the vadose zone within the Basin is intercepted. In the future, Watermaster will better outline the details and exact physical actions necessary to implement a comprehensive recharge, storage, and extraction plan for volumes of water up to 500,000 afy in a basin-wide, and potentially regional, conjunctive use program. At this time, forecasting detailed impacts regarding such a conjunctive use program would only be speculative, thus before a conjunctive use program is implemented, further detailed environmental evaluation will be necessary. A comparative evaluation with a conjunctive use program is provided in the alternative section.

g. Will the project alter the direction or rate of flow of groundwater?

Groundwater level changes caused by implementation of the OBMP were estimated with Watermaster's groundwater modeling tool that Watermaster has named ***Rapid Assessment Model*** (RAM). The RAM tool uses the ***Modular Three-Dimensional Finite-Difference Flow Model*** developed by the USGS. The current RAM tool implementation is a steady state model that was initially developed in 1998 with subsequent revisions to address specific questions by Watermaster. Figure 4.5-49 illustrates the estimated groundwater elevation in the Chino Basin for 1997 and represents current conditions. The current conditions map is based on observed groundwater levels. RAM modeling for water level impact forecasting was conducted as part of the analysis process for this PEIR by Wildermuth Environmental. Figures 4.5-50 through 4.5-51 are RAM tool projections of the groundwater elevations at ultimate equilibrium for the baseline, and in 2020 for the OBMP alternatives. Figures 4.5-52 through 4.5-53 show the differences in groundwater elevation between current and ultimate conditions for the baseline, and current and 2020 conditions for the OBMP alternatives, respectively. Figure 4.5-54 shows the projected difference in groundwater elevations in the year 2020 between the ultimate baseline and 2020 OBMP alternative conditions.

In comparison to current groundwater elevations, groundwater elevations at ultimate conditions for the baseline alternative are higher in the southern part of the basin due to the elimination of agricultural production in the agricultural areas of the southern Chino Basin and due to reduced groundwater production throughout the rest of the basin. In fact, groundwater levels approach the ground surface near the Santa Ana River (Figure 4.5-50).

In comparison to current groundwater elevations, groundwater elevations for the OBMP alternative in the southern part of the basin are similar to current conditions because production in the southern part of the basin is similar to current production levels and the basin is assumed to be operated in a safe yield mode with a safe yield equal to the current estimate of safe yield of 140,000 acre-ft/yr. For the OBMP alternative, groundwater levels are higher in the northern parts of the basin in the vicinity of recharge facilities due to the increased recharge that occurs in the OBMP alternative. The general groundwater gradient from the north to the south is slightly steeper than current conditions and baseline 2020 conditions. Groundwater velocities are slightly higher than the baseline alternative in the area between the recharge areas in the north and the OBMP desalter well fields in the southern Chino Basin.

Implementing Program Element 1 has the potential to alter the direction or rate of flow of ground water in the following way:

1. The process of sampling groundwater levels and groundwater quality at existing and future wells and extensometers is not forecast to change the direction or rate of flow of groundwater currents. No adverse impacts to these water issues are forecast to occur from implementing groundwater level and quality monitoring, either directly or indirectly.

2. Installation and operation of water production monitoring systems on existing and future wells in not forecast to cause any change in circumstances regarding groundwater rate flows or movement. No adverse impacts are forecast to occur with relation to this issue.

3. The action of obtaining surface water discharge and quality data depends upon sampling within existing stream channels. Locations for measuring flows within each major stream channel are assumed to be in place as a result of County Flood Control monitoring programs. In any case, stream runoff volume and water quality sampling is a passive activity that has no potential to cause changes in the direction or rate of flow of groundwater, either directly or indirectly.

4. Ground level monitoring is conducted by indirect (including remote sensing) methods that do not require any changes in the physical environment which could result in changes of groundwater directions or rates of flow. No adverse impacts, either direct or indirect are forecast.

5. The installation of monitoring wells will create no substantial impacts to groundwater flows.

Implementation of Program Element 2 is forecast to affect groundwater direction and/or the rate of flow in the following manner:

1. The recharge of up to 88,000 afy of water from various sources in the northern portion of the basin, combined with desalter-related pumping in the southern portion of the basin, will cause an increase in the hydraulic gradient in the basin. Consequently, groundwater velocities may increase slightly above what they are currently.

Implementation of Program Elements 3 and 5 have the potential to affect the direction and rate of flows of groundwater in the following way:

1. The development and implementation of a water supply plan for the impaired area of the Basin, and the development and implementation of a regional supplemental water program for the Basin do not have any potential to adversely impact groundwater rates or direction of flows. If any impact occurs, it is anticipated to be beneficial, due to supplemental water program beneficial effects on subsidence (achieved either through desalters, increased recharge (both spreading and injection), and possible decreases in localized production.

2. The installation and operation of the wells to support desalters will result in a substantial quantity of water being pulled out of the lower portion of the Basin. This pumping is intended to replace agricultural production that will transition to urban land use in the future. While the quantity of water produced may be unchanged, the pumping will be occurring in a concentrated location , and thus has the potential to impact groundwater flow patterns in this area. The changes in groundwater flow patterns are not considered significant unless contaminant plumes are mobilized which could reduce the area and amount of groundwater available for future production. This is shown no to be the case in Figure 4.5-55. There is no significant difference in mobilization of plumes between the OBMP and Baseline Alternatives. For other impacts related to desalter well fields, see discussions in Chapter 4, Subchapter 4.5 of this document. For those issues, mitigation measures were provided to reduce such impacts to a less than significant level. Further, localized impacts to groundwater levels and to subsidence areas in the vicinity of the desalter well fields will require further studies to ensure that impacts are reduced to a less than significant level. Mitigation measures in the form of performance standards to mitigate for

possible water level decline and potential subsidence impacts are provided below. These measures will reduce impacts to less than significant levels.

3. To meet the replenishment obligations, up to 55,000 afy, a mix of local water in storage, direct recharge of water or *in lieu* exchange is forecasted to occur. Adequate recharge capacity will be made available to meet this need under the OBMP, and includes the basin enhancements as outlined in the previous discussion. No adverse impacts, either direct or indirect are forecast.

Program Element 4 has the potential to alter the direction or rate of flow of groundwater in the following manner:

1. Modifying groundwater production for Management Zone 1 (MZ 1) has the potential to impact groundwater flow rates within this management zone, however this would have a beneficial impact on the area by allowing water to replenish localized areas that are possibly overdrafted, which in turn would have a beneficial impact on the subsidence zone in the City of Chino. Similarly, greater recharge in areas tributary to the subsidence zone could have a beneficial impact on the current circumstances in the Chino area.

2. Groundwater flow rates, due to a possible implementation of additional recharge in MZ 1 may slightly increase as a result of project implementation, but no significant adverse impacts are forecasted to occur, and mitigation and monitoring measures are provided below to ensure plume mobilization impacts remain less than significant.

3. Collection of additional data to fill gaps in knowledge about the zone is not forecast to include any activities that will affect the direction or the rates of flow of groundwater.

Program Elements 6 and 7 have the potential to impact the direction or the rate of flow of groundwater in the following manner:

1. The process of developing cooperative strategies and plans has no potential to change the physical environment; therefore, no potential effects to groundwater direction or rates of flow is forecast to result from implementing this component of Program Elements 6 and 7.

2. Meeting any additional recharge requirements in MZ 1 can occur without any modifications to the physical environment. No potential exists for recharge operations in MZ 1 to adversely impact the groundwater flow rates in this zone.

3. Seeking funds to speed up cleanup and restoration of contaminated sites does not, in itself, cause any adverse impacts to the environment. Prior to utilizing funds to conduct cleanup and restoration activities, these activities must complete additional environmental investigations to address issues, such as waste transport effects on local roads; potential public health risks from transporting the contaminated material; proper treatment, disposal or even recycling of the contaminated waste; etc. These activities are already under the jurisdiction of the RWQCB, and thus no additional mitigation is required since the OBMP will comply with the already established rules and regulations of the RWQCB regarding any cooperative clean-up efforts that may be under-taken as part of the OBMP.

Program Elements 8 and 9 have the potential to alter the direction or rate of flows of groundwater in the following manner:

1. The development of programs for storage management accounting practices has little potential of causing any adverse environmental effects. Impacts related to this issue are forecast to be less than significant.

2. Collection of additional data to fill gaps in knowledge about the water storage is not forecast to include any activities that will affect changes in groundwater direction and rates of flow.

3. The implementation of a conjunctive use program as part of Program Element 9 is only generally defined at this point in time. In the future, Watermaster will better outline the details and exact physical actions necessary to implement a comprehensive recharge, storage and extraction plan for volumes of water up to 500,000 afy in a basin-wide, and potentially regional, conjunctive use program. At this time, forecasting detailed impacts regarding such a conjunctive use program would only be speculative, thus before a conjunctive use program is implemented, further detailed environmental evaluation will be necessary. A comparative evaluation with a conjunctive use program is provided in the alternative section.

h. Will the project have an impact on groundwater quality?

Implementing Program Element 1 may result in the following activities that could have an adverse impact on groundwater quality:

1. The process of sampling groundwater levels and quality at existing and future wells is not forecast to generate any discharges of pollutants or cause any alterations to groundwater quality. No adverse impacts to groundwater quality is forecast to occur from implementing groundwater level and quality monitoring, either directly or indirectly.
2. Installation and operation of water production monitoring systems on existing and future wells is not forecast to cause the discharge of any pollutants that could degrade groundwater quality. It is assumed that any electrical connections will be installed along existing access routes to wells or that remote sending devices will be utilized that do not require direct electrical connections. Therefore, the gathering of the water production data can be conducted without causing any potential for adverse impacts to groundwater quality.

3. Obtaining surface water discharge and quality data depends upon sampling within existing stream channels. According to SBCFCD, many sites for measuring flows within each major stream channel are already in place as part of the County Flood Control monitoring programs (personal communication with Randy Forbey, SBCFCD, May 4, 2000). When existing flow measuring stations do not exist, but are necessary to fulfill monitoring goals, they will be installed by Watermaster or by other contributing entities. In any case, stream runoff volume and water quality sampling is a passive activity that has no potential to cause discharges of pollutants that could degrade groundwater quality.

4. Ground level monitoring is conducted by both direct and indirect (including remote sensing) methods that do not require any changes in the physical environment which could generate pollutant and cause degradation of groundwater quality. Only during extensometer installation might there be temporary

construction impacts, however these impacts are considered to be less than significant if the project is implemented so as to conform with the mitigation measures set forth in this PEIR.

5. Installing monitoring wells will create ground disturbances and entail drilling activities which can result in release of pollutants. The measures identified to control potential surface water pollution (BMPs, minimizing accidental releases of pollutants, etc.) are also protective of groundwater quality because the prevent the transport and percolation of pollutants into the Chino Basin groundwater aquifers. Although chemicals that could pollute a well are not normally utilized in modern well drilling operations, a potential exists for the drilling fluids to contain potential pollutants that could degrade groundwater quality. To prevent degradation of groundwater from happening, mitigation measures will be implemented as outlined below. These measures will require approval of all chemicals used in drilling fluids by the agency installing the wells prior to initiation of drilling. Also, the driller will be required to provide a performance bond to ensure that any contamination of the aquifer at a well location can be returned to natural background concentrations of chemical constituents before a well is brought on line for either monitoring or production.

6. In addition to well drilling activities, the process of abandoning wells under Program Element 1 can result in the identification of residual contamination in the well bore or in the adjacent groundwater. The discovery of such contamination is a passive discovery on the part of those implementing well closures, but to ensure that greater impacts do not affect the Chino Basin aquifer, the Watermaster will fully characterize the extent of contamination and identify the severity of the contamination (termed a water quality anomaly in the OBMP). Based on this assessment, Watermaster will notify the appropriate authorities and/or entity responsible or the well and monitor the clean-up of contamination. The goal here is to ensure that groundwater quality is not allowed to further degrade once contamination is identified in the well abandonment process. Mitigation is identified below to ensure that this measure is implemented and groundwater quality is protected to the extent feasible.

Implementing Program Element 2 may result in the following discharges that could cause degradation of groundwater quality:

1. The process of modifying existing recharge basins and constructing new recharge basins (including diversion facilities) to recharge water under the OBMP will entail construction activities that have been previously addressed. No additional evaluation is required to address the effects of construction and ensure that groundwater quality will be protected by the mitigation measures to ensure that surface water quality is not significantly degraded.

2. The issue of recharging substantial additional volumes of water to the Chino Basin is a key component of the OBMP. Recharge to the Chino Basin aquifer is integral to maintaining the safe yield of the Basin (as discussed below), but it also has potential direct and indirect consequences on groundwater quality that is a major concern, particularly in relation to meeting the Regional Board's Basin Plan beneficial uses and water quality objectives and Department of Health Services (DHS). The following is an extended discussion of the issues outlined under the Program Element 2 summary discussion in the introduction to Subchapter 4.5.3. This material is adapted from the OBMP and additional information provided by Mark Wildermuth of Wildermuth Environmental, Inc., the Chino Basin Watermaster's hydrological engineering consultant. Planning assumptions were summarized under Subchapter 4.5.3.c

and these assumptions will be considered along with the proposed activities summarized above for Program Element 2.

The recharge of storm water into the Chino Basin is not forecast to cause any adverse effects within any subbasin in which it may occur. Storm flows have been measured as having a TDS of approximately 100 mg/l, and therefore recharge of up to 30,000 acre-feet (compared to the current 12,000 acre-feet) of storm water within any subbasin will have a beneficial groundwater quality impact. Note, however, that recharge of storm water in the lower subbasin could have the adverse impact of contaminating the storm flows sufficiently to lose its value as potable water; therefore, all stormwater recharge, including stormwater generated within the lower subbasin, will be carried out in the two upper subbasins.

The recharge of State Project Water (SPW) is slightly more problematic. SPW varies in quality, and has ranged between the lower 200 mg/l to about 420 mg/l. The Chino Basin already has a salt imbalance which is part of the rationale for preparing and implementing the OBMP. Even though SPW is considered throughout the State as a natural source of water for recharge and use as potable water (or direct reuse after treatment), SPW delivered with concentrations above 330 mg/l will add salt to the Chino Basin, particularly if recharged in the upper subbasin where groundwater quality (TDS) is better than 330 mg/l. The net effect of recharging SPW of greater than 330 mg/l will be to degrade groundwater quality in the two upper subbasins, and as noted above, recharging up to 62,500 acre-feet of SPW in the lower subbasin would be tantamount to losing the SPW as a source of domestic water supply.

Recharge with SPW is a complex problem because in many instances the water quality of SPW is sufficient to not cause degradation. In order to ensure that imported SPW does not cause significant groundwater quality degradation or substantially increase the salt balance, the Watermaster will ensure that recharge with SPW does not degrade groundwater beyond the Basin Plan TDS or nitrate water quality objective (note that SPW has very low nitrate concentrations and its recharge would generally improve nitrate groundwater quality, not degrade it). Mitigation is established to require this measure be implemented.

A portion of the 88,000 afy of recharge may be comprised by up to 40,000 afy of recycled water. Under the 1995 Santa Regional Water Quality Control Plan (Basin Plan), the Chino Subbasins are defined as having no additional assimilative capacity for salts. What this means is that without mitigation, no recharge of water with TDS and nitrate (as nitrogen) concentrations above the Basin Plan objectives can occur. The recharge of approximately 40,000 afy of recycled water with an estimated TDS concentration of approximately 420 mg/l of salt. This equates to a total input of 22,269 tons of salt per year. Note, however, that in a letter from the Regional Board dated November 27, 1996, the Board has indicated that water with TDS values up to 470 mg/l can be recharged in the upper subbasin recognizing some assimilative capacity. Also, in the lower subbasin, there appears to be some assimilative capacity as a result of discharging recycled water with TDS concentrations about 300 mg/l below the Basin Plan objective (420 mg/l vs. 740 mg/l). Please note that in comment 9-18 made on the DEIR by the RWQCB, based on their opinion, there does not appear to be assimilative capacity in Subbasin III at this time. Further it should be noted that waste discharge requirements must be obtained from the RWQCB, and that any discharge of recycled water into a stream or channel carrying storm or other flows will be required to obtain the appropriate permit(s) from the RWQCB.

If the 40,000 afy had the Basin Plan TDS objective concentration of 220 mg/l, there would be a net addition of 10,137 tons of salt per year. The input of recycled water into the basin would cause a net increase over the Basin Plan objective of 12,132 tons. This would be the only potential adverse impact associated with an increase in the groundwater quantity due to recycled water recharge. This impact can be mitigated to a less than significant level with desalters in the southern portion of the basin. The installation and operation of desalters in the lower portion of the basin would provide adequate mitigation to offset the additional salt input into the basin through recycled water recharge. By the year 2020 the three desalters will remove 56,297 tons of salt per year (Alternative 6A--RO only) or 43,698 (Alternative 6B–RO/IX), which is more than enough to mitigative capacity to compensate for the salt loading associated with either recycled water or state project water. See Table 3 attachment to comments and responses to comments. Further, it should be noted that in comment letter number 9 by the RWQCB (Section 9-18) a recently completed TIN/TDS report indicates that TDS concentrations of 249 mg/L in this region exceed the Basin Plan objective of 220 mg/L. Consequently, it should be noted that it is the opinion of the Regional Board that there is no longer any recognized assimilative capacity in Chino Subbasin I.

Regarding salt balance, extensive discussions have been carried out regarding the effect of not only recharge with SPW but overall salt balance in the Basin. The following impact forecast has been developed regarding the overall hydrologic and salt budget of the Basin.

Tables 4.5-24 and 4.5-25 compare the hydrologic and salt budget for the Chino Basin for the baseline and OBMP alternatives (see planning assumptions, Subchapter 4.5.3.c). Table 4.5-24 shows these budgets for OBMP Alternative A where supplemental water recharge is 100 percent imported water and Table 4.5-25 shows these budgets for OBMP Alternative A where supplemental water recharge is 50 percent imported water and 50 percent recycled water from IEUA. Tables 4.5-26 and 4.5-27 are similar tables for OBMP Alternative B. These tables list the various hydrologic components of the inflows and outflows of the basin. The estimated safe yield for the baseline alternative is about 105,000 acre-ft/yr and is about 55,000 acre-ft/yr less than the ~160,000 acre-ft/yr safe yield of OBMP alternative. The difference in yield between the alternatives is due to:

- OBMP alternative increases safe yield by about 17,000 acre-ft/yr through new storm water recharge, and

- Baseline alternative loses about 40,000 acre-ft of safe yield due to increased groundwater discharge (rising water outflow) to the Santa Ana River caused by reduced groundwater production in the southern part of the basin.

Review of the salt budget as described by total dissolved solids (TDS) in Tables 4.5-25 through to 4.5-28 indicate the following:

- For the baseline alternative, the flow-weighted average TDS in recharge to the basin is about 490 mg/l.

- With the OBMP, the flow-weighted average TDS in recharge to the basin ranges from a low of about 440 mg/l for Alternative A using only imported water for replenishment purposes; to a high of about 480 mg/l for Alternative B using a 50 percent recycled water and 50 percent recycled water for replenishment purposes.

· For the baseline alternative, the annual TDS discharge from the basin is about 40 percent from groundwater production and 60 percent from groundwater discharge to the Santa Ana River. With the OBMP, the annual TDS discharge from the basin is about 90 percent from groundwater production and 10 percent groundwater discharge to the Santa Ana River. See table below (in tons per year):

Discharge Component	Baseline	OBMP	Difference
Production	53,632	143,399	89,768
Direct	40,180	53,997	13,817
OBMP Facilities	0	70,748	70,748
SAWPA	8,295	10,867	2,571
Other	5,157	7,787	2,630
Rising Water	84,356	15,918	-68,348
Phreatophyte	0	0	0
Subtotal Outflows	137,988	159,318	21,329

The groundwater discharge to the river in OBMP alternative is comparable in flow and TDS concentration to current conditions. The groundwater discharge to the river in the baseline alternative is about 40,000 acre-ft higher than the OBMP alternative and will contribute to elevated TDS concentrations in the Santa Ana River. As the data above indicates, aside from localized water quality degradation, the Basin-wide effect of using imported water will be to improve groundwater quality.

The highest potential for adverse impact to groundwater quality occurs when recycled water is utilized for recharge. Recent experience in measuring water quality impacts associated with recycled water recharge indicates that it can be recharged without significantly degrading water quality. There are four water quality factors that need to be considered with the recharge of recycled water before it can be utilized as a potable water supply. The first threshold is that the maximum recycled water contribution to a domestic well's supply is 20 percent. The implication of this policy is that until the recycled water is diluted to a 20 percent or less concentration in the groundwater beneath and downstream of a recharge site the recycled water is not usable. Depending on the volume of recycled water recharged at a specific location, this can remove substantial acreage (50-100 acres) from existing or future potable water production.

In addition to the 20 percent requirement imposed by DHS there is a minimum retention time of six months. Again, this restricts a substantial area from potable water production. Finally, DHS also requires a minimum horizontal separation between groundwater recharge and extraction. Fundamentally, these "groundwater" requirements are established by the DHS to protect the public health and as a result fairly substantial areas (possibly several thousand acres at 40,000 acre-feet of recycled water) may be removed from groundwater production, unless mitigation is implemented to ensure that the amount of area removed is reduced to the minimum feasible. Mitigation is provide below to accomplish this goal, and reduce potential impacts from recharging and using recycled water.

California Recharge Guidelines also include provisions for recharge of groundwater basins through injection wells. If recycled water is to be used in the injection process, it must meet these guidelines established by the DHS. The Total Organic Carbon content must be at or below 1 mg/l. Further, the

Total Inorganic Nitrogen concentration must be less than 5 mg/l, however, the DHS reviews and customizes these guidelines for each project that comes under its review.

To ensure that recharge of recycled water (whether it is surface recharge or inject) does not cause significant degradation of existing groundwater quality, modeling will be required to evaluate the change in groundwater quality where the recycled water recharge plume intercepts the groundwater table. If the modeling indicates that the change in TDS will exceed the Basin Plan TDS Water Quality Objective for the subbasin in which recharge occurs, an alternative location will be selected which protects and fulfills the objective. With such mitigation, and based on the data in Table 4.5-26, recycled water can be used without causing significant degradation of groundwater quality in the Chino Basin. It should also be noted that waste discharge requirements may be established by the RWQCB if water to be recharged exceeds basin plan objectives. Please refer to letter number 9 in the comments section that precedes the text of this document.

The mitigative capacity of the desalters to remove salt from the basin is presented in a supplemental table that has been included in this document in response to comments received on the DEIR. Table 3 is located in the attachments to the comments and responses to comments section that is located in Volume II of this document.

Another issue of concern raised in comments in response to the Notice of Preparation was a concern for changes in direction and/or rate of water quality anomalies (areas of contamination, most commonly as a result of human activities). Wildermuth examined this issue and concluded that implementation of the OBMP would not cause greater displacement of contaminated plumes. Figure 4.5-55 shows the estimated current locations of selected plumes of various contaminants that were identified in the OBMP Phase I Report. Figure 4.5-55 also shows the projected locations of these plumes in the year 2020 for the baseline and with OBMP alternative. The projections are based on groundwater seepage velocity projections made with the RAM tool for the year 2020 with the intervening years interpolated between current and the year 2020. The relative displacement of the plumes is similar for the baseline and with OBMP alternative. Thus, the impact over the next 20 years is forecast to be comparable under the proposed project and no project alternatives, i.e. no change in physical condition over the next 20 years. Based on this data, no potentially significant impact to groundwater quality will result from mobilizing plumes based on proposed recharge programs. However, to ensure that this conclusion remains valid for specific recharge locations, the OBMP implementation of recycled water recharge projects will include modeling to verify that no local plumes will be adversely impacted. This measure will be implemented through mitigation outlined below.

The beneficial uses of groundwater in the Chino Basin and the downstream Orange County groundwater basin are defined in the ***Water Quality Control Plan, Santa Ana River Basin*** (Basin Plan) prepared by the California Regional Water Quality Control Board (RWQCB) in 1995. These beneficial uses include municipal (MUN), agricultural (AGR), industrial (IND), and process (PROC) uses. The current Basin Plan divides the Chino Basin into three subbasins for water quality management -Chino I, Chino II and Chino III; and the Orange County Basin into the Santa Ana Forebay and the Santa Ana Pressure subbasins. The water quality objectives for these are described in the Basin Plan. The water quality objectives of significance for this effort are total inorganic nitrogen (TIN) and TDS. TIN as used herein is the sum of ammonia (NH3-N), nitrite (NO2-N) and nitrate (NO3-N). In groundwater TIN is almost completely composed of nitrate. Santa Ana River discharge may include all three forms of inorganic nitrogen. Upon recharge the ammonia is rapidly converted to nitrite, which in turns converts to nitrate. The TDS and TIN objectives for the Chino and Orange County groundwater basins are listed below:

Subbasin	Objectives (mg/l)	
	TDS	TIN
Chino I	220	5
Chino II	330	6
Chino III	740	11
Santa Ana Forebay	600	3
Santa Ana Pressure	500	3

In the Basin Plan the RWQCB has asserted that there is no assimilative capacity for TDS and TIN in the Chino I and II Subbasins because either the ambient TDS and TIN concentrations exceed the TDS and TIN objectives or because it is expected that the ambient concentrations will exceed the objectives in the future. The Subbasin boundaries, respective TDS and TIN objectives and findings of assimilative capacity may change in the next year or two due to a recent study of the objectives and current ambient quality (Wildermuth Environmental, 1999). In general, the TDS and TIN objectives will be lower and assimilative capacity will be absent for all subbasins or not allocated. It was noted in comment letter number 9 from the RWQCB that staff will recommend that no assimilative capacity for TDS or TIN in Chino Subbasins I or II or III be recognized for the reasons discussed in Section 9-19 of the letter.

For OBMP Alternative A1 groundwater levels and storage will not change significantly compared to existing conditions. The expected maximum storage volume for the OBMP Alternative A1 is an increase of 500,000 acre-feet plus local recharge programs to ring the total storage volume up to 5,900,000 acre-ft, (about and 11 percent increase of the existing storage of about 5,300,000 acre-ft). Note that this storage volume is higher than would occur if a 300,000 acre-foot conjunctive use program were implemented. TDS and TIN concentrations in groundwater will be less with the OBMP because groundwater storage will not increase significantly as in the baseline alternative. Exceptions to this will occur if storage exceeds safe storage (as defined in the OBMP Phase I Report) under conjunctive use programs. Conjunctive use related TDS and TIN impacts due to increases in groundwater storage will probably be less than the baseline alternative and will be mitigated by the proponent of the conjunctive use programs prior to the initiation of a conjunctive use program. The desalters in the OBMP Alternative A1 will allow the beneficial use of poor quality non-potable groundwater through treatment and distribution to various water users in and outside of the Basin.

The inclusion of the three additional basins (Wineville, Jurupa, and the RP-3 site) for recycled water recharge has already been analyzed in this document in that 40,000 afy of recycled water is what is being proposed for recycled water recharged under the OBMP. The fact that the locations where this recharge may occur has been expanded to include these three additional basins does not change the impact conclusions in a programmatic document such as this one; especially since site specific impacts from recharging recycled water must be evaluated in the future when specific recharge proposals are proposed with sufficient information to support site specific evaluations.

Extensive data demonstrating that recycled water recharge can be implemented under the current regulatory framework has been demonstrated with the concurrence of the Department of Health Services (DHS), Drinking Water Field Operations Branch (Los Angeles) for implementation of the San Gabriel Valley Recycled Water Demonstration Project. DHS made "findings of non-impairment of the receiving aquifers where water quality of the recycled water is not as high quality as that being generated by the IEUA wastewater reclamation facilities. A copy of this document is attached at Appendix 8.3. RP-1 and RP-4 effluent is of higher quality than water currently being recharged by Los Angeles County Sanitation District, and assuming that similar showings of non-impairment can be demonstrated, IEUA believes that it will be feasible to implement recycled water programs of comparable volume in the Chino Basin, as long as other water quality criteria can be fulfilled or protected (such as Basin Plan water quality objectives and beneficial uses.

Based on Wildermuth's evaluation, the data are equivocal regarding the ability to meet the future Basin Plan water quality objectives throughout the three subbasins of the Chino Basin. However, it is clear, based on the analyses performed to date, that the future water quality within the Basin will be better with the implementation of the OBMP, than under a no OBMP alternative. State another way, the future groundwater quality will degrade less, and perhaps not significantly, in the Basin with implementation of the OBMP. The analysis indicates that future groundwater quality will degrade if an overall management program is not implemented. Taken in this context, future Chino Basin groundwater quality will benefit, not be adversely impacted by implementing the OBMP.

Implementing Program Elements 3 and 5 is forecast to affect groundwater quality in the following manner:

1. The installation of three desalters is forecast to disturb a total of ~75 acres. As outlined for disturbances associated with monitoring wells, recharge basins and pipelines, construction activities associated with desalter operations have a potential to cause the discharge of pollutants, particularly eroded sediment and accidental releases of petroleum products, and possible degradation of surface water quality. Previously identified mitigation measures for construction activities will also apply to construction of the desalters. With implementation of these measures, no significant groundwater quality degradation is forecast to occur from constructing the desalters.

2. Meeting the replenishment obligations, up to 55,000 afy, can be fulfilled with a mix of local water in storage, direct recharge of water or ***in lieu*** exchange. Adequate recharge capacity is available to meet this need as outlined in the previous discussion. The potential environmental effects described under Program Element 2 for recharge basin effects on groundwater quality also apply to the proposed replenishment program. No additional groundwater quality impacts have been identified from meeting the replenishment obligations for the Chino Basin under the OBMP.

3. As part of the desalter operations, salt will be removed from the lower subbasin and over time as the water recharged into Chino I and II flows into Chino III, groundwater quality will improve. This improvement will require a substantial amount of time because of the legacy of salts that remain in the vadose zone, primarily in Chino III, but also in Chino I and II. Assuming 40,000 afy of desalting capacity, an estimated 35 million gallons of water could be treated on a given day. With a 15 percent rejection rate, the amount of fluid discharged to the SARI line would be about 5.25 million gallons. This equates to approximately 2 million pounds of salt being extracted and removed from the Basin per day at a concentration of 5,000 mg/l. This equates to about 100 tons per day of salt removed from the Chino Basin, or about 35,000 tons per year, assuming 350 days of operation per year when all of the proposed desalters are in operation. Also, refer to Table 3 which is included as an attachment to the comments and responses to comments section that is located in Volume II of this document.

The OBMP contains an extensive discussion of the complex issue of measuring and demonstrating improvement in groundwater quality (pages 4-27 through 4-31). The following general conclusions can be reached. With agriculture persisting in the lower subbasin TDS concentrations will continue to degrade, primarily du to irrigation return flows. With transition of the area to urban uses and implementation of the OBMP, TDS concentrations will decline, after a period of time, slowly, but are not forecast to be reduced to the point that the Chino III groundwater can be used for domestic water supply purposes without treatment. The difficulty for Basin managers and regulators is to agree upon some method of measuring the changes in improvements in water quality, particularly when no change is likely to be measurable for a discrete period of time. Implementation of expanded groundwater quality monitoring and numerical models is recommended as the best means to track the improvement in groundwater quality that is anticipated to occur, albeit gradually, over the planning horizon.

Overall, implementation of Program Elements 3 and 5 is forecast to make the major contribution in the OBMP to improving groundwater quality within the Chino Basin. It will carry out the direct removal of a significant quantity of salt from the Basin, through discharge of recycled water, SARI line discharges. Also, it is anticipate that losses to the basin in the form of rising groundwater will decrease due to OBMP implementation. This impact is considered beneficial overall, not adverse. Equally important, when compared to the alternative of no OBMP implementation, the benefits are substantial.

4. In addition to replacing agricultural production in the Basin, the desalters will remove a substantial tonnage of salt from the Basin. By 2020 the desalters will have the capacity to remove an annual tonnage of salt ranging from 43,698 to 56,297 tons. Since there is currently considered to be no assimilative capacity in the Chino Basin, the installation of the desalters would effectively provide mitigation for salt inputs and allow for substantial increases in recharge capacity for the basin. This is forecast to be a beneficial impact to the basin and it will provide effective mitigation for the recharge of SPW and recycled water which both tend to have TDS concentrations above the Basin Plan objectives.

5. The development and implementation of a regional supplemental water program to deliver SPW to purveyors and into the Chino Basin (potentially for recharge too) has the potential to affect groundwater quantities since this water could be used in place of pumping water from the Basin. Additionally, SPW could be used as a source of recharge water to meet basin replenishment obligations. As part of the recharge program IEUA has an entitlement to approximately 62,500 afy of SPW. The recharge program could still potentially use entirely SPW to meet the replenishment obligation. If this were the case, up to 88,000 afy of SPW could potentially be recharged into the Basin (though this is unlikely since recycled water and stormwater will likely be significant components of this recharge plan). The replenishment obligation for the Basin is 55,000 afy, however, recharge water sources may only be available every 7 out of 10 years, so an annual recharge capacity of 88,000 afy is necessary to ensure that the replenishment obligation can be met on average within a 10 year period). SPW is estimated to have a TDS concentration ranging between 250 and 400 mg/l for TDS. The salt addition to the basin for SPW water with a TDS concentration of 400 mg/l at a volume of 88,000 afy is 46,657 tons. For the same volume of water with a TDS concentration equal to the Basin Plan objective of 220 mg/l, the salt addition would be 25,662 tons per year. The difference between these two tonnages is well within the capacity of the desalters to mitigate adverse impacts due to salt loading. Impacts related to TDS concentrations in excess of the Basin Plan objective TDS concentrations can be mitigated to a less than significant level by operation of the desalting facilities proposed under the OBMP.

Implementing Program Element 4 is forecast to impact groundwater quality in the following way.

1. Modifying groundwater production for Management Zone 1 (MZ 1) has no substantial potential to adversely impact groundwater quality. It may have a potentially beneficial effect. Data indicates that groundwater from adjacent management zones or higher in MZ 1 is of better quality than that in the southern portion of MZ 1. Although the effect may be minor, the recycled water generated from the higher quality (less TDS and nitrate) water would be marginally better as a result of beginning with lower TDS water. Otherwise, no adverse groundwater quality impact is forecast to occur if the location of groundwater production is relocated in the Basin in conformance with implementing this component of Program Element 4.

2. Meeting any additional recharge requirements in MZ 1 can occur without any modifications to the physical environment. However, if construction impacts are incurred for construction of new recharge areas within MZ 1, the mitigation measures previously identified for construction activities will ensure that no adverse groundwater quality impacts will result surface water contamination. Regarding the effects of recharging water to the MZ 1 aquifer, the potential groundwater quality impacts will be the same as that outlined for Program Element 2 above. A potential does exist to degrade groundwater quality significantly, but this potential impact can be mitigated with the recharge of an appropriate blend of water sources for the specific location, based upon physical modeling and/or additional studies studies that must be conducted prior to implementing the recharge.
3. Collection of additional data to fill gaps in knowledge about the zone is not forecast to include any activities that will cause discharge of pollutants or adversely affect groundwater quality.

Implementing Program Elements 6 and 7 is forecast to affect groundwater quality in the following way:

1. The process of developing cooperative strategies and plans has no potential to substantially cause adverse impacts to the physical environment; therefore, no potential exists to cause the discharge of pollutants or to adversely impact groundwater quality. These cooperative efforts are intended to benefit the Basin through coordinated beneficial use oriented efforts and strategies.

2. Seeking funds to speed up cleanup and restoration of contaminated sites does not, in itself, cause any adverse impacts to the environment. Prior to utilizing funds to conduct cleanup and restoration activities, these activities must complete additional environmental investigations to address issues, such as waste transport effects on local roads; potential public health risks from transporting the contaminated material; proper treatment, disposal or even recycling of the contaminated waste; etc. Since no specific sites are referenced for speeding the remediation process, it would be speculative to assume that groundwater quality impacts would occur from obtaining such grants. In fact, the specific purpose of such grants would be to remove contamination from groundwater; therefore, the impact of Program Elements 6 and 7.

Implementing Program Elements 8 and 9 is forecast to affect groundwater quality in the following way.

1. The process of developing storage and conjunctive use programs and plans has no substantial potential to change the physical environment; therefore, no potential exists to discharge pollutants or to adversely impact groundwater quality from implementing this component of Program Elements 8 and 9.

2. Collection of additional data to fill gaps in knowledge about the water storage is not forecast to include any activities that will adversely affect discharge of pollutants or degradation of groundwater quality.

3. Attempting to make impact forecasts for an undefined pilot conjunctive use program would be speculative and the State CEQA Guidelines (Section 15145) indicate that the public be informed of this conclusion and no further evaluation is necessary. Note that a pilot conjunctive use program would be expected to use recharge basins to deliver the water for percolation into the Basin groundwater aquifer, and the groundwater quality issues associated with such activities have already been addressed above.

This completes the environmental analysis of potential impacts on water resources and water quality from implementing the OBMP. The responses to the specific environmental concerns raised in Subchapter 4.5.1 are addressed in Appendix 8.1 where the data in the above analysis that addresses a concern is specifically referenced. In addition, a minor amount of additional information is included in these specific responses to concerns. The reader is referenced to Appendix 8.1 for this information.

4.5.4 Mitigation Measures

4.5-1 To minimize potential ground disturbances associated with installation and maintenance of proposed monitoring equipment on existing wells, the equipment will be installed within or along existing disturbed easements or right-of-way or otherwise disturbed areas, including access roads and pipeline or existing utility easements.

4.5-2 The Watermaster or other agencies implementing recharge programs will confer with the San Bernardino County Department of Transportation and Flood Control and for each flood control basin that is proposed to be utilized for recharging water to the Chino Basin, to define the amount of water that can be set aside as a conservation pool within existing flood control basins and specific operational parameters (such as time and volume of water that can be diverted into each basin). This will ensure that recharge activities do not conflict with flood control operations at any flood control basins. Variable pooling and recharge schedules that are coordinated with storm forecasting to halt deliveries during storm events will ensure that flood-related hazards remain less than significant.

4.5-3 Within each desalter site, surface runoff will be collected and retained (for use onsite) or detained, and treated when released by passing the runoff through a "first-flush" treatment system, which may include onsite riparian area, detention basin with filtration system at the outlet, or other system that removes the majority of urban storm runoff pollutants, such as petroleum products and sediment. The purpose of this measure is to remove the onsite contribution to cumulative urban storm runoff and ensure the discharge from the desalter sites is treated to reduce contributions of urban pollutants to downstream flows.

4.5-4 In compiling local and *in lieu* groundwater storage balances, the Watermaster will include the estimated amount of water lost from the Basin due to rising water at the low end of the Basin and adjust storage salt balance accounts accordingly.

4.5-5 For each OBMP construction site, regardless of size, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared and implemented. Each plan will identify the best management practices (BMPs) that will be used for that site to minimize the potential for accidental releases of any chemicals or materials on the site that could degrade water quality, including solid waste and require that any spills be clean-up, contaminated material properly disposed of and the site returned to pre-discharge condition, or in full compliance with regulatory limits for the discharged material. The portion of the SWPPP that addresses erosion and related sediment discharge will specify the percentage of pollutant removal, as illustrated in the attached Figure 4.5-56 which was abstracted from Supplement A to the "Riverside County Drainage Area Management Plans, Attachment" publication. At a minimum BMPs will achieve 60 percent removal of sediment and other pollutants from disturbed sites.

4.5-6 For long-term mitigation of site disturbances at OBMP facility locations, all areas not covered by structures will be covered with hardscape (concrete, asphalt, gravel, etc.), native vegetation and/or man-made landscape areas (for example, grass). Revegetated or landscaped areas will provide sufficient cover to ensure that, after a two year period, erosion will not occur from concentrated flows (rills, gully, etc.) and sediment transport will be minimal as part of sheet flows. These measures and requirements will be applied to closure of abandoned well site disturbed areas.

4.5-7 Prior to cleaning out, refurbishing or capping a well, samples will be obtained and chemically analyzed to ensure that the discharge does not contain any contaminants exceeding regulatory thresholds. If contaminants are discovered, then they will be removed or lowered below the

regulatory threshold prior to discharge to the environment. Discharge of non-stormwater into storm drains will require a NPDES permit.

4.5-8 Recycled water will not be discharged to streams that are transporting storm flows for subsequent groundwater recharge (except as authorized by existing discharge permits issued by the Regional Board), unless mitigation as identified in mitigation measure 4.5-12 is provided. If the storm water component of the combined flow is a part of the total sub-basin assimilative capacity, which is fully allocated, then mitigation pursuant to mitigation measure 4.5-12 for recharge of the recycled water will be the same as if the recycled water had been directly recharged. However, if the assimilative capacity of the storm water has not been allocated, then mitigation will be based on the quality of the of the commingled storm flow and recycled wastewater.*

4.5-9 OBMP participants do not have responsibility and control over the SARI line, but they do interact with the agencies that would respond to an accidental release from the SARI line (or the Los Angeles County Nonreclaimable Wastewater Line). OBMP participants will provide support, as required or appropriate, and assist with control of and restoration of the environment damaged by an accidental release from the line.

4.5-10 Prior to authorizing contracts for drilling monitoring or production wells under OBMP auspices, the entity funding the well drilling effort will require the well driller to identify all chemicals that will be used at the drilling site and require the submittal of a SWPPP for review and approval before allowing the drilling to commence. A performance bond will be provided by the driller to ensure that any residual contamination from well drilling can be corrected. Further, the implementing agency will construct wells in a manner that will reduce the risk of movement of groundwater between zones of different quality , as required under California well standards.*

4.5-11 When closing abandoned wells in the Chino Basin the entity closing the well will, where technically feasible determine whether the groundwater in the well is contaminated. This will be accomplished by sampling and analyzing the well water. If contamination is identified, the entity will report the discovery to the appropriate parties, including the owner (if known) and the regulatory agencies. The Watermaster will monitor the status of the well until residual contamination is remediated.

4.5-12 When recharge of State Project Water (SPW) or recycled water with TDS greater than the background groundwater TDS or the Basin Plan water quality objective is utilized at a recharge site, the entity conducting the recharge will conduct additional analysis including modeling to identify the volume and rate of recharge that can be conducted without causing the Basin Plan water quality objective for TDS to be exceeded. In addition, the amount of additional salt added to the Basin above the background groundwater quality condition will be calculated and the greater of the two amounts will be offset, either by blending with lower TDS water (storm water) provided that the assimilative capacity of the sotrm water has not already been allocated as more thoroughly described in mitigation measure 4.5-8. The program could utilize SWP water for recharge when such water is available and when such water is better in quality than recycled water (i.e. lowest TDS). Under no circumstance will discharge of SPW or recycled water cause or contribute to a cumulative violation of Basin Plan water quality objectives or interfere with a designated beneficial use for a water or groundwater body.*

4.5-13 When recharge of recycled water is proposed for a specific location, the entity proposing such recycling will provide the following data to DHS: the area encompassed by the minimum six months detention period before use and the area encompassed by the long-term equilibrium concentration of 20 percent recycled water within the aquifer. Based on these area estimates,

the entity will determine whether any existing WSA production wells or water supply aquifers will be impacted by these pumping constrained areas. If impacts will affect existing wells or water supply aquifers, the entity proposing to discharge recycled water will fund the provision of a comparable quality and quantity of potable water to the WSA [this can be done through installing new wells, direct water deliveries (for example from desalters), etc.].*

4.5-14 When recharge of recycled water with TIN greater than the background groundwater TIN or the Basin Plan objective at a recharge site is utilized, the entity conducting the recharge will conduct modeling and/or additional studies to identify the volume and rate of recharge that can be conducted without causing the Basin Plan water quality objective for TIN to be exceeded. Under no circumstance will discharge of SPW or recycled water cause or contribute to a cumulative violation of Basin Plan water quality objectives or interfere with a designated beneficial use for a water or groundwater body.*

4.5-15 When recharge of water is proposed within the vicinity of an existing or known groundwater quality anomaly (contaminated groundwater plume), modeling and/or additional studies will be conducted to determine whether recharge of the recycled water will increase the local hydraulic gradient and cause more rapid spread of the existing plume. If existing domestic water production wells will be impacted by the plume a minimum of one year earlier than under pre-existing conditions, or if significant quantities of additional groundwater (more than 5,000 acre-feet) will become contaminated within a five year period due to the recharge of water, an alternative location for recharge will be selected to avoid not only the loss of the recharged water due to contamination, but also additional high quality groundwater due to more rapid expansion of the contaminated plume.

4.5-16 Whenever possible and feasible, OBMP projects that are highly capital intensive, or that employ workers who are onsite for more than just maintenance activities, will consider Figure 4.5-47 when siting specific project locations for OBMP facilities. Areas defined on this map that potentially may be affected by flood-hazards will be avoided, unless conjunctive use and flood-control operations demand that facilities must be located within these areas. If facilities are constructed in a flood zone, the facility will be brought to a level above flood hazards, or hardened against flood related impacts. Additionally, if facilities must be located within flood plains or hazard areas, a flood management program to minimize impacts to people and surrounding property will be created and implemented for each facility that may occur within these hazard areas.

4.5-17 Prior to implementation of any recharge projects as either existing or new basins, a management plan will be established to the satisfaction of SBCFCD. This plan will be created specifically for each individual basin to ensure the safety of surrounding property and people from undue risks associated with water-related hazards (i.e. flooding). The management plan will firmly establish a priority of flood-control functions over and above recharge-related operations. Weather forecasts of upcoming storm events will be carefully monitored and in the event of a significant forecasted storm-event, recharge deliveries the basins will be ceased until further notice is received from SBCFCD that it is safe for deliveries to resume. Additionally, no more than three days' percolative capacity of water will be allowed to sit in a basin at a time if such basin is also used for flood control activities. Additionally, each SBCFCD basin will have a specific management plan developed, so as to coordinate flood control with recharge. This mitigation measure will ensure that people and property are not subject to additional risk associated with water-related hazards in the Basin, and will allow SBCFCD to make full utilization of the basin's flood control capacity in the event of a storm.

4.5-18 In order to offset salt additions above the objective for the appropriate Subbasin defined in the Basin Plan, desalters will be constructed. Recharge of water with TDS concentrations above the

Basin Plan objectives will not occur until it can be adequately demonstrated that the users of pumped groundwater which are adversely affected by such recharge will be appropriately compensated or will receive sufficient amounts of high quality water to offset the adverse effects of the high TDS pumped groundwater at an overall cost no greater than that which would have been incurred by the adversely affected producers in the absence of the recharge. Desalters may be the source of higher quality water needed for mitigation. If water with TDS in excess of water quality objectives is recharged in such close proximity to the desalter extraction wells that other producers are unaffected, then mitigation will be accomplished when it is demonstrated that the salt leaving the basin, as a result of the OBMP desalter capacity that has been allocated to mitigate the TDS impacts of recycled water recharge is equal to or greater than the increment of additional salt above established Basin Plan water quality objectives. Desalters will be designed to capture any increase in rising water.*

4.5-19 **Among the alternatives available to reduce or control adverse effects caused by recharge is the use of injection of water of higher quality to resident poor quality groundwater to serve as a barrier against the migration of the poor quality gorundwater.**

* Indicates that a modification to the mitigation measure has been made for clarification purposes in response to comments received on the DEIR.

4.5.5 Unavoidable Adverse Impacts

The whole objective of implementing the OBMP is to create an integrated program to manage water resources within the Chino Basin to protect and enhance the existing safe yield of the Basin and to preserve existing water quality while making progress in enhancing this critical water characteristics. As previously noted, on the whole the OBMP can accomplish these objectives. At this point in time, compared to the no project alternative, which is the implementing of individual water supply master plans by the Chino Basin WSAs, the OBMP provides the only holistic approach to managing the Basin and protecting the water resource and water quality values required to meet future water supply requirements in the Basin.

However, as with any program that must substantially manipulate large components of the environment to achieve its goals, the OBMP has a potential to cause adverse environmental effects, some of them potentially significant. For most of the OBMP Program Elements at this stage of review, there is no potential for unavoidable adverse impacts to water resources and water quality, let alone significant unavoidable adverse impacts. For those Program Elements that have evolved sufficiently to define specific facilities and activities, there will be some unavoidable water resource and water quality impacts, and without mitigation, other impacts could be unavoidably significant. These issues are summarized below using the Program Element summaries provided at the beginning of Subchapter 4.5.3.

4.5.5.1 Program Element 1

Development and implementation of a comprehensive monitoring program will not, for the most part, result in any unavoidable adverse impacts to water resources and water quality. All monitoring equipment and efforts can be terminated at any time and these facilities removed from the environment. On the other hand the installation of monitoring wells and associated activities has a potential to cause or contribute to degradation of surface, and ultimately, groundwater quality. Mitigation measures are identified to reduce potential impacts from installation and operation of monitoring wells as proposed in Program Element 1 to a non-significant level.

4.5.5.2 Program Element 2

Developing and implementing a comprehensive recharge program has a potential to cause direct and indirect significant unavoidable adverse water resource and water quality impacts. Extensive mitigation has been identified to prevent recharging water to the Chino Basin groundwater aquifer from causing or contributing to these potential impacts. Through a combination of blending water sources, recharging at the correct locations, avoiding contaminated plumes and ensuring that recharge basin operations do not conflict with flood control operations and do not contribute to significant water quality degradation (both short- and long-term), this program element can be implemented without causing significant unavoidable adverse water resource and water quality impacts.

4.5.5.3 Program Elements 3 and 5

The implementation of desalters and replenishment programs (new water supplies from impaired areas and regional supplemental water programs) at the scale envisioned in the OBMP also has a potential to cause unavoidable significant adverse water resource and water quality impacts. Mitigation has been identified to control these unavoidable impacts to within a level of non-significance.

4.5.5.4 Program Element 4

The actions associated with Program Element 4, implementing a comprehensive management plan of MZ 1, were identified as having no potential to cause significant unavoidable adverse water resource impacts after implementation of mitigation measures, particularly for recharge in MZ 1.

4.5.5.5 Program Elements 6 and 7

The program actions under these two Elements, further development of cooperative and salt management programs, were concluded to pose no potential for significant unavoidable adverse impacts without mitigation.

4.5.5.6 Program Elements 8 and 9

The program actions under these two Elements, further development of a groundwater storage management program and a conjunctive use program, were generally concluded to pose no potential for significant unavoidable adverse impacts without mitigation. It is assumed that a “pilot” conjunctive use program will simply be an extension of recharge programs outlined above which will require mitigation to ensure that no unavoidable significant adverse water resource or water quality impacts occur from their implementation.

4.5.6 Cumulative Impacts

The OBMP consists of a program to manage the whole of the water resources and water quality issues within the Chino Basin. As such, the OBMP's ability to enhance and protect safe yield and water quality indicates that from the water resources and water quality standpoint, the cumulative effects of the program for the Basin as a whole will be beneficial, not adverse. The areas where OBMP programs have a potential to cause local cumulative impacts include: contributions to increased cumulative runoff and flood hazards (mitigated to a level of non-significance); violation of area-wide Basin Plan water quality objectives and beneficial uses (mitigated to a level of non-significance); contributions to subsidence (mitigated to a level of non-significance); preventing a loss of safe yield, on the order of 40,000 acre-feet (a beneficial impact); and maintaining water quality throughout the Basin at or better than current conditions (a beneficial impact). Based on the evaluation contained in this subchapter, implementation of the proposed OBMP is not forecast to cause any cumulative significant adverse environmental impacts with implementation of the recommended mitigation.

Table 4.5-1
ESTIMATED VOLUME OF GROUNDWATER IN STORAGE IN THE CHINO BASIN FOR SELECTED AREAS AND YEARS (acre-feet)

Year		Management Zone MZ 1	MZ 2	MZ 3	MZ 4	MZ 5	Lower Chino	Upper Chino	Total Chino Basin
1965	Volume	1,713,920	2,208,147	1,213,002	58,389	259,321	2,035,804	3,416,975	5,452,779
	%Change[a]	9%	6%	4%	6%	(1%)	6%	6%	6%
1969	Volume	1,671,715	2,204,049	1,220,580	60,093	266,271	2,042,278	3,380,430	5,422,708
	%Change[a]	6%	6%	5%	9%	2%	6%	5%	5%
1974	Volume	1,625,359	2,116,609	1,188,221	55,671	260,549	1,971,641	3,274,768	5,246,410
	%Change[a]	3%	1%	2%	1%	(0%)	3%	2%	2%
1977	Volume	1,578,063	2,086,177	1,165,445	55,264	261,721	1,921,216	3,225,454	5,146,671
	%Change[a]	0%	0%	0%	0%	0%	0%	0%	0%
1983	Volume	1,696,255	2,096,980	1,165,379	56,023	259,544	1,953,182	3,321,000	5,274,182
	%Change[a]	7%	1%	(0%)	1%	(1%)	2%	3%	2%
1991	Volume	1,653,396	2,120,942	1,176,420	56,657	251,797	1,921,934	3,337,277	5,259,211
	%Change[a]	5%	2%	1%	3%	(4%)	0%	3%	2%
1997	Volume	1,676,486	2,126,330	1,202,870	57,558	257,469	1,985,198	3,335,514	5,320,712
	%Change[a]	6%	2%	3%	4%	(2%)	3%	3%	3%

(a) Change relative to storage in 1977.

Table 4.5-2
ESTIMATED VOLUME OF GROUNDWATER IN STORAGE IN THE CHINO BASIN VERSUS CLIMATE CHANGES, PRODUCTION PATTERNS, VOLUME OF LOCAL AND CYCLIC STORAGE AND ARTIFICIAL RECHARGE

Year	Storage (acre-feet)[a] Volume	Storage % Change	Climate Index[b] Volume	Climate Index % Change	Production (acre-feet)[c] Volume	Production % Change	Volume of Local + Cyclic Storage (acre-feet) Volume	Local + Cyclic % Change	Artificial Recharge of Imported Water (acre-feet)[d] Volume	Artificial Recharge % Change	Landuse (acres)[a,e] Urban	Landuse Ag	Landuse Other
1965	5,452,779	0%	-2.12	0%	199,904	0%			3,002	0%	*22,975*	*56,680*	*37,201*
1966	*5,430,225*	(0%)	-2.13	(0%)	186,264	(7%)			0	N/A	*23,426*	*55,891*	*37,538*
1967	*5,437,743*	(0%)	-1.73	19%	192,597	(4%)			526	(82%)	*23,878*	*55,102*	*37,876*
1968	*5,445,261*	(0%)	-1.88	12%	190,489	(5%)			2,229	(26%)	*24,329*	*54,313*	*38,214*
1969	5,422,708	(1%)	-0.83	61%	192,103	(4%)			0	N/A	*24,780*	*53,524*	*38,551*
1970	*5,281,669*	(3%)	-1.21	43%	197,057	(1%)			0	N/A	*25,231*	*52,735*	*38,889*
1971	*5,316,929*	(2%)	-1.51	29%	197,428	(1%)			0	N/A	*25,683*	*51,946*	*39,227*
1972	*5,352,188*	(2%)	-1.96	8%	166,826	(17%)			0	N/A	*26,134*	*51,157*	*39,565*
1973	*5,387,448*	(1%)	-1.85	13%	180,997	(9%)			0	N/A	*26,585*	*50,368*	*39,902*
1974	5,246,410	(4%)	-2.04	4%	191,536	(4%)			840	(72%)	*27,037*	*49,579*	*40,240*
1975	*5,179,917*	(5%)	-2.19	(3%)	189,637	(5%)			2,001	(33%)	27,488	48,790	40,578
1976	*5,213,163*	(4%)	-2.48	(17%)	174,498	(13%)			939	(69%)	*28,822*	*47,378*	*40,656*
1977	5,146,671	(6%)	-2.83	(33%)	163,705	(18%)			531	(82%)	*30,156*	*45,966*	*40,733*
1978	*5,252,930*	(4%)	-1.87	12%	167,410	(16%)			19,588	553%	*31,490*	*44,554*	*40,811*
1979	*5,231,678*	(4%)	-1.76	17%	167,669	(16%)	15,911	0%	829	(72%)	*32,824*	*43,142*	*40,889*
1980	*5,210,426*	(4%)	-0.74	65%	174,421	(13%)	24,715	55%	7,582	153%	*34,158*	*41,730*	*40,967*
1981	*5,189,174*	(5%)	-1.22	43%	162,814	(19%)	33,759	112%	17,183	472%	*35,492*	*40,319*	*41,045*
1982	*5,167,922*	(5%)	-1.14	47%	151,878	(24%)	36,599	130%	16,079	436%	*36,826*	*38,907*	*41,123*
1983	5,274,182	(3%)	0.01	100%	172,420	(14%)	55,995	252%	21,817	627%	*38,160*	*37,495*	*41,201*
1984	*5,261,082*	(4%)	-0.25	88%	176,218	(12%)	73,822	364%	0	N/A	39,494	36,083	41,279
1985	*5,262,954*	(3%)	-0.43	80%	167,119	(16%)	97,437	512%	18,404	513%	*44,349*	*34,891*	*37,615*
1986	*5,264,825*	(3%)	-0.13	94%	180,778	(10%)	113,362	612%	11,616	287%	*49,205*	*33,699*	*33,951*
1987	*5,266,696*	(3%)	-0.69	68%	180,115	(10%)	128,122	705%	8,586	186%	*54,061*	*32,507*	*30,288*
1988	*5,268,568*	(3%)	-0.85	60%	189,513	(5%)	165,990	943%	3,449	15%	*58,916*	*31,315*	*26,624*
1989	*5,270,439*	(3%)	-1.09	49%	164,752	(18%)	174,505	997%	6,452	115%	*63,772*	*30,123*	*22,960*
1990	*5,272,310*	(3%)	-1.46	31%			163,012	925%	3,793	26%	68,627	28,931	19,297
1991	5,259,211	(4%)	-1.53	28%			187,986	1,081%	3,310	10%	*68,740*	*28,808*	*19,307*
1992	*5,310,462*	(3%)	-1.52	28%			201,503	1,166%	8,246	175%	*68,853*	*28,684*	*19,318*
1993	*5,300,212*	(3%)	-0.36	83%			204,698	1,187%	11,566	285%	68,966	28,561	19,328
1994	*5,289,962*	(3%)	-0.71	67%			211,350	1,228%	23,003	666%	*68,627*	*28,931*	*19,297*
1995	*5,279,711*	(3%)	-0.08	96%			230,861	1,351%	120	(96%)	*68,740*	*28,808*	*19,307*
1996	*5,269,461*	(3%)	-0.09	96%			229,840	1,345%	82	(97%)	*68,853*	*28,684*	*19,318*
1997	5,320,712	(2%)	0.00	100%			223,587	1,305%	5,648	88%	*68,966*	*28,561*	*19,328*

(a) Italics indicates interpolated values
(b) Based on precipitation in Fontana normalized to 26.6 inches
(c) Production data is from the CIGSM Model of the Chino Basin
(d) As reported in the monthly MWD billings
(e) Adjusted land uses from JMM, SAWPA Basin Plan Upgrade Task Force, Appendices for Nitrogen and TDS Studies USAW, February 1991.

Table 4.5-3
COMPARISON OF GROUNDWATER STORAGE AND SANTA ANA RIVER FLOW FOR CBWRMS ALTERNATIVES 3 AND 4 (acre-feet)

Simulation Year	Hydrologic Year	End of Year Storage		Total Santa Ana River Flow at Prado		Difference in Storage	Difference in Outflow (Losses to River from Storage)
		Alt 3	Alt 4	Alt 3	Alt 4		
2000	1947	4,725,000	4,792,000	347,407	352,943	67,000	5,536
2001	1948	4,713,000	4,827,000	413,738	420,894	114,000	7,156
2002	1949	4,706,000	4,869,000	466,627	476,705	163,000	10,078
2003	1950	4,697,000	4,905,000	406,421	416,560	208,000	10,139
2004	1951	4,692,000	4,950,000	543,868	550,967	258,000	7,099
2005	1952	4,742,000	5,034,000	792,539	817,176	292,000	24,637
2006	1953	4,713,000	4,998,000	440,611	448,703	285,000	8,092
2007	1954	4,720,000	4,896,000	651,547	666,182	176,000	14,635
2008	1955	4,711,000	4,784,000	565,954	577,107	73,000	11,153
2009	1956	4,709,000	4,684,000	585,669	591,800	-25,000	6,131
2010	1957	4,703,000	4,682,000	661,933	664,800	-21,000	2,867
2011	1958	4,723,000	4,706,000	781,641	783,833	-17,000	2,192
2012	1959	4,697,000	4,683,000	466,853	469,124	-14,000	2,271
2013	1960	4,674,000	4,670,000	496,566	495,354	-4,000	-1,212
2014	1961	4,646,000	4,646,000	426,841	429,353	0	2,512
2015	1962	4,631,000	4,692,000	597,518	596,920	61,000	-598
2016	1963	4,614,000	4,727,000	587,424	591,025	113,000	3,601
2017	1964	4,586,000	4,750,000	487,997	493,835	164,000	5,838
2018	1965	4,584,000	4,796,000	717,162	727,487	212,000	10,325
2019	1966	4,571,000	4,833,000	623,701	635,886	262,000	12,185
2020	1967	4,572,000	4,874,000	699,926	719,041	302,000	19,115
2021	1968	4,540,000	4,840,000	488,588	497,664	300,000	9,076
2022	1969	4,576,000	4,783,000	1,041,947	1,055,875	207,000	13,928
2023	1970	4,556,000	4,678,000	830,366	836,723	122,000	6,357
2024	1971	4,530,000	4,570,000	517,684	522,635	40,000	4,951
2025	1972	4,501,000	4,545,000	424,518	427,887	44,000	3,369
2026	1973	4,492,000	4,540,000	639,882	642,372	48,000	2,490
2027	1974	4,481,000	4,533,000	607,742	610,451	52,000	2,709
2028	1975	4,451,000	4,510,000	479,146	481,087	59,000	1,941
2029	1976	4,422,000	4,491,000	502,324	500,819	69,000	-1,505
2030	1977	4,405,000	4,527,000	597,505	602,728	122,000	5,223
2031	1978	4,451,000	4,621,000	1,023,131	1,035,589	170,000	12,458
2032	1979	4,442,000	4,655,000	788,345	803,158	213,000	14,813
2033	1980	4,480,000	4,738,000	993,827	1,009,339	258,000	15,512
2034	1981	4,456,000	4,763,000	751,693	760,693	307,000	9,000
2035	1982	4,451,000	4,805,000	727,380	741,379	354,000	13,999
2036	1983	4,499,000	4,844,000	1,069,565	1,089,631	345,000	20,066
2037	1984	4,472,000	4,730,000	736,299	747,600	258,000	11,301
2038	1985	4,450,000	4,621,000	513,855	524,741	171,000	10,886
2039	1986	4,437,000	4,523,000	650,023	658,253	86,000	8,230
2040	1987	4,413,000	4,501,000	574,550	581,532	88,000	6,982
Total Lost From Conjunctive Use Storage and Expanded Local Storage (2000 to 2040)							335,538

Table 4.5-4
COMPARISON OF ESTIMATES OF WATER IN CYCLIC AND LOCAL STORAGE ACCOUNTS WITH AND WITHOUT LOSSES TO THE SANTA ANA RIVER (acre-feet)

Year	---------- Cyclic and Local Storage Accounts ----------					
	Put	Take	Watermaster Estimated End of Period Storage	Accounting for Losses: Losses to Baseflow	Accounting for Losses: Estimated End of Period Storage	Accounting for Losses: Cumulative Losses
1978 / 79	16,074	0	16,074	163	15,911	-163
1979 / 80	19,898	10,678	25,295	417	24,715	-580
1980 / 81	12,665	3,021	34,938	600	33,759	-1,179
1981 / 82	6,015	2,454	38,500	721	36,599	-1,901
1982 / 83	20,345	0	58,846	949	55,995	-2,850
1983 / 84	19,158	0	78,004	1,331	73,822	-4,181
1984 / 85	25,986	615	103,375	1,756	97,437	-5,938
1985 / 86	18,192	106	121,461	2,162	113,362	-8,099
1986 / 87	31,257	14,021	138,698	2,476	128,122	-10,575
1987 / 88	58,037	17,153	179,582	3,016	165,990	-13,591
1988 / 89	43,990	31,983	191,588	3,491	174,505	-17,083
1989 / 90	26,742	34,774	183,555	3,461	163,012	-20,544
1990 / 91	34,451	5,877	212,129	3,599	187,986	-24,143
1991 / 92	83,614	66,103	229,640	3,994	201,503	-28,137
1992 / 93	30,388	23,028	237,000	4,165	204,698	-32,302
1993 / 94	32,807	21,889	247,918	4,266	211,350	-36,568
1994 / 95	30,333	6,288	271,963	4,534	230,861	-41,102
1995 / 96	38,488	34,785	275,666	4,724	229,840	-45,826
1996 / 97	20,698	22,301	274,063	4,649	223,587	-50,476

Table 4.5-5
CHINO BASIN GROUNDWATER PRODUCTION ESTIMATES (acre-feet)

Year	Production Estimates SWRCB(1)	Watermaster(2)	CBWRMS(3)
1947	108,079		
1948	121,367		
1949	127,427		
1950	138,168		
1951	152,784		
1952	145,957		
1953	164,175		
1954	159,944		
1955	174,205		
1956	192,319		
1957	172,818		
1958	167,383		
1959	179,794		
1960	186,465		
1961	194,763		217,536
1962	185,230		201,675
1963	172,008		190,548
1964	184,336		201,234
1965	158,389		190,358
1966	147,552		199,904
1967	156,900		186,264
1968	160,250		192,597
1969	153,975		190,489
1970	*154,000*		192,103
1971	149,150		197,057
1972	*157,000*		197,428
1973	*134,000*		166,826
1974	149,680		180,997
1975		175,757	191,536
1976		181,017	189,637
1977		173,355	174,489
1978		154,675	163,706
1979		141,314	167,410
1980		140,566	167,689
1981		144,416	174,421
1982		137,532	162,814
1983		122,635	151,878
1984		132,799	172,420
1985		134,563	176,218
1986		136,113	167,119
1987		147,068	180,778
1988		152,402	180,115
1989		143,998	189,513
1990		154,620	
1991		140,151	
1992		141,904	
1993		135,923	
1994		129,682	
1995		152,678	
1996		150,669	
1997		159,012	
1998		150,226	
	Averages		
1947 to 1974	158,361	na	na
1947 to 1960	156,492	na	na
1961 to 1974	161,231	na	193,215
1965 to 1974	152,090	na	189,402
1978 to 1989	na	147,881	173,983
1978 to 1998	na	142,997	na

(1) - From JMM notes on Chino Basin Adjudication.
(2) - Appendix H, Twentieth Annual Report of the Chino Basin Watermaster.
(3) - Chino Basin Water Resources Management Study, Task 6 Report.
na - not applicable.

Table 4.5-6
CHINO BASIN PRODUCTION BY POOL

Fiscal Year	Appropriative Pool			Overlying Agricultural Pool	Overlying Non-Agricultural Pool	Total	Distribution by Pool		
	Production	Exchanged with Metropolitan	Total				Appropriative Pool	Overlying Agricultural Pool	Overlying Non-Agricultural Pool
1974 - 1975	70,312	0	70,312	96,567	8,878	175,757	40%	55%	5%
1975 - 1976	79,312	0	79,312	95,349	6,356	181,017	44%	53%	4%
1976 - 1977	72,707	0	72,707	91,450	9,198	173,355	42%	53%	5%
1977 - 1978	60,659	0	60,659	83,934	10,082	154,675	39%	54%	7%
1978 - 1979	60,597	0	60,597	73,688	7,127	141,412	43%	52%	5%
1979 - 1980	63,834	0	63,834	69,369	7,363	140,566	45%	49%	5%
1980 - 1981	70,726	0	70,726	68,040	5,650	144,416	49%	47%	4%
1981 - 1982	66,731	0	66,731	65,117	5,684	137,532	49%	47%	4%
1982 - 1983	63,481	0	63,481	56,759	2,395	122,635	52%	46%	2%
1983 - 1984	70,558	0	70,558	59,033	3,208	132,799	53%	44%	2%
1984 - 1985	76,912	0	76,912	55,236	2,415	134,563	57%	41%	2%
1985 - 1986	80,859	0	80,859	52,061	3,193	136,113	59%	38%	2%
1986 - 1987	84,662	0	84,662	59,847	2,559	147,068	58%	41%	2%
1987 - 1988	91,579	7,634	99,213	57,865	2,958	152,402	60%	38%	2%
1988 - 1989	93,617	6,424	100,041	46,762	3,619	143,998	65%	32%	3%
1989 - 1990	101,344	16,377	117,721	48,420	4,856	154,620	66%	31%	3%
1990 - 1991	86,658	14,929	101,587	48,085	5,407	140,150	62%	34%	4%
1991 - 1992	91,982	12,202	104,184	44,682	5,240	141,904	65%	31%	4%
1992 - 1993	86,367	13,657	100,024	44,092	5,464	135,923	64%	32%	4%
1993 - 1994	80,798	20,195	100,993	44,298	4,586	129,682	62%	34%	4%
1994 - 1995	93,419	4,222	97,641	55,022	4,327	152,768	61%	36%	3%
1995 - 1996	101,606	6,167	107,773	43,639	5,424	150,669	67%	29%	4%
1996 - 1997	107,984	0	107,984	44,809	6,219	159,012	68%	28%	4%
1997 - 1998	101,710	4,275	105,985	43,344	5,171	150,225	68%	29%	3%
Totals	1,958,414	106,082	2,064,496	1,447,468	127,379	3,533,261			
Average	81,601	4,420	86,021	60,311	5,307	147,219	56%	41%	4%
Max	107,984	20,195	117,721	96,567	10,082	181,017	68%	55%	7%
Min	60,597	0	60,597	43,344	2,395	122,635	39%	28%	2%

Table 4.5-7
ESTIMATED HISTORICAL LAND USES IN CHINO BASIN

Land Use Category	Year 1933 (acres)	1949 (acres)	1957 (acres)	1963 (acres)	1975 (acres)	1984 (acres)	1993 (acres)
Non-irrigated Field Crops and Pasture	37,242	37,157	52,950	36,600	20,754	12,942	5,411
Irrigated Field Crops and Pasture	32,539	32,539	24,320	23,927	18,295	15,677	13,141
Irrigated and Non-irrigated Citrus	15,866	15,866	9,464	4,303	1,947	865	0
Irrigated Vineyards	1,332	1,332	7,268	18,057	9,353	8,195	2,975
Non-irrigated Vineyards	94	94	79	0	0	0	1,629
Dairies and Feedlots	259	259	3,963	4,140	6,280	6,517	7,611
Urban Residential, Commercial, Industrial and Vacant	7,135	7,157	17,695	25,598	41,405	53,260	65,115
Special Impervious	305	305	305	314	309	1,839	3,851
Native Vegetation	22,083	22,145	21,633	21,249	20,481	19,904	19,328
Total Urban	*7,440*	*7,462*	*18,000*	*25,912*	*41,714*	*55,099*	*68,966*
Total Non-urban	*109,415*	*109,393*	*119,678*	*108,276*	*77,109*	*64,101*	*50,095*
Potential Dairy Disposal Area	*87,073*	*86,988*	*94,082*	*82,887*	*50,349*	*37,680*	*23,156*

Table 4.5-8
ESTIMATED DAIRY WASTE GENERATION AND MINERAL LOADING IN THE CHINO BASIN

Year	Total Acreage (acres)	Area in Feedlots (acres)	Number of Milking Cows	Number of Non-Milking Cows (Equ. Milking Cows)	Total Mass of Manure Disposed in Basin (tons)	Mass of TDS from Manure to Groundwater (tons)	Mass of Nitrate from Manure Entering Soil (tons)	Theoretical Manure Disposal Area (acres)	Theoretical Manure Application Rate (tons/acre)
1949	55	47	1,079	324	4,217	329	53	86,988	0.05
1950	457	389	8,969	2,697	35,071	2,736	440	85,187	0.4
1951	860	731	16,860	5,071	65,925	5,142	828	83,386	1
1952	1,262	1,073	24,751	7,444	96,779	7,549	1,215	81,585	1
1953	1,665	1,415	32,642	9,817	127,632	9,955	1,603	79,784	2
1954	2,067	1,757	40,533	12,190	158,486	12,362	1,990	77,982	2
1955	2,469	2,099	48,424	14,563	189,340	14,769	2,377	76,181	2
1956	2,872	2,441	56,315	16,936	220,194	17,175	2,765	74,380	3
1957	3,274	2,783	64,205	19,309	251,048	19,582	3,152	72,579	3
1958	3,511	2,984	68,856	20,708	269,233	21,000	3,381	71,210	4
1959	3,748	3,186	73,507	22,107	287,419	22,419	3,609	69,840	4
1960	3,986	3,388	78,158	23,505	305,605	23,837	3,837	68,471	4
1961	4,223	3,589	82,809	24,904	323,790	25,256	4,066	67,102	5
1962	4,460	3,791	87,460	26,303	341,976	26,674	4,294	65,733	5
1963	4,697	3,992	92,111	27,702	360,162	28,093	4,522	64,364	6
1964	4,918	4,181	96,450	29,007	377,127	29,416	4,735	62,848	6
1965	5,140	4,369	100,789	30,311	394,092	30,739	4,948	61,331	6
1966	5,361	4,557	105,128	31,616	411,058	32,063	5,161	59,815	7
1967	5,582	4,745	109,467	32,921	428,023	33,386	5,374	58,299	7
1968	5,803	4,933	113,806	34,226	444,988	34,709	5,587	56,783	8
1969	6,025	5,121	118,145	35,531	461,953	36,032	5,800	55,267	8
1970	6,246	5,309	122,483	36,836	478,919	37,356	6,014	53,750	9
1971	6,467	5,497	126,822	38,141	495,884	38,679	6,227	52,234	9
1972	6,688	5,685	131,161	39,445	512,849	40,002	6,440	50,718	10
1973	6,910	5,873	135,500	40,750	529,815	41,326	6,653	49,202	11
1974	7,131	6,061	143,657	42,793	370,912	28,931	4,657	47,685	8
1975	7,352	6,249	152,052	44,859	391,155	30,510	4,912	46,169	8
1976	7,464	6,344	158,358	46,267	405,888	31,659	5,097	44,635	9
1977	7,575	6,439	164,784	47,673	420,808	32,823	5,284	43,100	10
1978	7,687	6,534	171,330	49,077	435,911	34,001	5,473	41,566	10
1979	7,799	6,629	177,995	50,478	451,194	35,193	5,665	40,031	11
1980	7,910	6,724	184,780	51,874	466,654	36,399	5,860	38,497	12
1981	8,022	6,819	191,684	53,264	482,287	37,618	6,056	36,962	13
1982	8,134	6,914	198,708	54,648	498,090	38,851	6,254	35,427	14
1983	8,245	7,009	205,852	56,024	514,059	40,097	6,455	33,893	15
1984	8,357	7,103	213,115	57,392	530,192	41,355	6,657	32,358	16
1985	8,469	7,198	220,498	58,750	546,484	42,626	6,862	31,091	18
1986	8,580	7,293	228,000	60,097	562,932	43,909	7,068	29,823	19
1987	8,692	7,388	200,070	54,019	498,200	38,860	6,256	28,556	17
1988	8,804	7,483	171,347	47,608	431,100	33,626	5,413	27,288	16
1989	8,915	7,578	173,520	48,212	436,568	34,052	5,482	26,020	17
1990	8,915	7,578	175,414	48,738	441,332	34,424	5,542	24,753	18
1991	8,915	7,578	177,308	49,264	446,097	34,796	5,601	23,485	19
1992	8,915	7,578	179,201	49,790	450,861	35,167	5,661	22,218	20
1993	8,915	7,578	181,095	50,316	455,626	35,539	5,721	20,950	22
1994	8,915	7,578	182,989	50,842	460,391	35,910	5,781	20,950	22
1995	8,915	7,578	184,883	51,369	465,155	36,282	5,841	20,950	22
1996	8,915	7,578	186,776	51,895	469,920	36,654	5,901	20,950	22
1997	8,915	7,578	188,670	52,421	474,684	37,025	5,960	20,950	23
Totals					18,678,084	1,456,391	234,530	na	na
Average	6,106	5,190	129,562	36,939	381,185	29,732	4,786	49,364	10

Sources: Final Task 6 Memorandum, Development of a Three-Dimensional Groundwater Model, Montgomery Watson, 1994; RWQCB 1997 Cow count.9 (personal conversation with Robert Holub of RWQCB, 1998)

Table 4.5-9
AVERAGE TDS VALUES FOR SELECTED WELLS WITHIN EACH MANAGEMENT AREA

Well	Average TDS (mg/l) Per Period						
	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995
Management Zone 1A							
01S08W15J01	276	247	N/A	208	294	301	304
01S08W25Q02	N/A	181	233	209	213	219	206
01S08W15R00	N/A	N/A	N/A	213	216	200	219
01S08W34A01	N/A	N/A	250	219	331	376	N/A
01S07W08N01	209	227	199	226	239	214	224
01S08W11R01	N/A	312	383	345	394	333	371
01S08W14A03	374	292	295	388	358	N/A	N/A
01S08W27H01	N/A	N/A	483	434	443	678	607
01S08W31J01	N/A	N/A	N/A	N/A	N/A	411	408
Management Zone 1B							
02S08W23C01	390	N/A	N/A	205	N/A	259	208
02S08W11L04	N/A	236	222	206	208	N/A	228
02S08W15C03	N/A	N/A	284	295	291	353	349
02S08W22J01	N/A	261	N/A	645	N/A	N/A	781
Management Zone 2A							
01S06W31D01	160	134	N/A	164	N/A	250	193
01S07W14G01	N/A	N/A	189	193	186	224	172
01S07W27D01	N/A	183	250	220	232	247	N/A
02S07W04B01	236	218	215	N/A	N/A	N/A	N/A
01S07W13R01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Management Zone 2B							
02S07W22K01	617	215	250	315	N/A	N/A	223
Management Zone 3A							
01S06W11B01	210	204	206	220	N/A	244	218
01S06W23D01	230	N/A	N/A	241	N/A	264	275
02S06W05A01	196	184	198	N/A	N/A	227	248
01S05W21B01	268	256	291	N/A	344	354	N/A
Management Zone 3B							
02S07W34K02	1305	1778	1977	735	N/A	N/A	N/A
03S07W03N01	399	574	592	N/A	N/A	N/A	N/A
Management Zone 4							
02S06W16B04	N/A	N/A	316	310	735	696	N/A
02S06W16B03	N/A	N/A	348	370	765	658	788
Management Zone 5							
03S07W11L03	600	578	633	645	771	660	841
02S06W26D02	497	580	650	685	N/A	720	N/A
02S07W36H02	N/A	1065	1477	1257	1156	1100	1047

Table 4.5-10
AVERAGE NITRATE VALUES FOR SELECTED WELLS WITHIN EACH MANAGEMENT AREA

Well	Average Nitrate-N (mg/l) Per Period						
	1961-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995
Management Zone 1A							
01S07W08N01	2.7	4.9	3.3	4.2	4.4	4.6	5.4
01S08W11R01	N/A	22.4	21.0	19.4	21.8	17.9	18.8
01S08W14A03	21.2	12.9	22.6	15.4	17.0	N/A	18.4
01S08W15J01	8.3	7.0	N/A	7.4	6.5	5.1	6.7
01S08W15R00	N/A	N/A	N/A	3.2	2.4	4.8	3.1
01S08W25Q02	N/A	2.7	3.8	4.3	3.4	4.0	5.2
01S08W27H01	N/A	N/A	1.5	13.8	20.4	4.9	4.0
01S08W31J01	N/A	N/A	N/A	N/A	N/A	6.4	6.8
01S08W34A01	N/A	N/A	5.2	4.0	11.7	17.7	N/A
Management Zone 1B							
02S08W11L04	N/A	2.6	1.8	1.7	1.9	N/A	4.8
02S08W15C03	N/A	N/A	3.0	2.2	3.4	4.8	5.6
02S08W22J01	N/A	1.8	N/A	12.3	N/A	17.9	19.5
02S08W23C01	5.0	N/A	N/A	3.2	N/A	5.6	5.2
Management Zone 2A							
01S06W31D01	0.4	0.5	N/A	1.3	1.9	2.5	1.9
01S07W13R01	0.8	N/A	N/A	N/A	N/A	N/A	N/A
01S07W14G01	N/A	N/A	2.9	0.4	0.4	0.5	0.7
01S07W27D01	2.7	2.9	3.0	5.0	5.0	4.6	0.0
02S07W04B01	1.8	2.3	2.4	N/A	N/A	N/A	N/A
Management Zone 2B							
02S07W22K01	9.5	1.6	1.7	5.9	N/A	N/A	3.5
Management Zone 3A							
01S05W21B01	6.5	8.6	8.9	N/A	15.2	15.2	N/A
01S06W11B01	1.9	1.1	1.8	2.5	2.5	4.3	5.5
01S06W23D01	4.0	N/A	N/A	5.8	3.3	7.2	12.2
02S06W05A01	1.4	1.3	1.5	N/A	N/A	2.9	5.2
Management Zone 3B							
02S07W34K02	4.8	8.3	16.5	0.5	N/A	N/A	N/A
03S07W03N01	3.1	5.7	8.0	N/A	N/A	N/A	N/A
Management Zone 4							
02S06W16B03	N/A	N/A	4.4	7.8	19.4	22.6	23.3
02S06W16B04	N/A	N/A	6.5	7.5	19.9	24.3	22.6
Management Zone 5							
02S06W26D02	3.6	3.4	5.4	8.1	N/A	8.6	N/A
02S07W36H02	N/A	3.8	6.7	4.3	6.9	2.7	6.5
03S07W11L03	0.5	0.8	0.7	3.6	3.2	6.1	14.9

Table 4.5-11a
INORGANIC CONSTITUENTS, THMs, RADIOACTIVITY WITH PRIMARY MCLs

Constituent	Observations At or Above 1/2*MCL	Wells w/ Observations At or Above 1/2*MCL	Observations At or Above MCL	Wells w/ Observations At or Above MCL	MCL
Inorganic Chemicals					
Aluminum	2	2	0	0	1 mg/L
Antimony	0	0	0	0	0.006 mg/L
Arsenic	8	1	0	0	0.05 mg/L
Asbestos	0	0	0	0	0.05 mg/L
Barium	0	0	0	0	1 mg/L
Beryllium	7	5	2	1	0.004 mg/L
Cadmium	17	8	5	4	0.005 mg/L
Chromium	16	10	7	5	0.05 mg/L
Cyanide	0	0	0	0	0.2 mg/L
Fluoride	302	51	160	30	2 mg/L
Mercury	4	3	2	2	0.002 mg/L
Nickel	2	2	0	0	0.1 mg/L
Nitrate (as N)	4165	513	2053	322	10 mg/L
Selenium	3	1	3	1	0.05 mg/L
Thallium	0	0	0	0	0.002 mg/L
Total Trihalomethanes					
Total Trihalomethanes[a]	0	0	0	0	0.1 mg/L
Bromodichloromethane (THM)	0	0	0	0	see THM
Bromoform (THM)	0	0	0	0	see THM
Chloroform (THM)	0	0	0	0	see THM
Dibromochloromethane (THM)	0	0	0	0	see THM
Radioactivity					
Gross Alpha Particle Activity	39	16	11	7	15 pCi/L
Gross Beta Particle Activity	0	0	0	0	50 pCi/L
Radium-226 and 228[b]	0	0	0	0	pCi/L
Strontium-90	0	0	0	0	8 pCi/L
Tritium	0	0	0	0	20,000 pCi/L
Uranium	5	3	0	0	20 pCi/L

(a) Includes individual THM constituents analyzed separately
(b) Radium-226 MCL is 3 pCi/L; Radium-228 MCL is 2 pCi/L

Table 4.5-11b
ORGANIC CHEMICALS WITH PRIMARY MCLs

Constituent	Observations At or Above 1/2*MCL	Wells w/ Observations At or Above 1/2*MCL	Observations At or Above MCL	Wells w/ Observations At or Above MCL	MCL
Organic Chemicals					
1,1,1-Trichloroethane (1,1,2-TCA)	0	0	0	0	0.2 mg/L
1,1,2,2-Tetrachloroethane	0	0	0	0	0.001 mg/L
1,1,2-Trichloro-1,2,2-Trifluoroethane	0	0	0	0	1.2 mg/L
1,1,2-Trichloroethane (1,1,2-TCA)	0	0	0	0	0.005 mg/L
1,1-Dichloroethane	34	7	22	7	0.005 mg/L
1,1-Dichloroethylene	497	18	355	13	0.006 mg/L
1,2,4-Trichlorobenzene	0	0	0	0	0.07 mg/L
1,2-Dichlorobenzene	0	0	0	0	0.6 mg/L
1,2-Dichloroethane	134	77	122	76a	0.0005 mg/L
1,2-Dichloropropane	1	1	0	0	0.005 mg/L
1,3-Dichloropropane	0	0	0	0	0.0005 mg/L
1,4-Dichlorobenzene	3	2	2	1	0.005 mg/L
2,3,7,8-TCDD (Dioxin)	0	0	0	0	0.00000003 mg/L
2,4,5,-TP (Silvex)	0	0	0	0	0.05 mg/L
2,4-D	0	0	0	0	0.07 mg/L
Alachlor	0	0	0	0	0.002 mg/L
Atrazine	0	0	0	0	0.003 mg/L
Bentazon	0	0	0	0	0.018 mg/L
Benzene	155	89	43	23	0.001 mg/L
Benzo(a)Pyrene	0	0	0	0	0.0002 mg/L
Carbofuran	0	0	0	0	0.018 mg/L
Carbon Tetrachloride	1	1	1	1	0.0005 mg/L
Chlordane	0	0	0	0	0.0001 mg/L
cis-1,2-Dichloroethylene	9	3	4	1	0.006 mg/L
Di (2-ethylhexyl) Adipate	0	0	0	0	0.4 mg/L
Di(2-Ethlhexyl)Phthalate	25	10	25	10	0.004 mg/L
Dibromochloropropane (DBCP)	1068	45	758	41	0.0002 mg/L
Dinoseb	0	0	0	0	0.007 mg/L
Diquat	0	0	0	0	0.02 mg/L
Endothal	0	0	0	0	0.1 mg/L
Endrin	0	0	0	0	0.002 mg/L
Ethylbenzene	0	0	0	0	0.7 mg/L
Ethylene Dibromide (EDB)	3	3	1	1	0.00005 mg/L
Glyphosate	0	0	0	0	0.7 mg/L
Heptachlor	0	0	0	0	0.00001 mg/L
Heptachlor Epoxide	0	0	0	0	0.00001 mg/L
Hexachlorobenzene	0	0	0	0	0.001 mg/L
Hexachlorocyclopentadiene	0	0	0	0	0.05 mg/L
Lindane (gamma-BHC)	61	46	20	15	0.0002 mg/L
Methoxychlor	0	0	0	0	0.04 mg/L
Molinate	0	0	0	0	0.02 mg/L
Monochlorobenzene	0	0	0	0	0.07 mg/L
Oxamyl	0	0	0	0	0.2 mg/L
Pentachlorophenol	0	0	0	0	0.001 mg/L
Picloram	0	0	0	0	0.5 mg/L
Polychlorinated Biphenyls (PCB's)	0	0	0	0	0.0005 mg/L
Simazine	0	0	0	0	0.004 mg/L
Styrene	0	0	0	0	0.1 mg/L
Tetrachloroethene (PCE)	521	59	198	54	0.005 mg/L
Thiobencarb	0	0	0	0	0.07 mg/L
Toluene	0	0	0	0	0.15 mg/L
Toxaphene	0	0	0	0	0.003 mg/L
trans-1,2-Dichloroethylene	0	0	0	0	0.01 mg/L
Trichloroethene (TCE)	1022	85	699	74	0.005 mg/L
Trichlorofluoromethane	0	0	0	0	0.15 mg/L
Vinyl chloride	154	81	136	79	0.0005 mg/L
Xylene	0	0	0	0	1.75 mg/L

(a) 67 wells at MCL only 2 wells have elevated results

Table 4.5-11c
INORGANIC CONSTITUENTS, ORGANIC CHEMICALS WITH SECONDARY MCLs; LEAD AND COPPER RULE; AND CONSTITUENTS WITH DHS ACTION LEVELS

Constituent	Observations At or Above 1/2*MCL	Wells w/ Observations At or Above 1/2*MCL	Observations At or Above MCL	Wells w/ Observations At or Above MCL	MCL
Secondary MCL					
Foaming Agents (MBAS)	41	22	37	19	0.5 mg/L
Iron	104	48	54	28	0.3 mg/L
Manganese	317	45	285	24	0.05 mg/L
Silver	1	1	1	1	0.1 mg/L
Total Dissolved Solids (TDS)[b]	2978	522	1077	219	500 mg/L
Total Dissolved Solids (TDS)[c]	1077	219	119	44	1,000 mg/L
Zinc	1	1	0	0	5 mg/L
Lead and Copper Rule					
Copper	1	1	0	0	1 mg/L
Lead	62	25	24	14	0.015 mg/L
DHS Action Levels					
	Inorganics				
Boron	122	47	48	19	1 mg/L
Perchlorate	7	4	1	1	0.018 mg/L
	Organics				
1,3-Dichlorobenzene	0	0	0	0	0.13 mg/L
2,4-Dimethylphenol	0	0	0	0	0.4 mg/L
2-Chlorotoluene	0	0	0	0	0.045 mg/L
4-Chlorotoluene	0	0	0	0	0.045 mg/L
a-Benzene Hexachloride	0	0	0	0	0.0007 mg/L
Aldicarb	0	0	0	0	0.01 mg/L
Aldrin	0	0	0	0	0.00005 mg/L
Baygon	0	0	0	0	0.09 mg/L
b-Benzene Hexachloride	0	0	0	0	0.0003 mg/L
Captan	0	0	0	0	0.35 mg/L
Carbaryl	0	0	0	0	0.06 mg/L
Diazinon	0	0	0	0	0.014 mg/L
Dichlorodifluoromethane	0	0	0	0	1 mg/L
Dieldrin	0	0	0	0	0.00005 mg/L
Dimethoate	0	0	0	0	0.14 mg/L
Diphenamide	0	0	0	0	0.04 mg/L
Ethion	0	0	0	0	0.035 mg/L
Formaldehyde	0	0	0	0	0.03 mg/L
Heptachlor	0	0	0	0	0.05 mg/L
Isopropyl N Carbamate	0	0	0	0	0.035 mg/L
Malathion	0	0	0	0	0.16 mg/L
Methyl Isobutyl Ketone	0	0	0	0	0.04 mg/L
Methyl Parathion	0	0	0	0	0.03 mg/L
Methyl-Tert-Butyl Ether	0	0	0	0	0.035 mg/L
n-Butylbenzene	0	0	0	0	0.045 mg/L
Parathion	0	0	0	0	0.03 mg/L
Pentachloronitrobenzene	0	0	0	0	0.0009 mg/L
Phenol	6	2	5	2	0.005 mg/L
Trithion	0	0	0	0	0.007 mg/L

(a) Not including constituents contained in Primary MCL standards
(b) Recommended Secondary MCL Range of 500 mg/l
(c) Upper Secondary MCL Range of 1,000 mg/l

Table 4.5-12
CONSTITUENTS DETECTED AT OR GREATER THAN THEIR MCLs

Constituent	Observations At or Above 1/2*MCL	Wells w/ Observations At or Above 1/2*MCL	Observations At or Above MCL	Wells w/ Observations At or Above MCL	MCL
Inorganic Constituents					
Aluminum	2	2	0	0	1 mg/L
Arsenic	8	1	0	0	0.05 mg/L
Beryllium	7	5	2	1	0.004 mg/L
Boron	122	47	48	19	1 mg/L
Cadmium	17	8	5	4	0.005 mg/L
Chromium	16	10	7	5	0.05 mg/L
Copper	1	1	0	0	1 mg/L
Fluoride	302	51	160	30	2 mg/L
Iron	104	48	54	28	0.3 mg/L
Lead	62	25	24	14	0.015 mg/L
Manganese	317	45	285	24	0.05 mg/L
Mercury	4	3	2	2	0.002 mg/L
Nickel	2	2	0	0	0.1 mg/L
Nitrate (as N)	4165	513	2053	322	10 mg/L
Perchlorate	7	4	1	1	0.018 mg/L
Selenium	3	1	3	1	0.05 mg/L
Silver	1	1	1	1	0.1 mg/L
Total Dissolved Solids (TDS)[a]	2978	522	1077	219	500 mg/L
Total Dissolved Solids (TDS)[b]	1077	219	119	44	1,000 mg/L
Zinc	1	1	0	0	5 mg/L
Radioactivity					
Gross Alpha Particle Activity	39	16	11	7	15 pCi/L
Uranium	5	3	0	0	20 pCi/L
Volatile Organic Chemicals					
1,1-Dichloroethane	34	7	22	7	0.005 mg/L
1,1-Dichloroethylene	497	18	355	13	0.006 mg/L
1,2-Dichloroethane	134	77	122	76	0.0005 mg/L
1,2-Dichloropropane	1	1	0	0	0.005 mg/L
1,4-Dichlorobenzene	3	2	2	1	0.005 mg/L
Benzene	155	89	43	23	0.001 mg/L
Carbon Tetrachloride	1	1	1	1	0.0005 mg/L
cis-1,2-Dichloroethylene	9	3	4	1	0.006 mg/L
Phenol	6	2	5	2	0.005 mg/L
Tetrachloroethene (PCE)	521	59	198	54	0.005 mg/L
Trichloroethene (TCE)	1022	85	699	74	0.005 mg/L
Vinyl chloride	154	81	136	79	0.0005 mg/L
Semi-Volatile Organic Chemical					
Di(2-Ethlhexyl)Phthalate	25	10	25	10	0.004 mg/L
Pesticides/Herbicides					
Dibromochloropropane (DBCP)	1068	45	758	41	0.0002 mg/L
Ethylene Dibromide (EDB)	3	3	1	1	0.00005 mg/L
Lindane (gamma-BHC)	61	46	20	15	0.0002 mg/L
Aesthetic Standards					
Foaming Agents (MBAS)	41	22	37	19	0.5 mg/L

(a) Recommended Secondary MCL Range of 500 mg/l
(b) Upper Secondary MCL Range of 1,000 mg/l

Table 4.5-13
COMPONENTS OF SAFE YIELD
ADOPTED IN THE CHINO BASIN JUDGMENT

Hydrologic Component	Annual Average (acre-ft/yr)	Annual Average (%)
Inflows to Chino Basin		
Deep Percolation		
Precipitation and Surface Inflow	47,500	33%
Imported Water	7,000	5%
Irrigation		
Domestic	9,800	7%
Agriculture	51,900	36%
Artificial Recharge	3,900	3%
Recharge of Sewage	18,200	13%
Subsurface Inflow	7,000	5%
Total Inflow	145,300	100%
Outflows from Chino Basin		
Subsurface Outflow	7,200	4%
Extractions	180,000	96%
Total Outflow	187,200	100%
Hydrologic Balance		
Estimated Annual Average Change in Storage 1965-1974	-40,000	
Safe Yield (equal to average annual extraction plus annual average change in storage)	140,000	

Table 4.5-14
CIGSM ESTIMATE OF THE CHINO BASIN HYDROLOGIC BUDGET 1961 THROUGH 1989 (acre-feet)

Year	Total Inflow Native Hydrology	Net Recharge from Stream Flow	Artificial Recharge(1)	Groundwater Pumpage	Change in Storage	End of Period Storage
1961	125,306	-7,071	11,561	217,536	-87,740	5,202,000
1962	178,032	-4,822	10,785	201,790	-17,795	5,184,205
1963	133,270	-8,167	12,466	190,303	-52,734	5,131,471
1964	131,485	-13,229	13,959	201,234	-69,019	5,062,452
1965	128,015	-9,024	13,902	190,358	-57,465	5,004,987
1966	178,168	-8,248	14,362	199,904	-15,622	4,989,365
1967	195,119	-2,428	15,336	186,264	21,763	5,011,128
1968	143,669	-10,342	14,619	192,597	-44,651	4,966,477
1969	251,892	4,321	16,927	190,489	82,651	5,049,128
1970	135,837	-13,076	15,059	192,103	-54,283	4,994,845
1971	140,908	-10,250	16,179	197,057	-50,220	4,944,625
1972	133,383	-7,170	14,000	197,428	-57,215	4,887,410
1973	174,962	431	3,028	166,826	11,595	4,899,005
1974	145,476	-2,968	3,440	180,997	-35,049	4,863,956
1975	127,546	1,914	4,601	191,536	-57,475	4,806,481
1976	112,294	7,107	3,933	189,637	-66,303	4,740,178
1977	116,683	3,955	3,620	174,498	-50,240	4,689,938
1978	263,055	6,785	15,484	163,705	121,619	4,811,557
1979	189,299	-7,278	34,122	167,410	48,733	4,860,290
1980	250,304	-5,201	19,989	167,669	97,423	4,957,713
1981	129,165	-8,810	27,727	174,421	-26,339	4,931,375
1982	153,379	-6,532	28,096	162,814	12,129	4,943,504
1983	252,507	-5,897	32,589	151,878	127,321	5,070,825
1984	134,649	-11,399	21,737	172,420	-27,433	5,043,392
1985	139,320	-8,934	20,897	176,218	-24,935	5,018,457
1986	149,613	-4,196	18,425	167,119	-3,277	5,015,180
1987	104,914	-9,595	23,530	180,778	-61,929	4,953,251
1988	110,004	-5,589	2,667	180,115	-73,033	4,880,218
1989	107,188	-3,905	7,407	189,513	-78,823	4,801,395
Statistics for Period 1961 to 1989						
Average	156,395	-5,159	15,188	183,263	-16,839	4,955,683
Max	263,055	7,107	34,122	217,536	127,321	5,202,000
Min	104,914	-13,229	2,667	151,878	-87,740	4,689,938
Statistics for Period 1965 to 1974						
Average	162,743	-5,875	12,685	189,402	-19,850	4,961,093
Max	251,892	4,321	16,927	199,904	82,651	5,049,128
Min	128,015	-13,076	3,028	166,826	-57,465	4,863,956

Source: Revised and final calibration simulations for the CBWRMS; previously unpublished. The results listed above are slightly different than reported by Montgomery Watson (1993) and supersede previously reported values.

Table 4.5-15
SUMMARY OF PROJECTED WATER DEMANDS BY PURVEYOR (acre-feet)

Purveyor	2000	2005	2010	2015	2020
Ameron	9	9	9	9	9
City of Chino	15,800	17,050	18,300	19,550	20,800
City of Chino Hills	17,640	19,100	20,670	22,350	23,240
~~City of Norco~~	7,000	7,400	7,700	8,400	9,000
City of Ontario(a)	41,530	45,830	53,530	61,330	69,030
~~City of Pomona~~(a)	37,200	38,440	39,580	40,900	42,104
City of Upland	22,000	23,000	24,000	24,000	24,000
Cucamonga County Water District	49,910	54,440	58,960	63,480	68,000
Fontana Water Company	36,800	41,200	45,600	49,900	54,300
~~Jurupa Community Services District~~	14,200	17,000	19,600	22,200	24,800
Kaiser Ventures	670	670	670	670	670
Marygold Mutual Water Company	1,450	1,580	1,620	1,660	1,700
Mira Loma Space Center	25	25	25	25	25
Monte Vista Irrigation Company	0	0	0	0	0
Monte Vista Water District	14,160	14,160	14,160	14,160	14,160
San Antonio Water Company - Domestic	640	1,620	1,640	1,660	1,680
San Bern. County Parks Dept.	75	75	75	75	75
San Bernardino Co Division of Airports - Domestic	300	300	300	300	300
~~Santa Ana River Water Company~~	2,000	2,090	2,120	2,140	2,170
Reliant Energy	3,300	3,300	3,300	3,300	3,300
Southern ~~California Water Company~~	14,200	14,950	15,680	15,680	15,680
Sunkist	1,470	1,470	1,470	1,470	1,470
~~Swan Lake~~	350	350	350	350	350
West San Bernardino County WD	6,130	7,835	10,900	10,900	10,900
Total Purveyor Demand	286,859	311,894	340,259	364,509	387,763
Agricultural Producers	49,100	39,975	30,850	21,725	10,000
Total Demand	335,959	351,869	371,109	386,235	397,763

Notes:
1 - SB County ag, CIM,and CIW included in the agricultural producers demand
2 - Mira Loma Space Center to be served by Jurupa Community Services District.
3 - Data from Chino Basin Water Resources Management Study Final Report, 1995
4 - Total Ag production from CBWCD and Watermaster Phase 1 Recharge Master Plan by Mark J. Wildermuth, Water Resources Engineers

Table 4.5-16
SUMMARY OF AVERAGE ANNUAL PROJECTED WATER DEMAND BY SOURCE (acre-feet/year)

Source	2000	2005	2010	2015	2020
Imported Water	62,090	77,720	103,170	117,510	125,224
Chino Basin Production Pools 2 and 3	148,630	157,891	156,511	168,502	180,191
Chino Basin Production Pool 1	46,490	39,120	28,580	18,270	7,950
Other Local Supplies	77,711	80,895	86,890	88,010	88,590
Recycled Water	8,300	8,300	8,300	8,300	8,300
Total	343,221	363,926	383,451	400,592	410,255

Table 4.5-17
HYPOTHETICAL REPLENISHMENT PLAN WITH THE OBMP

(1) Year	(2) Replenishment Obligation	(3) Underproduction — Total	(4) Underproduction — Used for Replenishment	(5) Storage — Volume in Storage at Start of Year	(6) Storage — Used for Replenishment	(7) Storage — Losses	(8) Supplemental Water Cyclic Storage Program — Storage	(9) Supplemental Water Cyclic Storage Program — Used for Replenishment	(11) Supplemental Water Cyclic Storage Program — Losses	(10) Imported/ Recycled Replenishment
		Replenishment Plan								
2001	40,000	19,437	19,437	182,705	20,000	0	36,796	563	0	0
2002	43,871	19,125	19,125	162,705	20,000	0	36,233	4,746	0	0
2003	47,742	18,814	18,814	142,705	20,000	2,654	31,487	8,928	540	0
2004	51,613	18,502	18,502	120,051	20,000	2,201	22,018	13,111	309	0
2005	55,485	18,191	18,191	97,850	20,000	1,757	8,598	8,598	0	8,696
2006	59,356	18,200	18,200	76,093	20,000	1,322	0	0	0	21,156
2007	63,227	18,208	18,208	54,771	20,000	895	0	0	0	25,018
2008	67,098	18,217	18,217	33,876	20,000	478	0	0	0	28,881
2009	70,969	18,226	18,226	13,398	13,398	134	0	0	0	39,345
2010	74,840	18,235	18,235	0	0	0	0	0	0	56,605
2011	76,319	18,945	18,945	0	0	0	0	0	0	57,374
2012	77,799	19,655	19,655	0	0	0	0	0	0	58,143
2013	79,278	20,366	20,366	0	0	0	0	0	0	58,912
2014	80,757	21,076	21,076	0	0	0	0	0	0	59,681
2015	82,236	21,786	21,786	0	0	0	0	0	0	60,450
2016	83,804	21,975	21,975	0	0	0	0	0	0	61,830
2017	85,373	22,163	22,163	0	0	0	0	0	0	63,209
2018	86,941	22,352	22,352	0	0	0	0	0	0	64,589
2019	88,509	22,540	22,540	0	0	0	0	0	0	65,969
2020	90,077	22,729	22,729	0	0	0	0	0	0	67,348
Totals	1,405,295	398,742	398,742	884,153	173,398	9,441	135,132	35,946	850	797,208
Average	70,265	19,937	19,937	44,208	8,670	472	6,757	1,797	42	39,860

Table 4.5-18a
PUMPING RIGHTS, PRODUCTION AND REPLENISHMENT OBLIGATIONS FOR YEAR 2020 (acre-feet/year)

Producer	Initial Share		With OBMP Allocation from New Recharge	Operating Yield	Production	Replenishment Obligation
Pool 2 -- Overlying Non Agricultural Pool						
Ameron Steel Products	98	1.329%		98	9	0
Angelica Rental Service	0	0.000%		0	0	0
Arrowhead Mountain Spring Water	0	0.000%		0	0	0
Blue Seal Linen	19	0.255%		19	0	0
California Steel Industries	1,300	17.650%		1,300	1,800	500
Calmat Company	318	4.315%		318	0	0
Kaiser Resources	1,630	22.134%		1,630	670	0
Mira Loma Space Center	104	1.414%		104	25	0
Praxair	427	5.803%		427	0	0
Quaker Chemical	0	0.000%		0	0	0
Red Star Fertilizer (to be reassigned)	16	0.213%		16	0	0
San Bernardino Co. Dept. of Airports	134	1.818%		134	300	166
Reliant Energy	954	12.952%		954	0	0
Southern California Edison	28	0.380%		28	0	0
Sunkist Growers	1,873	25.435%		1,873	1,470	0
Swan Lake	464	6.303%		464	0	0
General Electric	0	0.000%		0	0	0
Subtotal	7,366	100.000%		7,366	4,274	666
Pool 3 -- Appropriative Pool						
OBMP Treatment Facilities	0	0.000%	0	0	40,000	40,000
SAWPA Desalter (1)	0	0.000%	5,292	5,292	10,584	5,292
Inland Empire Utilities Agency	0	0.000%	0	0	0	0
City of Chino	4,034	7.357%	898	16,679	10,000	0
City of Chino Hills	2,111	3.850%	470	4,953	3,610	0
City of Norco	202	0.368%	45	337	0	0
City of Ontario	11,374	20.743%	2,532	29,852	31,480	1,628
City of Pomona	11,216	20.454%	2,497	18,719	19,529	810
City of Upland	2,852	5.201%	635	4,760	3,050	0
Cucamonga County Water District	10,016	18.266%	2,230	17,315	10,160	0
Fontana Union Water Company	0	0.000%	0	0	0	0
Fontana Water Company	0	0.000%	0	546	21,200	20,654
Jurupa Community Services District	1,593	2.905%	355	22,159	14,450	0
Marygold Mutual Water Company	655	1.195%	146	1,093	0	0
Monte Vista Irrigation Company	0	0.000%	0	0	0	0
Monte Vista Water District	5,501	10.032%	1,225	9,218	14,160	4,942
Mutual Water Co. of Glen Avon Heights	468	0.853%	104	781	0	0
San Antonio Water Company	1,507	2.748%	336	2,515	1,110	0
San Bernardino County Prado Parks	0	0.000%	0	0	75	75
Santa Ana River Water Company	1,301	2.373%	290	2,171	0	0
Southern California Water Company	412	0.751%	92	688	2,160	1,472
West End Consolidated Water Company	948	1.729%	211	1,582	1,500	0
West San Bernardino County Water Dist	644	1.174%	143	1,075	0	0
Subtotal	54,834	100.000%	17,500	139,734	183,068	74,874
Total Replenishment Obligation						75,540
Underproduction of Rights						
Overlying Non-Agricultural Pool						3,758
Appropriative Pool						31,540
Total Under Production of Rights						35,297
Deduct SAWPA Desalter Obligation						0
Net "Wet" Replenishment Obligation						44,000
"Wet" Recharge Capacity						80,000
Shortfall in Replenishment						0

Table 4.5-18b
PUMPING RIGHTS, PRODUCTION AND REPLENISHMENT OBLIGATIONS AFTER ADJUSTMENT FOR LOSS IN YIELD BASELINE (NO OBMP) ALTERNATIVE (acre-feet/year)

Producer	Initial Share		Operating Yield	Initial Production Goal	Initial Replenishment Obligation	Year 2020 adjustments Initial Under Production	Reduction 100% on Production	Final Production	Final Under Production	Revised Replenishment Obligation
Pool 2 – Overlying Non Agricultural Pool										
Ameron Steel Products	98	1.524%	98	9	0	89	3	6	92	0
Angelica Rental Service	0	0.000%	0	0	0	0	0	0	0	0
Arrowhead Mountain Spring Water	0	0.000%	0	0	0	0	0	0	0	0
Blue Seal Linen	19	0.293%	19	0	0	19	0	0	19	0
California Steel Industries	1,300	20.246%	1,300	1,800	500	0	608	1,192	108	0
Calmat Company	318	4.950%	318	0	0	318	0	0	318	0
Kaiser Resources	1,630	25.390%	1,630	670	0	960	226	444	1,187	0
Mira Loma Space Center	104	1.622%	104	25	0	79	8	17	88	0
Praxair	427	6.657%	427	0	0	427	0	0	427	0
Quaker Chemical	0	0.000%	0	0	0	0	0	0	0	0
Red Star Fertilizer (to be reassigned)	16	0.244%	16	0	0	16	0	0	16	0
San Bernardino Co. Dept. of Airports	134	2.085%	134	300	166	0	101	199	0	65
Reliant Energy	10	0.149%	10	0	0	10	0	0	10	0
Southern California Edison	28	0.436%	28	28	0	0	9	19	9	0
Sunkist Growers	1,873	29.176%	1,873	1,470	0	403	497	973	900	0
Swan Lake	464	7.230%	464	350	0	114	118	232	232	0
General Electric	0	0.000%	0	0	0	0	0	0	0	0
Subtotal	6,421	100.000%	6,421	4,652	666	2,435	1,571	3,081	3,405	65
Pool 3 – Appropriative Pool										
OBMP Treatment Facilities	0	0.000%	0	0	0	0	0	0	0	0
SAWPA Desalter (1)	0	0.000%	0	12,195	12,195	0	4,119	8,076	0	8,076
Inland Empire Utilities Agency	0	0.000%	0	0	0	0	0	0	0	0
City of Chino	4,034	7.357%	12,838	10,950	0	1,888	3,699	7,251	5,587	0
City of Chino Hills	2,111	3.850%	2,943	3,610	667	0	1,219	2,391	553	0
City of Norco	202	0.368%	145	0	0	145	0	0	145	0
City of Ontario	11,374	20.743%	19,023	37,880	18,857	0	12,795	25,085	0	6,062
City of Pomona	11,216	20.454%	8,040	19,529	11,489	0	6,597	12,933	0	4,892
City of Upland	2,852	5.201%	2,044	3,050	1,006	0	1,030	2,020	25	0
Cucamonga County Water District	10,016	18.266%	7,778	10,160	2,382	0	3,432	6,728	1,050	0
Fontana Union Water Company	0	0.000%	0	0	0	0	0	0	0	0
Fontana Water Company	0	0.000%	546	21,200	20,654	0	7,161	14,039	0	13,493
Jurupa Community Services District	1,593	2.905%	20,642	18,170	0	2,472	6,138	12,032	8,609	0
Marygold Mutual Water Company	655	1.195%	470	0	0	470	0	0	470	0
Monte Vista Irrigation Company	0	0.000%	0	0	0	0	0	0	0	0
Monte Vista Water District	5,501	10.032%	3,980	14,160	10,180	0	4,783	9,377	0	5,397
Mutual Water Co. of Glen Avon Heights	468	0.853%	335	0	0	335	0	0	335	0
San Antonio Water Company	1,507	2.748%	1,080	1,110	30	0	375	735	345	0
San Bernardino County Prado Parks	0	0.000%	0	75	75	0	25	50	0	50
Santa Ana River Water Company	1,301	2.373%	933	0	0	933	0	0	933	0
Southern California Water Company	412	0.751%	295	2,160	1,865	0	730	1,430	0	1,135
West End Consolidated Water Company	948	1.729%	680	1,500	820	0	507	993	0	314
West San Bernardino County Water Dist	644	1.174%	462	0	0	462	0	0	462	0
Subtotal	54,834	100.000%	82,234	155,749	80,219	6,704	52,610	103,139	18,513	39,418
Totals	61,255		88,655	160,401	80,885	9,139	54,181	106,220	21,918	39,483
Underproduction of Rights										
Overlying Non-Agricultural Pool						2,435				3,405
Appropriative Pool						6,704				18,513
Total Under Production of Rights						9,139				21,918
Deduct SAWPA Desalter Obligation										
Net "Wet" Replenishment Obligation					74,181					20,970
"Wet" Recharge Capacity					20,000					20,000
Shortfall in Replenishment					54,181					970

Table 4.5-19
WATER SUPPLY PLANS FOR THE OBMP (acre-feet/year)

Purveyor Source		Year 2000	2005	2010	2015	2020
City of Chino						
Chino Basin Wells		10,000	10,000	10,000	10,000	10,000
SAWPA Desalter (8 mgd Plant)		1,680	3,360	3,360	3,360	3,360
WFA Treatment Plant		4,020	2,640	2,830	3,010	3,200
Reclaimed Water		100	1,050	1,050	1,050	1,050
OBMP Supply	WFA Transfer from Ontario	0	0	0	0	0
	West CBWM OBMP Desalter	0	0	1,060	2,130	3,190
Total Supply		15,800	17,050	18,300	19,550	20,800
Total Demand		15,800	17,050	18,300	19,550	20,800
City of Chino Hills						
Chino Basin Wells		3,610	3,610	3,610	3,610	3,610
SAWPA Desalter (8 mgd Plant)		1,120	5,840	5,840	5,840	5,840
SAWPA Desalter (to 10 mgd Plant)		0	1,700	1,700	1,700	1,700
Reclaimed Water		400	1,020	1,020	1,815	2,610
WFA Treatment Plant		0	6,930	8,500	9,385	9,480
MVWD Supply	Chino GW	12,510	0	0	0	0
Total Supply		17,640	19,100	20,670	22,350	23,240
Total Demand		17,640	19,100	20,670	22,350	23,240
City of Norco						
Chino Basin Wells		0	0	0	0	0
SAWPA Desalter (8 mgd Plant)		0	0	0	0	0
City of Corona		220	0	0	0	0
Temescal Basin Groundwater		5,880	5,870	5,560	5,070	4,650
Supply from JCSD		900	0	0	0	0
OBMP Supply	East CBWM OBMP Desalter	0	1,530	2,140	3,330	4,350
Total Supply		7,000	7,400	7,700	8,400	9,000
Total Demand		7,000	7,400	7,700	8,400	9,000
City of Ontario						
Chino Basin Wells		34,720	32,950	32,950	32,950	32,950
WFA Treatment Plant		6,590	12,660	15,020	17,950	20,630
Reclaimed Water		840	840	1,680	2,520	3,360
Supply from SAWC (Chino GW)		850	850	850	850	850
OBMP Supply	East CBWM OBMP Desalter	0	0	4,500	8,530	12,710
Total Supply		43,000	47,300	55,000	62,800	70,500
Total Demand		41,530	45,830	53,530	61,330	69,030
Supply to Sunkist (Chino GW)		1,470	1,470	1,470	1,470	1,470

Table 4.5-19 (continued)
WATER SUPPLY PLANS FOR THE OBMP (acre-feet/year)

Purveyor / Source	2000	2005	2010	2015	2020
City of Pomona					
Chino Basin Wells	5,220	5,220	5,220	5,220	5,220
Pomona Nitrate Treatment Plant (Chino GW)	13,880	13,880	13,880	13,880	13,880
Other Groundwater Basins	5,160	5,160	5,160	5,160	5,160
Reclaimed Water	7,000	7,000	7,000	7,000	7,000
Pedley Treatment Plant	3,800	3,800	3,800	3,800	3,800
TVMWD Weymouth Treatment Plant	2,140	3,380	4,520	5,840	7,044
Total Supply	37,200	38,440	39,580	40,900	42,104
Total Demand	37,200	38,440	39,580	40,900	42,104
City of Upland					
Chino Basin Wells	2,429	2,430	3,410	3,070	3,050
Supply from SAWC (non-Chino GW)	4,920	4,520	4,520	4,520	4,520
Supply from SAWC (San Antonio Canyon TP)	2,411	2,390	2,390	2,690	2,690
Supply from WECWC (Chino GW)	0	1,420	1,440	1,480	1,500
Supply from WECWC (other GW basins)	4,650	4,650	4,650	4,650	4,650
WFA Treatment Plant	7,590	7,590	7,590	7,590	7,590
Total Supply	22,000	23,000	24,000	24,000	24,000
Total Demand	22,000	23,000	24,000	24,000	24,000
Cucamonga County Water District					
Chino Basin Wells	8,000	10,160	10,160	10,160	10,160
Other Groundwater Basins	12,650	11,180	12,390	12,390	12,390
Reclaimed Water	0	0	0	2,402	4,804
CCWD Bridge Water Treatment Plant — Surface	1,000	1,000	1,000	1,000	1,000
CCWD Lloyd Michael Treatment Plant) MWD	21,710	25,550	28,860	30,978	33,096
CCWD Royer-Nesbit Treatment Plant	6,000	6,000	6,000	6,000	6,000
Deer Creek	550	550	550	550	550
Total Supply	49,910	54,440	58,960	63,480	68,000
Total Demand	49,910	54,440	58,960	63,480	68,000
Fontana Water Company					
Chino Basin Wells	1,840	22,825	16,050	20,375	24,800
Other Groundwater Basins	12,700	12,700	12,700	12,700	12,700
Reclaimed Water	0	0	0	1,685	3,370
Fontana Water Treatment Plant	0	0	18,600	16,915	15,230
Sandhill Treatment Plant	7,400	7,400	0	0	0
Total Supply	21,940	42,925	47,350	51,675	56,100
Total Demand	36,800	41,200	45,600	49,900	54,300
Supply to California Steel	1,700	1,725	1,750	1,775	1,800

Table 4.5-19 (continued)
WATER SUPPLY PLANS FOR THE OBMP (acre-feet/year)

Purveyor Source		Year			
	2000	2005	2010	2015	2020
Jurupa Community Services District					
Chino Basin Wells (Potable)	14,425	12,535	12,885	13,265	13,625
Chino Basin Wells (Non-potable)	50	250	450	650	850
Other Groundwater Basins	500	500	500	500	500
SAWPA Desalter (8 mgd Plant)	1,800	0	0	0	0
OBMP Supply East CBWM OBMP Desalter	0	3,740	5,790	7,810	9,850
Total Supply	16,775	17,025	19,625	22,225	24,825
Total Demand	14,200	17,000	19,600	22,200	24,800
Supply to Mira Loma SC	25	25	25	25	25
Supply to Norco	900	0	0	0	0
Supply to Swan Lake	350	0	0	0	0
Supply to SARWC	1,300	0	0	0	0
Subtotal	2,575	25	25	25	25
Mira Loma SC					
Chino Basin Wells	0	0	0	0	0
Supply from JCSD	25	25	25	25	25
Total Supply	25	25	25	25	25
Total Demand	25	25	25	25	25
Santa Ana River Water Company					
Chino Basin Wells	0	0	0	0	0
Almost Chino Basin Wells (along SAR outside legal bndy)	700	910	660	490	320
Supply from JCSD	1,300	0	0	0	0
OBMP Supply East CBWM OBMP Desalter	0	1,180	1,460	1,650	1,850
Total Supply	2,000	2,090	2,120	2,140	2,170
Total Demand	2,000	2,090	2,120	2,140	2,170
Swan Lake					
Chino Basin Wells	0	0	0	0	0
Supply from JCSD	350	0	0	0	0
OBMP Supply East CBWM OBMP Desalter	0	350	350	350	350
Total Supply	350	350	350	350	350
Total Demand	350	350	350	350	350
Marygold Mutual Water Company					
Baseline Feeder	1,450	1,580	1,620	1,660	1,700
Total Supply	1,450	1,580	1,620	1,660	1,700
Total Demand	1,450	1,580	1,620	1,660	1,700

Table 4.5-19 (continued)
WATER SUPPLY PLANS FOR THE OBMP (acre-feet/year)

Purveyor Source	Year 2000	2005	2010	2015	2020
Monte Vista Water District					
Chino Basin Wells	26,670	14,160	14,160	14,160	14,160
WFA Treatment Plant	0	0	0	0	0
Total Supply	26,670	14,160	14,160	14,160	14,160
Total Demand	14,160	14,160	14,160	14,160	14,160
Supply to Chino Hills (Chino GW)	12,510	0	0	0	0
San Antonio Water Company -- Domestic					
Chino Basin Wells	70	1,050	1,070	1,090	1,110
Other Groundwater Basins	400	400	400	400	400
San Antonio Canyon	0	0	0	0	0
San Antonio Tunnel	1,020	1,020	1,020	1,020	1,020
Total Supply	1,490	2,470	2,490	2,510	2,530
Total Demand	640	1,620	1,640	1,660	1,680
Supply to Ontario (Chino GW)	850	850	850	850	850
Southern California Water Company					
Chino Basin Wells	2,160	2,160	2,160	2,160	2,160
Other Groundwater Basins	4,950	4,490	4,850	4,850	4,850
TVMWD -- Miramar Water Treatment Plant	7,090	8,300	8,670	8,670	8,670
Total Supply	14,200	14,950	15,680	15,680	15,680
Total Demand	14,200	14,950	15,680	15,680	15,680
West End Consolidated Water Company					
Chino Basin Wells	0	1,420	1,440	1,480	1,500
Other Groundwater Basins	4,650	4,650	4,650	4,650	4,650
Total Supply	4,650	6,070	6,090	6,130	6,150
Total Demand	0	0	0	0	0
Supply to Upland	4,650	6,070	6,090	6,130	6,150
West San Bernardino County Water District					
Other Groundwater Basins	5,330	6,835	9,520	9,510	9,510
SBVMWD Baseline Feeder	800	1,000	1,380	1,390	1,390
Total Supply	6,130	7,835	10,900	10,900	10,900
Total Demand	6,130	7,835	10,900	10,900	10,900

Table 4.5-19 (continued)
WATER SUPPLY PLANS FOR THE OBMP (acre-feet/year)

Purveyor / Source	2000	2005	2010	2015	2020
Ameron					
Chino Basin Wells	9	9	9	9	9
Total Supply	9	9	9	9	9
Total Demand	9	9	9	9	9
San Bernardino County Division of Airports					
Chino Basin Wells (Potable (Domestic))	300	300	300	300	300
Total Supply	300	300	300	300	300
Total Demand	300	300	300	300	300
Reliant Energy					
Chino Basin Wells	800	0	0	0	0
Reclaimed Water	0	3,300	3,300	3,300	3,300
IEUA – MWD Water from CRA	2,500	0	0	0	0
Total Supply	3,300	3,300	3,300	3,300	3,300
Total Demand	3,300	3,300	3,300	3,300	3,300
Sunkist					
Chino Basin Wells	0	0	0	0	0
Supply from Ontario (Chino GW)	1,470	1,470	1,470	1,470	1,470
Total Supply	1,470	1,470	1,470	1,470	1,470
Total Demand	1,470	1,470	1,470	1,470	1,470
Kaiser Ventures					
Chino Basin Wells	670	670	670	670	670
Total Supply	670	670	670	670	670
Total Demand	670	670	670	670	670
San Bernardino County Parks Department					
Chino Basin Wells	75	75	75	75	75
Total Supply	75	75	75	75	75
Total Demand	75	75	75	75	75
Monte Vista Irrigation Company					
Chino Basin Wells	0	0	0	0	0
Total Supply	0	0	0	0	0
Total Demand	0	0	0	0	0
California Steel					
Chino Basin Wells	0	0	0	0	0
Fontana Water Company	1,700	1,725	1,750	1,775	1,800
Total Supply	1,700	1,725	1,750	1,775	1,800
Total Demand	1,700	1,725	1,750	1,775	1,800

Table 4.5-19 (continued)
WATER SUPPLY PLANS FOR THE OBMP (acre-feet/year)

Purveyor Source	Year 2000	2005	2010	2015	2020
Totals By Source Type and Pool					
Pool 1 Overlying Agricultural Pool	49,100	39,975	30,850	21,725	10,000
Pool 2 Overlying Non-Agricultural Pool					
Chino Basin Groundwater	3,624	2,474	2,474	2,474	2,474
East CBWM OBMP Desalter	0	350	350	350	350
Other Local Supplies	0	0	0	0	0
Imported Water	2,500	0	0	0	0
Recycled Water	0	3,300	3,300	3,300	3,300
Total Pool 2	6,124	6,124	6,124	6,124	6,124
Pool 3 Appropriative Pool					
Chino Basin Groundwater	122,774	132,700	127,495	132,120	137,125
East CBWM OBMP Desalter	0	6,450	13,890	21,320	28,760
West CBWM OBMP Desalter	0	0	1,060	2,130	3,190
SAWPA Desalter (8 mgd Plant)	4,600	9,200	9,200	9,200	9,200
SAWPA Desalter (10 mgd Plant)	0	1,700	1,700	1,700	1,700
Other Local Supplies	84,141	83,605	80,320	80,000	79,450
Imported Water					
WFA Treatment Plant	18,200	29,820	33,940	37,935	40,900
CCWD Lloyd Michael TP	21,710	25,550	28,860	30,978	33,096
CCWD Royer Nesbit	3,000	3,000	3,000	3,000	3,000
Other	11,730	11,680	31,790	31,425	30,944
Subtotal	49,940	68,050	95,970	101,728	106,330
Recycled Water	8,340	9,910	10,750	16,472	22,194
Total Pool 3	269,795	311,615	340,385	364,670	387,949
Total All Pools	325,019	357,714	377,359	392,519	404,073
Total Water Produced By Desalter Projects					
OBMP Projects					
East Desalter Production	0	6,800	14,240	21,670	29,110
East Desalter Raw Water Supply	0	8,000	16,753	25,494	34,247
West Desalter Production	0	0	1,060	2,130	3,190
West Desalter Raw Water Supply	0	0	1,247	2,506	3,753
SAWPA Desalter Expansion Production	0	1,700	1,700	1,700	1,700
SAWPA Desalter Expansion Raw Water Supply	0	1,956	1,956	1,956	1,956
SAWPA Desalter					
Production	4,600	9,200	9,200	9,200	9,200
Raw Water Supply	5,292	10,584	10,584	10,584	10,584
Pomona Ion Exchange					
Production	13,880	13,880	13,880	13,880	13,880
Raw Water Supply	14,309	14,309	14,309	14,309	14,309
Total Chino Basin Groundwater Production Summary					
Pool 1	49,100	39,975	30,850	21,725	10,000
Pool 2	3,624	2,824	2,824	2,824	2,824
Pool 3	128,495	153,319	158,114	172,739	187,744
Total	181,219	196,118	191,788	197,288	200,568

Table 4.5-20
WATER SUPPLY PLANS FOR THE BASELINE (acre-feet/year)

Purveyor / Source	Year 2000	2005	2010	2015	2020
City of Chino					
Chino Basin Wells	10,000	10,000	10,000	10,000	10,950
SAWPA Desalter (8 mgd Plant)	1,680	3,360	3,360	3,360	3,360
WFA Treatment Plant	4,020	2,640	3,890	5,140	5,440
Reclaimed Water	100	1,050	1,050	1,050	1,050
Total Supply	15,800	17,050	18,300	19,550	20,800
Total Demand	15,800	17,050	18,300	19,550	20,800
City of Chino Hills					
Chino Basin Wells	3,610	3,610	3,610	3,610	3,610
SAWPA Desalter (8 mgd Plant)	1,120	2,240	2,240	2,240	2,240
Reclaimed Water	1,020	1,020	1,020	1,020	1,020
WFA Treatment Plant	0	0	0	0	0
MVWD Supply Chino GW	11,890	12,230	13,800	15,480	16,370
Total Supply	17,640	19,100	20,670	22,350	23,240
Total Demand	17,640	19,100	20,670	22,350	23,240
City of Norco					
Chino Basin Wells	0	0	0	0	0
SAWPA Desalter (8 mgd Plant)	0	0	0	0	0
City of Corona	220	400	600	800	1,000
Temescal Basin Groundwater	5,880	5,600	5,700	6,200	6,600
Supply from JCSD	900	1400	1400	1400	1400
Total Supply	7,000	7,400	7,700	8,400	9,000
Total Demand	7,000	7,400	7,700	8,400	9,000
City of Ontario					
Chino Basin Wells	34,720	32,950	33,440	33,590	39,350
WFA Treatment Plant	7,340	12,660	19,030	25,840	26,940
Reclaimed Water	0	840	1,680	2,520	3,360
Supply from SAWC (Chino GW)	850	850	850	850	850
Total Supply	42,910	47,300	55,000	62,800	70,500
Total Demand	41,440	45,830	53,530	61,330	69,030
Supply to Sunkist (Chino GW)	1,470	1,470	1,470	1,470	1,470

Table 4.5-20 (continued)
WATER SUPPLY PLANS FOR THE BASELINE (acre-feet/year)

Purveyor Source	Year 2000	2005	2010	2015	2020
City of Pomona					
Chino Basin Wells	5,220	5,220	5,220	5,220	5,220
Pomona Nitrate Treatment Plant (Chino GW)	13,880	13,880	13,880	13,880	13,880
Other Groundwater Basins	5,160	5,160	5,160	5,160	5,160
Reclaimed Water	7,000	7,000	7,000	7,000	7,000
Pedley Treatment Plant	3,800	3,800	3,800	3,800	3,800
TVMWD Weymouth Treatment Plant	2,140	3,380	4,520	5,840	7,044
Total Supply	37,200	38,440	39,580	40,900	42,104
Total Demand	37,200	38,440	39,580	40,900	42,104
City of Upland					
Chino Basin Wells	2,429	2,430	3,410	3,070	3,050
Supply from SAWC (non-Chino GW)	4,920	4,520	4,520	4,520	4,520
Supply from SAWC (San Antonio Canyon TP)	2,411	2,390	2,390	2,690	2,690
Supply from WECWC (Chino GW)	0	1,420	1,440	1,480	1,500
Supply from WECWC (other GW basins)	4,650	4,650	4,650	4,650	4,650
WFA Treatment Plant	7,590	7,590	7,590	7,590	7,590
Total Supply	22,000	23,000	24,000	24,000	24,000
Total Demand	22,000	23,000	24,000	24,000	24,000
Cucamonga County Water District					
Chino Basin Wells	8,000	10,160	10,160	10,160	10,160
Other Groundwater Basins	12,650	11,180	12,390	12,390	12,390
Reclaimed Water	0	0	0	2,402	4,804
CCWD Bridge Water Treatment Plant	1,000	1,000	1,000	1,000	1,000
CCWD Lloyd Michael Treatment Plant	21,710	25,550	28,860	30,978	33,096
CCWD Royer-Nesbit Treatment Plant	6,000	6,000	6,000	6,000	6,000
Deer Creek	550	550	550	550	550
Total Supply	49,910	54,440	58,960	63,480	68,000
Total Demand	49,910	54,440	58,960	63,480	68,000
Fontana Water Company					
Chino Basin Wells	1,840	22,825	16,050	20,375	24,800
Other Groundwater Basins	12,700	12,700	12,700	12,700	12,700
Reclaimed Water	0	0	0	1,685	3,370
Fontana Water Treatment Plant	0	0	18,600	16,915	15,230
Sandhill Treatment Plant	7,400	7,400	0	0	0
Total Supply	21,940	42,925	47,350	51,675	56,100
Total Demand	36,800	41,200	45,600	49,900	54,300
Supply to California Steel	1,700	1,725	1,750	1,775	1,800

Table 4.5-20 (continued)
WATER SUPPLY PLANS FOR THE BASELINE (acre-feet/year)

Purveyor Source	Year 2000	2005	2010	2015	2020
Jurupa Community Services District					
Chino Basin Wells (Potable)	14,425	11,815	12,845	15,265	17,695
Chino Basin Wells (Non-potable)	50	250	450	650	850
Other Groundwater Basins	500	3,600	4,500	4,500	4,500
SAWPA Desalter (8 mgd Plant)	1,800	4,500	5,000	5,000	5,000
Total Supply	16,775	20,165	22,795	25,415	28,045
Total Demand	14,200	17,000	19,600	22,200	24,800
Supply to Mira Loma SC	25	25	25	25	25
Supply to Norco	900	1,400	1,400	1,400	1,400
Supply to Swan Lake	350	350	350	350	350
Supply to SARWC	1,300	1,390	1,420	1,440	1,470
Subtotal	2,575	3,165	3,195	3,215	3,245
Mira Loma SC					
Chino Basin Wells	0	0	0	0	0
Supply from JCSD	25	25	25	25	25
Total Supply	25	25	25	25	25
Total Demand	25	25	25	25	25
Santa Ana River Water Company					
Chino Basin Wells	0	0	0	0	0
Almost Chino Basin Wells (along SAR outside legal bndy)	700	700	700	700	700
Supply from JCSD	1,300	1,390	1,420	1,440	1,470
Total Supply	2,000	2,090	2,120	2,140	2,170
Total Demand	2,000	2,090	2,120	2,140	2,170
Swan Lake					
Chino Basin Wells	0	0	0	0	0
Supply from JCSD	350	350	350	350	350
Total Supply	350	350	350	350	350
Total Demand	350	350	350	350	350
Marygold Mutual Water Company					
Baseline Feeder	1,450	1,580	1,620	1,660	1,700
Total Supply	1,450	1,580	1,620	1,660	1,700
Total Demand	1,450	1,580	1,620	1,660	1,700

Table 4.5-20 (continued)
WATER SUPPLY PLANS FOR THE BASELINE (acre-feet/year)

Purveyor Source	Year 2000	2005	2010	2015	2020
Monte Vista Water District					
Chino Basin Wells	26,050	26,390	27,960	29,640	30,530
WFA Treatment Plant	0	0	0	0	0
Total Supply	26,050	26,390	27,960	29,640	30,530
Total Demand	14,160	14,160	14,160	14,160	14,160
Supply to Chino Hills (Chino GW)	11,890	12,230	13,800	15,480	16,370
San Antonio Water Company -- Domestic					
Chino Basin Wells	70	1,050	1,070	1,090	1,110
Other Groundwater Basins	400	400	400	400	400
San Antonio Canyon	0	0	0	0	0
San Antonio Tunnel	1,020	1,020	1,020	1,020	1,020
Total Supply	1,490	2,470	2,490	2,510	2,530
Total Demand	640	1,620	1,640	1,660	1,680
Supply to Ontario (Chino GW)	850	850	850	850	850
Southern California Water Company					
Chino Basin Wells	2,160	2,160	2,160	2,160	2,160
Other Groundwater Basins	4,950	4,490	4,850	4,850	4,850
TVMWD -- Miramar Water Treatment Plant	7,090	8,300	8,670	8,670	8,670
Total Supply	14,200	14,950	15,680	15,680	15,680
Total Demand	14,200	14,950	15,680	15,680	15,680
West End Consolidated Water Company					
Chino Basin Wells	0	1,420	1,440	1,480	1,500
Other Groundwater Basins	4,650	4,650	4,650	4,650	4,650
Total Supply	4,650	6,070	6,090	6,130	6,150
Total Demand	0	0	0	0	0
Supply to Upland	4,650	6,070	6,090	6,130	6,150
West San Bernardino County Water District					
Other Groundwater Basins	5,330	6,835	9,520	9,510	9,510
SBVMWD Baseline Feeder	800	1,000	1,380	1,390	1,390
Total Supply	6,130	7,835	10,900	10,900	10,900
Total Demand	6,130	7,835	10,900	10,900	10,900

Table 4.5-20 (continued)
WATER SUPPLY PLANS FOR THE BASELINE (acre-feet/year)

Purveyor Source	Year 2000	2005	2010	2015	2020
Ameron					
Chino Basin Wells	9	9	9	9	9
Total Supply	9	9	9	9	9
Total Demand	9	9	9	9	9
San Bernardino County Division of Airports					
Chino Basin Wells (Potable (Domestic))	300	300	300	300	300
Total Supply	300	300	300	300	300
Total Demand	300	300	300	300	300
Reliant Energy					
Chino Basin Wells	800	0	0	0	0
Reclaimed Water	0	3,300	3,300	3,300	3,300
IEUA -- MWD Water from CRA	2,500	0	0	0	0
Total Supply	3,300	3,300	3,300	3,300	3,300
Total Demand	3,300	3,300	3,300	3,300	3,300
Sunkist					
Chino Basin Wells	0	0	0	0	0
Supply from Ontario (Chino GW)	1,470	1,470	1,470	1,470	1,470
Total Supply	1,470	1,470	1,470	1,470	1,470
Total Demand	1,470	1,470	1,470	1,470	1,470
Kaiser Ventures					
Chino Basin Wells	670	670	670	670	670
Total Supply	670	670	670	670	670
Total Demand	670	670	670	670	670
San Bernardino County Parks Department					
Chino Basin Wells	75	75	75	75	75
Total Supply	75	75	75	75	75
Total Demand	75	75	75	75	75
Monte Vista Irrigation Company					
Chino Basin Wells	0	0	0	0	0
Total Supply	0	0	0	0	0
Total Demand	0	0	0	0	0
California Steel					
Chino Basin Wells	0	0	0	0	0
Fontana Water Company	1,700	1,725	1,750	1,775	1,800
Total Supply	1,700	1,725	1,750	1,775	1,800
Total Demand	1,700	1,725	1,750	1,775	1,800

Table 4.5-20 (continued)
WATER SUPPLY PLANS FOR THE BASELINE (acre-feet/year)

Purveyor Source	Year 2000	2005	2010	2015	2020
Totals By Source Type and Pool					
Pool 1 Overlying Agricultural Pool	49,100	39,975	30,850	21,725	10,000
Pool 2 Overlying Non-Agricultural Pool					
Chino Basin Groundwater	3,624	2,824	2,824	2,824	2,824
East CBWM OBMP Desalter	0	0	0	0	0
Other Local Supplies	0	0	0	0	0
Imported Water	2,500	0	0	0	0
Recycled Water	0	3,300	3,300	3,300	3,300
Total Pool 2	6,124	6,124	6,124	6,124	6,124
Pool 3 Appropriative Pool					
Chino Basin Groundwater	122,154	143,860	141,395	149,890	164,565
East CBWM OBMP Desalter	0	0	0	0	0
West CBWM OBMP Desalter	0	0	0	0	0
SAWPA Desalter (8 mgd Plant)	4,600	10,100	10,600	10,600	10,600
SAWPA Desalter (10 mgd Plant)	0	0	0	0	0
Other Local Supplies	84,141	86,625	85,100	86,140	86,780
Imported Water					
WFA Treatment Plant	18,950	22,890	30,510	38,570	39,970
CCWD Lloyd Michael TP	21,710	25,550	28,860	30,978	33,096
CCWD Royer Nesbit	3,000	3,000	3,000	3,000	3,000
Other	11,730	11,680	31,790	31,425	30,944
Subtotal	50,690	61,120	92,540	102,363	105,400
Recycled Water	8,120	9,910	10,750	15,677	20,604
Total Pool 3	269,705	311,615	340,385	364,670	387,949
Total All Pools	324,929	357,714	377,359	392,519	404,073
Total Water Produced By Desalter Projects					
OBMP Projects					
East Desalter Production	0	0	0	0	0
East Desalter Raw Water Supply	0	0	0	0	0
West Desalter Production	0	0	0	0	0
West Desalter Raw Water Supply	0	0	0	0	0
SAWPA Desalter Expansion Production	0	0	0	0	0
SAWPA Desalter Expansion Raw Water Supply	0	0	0	0	0
SAWPA Desalter					
Production	4,600	10,100	10,600	10,600	10,600
Raw Water Supply	5,292	11,619	12,195	12,195	12,195
Pomona Ion Exchange					
Production	13,880	13,880	13,880	13,880	13,880
Raw Water Supply	14,309	14,309	14,309	14,309	14,309
Total Chino Basin Groundwater Production Summary					
Pool 1	49,100	39,975	30,850	21,725	10,000
Pool 2	3,624	2,824	2,824	2,824	2,824
Pool 3	127,875	155,909	154,019	162,514	177,189
Total	180,599	198,708	187,693	187,063	190,013

Table 4.5-21
ARTIFICIAL RECHARGE PLAN FOR THE CHINO BASIN FOR 2020

Spreading Basin			2020 Conditions								
	Storm Water	Imported	Supplemental Water							Subtotal	Total
			Recycled								
			RP1	RP2	Carbon Cyn	RP4	RP5	Other	Subtotal		
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)
7th and 8th Street	600	0							0	0	600
15th St	0	0							0	0	0
Bannana	400	0							0	0	400
Brooks	1,200	2,000							0	2,000	3,200
Declez	600	0							0	0	600
Ely	2,800	0							0	0	2,800
Etiwanda Spr. Grnds	0	4,000							0	4,000	4,000
Etiwanda Debris	3,300	4,000							0	4,000	7,300
Etiwanda Perc. Bas	800	0							0	0	800
Grove	600	0							0	0	600
Hickory	800	0							0	0	800
Jurupa	3,000	0							0	0	3,000
Montclair 1	1,600	5,000							0	5,000	6,600
Montclair 2	600	6,000							0	6,000	6,600
Montclair 3	500	5,000							0	5,000	5,500
Montclair 4	700	0							0	0	700
Riverside	2,500	0							0	0	2,500
San Sevaine 1	2,600	5,000							0	5,000	7,600
San Sevaine 2	400	5,000							0	5,000	5,400
San Sevaine 3	700	4,000							0	4,000	4,700
San Sevaine 4/5	500	0							0	0	500
Turner 1	500	0							0	0	500
Rich	1,200	0							0	0	1,200
Upland	1,100	2,000							0	2,000	3,100
Victoria	500	2,000							0	2,000	2,500
Wineville	2,500	0							0	0	2,500
Total	30,000	44,000	0	0	0	0	0	0	0	44,000	74,000

Table 4.5-22
ARTIFICIAL RECHARGE PLAN FOR THE CHINO BASIN FOR 2000

Spreading Basin	2000 Conditions										
	Storm Water	Imported	Supplemental Water							Subtotal	Total
			Recycled								
			RP1	RP2	Carbon Cyn	RP4	RP5	Other	Subtotal		
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)
7th and 8th Street	0	0	0						0	0	0
15th St	0	0	0						0	0	0
Bannana	0	0	0						0	0	0
Brooks	807	0	0						0	0	807
Declez	0	0	0						0	0	0
Ely	2,749	0	500						500	500	3,249
Etiwanda Spr. Grnds	575	0	0						0	0	575
Etiwanda Debris	0	0	0						0	0	0
Etiwanda Perc. Bas	575	0	0						0	0	575
Grove	0	0	0								
Hickory	0	0	0						0	0	0
Jurupa	0	0	0						0	0	0
Montclair 1	807	650	0						0	650	1,457
Montclair 2	282	0	0						0	0	282
Montclair 3	359	0	0						0	0	359
Montclair 4	510	0	0						0	0	510
Riverside	1,387	0	0						0	0	1,387
San Sevaine 1	2,476	0	0						0	0	2,476
San Sevaine 2	315	0	0						0	0	315
San Sevaine 3	0	0	0						0	0	0
San Sevaine 4/5	0	0	0						0	0	0
Turner 1	0	0	0						0	0	0
Rich	0	0	0						0	0	0
Upland	893	0	0						0	0	893
Victoria	0	0	0						0	0	0
Wineville	1,778	0	0						0	0	1,778
Total	13,513	650	500	0	0	0	0	0	500	1,150	14,663

Table 4.5-23
FLOW AND TDS IMPACTS OF THE OBMP FOR THE SANTA ANA RIVER BELOW PRADO FOR ULTIMATE CONDITIONS

Month	Baseline Total Discharge At Below Prado		OBMP Alt A1 Recycled Water Recharge		OBMP Alt A1 Storm Water Recharge		OBMP Alt A1 Total Discharge At Below Prado		Difference	
	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)
10/80	28,213	546	2,842	390	0	0	25,372	564	-2,842	17
11/80	31,283	575	2,842	390	0	0	28,442	593	-2,842	18
12/80	37,679	609	2,842	390	0	0	34,838	627	-2,842	18
1/81	41,828	612	2,842	390	5666	100	33,321	718	-8,508	106
2/81	33,466	552	2,842	390	5666	100	24,959	673	-8,508	121
3/81	39,751	561	2,842	390	5666	100	31,244	661	-8,508	99
4/81	33,859	557	2,842	390	0	0	31,018	573	-2,842	15
5/81	28,901	563	2,842	390	0	0	26,060	582	-2,842	19
6/81	26,767	544	2,842	390	0	0	23,926	562	-2,842	18
7/81	25,374	530	2,842	390	0	0	22,532	548	-2,842	18
8/81	25,226	525	2,842	390	0	0	22,384	542	-2,842	17
9/81	25,408	525	2,842	390	0	0	22,566	542	-2,842	17
10/81	27,535	573	2,842	390	0	0	24,693	594	-2,842	21
11/81	29,709	544	2,842	390	0	0	26,867	561	-2,842	16
12/81	30,894	566	2,842	390	0	0	28,052	584	-2,842	18
1/82	39,929	545	2,842	390	5666	100	31,421	640	-8,508	94
2/82	34,803	517	2,842	390	5666	100	26,295	620	-8,508	104
3/82	55,778	433	2,842	390	5666	100	47,270	476	-8,508	43
4/82	42,463	431	2,842	390	0	0	39,621	434	-2,842	3
5/82	29,860	487	2,842	390	0	0	27,018	498	-2,842	10
6/82	27,369	519	2,842	390	0	0	24,527	534	-2,842	15
7/82	27,238	541	2,842	390	0	0	24,396	558	-2,842	18
8/82	25,872	526	2,842	390	0	0	23,030	543	-2,842	17
9/82	26,796	539	2,842	390	0	0	23,954	557	-2,842	18
10/82	26,530	536	2,842	390	0	0	23,688	554	-2,842	18
11/82	39,794	567	2,842	390	0	0	36,952	580	-2,842	14
12/82	42,807	462	2,842	390	0	0	39,965	468	-2,842	5
1/83	57,677	510	2,842	390	5666	100	49,169	564	-8,508	54
2/83	66,135	410	2,842	390	5666	100	57,627	441	-8,508	31
3/83	145,709	329	2,842	390	5666	100	137,201	337	-8,508	8
4/83	69,957	458	2,842	390	0	0	67,115	461	-2,842	3
5/83	70,667	399	2,842	390	0	0	67,825	399	-2,842	0
6/83	45,489	446	2,842	390	0	0	42,647	450	-2,842	4
7/83	36,772	529	2,842	390	0	0	33,930	541	-2,842	12
8/83	42,393	506	2,842	390	0	0	39,551	514	-2,842	8
9/83	32,686	564	2,842	390	0	0	29,844	581	-2,842	17
10/83	41,111	520	2,842	390	0	0	38,269	530	-2,842	10
11/83	48,299	556	2,842	390	0	0	45,457	567	-2,842	10
12/83	54,190	525	2,842	390	0	0	51,348	532	-2,842	7
1/84	41,820	575	2,842	390	5666	100	33,312	672	-8,508	97
2/84	34,519	573	2,842	390	5666	100	26,011	696	-8,508	123
3/84	33,050	562	2,842	390	5666	100	24,542	689	-8,508	127
4/84	31,126	546	2,842	390	0	0	28,284	562	-2,842	16
5/84	29,775	547	2,842	390	0	0	26,933	564	-2,842	17
6/84	28,901	540	2,842	390	0	0	26,059	556	-2,842	16
7/84	28,381	538	2,842	390	0	0	25,539	555	-2,842	16

Table 4.5-23 (continued)
FLOW AND TDS IMPACTS OF THE OBMP FOR THE SANTA ANA RIVER BELOW PRADO FOR ULTIMATE CONDITIONS

Month	Baseline Total Discharge At Below Prado Volume (af/m)	Baseline TDS (mg/L)	OBMP Alt A1 Recycled Water Recharge Volume (af/m)	Recycled Water Recharge TDS (mg/L)	Storm Water Recharge Volume (af/m)	Storm Water Recharge TDS (mg/L)	Total Discharge At Below Prado Volume (af/m)	Total Discharge TDS (mg/L)	Difference Volume (af/m)	Difference TDS (mg/L)
8/84	28,076	535	2,842	390	0	0	25,234	551	-2,842	16
9/84	27,792	533	2,842	390	0	0	24,950	549	-2,842	16
10/84	29,137	547	2,842	390	0	0	26,295	564	-2,842	17
11/84	32,608	562	2,842	390	0	0	29,766	578	-2,842	16
12/84	52,704	454	2,842	390	0	0	49,862	457	-2,842	4
1/85	39,314	525	2,842	390	5666	100	30,806	616	-8,508	91
2/85	40,109	542	2,842	390	5666	100	31,601	635	-8,508	93
3/85	36,858	559	2,842	390	5666	100	28,350	668	-8,508	109
4/85	32,315	550	2,842	390	0	0	29,473	566	-2,842	15
5/85	32,393	556	2,842	390	0	0	29,551	571	-2,842	16
6/85	30,273	549	2,842	390	0	0	27,431	565	-2,842	16
7/85	28,474	547	2,842	390	0	0	25,632	564	-2,842	17
8/85	28,117	543	2,842	390	0	0	25,275	560	-2,842	17
9/85	28,496	539	2,842	390	0	0	25,654	556	-2,842	17
10/85	30,786	555	2,842	390	0	0	27,944	572	-2,842	17
11/85	41,152	547	2,842	390	0	0	38,310	558	-2,842	12
12/85	34,993	525	2,842	390	0	0	32,151	537	-2,842	12
1/86	36,475	562	2,842	390	5666	100	27,967	673	-8,508	111
2/86	54,947	444	2,842	390	5666	100	46,439	489	-8,508	45
3/86	56,061	460	2,842	390	5666	100	47,553	507	-8,508	47
4/86	37,129	533	2,842	390	0	0	34,287	545	-2,842	12
5/86	31,500	550	2,842	390	0	0	28,658	566	-2,842	16
6/86	30,007	550	2,842	390	0	0	27,165	566	-2,842	17
7/86	28,357	532	2,842	390	0	0	25,515	548	-2,842	16
8/86	27,504	535	2,842	390	0	0	24,662	551	-2,842	17
9/86	29,509	534	2,842	390	0	0	26,667	549	-2,842	15
10/86	30,611	539	2,842	390	0	0	27,770	554	-2,842	15
11/86	31,434	542	2,842	390	0	0	28,592	557	-2,842	15
12/86	33,360	543	2,842	390	0	0	30,518	557	-2,842	14
1/87	38,964	512	2,842	390	5666	100	30,457	600	-8,508	88
2/87	34,466	548	2,842	390	5666	100	25,958	664	-8,508	115
3/87	37,959	532	2,842	390	5666	100	29,451	629	-8,508	97
4/87	32,009	534	2,842	390	0	0	29,167	548	-2,842	14
5/87	30,196	539	2,842	390	0	0	27,354	555	-2,842	16
6/87	27,857	533	2,842	390	0	0	25,016	549	-2,842	16
7/87	27,766	531	2,842	390	0	0	24,924	548	-2,842	16
8/87	27,195	529	2,842	390	0	0	24,353	546	-2,842	16
9/87	27,478	531	2,842	390	0	0	24,637	547	-2,842	16
10/87	33,463	541	2,842	390	0	0	30,621	555	-2,842	14
11/87	35,662	502	2,842	390	0	0	32,820	512	-2,842	10
12/87	39,577	531	2,842	390	0	0	36,735	541	-2,842	11
1/88	41,240	505	2,842	390	5666	100	32,732	585	-8,508	80
2/88	35,358	540	2,842	390	5666	100	26,850	649	-8,508	109
3/88	35,519	535	2,842	390	5666	100	27,011	641	-8,508	106
4/88	37,278	516	2,842	390	0	0	34,436	527	-2,842	10
5/88	29,849	524	2,842	390	0	0	27,008	538	-2,842	14

Table 4.5-23 (continued)
FLOW AND TDS IMPACTS OF THE OBMP FOR THE SANTA ANA RIVER BELOW PRADO FOR ULTIMATE CONDITIONS

Month	Baseline Total Discharge At Below Prado		OBMP Alt A1 Recycled Water Recharge		OBMP Alt A1 Storm Water Recharge		OBMP Alt A1 Total Discharge At Below Prado		Difference	
	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)
6/88	28,499	531	2,842	390	0	0	25,657	547	-2,842	16
7/88	28,973	518	2,842	390	0	0	26,131	532	-2,842	14
8/88	27,790	528	2,842	390	0	0	24,948	544	-2,842	16
9/88	28,021	529	2,842	390	0	0	25,179	544	-2,842	16
10/88	29,370	536	2,842	390	0	0	26,528	551	-2,842	16
11/88	31,749	546	2,842	390	0	0	28,907	562	-2,842	15
12/88	43,344	486	2,842	390	0	0	40,503	493	-2,842	7
1/89	32,953	521	2,842	390	5666	100	24,445	634	-8,508	113
2/89	38,288	469	2,842	390	5666	100	29,781	547	-8,508	78
3/89	33,514	532	2,842	390	5666	100	25,007	646	-8,508	114
4/89	29,971	542	2,842	390	0	0	27,130	558	-2,842	16
5/89	28,178	524	2,842	390	0	0	25,336	539	-2,842	15
6/89	27,426	528	2,842	390	0	0	24,585	544	-2,842	16
7/89	28,848	510	2,842	390	0	0	26,007	523	-2,842	13
8/89	26,045	516	2,842	390	0	0	23,204	531	-2,842	15
9/89	25,971	526	2,842	390	0	0	23,130	543	-2,842	17
10/89	27,747	533	2,842	390	0	0	24,905	549	-2,842	16
11/89	29,210	526	2,842	390	0	0	26,369	541	-2,842	15
12/89	29,878	543	2,842	390	0	0	27,036	560	-2,842	16
1/90	34,713	518	2,842	390	5666	100	26,206	622	-8,508	104
2/90	43,831	470	2,842	390	5666	100	35,324	535	-8,508	66
3/90	29,486	520	2,842	390	5666	100	20,978	651	-8,508	131
4/90	28,618	535	2,842	390	0	0	25,776	551	-2,842	16
5/90	28,553	530	2,842	390	0	0	25,711	546	-2,842	15
6/90	26,182	525	2,842	390	0	0	23,341	542	-2,842	16
7/90	24,285	528	2,842	390	0	0	21,443	546	-2,842	18
8/90	25,191	519	2,842	390	0	0	22,349	535	-2,842	16
9/90	24,647	522	2,842	390	0	0	21,806	539	-2,842	17
10/90	25,901	535	2,842	390	0	0	23,059	553	-2,842	18
11/90	28,131	532	2,842	390	0	0	25,289	548	-2,842	16
12/90	28,296	545	2,842	390	0	0	25,455	562	-2,842	17
1/91	34,453	529	2,842	390	5666	100	25,945	637	-8,508	109
2/91	40,817	544	2,842	390	5666	100	32,310	635	-8,508	91
3/91	85,634	365	2,842	390	5666	100	77,126	383	-8,508	19
4/91	28,265	476	2,842	390	0	0	25,423	486	-2,842	10
5/91	28,104	498	2,842	390	0	0	25,263	510	-2,842	12
6/91	28,601	526	2,842	390	0	0	25,759	541	-2,842	15
7/91	25,879	517	2,842	390	0	0	23,038	533	-2,842	16
8/91	25,221	508	2,842	390	0	0	22,379	523	-2,842	15
9/91	24,296	502	2,842	390	0	0	21,454	517	-2,842	15
10/91	24,878	513	2,842	390	0	0	22,036	529	-2,842	16
11/91	28,115	529	2,842	390	0	0	25,274	545	-2,842	16
12/91	32,378	523	2,842	390	0	0	29,537	535	-2,842	13
1/92	37,399	482	2,842	390	5666	100	28,891	566	-8,508	84
2/92	65,972	370	2,842	390	5666	100	57,465	396	-8,508	26
3/92	60,091	438	2,842	390	5666	100	51,584	478	-8,508	40

Table 4.5-23 (continued)
FLOW AND TDS IMPACTS OF THE OBMP FOR THE SANTA ANA RIVER BELOW PRADO FOR ULTIMATE CONDITIONS

Month	Baseline Total Discharge At Below Prado		OBMP Alt A1 Recycled Water Recharge		OBMP Alt A1 Storm Water Recharge		OBMP Alt A1 Total Discharge At Below Prado		Difference	
	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)
4/92	29,036	466	2,842	390	0	0	26,194	475	-2,842	8
5/92	28,326	533	2,842	390	0	0	25,484	549	-2,842	16
6/92	25,658	531	2,842	390	0	0	22,816	548	-2,842	18
7/92	25,794	527	2,842	390	0	0	22,952	544	-2,842	17
8/92	25,800	495	2,842	390	0	0	22,958	508	-2,842	13
9/92	25,120	522	2,842	390	0	0	22,278	539	-2,842	17
10/92	28,576	545	2,842	390	0	0	25,735	562	-2,842	17
11/92	27,479	540	2,842	390	0	0	24,637	557	-2,842	17
12/92	51,162	447	2,842	390	0	0	48,321	450	-2,842	3
1/93	237,386	272	2,842	390	5666	100	228,878	275	-8,508	3
2/93	164,133	346	2,842	390	5666	100	155,626	354	-8,508	8
3/93	71,229	441	2,842	390	5666	100	62,721	474	-8,508	33
4/93	48,767	471	2,842	390	0	0	45,926	476	-2,842	5
5/93	37,874	503	2,842	390	0	0	35,033	512	-2,842	9
6/93	32,374	540	2,842	390	0	0	29,533	555	-2,842	14
7/93	26,603	546	2,842	390	0	0	23,761	565	-2,842	19
8/93	25,309	539	2,842	390	0	0	22,467	558	-2,842	19
9/93	23,588	537	2,842	390	0	0	20,746	557	-2,842	20
10/93	25,178	547	2,842	390	0	0	22,336	567	-2,842	20
11/93	31,551	555	2,842	390	0	0	28,710	571	-2,842	16
12/93	30,568	510	2,842	390	0	0	27,726	523	-2,842	12
1/94	30,887	547	2,842	390	5666	100	22,379	680	-8,508	133
2/94	45,403	453	2,842	390	5666	100	36,895	512	-8,508	59
3/94	40,957	589	2,842	390	5666	100	32,450	692	-8,508	103
4/94	30,500	544	2,842	390	0	0	27,658	559	-2,842	16
5/94	28,422	542	2,842	390	0	0	25,581	559	-2,842	17
6/94	25,185	538	2,842	390	0	0	22,344	557	-2,842	19
7/94	24,758	539	2,842	390	0	0	21,916	558	-2,842	19
8/94	24,135	526	2,842	390	0	0	21,294	544	-2,842	18
9/94	24,433	523	2,842	390	0	0	21,591	540	-2,842	17
10/94	27,885	526	2,842	390	0	0	25,043	542	-2,842	15
11/94	31,004	525	2,842	390	0	0	28,162	538	-2,842	14
12/94	30,650	543	2,842	390	0	0	27,808	558	-2,842	16
1/95	124,632	367	2,842	390	5666	100	116,124	379	-8,508	12
2/95	51,348	477	2,842	390	5666	100	42,840	533	-8,508	56
3/95	160,082	338	2,842	390	5666	100	151,575	346	-8,508	8
4/95	54,543	494	2,842	390	0	0	51,701	500	-2,842	6
5/95	42,040	522	2,842	390	0	0	39,199	532	-2,842	10
6/95	37,544	511	2,842	390	0	0	34,702	521	-2,842	10
7/95	24,568	512	2,842	390	0	0	21,726	528	-2,842	16
8/95	25,559	541	2,842	390	0	0	22,718	559	-2,842	19
9/95	25,336	535	2,842	390	0	0	22,494	553	-2,842	18
10/95	26,351	533	2,842	390	0	0	23,509	551	-2,842	17
11/95	28,274	541	2,842	390	0	0	25,432	558	-2,842	17
12/95	29,879	520	2,842	390	0	0	27,038	534	-2,842	14
1/96	34,208	546	2,842	390	5666	100	25,700	662	-8,508	116

Table 4.5-23 (continued)
FLOW AND TDS IMPACTS OF THE OBMP FOR THE SANTA ANA RIVER BELOW PRADO FOR ULTIMATE CONDITIONS

Month	Baseline Total Discharge At Below Prado		OBMP Alt A1 Recycled Water Recharge		OBMP Alt A1 Storm Water Recharge		OBMP Alt A1 Total Discharge At Below Prado		Difference	
	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)	Volume (af/m)	TDS (mg/L)
2/96	68,561	365	2,842	390	5666	100	60,053	388	-8,508	24
3/96	40,347	492	2,842	390	5666	100	31,839	571	-8,508	79
4/96	34,497	532	2,842	390	0	0	31,656	545	-2,842	13
5/96	35,438	511	2,842	390	0	0	32,597	521	-2,842	11
6/96	33,170	501	2,842	390	0	0	30,328	511	-2,842	10
7/96	29,959	497	2,842	390	0	0	27,117	509	-2,842	11
8/96	25,172	537	2,842	390	0	0	22,331	555	-2,842	19
9/96	24,971	530	2,842	390	0	0	22,129	548	-2,842	18
10/96	29,041	536	2,842	390	0	0	26,199	551	-2,842	16
11/96	37,026	487	2,842	390	0	0	34,184	495	-2,842	8
12/96	39,517	486	2,842	390	0	0	36,676	493	-2,842	7
1/97	69,209	385	2,842	390	5666	100	60,702	411	-8,508	26
2/97	32,086	523	2,842	390	5666	100	23,579	640	-8,508	118
3/97	30,967	539	2,842	390	5666	100	22,460	669	-8,508	130
4/97	30,304	519	2,842	390	0	0	27,463	532	-2,842	13
5/97	33,889	482	2,842	390	0	0	31,048	490	-2,842	8
6/97	33,184	472	2,842	390	0	0	30,343	480	-2,842	8
7/97	31,742	471	2,842	390	0	0	28,901	479	-2,842	8
8/97	36,168	438	2,842	390	0	0	33,327	442	-2,842	4
9/97	37,822	440	2,842	390	0	0	34,981	444	-2,842	4
10/97	30,227	502	2,842	390	0	0	27,386	514	-2,842	12
11/97	31,902	502	2,842	390	0	0	29,060	513	-2,842	11
12/97	43,177	456	2,842	390	0	0	40,335	460	-2,842	5
1/98	44,801	437	2,842	390	5666	100	36,294	493	-8,508	56
2/98	195,307	287	2,842	390	5666	100	186,800	291	-8,508	4
3/98	55,396	460	2,842	390	5666	100	46,888	508	-8,508	48
4/98	47,537	470	2,842	390	0	0	44,696	475	-2,842	5
5/98	74,371	380	2,842	390	0	0	71,529	380	-2,842	0
6/98	37,519	463	2,842	390	0	0	34,677	469	-2,842	6
7/98	27,550	520	2,842	390	0	0	24,709	534	-2,842	15
8/98	28,023	522	2,842	390	0	0	25,182	536	-2,842	15
9/98	27,729	523	2,842	390	0	0	24,887	538	-2,842	15
Average	38,502	512	2,842	390	1,417	25	34,244	542	-4,258	29
Max	237,386	612	2,842	390	5,666	100	228,878	718	-2,842	133
Min	23,588	272	2,842	390	0	0	20,746	275	-8,508	0
StDev	25,639	52	0	0	2,459	43	24,641	68	2,459	34
Coef of Var	67%	10%	0%	0%	174%	174%	72%	13%	-58%	114%

Table 4.5-24
HYDROLOGIC AND SALT BUDGET SUMMARY FOR THE CHINO BASIN COMPARISON OF BASELINE TO OBMP ALTERNATIVE A AT YEAR 2020 REPLENISHMENT WITH IMPORTED WATER ONLY

Inflow/Outflow Components	With OBMP Volume	With OBMP TDS Conc	With OBMP TDS Mass	With OBMP TDS % of Inflow	No OBMP Volume	No OBMP TDS Conc	No OBMP TDS Mass	No OBMP TDS % of Inflow	*With OBMP minus No OBMP* Volume	*With OBMP minus No OBMP* TDS Conc	*With OBMP minus No OBMP* TDS Mass	*With OBMP minus No OBMP* TDS % of Inflow
	(acre-ft/yr)	(mg/L)	(tons)		(acre-ft/yr)	(mg/L)	(tons)		(acre-ft/yr)	(mg/L)	(tons)	
Inflows												
Deep Percolation of Precipitation	69,691	100	9,482	7.1%	69,691	100	9,482	7.6%	0	0	0	-1%
Deep Percolation of Applied Water from Dairies and Agriculture	3,378	2,572	11,818	8.9%	3,378	2,572	11,818	9.5%	0	0	0	-1%
Deep Percolation of Applied Water from All Other Sources	42,734	1,256	73,013	54.7%	42,734	1,267	73,685	59.4%	0	-12	-672	-5%
Non Santa Ana River Storm Flow Recharge	30,000	100	4,082	3.1%	13,513	100	1,839	1.5%	16,487	0	2,243	2%
Santa Ana River Recharge	19,100	567	14,734	11.0%	19,100	567	14,734	11.9%	0	0	0	-1%
Imported Water Recharge	44,000	250	14,966	11.2%	20,000	250	6,803	5.5%	24,000	0	8,163	6%
Recycled Water Recharge	0	487	0	0.0%	500	487	331	0.3%	-500	0	-331	0%
Subsurface Inflow	16,400	240	5,355	4.0%	16,400	240	5,355	4.3%	0	0	0	0%
Subtotal of Inflows	225,303	435	133,449	100%	185,316	492	124,046	100%	39,987	-57	9,403	0%
Outflows												
Production	197,742	533	143,399	90.0%	116,620	339	53,632	39%	81,122	194	89,768	51%
Direct	*132,849*	*299*	*53,997*	*33.9%*	*99,069*	*298*	*40,180*	*29%*	*33,780*	*1*	*13,817*	*5%*
OBMP Facilities	*40,000*	*1,300*	*70,748*	*44.4%*	*0*	*na*	*0*	*0%*	*40,000*	*1,300*	*70,748*	*44%*
SAWPA Desalter	*10,584*	*755*	*10,867*	*6.8%*	*8,076*	*755*	*8,295*	*6%*	*2,509*	*0*	*2,571*	*1%*
Other	*14,309*	*400*	*7,787*	*4.9%*	*9,476*	*400*	*5,157*	*4%*	*4,833*	*0*	*2,630*	*1%*
Rising Water	9,000	1,300	15,918	10.0%	47,694	1,300	84,356	61%	-38,694	0	-68,438	-51%
Phreatophyte	12,300	0	0	0.0%	12,300	0	0	0%	0	0	0	0%
Subtotal Outflows	219,042	535	159,318	100%	176,614	574	137,988	100%	42,429	-40	21,329	0%
Inflow - Outflow	6,261		-25,868		8,703		-13,942		-2,442		-11,926	
Safe Yield Estimate												
"Native" Inflow	181,303				164,816							
Less Uncontrolled Outflow	21,300				59,994							
Equals – Safe Yield	160,003				104,822							

Table 4.5-25
HYDROLOGIC AND SALT BUDGET SUMMARY FOR THE CHINO BASIN COMPARISON OF BASELINE TO OBMP ALTERNATIVE A AT YEAR 2020 REPLENISHMENT WITH 50% IMPORTED WATER AND 50% RECYCLED WATER

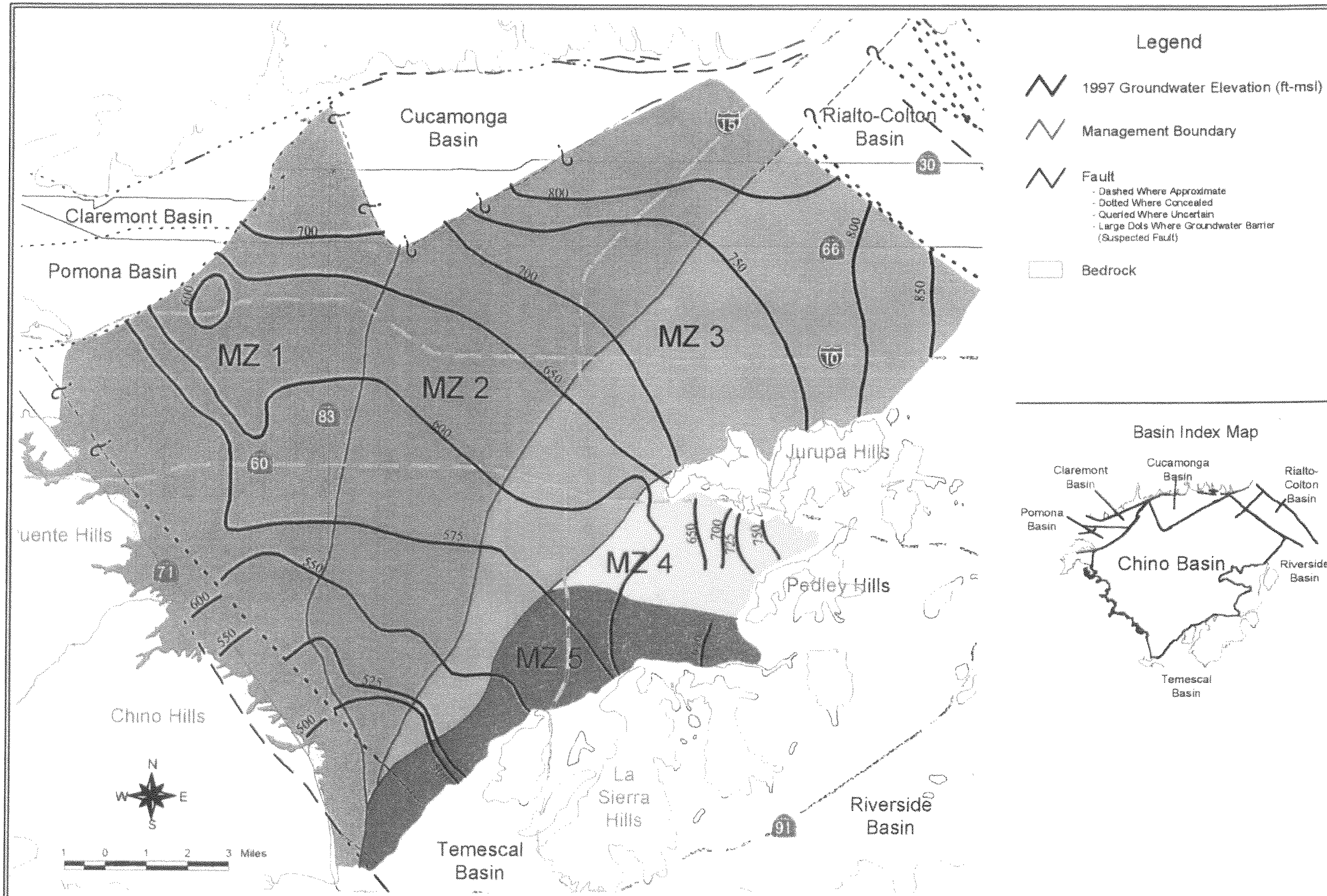
Inflow/Outflow Components	With OBMP Volume (acre-ft/yr)	With OBMP TDS Conc (mg/L)	With OBMP TDS Mass (tons)	With OBMP TDS % of Inflow	No OBMP Volume (acre-ft/yr)	No OBMP TDS Conc (mg/L)	No OBMP TDS Mass (tons)	No OBMP TDS % of Inflow	*With OBMP* minus *No OBMP* Volume (acre-ft/yr)	*With OBMP* minus *No OBMP* TDS Conc (mg/L)	*With OBMP* minus *No OBMP* TDS Mass (tons)	*With OBMP* minus *No OBMP* TDS % of Inflow
Inflows												
Deep Percolation of Precipitation	69,691	100	9,482	7%	69,691	100	9,482	7.6%	0	0	0	-1%
Deep Percolation of Applied Water from Dairies and Agriculture	3,378	2,572	11,818	8%	3,378	2,572	11,818	9.5%	0	0	0	-1%
Deep Percolation of Applied Water from All Other Sources	42,734	1,256	73,013	52%	42,734	1,267	73,685	59.4%	0	-12	-672	-7%
Non Santa Ana River Storm Flow Recharge	30,000	100	4,082	3%	13,513	100	1,839	1.5%	16,487	0	2,243	1%
Santa Ana River Recharge	19,100	567	14,734	10%	19,100	567	14,734	11.9%	0	0	0	-1%
Imported Water Replenishment	22,000	250	7,483	5%	20,000	250	6,803	5.5%	2,000	0	680	0%
Recycled Water Replenishment	22,000	487	14,577	10%	500	487	331	0.3%	21,500	0	14,246	10%
Subsurface Inflow	16,400	240	5,355	4%	16,400	240	5,355	4.3%	0	0	0	-1%
Subtotal of Inflows	<u>225,303</u>	<u>458</u>	<u>140,543</u>	100%	<u>185,316</u>	<u>492</u>	<u>124,046</u>	100%	39,987	-34	16,497	0%
Outflows												
Production	197,742	533	143,399	90%	116,620	339	53,632	39%	81,122	194	89,768	51%
Direct	*132,849*	*299*	*53,997*	*34%*	*99,069*	*298*	*40,180*	*29%*	*33,780*	*1*	*13,817*	*5%*
OBMP Facilities	*40,000*	*1,300*	*70,748*	*44%*	*0*	*na*	*0*	*0%*	*40,000*	*1,300*	*70,748*	*44%*
SAWPA Desalter	*10,584*	*755*	*10,867*	*7%*	*8,076*	*755*	*8,295*	*6%*	*2,509*	*0*	*2,571*	*1%*
Other	*14,309*	*400*	*7,787*	*5%*	*9,476*	*400*	*5,157*	*4%*	*4,833*	*0*	*2,630*	*1%*
Rising Water	9,000	1,300	81,615 15,918	10%	47,694	1,300	84,356	61%	-38,694	0	-68,438	-51%
Phreatophyte	12,300	0	0	0%	12,300	0	0	0%	0	0	0	0%
<u>Subtotal Outflows</u>	<u>219,042</u>	<u>535</u>	<u>159,318</u>	100%	<u>176,614</u>	<u>574</u>	<u>137,988</u>	100%	42,429	-40	21,329	0%
<u>Inflow - Outflow</u>	<u>6,261</u>		<u>-18,775</u>		<u>8,703</u>		<u>-13,942</u>		<u>-2,442</u>		<u>-4,833</u>	
Safe Yield Estimate												
"Native" Inflow	181,303				164,816							
Less Uncontrolled Outflow	21,300				59,994							
Equals – Safe Yield	160,003				104,822							

Table 4.5-26
HYDROLOGIC AND SALT BUDGET SUMMARY FOR THE CHINO BASIN COMPARISON OF BASELINE TO OBMP ALTERNATIVE B AT YEAR 2020 REPLENISHMENT WITH IMPORTED WATER ONLY

Inflow/Outflow Components	With OBMP				No OBMP				*With OBMP* minus *No OBMP*			
	Volume	TDS			Volume	TDS			Volume	TDS		
		Conc	Mass	% of Inflow		Conc	Mass	% of Inflow		Conc	Mass	% of Inflow
	(acre-ft/yr)	(mg/L)	(tons)		(acre-ft/yr)	(mg/L)	(tons)		(acre-ft/yr)	(mg/L)	(tons)	
Inflows												
Deep Percolation of Precipitation	69,691	100	9,482	6.9%	69,691	100	9,482	7.6%	0	0	0	-1%
Deep Percolation of Applied Water from Dairies and Agriculture	3,378	2,572	11,818	8.6%	3,378	2,572	11,818	9.5%	0	0	0	-1%
Deep Percolation of Applied Water from All Other Sources	42,734	1,256	73,013	53.0%	42,734	1,267	73,685	59.4%	0	-12	-672	-6%
Non Santa Ana River Storm Flow Recharge	13,513	100	1,839	1.3%	13,513	100	1,839	1.5%	0	0	0	0%
Santa Ana River Recharge	19,100	567	14,734	10.7%	19,100	567	14,734	11.9%	0	0	0	-1%
Imported Water Recharge	63,000	250	21,429	15.6%	20,000	250	6,803	5.5%	43,000	0	14,626	10%
Recycled Water Recharge	0	487	0	0.0%	500	487	331	0.3%	-500	0	-331	0%
Subsurface Inflow	16,400	240	5,355	3.9%	16,400	240	5,355	4.3%	0	0	0	0%
Subtotal of Inflows	**227,816**	**444**	**137,669**	**100%**	**185,316**	**492**	**124,046**	**100%**	**42,500**	**-48**	**13,623**	**0%**
Outflows												
Production	197,742	533	143,399	90.0%	116,620	339	53,632	39%	81,122	194	89,768	51%
Direct	*132,849*	*299*	*53,997*	*33.9%*	*99,069*	*298*	*40,180*	*29%*	*33,780*	*1*	*13,817*	*5%*
OBMP Facilities	*40,000*	*1,300*	*70,748*	*44.4%*	*0*	*na*	*0*	*0%*	*40,000*	*1,300*	*70,748*	*44%*
SAWPA Desalter	*10,584*	*755*	*10,867*	*6.8%*	*8,076*	*755*	*8,295*	*6%*	*2,509*	*0*	*2,571*	*1%*
Other	*14,309*	*400*	*7,787*	*4.9%*	*9,476*	*400*	*5,157*	*4%*	*4,833*	*0*	*2,630*	*1%*
Rising Water	9,000	1,300	15,918	10.0%	47,694	1,300	84,356	61%	-38,694	0	-68,438	-51%
Phreatophyte	12,300	0	0	0.0%	12,300	0	0	0%	0	0	0	0%
Subtotal Outflows	**219,042**	**535**	**159,318**	**100%**	**176,614**	**574**	**137,988**	**100%**	**42,429**	**-40**	**21,329**	**0%**
Inflow - Outflow	**8,774**		**-21,649**		**8,703**		**-13,942**		**71**		**-7,707**	
Safe Yield Estimate												
"Native" Inflow	164,816				164,816							
Less Uncontrolled Outflow	21,300				59,994							
Equals – Safe Yield	143,516				104,822							

Table 4.5-27
HYDROLOGIC AND SALT BUDGET SUMMARY FOR THE CHINO BASIN COMPARISON OF BASELINE TO OBMP ALTERNATIVE B AT YEAR 2020 REPLENISHMENT WITH 50% IMPORTED WATER AND 50% RECYCLED WATER

Inflow/Outflow Components	With OBMP				No OBMP				*With OBMP* minus *No OBMP*			
	Volume	TDS Conc	TDS Mass	TDS % of Inflow	Volume	TDS Conc	TDS Mass	TDS % of Inflow	Volume	TDS Conc	TDS Mass	TDS % of Inflow
	(acre-ft/yr)	(mg/L)	(tons)		(acre-ft/yr)	(mg/L)	(tons)		(acre-ft/yr)	(mg/L)	(tons)	
Inflows												
Deep Percolation of Precipitation	69,691	100	9,482	6.4%	69,691	100	9,482	7.6%	0	0	0	-1%
Deep Percolation of Applied Water from Dairies and Agriculture	3,378	2,572	11,818	8.0%	3,378	2,572	11,818	9.5%	0	0	0	-2%
Deep Percolation of Applied Water from All Other Sources	42,734	1,256	73,013	49.4%	42,734	1,267	73,685	59.4%	0	-12	-672	-10%
Non Santa Ana River Storm Flow Recharge	13,513	100	1,839	1.2%	13,513	100	1,839	1.5%	0	0	0	0%
Santa Ana River Recharge	19,100	567	14,734	10.0%	19,100	567	14,734	11.9%	0	0	0	-2%
Imported Water Replenishment	31,500	250	10,714	7.2%	20,000	250	6,803	5.5%	11,500	0	3,912	2%
Recycled Water Replenishment	31,500	487	20,871	14.1%	500	487	331	0.3%	31,000	0	20,540	14%
Subsurface Inflow	16,400	240	5,355	3.6%	16,400	240	5,355	4.3%	0	0	0	-1%
Subtotal of Inflows	<u>227,316</u>	<u>477</u>	<u>147,826</u>	100%	<u>185,316</u>	<u>492</u>	<u>124,046</u>	100%	42,500	-15	23,780	0%
Outflows												
Production	197,742	533	143,399	90.0%	116,620	339	53,632	39%	81,122	194	89,768	51%
Direct	*132,849*	*299*	*53,997*	*33.9%*	*99,069*	*298*	*40,180*	*29%*	*33,780*	*1*	*13,817*	*5%*
OBMP Facilities	*40,000*	*1,300*	*70,748*	*44.4%*	*0*	*na*	*0*	*0%*	*40,000*	*1,300*	*70,748*	*44%*
SAWPA Desalter	*10,584*	*755*	*10,867*	*6.8%*	*8,076*	*755*	*8,295*	*6%*	*2,509*	*0*	*2,571*	*1%*
Other	*14,309*	*400*	*7,787*	*4.9%*	*9,476*	*400*	*5,157*	*4%*	*4,833*	*0*	*2,630*	*1%*
Rising Water	9,000	1,300	15,918	10.0%	47,694	1,300	84,356	61%	-38,694	0	-68,438	-51%
Phreatophyte	12,300	0	0	0.0%	12,300	0	0	0%	0	0	0	0%
<u>Subtotal Outflows</u>	<u>219,042</u>	<u>535</u>	<u>159,318</u>	100%	<u>176,614</u>	<u>574</u>	<u>137,988</u>	100%	42,429	-40	21,329	0%
<u>Inflow - Outflow</u>	<u>8,774</u>		<u>-11,492</u>		<u>8,703</u>		<u>-13,942</u>		<u>71</u>		<u>2,450</u>	
Safe Yield Estimate												
"Native" Inflow	164,816				164,816							
Less Uncontrolled Outflow	21,300				59,994							
Equals ~ Safe Yield	143,516				104,822							



MANAGEMENT ZONES AND FALL 1997 GROUNDWATER ELEVATION CONTOURS

Source: OBMP Phase I Report, Figure 2-5

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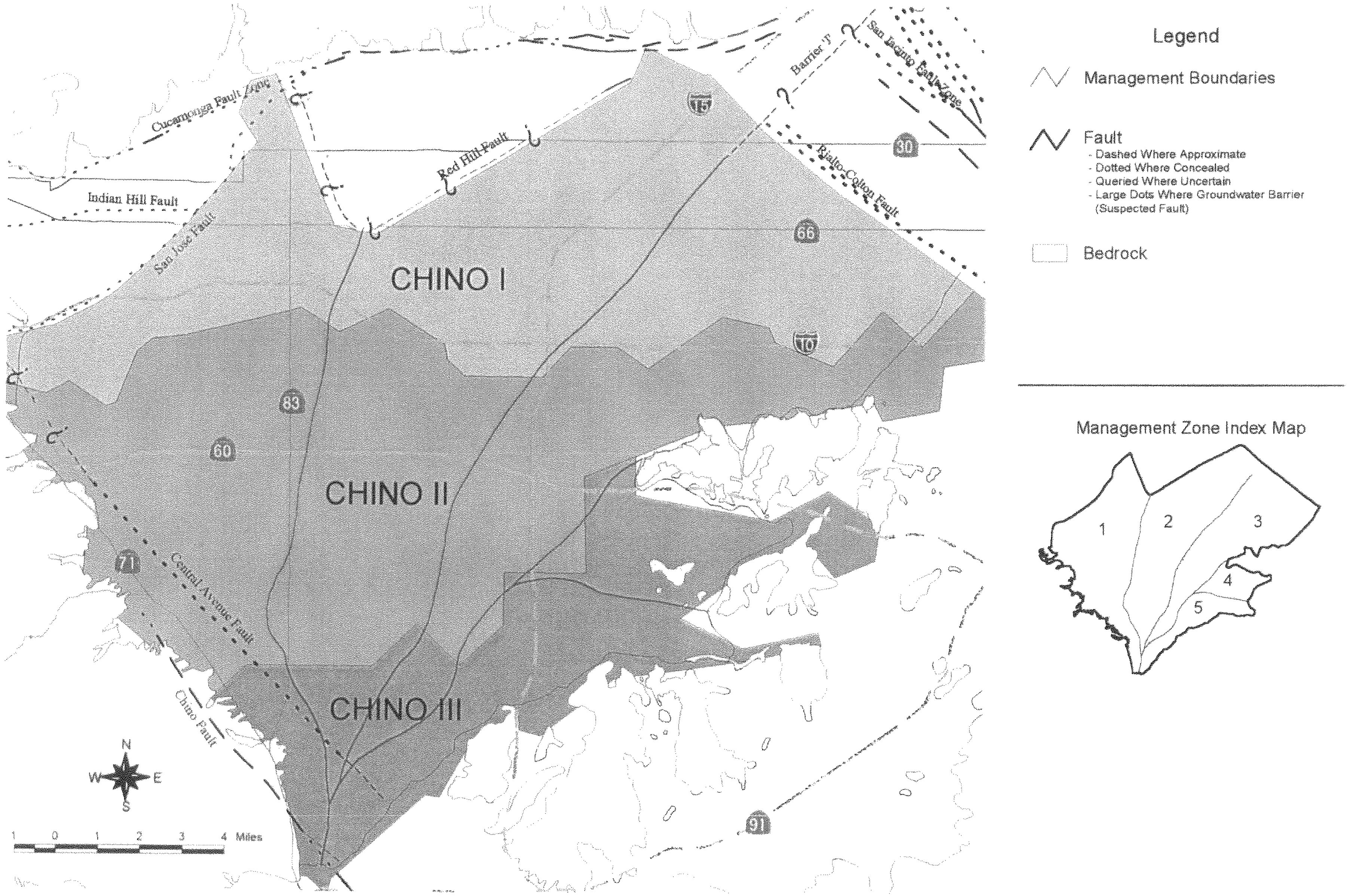
FIGURE 4.5-1



CHINO SUBBASINS DEFINED IN THE 1995 (AND PRIOR) WATER QUALITY CONTROL PLANS

Source: OBMP Phase I Report, Figure 2-6

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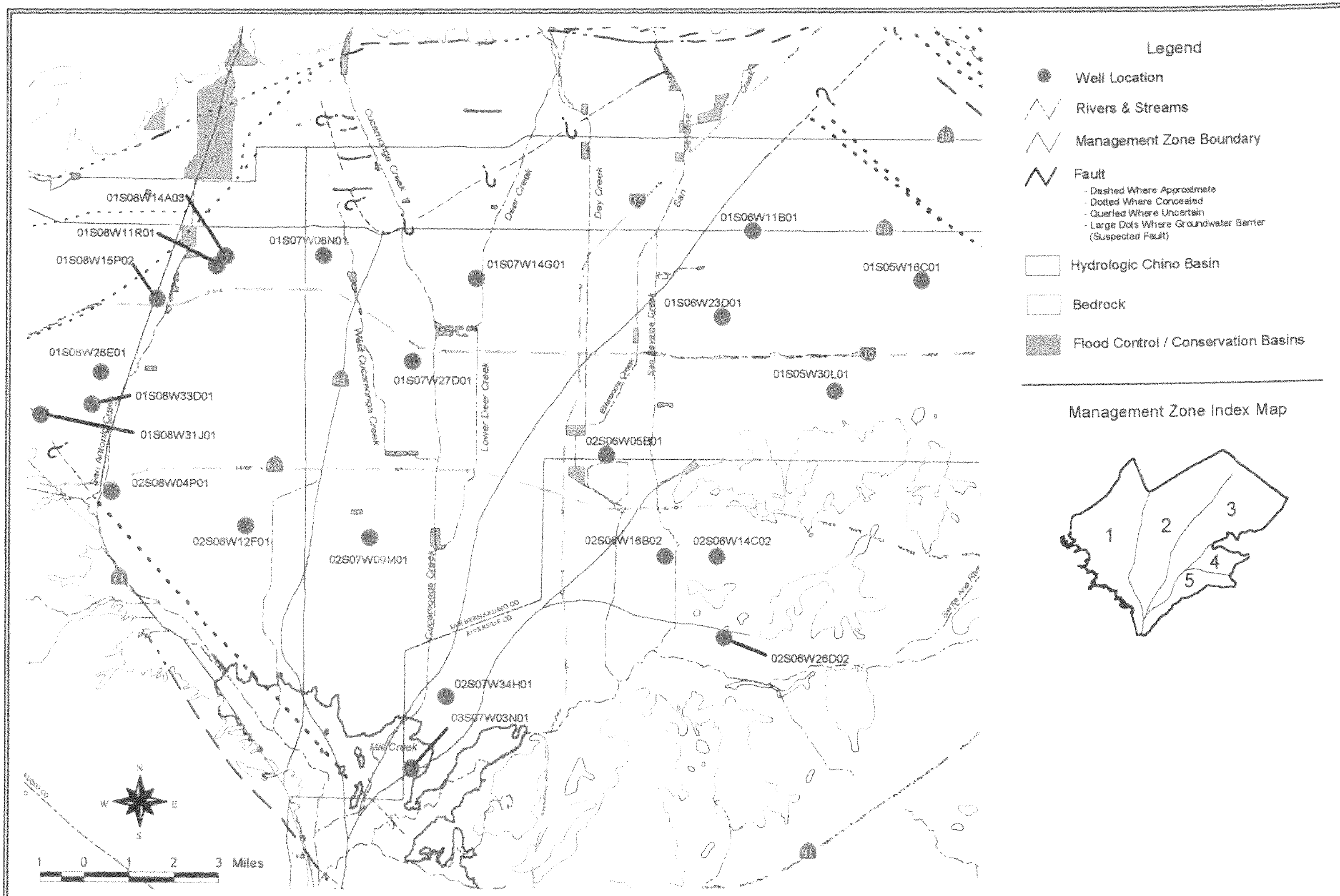
FIGURE 4.5-2



WELL LOCATION MAP FOR WATER LEVEL TIME HISTORIES

Source: OBMP Phase I Report, Figure 2-7

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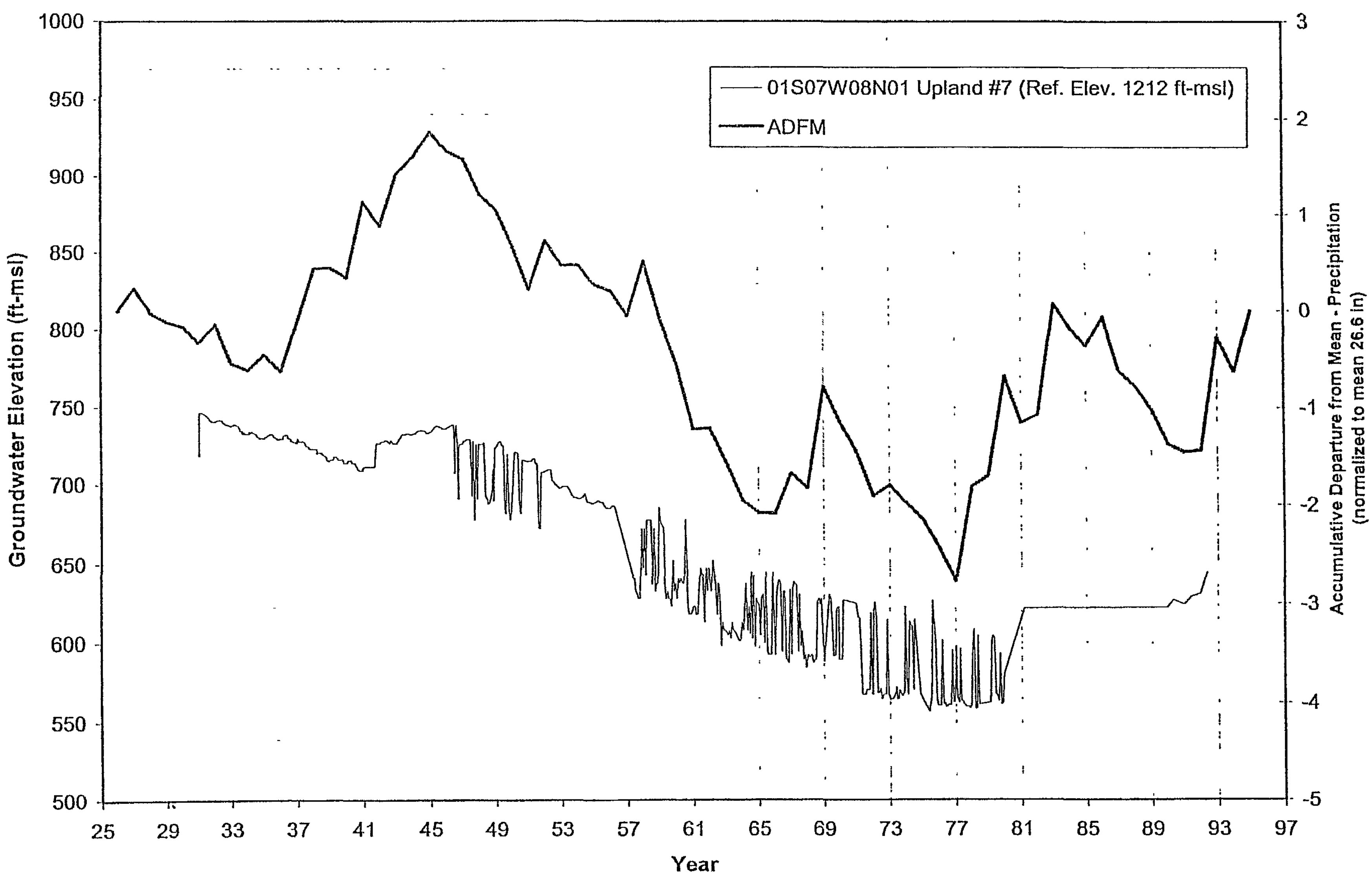
FIGURE 4.5-3



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 1)

Source: OBMP Phase 1 Report, Figure 2-8

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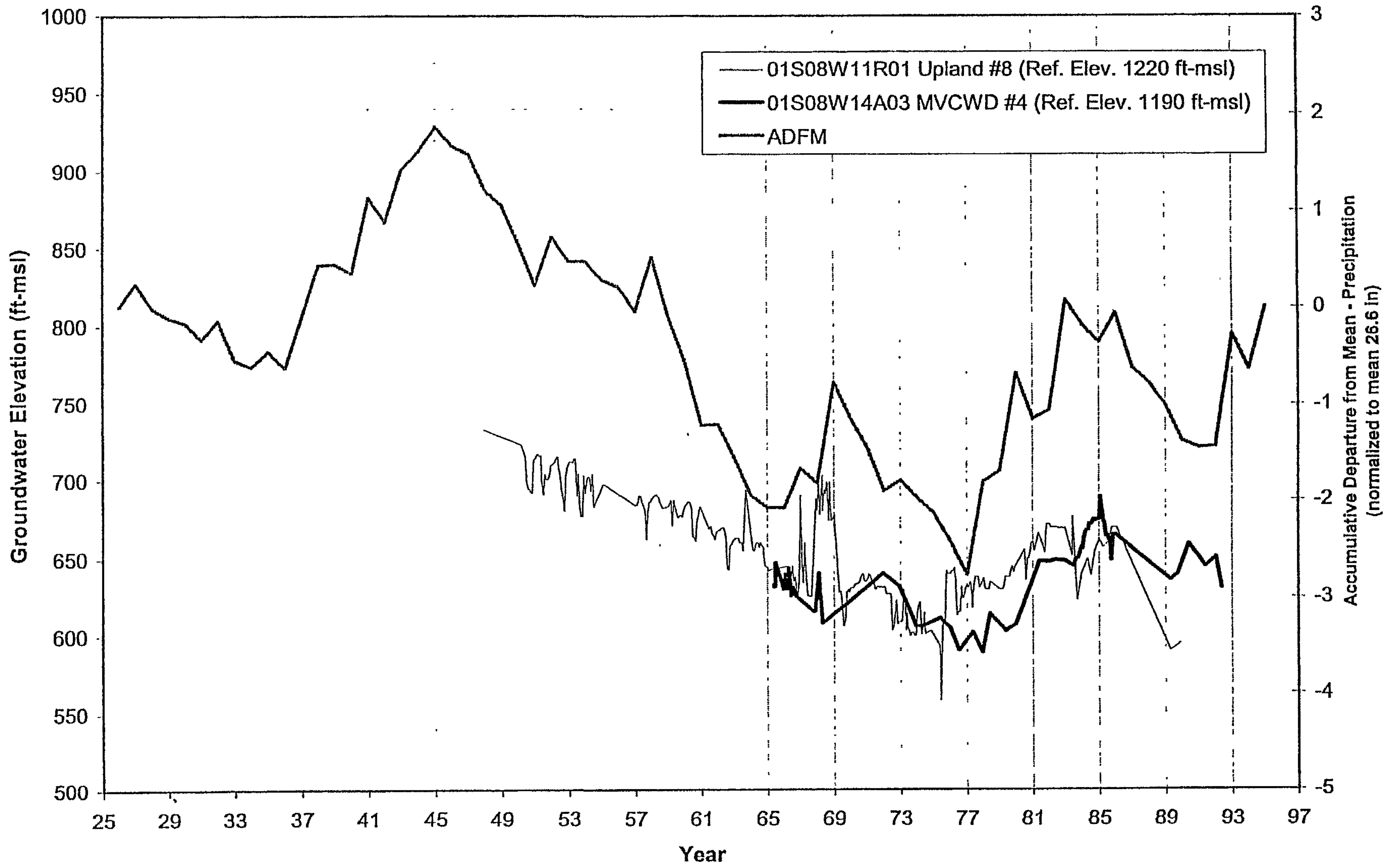
FIGURE 4.5-4



HISTORICAL GROUNDWATER ELEVATION
(MANAGEMENT ZONE 1)

Source: OBMP Phase I Report, Figure 2-9

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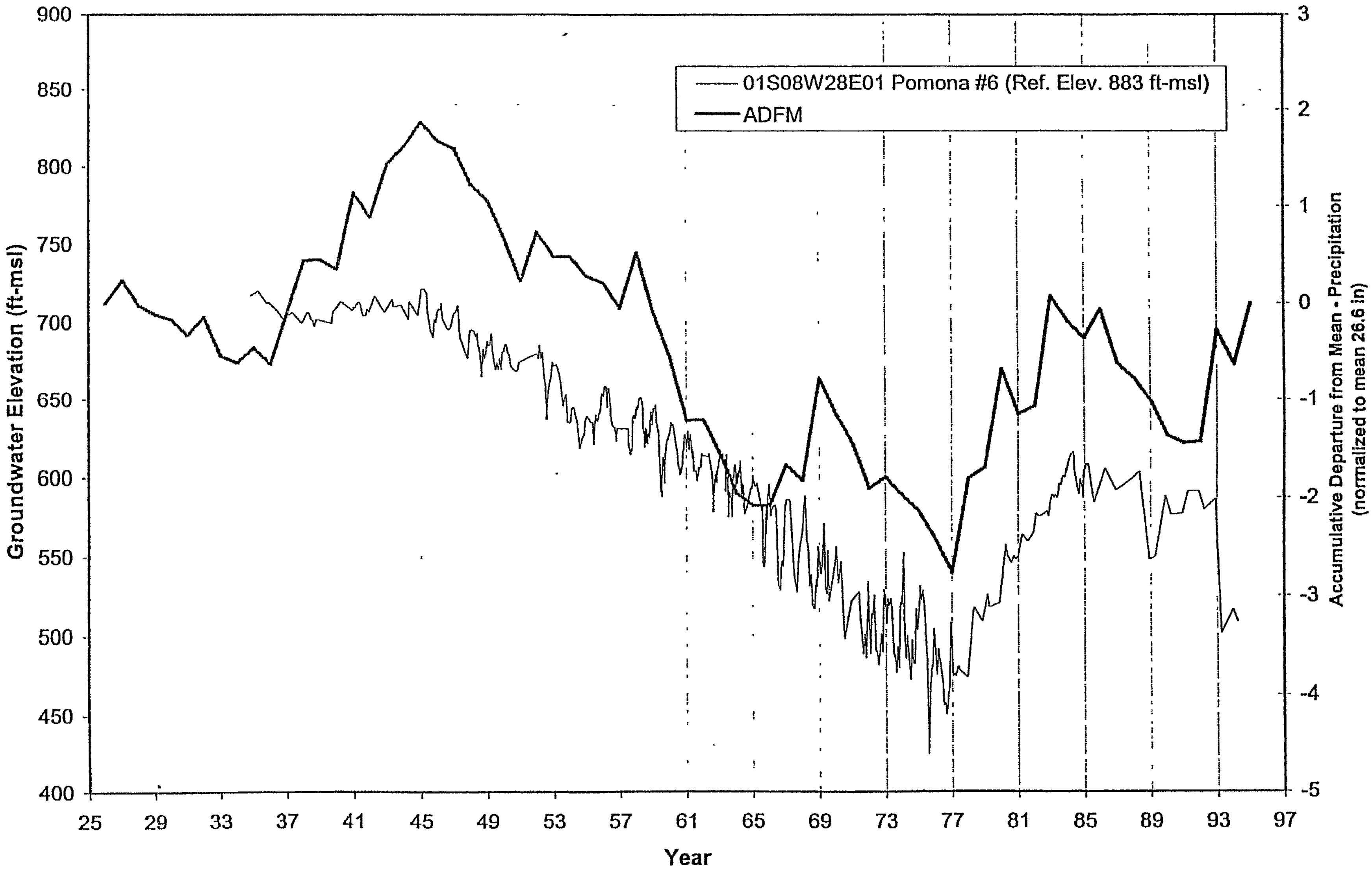
FIGURE 4.5-5



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 1)

Source: OBMP Phase I Report, Figure 2-10

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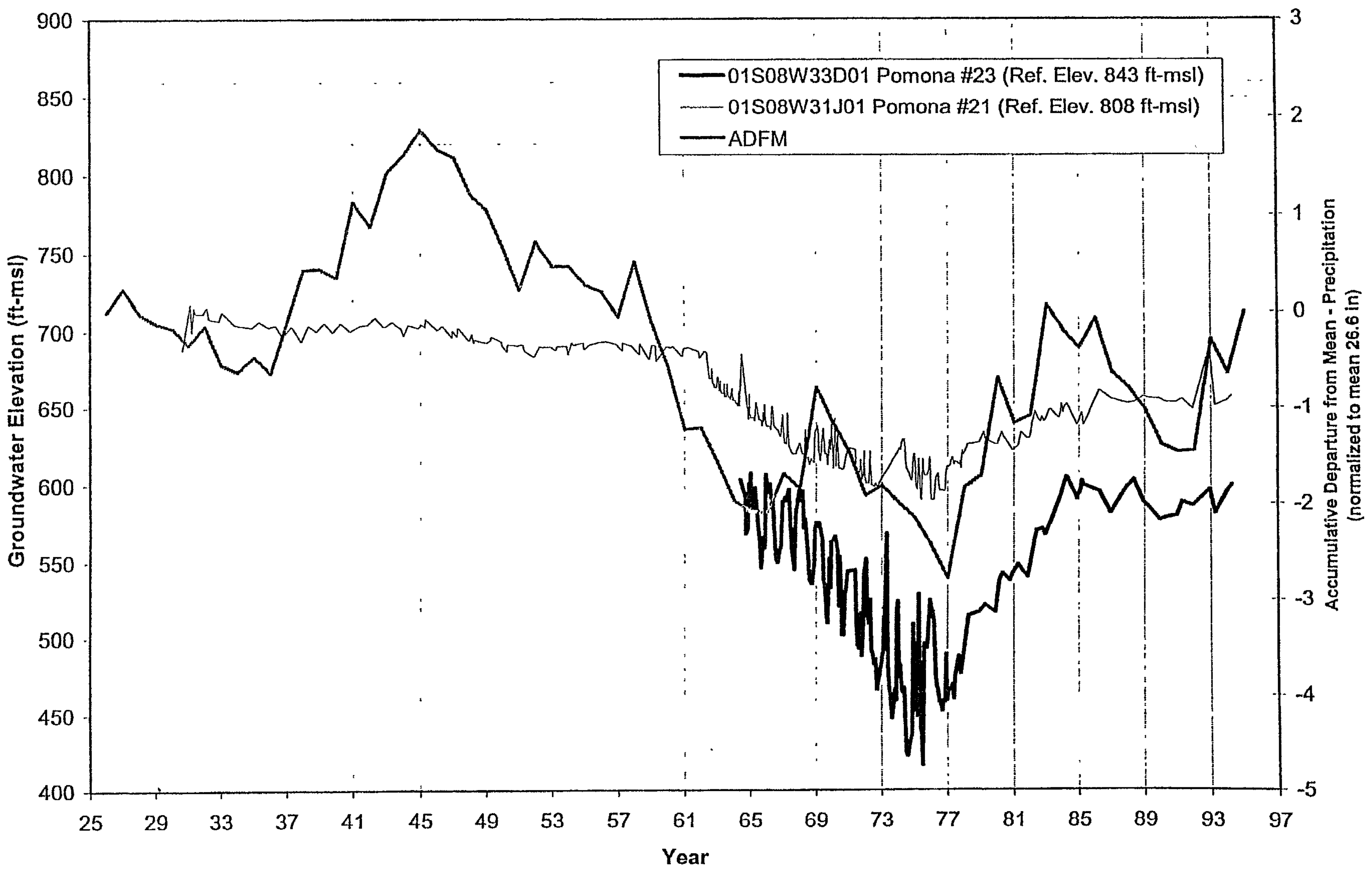
FIGURE 4.5-6



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 1)

Source: OBMP Phase I Report, Figure 2-11

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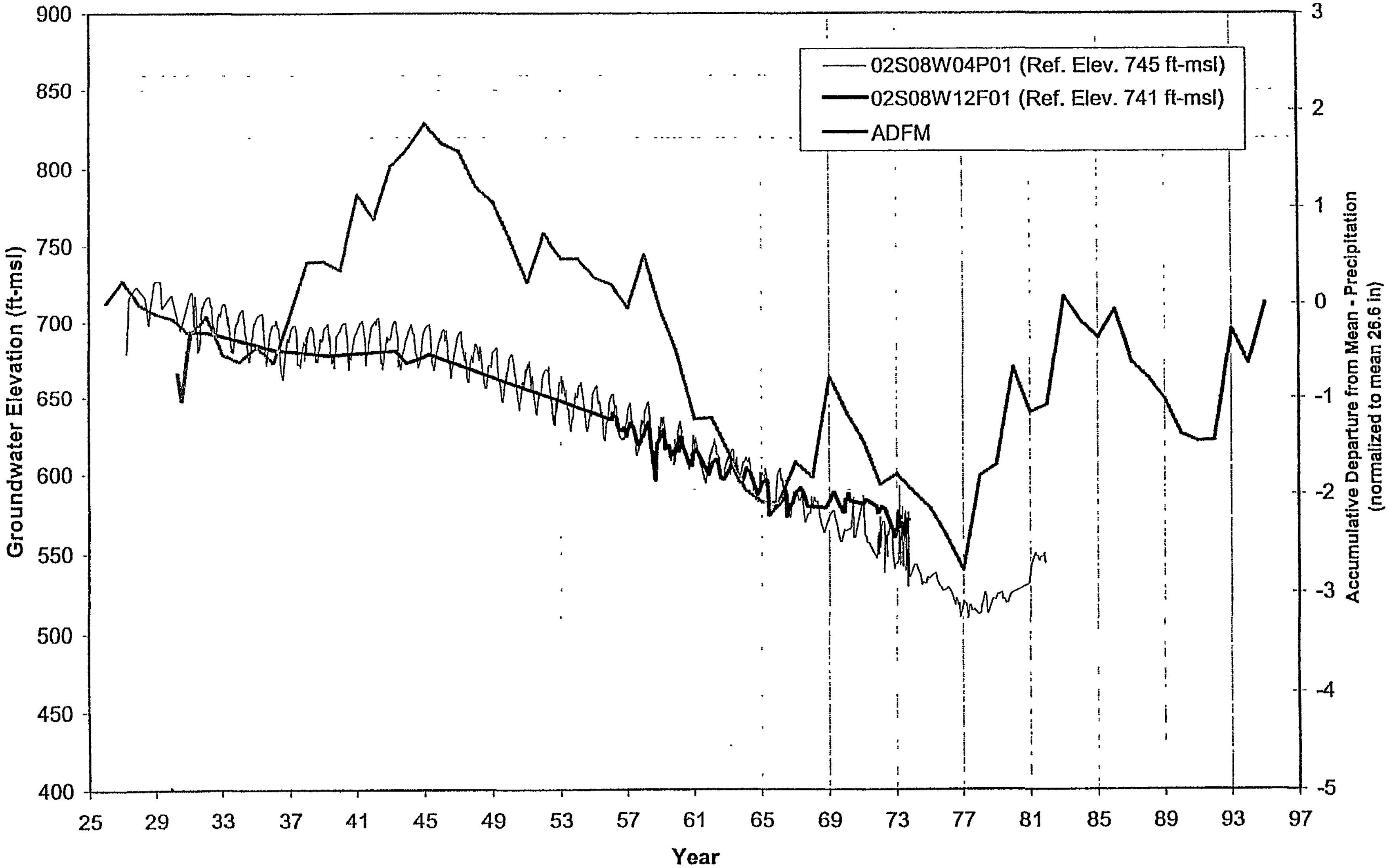
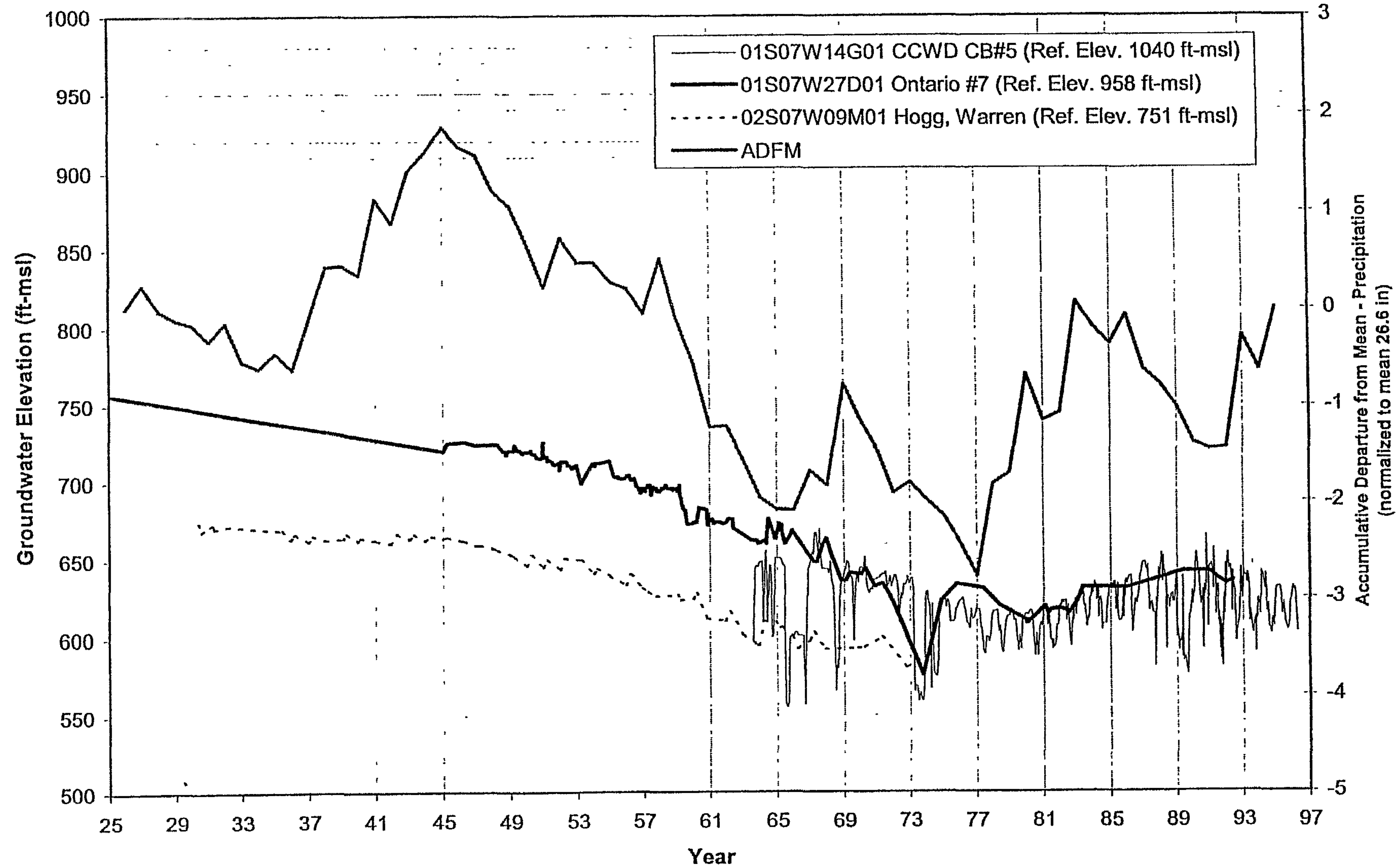
FIGURE 4.5-7

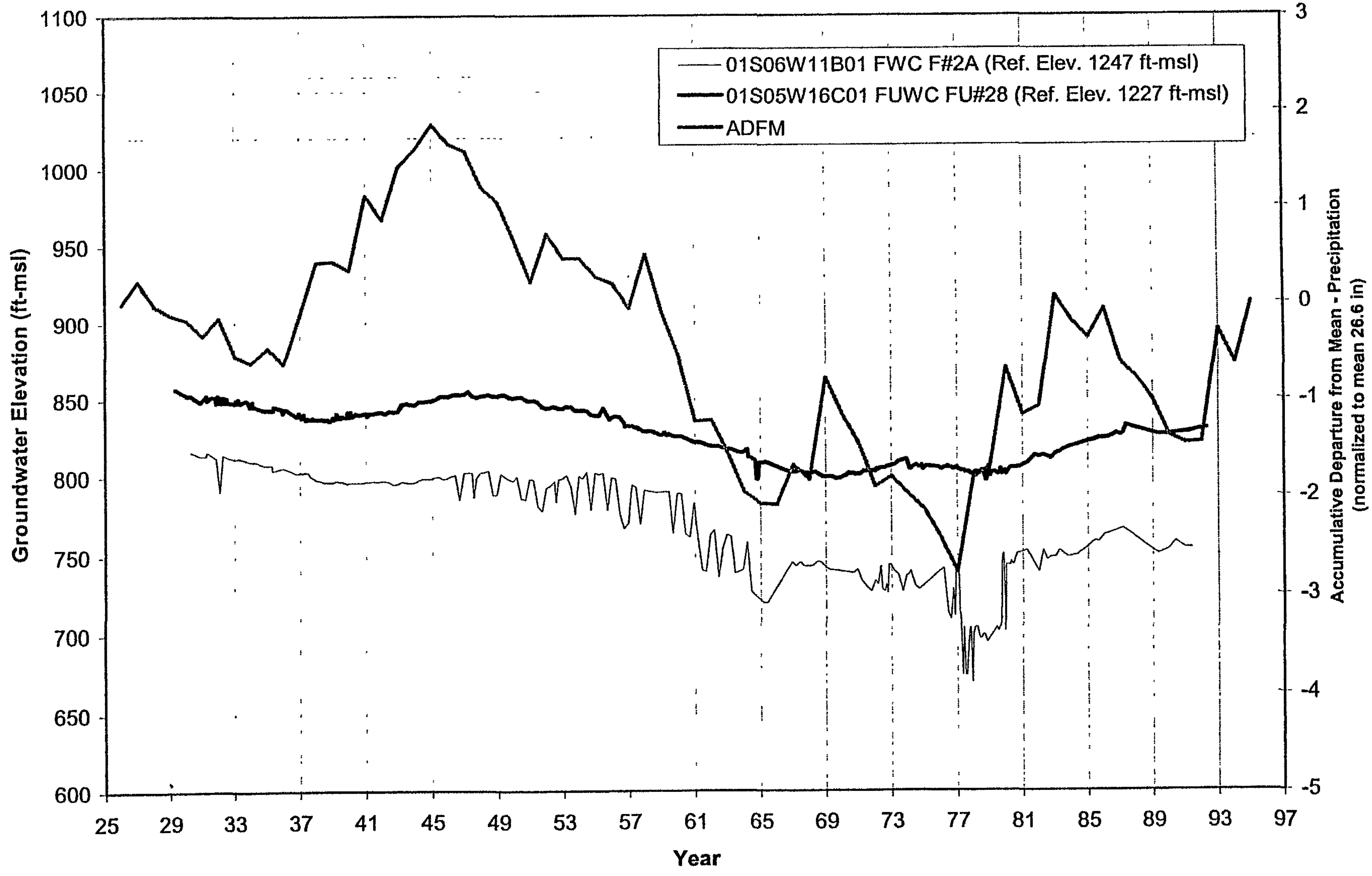


HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 1) Source: OBMP Phase I Report, Figure 2-12	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.5-8**



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 2)	TOM DODSON & ASSOCIATES Environmental Consultants	FIGURE 4.5-9

Source: OBMP Phase I Report, Figure 2-13



HISTORICAL GROUNDWATER ELEVATION
(MANAGEMENT ZONE 3)

Source: OBMP Phase I Report, Figure 2-14

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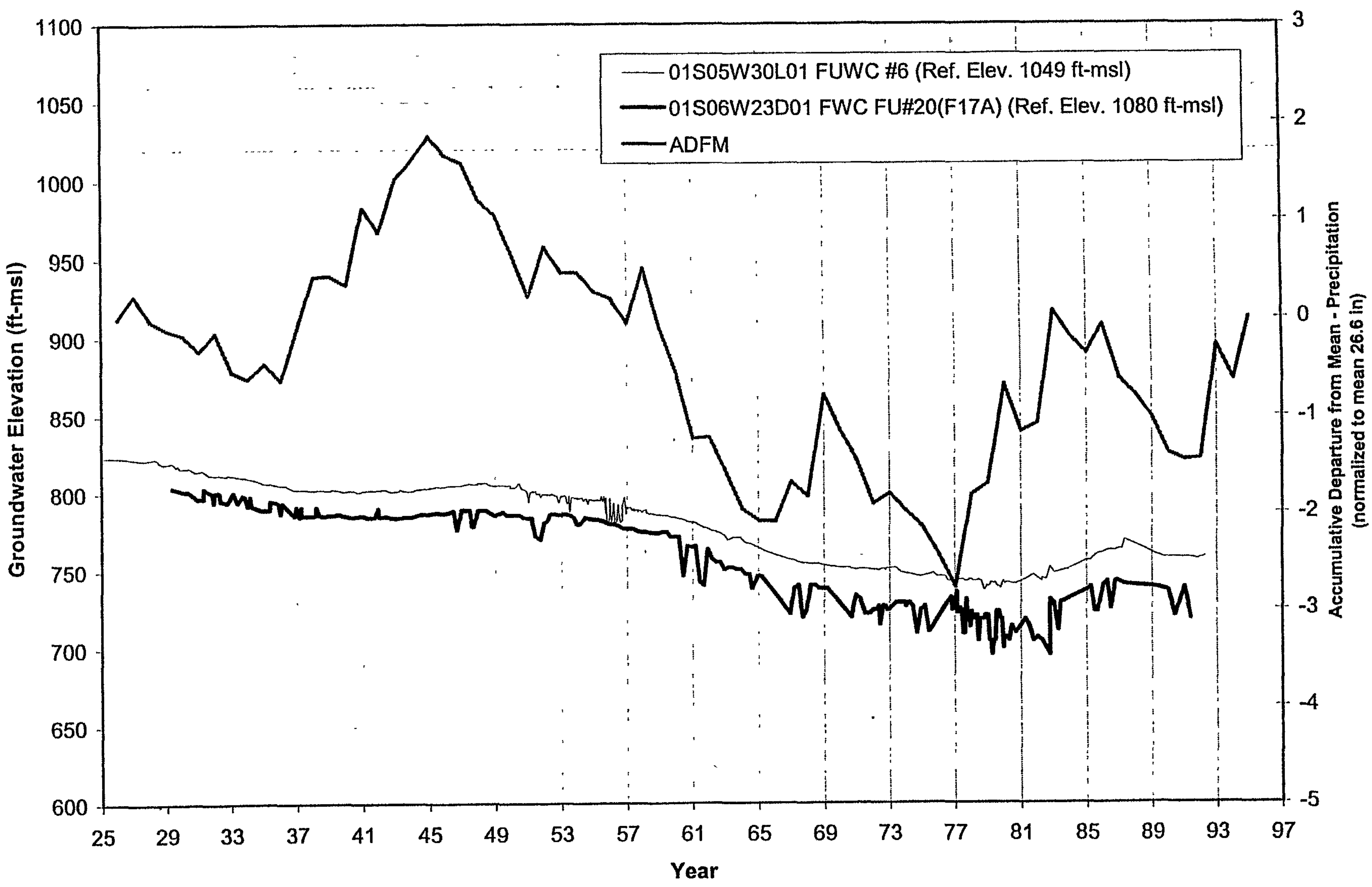
FIGURE 4.5-10



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 3)

Source: OBMP Phase I Report, Figure 2-15

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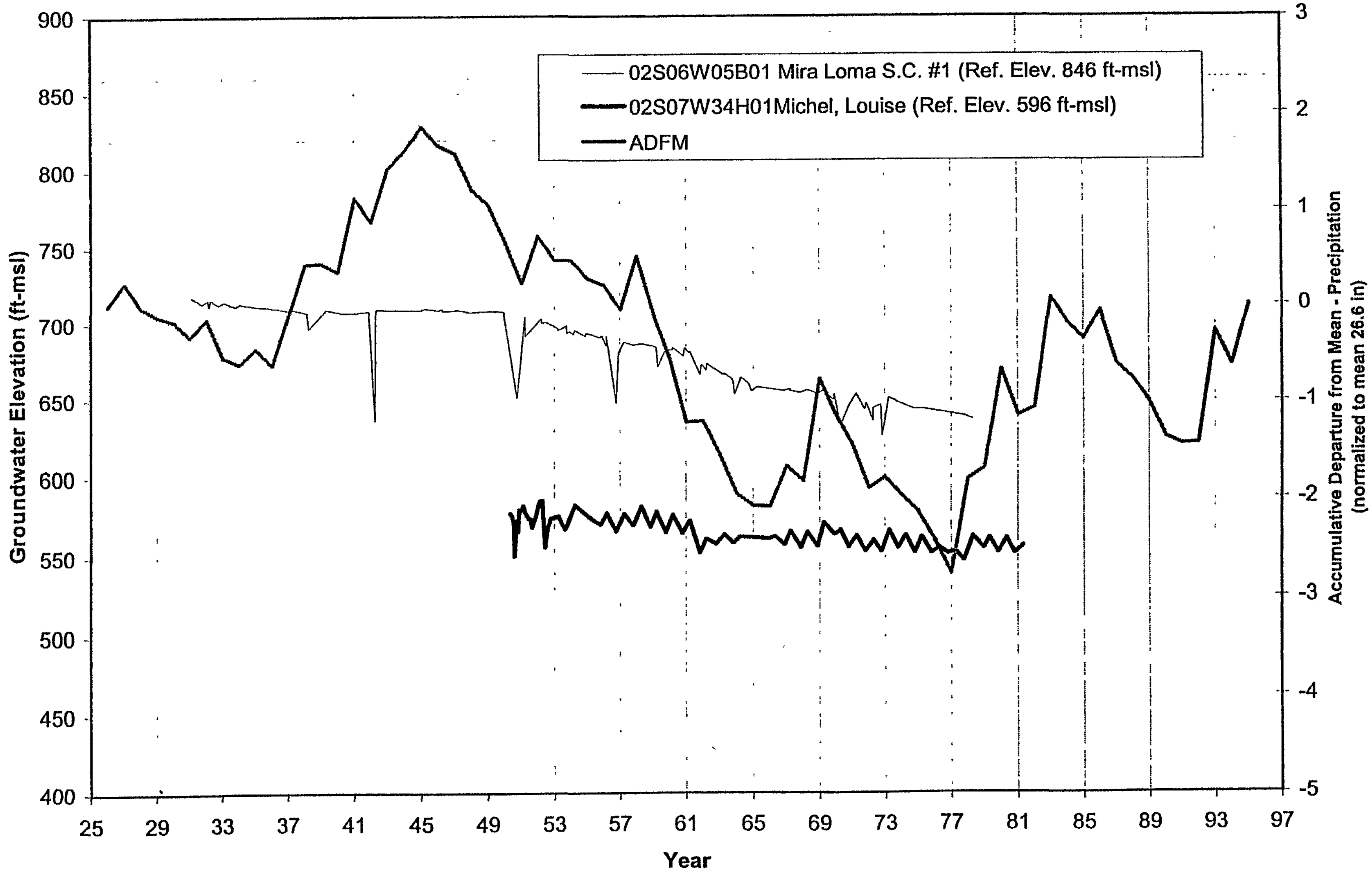
FIGURE 4.5-11



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 3)

Source OBMP Phase I Report, Figure 2-16

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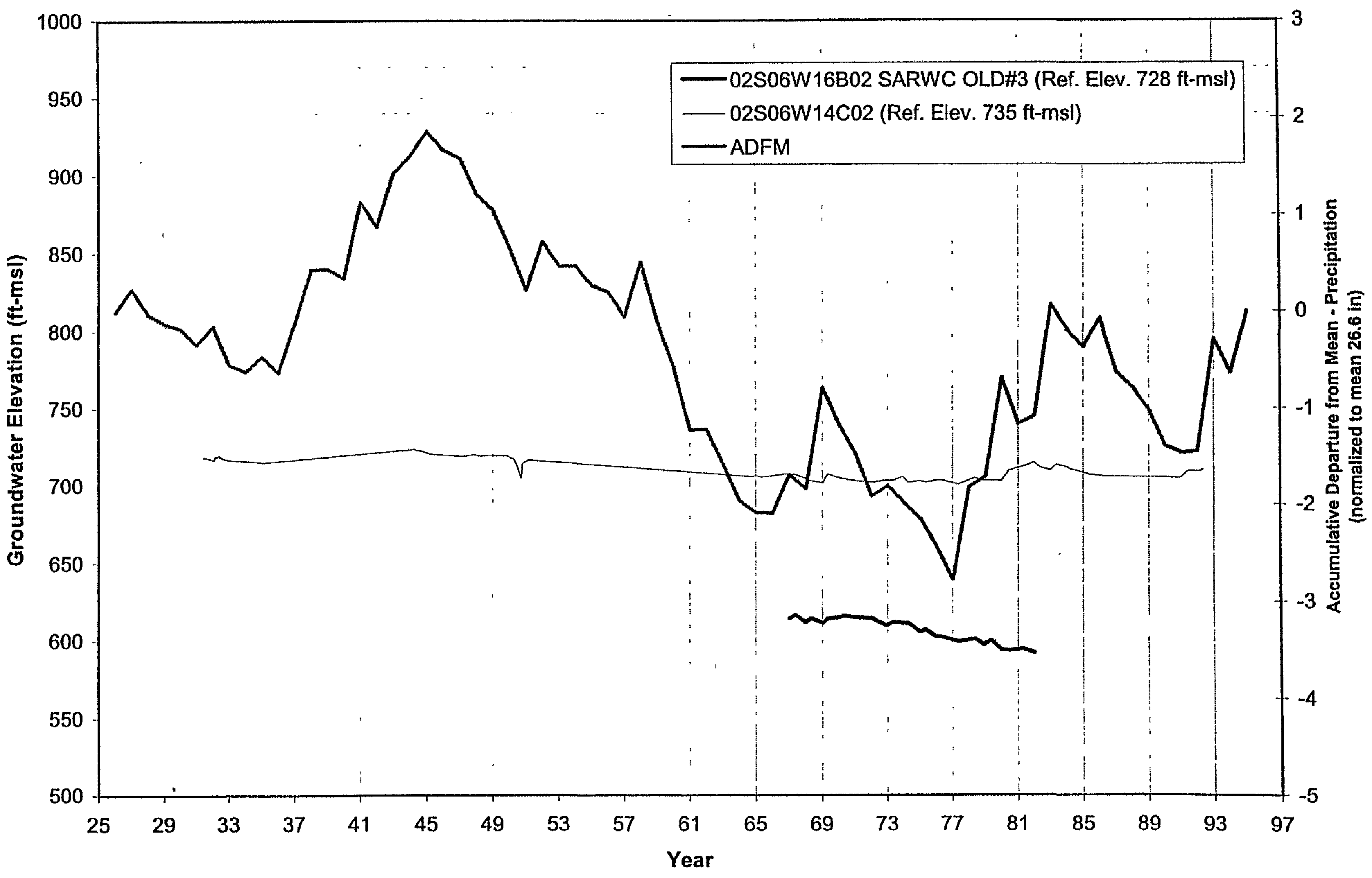
FIGURE 4.5-12



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 4)

Source: OBMP Phase I Report, Figure 2-17

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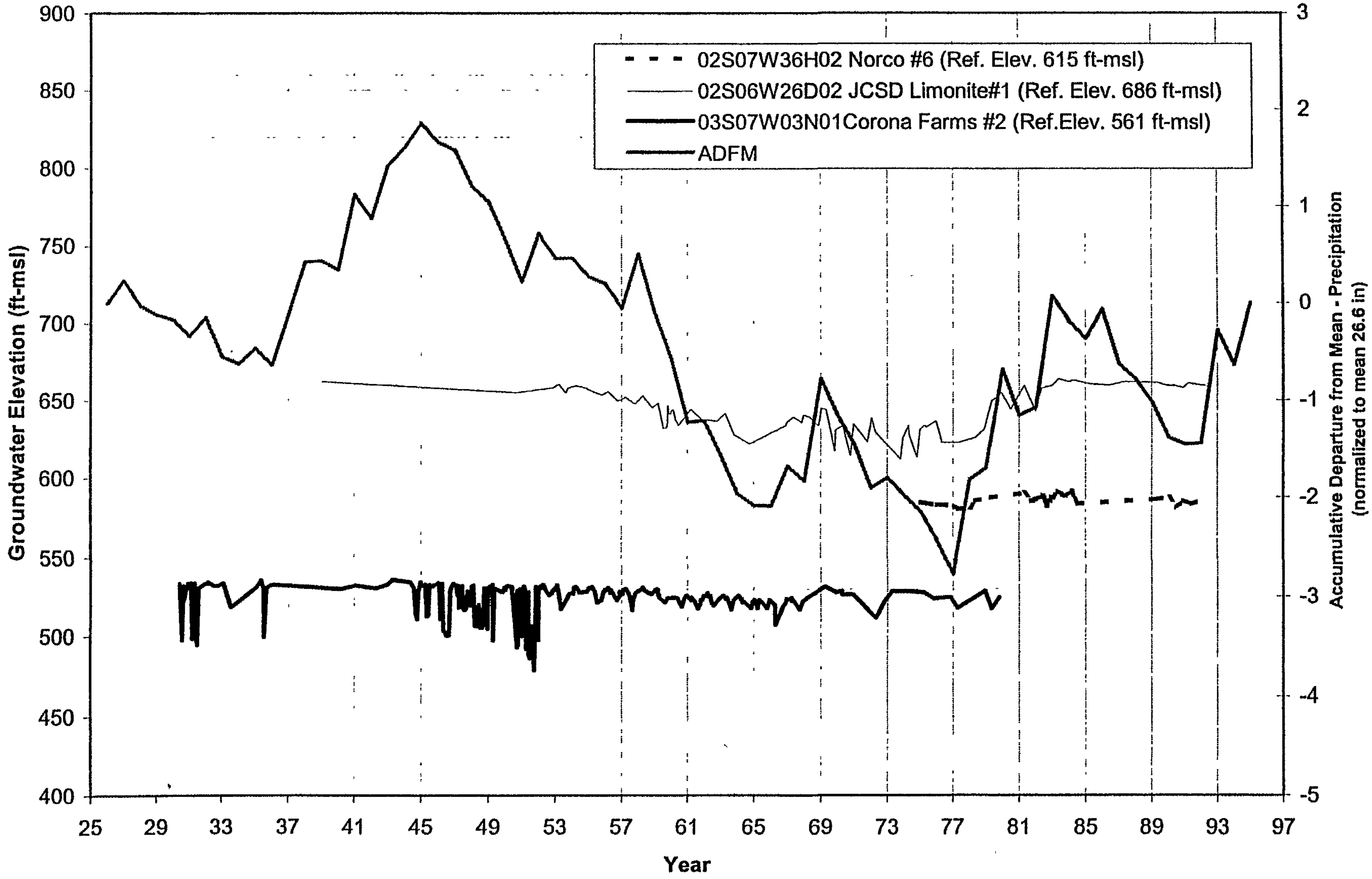
FIGURE 4.5-13



HISTORICAL GROUNDWATER ELEVATION (MANAGEMENT ZONE 5)

Source. OBMP Phase I Report, Figure 2-18

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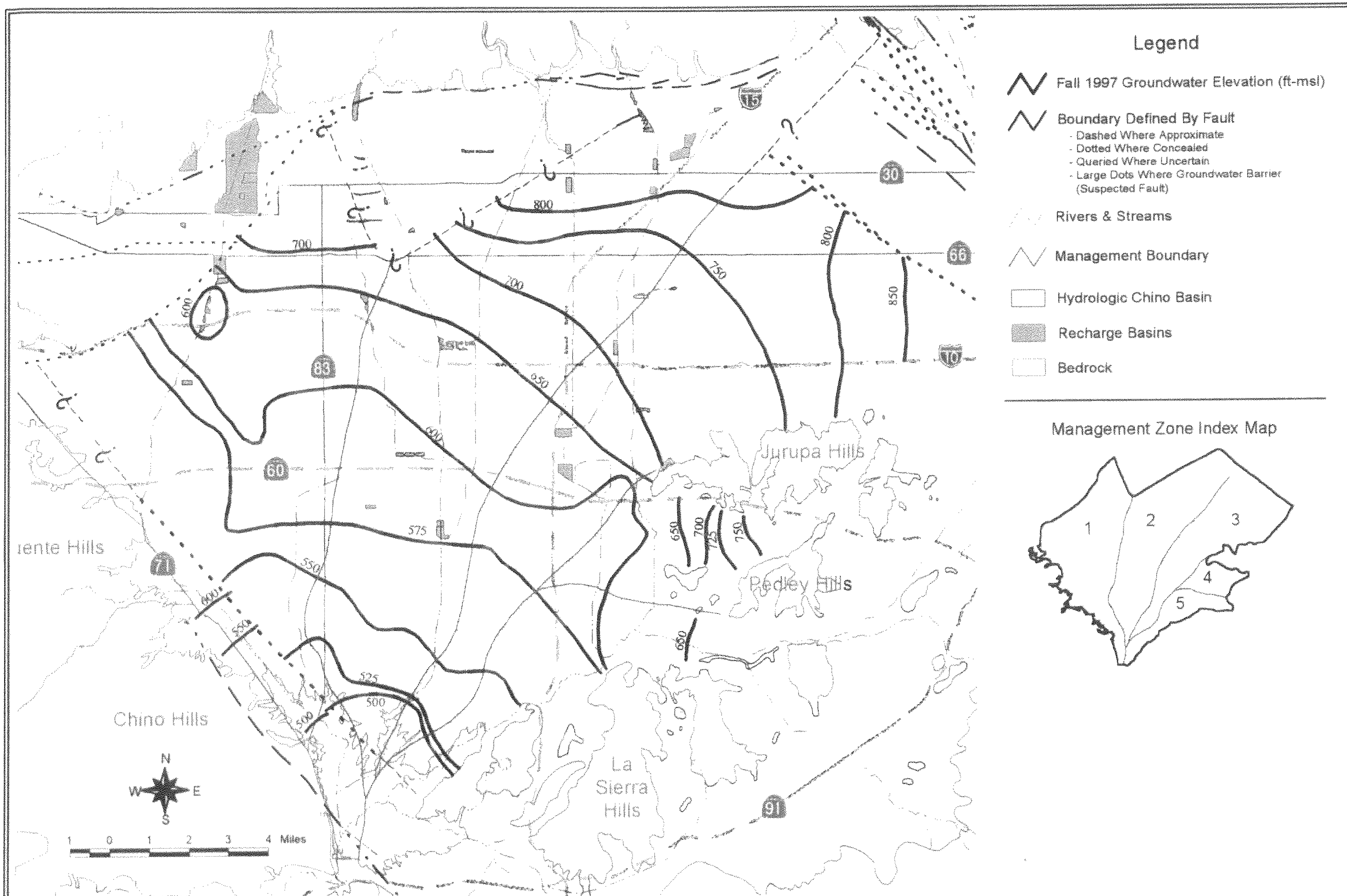
FIGURE 4.5-14

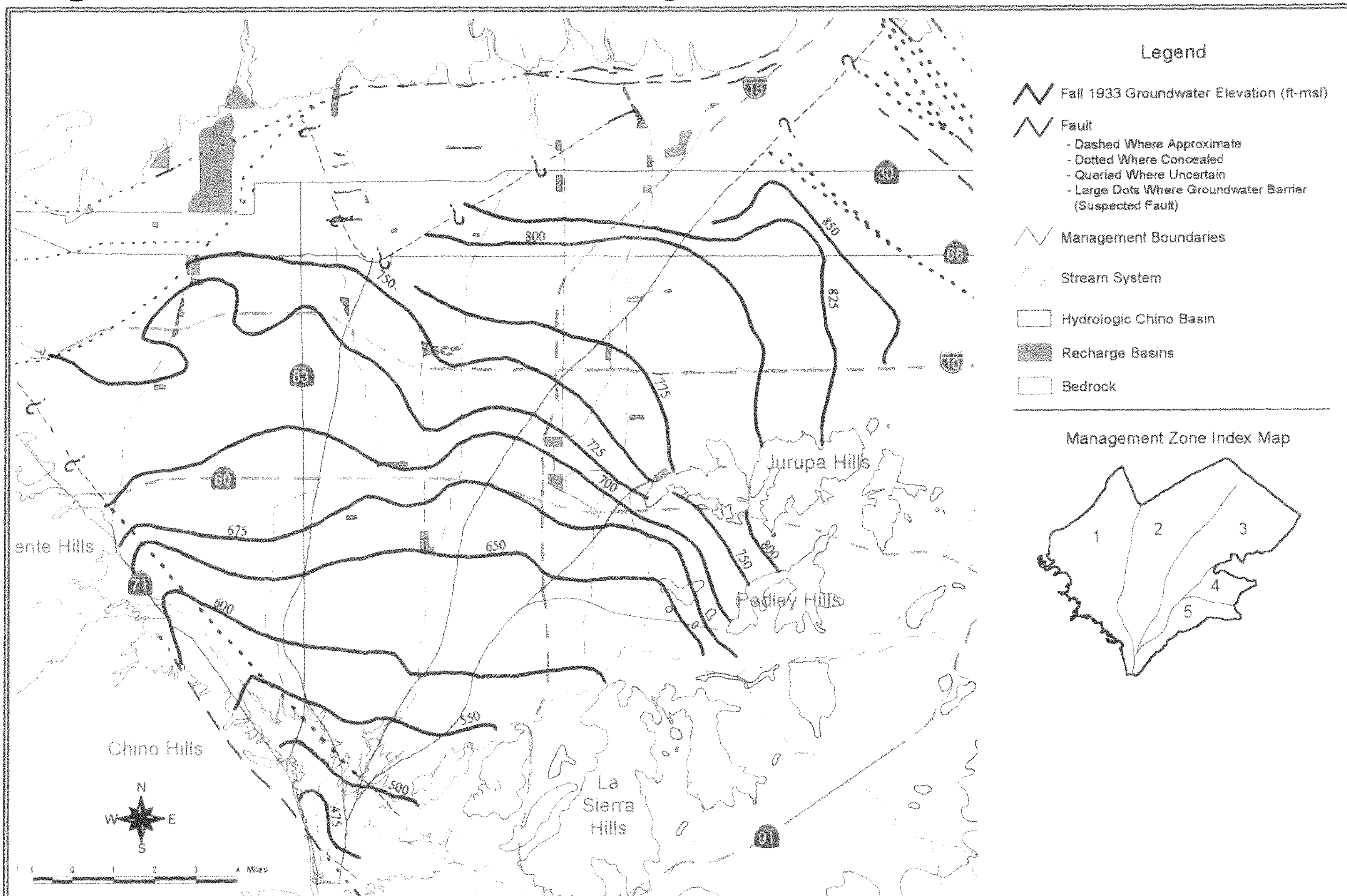


FALL 1997 GROUNDWATER ELEVATION MAP

Source: OBMP Phase I Report, Figure 2-19

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-15

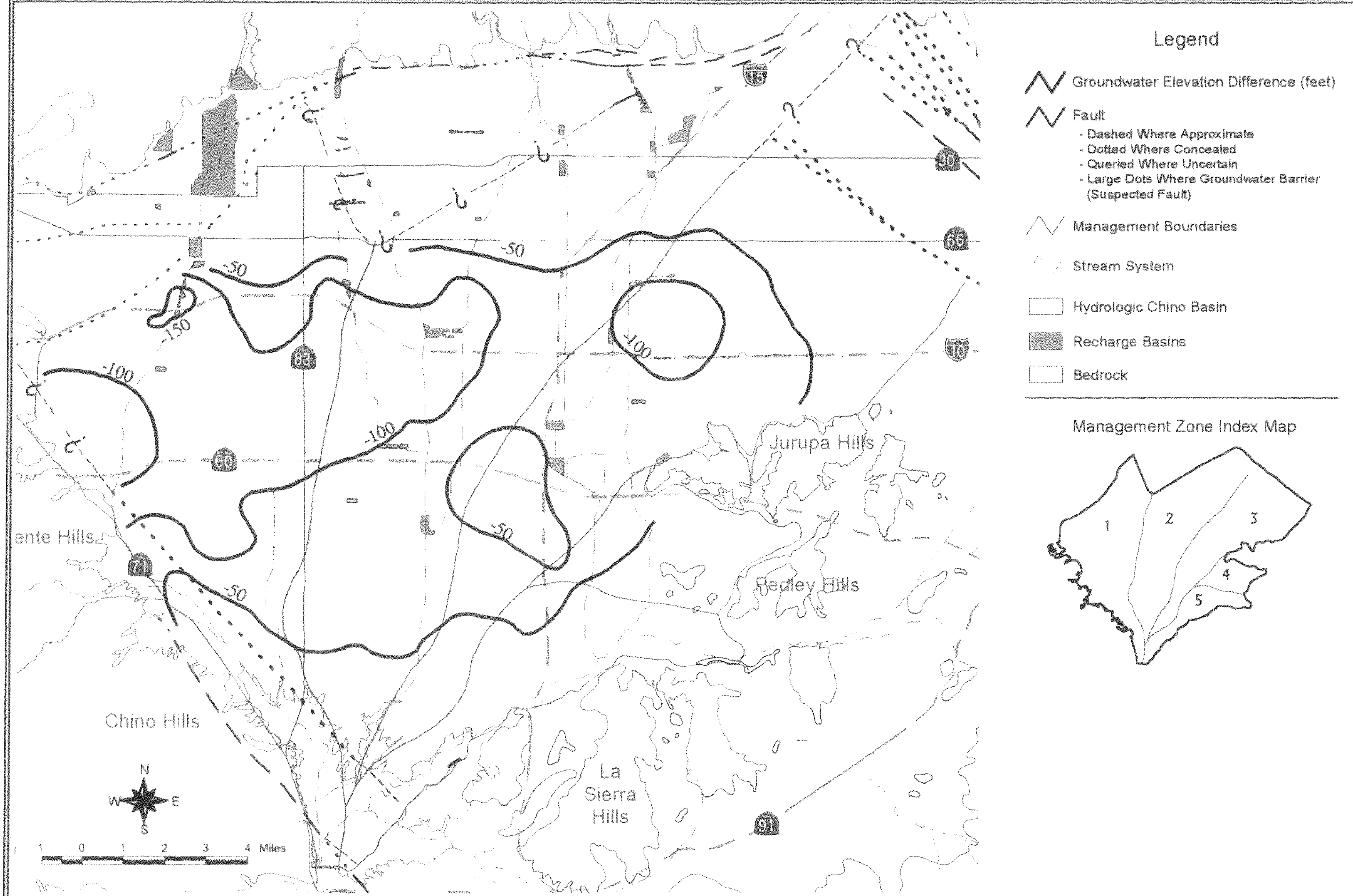


FALL 1993 GROUNDWATER ELEVATION MAP

Source: OBMP Phase I Report, Figure 2-20

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-16

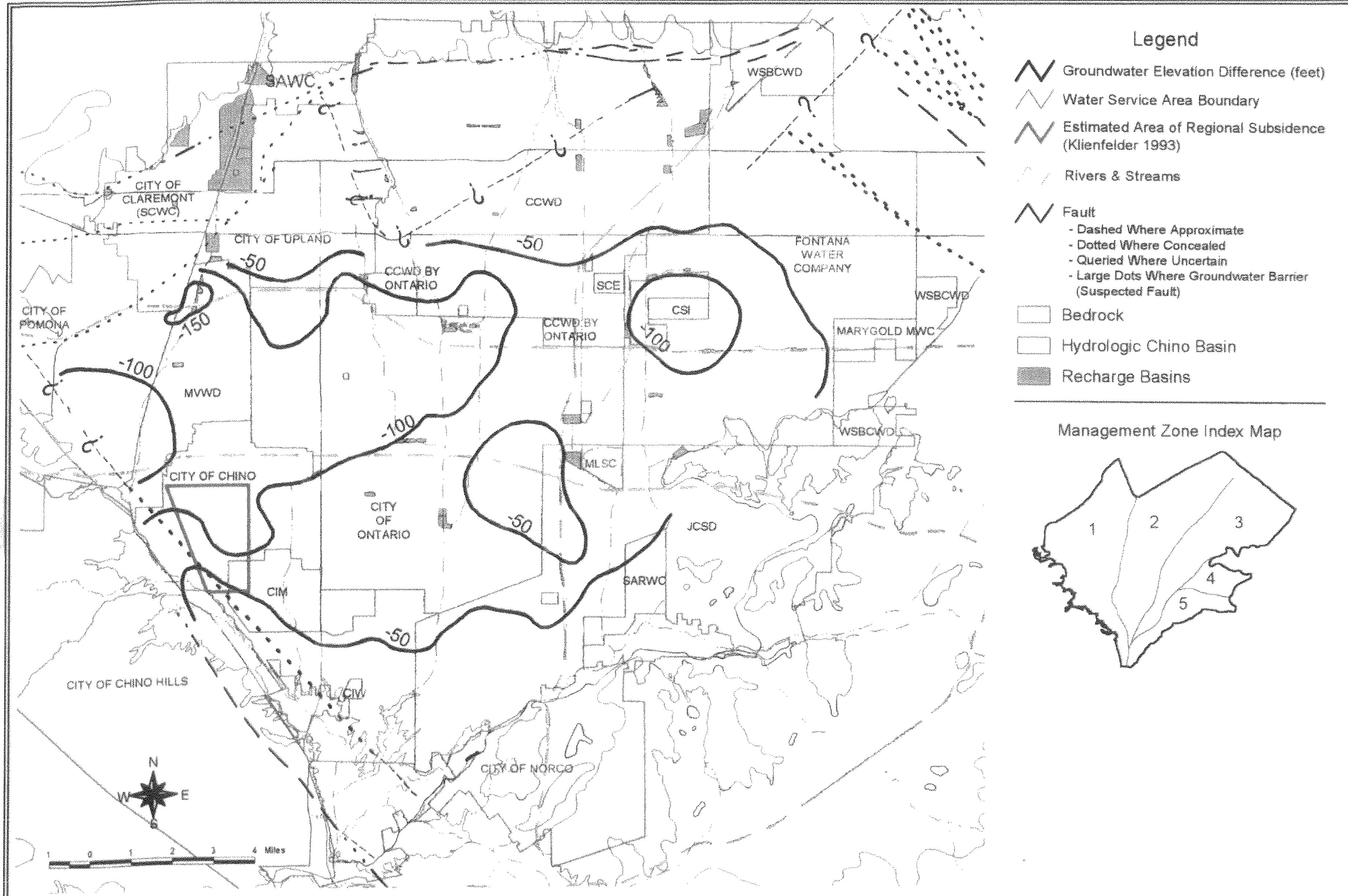


GROUNDWATER LEVEL CHANGE BETWEEN FALL 1933 - FALL 1997 WITH MANAGEMENT ZONE BOUNDARIES

Source: OBMP Phase I Report, Figure 2-21

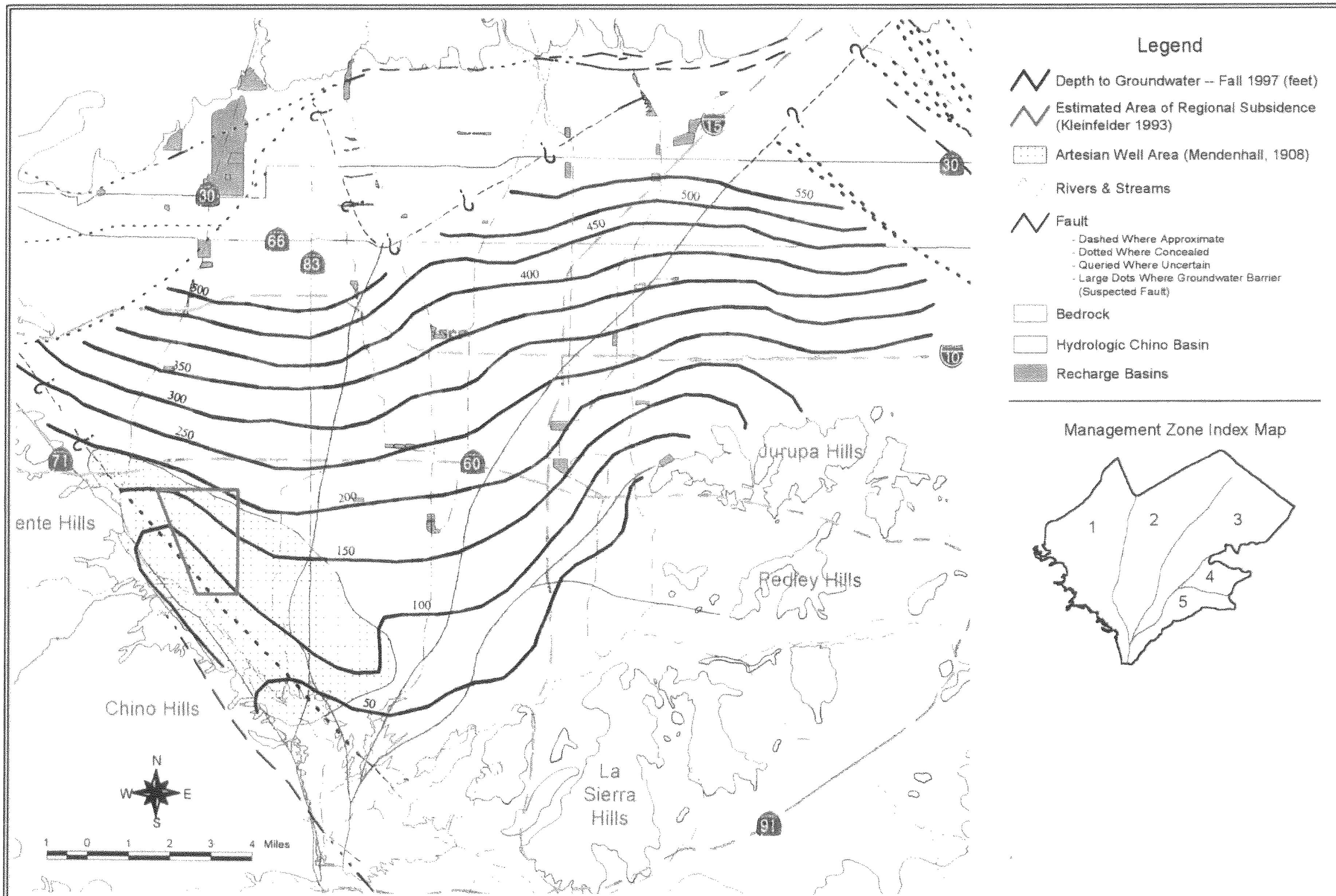
TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-17



GROUNDWATER LEVEL CHANGE BETWEEN FALL 1933 - FALL 1997 WITH WATER SERVICE AREAS	TOM DODSON & ASSOCIATES Environmental Consultants	FIGURE 4.5-18

Source: OBMP Phase I Report, Figure 2-22

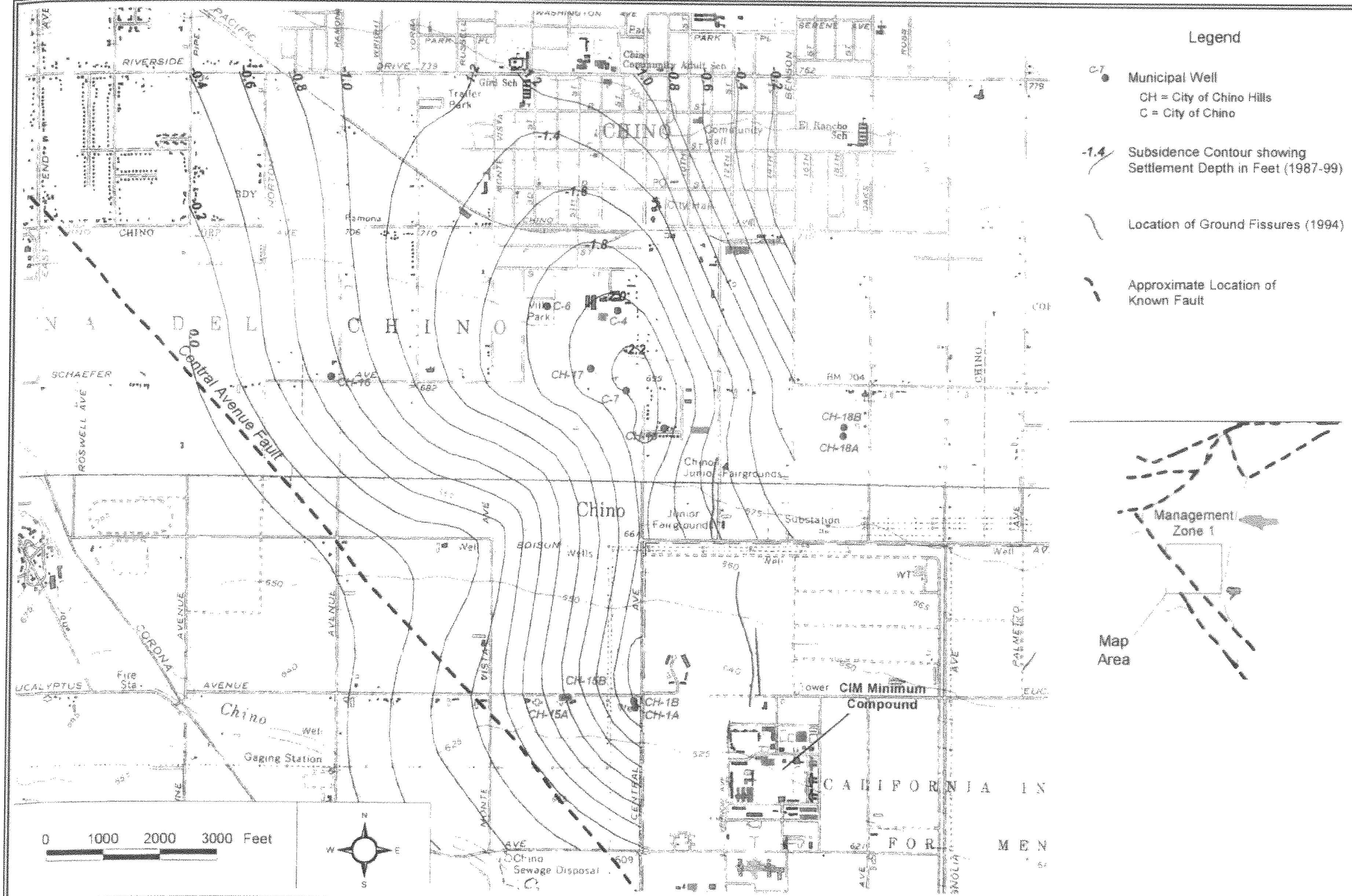


DEPTH TO WATER FOR 1997 AND ARTESIAN AREA IN 1902

Source: OBMP Phase I Report, Figure 2-23

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-19

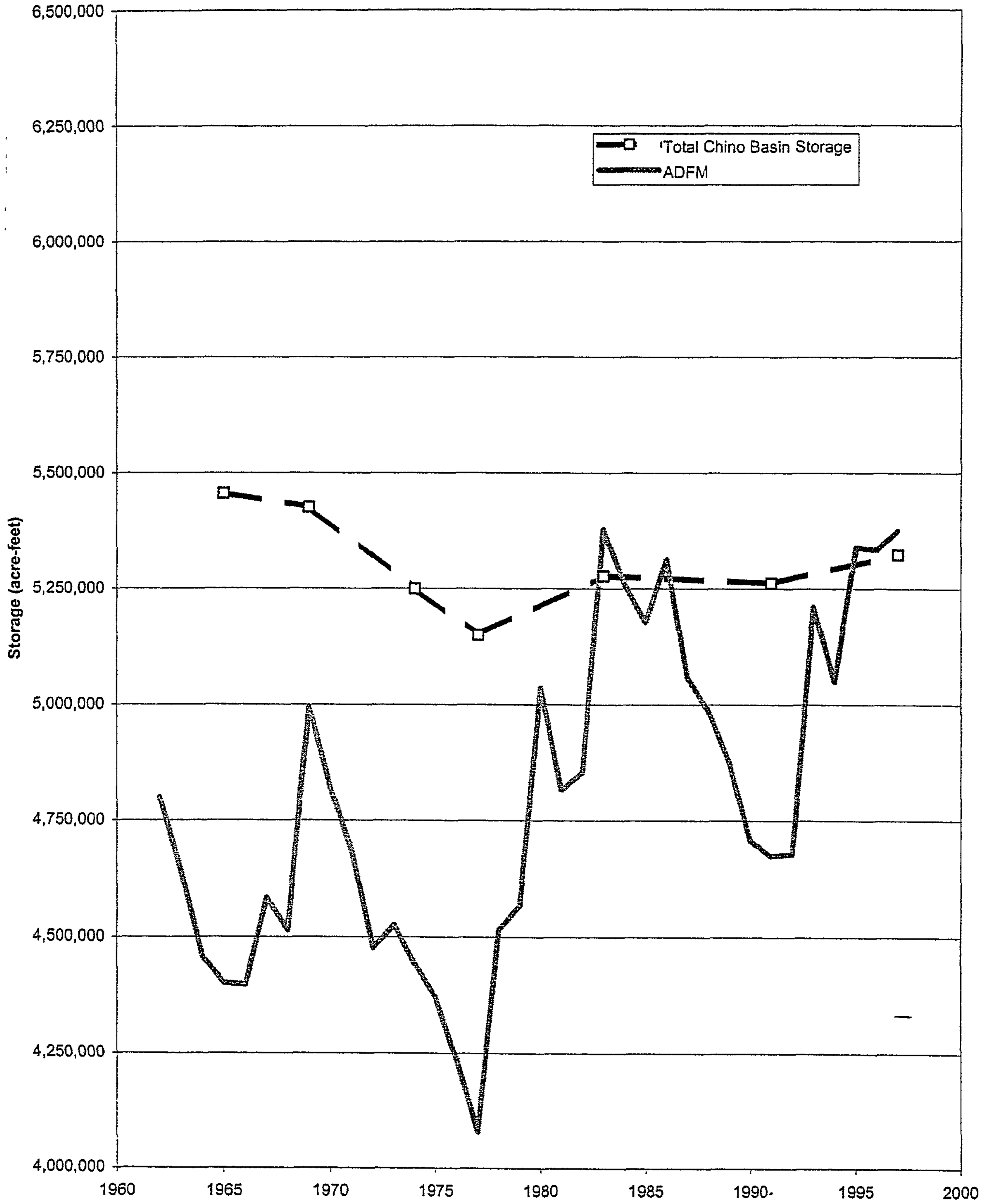


SUBSIDENCE CONTOURS AND GROUND FISSURES IN THE CHINO AREA

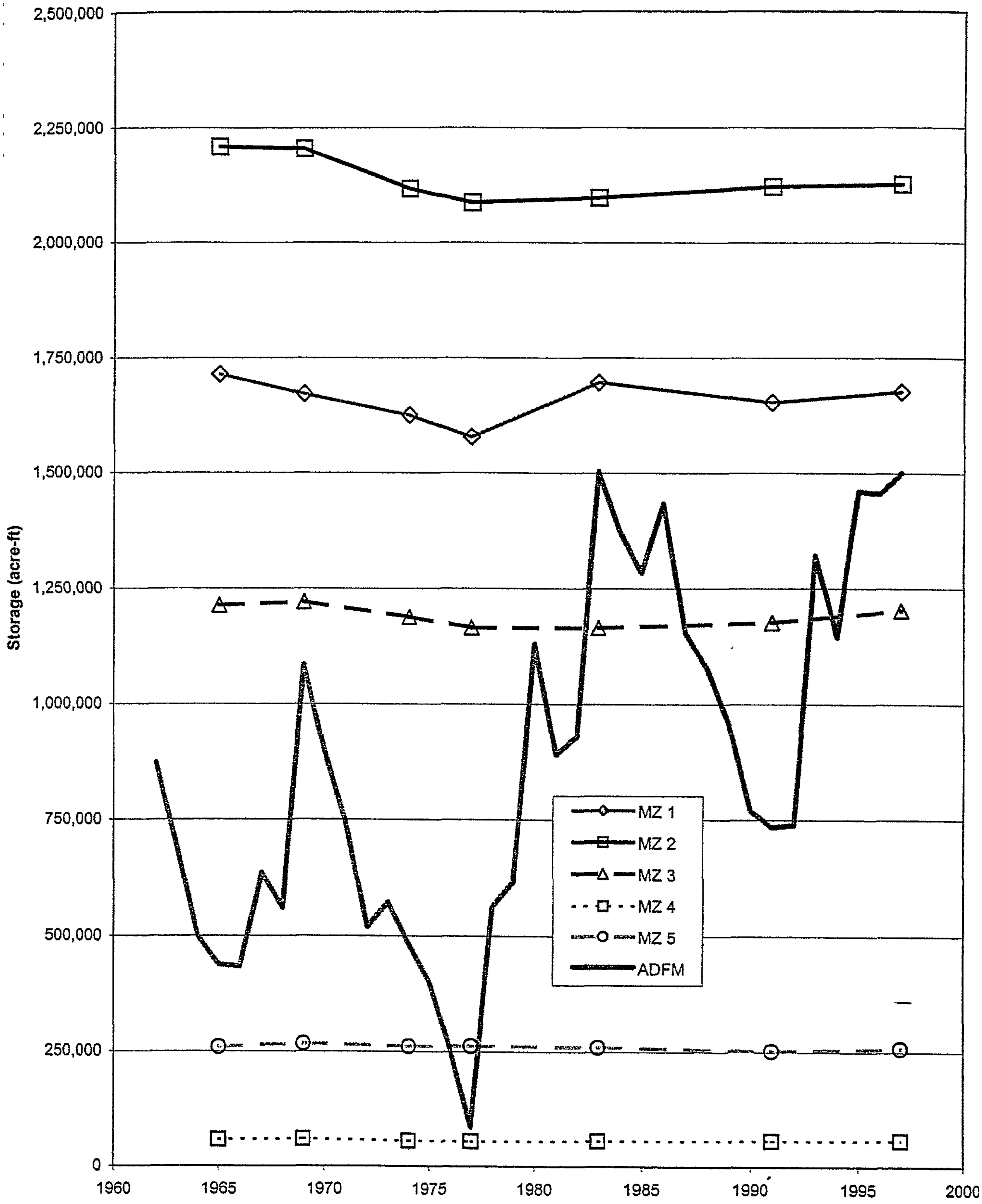
Source: OBMP Phase I Report, Figure 2-24

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-20



ESTIMATED GROUNDWATER STORAGE IN THE CHINO BASIN FROM 1965-1997 Source: OBMP Phase I Report, Figure 2-25	**TOM DODSON & ASSOCIATES** Environmental Consultants	**FIGURE 4.5-21**

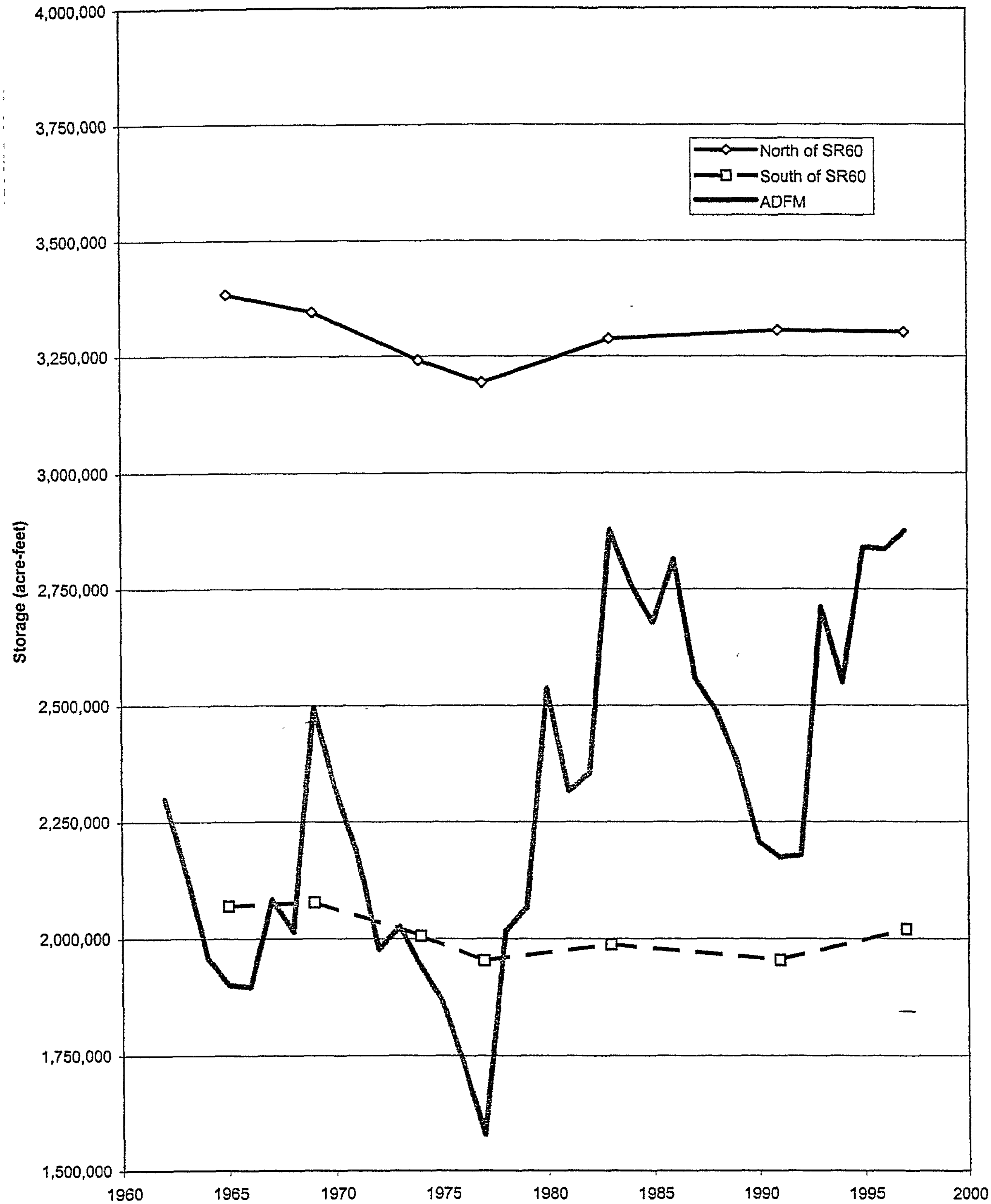


Estimated Groundwater Storage In the Chino Basin Management Zones

Source: OBMP Phase I Report, Figure 2-26

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-22

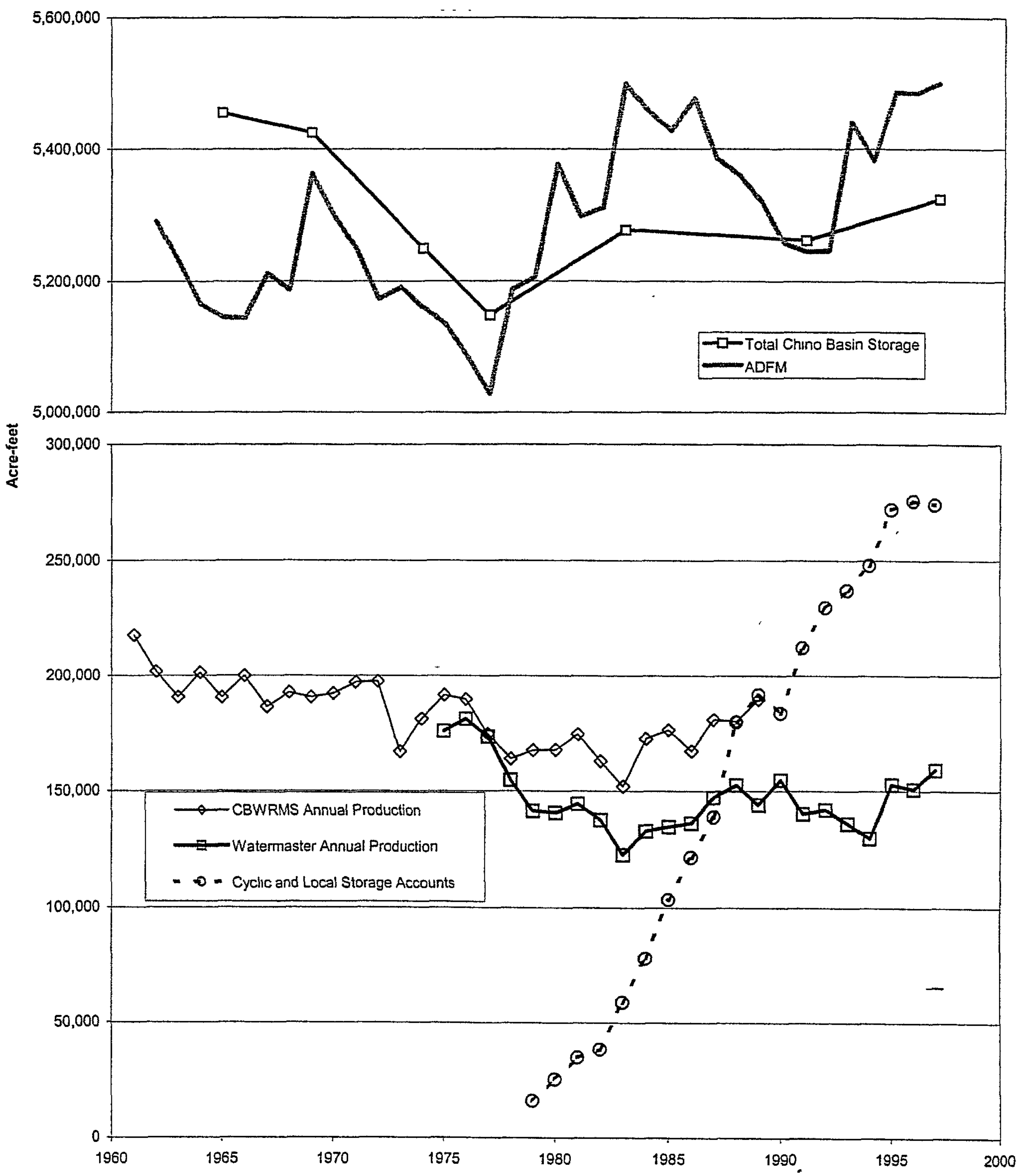


Estimated Groundwater Storage In the Chino Basin North and South of State Route 60 from 1965-1997

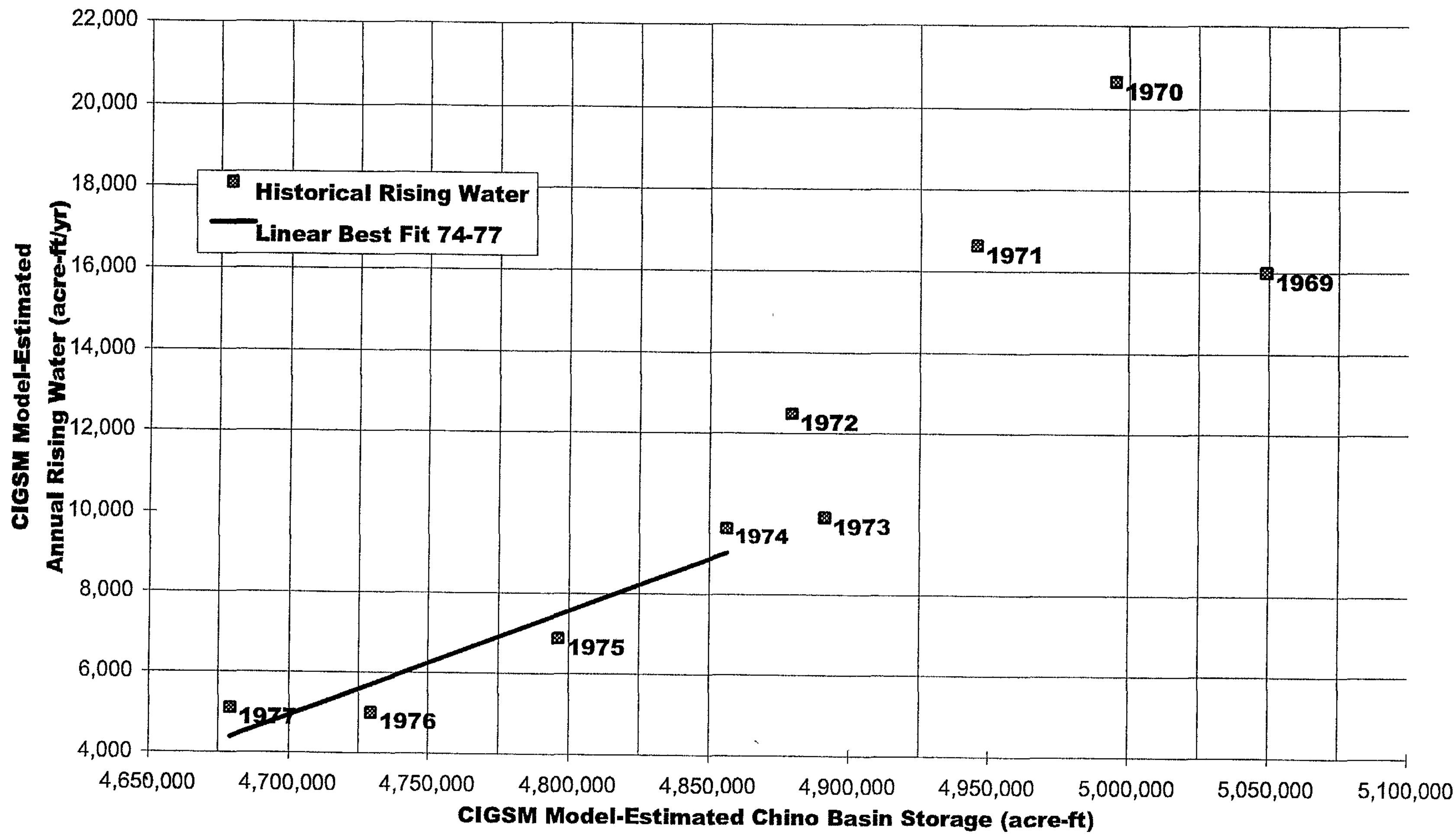
Source. OBMP Phase I Report, Figure 2-27

TOM DODSON & ASSOCIATES
Environmental Consultants

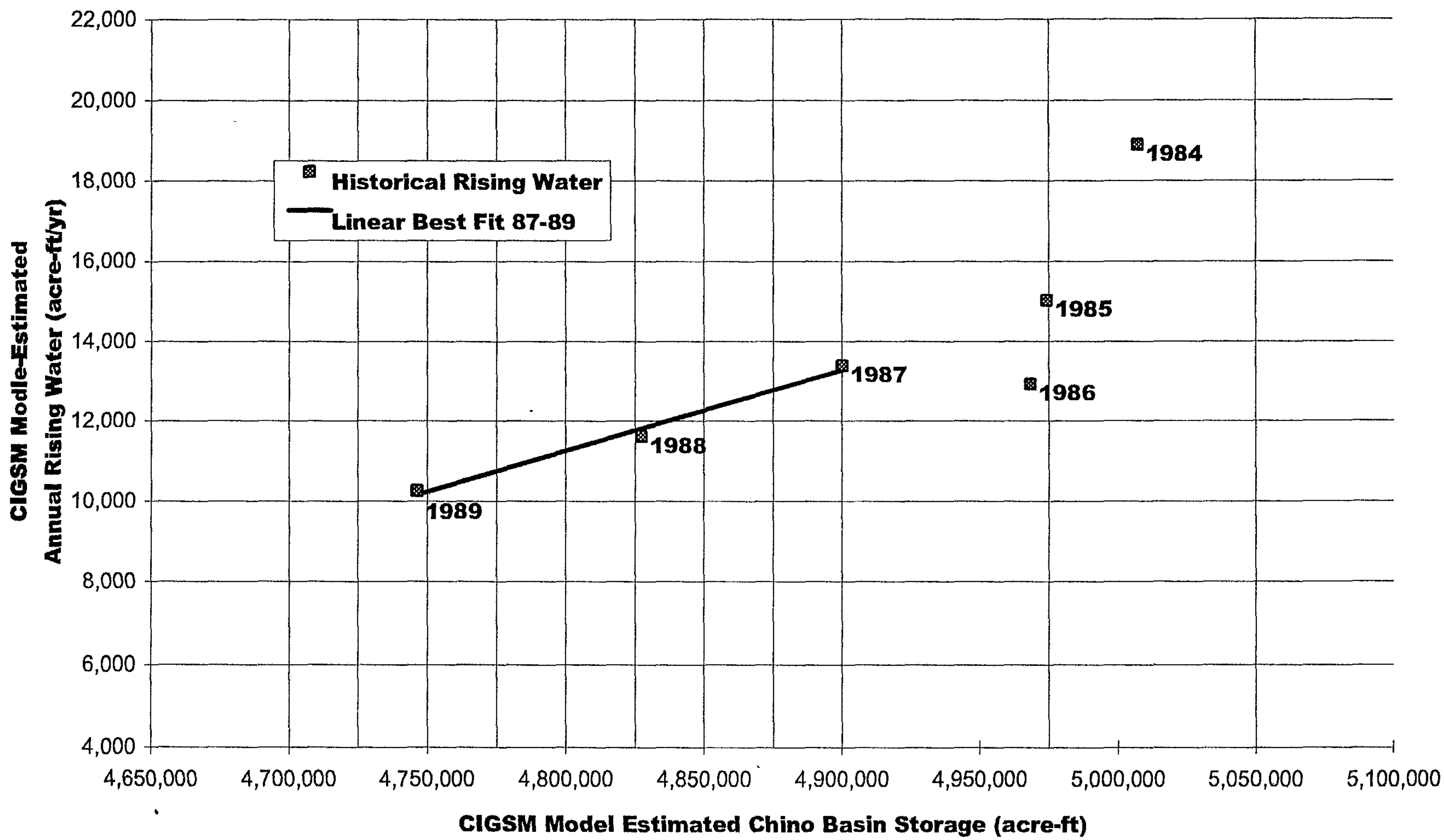
FIGURE 4.5-23



Estimated Groundwater Storage Compared to Average Production and Storage Accounts in the Chino Basin 1965-1997 Source: OBMP Phase I Report, Figure 2-28	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.5-24**



HISTORICAL STORAGE - RISING WATER RELATIONSHIP **1969 THROUGH 1977** Source: Wildermuth Environmental, Inc.	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.5-25**

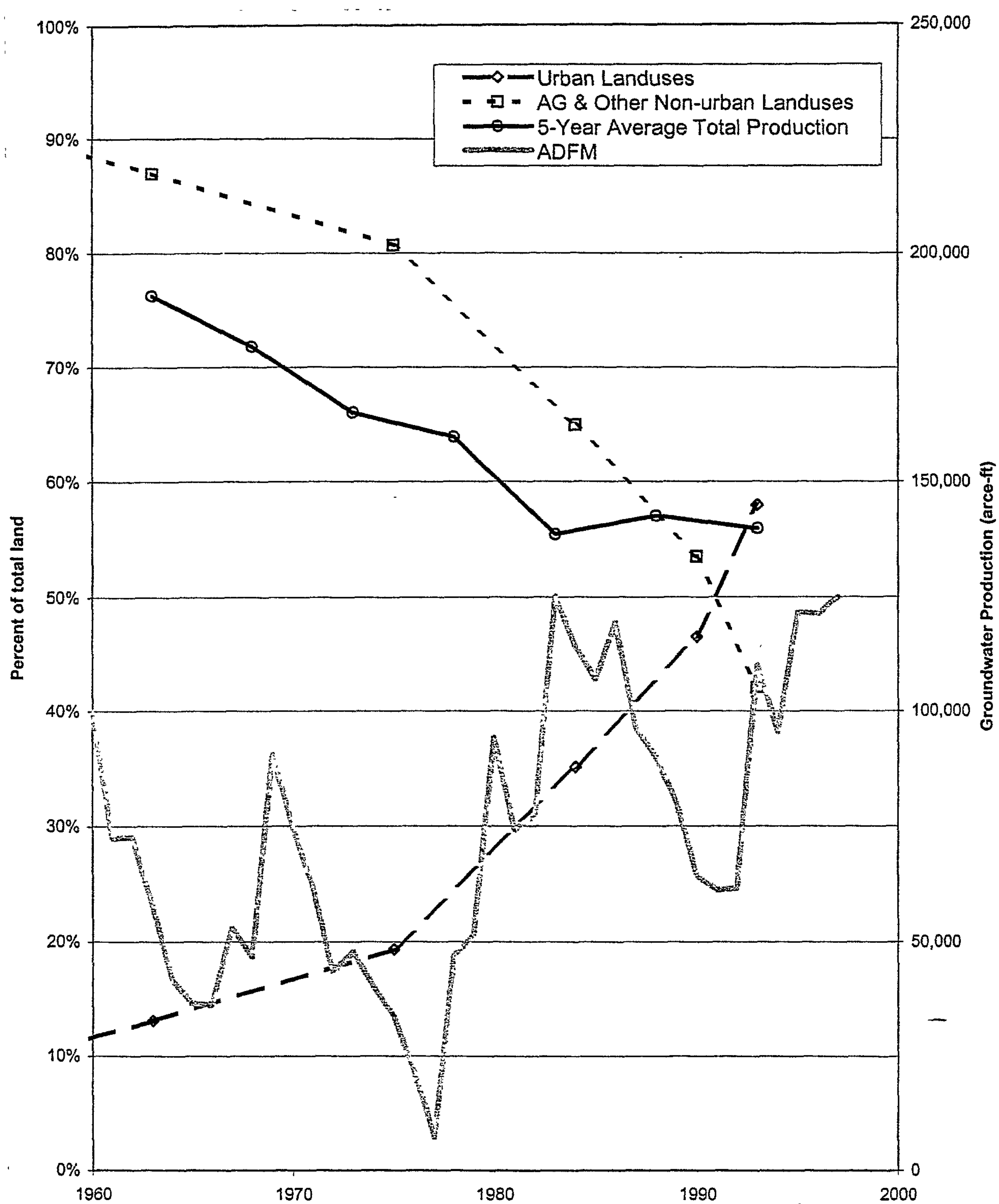


HISTORICAL STORAGE - RISING WATER RELATIONSHIP
1984 THROUGH 1989

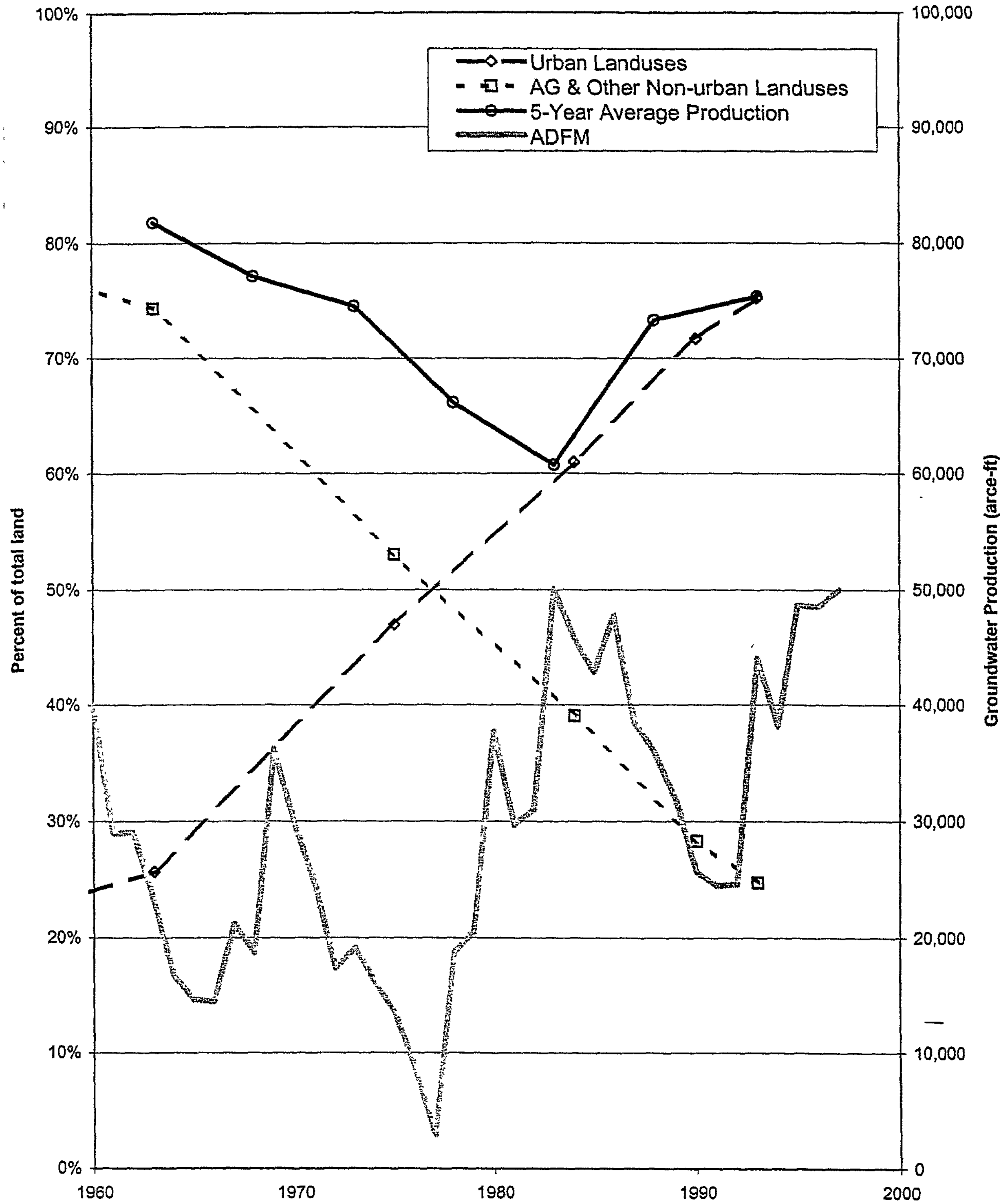
Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

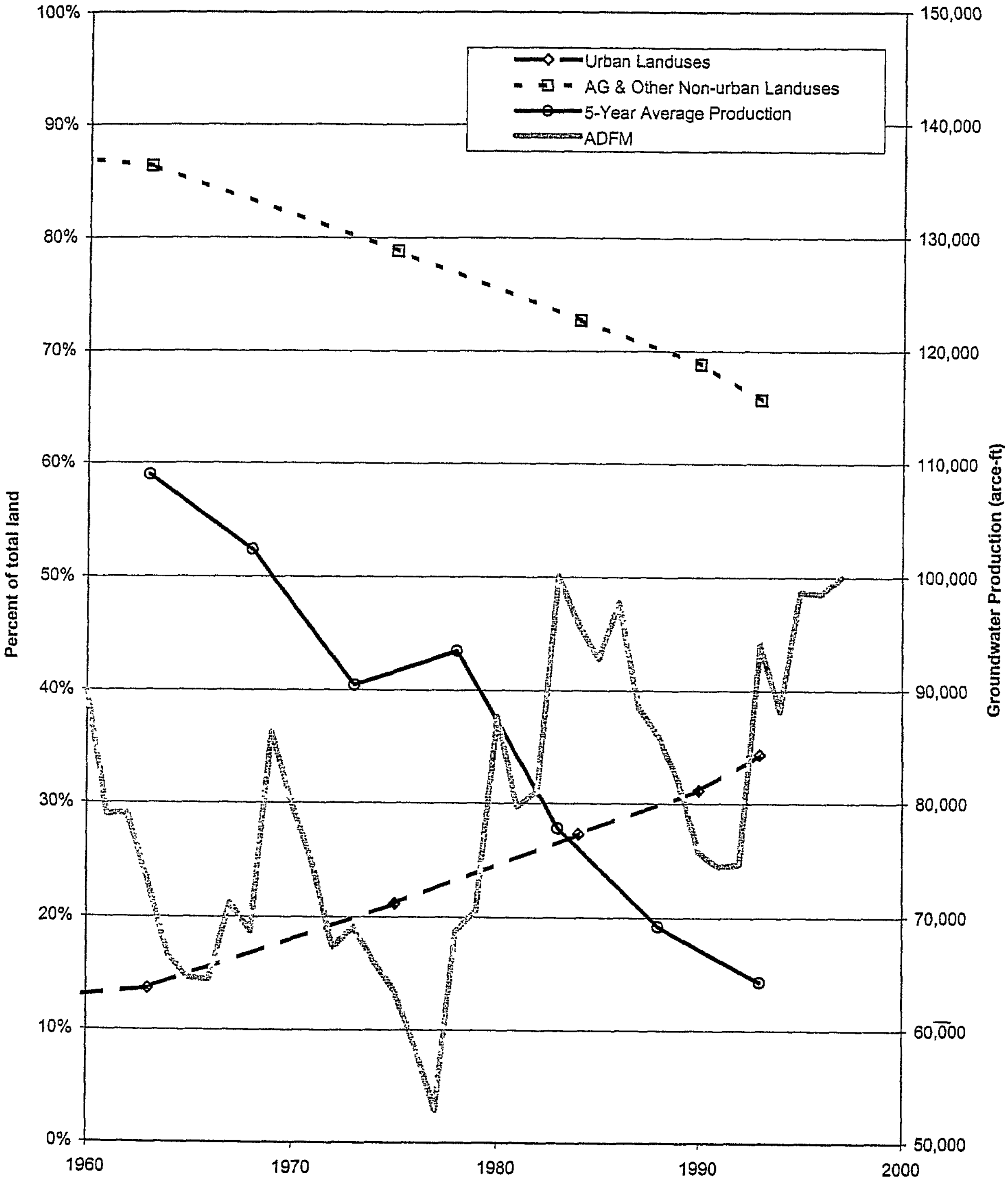
FIGURE 4.5-26



Estimated Groundwater Production in the Chino Basin Compared to Climate and Land Use Source. OBMP Phase I Report, Figure 2-29	**TOM DODSON & ASSOCIATES** Environmental Consultants	**FIGURE 4.5-27**



Estimated Groundwater Production in the Chino Basin North of SR-60 Compared to Climate and Land Use Source: OBMP Phase I Report, Figure 2-30	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.5-28**

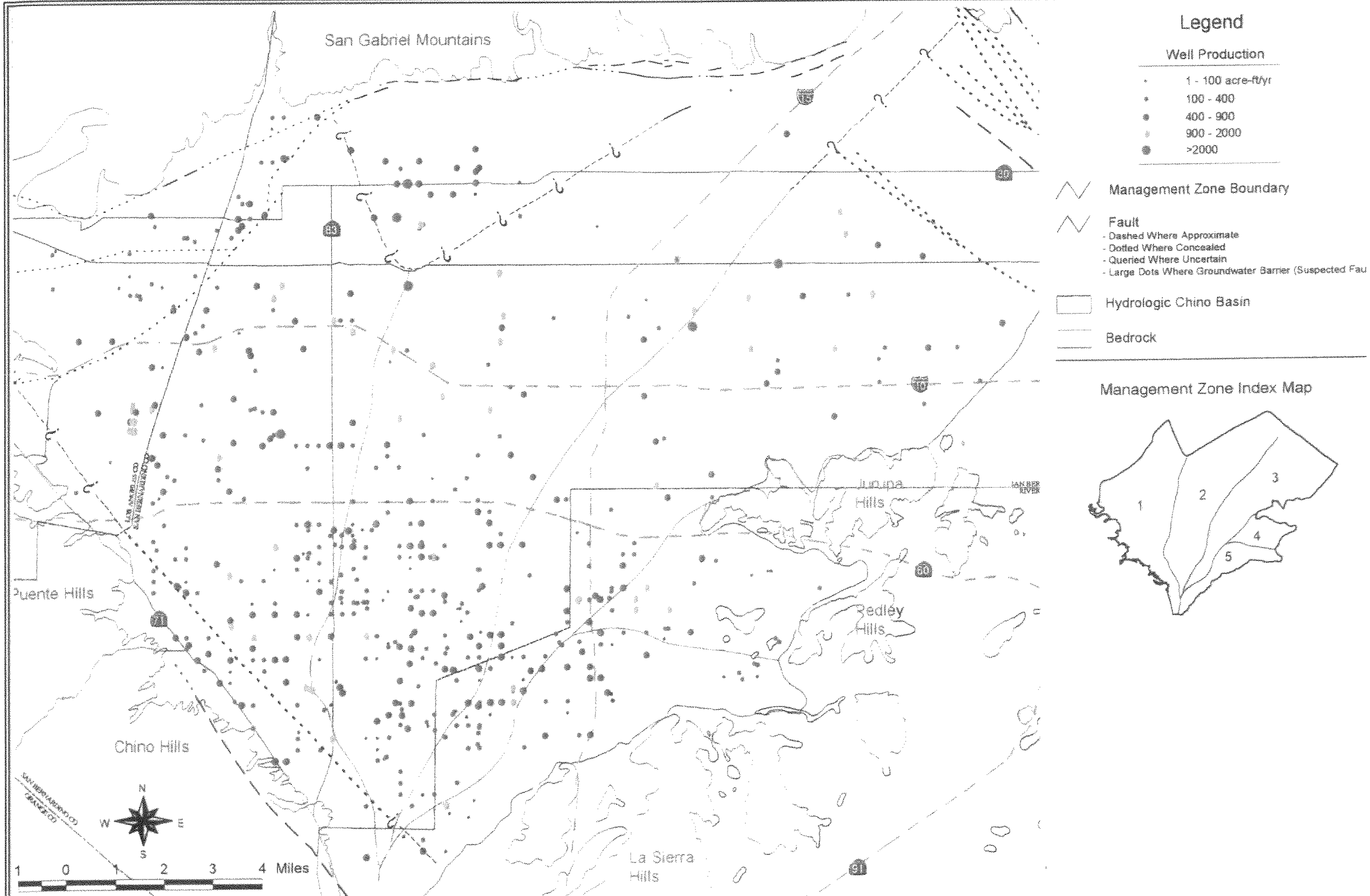


Estimated Groundwater Production in the Chino Basin South of SR-60 Compared to Climate and Land Use

Source. OBMP Phase I Report, Figure 2-31

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-29

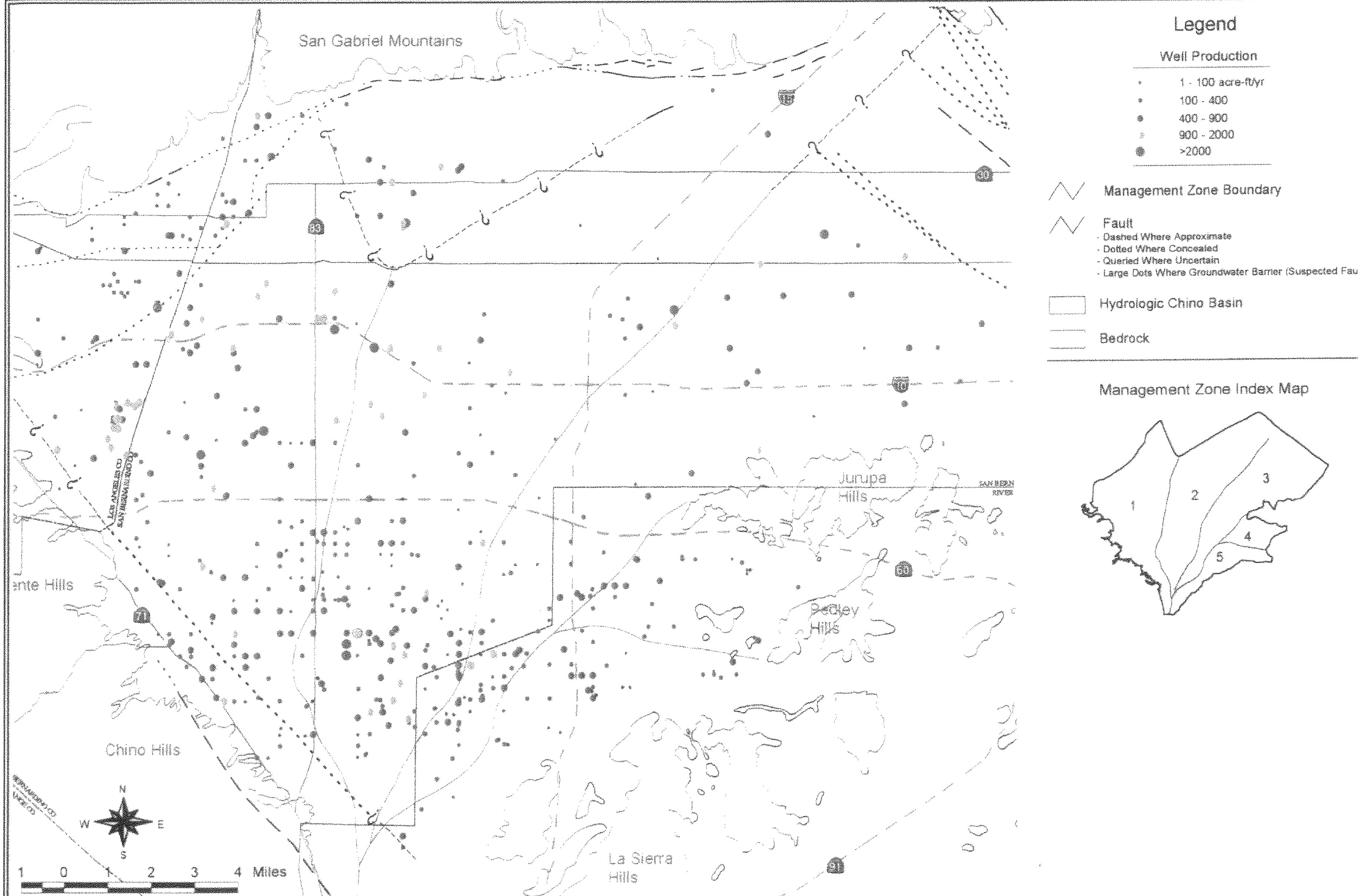


1961 ANNUAL PRODUCTION ESTIMATES BY WELLS FROM CBWRMS

Source: OBMP Phase I Report, Figure 2-32

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-30

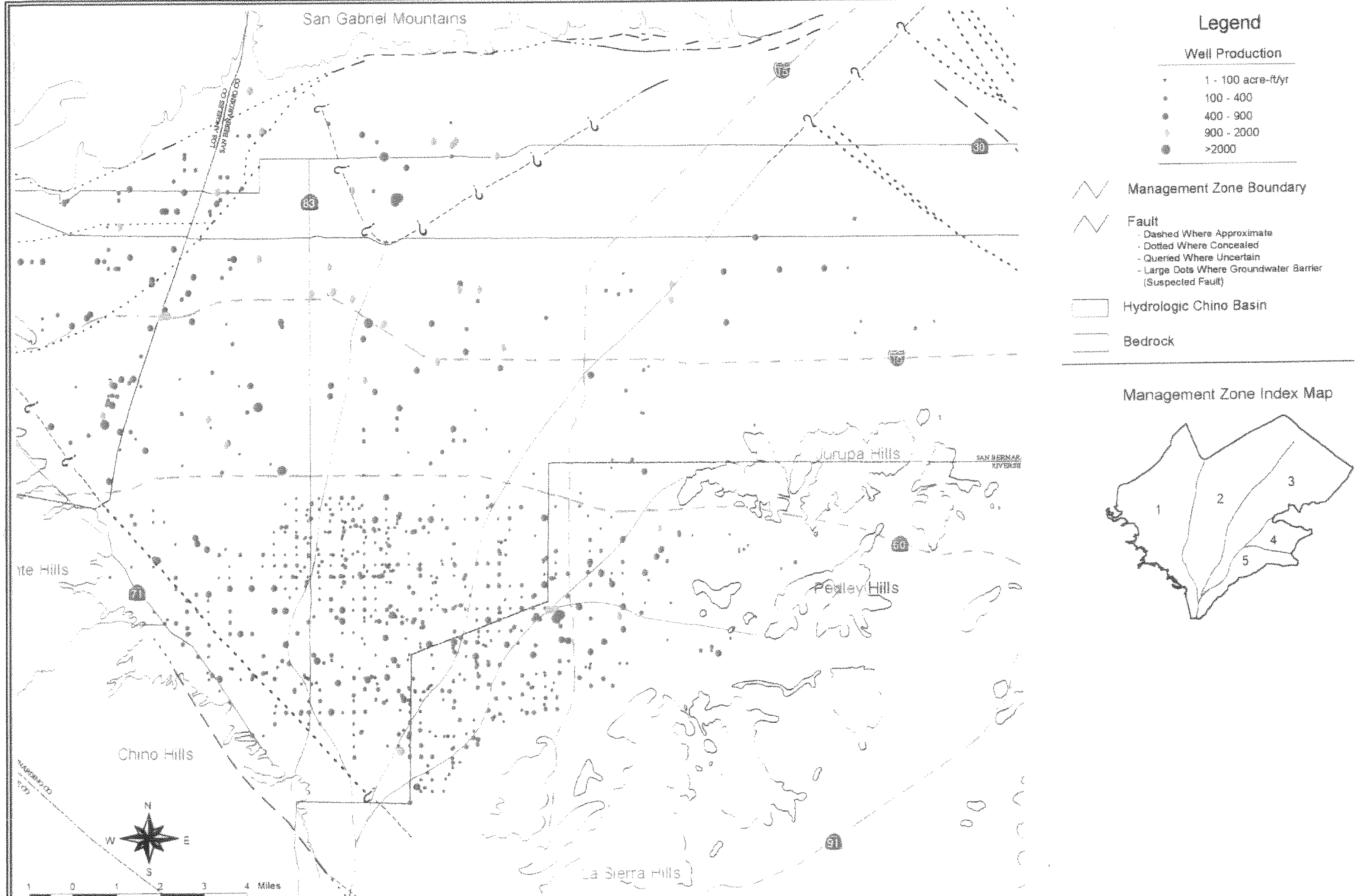


1971 ANNUAL PRODUCTION ESTIMATES BY WELL FROM CBWRMS

Source: OBMP Phase I Report, Figure 2-33

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-31

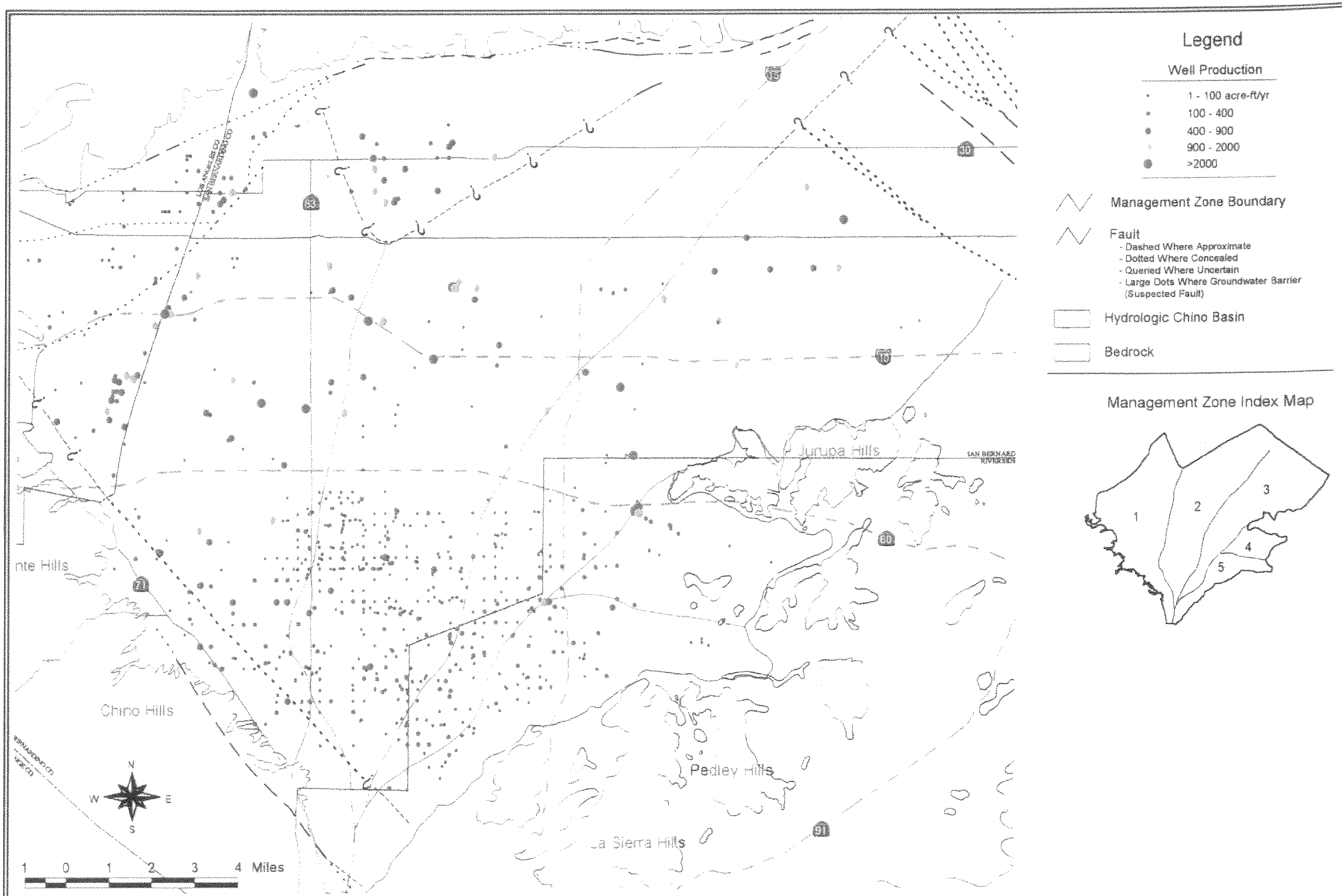


1981 ANNUAL PRODUCTION ESTIMATES BY WELL FROM CBWRMS

Source: OBMP Phase I Report, Figure 2-34

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-32

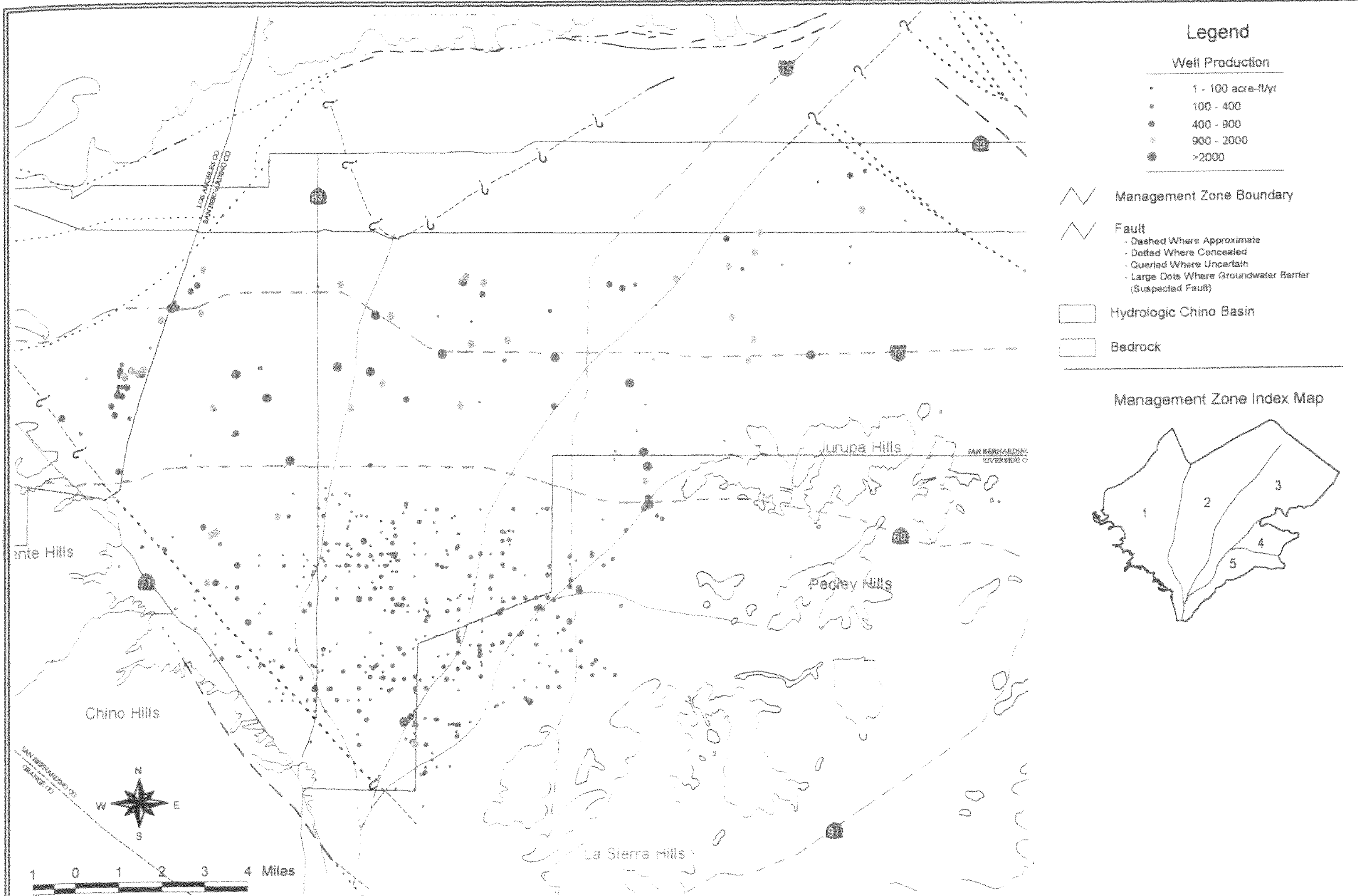


1989 ANNUAL PRODUCTION ESTIMATES BY WELL FROM CBWRMS

Source: OBMP Phase I Report, Figure 2-35

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-33



1998 ANNUAL PRODUCTION ESTIMATES BY WELL FROM WATERMASTER

Source: OBMP Phase I Report, Figure 2-36

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-34

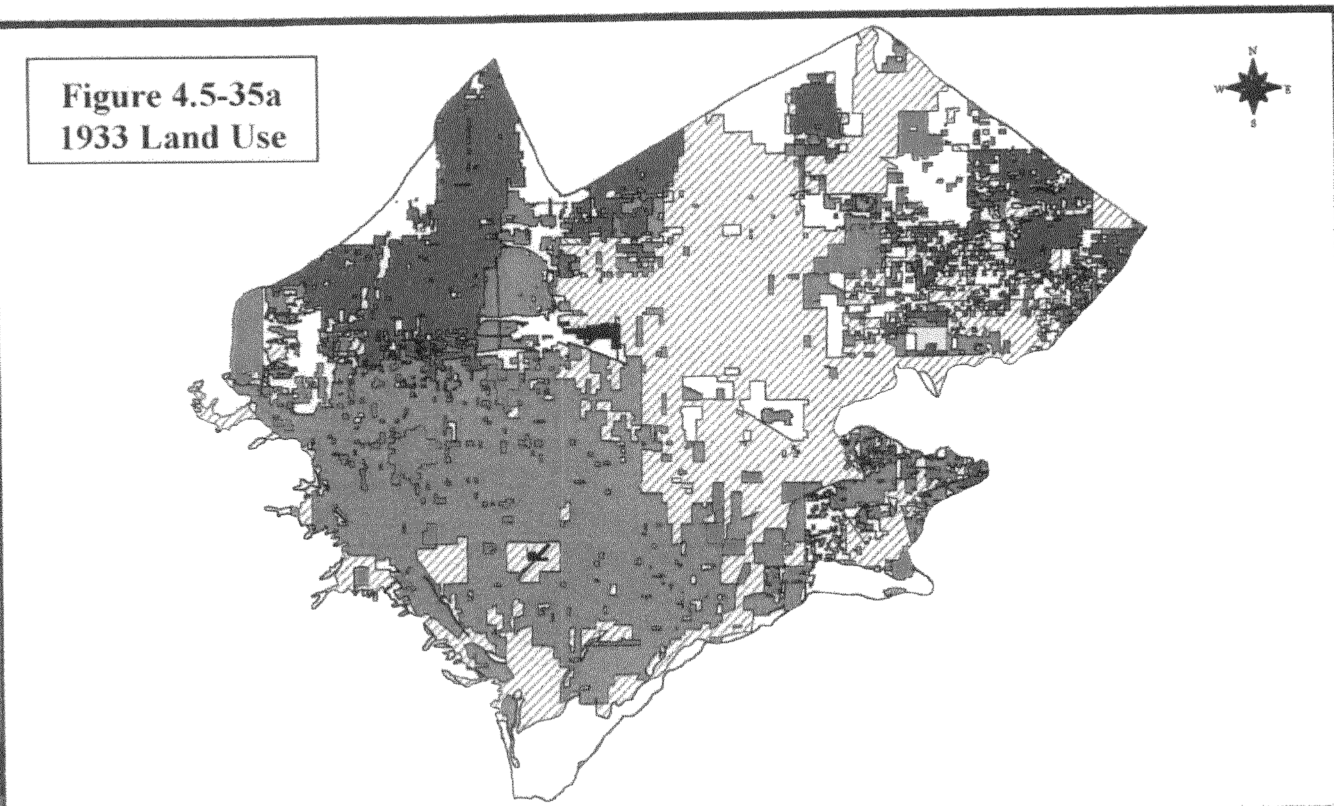


Figure 4.5-35a
1933 Land Use

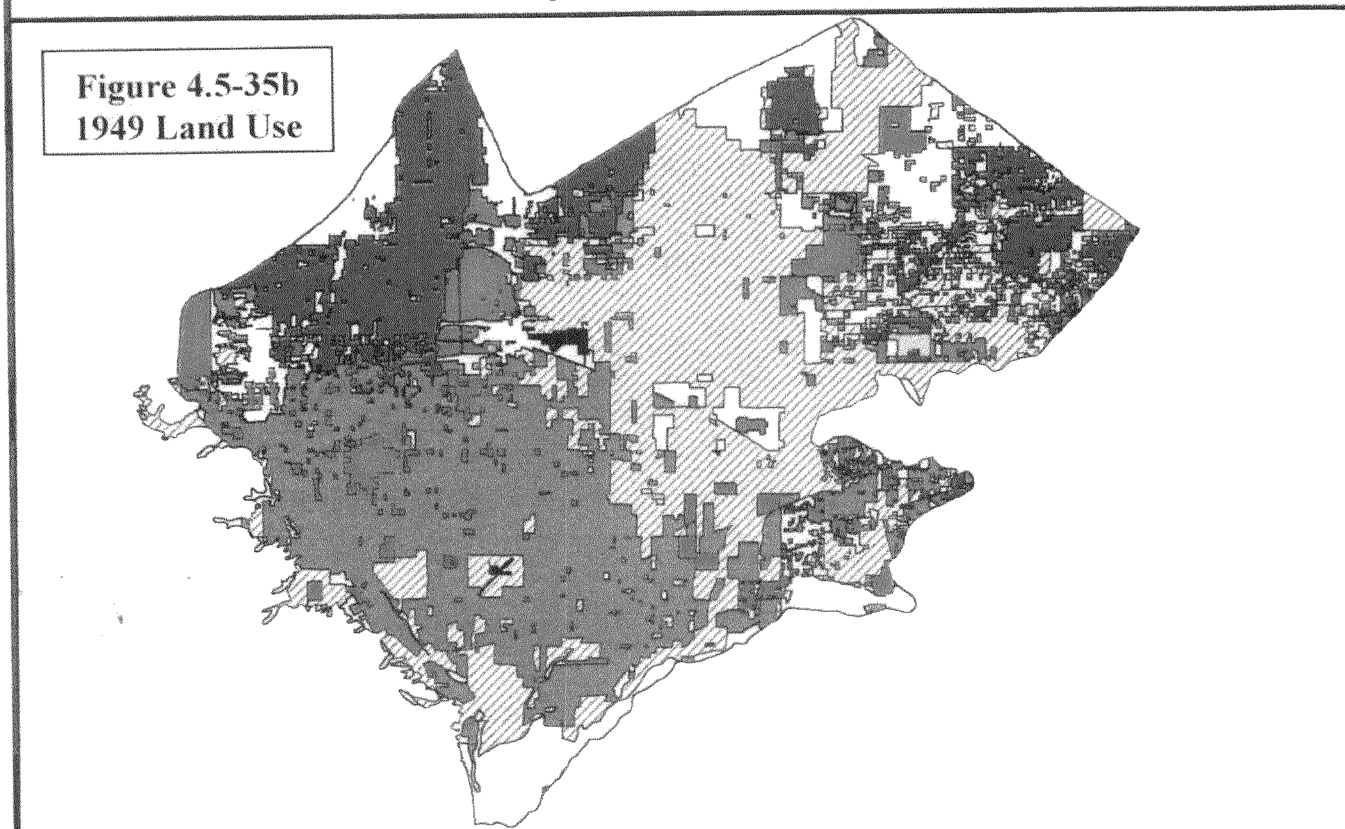


Figure 4.5-35b
1949 Land Use

- Non-Irrigated Fieldcrops, Pasture
- Irrigated Fieldcrops, Pasture
- Irrigated and Non-Irrigated Citrus
- Irrigated Vineyards
- Non-Irrigated Vineyards
- Dairies and Feedlots
- Urban, Residential, Commercial, Industrial, and Vacant
- Native Vegetation
- Special Impervious

TOM DODSON & ASSOCIATES
Environmental Consultants

Source: OBMP Phase I Report, Figure 2-37a-b

Figure 4.5-35c
1957 Land Use

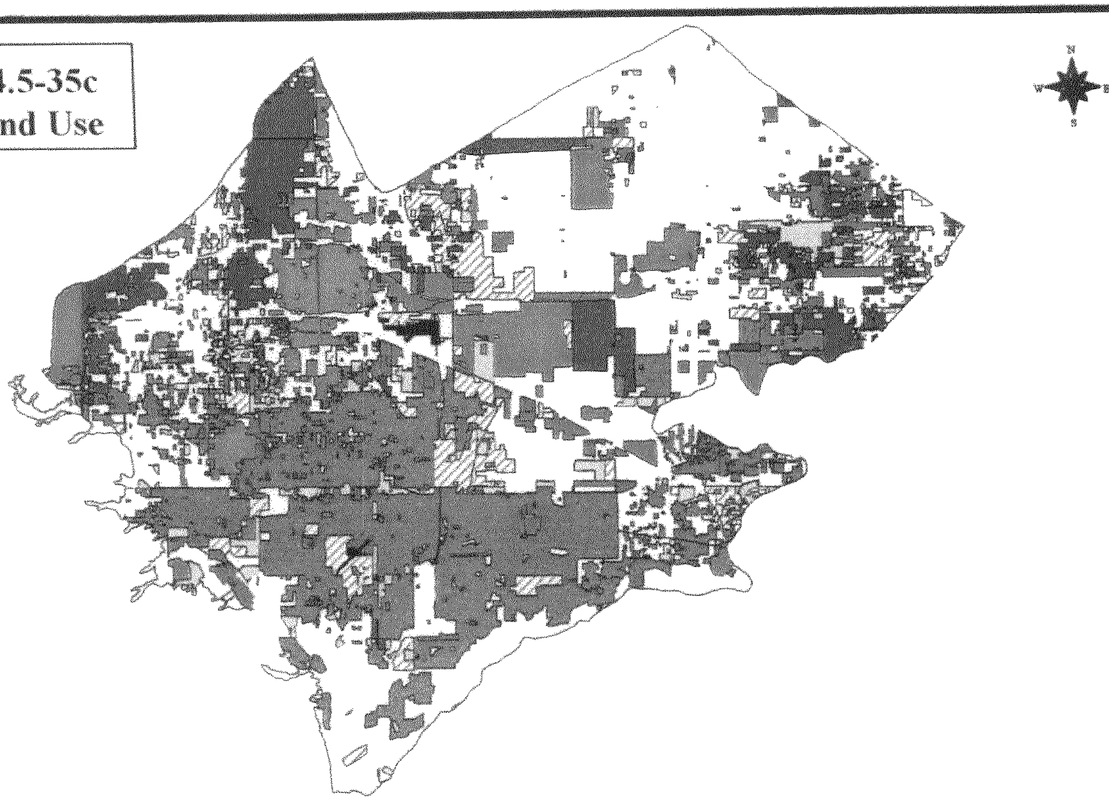


Figure 4.5-35d
1963 Land Use

Non-Irrigated Fieldcrops, Pasture	Dairies and Feedlots
Irrigated Fieldcrops, Pasture	Urban, Residential, Commercial, Industrial, and Vacant
Irrigated and Non-Irrigated Citrus	Native Vegetation
Irrigated Vineyards	Special Impervious
Non-Irrigated Vineyards	

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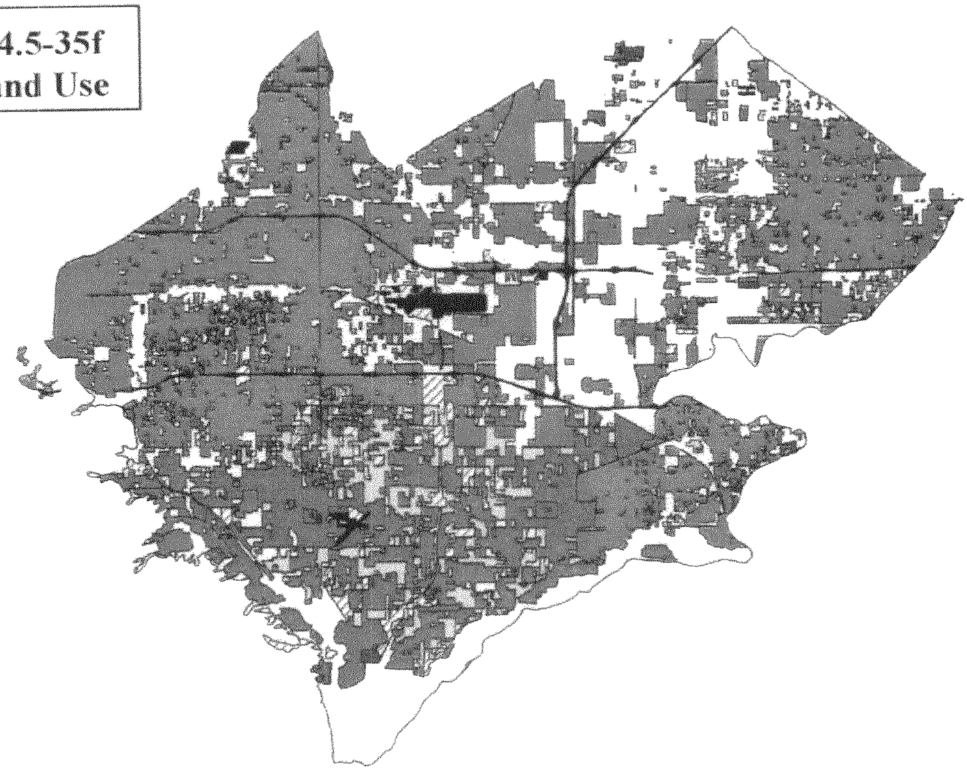
Environmental Consultants

Source: OBMP Phase I Report, Figure 2-37c-d

Figure 4.5-35e
1975 Land Use

Figure 4.5-35f
1984 Land Use



Non-Irrigated Fieldcrops, Pasture
Irrigated Fieldcrops, Pasture
Irrigated and Non-Irrigated Citrus
Irrigated Vineyards
Non-Irrigated Vineyards
Dairies and Feedlots
Urban, Residential, Commercial, Industrial, and Vacant
Native Vegetation
Special Impervious

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Source: OBMP Phase I Report, Figure 2-37e-f

Figure 4.5-35g
1990 Land Use

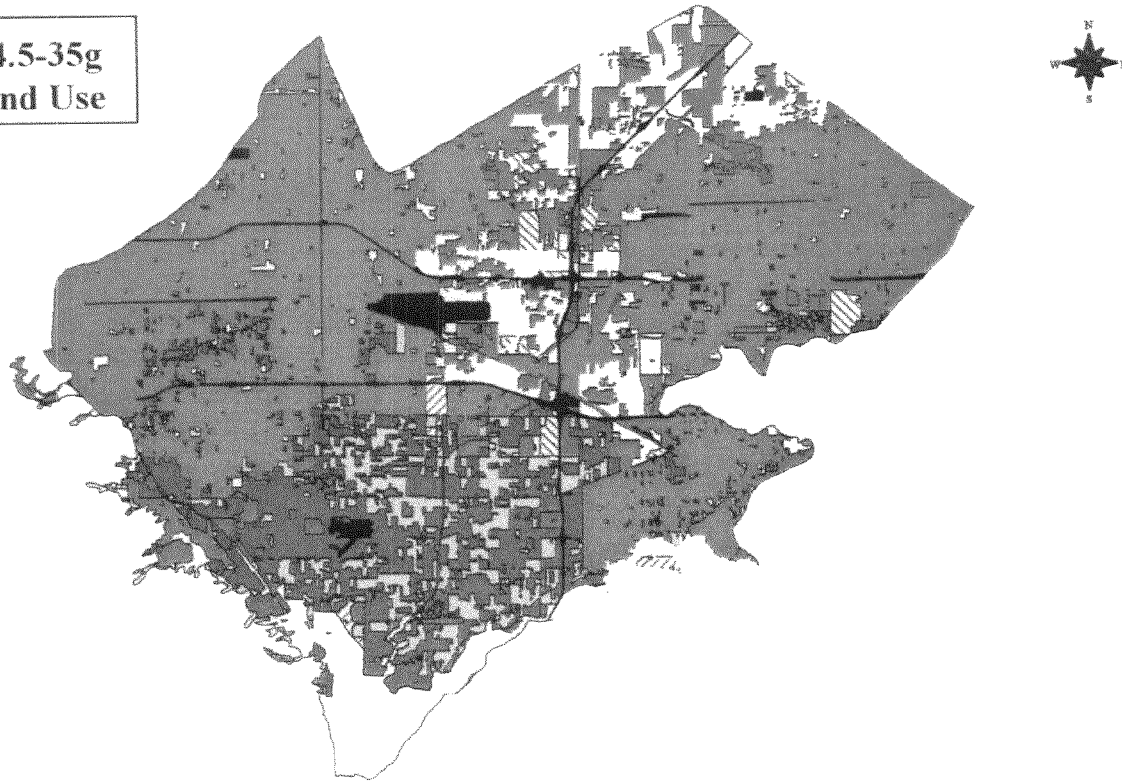
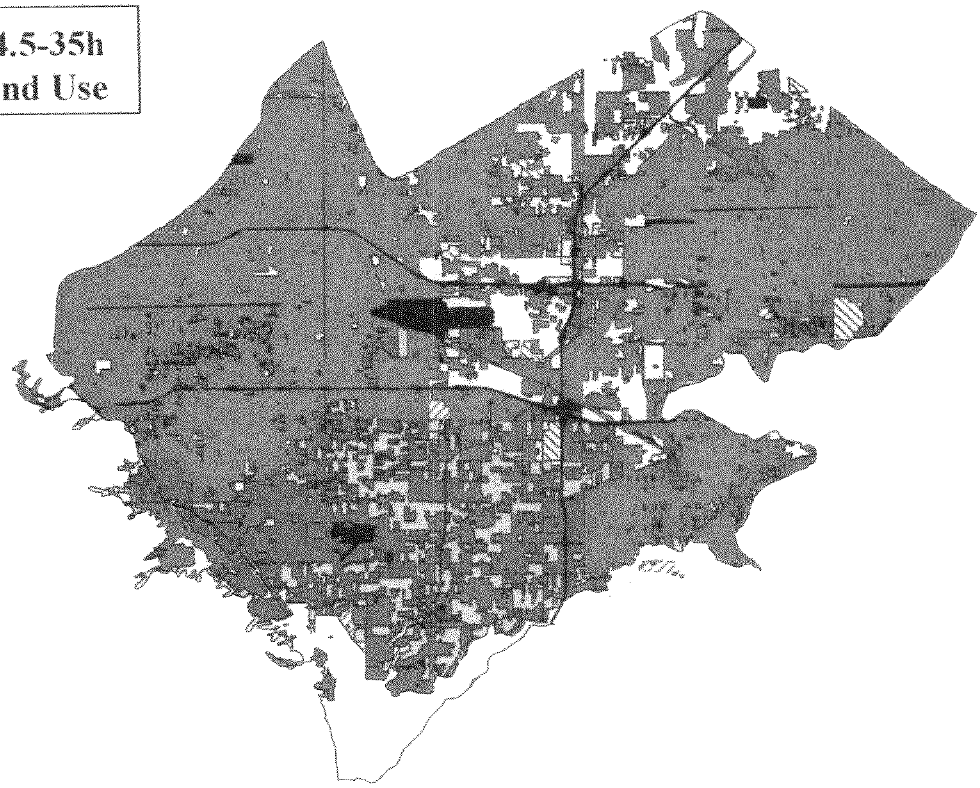


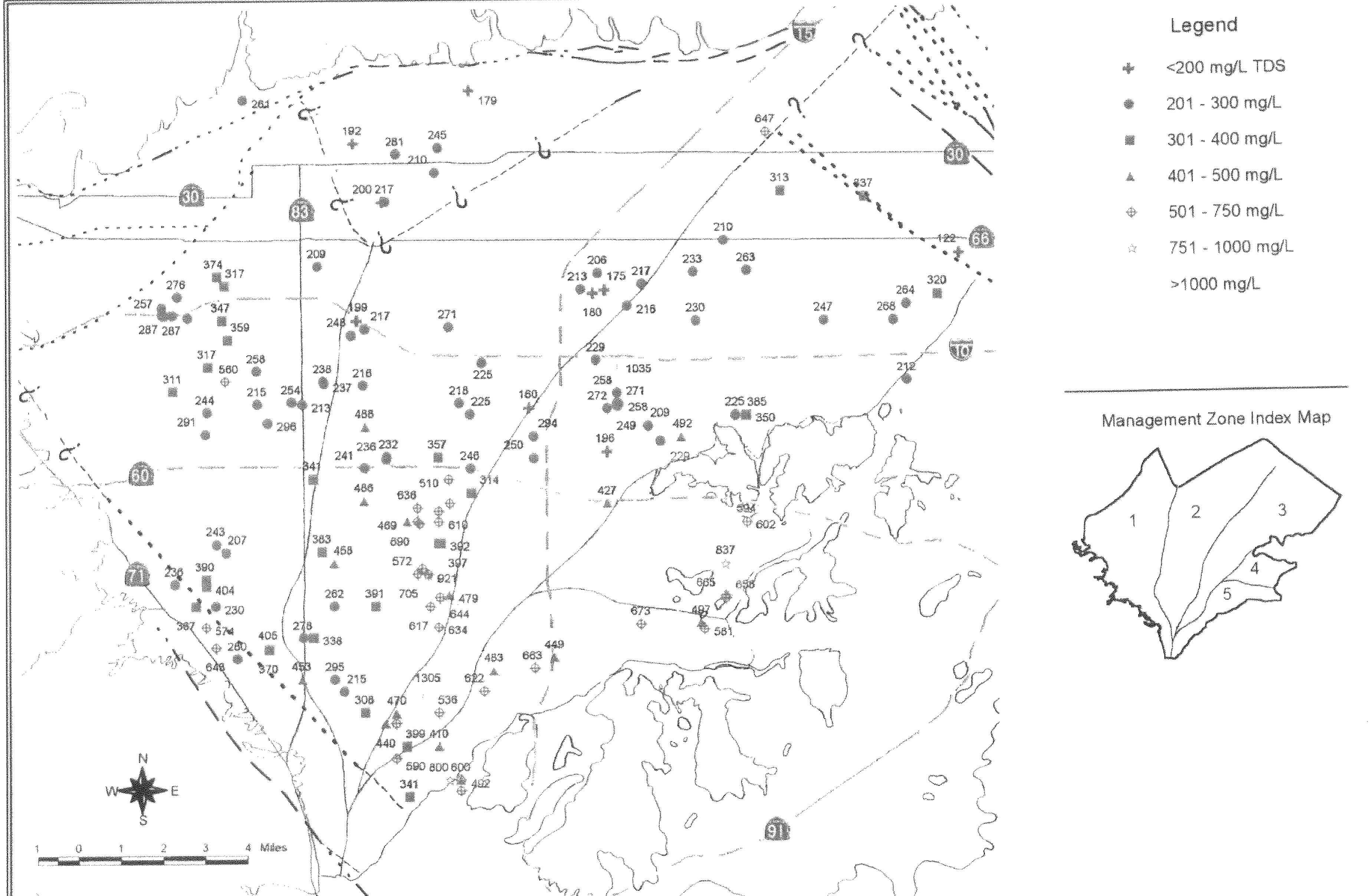
Figure 4.5-35h
1993 Land Use



- Non-Irrigated Fieldcrops, Pasture
- Irrigated Fieldcrops, Pasture
- Irrigated and Non-Irrigated Citrus
- Irrigated Vineyards
- Non-Irrigated Vineyards
- Dairies and Feedlots
- Urban, Residential, Commercial, Industrial, and Vacant
- Native Vegetation
- Special Impervious

TOM DODSON & ASSOCIATES
Environmental Consultants

Source: OBMP Phase I Report, Figure 2-37g-h

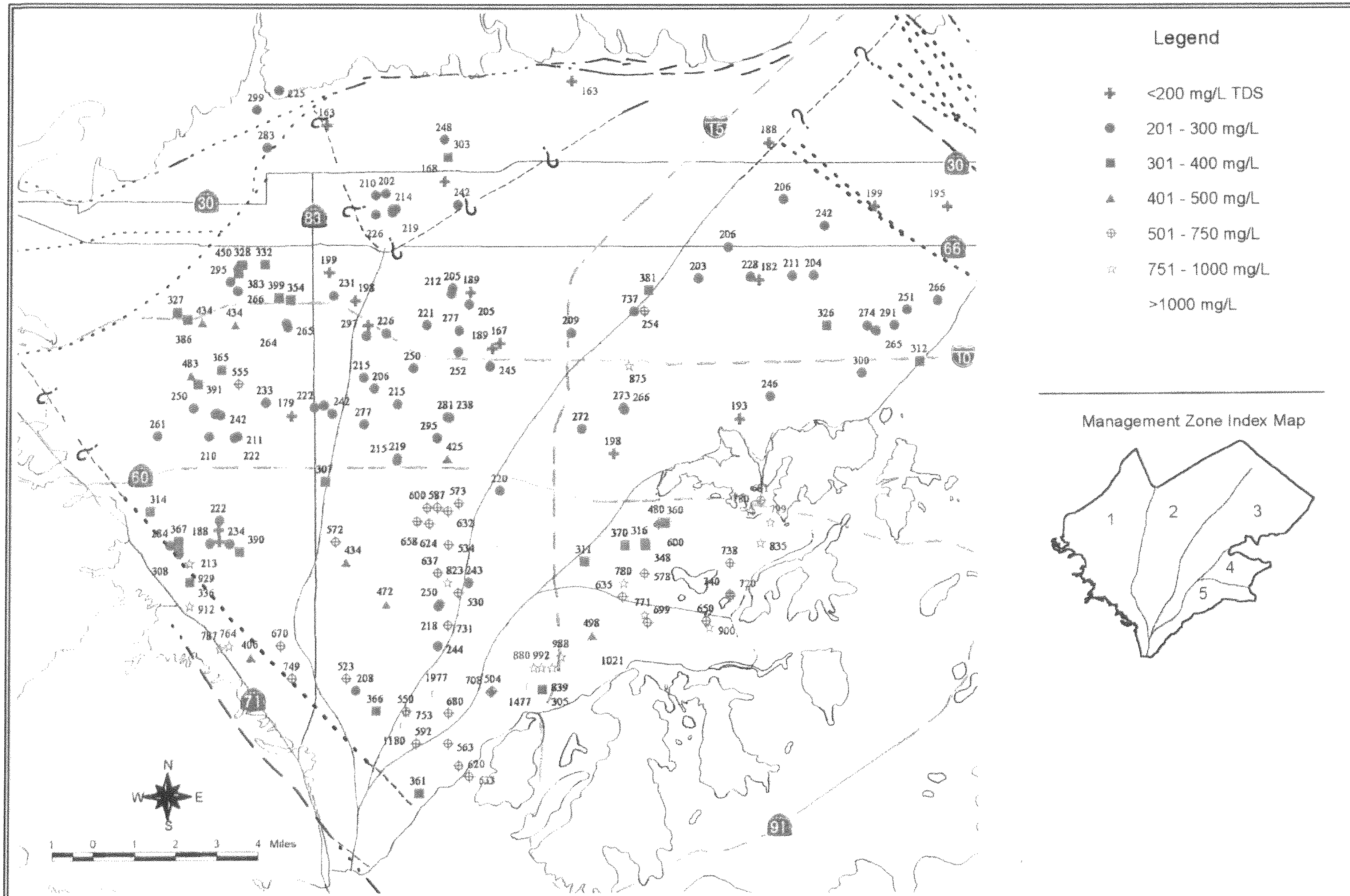


AVERAGE TDS CONCENTRATIONS (mg/L) IN THE CHINO BASIN - 1961 TO 1965

Source: OBMP Phase I Report, Figure 2-38

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-36

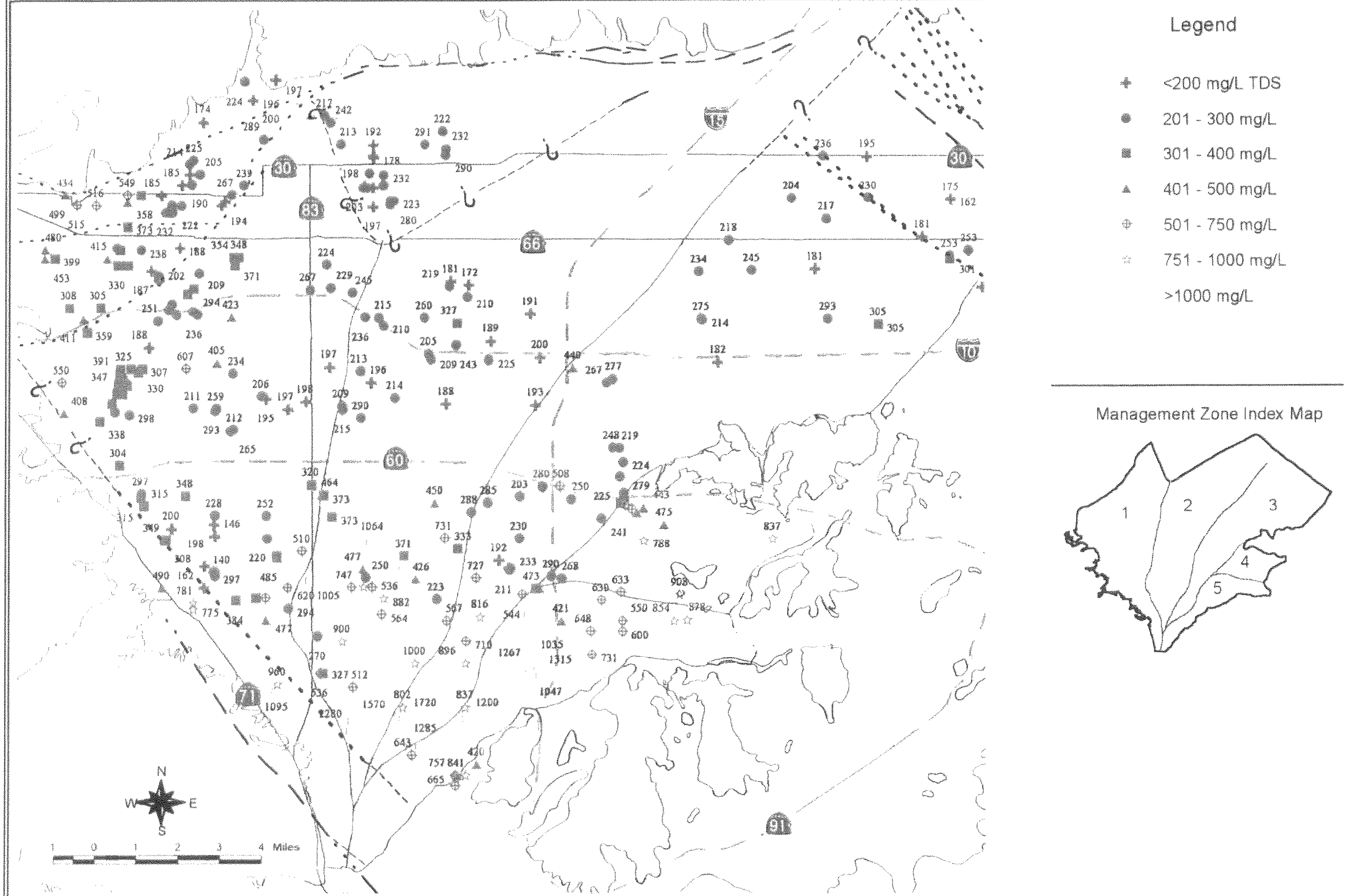


AVERAGE TDS CONCENTRATIONS (mg/L) IN THE CHINO BASIN - 1971 TO 1975

Source: OBMP Phase I Report, Figure 2-39

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-37

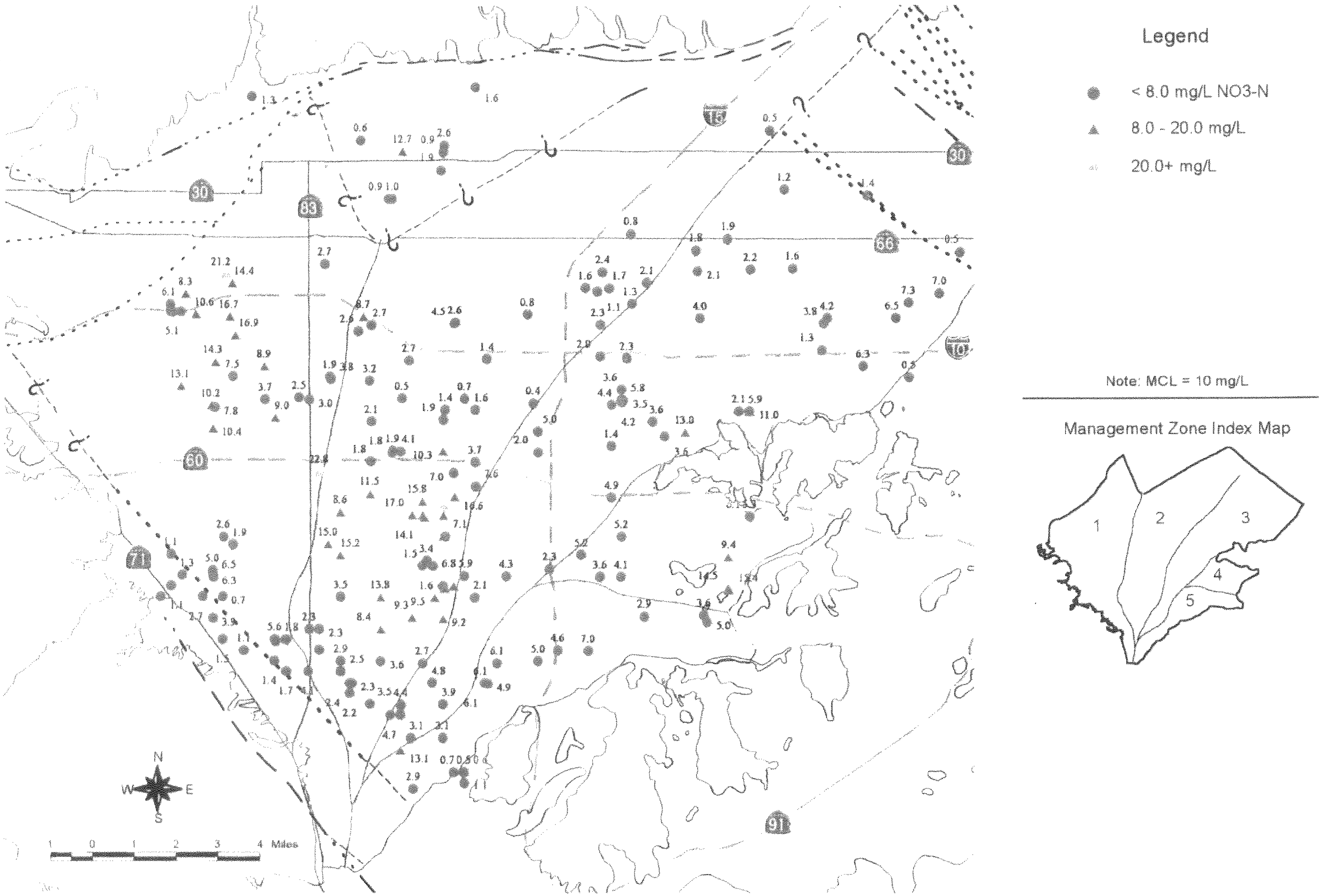


AVERAGE TDS CONCENTRATIONS (mg/L) IN THE CHINO BASIN - 1991 TO 1995

Source: OBMP Phase I Report, Figure 2-40

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-38

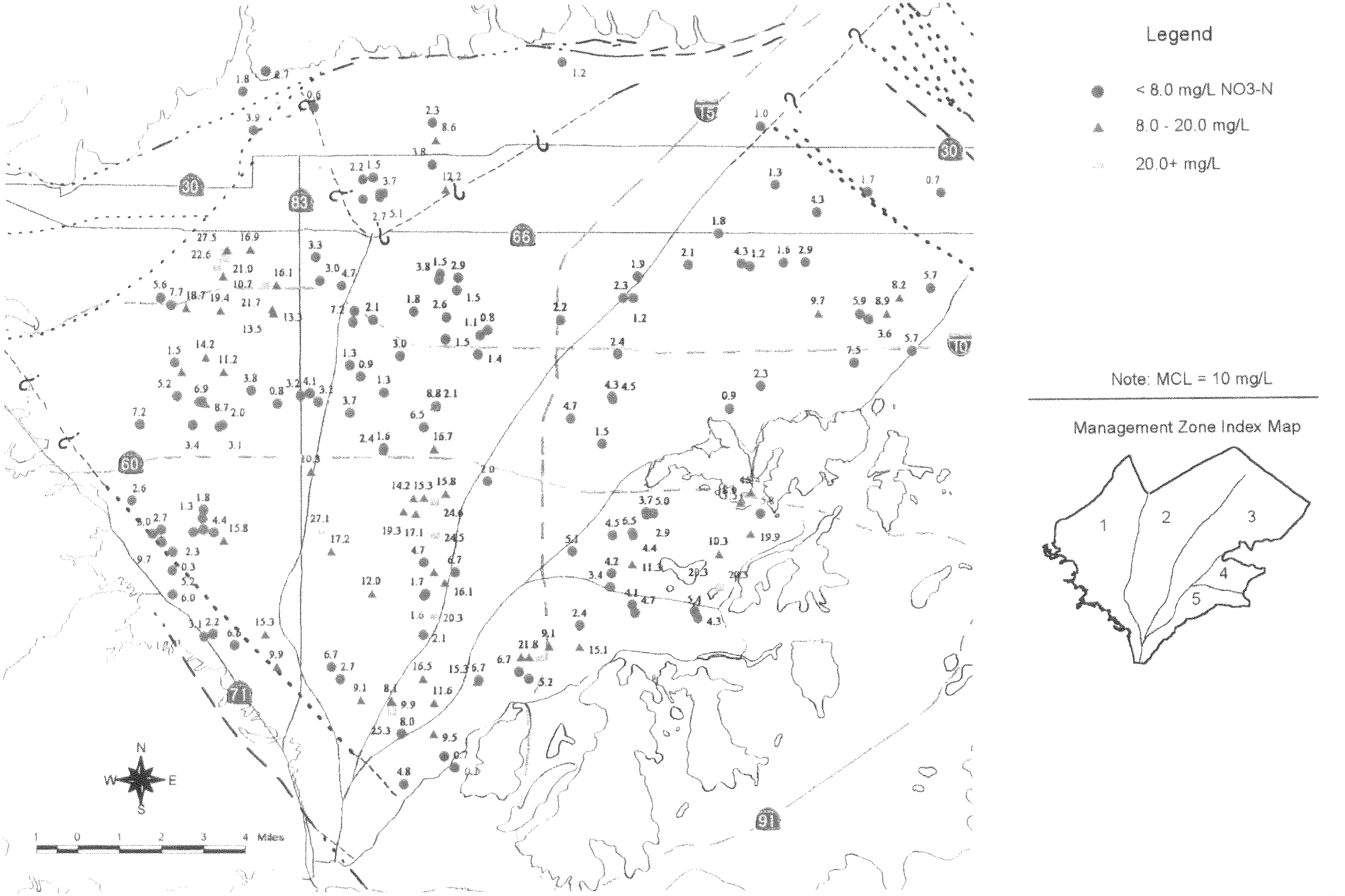


AVERAGE NITRATE-N CONCENTRATIONS (mg/L) IN THE CHINO BASIN - 1961 TO 1965

Source: OBMP Phase I Report, Figure 2-41

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-39

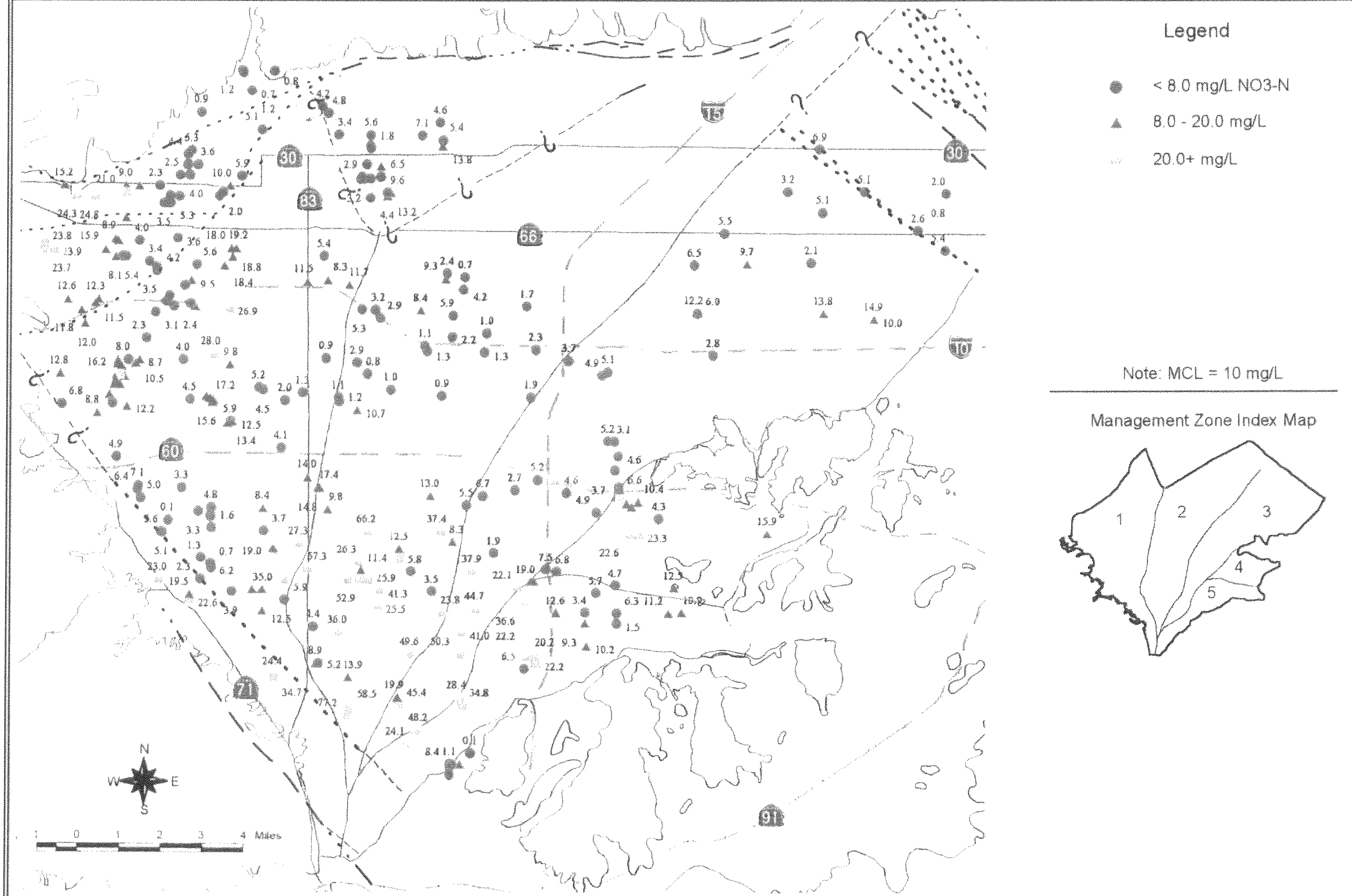


AVERAGE NITRATE-N CONCENTRATIONS (mg/L) IN THE CHINO BASIN - 1971 TO 1975

Source: OBMP Phase I Report, Figure 2-42

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-40

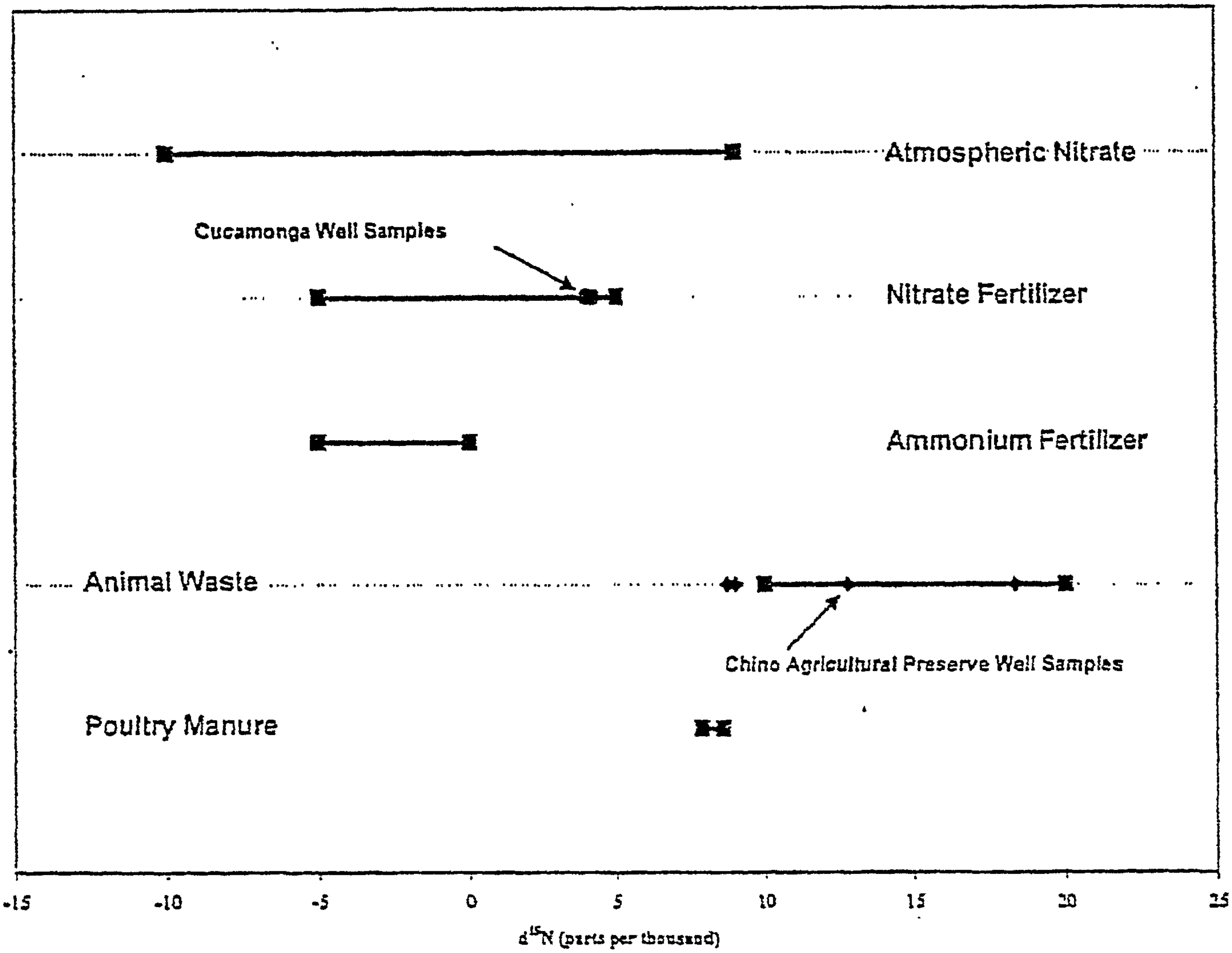


AVERAGE NITRATE-N CONCENTRATIONS (mg/L) IN THE CHINO BASIN - 1991 TO 1995

Source: OBMP Phase I Report, Figure 2-43

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-41

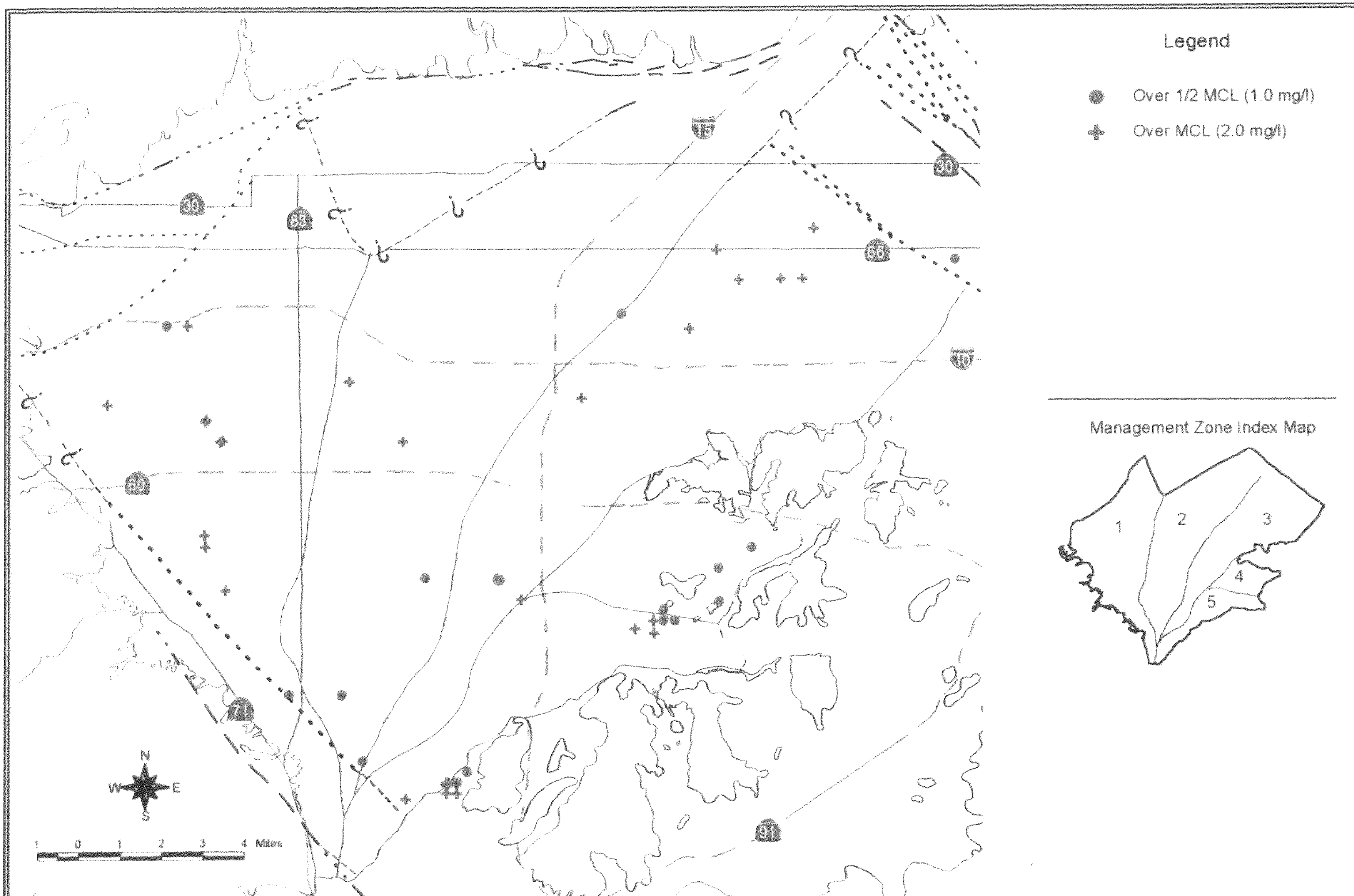


COMPARISON OF NITRATE ISOTOPE RESULTS WITH RANGES FROM KNOWN SOURCES

Source. OBMP Phase I Report

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-42

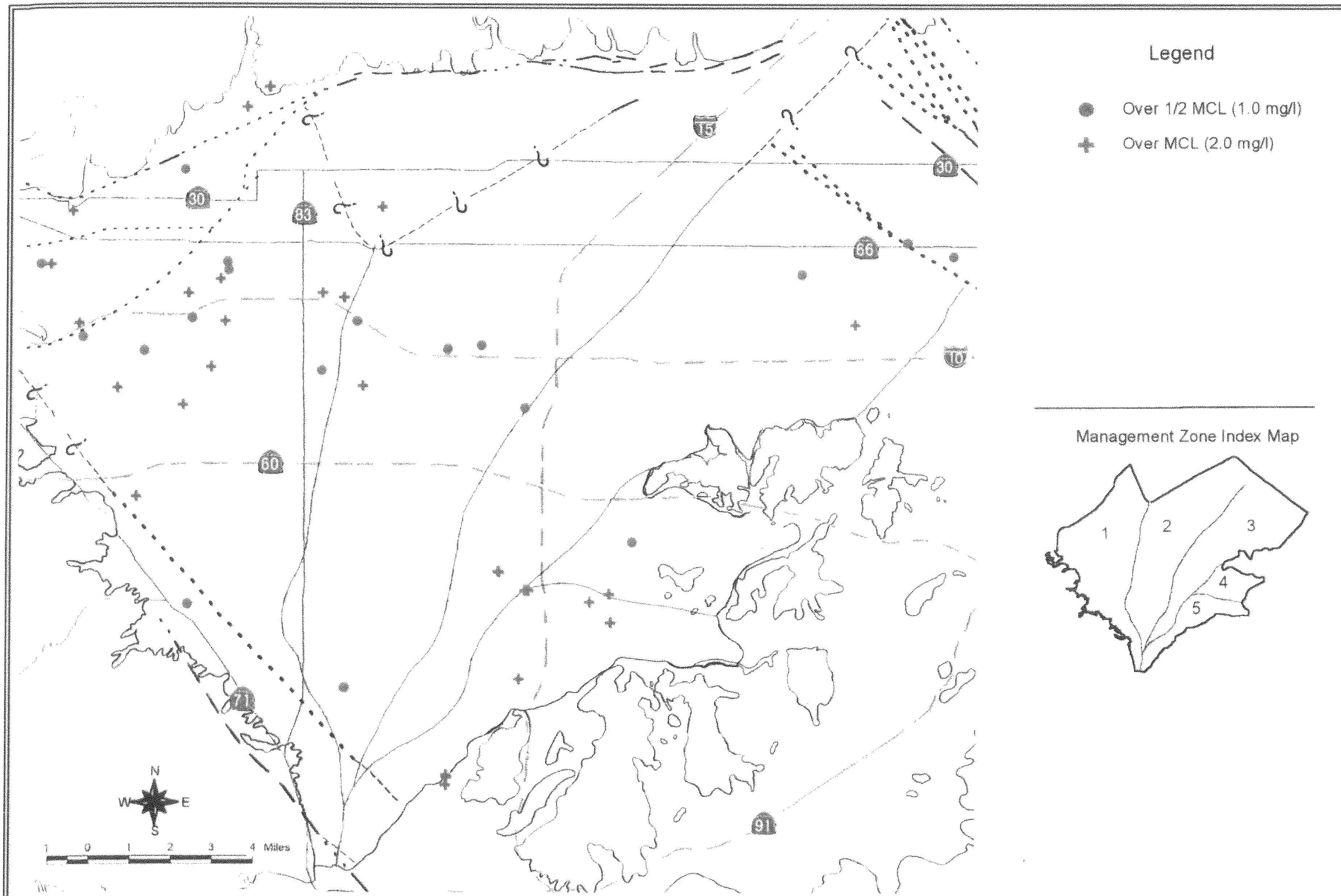


WELLS WITH ONE OR MORE HISTORICAL FLUORIDE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-44

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-43

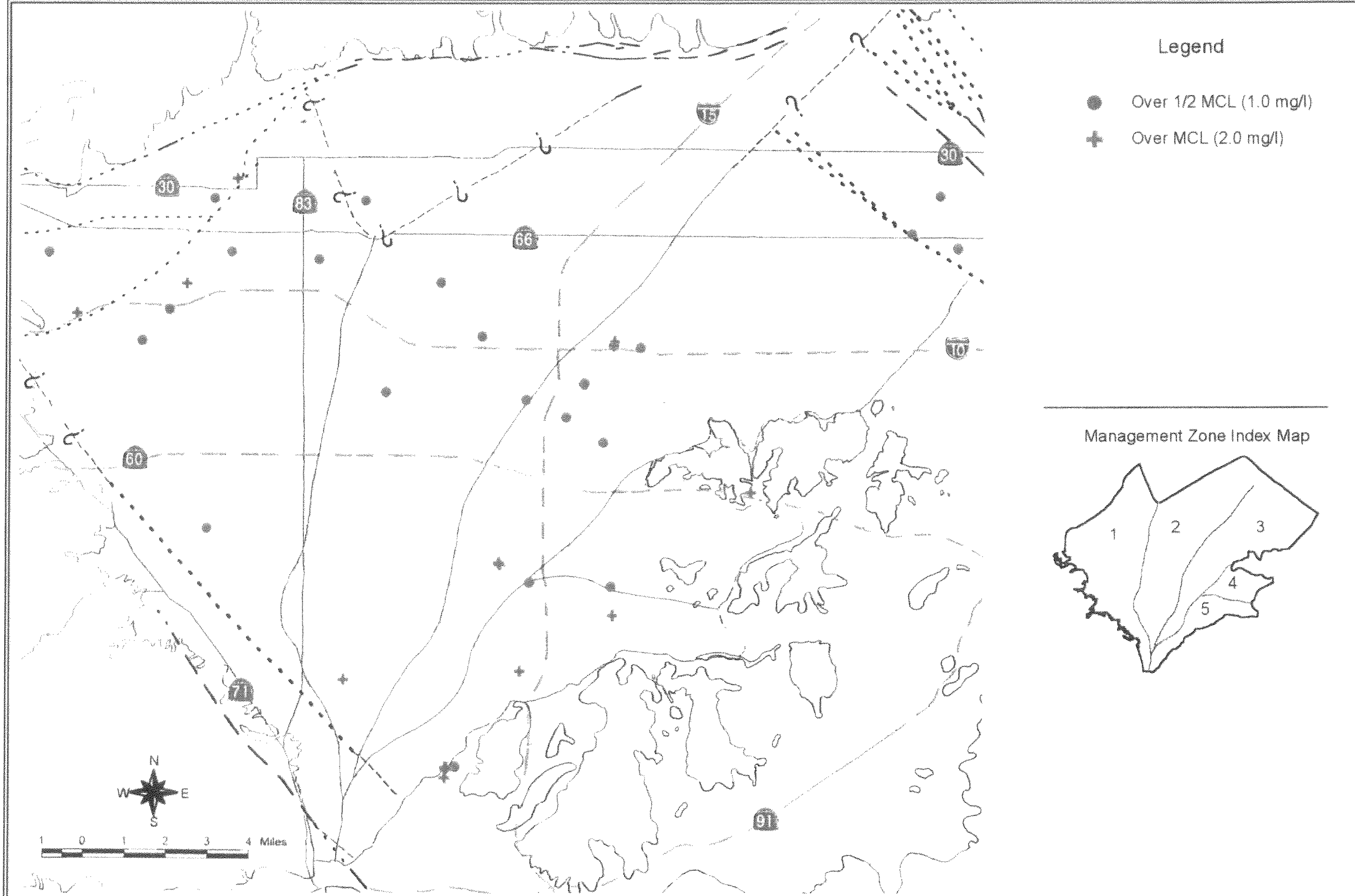


WELLS WITH ONE OR MORE HISTORICAL IRON VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-45

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-44

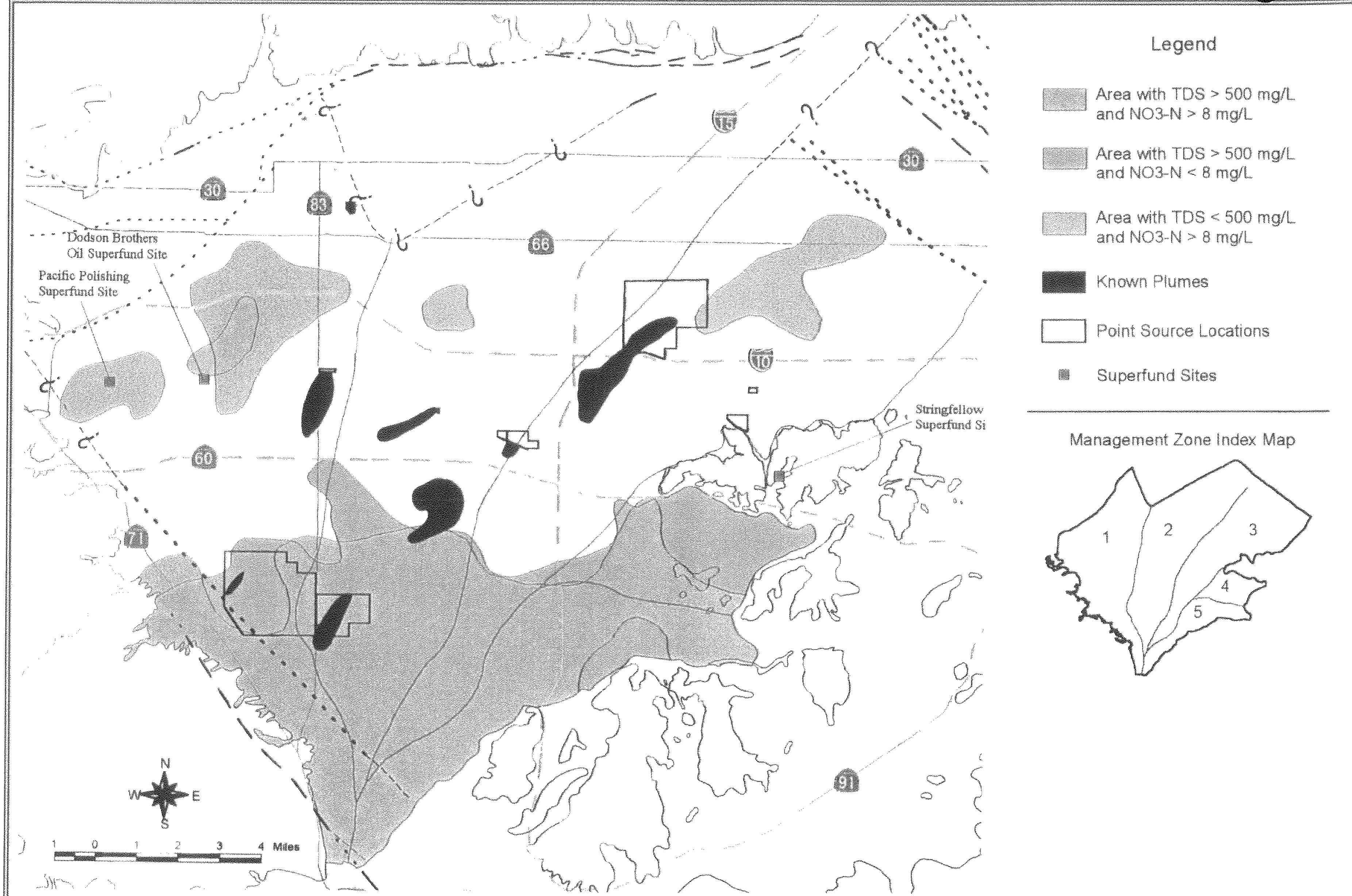


WELLS WITH ONE OR MORE HISTORICAL MANGANESE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-46

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-45

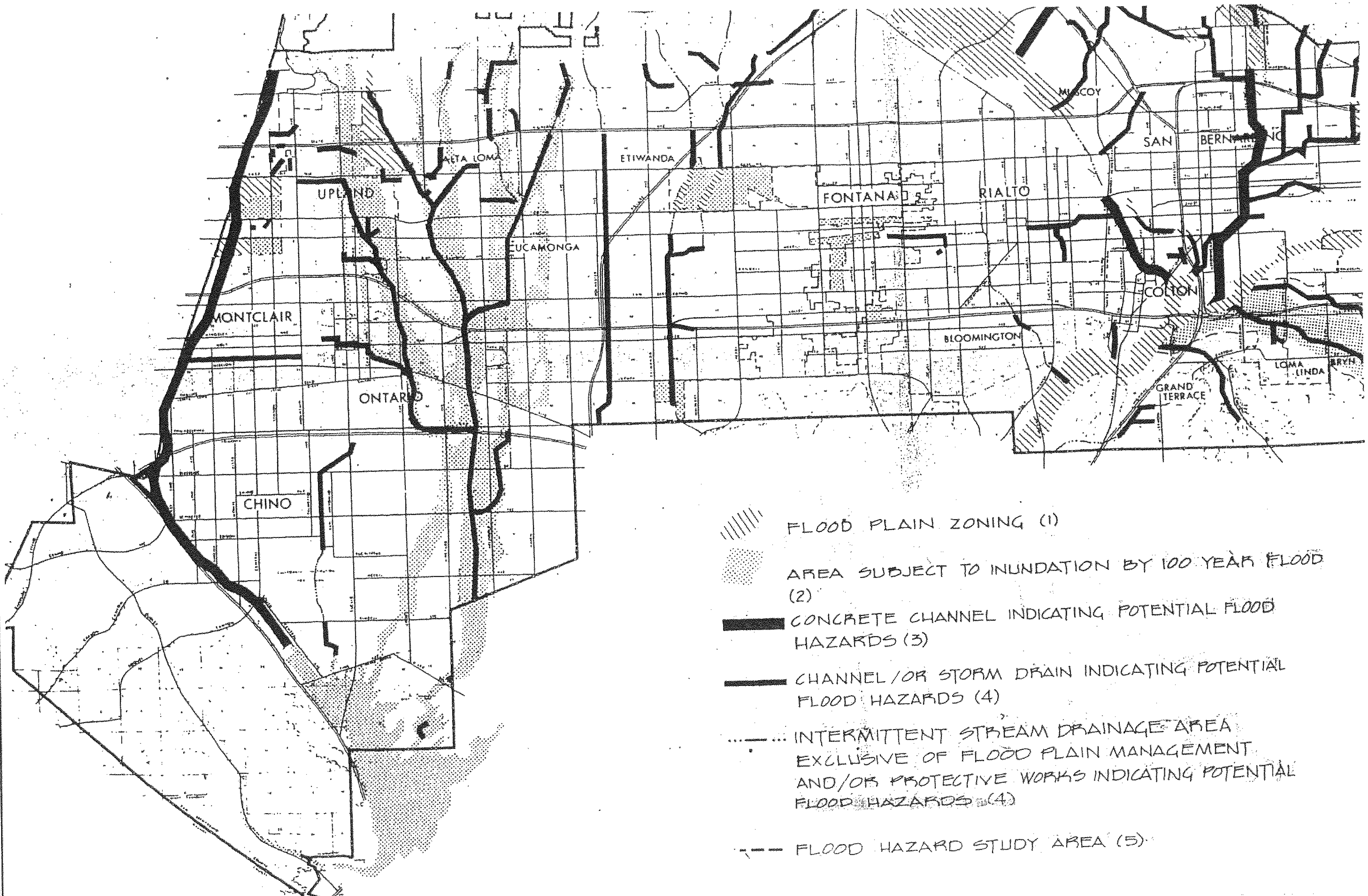


LOCATIONS OF KNOWN POINT SOURCES AND AREAS WITH IMPAIRED WATER QUALITY IN THE CHINO BASIN

Source: OBMP Phase I Report, Figure 2-59

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-46

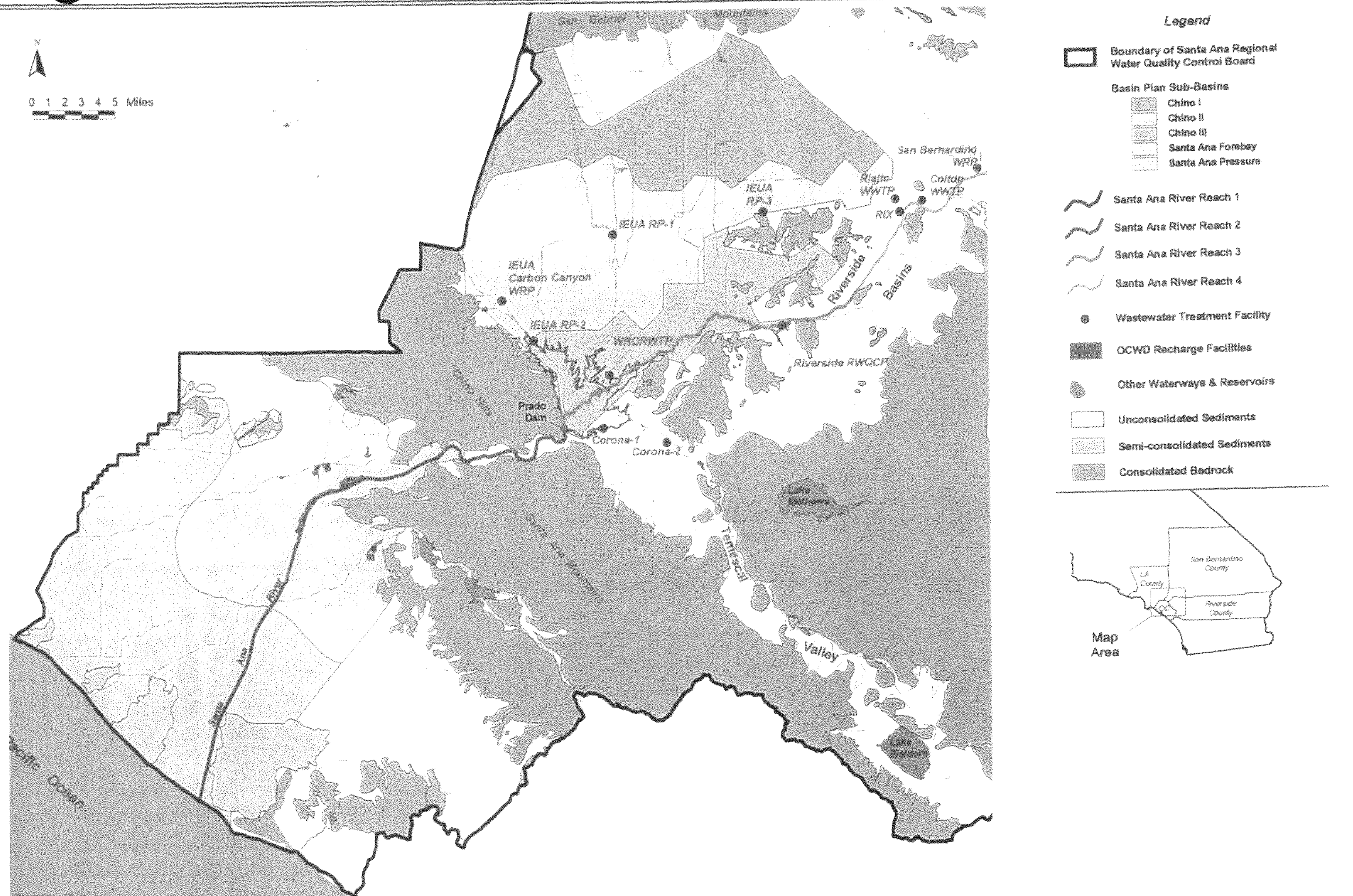


FLOOD HAZARDS FOR SAN BERNARDINO COUNTY

Source: San Bernardino County Hazards Maps

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-47

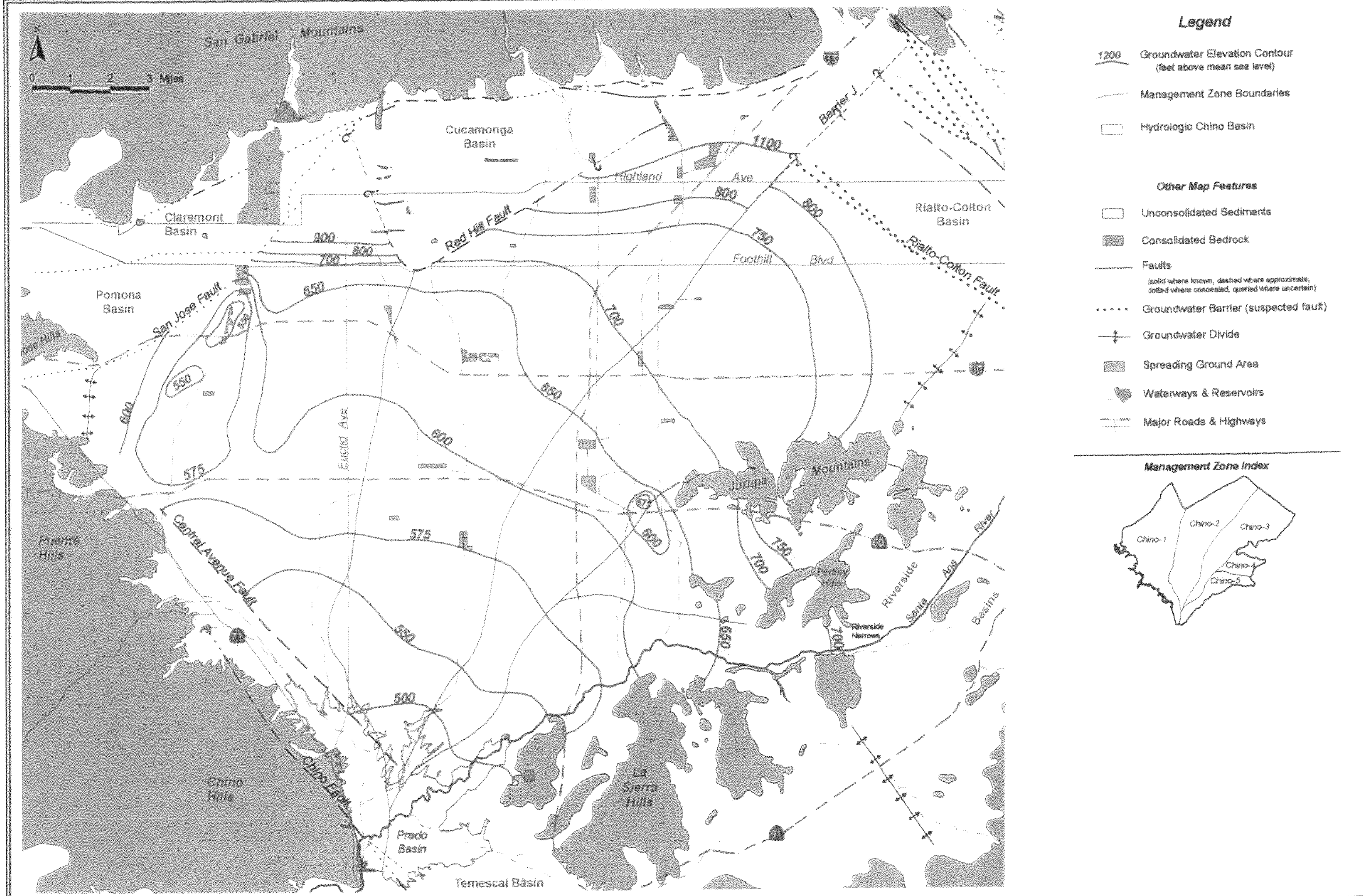


LOCATION MAP OF CHINO BASIN, SANTA ANA RIVER, AND BASIN PLAN SUBBASINS

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-48

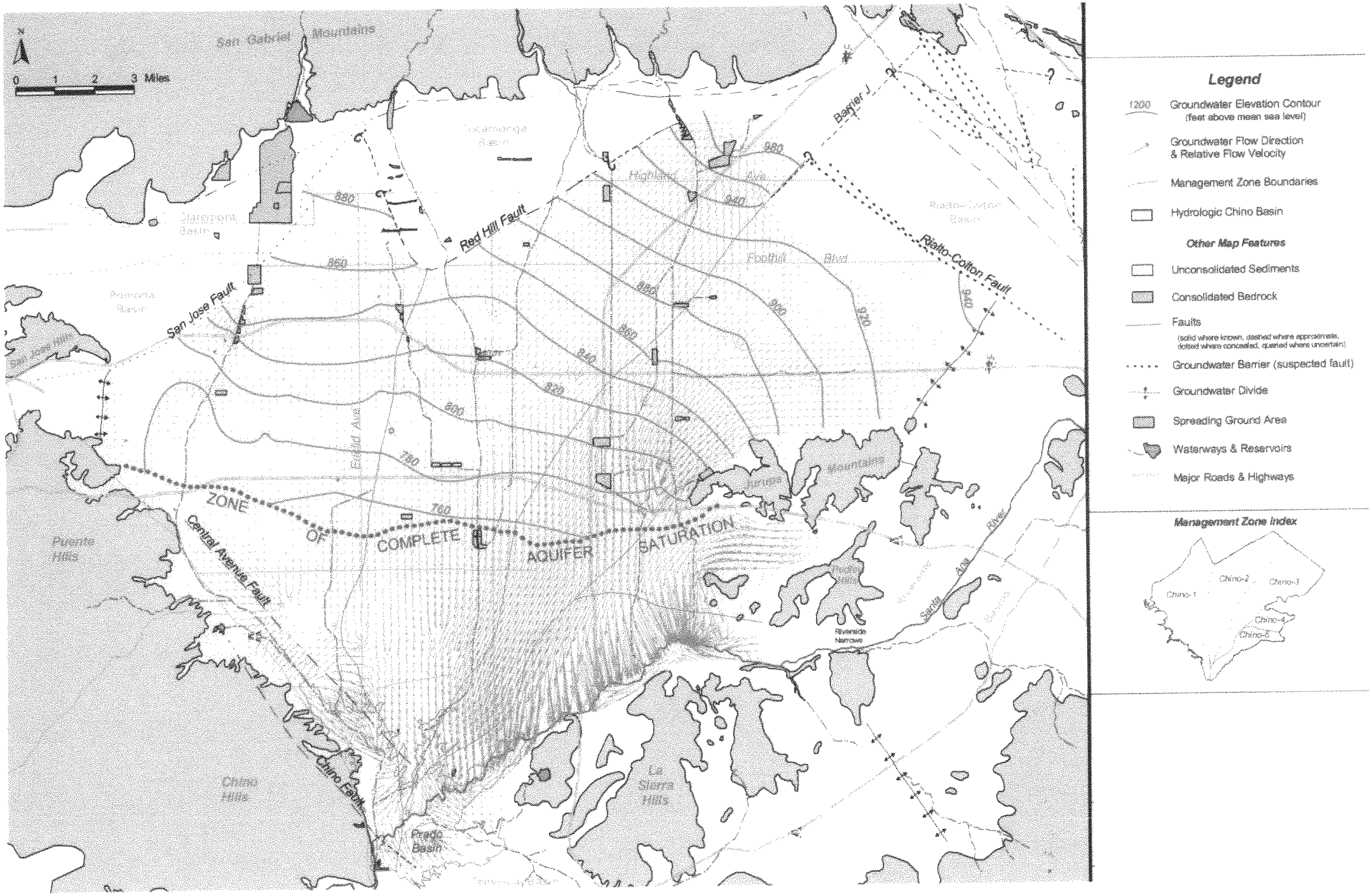


ESTIMATED GROUNDWATER ELEVATION FOR CURRENT (1997) CONDITIONS

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-49

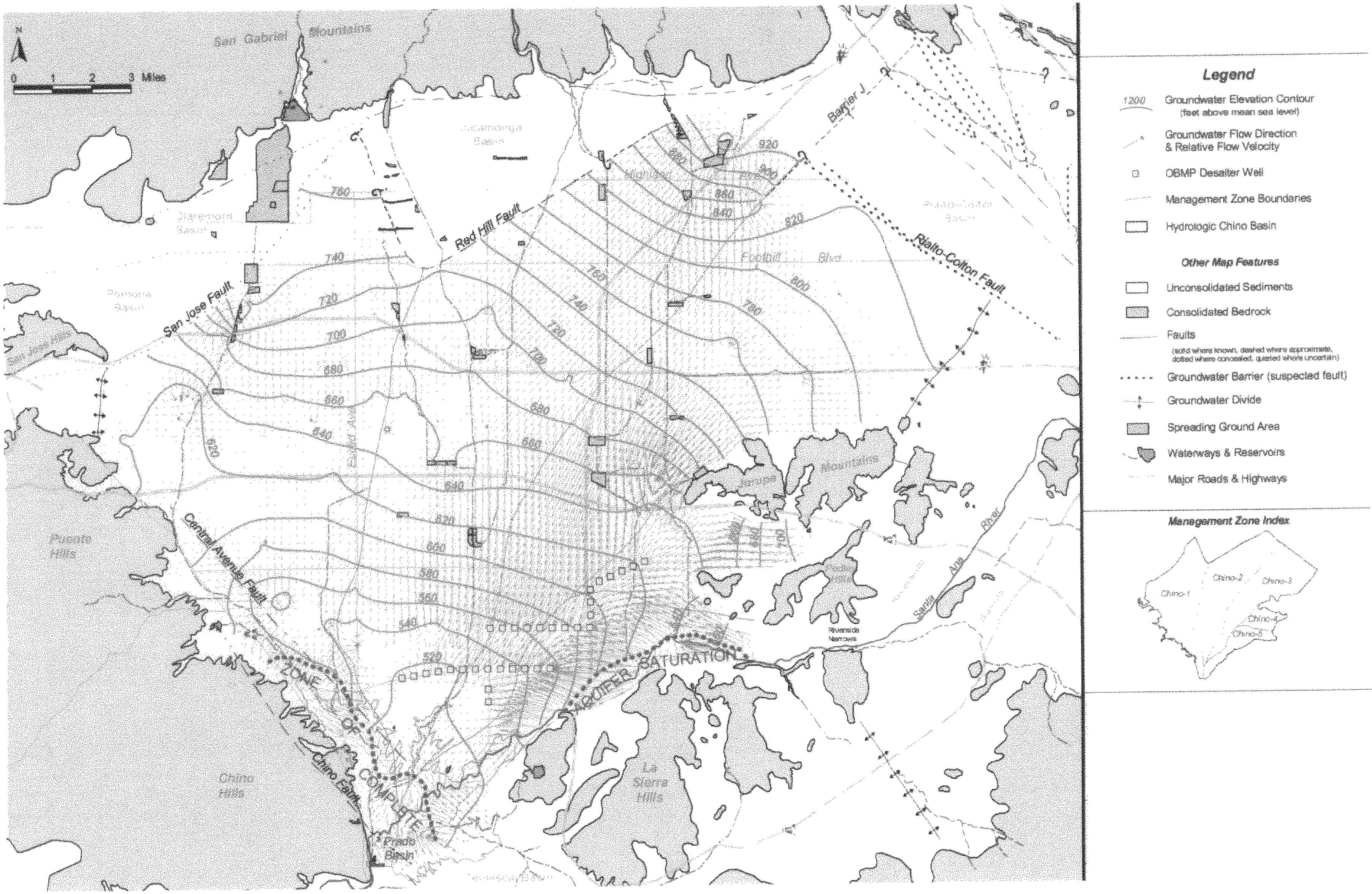


ESTIMATED GROUNDWATER ELEVATION FOR ULTIMATE CONDITIONS WITHOUT OBMP

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-50

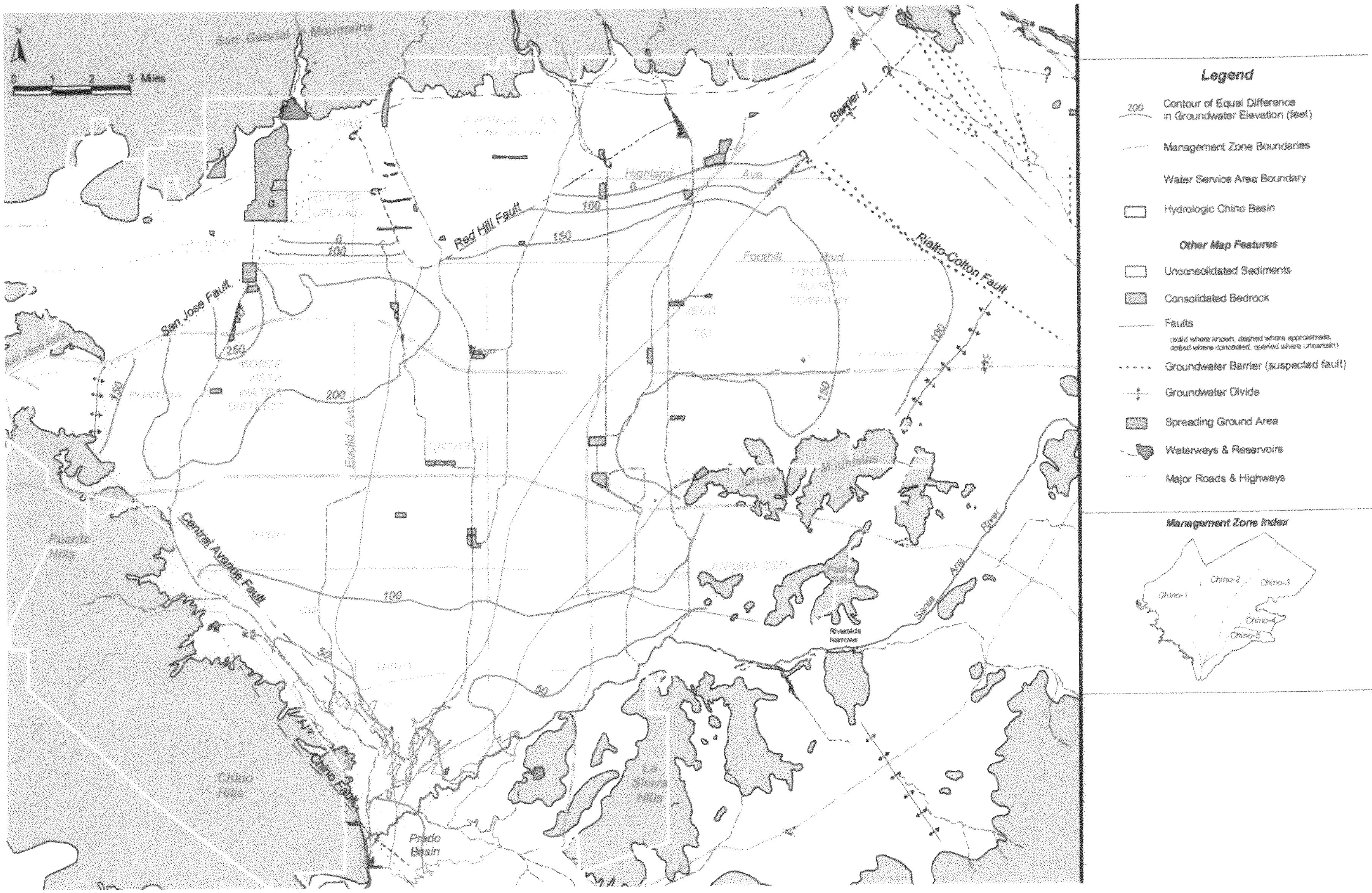


ESTIMATED GROUNDWATER ELEVATION FOR ULTIMATE CONDITIONS WITH OBMP

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-51

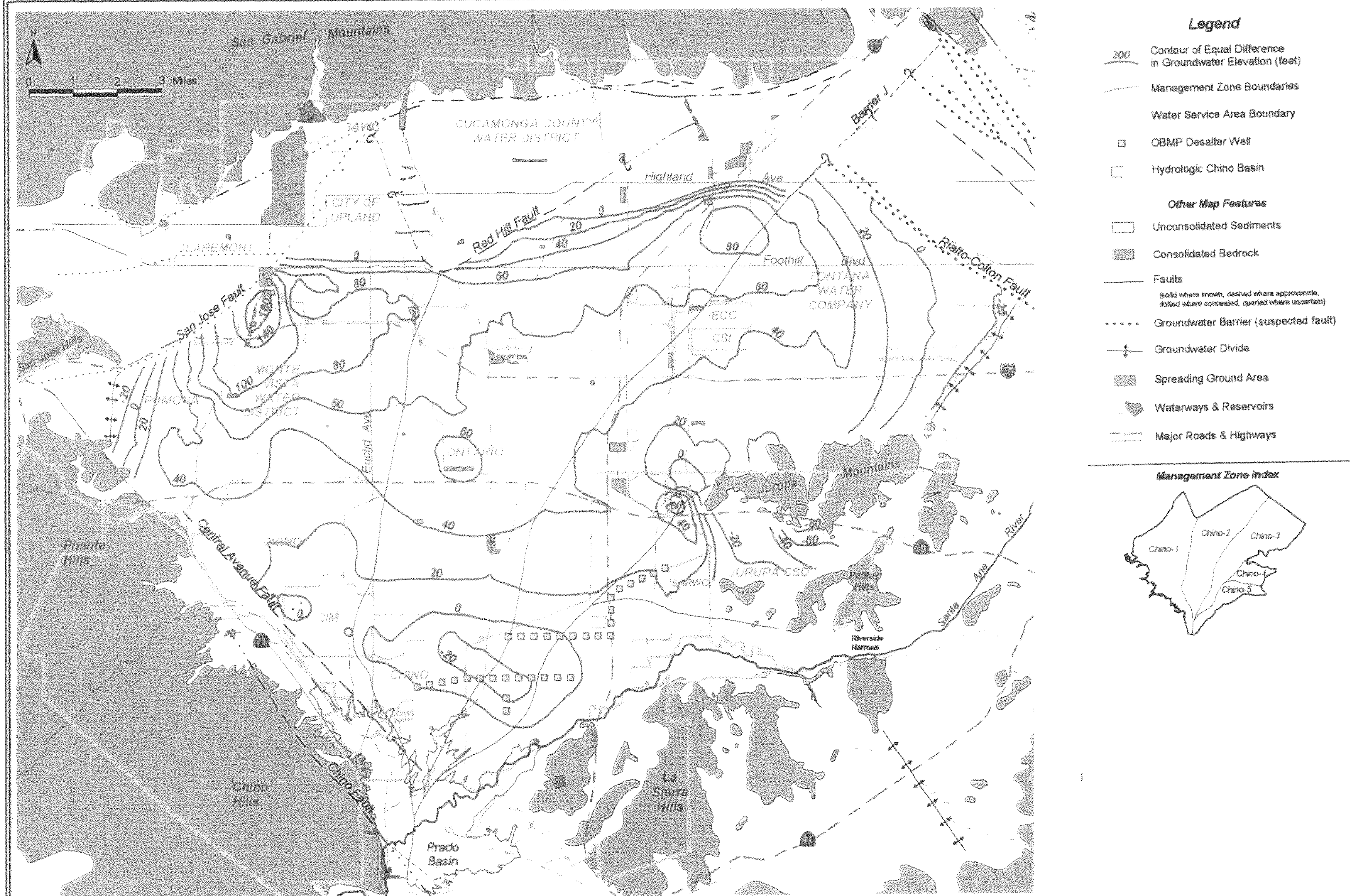


CHANGE IN GROUNDWATER ELEVATIONS FROM 1997 TO ULTIMATE CONDITIONS WITHOUT OBMP

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-52

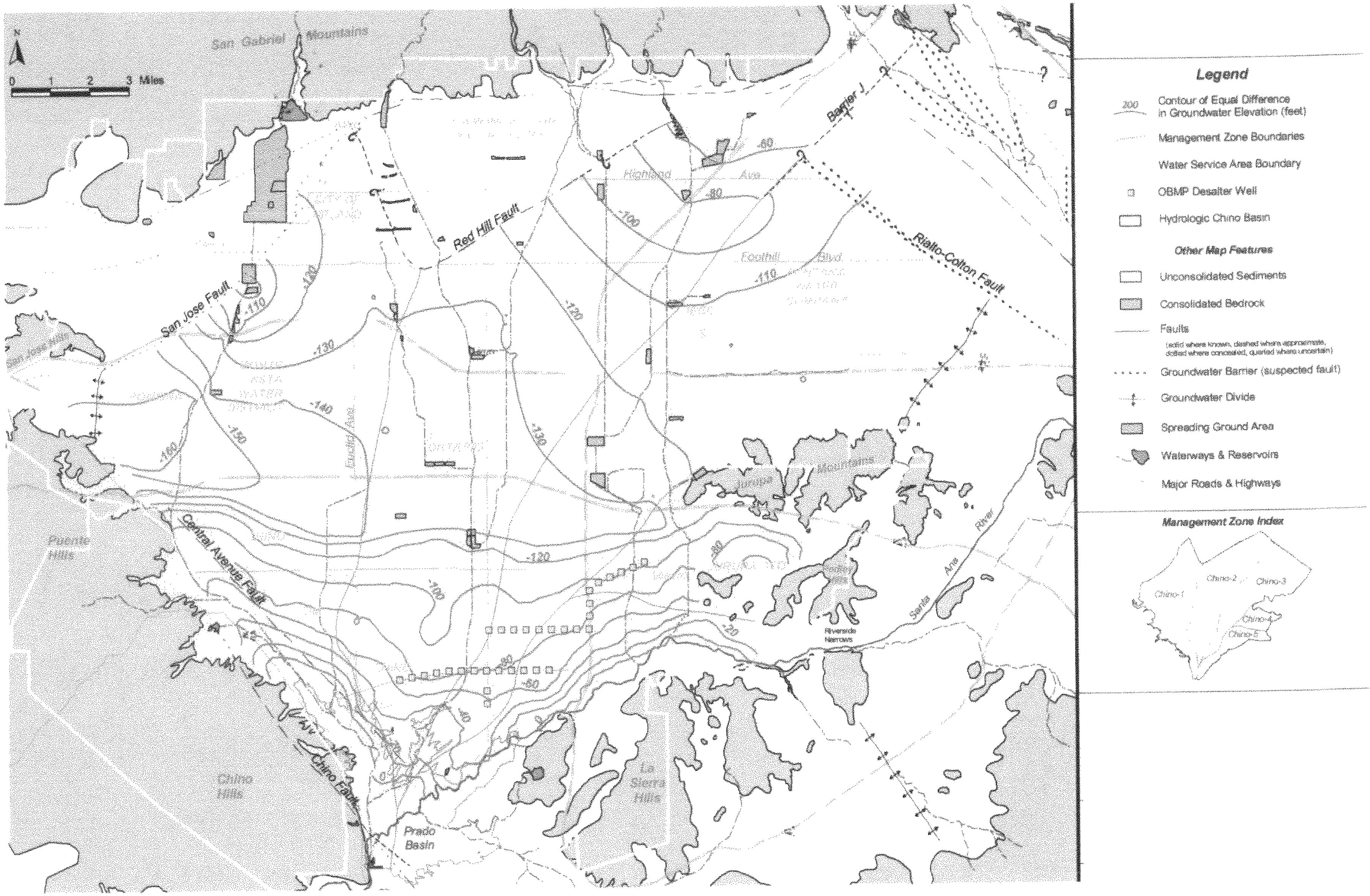


CHANGE IN GROUNDWATER ELEVATIONS FROM 1997 TO ULTIMATE CONDITIONS WITH OBMP

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-53

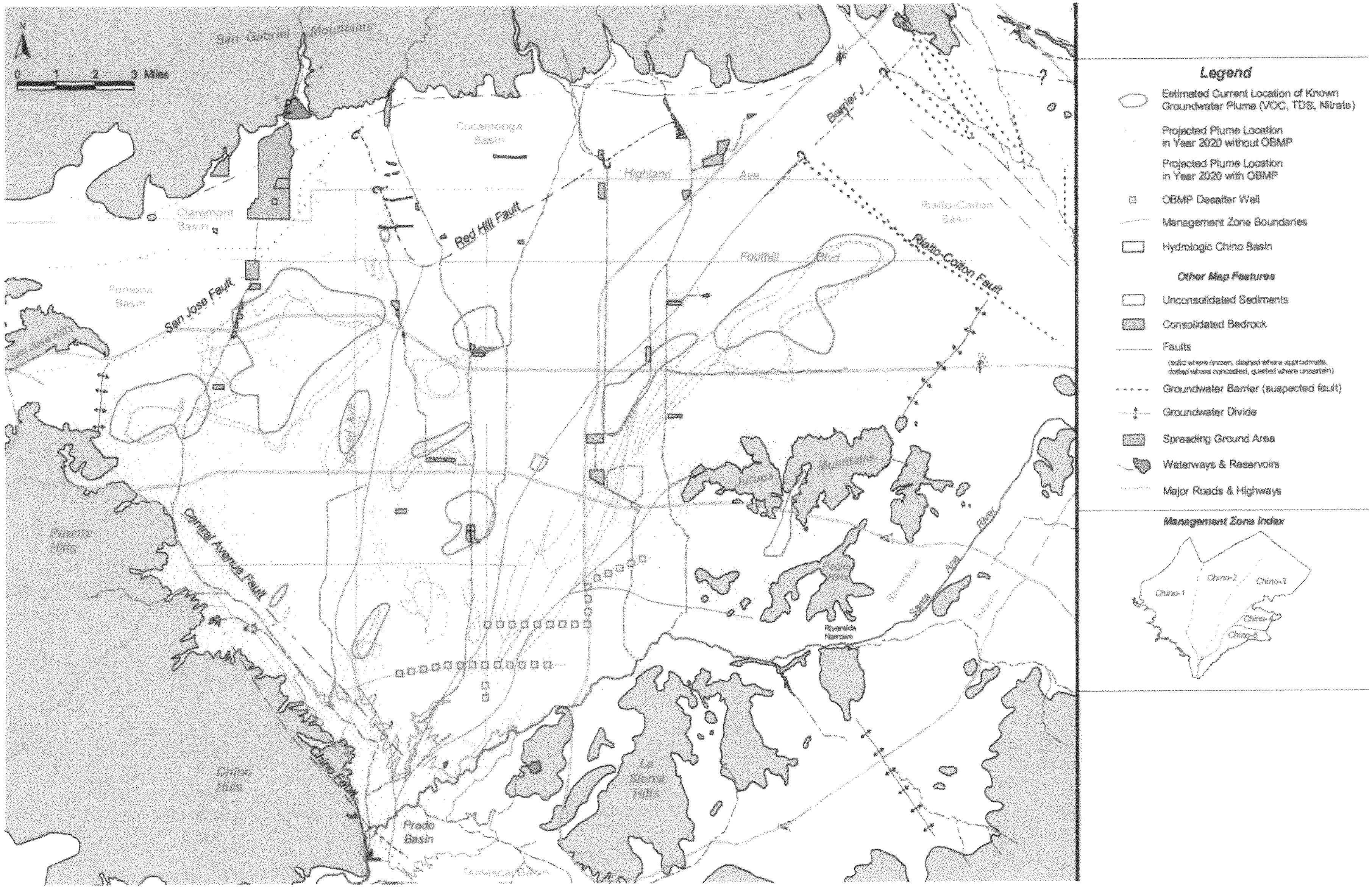


DIFFERENCE IN GROUNDWATER ELEVATIONS FROM NON-OBMP TO OBMP CONDITIONS FOR ULTIMATE CONDITIONS

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-54



LOCATION AND MOVEMENT OF KNOWN GROUNDWATER PLUMES WITH AND WITHOUT OBMP

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-55

BMP/design	SUSPENDED SEDIMENT	TOTAL PHOSPHORUS	TOTAL NITROGEN	OXYGEN DEMAND	TRACE METALS	BACTERIA	OVERALL REMOVAL CAPABILITY
EXTENDED DETENTION POND							
DESIGN 1	◕	◔	◔	◔	◑	⊗	MODERATE
DESIGN 2	●	◑	◔	◑	◕	⊗	MODERATE
DESIGN 3	●	◕	◑	◑	◕	⊗	HIGH
WET POND							
DESIGN 4	◕	◑	◔	◔	◔	⊗	MODERATE
DESIGN 5	◕	◑	◔	◔	◕	⊗	MODERATE
DESIGN 6	●	◕	◑	◑	◕	⊗	HIGH
INFILTRATION TRENCH							
DESIGN 7	◕	◑	◑	◕	◕	◕	MODERATE
DESIGN 8	●	◑	◑	◕	●	◕	HIGH
DESIGN 9	●	◕	◕	●	●	●	HIGH
INFILTRATION BASIN							
DESIGN 7	◕	◑	◑	◕	◑	◕	MODERATE
DESIGN 8	●	◑	◑	◕	●	◕	HIGH
DESIGN 9	●	◕	◕	●	●	●	HIGH
POROUS PAVEMENT							
DESIGN 7	◑	◕	◑	◕	◑	◕	MODERATE
DESIGN 8	●	◕	◕	◕	●	●	HIGH
DESIGN 9	●	◕	◕	●	●	●	HIGH
WATER QUALITY INLET							
DESIGN 10	○	⊗	⊗	⊗	⊗	⊗	LOW
FILTER STRIP							
DESIGN 11	◔	○	○	○	◔	⊗	LOW
DESIGN 12	●	◑	◑	◕	●	⊗	MODERATE
GRASSED SWALE							
DESIGN 13	○	○	○	○	○	⊗	LOW
DESIGN 14	◔	◔	◔	◔	○	⊗	LOW

KEY:

- ○ 0 TO 20% REMOVAL
- ◔ 20 TO 40% REMOVAL
- ◑ 40 TO 60% REMOVAL
- ◕ 60 TO 80% REMOVAL
- ● 80 TO 100% REMOVAL
- ⊗ INSUFFICIENT KNOWLEDGE

Design 1: First-flush runoff volume detained for 6-12 hours.
Design 2: Runoff volume produced by 1.0 inch, detained 24 hours.
Design 3: As in Design 2, but with shallow marsh in bottom stage.
Design 4: Permanent pool equal to 0.5 inch storage per impervious acre.
Design 5: Permanent pool equal to 2.5 (Vr); where Vr=mean storm runoff.
Design 6: Permanent pool equal to 4.0 (Vr); approx. 2 weeks retention.
Design 7: Facility exfiltrates first-flush; 0.5 inch runoff/imper. acre.
Design 8: Facility exfiltrates one inch runoff volume per imper. acre.
Design 9: Facility exfiltrates all runoff, up to the 2 year design storm.
Design 10: 400 cubic feet wet storage per impervious acre.
Design 11: 20 foot wide turf strip.
Design 12: 100 foot wide forested strip, with level spreader.
Design 13: High slope swales, with no check dams.
Design 14: Low gradient swales with check dams.

COMPARATIVE POLLUTANT REMOVAL OF URBAN BMP DESIGNS

Source: Wildermuth Environmental, Inc.

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.5-56

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4.6 AIR QUALITY

4.6.1 Introduction

Air Quality was identified as a topic for evaluation in this PEIR because construction and operation of the proposed facilities have the potential to generate substantial air emissions. The emissions will be associated with operation of construction equipment, the disturbance of soil and energy consumed to power equipment. This section of the PEIR will attempt to quantify these emissions based on information contained in the OBMP. Air quality impacts will be forecast and evaluated in as much detail as allowed based on the level of detail contained in the OBMP.

4.6.2 Environmental Setting

The OBMP encompasses the Chino Basin. The Chino Basin is located within the South Coast Air Basin (SCAB). Jurisdiction over air quality issues within the SCAB are under the jurisdiction of the South Coast Air Quality Management District (SCAQMD).

The project area is comprised of highly urbanized areas, natural open space, and agricultural areas that are primarily associated with the dairy industry. The applicable general plans (cities and counties) envision additional urban development with a reduction in the agricultural uses.

While the SCAB has some of the most unhealthful air in the nation, air quality within the SCAB continues to show improvement. However at this time, the SCAB is classified non-attainment for four of the six criteria pollutants utilized to determine attainment of natural ambient air quality standards (NAAQS).

4.6.2.1 Climate/Meteorology[1]

Climate in the OBMP area is characterized by warm, dry summers, low precipitation, and mild winters. Average daily winter temperature is 51°F and average daily summer temperature is 75°F. During the year, temperatures range from a low near 20°F during the winter to a high of over 100°F during the summer. More than two-thirds of annual rainfall occurs from December through March with approximately 90 percent occurring between November and April. Little rain falls between May and November, due to the semipermanent Pacific high pressure system that prevents storms from entering the OBMP area. In the OBMP area, mean annual precipitation ranges from 13 inches near Prado Dam to 25 inches at the base of the San Gabriel Mountains. In these mountains, average annual rainfall has reached as high as 40 inches with extremes ranging between 40 and 200 percent

[1] Metropolitan Water District of Southern California, Chino Basin Groundwater Storage Program, Draft Environmental Impact Report.

of normal. In nearly all months out of the year, evaporation exceed precipitation. Relative humidity averages 45 percent year-round; 40 to 70 percent in winter, and 10 to 20 percent in summer. Topography is a major factor influencing wind direction over the project area. Prevailing winds are generally light, and westerly or southwesterly. Night and early morning winds are usually northeasterly. Some afternoon sea breezes blow into the Chino Basin from the Los Angeles area. Summer daytime wind speed averages 10 to 15 miles per hour (mph) whereas the winter daytime wind speed averages 5 to 8 mph. There is little seasonal variability in this pattern. Occasionally during autumn and winter, "Santa Ana" conditions develop from a high pressure zone to the east and bring dry, high velocity winds from the deserts to the east and northeast over Cajon Pass. These winds, gusting to over 80 mph, can reduce relative humidity to below 10 percent.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed in mid-afternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently bread by mid-morning.

The SCAQMD maintains monitoring stations throughout the SCAG to monitor concentrations of criteria pollutants in the air. The nearest SCAQMD monitoring stations to the Chino Basin that measure all criteria pollutants are the East San Gabriel Valley V1 station and the Central San Bernardino V2 station. Air quality monitoring data from these stations for the last 3 years available (1996-1998) are provided in Tables 4.6-1 and 4.6-2.

These stations are located generally upwind and downwind of the Chino Basin. The data on Tables 4.6-1 and 4.6-2 indicate that air quality is essentially the same for carbon monoxide and nitrogen dioxide both upwind while ozone and PM_{10} levels are generally higher downwind or easterly of the OBMP area.

4.6.2.2 Air Quality Regulations

Federal Regulations/Standards

Pursuant to the federal Clean Air Act (CAA) of 1970, the U.S. Environmental Protection Agency (EPA) established NAAQS. The NAAQS were established for several major pollutants, termed "criteria" pollutants because the choices of NAAQS are supported by specific medical evidence. The NAAQS are two-tiered: primary, to protect public health; and secondary, to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property, etc.).

Table 4.6-1
AIR POLLUTANT DATA SUMMARY FROM CENTRAL SAN BERNARDINO V2 MONITORING STATION (1996-1998)

Pollutant	SCAQMD Station Data		
	1996	1997	1998
Ozone			
Highest 1 hour, ppm	0.24	0.20	0.21
Days > 0.12 ppm[1]	63	32	39
Days ≥ 0.09 ppm[2]	113	102	65
Carbon Monoxide			
Highest 1 hour, ppm	6.0	8.0	6.3
Days > 35.0 ppm[1]	0	0	0
Days > 20.0 ppm[2]	0	0	0
Highest 8 hour, ppm	4.6	6.0	4.7
Days > 9.0 ppm[1,2]	0	0	0
Nitrogen Dioxide			
Highest 1 hour, ppm	0.15	0.14	0.11
Days > 0.25 ppm[2]	0	0	0
Annual Average	0.038	0.035	0.034
Days ≥ 0.053 ppm[1]	No	No	No
Sulfur Dioxide			
Highest 24 hour, ppm	NM	NM	NM
Days > 0.05 ppm[2]	NM	NM	NM
Particulates (PM_{10})			
Highest 24 hour	136	108	114
Days > 150 $\mu g/m^3$ [1]	0	0	0
Days > 50 $\mu g/m^3$ [2]	35	28	22
AAM[1]	52.5	51.4	46.3
Year > 50 $\mu g/m^3$	Yes	Yes	No
AGM[2]	45.9	45.6	39.3
Year > 30 $\mu g/m^3$	Yes	Yes	Yes

ppm - parts per million; $\mu G/m^3$ - micrograms per cubic meter
NM - Not measured at this station
AAM - Annual Arithmetic Mean
AGM - Annual Geometric Mean

[1] Federal Standard
[2] State Standard

Source: SCAQMD Annual Monitoring Reports, 1996-1998

Table 4.6-2
AIR POLLUTANT DATA SUMMARY FROM EAST SAN GABRIEL VALLEY V1 MONITORING STATION (1996-1998)

Pollutant	SCAQMD Station Data		
	1996	1997	1998
Ozone			
Highest 1 hour, ppm	0.20	0.16	0.15
Days > 0.12 ppm[1]	26	11	19
Days ≥ 0.09 ppm[2]	74	42	43
Carbon Monoxide			
Highest 1 hour, ppm	6.0	8.0	6.0
Days > 35.0 ppm[1]	0	0	0
Days > 20.0 ppm[2]	0	0	0
Highest 8 hour, ppm	4.0	4.3	3.9
Days > 9.0 ppm[1,2]	0	0	0
Nitrogen Dioxide			
Highest 1 hour, ppm	0.15	0.16	0.14
Days > 0.25 ppm[2]	0	0	0
Annual Average	0.0415	0.0338	0.364
Days ≥ 0.053 ppm[1]	No	No	No
Sulfur Dioxide			
Highest 24 hour, ppm	NM	NM	NM
Days > 0.05 ppm[2]	NM	NM	NM
Particulates (PM_{10})			
Highest 24 hour	100	116	87
Days > 150 $\mu g/m^3$ [1]	0	0	0
Days > 50 $\mu g/m^3$ [2]	24	24	16
AAM[1]	45.2	45.9	40.6
Year > 50 $\mu g/m^3$	No	No	No
AGM[2]	39.3	40.8	35.7
Year > 30 $\mu g/m^3$	Yes	Yes	Yes

ppm - parts per million; $\mu G/m^3$ - micrograms per cubic meter
NM - Not measured at this station
AAM - Annual Arithmetic Mean
AGM - Annual Geometric Mean

1 Federal Standard
2 State Standard

Source: SCAQMD Annual Monitoring Reports, 1996-1998

The six criteria pollutants are ozone (O_3), carbon monoxide (CO), particulates less than ten microns (PM_{10}), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). The primary standards for these pollutants are shown in Table 4.6-3; the health effects resultant from exposure to these pollutants are shown in Table 4.6-4. In July 1997, the EPA adopted a new NAAQS for particulates less than 2.5 microns (PM2.5).

Data collected at permanent monitoring stations are used by the EPA to classify regions as "attainment" if the primary NAAQS have been achieved, or "non-attainment" if not. The Basin is currently classified as a non-attainment area for four criteria pollutants. The Basin air quality status is listed as "extreme" for ozone, "serious" for CO, and "non-attainment" for PM_{10}. Concentrations of SO_2 and Pb are classified as "attainment." The Basin attainment status for PM2.5 has not been determined.

A 5-year deadline for NAAQS attainment was set by the CAA; however, the attainment date was subsequently revised by the CAA Amendments, which also required the states to identify non-attainment subareas within their borders and to develop an EPA approved State Implementation Plan (SIP), demonstrating attainment of all NAAQS by 1982. In a later EPA mandate, that attainment deadline was extended to 1987. The 1990 CAA Amendments specify new strategies for attaining NAAQS nationwide over the next 20 years, including mandatory 3 percent annual reductions of air pollutant emissions for both existing and new stationary sources, the scheduled introduction of low emitting cars and trucks into the nation's motor vehicle fleet, and the development of mass transit or higher occupancy vehicle alternatives to the single passenger automobile. The CAA Amendments designated the Basin as: "extreme" for ozone, requiring attainment with the federal ozone standard by 2010; "serious" for CO, requiring attainment of federal CO standards by 2000; and "serious" for PM_{10} requiring attainment with federal standards by 2001.

The EPA has designated the SCAG as the Metropolitan Planning Organization responsible for ensuring compliance with the requirements of the CAA.

State Regulations/Standards

The State of California began to set California ambient air quality standards (CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are listed in Table 4.6-3.

Table 4.6-3
AMBIENT AIR QUALITY STANDARDS

Pollutant	Average Time	State Concentration	Federal Primary	Federal Secondary
Ozone	1 Hour	0.09 ppm ($180\ \mu g/m^3$)	0.12 ppm ($235\ \mu g/m^3$)	Same as Primary Std.
Nitrogen Dioxide	Annual Average 1 Hour	– 0.25 ppm ($470\ \mu g/m^3$)	0.053 ppm ($100\ \mu g/m^3$) –	 Same as Primary Std.
Carbon Monoxide	8 Hour 1 Hour	9 ppm ($10\ mg/m^3$) 20 ppm ($23\ mg/m^3$)	9 ppm ($10\ mg/m^3$) 35 ppm ($40\ mg/m^3$)	
PM10	Annual Geometric Mean 24 Hour Annual Arithmetic Mean	$30\ \mu g/m^3$ $50\ \mu g/m^3$ –	– $150\ \mu g/m^3$ $50\ \mu g/m^3$	 Same as Primary Std.
Sulfur Dioxide	Annual Average 24 Hour 3 Hour 1 Hour	– 0.04 ppm ($105\ \mu g/m^3$) – 0.25 ppm ($655\ \mu g/m^3$)	$80\ \mu g/m^3$ (0.03 ppm) $365\ \mu g/m^3$ (0.14 ppm) – –	– – $1300\ \mu g/m^3$ (0.5 ppm) –
Lead	30-Day Average Calendar Quarter	$1.5\ \mu g/m^3$ –	– $1.5\ \mu g/m^3$	– Same as Primary Std.
Sulfates	24 Hour	$24\ \mu g/m^3$	–	–
Hydrogen Sulfide	1 Hour	0.03 ppm ($42\ \mu g/m^3$)	–	–
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm ($26\ \mu g/m^3$)	–	–
Visibility Reducing Particles	8 Hour (10 am to 6 pm, PST)	**	–	–

** In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. Measurement in accordance with ARB Method V.

Table 4.6-4
HEALTH EFFECTS SUMMARY FOR AIR POLLUTANTS

Pollutants	Sources	Primary Effects
Ozone	Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	Aggravation of respiratory and cardio-vascular diseases. Irrigation of eyes. Impairment of cardiopulmonary function. Plant leaf injury.
Nitrogen Dioxide	Motor vehicle exhaust. High temperature. Stationary combustion. Atmospheric reactions.	Aggravation of respiratory illness. Reduced visibility. Reduced plant growth. Formation of acid rain.
Carbon Monoxide	Incomplete combustion of fuels and other carbon-containing substances, such as motor vehicle exhaust. Natural events, such as decomposition of organic matter.	Reduced tolerance for exercise. Impair-ment of mental function. Impairment of fetal development. Death at high levels of exposure. Aggravation of some heart disease (angina).
PM10	Stationary combustion of solid fuels. Construction activities. Industrial processes. Atmospheric chemical reactions.	Reduced lung function. Aggravation of the effects of gaseous pollutants. Aggra-vation of respiratory and cardiorespiratory diseases. Increased cough and chest dis-comfort. Soiling. Reduced visibility.
Sulfur Dioxide	Combustion of sulfur-containing fossil fuels. Smelting of sulfur-bearing metal ores. Industrial processes.	Aggravation of respiratory diseases (asthma, emphysema). Reduced lung function. Irritation of eyes. Reduced visibility. Plant injury. Deterioration of metals, textiles, leather, finishes, coating, etc.
Lead	Contaminated soil.	Impairment of blood function and nerve construction. Behavioral and hearing problems in children.

Source: SCAQMD 1993

Originally, there were no attainment deadlines for the CAAQS. However, the California Clean Air Act (CCAA) of 1988 provided a timeframe and a planning structure to promote their attainment. The CCAA required non-attainment areas in the State to prepare attainment plans, and proposed to classify each such areas on the basis of the submitted plan, as follows: moderate, if CAAQS attainment could not occur before December 31, 1994; serious, if CAAQS attainment could not occur before December 31, 1997; and severe, if CAAQS attainment could not be conclusively demonstrated at all. The attainment plans are required to achieve a minimum 5 percent annual reduction in the emissions of non-attainment pollutants, unless all feasible measures have been implemented. The Basin is classified as a “severe” non-attainment area for ozone and carbon monoxide. Per SCAQMD’s comments, the basin is now considered to be in attainment of both federal and state nitrogen dioxide standards.

Regional Air Quality Planning Framework

The California Air Resources Board (CARB) coordinates and oversees both State and federal air pollution control programs in California. The CARB has divided the State into 15 air basins. Significantly authority for air quality control within them has been given to local Air Pollution Control Districts (APCD) or Air Quality Management District (AQMD), which regulate stationary source emissions and develop local non-attainment plans. CARB has designated all of Los Angeles County south of the San Gabriel Mountains, Orange County, and the non-desert portions of Riverside and San Bernardino counties as the Basin under the jurisdiction of the SCAQMD. SCAQMD is responsible for regulatory stationary source emissions, and has been given the authority to regulate mobile emissions as an indirect source. The SCAQMD and SCAG jointly conduct air quality planning in the Basin. The CARB regulates motor vehicles and fuels.

Regional Air Quality Management Plan

Compliance with the provisions of the federal CAA and CCAA is the primary focus of the latest AQMP developed by SCAQMD and SCAG. The Plan is revised every 3 years, with the latest version adopted by the SCAQMD in November 1996 and title the 1997 AQMP. The latest AQMP was adopted by the CARB in February 1997, and was included in the SIP and send to the EPA for its review and approval.

According to the 1997 AQMP, attainment for all federal health standards is to occur no later than year 2000 for carbon monoxide, the year 2006 for PM_{10} and the year 2010 for ozone. State standards would be attained no later than the year 2000 for carbon monoxide. State standards for ozone and PM_{10} would not be achieved until after the year 2010. Both the federal and State standards for nitrogen dioxide have been met, and the SCAQMD has requested EPA redesignation of the Basin to “attainment” for this criteria pollutant.

The 1997 AQMP includes short-term, intermediate, and long-term control measures, and market based incentive strategies to meet targets for emission reduction. The short-term measures identified specific control measures under existing technology. The control measures consist mainly of stationary source controls that will be the subject of the SCAQMD rule making, CARB adopted motor vehicle emissions standards and fuel specifications, and federally adopted programs to reduce emissions from sources under federal jurisdiction. Intermediate term measures are composed primarily of the extension, or more stringent application, of short-term control measures. Long-term measures depend on substantial technological advancements and breakthroughs that are expected to occur throughout the next two decades.

Control measures focus on adoption of new regulations or enhancement of existing regulations for stationary sources, implementation/facilitation of advanced transportation technologies (i.e., telecommunication, zero emission and alternative fuel vehicles and infrastructure and both capital and non-capital based transportation improvements). Capital based improvements consist of high occupancy vehicle (HOV) lanes, transit improvements, traffic flow improvements, park and ride and intermodal facilities, and urban freeway, bicycle and pedestrian facilities. Non-capital based improvements consist of rideshare matching and Congestion Management Plan (CMP) based transportation demand management activities.

One type of transportation measure eliminated from the 1997 AQMP was indirect source controls, which would regulate local land use decisions, particularly medium to large-scale developments. These measures were found too expensive to implement without producing cost-effective emissions reductions. Rule 2202, the replacement for Regulation XV - Ridesharing, remains in effect to ensure that emissions reduction levels originally forecast with implementation of Regulation XV and other indirect source control strategies are achieved. This removal reflects a growing understanding that command and control measures tied to local land use decisions do not effectively alter travel behavior.

Air Toxics

Toxic air contaminants (TACs) are airborne substances that are capable of causing short-term or long-term adverse human health effects. TACs include both organic and inorganic chemical substances. TACs may be emitted from a variety of common sources, including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. Research and teaching facilities where a variety of chemicals are used for various experiments may also be a source of TACs.

The 1990 federal CAA Amendments expanded the regulation of hazardous air pollutants (HAPs; the federal government terminology for TACs), establishing a list of 172 individual compounds and 17 compounds categories to be regulated as HAPs. The federal CAA required the EPA to establish a stringent, technology based emissions standard for stationary sources of emissions of these listed substances. The Act also required the EPA to list "major" and "area" source categories that the EPA finds sufficiently threatening to human health or the environment by November 1993, to establish emissions standards for at least 40 stationary source categories by November 1994, and to establish standards for all regulated sources by November 2002.

"Major sources" are defined as any stationary source that emits at least 10 tons per year (tpy) of any HAP or 25 tons per year of any combination of HAPs. "Area sources" are stationary sources encompassing small diverse facilities that routinely release small amounts of HAPs. By November 1997, the EPA must list sufficient categories and subcategories of area sources to ensure that 90 percent of the emissions of the 30 HAPs presenting the greatest threat to the public health in the largest number of urban areas are subject to regulation.

In the state of California, the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB2588) requires specified facilities to submit to the local air pollution control agency, in this case, the SCAQMD, a comprehensive plan to inventory air toxics emissions for all substances listed pursuant to the Act. After the inventory preparation plan is approved, the facility must implement the plan and submit the resulting air toxics emission inventory to the District. After the District receives the completed emission inventories subject to the Act, it is then required to identify high priority facilities for which health risk assessments must be prepared to estimate the potential health risk associated with TAC emissions.

Assembly Bill 1807 (Tanner Bill) set up a statewide process to determine the need for methods to set standards for toxic air contaminants. The process includes identification of toxic air contaminants, determination of emissions and ambient levels of the identified compounds, preparation of regulatory needs documents, and establishment of minimum statewide emission control standards by the Air Resources Board (ARB).

The ARB has identified several chemicals as TACs under the Tanner Bill, including asbestos, benzene, cadmium, carbon tetrachloride, chlorinated dioxins and dibensofurans (15 species), chromium (VI), ethylene dibromide, ethylene oxide and methylene chloride as toxic air contaminants. The ARB has not developed statewide ambient air quality standards for any of these toxic chemicals.

Table 10-2 of the CEQA Handbook identifies air toxics that are subject to regulations. The uses identified that utilize air toxics do not include water treatment or production facilities as potential sources of air toxics.

The SCAQMD regulates levels of air toxics through a permitting process that covers both construction and operation. Both new and existing industries routinely use materials classified as air toxics. For both new and modified sources, the SCAQMD has adopted Rule 1401, with which the project proponent must comply before the project can be constructed and put into operation. A permit, when issued, will allow the facility to operate and will specify the conditions, if any, that might limit its operation.

Rule 1401 pertains to new source review of carcinogenic air contaminates. Rule 1401 specifies limits for maximum individual cancer risks resulting from permit units which emit carcinogenic air contaminants. It imposes Best Available Control Technology for Toxics (T-BACT) requirements based on allowable risk. It should be noted that the cumulative analysis requirement in Rule 14-1 has been eliminated. Cumulative or facility wide inventory requirements are considered to be included in AQMD Rule 1402, per SCAQMD's comments on the DEIR.

The cumulative impacts from the new units plus all permitted units within a 100-meter radius operated by the applicant must be modeled. This cumulative risk must not result in:

- A maximum individual excess cancer risk greater than one in one million ($1x10^{-6}$), if the unit is constructed without T-BACT;
- A maximum individual excess cancer risk greater than ten in one million ($1x10^{-5}$), if the unit is constructed with T-BACT; or
- Greater than 0. 5 excess cancers in the population subject to a risk greater than one in one million.

In addition to the air toxics, the SCAQMD controls the emissions of reactive organic gases (ROGs), and odors through regulations and the permitting process.

Regulation II
Identifies the information required of applicants seeking a Permit to Construct for air pollution sources and requires submission of information before an application can be considered. Specific rules that maybe applicable to the OBMP include: (1) Rule 201 - Permit to Construct, (2) Rule 204 - Permit Conditions, (3) Rule 212 - Standard for Approving Permits, and (4) Rule 217 - Provisions for Sampling and Testing Facilities.

Regulation II also contains a "List of Criteria Identifying Information Required of Applicants Seeking a Permit to Construct." Include in this list are a concentration impact analysis, a health risk assessment, a Best Available Control Technology (BACT) evaluation, and source test data. The type of information and level of detail required will vary depending on the scope of the project, predicted emissions, and potential health effects.

Regulation IV
Operation of existing equipment is governed by Regulation IV. All visible emissions are regulated by rules in Regulation IV. Odors are regulated by Rule 402, "Public Nuisance."

Regulation XI
Addresses source-specific standards. Specific rules that maybe applicable to OBMP facilities under this regulations include: (1) Rule 1110.2 - Emissions from Stationary Internal Combustion Engines, and (2) Rule 1146.1 - Emission of Oxides of Nitrogen from Small Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters.

Regulation XIII
Addresses new source review. This regulation sets forth preconstruction review requirements to ensure that operation of new or modified facilities does not interfere with progress toward attainment of the national ambient air quality standards, and that future economic growth within the SCAQMD is not unnecessarily restricted.

A key impact of Regulation XIII is the required application of BACT and use of emission offsets. BACT must be employed for any permit which results in a net emission increase of any non-attainment air contaminant, any halogenated hydrocarbon or ammonia. Air contaminants of concern include carbon monoxide, sulfur dioxide, nitrogen oxides, particulate matter, lead compounds, and ROGs. BACT is determined by SCAQMD based either on published guidelines or on a case-by-case basis.

The SCAQMD which has jurisdiction over air quality issues in the SCAB has determined that compliance with the terms and conditions of its applicable permits and regulations is adequate mitigation for potential project-related impacts to air quality. No further mitigation is required.

The EPA rejected the ozone attainment portion of the 1997 SIP for the Basin in January 1999. The SCAQMD will incorporate the required changes in its 2000 AQMD for inclusion in the 2000 SIP.

4.6.2.3 Air Quality Planning Conformity

The issue of air quality conformity or consistency with the regional air quality planning process is determined by comparing the proposed project with the regional growth forecasts contained in these documents. The SCAQMD AQMP has concluded that regional air quality for the SCAB can meet NAAQS by the year 2010 with reasonable growth if all of the measures identified in the AQMP to reduce pollutant emissions are implemented. Part of the overall air quality planning effort has been the compilation of a RCPG 1996 by the SCAG. For planning purposes, the AQMP assumes that if future growth in the region is consistent with the forecasts contained in the RCPG, the measures identified in the AQMP will be sufficient to reduce emissions in the SCAB to the point that ambient air pollutants concentrations will not exceed the federal NAAQS by the year 2010. The AQMP indicates that there still maybe violations of the California AAQS for ozone in the year 2010, but the region will be near compliance for these standards.

Given this assumption, the key to determining consistency with the AQMP and RCPG is to evaluate the project's contribution to growth projections by ascertaining whether the project is being implemented consistent with applicable General Plan and whether growth forecasts for the region are meeting or exceeding the forecast contained within the RCPG.

This project does not propose to alter existing land use designations or increase development densities allowed by applicable general plans.

4.6.3 <u>Air Quality Impact Analysis</u>

This section assesses potentially significant environmental impacts to air quality resulting from the proposed OBMP. Section 4.6.3.2 assesses project impacts to air quality from construction emission sources. Section 4.6.3.3 assesses project impacts to air quality from operational emission sources. These two sections include comparisons to significance criteria outlined in Section 4.6.3.1. This assessment is based on data for the proposed project outlined in the OBMP.

4.6.3.1 Criteria for Determining Significant Impact

Thresholds for Construction Emissions

Specific criteria for determining whether the potential air quality impacts of a project are significant are set forth in the SCAQMD's CEQA Air Quality Handbook. The criteria include emission thresholds, compliance with State and federal air quality standards, and conformity with the existing SIP or consistency with the current AQMP.

The following CEQA significance thresholds for construction emissions have been established by the SCAQMD:

- 24.75 tons per quarter or 550 pounds per day of CO
- 2.5 tons per quarter or 75 pounds per day of ROC
- 2.5 tons per quarter or 100 pounds per day of NO_X
- 6.75 tons per quarter or 150 pounds per day of SO_X
- 6.75 tons per quarter or 150 pounds per day of PM_{10}

Thresholds for Operational Emissions

The daily operational emissions "significance" thresholds are as follows:

Regional Emissions Thresholds

- 550 pounds per day of CO
- 55 pounds per day of ROC
- 55 pounds per day of NO_X
- 150 pounds per day of SO_X
- 150 pounds per day of PM_{10}

Projects in the SCAB with operation-related emissions that exceed any of the emission thresholds are considered significant by the SCAQMD.

Location Emission Standards

- California State 1-hour CO standard of 20.0 ppm
- California State 8-hour CO standard of 9.0 ppm

The significance of localized project impacts depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. If ambient levels are below the standards, a project is considered to have significant impacts if project emissions result in an exceedance of one or more of these standards. If ambient levels already exceed a State or Federal standard, project emissions are considered significant if they increase one hour CO concentrations by 1.0 ppm or more, or eight hour CO concentrations by 0.45 ppm or more.

Facilities with emissions of TACs are considered significant if a health risk assessment shows an increased risk of greater than ten in one million.

The potential air quality impacts of the proposed project were assessed using guidelines and data developed by the SCAQMD CEQA Air Quality Handbook.

4.6.3.2 Construction Emissions

Implementation of the OBMP will result in the installation of pipelines, new wells, pump station, desalter units, storage facilities, and water treatment facilities. The plan envisions utilizing existing water percolation basins that will be connected to the system by new pipelines. It is projected that all the new pipelines and desalter units, except the West Desalter, will be installed during the first 5 years of the project. This is an aggressive schedule, but also provides for a worse-case evaluation of air quality impacts. The SCAQMD construction thresholds are based on quarterly and daily emissions from a project. Because construction schedules are not available at this time, the annual emissions will be circulated and converted to quarterly emissions.

Pipelines Construction

Based on data provided in Table 4.2-3, it is projected this project will result in about 35,380 lineal feet (LF) of new pipeline being installed in the first 5 years. Assuming that pipe installation will occur evenly over the 5-year period, it is forecast that approximately 7,100 feet of pipeline will be installed annually. It is also projected that an additional 32,000 LF of pipeline will be installed as part of the East Desalter facility resulting in the potential for 39,100 LF in pipe to be installed in a given year. Generally the installation of underground pipelines in roadways is slower than installation in undeveloped areas due to the presence of existing underground utilities. Typically about 300 LF of pipe can be installed per day. Based on these projections, it is forecast that installation of the pipe will require the following pieces of equipment.

Developed Areas
Backhoe
Service Truck
Front Loader
Asphalt Roller
Water Truck

It is forecast that most of the pipe will be 12 and 16-inch diameter pipe. Trucks delivering the pipe and appurtenant equipment can carry an average of about 900 feet of 12 and 16-inch pipe per load and installation of approximately 39,100 LF of pipe will require about 43 truck deliveries per year. It is anticipated that the majority of the pipe and equipment will come from the Fontana, Ontario, Mira

Loma area by way of the freeways. Such deliveries will result in roundtrips that average about 40 miles at an average speed of about 40 mph.

It is also projected that installation of the pipelines will require about 10 workers at any given time. This will result in 10 passenger vehicle trips that average about 30 miles roundtrip at an average speed of 35 mph. It is also projected that all of the 39,100 LF of pipeline will be installed in existing paved roads. This will result in trucks delivering asphalt and base material to repair the pipe trenches. At the projected pipe installation rate of 300 feet per day, it is forecast that one truck per day for each base and asphalt will be needed. This equates to a total of 260 roundtrips per year (130 days x 2 trucks/day) to deliver these materials. It is forecast these trucks will travel about 30 miles roundtrip at an average speed of 30 mph.

Based on the above data, it is forecast that installation of the pipelines will result in the following emissions.

Pipe and Materials Delivery

The SCAQMD CEQA Handbook provides tables to calculate emissions from large diesel trucks on a per mile traveled basis. Utilizing CEQA Handbook data for the year 2001, it is forecast that the annual delivery of pipe and materials will result in 1,720 miles being traveled (43 trucks x 40 miles). The average speed of the trucks per trip is projected to be 40 mph. Using Table A9-5-K-6 of the CEQA Handbook, it is forecast that these delivery trips will result in the following emissions:

CO = 25 lbs/year
ROC = 3 lbs/year
NOx = 19 lbs/year
PM_{10} = 2 lbs/year

These emissions are considered worse case because they are based on SCAQMD 2001 (first year of construction) emission projections for vehicles. As newer vehicles are produced, the CEQA Handbook projects that engine emissions will decline to meet clean air standards.

Based on data provided in Table A9-5-K-6, it is projected the asphalt and base delivery vehicles will produce the following emissions based on a projected 7,800 vehicle miles traveled. Once again, these pollutant vehicle rates are based on projected 2001 emission rates for large trucks.

CO	=	148 lbs/year
ROC	=	19 lbs/year
NOx	=	83 lbs/year
PM_{10}	=	7 lbs/year

Total annual pipe and materials delivery emissions

2001

CO	=	173 lbs/year
ROC	=	22 lbs/year
NOx	=	102 lbs/year
PM_{10}	=	9 lbs/year

Construction Workers Commute (Table A9-5-J-6)

2001

CO	=	2 lbs/year
ROC	=	0 lbs/year
NOx	=	0 lbs/year
PM_{10}	=	0 lbs/year

Pipeline Construction Equipment

Based on an average pipe installation rate of 300 feet per day, it is forecast that the annual average pipe installation activities will require 130 eight-hour work days to complete. It should be noted the CEQA Handbook only provides one set of emissions data for large equipment. It does not project vehicle emissions for future years. These data in the CEQA Handbook is considered worse case because it is data generated in 1985 by the Federal EPA and vehicle emissions have and will continue to improve since that time.

Installation of the pipeline and appurtenant equipment will require the operation of a diesel powered diesel backhoe for 130 work days (8 hours) during any given year. Based on data contained in the CEQA Handbook it is calculated the backhoe will generate the following daily emissions:

CO	=	5.4 lbs/day
ROC	=	1.2 lbs/day
NOx	=	13.6 lbs/day
SOx	=	1.1 lbs/day
PM_{10}	=	1.1 lbs/day

Based on normal construction methods, it is projected that the other construction equipment (all diesel powered) will be utilized in the following manner.

Front Loader - 8 hours/day for 130 days
Roller - 5 hours/day for 130 days

Based on the above and data in the CEQA Handbook, the following annual emissions are projected:

Front Loader			Roller		
CO	=	269 lbs/year	CO	=	195 lbs/day
ROC	=	94 lbs/year	ROC	=	42 lbs/day
NOx	=	923 lbs/year	NOx	=	566 lbs/day
SOx	=	90 lbs/year	SOx	=	44 lbs/day
PM_{10}	=	77 lbs/year	PM_{10}	=	33 lbs/year

The two trucks to be utilized in developed areas will travel about one mile per day for 130 days. These vehicles will generate the following 2001 emissions:

CO	=	24 lbs/year
ROC	=	4 lbs/year
NOx	=	8 lbs/year
PM_{10}	=	1 lbs/year

Fugitive Emission During Pipeline Construction

Based on the above calculations, implementation of the pipe installation activities will result in the following pipeline construction vehicle emissions for the worst case year 2001.

CO	=	1,690 lbs/year
ROC	=	464 lbs/year
NOx	=	4,418 lbs/year
SOx	=	383 lbs/year
PM_{10}	=	368 lbs/year
Fugitive PM_{10}	=	643 lbs/year

Construction activities can generate significant volumes of particulate matter (dust) from the disturbance of soil material. Such dust is generally chemically inert and of a large enough diameter to be readily filtered by the human breathing system. Due to their large size and weight most of the dust particles settle out of the air soon after they are generated. Particulates with the respirable range of ten microns or less in diameter (PM_{10}) comprise 20 to 40 percent of dust near a construction site (CEQA Handbook). Implementation of the OBMP could result in the generation of PM_{10} from pipe trench excavations, the storage of backfill material and the movement of equipment. Based on available information and data in the CEQA Handbook, the following annual fugitive emissions are forecast to be generated.

Trenching

Based on data provided in the CEQA Handbook, the excavation of 39,100 LF of pipe trench is forecast to generate the following.

Dirt Storage Piles

It is assumed that excavated soil will be stored adjacent to the trench in piles that are about 6 feet wide. The 39,100 feet of trench excavated within a maximum year will create storage piles that total about 5 acres in size. Based on data contained in the CEQA Handbook, the following PM_{10} generation is forecast to occur.

Fugitive PM_{10} = 123 lbs/year

Construction in developed areas will require the use of a service truck and a water truck. These vehicles will generally travel about one mile daily on paved surfaces for 130 days a year. This will result in the PM_{10} generation:

Fugitive PM_{10} = 52 lbs/year

Based on the above, it is forecast that installation of the pipelines will generate the following annual fugitive PM_{10} emissions:

Fugitive PM_{10} = 643 lbs/year

Well Development

Well Drilling Equipment Delivery

Based on data provided in the OBMP, is projected that about 30 new wells could be installed in the first 10 years. It is forecast that a maximum of 5 wells will be developed in any given year.

Development of five new wells during a given year will require the delivery and set up of the drilling rig. It is anticipated these wells will be drilled at different times and the drilling equipment transported to and from the sites on separate occasions.

For the purposes of this evaluation, it is forecast that delivery of the drilling equipment five times will result in five 50 miles roundtrips at an average speed of 30 mph. Using data contained in Table A9-5-K-6 of the CEQA Handbook, the following emissions are forecast to occur.

CO = 5 lbs/year
ROC = 1 lbs/year

NOx	=	3 lbs/year
PM_{10}	=	negligible

Well Drilling

It is forecast the drilling of five wells to an average depth of 850 feet each will require a total of 440 hours with drilling being ongoing 24 hours per day. Using CEQA Handbook data, it is forecast these activities will generate the following emissions:

CO	=	290 lbs/year
ROC	=	65 lbs/year
NOx	=	748 lbs/year
SOx	=	63 lbs/year
PM_{10}	=	63 lbs/year

Well Test Pumping

It is anticipated that test pumping each well will take about 8 hours/day for about 5 days each (total 25 days). These activities will result in the following emissions:

CO	=	135 lbs/year
ROC	=	30 lbs/year
NOx	=	340 136 lbs/year
SOx	=	28 lbs/year
PM_{10}	=	28 lbs/year

Equipment Delivery

Delivery of the well casings, pumps, motors, etc. is forecast to result in about 1,000 miles being traveled by trucks averaging about 45 mph. These delivery trips will result in the following emissions.

CO	=	20 lbs/year
ROC	=	3 lbs/year
NOx	=	13 lbs/year
PM_{10}	=	2 lbs/day

Finish Well

Lining, packing and development of the five wells are forecast to generate the following emissions:

CO	=	135 lbs/year

ROC = 30 lbs/year
NOx = 340 lbs/year
SOx = 28 lbs/year
PM_{10} = 28 lbs/year

Fugitive emissions from well construction due to the small area of the well sites (less than one-half acre square feet) and the short period of site preparation, it is projected that site development will generate the following:

PM_{10} = 62 lbs/year

Total Production Well Development Emissions

CO = 593 lbs/year
ROC = 128 lbs/year
NOx = 1444 lbs/year
SOx = 119 lbs/year
PM_{10} = 121 lbs/year
Fugitive PM_{10} = 62 lbs/year

Monitoring Wells

According to the OBMP, about 50 monitoring wells may be installed to monitor groundwater quality in the future. Typically these are drilled to shallower depths than water production wells do not require test pumping and thus require less development time and materials to construct. It is forecast that development of the monitoring wells could result in air emissions in a given year that are one half the emissions associated with production well development.

Total Emissions from Production and Monitoring Well Development:

CO = 687 lbs/year
ROC = 147 lbs/year
NOx = 1,651 lbs/year
SOx = 136 lbs/year
PM_{10} = 327 lbs/year

Reservoir Construction

The OBMP envisions the potential need for reservoirs. Development of a reservoir site will require site preparation (clearing, grading, etc.) on about two acre of land. The sites will take about a total of 3 days to complete. It is anticipated the site preparation will require the use of a small dozer, a front loader and a water truck. It is projected that reservoir materials and equipment delivery will require about thirty 50 mile roundtrips by truck at 40 mph. As with the pipe deliveries, it is anticipated the materials will be delivered using freeways and take about 4 days.

Construction of the reservoir will take about 10 workers for about 30 days each. It is anticipated these workers will come from the local work force and travel to the site in private vehicles. It is projected these commute trips will average about a 40 miles roundtrip primarily on local streets. Once constructed, the reservoir will be coated to prevent corrosion.

Vehicle Emissions from Site Preparation

CO = 0.8 lbs/day
ROC = negligible
NOx = negligible
PM_{10} = negligible
Fugitive PM_{10} = 49.3 lbs/day

Vehicle Emissions from Materials Delivery

CO = 5.5 lbs/day
ROC = 0.8 lbs/day
NOx = 0.8 lbs/day
PM_{10} = negligible

Workers Commute

CO = 2.1 lbs/day
ROC = 0.1 lbs/day
NOx = 2.5 lbs/day
PM_{10} = 0.8 lbs/day

Emissions From Coating Reservoirs 6 mils thick.

Typically, the exteriors of reservoirs are coated with a primer and enamel coats to prevent corrosion and for aesthetic purposes. Presently, low volatile reactive organic compound (VOC or ROC) coatings are available. Based on manufacturer emission data for such coatings it is forecast that a 5 million gallon tank coated to a 6 mil thickness will generate the following ROC emissions:

ROC = 317 lbs/year

Total Reservoir Construction Emissions

CO = 112 lbs/year
ROC = 331 lbs/year
NOx = 20 lbs/year
PM_{10} = 10 lbs/year
Fugitive PM_{10} = 221 lbs/year

Identified Construction-Related Emissions Without Mitigation:

Based on the activities identified above, it is projected that implementation of the OBMP will generate the following unmitigated annual emissions. These emissions are compared to the SCAQMD's threshold of significance for evaluating this projects potential impacts to air quality.

Annual Construction Emissions

CO = 2,489 lbs/year or 1.2 tpy
ROC = 882 lbs/year or 0.4 tpy
NOx = 6,067 lbs/year or 3.0 tpy
SOx = 219 lbs/year of 0.1 tpy
PM_{10} = 1,569 lbs/year or 0.8 tpy

It is not possible to predict construction schedules at this time, but it should be anticipated that the construction activities identified will occur somewhat equally throughout a given year. This will result in the annual emissions being spreadout over all four quarter years and result in the following quarterly unmitigated emissions:

Quarterly Construction Emissions	SCAQMD Thresholds
CO = 0.3 tons/quarter	24.75 tons per quarter or 550 lbs/day
ROC = 0.1 tons/quarter	2.5 tons per quarter or 75 lbs/day
NOx = 0.8 tons/quarter	2.5 tons per quarter or 100 lbs/day
SOx = >0.1 tons/quarter	6.75 tons per quarter or 150 lbs/day
PM_{10} = 0.2 tons/quarter	6.75 tons per quarter or 150 lbs/day

As can be seen, the projected construction related annual impacts are forecast to be well below the SCAQMD's quarterly thresholds of significance for all criteria pollutants without mitigation. At this time, there is inadequate data to forecast potential daily emissions.

These emissions forecasts are based on an aggressive schedule of development. If development should occur at a lesser intensity, construction-related emissions would be reduced.

4.6.3.3 Other Construction Emissions

The OBMP identifies the construction of such other facilities as desalter units, pump stations, expansion of water treatment plants, and a recycled water distribution system. Neither the size (other than numbers of acres) or timing of construction of these facilities are known. It is not anticipated, however, that more than one of the major facilities will be constructed in a given year. It is anticipated that no more than 50 acres of land will be under development. Table 6-3 of the CEQA Handbook provides screening data for projects to assist lead agencies in determining a project's potential to generate significant construction-related air quality impacts. Table 6-3 identifies projects that result in less than 177 acres in a quarter year as potentially having non-significant construction-related air quality impacts. Table 6-3 also identifies projects that contain less than 559,000 square feet of gross floor area as also having the potential to result in less than significant construction-related air quality impacts.

Based on data identified in Table 6-3, it is projected that construction of the other facilities may not result in significant construction-related impacts. As previously stated, however, the number and size of OBMP projects constructed within a given year will affect the potential for significant adverse construction-related impacts to result.

4.6.3.4 Operations Emissions

The only potentially significant operations emissions associated with the project will be the consumption of electrical energy by motors at wells, desalters, pump stations, etc.

<u>Wells</u>

As previously stated, it is anticipated that up to 30 new wells could be constructed by implementation of the OBMP. While not presently sized, it is anticipated these wells will be equipped with 500 Bhp electrical motors and thus generate about 15,000 horsepower. Under a likely operations condition with one-half the wells operating 24 hours per day, these motors would consume 180,000 horsepower hours per day. One horsepower hour is equivalent to 0.7457 kilowatt. This converts to about 134 megawatt hours. The CEQA Handbook contains emission factors for criteria pollutants from electricity consumption (Table A9-11-B) and based on these factors, the following emissions would occur on a maximum water pumping day.

CO	=	26.8 lbs/day
ROC	=	1.4 lbs/day
NOx	=	104.1 lbs/day
SOx	=	16.1 lbs/day
PM_{10}	=	5.3 lbs/day

All of these emissions are below the SCAQMD's threshold of significance for criteria pollutants except NOx which exceeds the threshold of 55 lbs/day.

Further review conducted in response to comments received by SCAG and verbal comments from Dave Argo and new information provided in the *Revised Draft Water Supply Plan Phase I Desalting Project Facilities Report* indicates that NOx emissions may, in fact, be less than that quantity identified above. The desalter pumps were originally sized at 500Bhp, however, personal communication between Dave Argo of Black and Veatch and Tami Fincher of Tom Dodson and Associates on June 29, 2000 indicates that no more than 150 horsepower per desalter well pump should be necessary. This would reduce NOx emissions to approximately 31.2 lbs/day. However, several additional factors should be considered. Two booster pump stations utilizing 142 and 347 Bhp motors will be necessary for the desalter water distribution system. The NOx emissions from these motors remains within the scope of what was previously analyzed for the well pumps sized at 500 Bhp minus the 31.2 lbs/day of NOx resulting from the thirty desalter well pumps resized at 150 Bhp each, so impacts remain within the range originally forecast. In the future, a conjunctive use program may utilize existing wells for extraction of stored water. The pumps for these wells will remain less than 500 Bhp in size and will not contribute to the cumulative exceedance of the 104.1 lbs/day NOx value that was analyzed in under the original project description, or else a new environmental document must be prepared. It should still be noted that when emissions are totaled for the sum of all pumping for desalters, conjunctive use and/or distribution are totaled, the total still exceeds 55 lbs/day. Therefore, impacts are considered to be significant.

It should be noted that these emissions are associated with buildout of the OBMP. Until about one-half or 15 wells are on line, operations impacts of the wells will be below significance thresholds.

<u>Desalter Units</u>

Data provided in the OBMP indication that operation of the East and West Desalters could ultimately consume about 30,057,967 kilowatt hours of electricity annual. This converts to about 82.3 megawatt hours. Based on data contained on Table A9-11-13, the following emissions are forecast to result.

CO	=	16.5 lbs/day
ROC	=	0.8 lbs/day
NOx	=	94.6 lbs/day
SOx	=	9.9 lbs/day
PM_{10}	=	3.3 lbs/day

Other Operations Emissions

Implementation of the OBMP will result in the use of vehicles to inspect, maintain, and repair the facilities. While it is not possible to predict the number and length of such trips on a daily basis, it is forecast that emissions associated with these activities will be negligible.

Total Operation Emissions			Operations Emissions Thresholds
CO	=	43.3 lbs/day	550 lbs/day
ROC	=	2.2 lbs/day	55 lbs/day
NOx	=	198.6 lbs/day	55 lbs/day
SOx	=	26.0 lbs/day	150 lbs/day
PM_{10}	=	8.6 lbs/day	150 lbs/day

Operations emissions are all below thresholds for criteria pollutants except NOx which exceeds the significance thresholds. These emissions are considered worst-case because they reflect operation at maximum capacity. This is a highly unlikely condition and actual emissions are expected to be substantially lower.

It should be noted that potentially significant operations emissions are associated with stationary equipment. Such equipment may be subject to permitting by the SCAQMD. Compliance with the terms of the permits is deemed adequate mitigation by the SCAQMD for potential air emission impacts.

Toxic Emissions

Table 10-2 of the CEQA Handbook identifies the type of facilities that are representative of users that could generate toxic contaminants. Water treatment and supply facilities are not listed. Water facilities do utilize chlorine which is identified as a contaminant of concern for acute exposure.

Water facilities do utilize chlorine to disinfect water. The use and storage of chlorine is regulated by state and local rules and regulations. Compliance with these rules and regulation are deemed by regulatory agencies to be adequate to mitigate the potential risk of exposure to acceptable levels.

4.6.4 Mitigation Measures

4.6.4.1 Construction Impacts

4.6-1 Water active grading sites at least twice daily and when dust is observed migrating from the site. The project will comply with SCAQMD Rule 403 requirements where applicable. Rule 403 prohibits visible dust emissions beyond the property boundaries.

4.6-2 Suspend all grading and excavation operations when wind speeds exceed 25 mph.

4.6-3 Apply non-toxic chemical soil stabilizers according to manufacturers specifications to inactive construction areas (previously graded areas inactive for 10 days or more).

4.6-4 Replace ground cover or pave disturbed areas immediately after construction is completed in the affected area.

4.6-5 Sweep streets once a day and when soil material is observed on traveled roadways.

4.6.4.2 Operation Impacts

Other than compliance with SCAQMD rules, regulations and permit conditions, no further mitigation can be identified.

4.6.5 Unavoidable Significant Impact

Operation of the facilities identified in the OBMP have the potential to result in significant adverse air quality impacts. This impact must be classified as a Class I impact, however it should be noted that in the future efforts will be made to minimize impacts, and it may be possible to reduce impacts to less than significant levels. Adverse impacts could result at or near buildout of the OBMP. This would result from operation of all the systems at or near full capacity at the same time. It is possible that staggering the operation of pumps and motors could result in a substantial reduction in energy consumed and emissions generated. These forecasts are also worst case because it is highly likely that all the electricity consumed will not be produced in the SCAB. Further, with the deregulation of utilities services, it may be possible to knowingly purchase electricity produced outside the SCAB. Current rules and regulations are now under review and may be revised to reflect the new utilities production and distribution situation. Since these revisions have not been formally adopted, however, impacts must still be forecast according to a "worst-case" scenario, and impacts must be classified as potentially significant.

4.6.6 Cumulative Impact

Implementation of the OBMP will contribute pollutants into the SCAB from construction and operation of the facilities. These facilities are designed to provide an adequate water supply for the land uses and intensities identified in applicable general plans. The AQMD assumes that if growth occurs that is consistent with applicable general plans then, ambient air quality standards can be met. Because this project does not propose amendments to existing general plan land uses, it is in conformity with the AQMD and will not result in significant adverse cumulative air quality impacts.

4.7 TRANSPORTATION AND CIRCULATION

4.7.1 Introduction

Potential impacts to the transportation and circulation system were included as a topic of evaluation in this PEIR based on the ultimate (buildout) development conditions anticipated by affected jurisdictions the within the OBMP's project area. The NOP and scoping processes did not identify specific concerns relating to potential impacts that might result from the installation of water management facilities throughout the Chino Basin.

This subchapter focuses on the transportation and circulation system in the Chino Basin and the potential impacts to this system of the environment from implementing the OBMP. Four types of circulation systems are evaluated: air transport, non-motorized transport, rail and roads. The evaluations are based upon information contained within general plans and other pertinent transportation planning resources for the project area. General Plans from the following entities were utilized: cities of Chino, Chino Hills, Fontana, Montclair, Norco, Ontario, Pomona, Rancho Cucamonga, Rialto, and Upland; and the counties of Riverside and San Bernardino. In addition, SCAG and Western Riverside Council of Governments (WRCOG) publications, such as the RCPG, RMP, the Regional Transportation Plan (RTP) and Non-motorized Transportation Plan were consulted. Traffic volume data was provided from the California Department of Transportation relating to California State Highways and San Bernardino Associated Governments (SANBAG) relating to projected traffic volumes.

4.7.2 Environmental Setting

4.7.2.1 Air Transport System

The Chino Basin Project Area is well served by a number of airport facilities providing service to the cities within the Inland Empire, communities in the High Desert region, Los Angeles County and Orange County. The air transport system is comprised of a commercial air carrier facility, general aviation airports and private airfields. The following is a description of the main airport facilities in the Chino Basin Project Area:

Ontario International Airport serves the growing international air transportation needs of the Inland Empire area. It functions as a major satellite airport to Los Angeles International Airport, providing both passenger and air cargo service.

The Chino Airport is located 4 miles southeast of downtown Chino, at the southeast corner of Euclid Avenue and Merrill Avenue. The facility provides general aviation services for approximately 950 aircraft based there.

Rialto Municipal Airport, located west of Cedar Avenue between Baseline Road and Highland Avenue (SR 30) is also a general aviation airport. It is also designated by the Federal Aviation Administration (FAA) as a reliever airport for Ontario International Airport, relieving the larger facility of some of the general aviation activities which would otherwise locate there.

Cable Airport, located in the northwest portion of the City of Upland, serves the general aviation needs of the Upland community and adjacent cities. It is a privately owned, public use airport, serving customers with light personal and business airplanes.

4.7.2.2 Non-Motorized Transport System

Non-motorized transport encompasses bicycle, equestrian and pedestrian circulation. Within the various affected jurisdictions, bicycle trails are noted as an energy efficient alternative to the automobile to help link the commercial, residential and open space uses within a community. The Project area has various sites, areas and paths which the bicyclist may access. The City of Upland has designated State Routes 83 and 66 as routes for bicycles. The City of Chino has identified numerous trails within their General Plan including: Euclid and Chino Avenues, the Cypress Channel, the Southern California Edison (SCE) easement along Edison Avenue, adjacent to the San Antonio Channel. Other jurisdictions have identified potential trails long the Santa Ana River, Philadelphia, Walnut, Riverside and San Antonio Avenues in the western portion of the Basin Area. Regional connections to specific attractions are encouraged with the general plans. As an example, within the City of Chino, the Chino Fairgrounds and Ruben Ayala Community Park attract recreational cyclists.

According to information from WRCOG, the Northwest APD (cities of Corona, Norco and Riverside) has the most miles and extensive system of existing bicycle facilities in the subregion. There were 56 miles of existing bike paths/lanes in 1995 with an additional 210 miles planned with future developments This APD also contains the most population and greatest population density (2,458 persons/square mile), as well as the second youngest average median age group (29.6 years), in the subregion. The Northwest APD also contains the greatest number and concentration of major activity centers in the subregion, including Reg 15 employer sites (those employers with 100 or more employees). In addition, the Northwest APD is ranked third of the six APDs in the subregion in terms of the percentage of combined journey to work non-motorized mode split (walk+bike) trips; however, in terms of the number of trips, the Northwest APD has the largest number of commuters who bicycle to work. The Northwest APD also has the highest average jobs per household ratio in the subregion at 1.28, compared to 0.85 for the subregion as a whole. The Northwest APD also has the most households with no vehicle available, and the largest teen population in the subregion.

Equestrian and pedestrian circulation primarily consists of multi-purpose trails and sidewalks. The equestrian trails generally share rights-of-way with secondary arterials, utility lines, and flood control channels. The City of Upland's General Plan has identified pedestrian enhancements for a number of primary roadways and facilities including the Cucamonga Wash and the San Antonio Wash. The

City of Norco has provided an extensive system of equestrian paths and trails within their corporate limits. The City of Chino and Chino Hills provide a series of local trails that also provide access to a larger regional system of trails. Numerous local trails serve as equestrian attractions, such as the Chino Fairgrounds, Chino Hills State Park, the Prado Dam area, and the Santa Ana River.

4.7.2.3 Rail System

Extensive rail service is provided within the Chino Basin area serving both passenger and freight services. The Burlington Northern Santa Fe (BNSF) and the Southern Pacific main lines run in an east-west direction north and south of Interstate 10, respectively. The BNSF line carries both freight and passenger traffic including Metrolink and Amtrak services. The Southern Pacific main line runs south of, and parallel to, the I-10 Freeway through the cities of Chino, Fontana, Ontario, Pomona, and Rialto. This line provides freight rail service. The two main line railroads maintain major facilities in the Chino Basin region including a major classification yard in West Colton and rail-truck transload and warehousing facilities in Fontana and Pomona. These railroads connect southern California with other U.S. regions, Mexico and Canada via their connections with other railroads.

4.7.2.4 Road System

The Project Area is served by a number of regional roadways which provide access to Los Angeles, Orange, Riverside and San Bernardino County areas. The primary regional roadway network is comprised of two interstate freeways, the San Bernardino Freeway (I-10), which passes on an east-west alignment through the central portion of the Chino Basin area, and the Ontario Freeway (I-15) oriented north-south through the middle of the Chino Basin. In addition, there are five State Routes (SR) running through the Project Area. The Pomona Freeway (SR 60) passes through the southern portion of the Chino Basin also in an east-west direction and provides access to Riverside County via Los Angeles and San Bernardino Counties. The Corona Expressway (SR 71) connects Riverside County with Orange County through a reach of San Bernardino County and the cities of Chino Hills and Pomona. Highland Avenue (SR 30) and Foothill Boulevard (SR 66) provide circulation within the northern Chino Basin area in an east-west direction through the cities of Fontana, Rancho Cucamonga, Rialto and Upland. Euclid Avenue (SR 83) provides north-south access through the cities of Chino, Ontario and Upland. The State Route 30 freeway (Foothill Freeway) is currently under construction and will provide a new route at the north end of the Basin.

The following is a description of the main regional roadways in the Chino Basin Project Area:

<u>San Bernardino Freeway (I-10)</u> is an eight-lane interstate freeway which currently traverses the Project Area in an east-west direction. The projected year 2020 average daily traffic (ADT) volumes on I-10 range from 85,900 vehicles per day to 134,100 vehicles per day through the Project Area.

Ontario Freeway (I-15) is a six to eight lane interstate freeway bisecting the Project Area connecting Riverside County to San Bernardino County. The projected year 2020 ADT volumes on I-15 range from 89,600 vehicles per day to 122,400 vehicles per day through the Project Area.
Highland Avenue (SR 30) provides circulation within the northern Chino Basin area in an east-west direction through the cities of Fontana, Rancho Cucamonga, Rialto and Upland. It varies in configuration and ultimate right-of-way through the each of the affected cities. The City of Fontana identifies the roadway as a primary highway intended to accommodate four travel lanes with a median. The City of Rancho Cucamonga designates the roadway as a collector. The City of Rialto's General Plan defines SR 30 as a freeway and in its current condition is a two-lane road west of Riverside Avenue and a four-lane divided highway east of Riverside Avenue. The City of Upland categorizes the roadway as a collector and identifies it as Nineteenth Street form Mountain Avenue to east City limits. The projected ADT volume on Highland Avenue ranges from 68,200 vehicles per day near Alder Avenue in the City of Fontana to 80,200 vehicles per day west of Carnelian Street in the City of Rancho Cucamonga in the year 2020.

Pomona Freeway (SR 60) is a six-lane facility which traverses the Project Area in an east-west direction, providing access to Riverside County via Los Angeles and San Bernardino Counties. The projected year 2020 ADT volumes on SR 60 range from 63,700 vehicles per day (east of Pedley Road) to 133,000 vehicles per day (west of the SR 83).

Foothill Boulevard (SR 66) provides an additional circulation route within the northern Chino Basin area in an east-west direction through the cities of Fontana, Rancho Cucamonga, Rialto and Upland. It varies in configuration and ultimate right-of-way through the each of the affected cities. The City of Fontana identifies the roadway as a Major Highway that can accommodate six travel lanes and may have raised medians. Within the City of Rancho Cucamonga, SR 66 is categorized as a major divided arterial. Rialto designates SR 66 as a major arterial consisting of a four-lane facility. The City of Upland categorizes the roadway as a major arterial comprised of four traffic lanes and a frontage road. The projected ADT volume on Foothill Boulevard ranges from 7,300 vehicles per day near Citrus Avenue in the City of Fontana to 21,100 vehicles per day west of Central Avenue in the City of Upland in the year 2020.

Corona Expressway (SR 71) is a six-lane divided freeway located in the western portion of the Chino Basin. The project 2020 ADT volumes on SR 71 range from 13,400 vehicles per day near Pine Avenue in south Chino to 32,300 vehicles per day at the confluence of State Route 60.

Euclid Avenue (SR 83) is a roadway which traverses the Project Area in a north-south direction from the southern portion of the City of Chino through the City of Ontario and up into the northern portion of the City of Upland. Euclid Avenue varies in configuration and ultimate right-of-way through the each of the affected cities. In the City of Chino, Euclid Avenue is designated as an expressway with eight travel lanes under the proposed Master Plan of Arterials. The City of Ontario identifies the roadway as a divided arterial accommodating four to six lanes of traffic with a median. The City of Upland categorizes the roadway as a major arterial and includes a wide landscaped median with six

lanes south of Foothill Boulevard and four traffic lanes north of Foothill Boulevard. The projected ADT volume on Euclid Avenue ranges from 7,200 vehicles per day in then City of Chino to 34,300 vehicles per day north of I-10 in the City of Upland in the year 2020.
Based upon information provided by SANBAG through the Comprehensive Transportation Plan (CTP) funded 2020 Model (Hybrid Model) for the West Valley, the projected volumes for year 2020 are estimated to be 1,751,800 Annual ADT. This is an overall reduction of 22 percent from the 1998 Annual ADT which was 2,243,200 ADT which is attributable to a combination of construction of new roads, greater use of alternative means of transportation including rail and transit and establishing job centers closer to housing centers. Table 4.7-1, ***Traffic Volumes on Key Roads*** depicts the ADT for Interstates and State Routes within the Chino Basin area.

The forecasting of traffic volumes is necessary for presenting a global picture of traffic flow, evaluating traffic trends, and planning and designing highways. A more localized method to determining traffic flow is based on a Level of Service (LOS) approach. Traffic flow is measured by the number of vehicles that can pass over a given section of road in a given time period, particularly through constrictions, such as intersections with stop signs or traffic signals. The LOS on a roadway varies between LOS "A", unrestricted traffic flow to forced flow conditions with high approach delays. The definitions of LOS for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" representing free flow where individual users are virtually unaffected by the presence of others in the traffic stream.

- LOS "B", in the range of stable flow, but where the presence of other users in the traffic stream begins to be noticeable. Here the freedom to select desired speeds is relatively unaffected but there is a slight decline in the freedom to maneuver.

- LOS "C", in the range of stable flow, but where the operation of individual users becomes significantly affected by intersections with others in the traffic stream.

- LOS "D" representing high-density but stable flow where speed and freedom to maneuver are severely restricted and the driver experiences a generally poor level of comfort and convenience.

- LOS "E" representing operating conditions at or near the capacity level where all speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS "F" which defines forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

Table 4.7-1
TRAFFIC VOLUMES ON KEY ROADS

Roadway	1998 Annual ADT	2020 Projected Annual ADT
Interstate 10		
I-10 at San Bernardino County Line	231,000	129,700
I-10 at State Route 83	230,000	131,000
I-10 at Interstate 15	218,000	134,100
Interstate 15		
I-15 at State Route 60	172,000	113,500
I-15 at Interstate 10	175,000	114,400
I-15 at State Route 66	132,000	122,400
State Route 30		
SR-30 at Upland City Limit	24,900	75,600
SR 30 at State Route 83	18,000	74,000
SR 30 at Interstate 15	12,800	74,000
State Route 60		
SR 60 at San Bernardino County Line	170,000	130,500
SR 60 at State Route 83	201,000	133,000
SR 60 at Interstate 15	186,000	126,400
SR 60 at Pedley Road	86,000	66,200
State Route 66		
SR 66 at San Bernardino County Line	36,500	21,100
SR 66 at State Route 83	42,000	16,200
SR 66 at Interstate 15	47,000	20,100
State Route 71		
SR 71 at State Route 60	57,000	77,100
SR 71 at Route 142 (Chino Hills Pkwy)	40,000	63,300
SR 71 at State Route 83	37,000	33,900
State Route 83		
SR 83 at State Route 71	12,500	7,400
SR 83 at State Route 60	32,000	21,900
SR 83 at Interstate 10	33,500	34,300
SR 83 at State Route 66	34,500	22,100
SR 83 at State Route 30	14,500	9,600
TOTAL ADT:	2,243,200	1,751,800

Source: 1998 Traffic Volumes on California State Highways, Caltrans, 1998.
CTP Funded 2020 Model (Hybrid Model) West Valley, SCAG, 2000.

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the specific element of the roadway being considered, e.g., signalized intersections versus arterial segments. The LOS criteria for signalized intersections are:

- LOS "A" - describes operations with average intersection stopped delay (how long a driver must wait at a signal before the vehicle can begin moving again) of five seconds or less.
- LOS "B" - average stopped delay between 5.1 and 15.0 seconds per vehicle.
- LOS "C" - average stopped delay between 15.1 and 25.0 seconds per vehicle.
- LOS "D" - average stopped delay between 25.1 and 40.0 seconds per vehicle.
- LOS "E" - average stopped delay between 40.1 and 60.0 seconds per vehicle.
- LOS "F" - average stopped delay greater than 60.0 seconds per vehicle.

An intersection is also designated as operating at LOS "F" when the volume/capacity ratio of the critical movements at the intersection is equal to or greater than 1.0.

In 1992, the San Bernardino Associated Governments adopted a Congestion Management Program (CMP) for San Bernardino County. The requirements for the CMP were formulated by the legislature to address a number of transportation concerns relating to a lack of an integrated system and the increases in the number of vehicles causing traffic congestion. SANBAG was required to establish traffic levels of service standards for, at a minimum, all state highways and principal arterials. SANBAG determined that the LOS standard shall be “E” for all roadway links and intersections to the County of Riverside. Local jurisdictions in most cases are more restrictive in their LOS threshold, which for roadways and intersections is a LOS “D”.

4.7.3 <u>Project Impacts</u>

Transportation impacts of a project are defined in the CEQA Guidelines as causing “an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system.” An impact is also considered significant if it results in the violation of existing standards or policies, such as the goal of LOS “C” or “D” contained in the general plans throughout San Bernardino County. Implementation of the OBMP is not anticipated to substantially increase the traffic load or alter the carrying capacity of street systems within the Chino Basin area. The OBMP is a water management program specifically designed to provide a more efficient and effective water supply program through implementation of recycled water use, implementation of storage strategies and conjunctive use of the local groundwater supply in the Chino Basin. None of the physical changes in the environment are forecast to directly or indirectly cause any permanent changes in any transportation or circulation systems.

Of the four main types of facilities that will be implemented in support of the OBMP, the installation and construction of pipelines and the proposed desalters will generate the potential for short-term, construction impacts to the existing circulation system. Pipelines will be placed underground (except possibly within OBMP facilities) and there will be short-term disruptions of traffic flows and the potential creation of traffic hazards as a result of the construction within road rights-of-way. Mitigation measures are identified to ensure that pipeline construction activities do not create significant adverse impacts related to these conflicts in activities.

The desalters will serve to modestly increase local traffic due to employment. An estimated 100 people may be required to operate all of the proposed facilities and implement the OBMP Program Elements. Large number of people will only be present in-site for short periods of time during construction and maintenance activities.

4.7.3.1 Threshold of Significance

The following criteria will be used as the thresholds of significance in this evaluation of traffic and circulation for the OBMP.

- Substantially increase the traffic flow or reduce the capacity of the street system within the Chino Basin above that identified in regional traffic forecasts and planned for in the local jurisdiction general plans.

- Result in the violation of existing standards or policies.

- Cause a substantial change in the functioning of an existing or future alternative transportation system

a. Will the project cause an increase in vehicle trips or traffic congestion?

The OBMP project area is extensively developed with residential, commercial, and industrial uses that already utilize an established circulation pattern. In addition, the existing circulation system experiences certain levels of utilization based on the existing levels of development and the role that certain roads (I-10, I-15 and SR-60) play in regional and interstate travel and commerce. The four main types of facilities that will be implemented in support of the OBMP include recharge basins, desalting facilities, monitoring wells and pipelines. There are no specific development proposals under consideration that would indicate existing or future traffic generation and destination activities will be altered by implementation of the proposed project. Aside from the short-term construction related trips, the proposed project is not forecast to cause any adverse impacts on the project area circulation system as a result of implementing the Program Elements to enhance the safe yield of the

Basin and improve the water quality. An estimated 100 people may be required to operate all of the proposed facilities and implement the OBMP Program Elements. Assuming 10 trips per day per employee family per day in the context of millions of trip ends within the Chino Basin, the proposed project has no potential to cause or contribute to any project specific or cumulative significant traffic impacts.

The General Plans identify a circulation system designed to meet the buildout traffic generation of their respective jurisdictions. Future traffic volume estimates are enumerated in Table 4.7-1. Fundamentally, the ultimate road sections throughout the circulation system are designed to provide adequate capacity for the projected trip generation within the Chino Basin project area. The General Plan EIRs have concluded that their local circulation systems, with planned improvements will be adequate to meet the forecast traffic volumes at build-out without any significant adverse circulations system impacts. Road improvements are constantly being implemented by the cities and the counties under their capital improvement programs, and when an individual OBMP construction project occurs in the future, any existing deficiencies may have been corrected and a project may not be required to provide any mitigation. Future Initial Studies prepared in accordance with the PEIR requirements contained in Section 15168 of the State CEQA Guidelines can document these improvements, which may eliminate the need for mitigation or define the need for additional mitigation. With implementation of project specific road improvements in accordance with local agency general plan requirements, no significant circulation system impacts are forecast to occur in the future.

b. Will the project cause hazards to safety from design features, such as sharp curves, or dangerous intersections?

Off of project sites, OBMP pipelines will be placed underground and there will be short-term disruptions of traffic flows and the potential creation of traffic hazards as a result of the construction within road rights-of-way. Mitigation measures are identified to ensure that pipeline construction activities do not create significant adverse impacts related to construction activities. Further, individual projects in the future will undergo review for approval by the IEUA and these reviews will control potential for safety hazards from short-term construction activities.

For long-term operational facilities, a potential exists for a facility, such as a desalter, to create localized traffic hazards, such as ingress and egress from a facility onto a highway with high speed traffic. Mitigation can be implemented, such as acceleration and turn lanes, to ensure that future specific projects can be implemented without causing any significant traffic hazards. A mitigation measures is included below to ensure that no significant local traffic hazards are caused by implementing the OBMP.

c. Will the project cause inadequate emergency access or inadequate access to nearby uses?

The proposed project may create short-term detours related to construction activities of OBMP facilities and pipelines. To limit reductions in emergency access, all affected public safety providers shall be notified prior to the construction of OBMP facilities or the closure of a public street. See mitigation under Subchapter 4.10.

d. Will the project cause insufficient parking capacity onsite or offsite?

Project specific future demand for parking capacity will be identified on a case-by-case basis. Each jurisdiction has established parking capacity requirements that will be implemented as individual projects are reviewed and approved. The OBMP facilities will be constructed in compliance with the municipal codes where the projects will be constructed. No mitigation is necessary because provision of adequate parking onsite will meet the needs of the facilities.

e. Can the project cause hazards for pedestrians or bicyclists?

During short-term construction projects to install pipelines and construct facilities, the project has a potential to create traffic hazards for pedestrians or bicyclists. However, after completing the proposed pipeline installations, the project impacts to hazards should be positive because existing hazards can be eliminated. Mitigation is proposed below that can reduce potential hazards to a non-significant level of impact. Without implementing these measures, potentially significant hazards could result from project implementation.

f. Will the project create conflicts with adopted policies supporting alternative transportation, such as bus turnouts and bicycle racks?

Implementation of the OBMP is not envisioned to create conflicts with adopted policies supporting alternative transportation. An estimated 100 people may be required to operate all of the proposed facilities and implement the OBMP Program Elements. These employees will be encouraged to utilize alternative transportation modes as are deemed appropriate for their work conditions. No mitigation is required.

g. Will the project cause adverse impacts to rail, waterborne or air traffic?

The proposed project has no potential to adversely impact waterborne traffic since such a transportation system does not occur within the Chino Basin project area. The OBMP is not anticipated to conflict with rail or air service to the existing facilities within the project area. There may be short-term detours related to construction that may affect rail service. These detours will be coordinated with the railroad companies prior to construction activities. No other potential impacts to the rail transportation system have been identified from implementing the proposed project.

4.7.4 Mitigation Measures

Mitigation measures have been identified in the impact analysis to prevent future development projects from contributing to significant local traffic impacts and to prevent short- and long-term hazards to pedestrian or bicycle traffic. The following measures will be implemented to ensure that future traffic generation does not cause significant impacts to the circulation system and to ensure that traffic hazards are controlled and reduced to a non-significant level of impact.

4.7-1 For each development project that will increase traffic generation relative to current traffic generation, the IEUA shall prepare a traffic study that identifies the net number of trips, the effect on levels of service to maintain a LOS "E".

4.7-2 The IEUA shall require the construction contractor to provide adequate traffic management resources during construction (signing protective devices. flag persons. etc.) to maintain safe traffic flow, particularly emergency access, on local streets at all times.

4.7-3 During construction the IEUA shall require traffic hazards for vehicles, bicycles, and pedestrians be adequately identified and such traffic controlled to minimize hazards.

4.7-4 The IEUA shall require the contractor to ensure no open trenches or traffic safety hazards be left in roadways during periods of time when construction personnel are not present (nighttime. weekends. etc.).

4.7-5 The IEUA shall require all roads be repaired adequately after pipeline installation to ensure that traffic can move in the same manner as before construction without damage to vehicles.

4.7-6 Emphasize transportation demand management or non-motorized transportation alternatives for OBMP project related employees, where feasible, to reduce demand for roadway capacity.

4.7-7 Future OBMP facility ingress/egress shall be reviewed with the agency having jurisdiction or the roadway providing access, and roadway improvements required to eliminate any traffic hazards associated with access to a facility in accordance with standard agency requirements or prudent circulation system planning requirements.

These measures ensure that implementation of the OBMP will not cause significant impacts to the circulation system or to street users by creating uncontrolled safety hazards. Based on the proposed project's anticipated activities, the potential circulations system impacts associated with OBMP facilities can be reduced to a non-significant level by implementing the above recommended mitigation measures.

4.7.5 Unavoidable Adverse Impact

The traffic and circulation impact discussion presented above indicates that implementation of the OBMP for the Chino Basin area will not cause any significant adverse circulation system impacts. The program will support more efficient and effective water supplies and is, therefore, not forecast to cause any change in the buildout circulation system for the local agency general plans. Therefore, no significant adverse and unavoidable traffic impacts are forecast to occur if the proposed project is implemented.

4.7.6 Cumulative Impact

The Chino Basin project area circulation systems have been evaluated as generating trips from existing residences and businesses, as well as serving as a destination for commercial and industrial traffic. The OBMP will not cause traffic generation that will be different from that which is forecast to occur within the general plans for the affected jurisdictions. The addition of up to 100 permanent jobs in support of OBMP activities result in a *de minimus* contribution to an area that is forecast to generate approximately two million trips per day at present and into the future. By facilitating implementation of the general plans through the development activities identified in the Project Description (Chapter 3), implementation of the OBMP will accommodate, but not cause, cumulative traffic growth as is forecast to occur as the affected jurisdictions are buildout.

Therefore, under the current conditions, the proposed project is not forecast to contribute to cumulative significant traffic impacts within the Chino Basin area. As individual development projects are considered in the future, OBMP projects will be required to identify any circulation system effects and provide mitigation, if required. The proposed project does not have the potential to contribute to the generation of substantial volumes of traffic that could contribute to cumulatively significant effects on existing or future roadway capacities.

4.8 BIOLOGICAL RESOURCES

4.8.1 Introduction

This section is intended to serve as a broad overview of biological resources in the West San Bernardino Valley that are included within, or occur adjacent to the project area. This section will include a general inventory and description of the communities, sensitive habitats, and species of special concern that may occur in the vicinity of Chino Basin. The majority of the project area has already been developed. Within the valley area itself, there are very few undisturbed areas with significant biological resources. Most of the land has been previously disturbed as part of construction and grading operations. Near the foothills of the San Gabriel Mountains there is a greater potential for encountering significant biological resources than in the valley area. Additionally, the Santa Ana River Corridor and the Prado Basin Reservoir contain many sensitive plant and animal species. Riparian/wetland resources can also be found in the southern portion of the project area, and along some of the existing drainage courses throughout the Basin.

Data provided in this section of the PEIR was obtained from the following biological resources:

- Kirtland Biological Services – Trapping Studies for the San Bernardino Kangaroo Rat, Etiwanda Basin Expansion Project, December 13, 1999 (KBS Report).
- Tierra Madre Consultants, Inc. – Southern California Edison Properties Focused Surveys for the Delhi Sand Flower-loving Fly, December 29, 1999 (TMC Report).
- Tom Dodson & Associates – Biological Assessment for the Inland Empire Utilities Agency Recycled Water Groundwater Recharge Project, January 1999 (TDA Report).
- Kendall H. Osborne – Focused Survey for Delhi Sands Giant Flower-loving Fly on a 40-acre Site in Etiwanda, October 1999 (Osborne Report).
- LSA Associates, Inc.,Ventura Freeway Corridor Areawide Plan DEIR, March 1999.
- San Bernardino County General Plan EIR Biological Background Report, March 1989.
- Riverside County General Plan, 1984.
- California Natural Diversity Database, California Department of Fish and Game, 2000.
- Hickman, James ed., ***The Jepson Manual: Higher Plants of California***, 1993.
- Munz, Philip, ***A Flora of Southern California,*** 1974.
- Ventura Freeway Corridor Areawide Plan EIR, 1999.
- Chino Basin Groundwater Storage Program DEIR, MWDSC, 1988.

Data contained in these reports, where applicable, are summarized herein with editing to conform to the EIR format.

The principal environmental actions that may need to be implemented as a part of this project are:

1. Compliance with NEPA and CEQA guidelines regarding sensitive biological resources
2. U.S. Army Corps of Engineers (COE) Clean Water Act Section 404 Permit and U.S. Environmental Protection Agency (EPA) 404 (b)1 Alternatives Analysis
3. Section 7 and/or 10 of U.S. Endangered Species Act of 1973, as amended
4. U.S. Migratory Bird Treaty Act
5. U.S. Bald Eagle Act
6. California Endangered Species Act
7. California Department of Fish and Game (CDFG) Streambed Alteration Agreement (Section 1600 of the Fish and Game Code)
8. State of California Native Plant Protection Act
9. Plant Protection and Management Ordinances (County Code Title 8, Div. 11)

Both the California and Federal endangered species acts provide legislation to protect the habitats of listed species as well as the species itself. If a state or federally listed endangered species was determined to be present, the proposed project may be constrained to avoid or minimize effects to the species. Species specific mitigation measures would thus need to be agreed upon and implemented to the satisfaction of all jurisdictional agencies. These jurisdictional agencies may be some or all of the following: U.S. Fish and Wildlife Service (USFWS), CDFG, and/or COE.

4.8.2 Environmental Setting

The project area is comprised of a primarily urban setting, as indicated on Figure 4.8-1. The vast majority of the approximately 225,000 acres that comprises the Chino Basin has been previously developed or disturbed by human activity. Relatively speaking, very few pristine areas of undisturbed natural habitat remain. The following is a discussion of areas with in the Chino Basin that have the largest areas of extant habitat communities or have the most significant biological resources:

The Prado Reservoir area comprises 9,741 acres northwest of Corona and south of Chino. Approximately 4,000 acres of this area can be classified as riparian woodland vegetation, of which 2,000 to 2,500 acres is dense riparian habitat dominated by large stands of willow woodland. This is one of the largest remaining riparian woodland in southern California. This areas supports a wide array of sensitive species, both floral and faunal. According to the Biological Resources section for the Chino Basin Groundwater storage Program Draft Environmental Impact Report for MWDSC, a total of 311 species of vascular plants, belonging to 65 families, were identified in the Basin area. Three major vegetational communities occur in this area. First is riparian habitat which occurs in low lying sections of the Basin and along the Santa Ana River and streams running into the Basin.

The riparian habitat is dominated by extensive stands of black willow, and smaller stands of arroyo willow. Several stands of tall cottonwoods and a single stand of sycamore have been identified. The second habitat type is upland habitat characteristic of coastal sage scrub, plus grasses and exotic weeds. This upland area has been heavily impacted by agriculture and grazing activities. The third major vegetational type is the aquatic and semi-aquatic communities occurring in permanent streams and artificial duck ponds, and intermittently filled reservoirs and streams within the Basin. The wildlife in the riparian area includes a variety of amphibians, mammals, and birds. For an additional discussion of the biological resources identified in the area, please refer to MWDSC Chino Basin Groundwater Storage EIR's biological resource section which is included as Appendix 8.4 of Chapter 8 to this document.

The Santa Ana River and its tributaries within the Chino Basin are also significant areas for biological resources as they provide refugia and breeding grounds for neotropical migrant species as well as provide habitat linkages and movement corridors connecting various large blocks of relatively undisturbed habitat areas. The MWDSC Chino Basin EIR also reports that many of these tributary streams will be fully lined as part of flood control activities in the future.

Another significant area for biological resources that lies adjacent to the Chino Basin is Chino Hills State Park has approximately 13,000 acres of wild land situated in the hills north of Santa Ana Canyon. Although Chino Hill State Park containing large blocks of non-native grasslands, it is also contains riparian habitat comprised of coast live oak and sycamore woodlands. Additionally, this park contains one of the largest remaining stands of Southern California black walnut. This park functions as an important area for connectivity to and movement between the park the boundary of the project area.

4.8.2.1 Plant Communities

The inventory of generalized plant communities that follows was obtained from San Bernardino County's Vegetation Map by Holland Classification. This Map is included for reference purposes as Figure 4.8-1.

- Mule Fat Scrub
- Southern Cottonwood-Willow Riparian Forest
- Coastal Sage Scrub
- Hoaryleaf Ceanothus Chaparral
- Non-Native Grassland

Additionally, a review of San Bernardino and Riverside County general plan documents listed the plant communities shown below as being present in the project area. The general characteristics of these communities are described in the following discussion extracted from San Bernardino County's Biological Resources Report.

Chaparral

Several different chaparral subtypes occur in San Bernardino County. The most common subtypes in the valley region are southern mixed chaparral, chamise chaparral and scrub oak chaparral. These associations are located predominantly along the lower slopes of the mountains and in the interface zone between valley and mountain regions.

Southern mixed chaparral is composed of broad-leaved sclerophyllous shrubs that grow to about 8-12 feet tall and form dense, often nearly impenetrable stands. The plants of this association are typically deep-rooted. There is usually little or not understory, except in openings; however, considerable leaf litter accumulates. This habitat occurs on dry, rocky often steep north-facing slopes with little soil. It may grade into Riversidean coastal sage scrub at lower elevations, but generally grown on moister and rockier sites. Characteristic shrub species include chamise, toyon and lemonadeberry.

Chamise chaparral is dominated by chamise, almost to the exclusion of all other plants. This habitat occurs on shallower, drier soils or at somewhat lover elevations than mixed chaparral. Chamise has adapted tot he characteristic fire cycles of this habitat by stump sprouting. In mature stands, the shrubs are densely interwoven and there is very little herbaceous understory or leaf litter.

Scrub oak chaparral is a dense evergreen association that grown to twenty feet tall and is dominated by scrub oak. This habitat occurs on wetter sites than other chaparral associations, often at slightly higher elevations. These more favorable sites recover from fire more quickly than other chaparral subtypes and substantial leaf litter accumulates. Additional shrub species found in scrub oak chaparral include eastwood manzanita, toyon and mountain mahogany, poison oak and narrow leaf bedstraw. Other *chaparral associations may occur in the Valley region but are more predominant at higher elevations. Such associations include buck brush chaparral, bigpod ceanothus chaparral and interior live oak chaparral.*

Chaparral habitats are suitable for burrows and soil nests of many mammal species. Another important feature of this habitat are rock outcrops, which are important for reptiles and as raptor perch sites. No sensitive species of San Bernardino county are directly dependent upon chaparral habitat. However, sensitive faunal species from adjacent coastal sage scrub habitat may utilize chaparral as a corridor or for foraging. These species may include Stephens' kangaroo rat, Los Angeles pocket mouse, and San Diego horned lizard.

According to the California Native Plant Society (CNPS) database, subseries of this habitat type that may occur within the project area are the scalebroom series and the Hoaryleaf ceanothus series. These series are described below as they appear in the CNPS database.

The scalebroom series occurs on upland that are rarely flooded, low gradient deposits along streams. Species composition differs greatly among stands. Some stands in this habitat may have sufficient emergent trees to be placed in tree-dominated series. The federal and state listed Slender-horned spineflower (CNPS list 1B plant) and santa Ana river woollystar (CNPS list 1B plant) grow in some stands of this series. This series may occur in western Riverside County.

The hoaryleaf ceanothus series occurs on upland slopes that are south-facing at high elevations. Soils are deep or shallow and usually coarse textured. Hoaryleaf ceanothus occurs as scattered shrubs or as the sole or dominant shrub in chaparral. Stands where hoaryleaf ceanothus and chamise are equally important are members of the chamise-hoaryleaf series. Series height is less than 3.5 meters, and occurs from 100 to 1,350 meters in elevation.

Coastal sage scrub

Coastal sage scrub in the valley region is classified as Riversidean sage scrub, the most xeric expression of coastal sage scrub south of Point Concepcion (Holland 1986). This habitat grows on steep slopes with severely drained soil and dominant species are relatively shallow-rooted shrubs, seldom over four feet tall.

Riversidean Alluvial Sage Scrub is a variation of Riversidean sage scrub which also exists in the valley region. This vegetation type is the dominant habitat of the Upper Santa Ana River floodplain and also occurs in the Cajon and Lytle washes (CNDDB, 2000)...

Coastal sage scrub habitat in Southern California is decreasing rapidly as a result of urbanization. Evidence of its decline is the growing number of declining plants often associated with it. In the valley region of San Bernardino county, three state and/or federally listed endangered species are known to occur in association with the coastal sage scrub: slender-horned spineflower (Centrostegia lepoceras), Santa Ana River woolly star (Eriastrum densifolium spp. sanctorum), and Nevin's barberry (Berberis nevinii). Additionally, Pringles monardella is federally listed as a Category I species, while Payson's jewelflower and California bedstraw are category 2 species.

San Bernardino kangaroo rat a federally listed endangered species; and Stephens' kangaroo rat, a state-listed threatened species and federally listed endangered species are also known to have its habitat associate with this community type in the Valley area. Los Angeles pocket mouse is federally listed as a category 2 species and a species of special concern by the state. The Los Angeles pocket mouse has been found in San Bernardino county near the Cajon Wash, north of Etiwanda and San Bernardino and in Reche Canyon...The Valley region of San Bernardino county represents the northern limit of the range of the whiptail and coastal California gnatcatcher, a federally listed threatened species. Currently the U.S. Fish and Wildlife Service has proposed critical habitat for this species. This area is discussed and depicted in the Project Impacts subsection to follow.

Deciduous woodlands

California walnut woodland is a rather specialized woodland habitat restricted to the Chino Hills and Etiwanda area within the Valley region. This woodland, which occurs among rocky outcrops integrating with scrub habitat or on more mesic sites integrating with canyon live oak woodland, is dominated by California walnut; associated species include canyon live oak, Engelman oak, sugar bush, and squaw bush. California walnut woodland is considered a sensitive habitat due to its small acreage and limited distribution in the county; no sensitive floral species are solely dependent on this woodland habitat for their life cycle, however. No federal or state sensitivity listing exists for the live oak walnut or for any other species associated with California walnut woodland. Animals associates with California walnut woodland are similar to the species that would utilize oak woodland. These include Anna's hummingbird, acorn woodpecker, Nuttall's woodpecker, deer mouse, California ground squirrel, striped skunk, and coyote. No sensitive animals as listed by the USFWS or CDFG are *dependent on California walnut woodland within the valley region on San Bernardino county.*

Grasslands

The disturbed grasslands of the valley region of San Bernardino county are a heterogeneous complex that may be associated with shrubs or trees on land that has been disturbed or altered by development or fire. Non-native weedy vegetation is common in this habitat and includes slender wild oats, foxtail fescue, ripgutgrass, short-pod mustard, red-stem filaree, and pin-clover. On sensitive plant species may occur in the grassland areas of the northern Valley area of San Bernardino County, Orcutt's brodiaea. This species, which is seriously threatened by development, may be found in valley/foothill grasslands, cismontane woodlands and vernal pool habitats. Birds or prey utilize grassland areas for foraging. Locally breeding raptor species include black-shouldered kite, red-tailed hawk, red-shouldered hawk, great horned owl, and barn owl, Other faunal associates include house mouse, southern grasshopper mouse, and gopher snake. No sensitive animal species are expected to utilize the grassland areas of the valley region of San Bernardino County.

Wetland

Wetland communities are areas of land which are either permanently or seasonally wet and support vegetation that is specifically adapted for saturated soil conditions. These areas include riparian areas and marshes, where moisture is at or near the surface, and often include intermittent drainages. In southern California, wetland habitats are declining and are considered sensitive. Wetlands are further subject to state and federal regulations that include the federal Clean water Act (Section 404) and the CDFG Streambed Alteration Agreement (Section 1600 of the Fish and Game Code). A number of stream channels flow through the valley region of San Bernardino County including Cucamonga Creek, Cajon and Lytle creek washes, and Santa Ana River. Where water is present near the surface in stream channels, a riparian woodland community can be maintained. In stream channels with intermittent surface or groundwater availability, a riparian scrub community may also develop. Both of these communities exist in the valley region. Dominant woodland tree species include Fremont cottonwood, arroyo willow and black willow with western sycamore on the upper terraces. Common shrubs include mulefat, California mugwort, poison oak and the coyote bush. A well developed stand of riparian woodland occurs in the Prado Basin of San Bernardino County and extends into Riverside county. Remnant riparian woodlands also occur in less frequently flooded areas such as the Santa Ana Wash area.

A freshwater marsh is located north of Etiwanda in the Day Canyon wash area. Freshwater marsh also occurs in the Prado Basin and may occur in the other drainages *of the valley region, wherever moisture is at or near the surface for a long duration during the growing season. This habitat is usually dominated by perennial emergent species 4 to 7 feet tall. Stands of bulrushes or cattails often characterize this habitat. Also, large stands of the non-native pest plant giant reed grass (Arundo) occur along much of the basin's riparian areas. This giant reed grass not only takes over native riparian communities, but it also uses a tremendous amount of water.*

These Riparian resources serve as important habitat, as water sources, and as movement corridors for wildlife. This habitat type also supports numerous sensitive animal species including least Bell's vireo, a state and federally listed endangered species; southwestern willow flycatcher, a state and federally listed endangered species; bald eagle, a state and federally endangered species; western yellow-billed cuckoo, a state listed threatened species; long eared own, a species of special concern and the California black rail, a state listed threatened species. The cuckoo and vireo occur in the dense riparian habitat of the Prado Basin in Riverside county but apparently have been extirpated from the valley region of San Bernardino County. The black rail, dependent on marshes, was recorded long ago at Chino but is not known to occur currently in San Bernardino County. (San Bernardino County Plan Biological Background Report, 1987)

Other riparian and wetlands vegetation series that may occur within the project area are the Arroyo willow series, the California sycamore series, types of riparian woodland forests. The California Native Plant Society database describes these series as follows:

California Sycamore Series

This vegetation series occurs on upper terraces and canyon slopes that are commonly rocky. This series occurs along the Santa Ana River, and possibly in other areas of San Bernardino County. Series height is less than 35 meters.

Arroyo Willow Series

These riparian willow stands may or may not be dominated by a single species. If no dominant willow is present at low elevations, then the stand can be characterized as a mixed willow series. Montane and subalpine willow stands are placed in separate classes since different willow species are restricted to those elevations. Stands of the Arroyo willow series have environmental conditions similar to alder, cottonwood and other willow series. Tree density and cover occurs along the Santa Ana River, and a possible candidate site occurs in San Bernardino County. Series height is typically less than 10 meters.

San Bernardino County's has prepared a Sensitive Biological Areas Map for the Western Valley Planning Area which outlines several habitat types that have been particularly sensitive for certain sensitive species. This map is part of the multi species habitat conservation plan that is currently under development by the county. The four habitat or area types that are identified on this map are described below.

Coastal Sage Scrub

Please refer to the habitat description previously provided in this subchapter for information regarding this community type. The coastal scrub series is better though of as a collection of several vegetative series. One such series is the California buckwheat series. This series occurs on upland slopes that are rarely flooded low-gradient deposits along streams. Soils are shallow and rocky. This series is comparable to coast bluff scrub but differs in plant height and cover from coastal sage, but contrasts little in species composition. Three varieties of *Eriogonum fasciculatum* grow in the range of coastal scrub. There is some geographic separation between them. Stands dominated by *E. gigateum* are included in this series, stands of this series differ from the California sagebrush-California buckwheat series in the California buckwheat dominates here. This series occurs in Cajon creek, Cucamonga Canyon, Lytle Creek, San Sevaine Canyon and the Upper Santa Ana River.

Delhi Sands

While this is not a definitive community type, *per se*, it is typified as a blow sand community species, which is associated with a suite of blow sand endemic invertebrates. These blow sand areas, including the delhi soil series, are highly important habitat requirements for the federally listed endangered Delhi Sands Flower-loving Fly. Soil surveys for southwestern San Bernardino County (USDA Soil Conservation Service 1980) and western Riverside County (USDA Soils Conservation Service 1979) were consulted to identify the soil types occurring throughout the site. The locations of this soil type are described in more detail in the geology section of this document (Chapter 4, Section 4). There are several areas with Delhi Sands soil associations within the project area, and they are outlined on the Multiple Species Habitat Conservation Planning Area Map for Sensitive Biological Areas within the San Bernardino County portion of the Valley Planning Area. This map is available through San Bernardino County's Geographical Information Systems Office and a map of sensitive areas for Delhi Sands Flower-loving Fly is also provided in the Project Impacts section of this subchapter.

Riparian/Wetland Areas

Of the habitat and community types occurring within the boundaries of the project area, wetlands are typically considered to be one of the most sensitive types. This vegetation heading includes riparian woodland, riparian scrub, vernal pools, and freshwater marsh. The Prado Basin is one of the best representative examples of riparian woodlands (described previously) in the valley region. Additional wetland resources may also occur along the Santa Ana and Lytle creek washes in alluvial sage scrub habitat that has adapted to frequent flooding and therefore supports a unique diversity of plant species. Further, the Chino Hills support a vide variety of habitat types including Riversidean sage scrub, riparian woodland and California walnut woodland.

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Aleutian Canada Goose *Branta canadensis leucopareia*	threatened	Central Valley is main wintering ground	nests on islands or marshes, feeds on shoots and seeds of grains and wild grasses	N,C,S
American Peregrine Falcon *Falco peregrinus anatum*	endangered/ protected	western Riverside and San Bernardino counties	breeds near wetlands, lakes, rivers or other water on high cliffs, banks and dunes, will also use human-made structures for nesting, feeds on other birds	N,C,S
Arroyo Chub *Gila orcutti*		generally prefer slowest moving sections of streams, where bottoms are sand or mud, creek and river systems of sw Ca, coastal streams of LA and Orange Co.	chunky minnows with small mouths and moderately large eyes, gray-green back, white belly, body length usually less than 4 "; eats aquatic vegetation and invertebrates associated with such plants; well adapted for surviving summer; breed in Mar-April	
Arroyo Toad *Bufo microscaphus californicus*	endangered	found in intermediate sized drainages, 3rd or 4th order streams in decomposed granite, waterways with no silt, pools < 1' deep, tadpoles in open bars and flats along stream edge	where shallow pools persist until at last July, breed in pools where stream current is minimal	N,C,S
Bald Eagle *Haliaeetus leucocephalus*	delisted as threatened	Alaska, Canada to southern U.S.	coasts, rivers in open and forested areas, large lakes	N
Black Swift *Cypseloides niger* (nesting)		nests in small colonies in steep, rocky, often moist cliffs behind or near waterfalls in deep canyons, nest made of mud mixed with plant material, feeds on flying insects, breeds in San San Bernardino, San Gabriel and San Jacinto Mts.	migrates south for winter, most absent from this area bet. Oct-April, breeds from June-Aug, lays only 1 egg per year	N
Bonytail Chub *Gila elegans*	endangered	found in freshwater streams and rivers	threatened by development	N,C,S
Brown Pelican *Pelecanus occidentalis*	endangered	common along Ca coast from June-Oct., may be on Salton Sea from July-Sept.	breeds on offshore islands	C,S

Table 4.8-1

SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Burrowing Owl *Athene cunicularia* (burrow sites)		hunts from perch, hovers, or hops after prey on the ground; uses rodent or other burrow for roosting and nesting cover, usually found in open grasslands and shrublands	eats mostly insects; also small mammals, reptiles, birds and carrion; breeding from March-Aug, average 5-6 eggs, somewhat colonial; numbers declining due to loss of grassland to agriculture, development, and poisoning of ground squirrels; predators include hawks, coyotes, domestic dogs and cats	N,C,S
California Mastiff Bat *Eumops perotis californicus*		occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub and urban; catches and feeds on insects in flight, roosts in crevices in cliff faces, high buildings, trees and tunnels, requires extensive open areas with abundant roost locations; sw San Bernardino, w Riverside.. Co.	largest native bat in the US, has long, narrow wings, chocolate brown with free tail nocturnal, foraging 6-7 hours per night, roosts in small colonies of 100 or fewer, may range 15 miles in search of food, give birth from April-August, 1 young produced per year, may roost with other species of bat	N,C,S
California Red-legged Frog *Rana aurora draytoni*	threatened	found in slow streams and rivers, ponds, marshes, lakes, reservoirs, canals with slow or still water, need deep pools and cool water	require dense riparian vegetation in contact with or close to deep water, may go to upland forests during non-breeding season	N,C,S
Coachella Valley Fringe-toed Lizard *Uma inornata*	threatened	sand dunes in Coachella Valley, central Riverside Co.	burrow in sand to escape from enemies, hunt a variety of insects, require fine, loose, windblown sand	N,C,S

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Coastal California Gnatcatcher *Polioptila californica californica*	threatened	glean insects and spiders from foliage of shrubs, roost and nest in shrubs, found in California sagebrush, patches of prickly pear, arid washes, on mesas and slopes below 2500' from e Orange and sw Riverside Co., possibly along lower, coastal slopes of San Gabriel and San Bernardino Mts., LA and San Bernardino Co.	nesting season April-June, both parents caring for young, threatened due to loss of habitat for human development	N,C,S
Delhi Sands Flower-loving Fly *Rhaphiomidas terminatus abdominalis*	endangered/none	found in highly specialized habitat, on sand dunes, 155 acre distribution among 8 sites in Riverside.. and San Bernardino Co.	feeds on nectar of native plants, hovers like hummingbird	N,C
Golden Eagle *Aquila chrysaetos* (nesting & wintering)	none/none	typically in rolling foothills, mountain areas, sage-juniper flats, desert, found over southern Ca, from sea level to over 11,000 ft, needs open areas for hunting, hunts from air or perch, may hunt in pairs, requires secluded cliffs with overhanging ledges and large trees for cover and nesting,	eats rabbits, hares and rodents, occasionally preys on domestic calves and lambs; territory size approx. 36 sq. mi., breeds from late Jan-Aug, average 2 young per year, occasionally preys on domestic calves and lambs, nest is a platform of sticks, twigs and greenery 10 feet across and 3 feet high, will reuse old nest sites	N,C,S
Least Bell's Vireo *Vireo bellii pusillus* (nesting)	endangered/ endangered	in thickets of willows and other low, dense valley foothill riparian habitat, found from coast inland to western edge of deserts in desert riparian habitat	active during the day, gleans insects from foliage and branches usually within 8 feet of ground, builds an open-cup nest of bark, grasses, nests from May-July with an average of 4 eggs, threatened by cowbird nest parasitism, may be nearing extinction in Cal	N,C,S

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Long-eared Owl *Asio otus* (nesting)	none/none	requires riparian bottomlands grown to tall willows and cottonwoods, or live oak thickets and other dense stands of trees for roosting and nesting, hunts in open areas, occasionally in woodland and forested habitats	nocturnal; uses old crow, hawk, heron or squirrel nests, breeds from March-July averaging 4-5 eggs per nest; eats mostly voles and other rodents, occasionally birds, including smaller owls; threatened by loss of live oak groves	N,C,S
Los Angeles Pocket Mouse *Perognathus longimembris brevinasus*	species of concern/ none	preferred habitat valleys and slopes, sandy soil with pebbles, sagebrush, creosote bush and cactus; occupies arid coastal basins of southern California in grassland and coastal sage scrub; LA, San Bernardino, Riverside. Co.	small-bodied nocturnal rodent with long tail, buff upper parts, white belly, well adapted to desert life; eats green vegetation of grasses in spring, seeds the remainder of the year; search for seeds under shrubs and collect seeds in cheek pouches, obtain water from food alone; nest made of green leaves and dry roots, usually beneath shrubs; breeds Jan-Aug with 2-8 young per litter; predators include snakes, owls, predatory mammals; threatened by severe loss of habitat	N,C,S
Mountain Plover *Charadrius montanus*	proposed threatened	western Riverside County	does not nest in Ca, requires high-elevation grassland for nesting, feeds on large insects on ground, esp. grasshoppers	C,S
Mountain Yellow-legged Frog *Rana mucosa*	proposed endangered	streams, lakes and ponds in western San Bernardino and Riverside County, elevations above 5940', always found near water	eat aquatic and terrestrial insects, breed June-Aug.	N
Nelson's Bighorn Sheep Desert Bighorn Sheep *Ovis canadensis nelsoni*	none/none	feed in rocky barrens, meadows and low sparse brushlands, use rocky, steep terrain for escape and bedding, presence of water is critical, San San Bernardino Mts., San Gabriel Mts.	brown to grayish brown with creamy white rump and massive coiled horns in males; polygamous, rutting in Nov-Dec and lambing in steep rugged slopes and canyons from April-June; graze and browse on a wide variety of plant species, preferring green succulent grasses and forbs; threatened by disease transmitted from livestock,	N

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Northwestern San Diego Pocket Mouse *Chaetodipus (=Perognathus) fallax fallax*	species of concern/ none	favors rocky/gravelly areas with yucca overstory, desert scrub near or in pine-juniper belt; basins and slopes on Pacific side of southern California Mts., San San Bernardino Mts., LA Co. southward	upper parts of body rich brown flecked with deep tawny color, spine-like hairs on rump, belly white, tail crested; nocturnal, forages on seeds of forbs, grasses and shrubs, collects seeds in check pouches and stores in underground burrow, obtains water from food alone; breeding March-May, average 4 young; predators include foxes, coyotes, badgers, owls and snakes	N,C,S
Orange-Throated Whiptail *Cnemidophorus hyperythrus*	species of concern/ none	areas with summer morning fog, low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats, prefers washes and other sandy areas with patches of brush and rocks, coastal in extreme s LA Co., sw San Bernardino Co., Orange, Riverside. Co.	active during the day, forages actively on surface and scratches through surface debris, eats many small arthropods, esp. termites, takes cover under surface objects such as rocks, logs, or in rock crevices; breeds April-Sept, with 2-3 eggs per clutch laid in loose soil; predators include snakes and nocturnal mammals	N,C,S
Peninsular Bighorn Sheep *Ovis canadensis cremnobates*	proposed endangered	Peninsular Ranges from the San Jacinto and Santa Rosa Ranges south into Mexico	graze and browse on a wide variety of plant species, use rocky, steep terrain for escape and bedding, require steep rocky slopes and canyons for lambing	S
Quino Checkerspot Butterfly *Euphydryas editha quino*	endangered	coastal sage scrub, Riverside and San Bernardino Counties	requires young host plants of *Plantago erecta*, associated species	N,C,S

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Razorback Sucker *Xyrauchen texanus*	endangered	limited to freshwater habitats, Santa Ana River	threatened by flood control projects	N,C,S
Riverside Fairy Shrimp *Streptocephalus woottoni*	endangered	vernal pool habitats, Riverside and San Bernardino Co.	present for only a few weeks following spring rains, dormant majority of the year	N,C,S
San Bernardino Kangaroo Rat *Dipodomys merriami parvus*	endangered/ none	prefers light sandy soils across much of southern half of the state except in the Coast Ranges, alluvial scrub habitats, desert scrub, sagebrush, Joshua tree, pinon-juniper habitats, San Bernardino and Riverside.. Co.	forage under shrubs, feeding on seeds of many plants, leafy vegetation in spring, some insects; active in bright twilight, aggressively solitary; breeding may be several times in a year, from Dec-summer, litters average 4 young; predators include kit foxes, badgers, snakes, owls, gray foxes and coyotes	N,C,S
San Diego Desert Woodrat *Neotoma lepida intermedia*	species of concern/ none	favor rocky areas with Joshua trees, pinon-juniper, chaparral, sagebrush and desert habitats throughout southern Cal, San San Bernardino Mts.	moderate-sized rodent, pale to dark gray body washed with tawny, belly grayish to tawny, bases of hairs slate color; eat buds, fruits, seeds, bark, leaves and young shoots of many plants; build houses with twigs, sticks, cactus parts, usually against a rock crevice, or at the base of a large shrub, lined with grasses or shredded stems; aggressively solitary, breeds from Oct-May, averaging 2-3 young, may have 4 litters in a year.	N
San Diego Horned Lizard *Phrynosoma coronatum blainvillei*	species of concern/ none	valley-foothill hardwood, conifer, annual grass and riparian habitats, mountains of So Cal exclusive of desert regions, open country , especially sandy areas, washes, flood plains and wind-blown deposits, below 3000 ft.	body armored with spines and aggressively defensive toward potential predators, relies on camouflage for protection, bask on ground or low rocks burrow into loose soil to avoid intense heat or predators; active during the day, foraging on the ground in open areas, usually between shrubs near ant nests, eat ants, beetles, other insects; reproductive season from May-June, averaging 13 eggs; predators include leopard lizards, snakes, loggerhead shrikes and hawks	N,C,S

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Santa Ana Speckled Dace *Rhinichthys osculus* ssp... 3	species of concern/ none	inhabitants of cool, flowing, rocky-bottomed permanent streams and rivers, habitat among rocks and riffles	body color highly variable with speckles or blotches, pointed snout, mouth set slightly under jaw, slender body with small scales, to 3 in long; food small bottom-dwelling invertebrates; seminocturnal, hides among bottom rocks during daylight hours, forages in small groups; spawn throughout summer months, eggs are laid and fertilized among bottom rock and gravel, base of fins of both sexes turns orange to red during the breeding season	N,C,S
Santa Ana Sucker *Catostomus santaanae* Southern California Arroyo Chub	threatened/ none	prefer cool, unpolluted, small, rocky-bottomed shallow streams with currents ranging from swift (in canyons) to sluggish (in the bottomlands), LA, San Gabriel and Santa Ana River drainages; LA, Orange, San Bernardino and Riverside. Co.	body length to 6 in., dark back with irregular dorsal blotches, silvery belly; feeds primarily on algae; spawn from April-July, producing thousands of eggs; only native fish species still occurring in this portion of Santa Ana River, threatened by flood control projects, urbanization, nonnative fish species	N,C,S
Southern Rubber Boa *Charina bottae umbratica*	species of concern/ threatened	red fir, ponderosa pine, hardwood, meadow, chaparral and riparian habitats, San Bernardino and San Jacinto Mts.	feed on aquatic plants, beetles, invertebrates, fishes, frogs and carrion; active at dawn and dusk, feeds on small mammals and lizards; very secretive seeking cover in rotting logs, rocks, burrows through loose soil or decaying vegetation, may climb; breeds from April-June, young born alive in loose, well-aerated soil, under surface objects or within rotting logs; predators include hawks, owls, predatory mammals; threatened by development and recreational uses of forest habitat	N,C,S

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Southwestern Pond Turtle *Clemmys marmorata pallida*	species of concern/ none	permanent ponds, lakes, streams, irrigation ditches or permanent pools, found in suitable aquatic habitat west of Sierras, along Mojave River and its tributaries, from sea level to 6000'	require basking sites such as logs, rocks, mats of floating vegetation, breed from March-August, laying 3-11 eggs, young may desiccate rapidly if conditions are hot and dry; hibernate in bottom mud during colder season; predators include fish, bullfrogs, garter snakes, wading birds and some mammals	N,C,S
Southwestern Willow Flycatcher *Empidonax trailii extimus*	endangered	prefer extensive thickets of low, dense willows edging on wet meadows, ponds or backwaters, lowland Ca, records sparse	feeds on flying insects, occasionally on berries and seeds; winters in S. and Cen... Am, arrives locally in May/June; breeds June-July, builds nest 1.5-10 feet high in willow, averaging 3-4 eggs; threatened by cowbird nest parasitism and habitat destruction	
Stephen's Kangaroo Rat *Dipodomys stephensi*	endangered/ threatened	prefer sparse perennial plant cover, annual and perennial grassland, coastal sage scrub, sagebrush habitats, found only in San Jacinto Valley, w Riverside. and s San San Bernardino Co.	moderate-sized rodent with 5 toes; excavate burrows in firm soil (neither hard nor sandy), or occupy abandoned pocket gopher burrows; breed from April-June, lining nest with dried plants, 2-3 young produced; predators include snakes, owls, predatory mammals; threatened by habitat loss due to urbanization and cultivation	N,C,S
Unarmored Threespine Stickleback *Gasterosteus aculeatus williamsoni*	endangered	Mojave River low elevations sites in Central Valley	coastal streams and rivers, lower and middle elevation reservoirs	
Vernal Pool Fairy Shrimp *Branchinecta lynchii*	endangered	found only in vernal pool habitats, Riverside and San Bernardino counties	active and breeding for brief period following spring rains, dormant for majority of the year	N,C,S

Table 4.8-1
SENSITIVE FAUNAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL/ STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION NORTH CENTRAL SOUTH
Western Yellow-billed Cuckoo *Coccyzus americanus occidentalis*	none/ endangered	requires densely foliated, deciduous trees and shrubs, especially willows for roosting, breeds only in river bottoms and other habitats with high humidity in or near slow-moving watercourses, backwaters or seeps; valley foothill and desert riparian habitats, along Santa Ana River, Riverside.. Co., San Bernardino Co.	feeds on grasshoppers, cicadas, caterpillars, occasionally frogs, lizards or fruit; winters in So Am., breeds from June-July, averaging 3-4 eggs per clutch, nest built 2-25 feet above ground as flimsy open cup of twigs in tree or shrub; threatened by loss of riparian habitats	N,C,S
White-eared Pocket Mouse *Perognathus alticola alticola*	species of concern/ none	ponderosa and Jeffrey pine habitats where bracken fern grows, occasionally in mixed chaparral and sagebrush habitats, San Bernardino Mts.	small rodent with olive-buff upper parts, white ears and underparts; burrows in loose soil, little known of reproduction, probably March-June with an average of 5 young in a nest of dried grass in an underground burrow; predators include foxes, coyotes, weasels, owls and snakes	N
Yellow-breasted Chat *Icteria virens* (nesting)	none/none	dense, brushy thickets and tangles near water, thick understory in riparian woodland, southern Cal coast and locally inland	eats insects and spiders, berries and other fruit; breeds May-Aug, producing 3-6 eggs in a nest 2-8 feet above the ground in dense shrubs along a stream or river; predators include falcons, small mammals and snakes; threatened by cowbird nest parasitism	N,C,S
Yuma Clapper Rail *Rallus longirostris yumanensis*	endangered	April-Sept. in freshwater and brackish emergent wetlands along Colorado River and around Salton Sea	nests in wetlands, forages in marshes and long rivers for crayfish, clams and insects	

Table 4.8-2
SENSITIVE FLORAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL STATUS	CNPS LIST/ CODE	STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION North Central South
Bristly sedge *Carex comosa*		**2/331**		swampy places, San Bernardino Valley	narrow leafed perennial herb, growing close to ground	N,C
California muhly *Muhlenbergia californica*		**1B/223**		wet places up to 7000', coastal sage scrub, chaparral, yellow pine forest, San Bernardino Valley to edge of desert	grasslike perennial herb 1-2' high, highly branched upper portion of plant, blooms July -Sept.	N,C,S
California Orcutt grass *Orcuttia californica*	endangered	**1B/332**		drying mud flats, vernal pools, valley grassland, Murrieta Hot Springs, western Riverside Co.	flattened grass, sometimes forming mats	S
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*		**1B/232**		salt marshes, vernal pools and damp alkaline spots, alkali sink, coastal salt marsh, Riverside & San Bernardino Co.	annual herb, blooms April-May	N,C,S
Coulter's saltbush *Atriplex coulteri*		**1B/222**		somewhat alkaline low places, valley grassland, coastal sage scrub, Riverside & San Bernardino Co.	perennial herb with scaly gray leaves, favors shade, blooms March-Oct.	N,C,S
Gambel's water cress *Rorippa gambelii*	endangered	**1B/332**	threatened	marshes, streambanks, lake margins, below 3750', Riverside & San Bernardino Co.	white-flowered, perennial herb, rhizomatous, seriously threatened by loss of habitat	N,C,S
Hall's monardella *Monardella macrantha* ssp. *hallii*		**1B/213**		chaparral, woodland, forest, 1800-6000', Riverside Co., San Bernardino Mts.	perennial herb with heavy stem, triangular leaf, yellowish flower	N,C,S
Hot springs fimbristylis *Fimbristylis thermalis*		**2/221**		freshwater marsh above 1500', Arrowhead Hot Springs, San Bernardino Co.	perennial herb, leaves spiraled with linear blades, slate colored flower	N

Table 4.8-2
SENSITIVE FLORAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL STATUS	CNPS LIST/ CODE	STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION North Central South
Intermediate Mariposa lily *Calochortus weedii* var. *intermedius*	sp. of concern	1B/223		dry rocky open slopes, hills below 2000', coastal sage scrub, valley grassland, Orange Co.	perennial herb, purplish flowers, dark- or yellow-hairy with basal leaves, blooms June-July	C,S
Many-stemmed dudleya *Dudleya multicaulis*	sp. of concern	1B/123		dry stony places below 2000', coastal sage scrub, chaparral, western Riverside & San Bernardino Co.	perennial herb with narrow fleshy leaves arranged along stem with flowers toward the top, threatened by development	N,C,S
Marsh sandwort *Arenaria paludicola*	endangered	1B/332	endangered	swamps, freshwater marsh, below 900', San Bernardino Co.	perennial herb, grows close to ground, narrow leaves, blooms May-June	N,C
Munz's onion *Allium munzii*	proposed endangered	1B/333		grassy openings in coastal sage scrub, 900-2700', western Riverside Co.	white flowered lily	C,S
Nevin's Barberry *Berberis nevinii*	federally-proposed endangered	1B/333	endangered	coastal sage scrub, chaparral, riparian scrub, San Timoteo Canyon near Redlands, Dripping Springs near Aguanga, San Gabriel Mts., San Bernardino Co.	large rounded shrub, 3-12 ' tall, toothed leaf margins, reddish fruit, blooms March-May	N,C
Parish's desert-thorn *Lycium parishii*		2/211		dry places below 2000', coastal sage scrub, creosote bush scrub, San Bernardino Valley	spiny, highly branched shrub with bell-shaped purple flowers, blooms Mar.-April	N, C
Parish's gooseberry *Ribes divaricatum* var. *parishii*	sp. of concern	1B/333		willow thickets, swamps, coastal sage scrub, San Bernardino region	shrub to 10 ' tall, spiny arched stem with toothed leaf, pink or red flowers, blooms Mar.-April	N,C
Parry's spineflower *Chorizanthe parryi* var. *parryi*	sp. of concern	3/323		sandy places, dry slopes and flats in coastal and desert scrubs from 1000-3600 ', chaparral, coastal sage scrub, Riverside & San Bernardino Co.	white-flowered annual blooming April-May	N,C,S

Table 4.8-2

SENSITIVE FLORAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL STATUS	CNPS LIST/ CODE	STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION North Central South
Pious daisy, Brewer's erigeron *Erigeron breweri* var. *bisanctus*		1B/223		open dry slopes and washes, 900-4800', San Gabriel Mts., San Bernardino Mts.	perennial herb 1-3' high	N
Plummer's Mariposa lily *Calochortus plummerae*	sp. of concern	1B/223		dry rocky places, often in brush, below 5000', coastal sage scrub to yellow pine forest, Santa Monica Mts. to San Jacinto Mts.	perennial herb, pale pink bell shaped flowers with long yellow hairs, blooms May-July	N,C
Pringle's monardella, Pringle's mountainbalm *Monardella pringlei*	sp. of concern	1A		sandy places, coastal sage scrub, San Bernardino Co., Riverside Co.	annual herb branched near base with heavy ash-gray stems and hairy leaves, rose or purple flower, last seen in 1921, presumed extinct	N,C
Prostrate navarretia *Navarretia fossalis*	proposed threatened	1B/232		vernal pools, ditches, 90-3900'	spreading plant with white flowers	N,C,S
Robinson's peppergrass *Lepidium virginicum* var. *robinsonii*		1B/322		shrublands with clay soils, below 1500', chaparral, coastal sage scrub, Riverside & San Bernardino Co.	annual herb with leaves a part of the stem, blooms Jan.-April	N,C,S
Salt spring checkerbloom *Sidalcea neomexicana*		2/221		alkaline springs and marshes below 4500', San Gabriel Mts., Riverside & San Bernardino Co.	fleshy-leafed perennial, rose-colored flowers	N,C,S
San Diego button-celery *Eryngium aristulatum* var. *parishii*	endangered	1B/232		vernal pools, chaparral, west of Murrieta, Riverside Co.	small, slender annual	C,S
Santa Ana River woollystar *Eriastrum densifolium* ssp. *sanctorum*	endangered	1B/333	endangered	below 1500', coastal sage scrub, along Santa Ana River	perennial herb blooms June-Aug,	N,C,S

Table 4.8-2
SENSITIVE FLORAL RESOURCES

COMMON NAME *SCIENTIFIC NAME*	FEDERAL STATUS	CNPS LIST/ CODE	STATE STATUS	HABITAT/ DISTRIBUTION	DISCUSSION	BASIN SECTION North Central South
Slender-horned spineflower, Slenderhorn spinyherb *Dodecahema leptoceras*	endangered	**1B/333**	endangered	alluvial-fan habitats in chaparral, coastal sage scrub, Riverside, San Bernardino Counties	annual herb with basal leaves and very small white-pink flowers, blooms April-June	N,C,S
Slender Mariposa lily, Clubhair Mariposa lily *Calochortus clavatus* var. *gracilis*	sp. of concern	**1B/323**		canyons below 2500', chaparral, base of San Gabriel Mts.	perennial herb, with slender stem, basal leaves and cup/bell shaped yellow flowers, blooms April-June	N
Smooth tarplant, Spikeweed *Hemizonia pungens* ssp. *laevis*	sp. of concern	**1B/233**		grasslands below 1200'	annual herb with spiky leaves and yellow flowers	N,C,S
Southern mountain wild buckwheat *Eriogonum kennedyi* var. *austromontanum*	threatened	**1B/223**		dry gravel in yellow pine forest, 1900-2100', San Bernardino Mts.	perennial with white to rose-colored flowers	N
Thread-leafed brodiaea *Brodiaea filifolia*	threatened	**1B/333**	endangered	heavy clay soil below 2000', in vernally flooded conditions, coastal sage scrub, chaparral, valley grassland, Riverside, & San Bernardino Co.	perennial herb, blooms May-June	N,C,S
Triple-ribbed milk-vetch *Astragalus tricarinatus*	endangered	**1B/313**		gravelly places 1400-4000', creosote bush scrub, joshua tree woodland	bushy perennial, blooms Feb.-May	N,C,S
Vail Lake ceanothus *Ceanothus ophiochilus*	proposed threatened	**1B/333**		rocky, north-facing slopes, ridges, chaparral around 1800', near Vail Lake, Riverside Co.	flowers pale blue or pink	C,S

California walnut woodland occurs on upland north-facing slopes that are rarely flooded, terraced and relatively flat. Soils are shale-derived and deep. Understories to the walnut tree are composed of coastal scrub, chaparral, and non-native grass species. California walnut is rare (a CNPS Class 4 species). The series height is usually less than 10 meters. (CNPS database).

4.8.2.2 Flora and Faunal Resources

No biological surveys were conducted as part of this biological evaluation. The area has already been evaluated in many different environmental reports, especially those conducted for the counties of San Bernardino and Riverside. Sensitive species that have any potential of occurring within the project area boundaries that have been designated as species of concern, rare, threatened or endangered by either the USFWS or the CDFG or listed as sensitive species by the California Native Plant society are included in Tables 4.8-1 and 4.8-2 for reference purposes. Table 4.8-1 lists animals and Table 4.8-2 describes plants. This list was compiled from all occurrences identified using the CNDDB 2000, and a list of all sensitive species obtained from the USFWS for all of San Bernardino and Riverside County areas. Only when there is absolute certainty that the project area is outside of the normal habitat range for a species included on the USFWS list have species been removed from further discussion in Table 4.8-1. In some cases, it was not possible to determine if the project area was truly outside of possible habitat ranges, so as to err on the side of caution, these species were included in the list, even though the probability of occurrence for such species is so low as to be almost no probability.

4.8.2.3 Habitat Linkages and Biological Preserves

A biological issue of special concern is the preservation of habitat connectivity and linages. The National Park Service and the CDFG have both expressed concerns about the negative impacts to biological resources due to increasing urbanization and fragmentation of habitat areas.

In general terms, habitat connectivity and linages are important for three main reasons. First, they allow wildlife movement through all habitat areas suitable for use by a species, even those areas that are not currently being used. Second, increased connectivity allows for recolonization of areas that were historically occupied, but from which the species has been extirpated. Third, connectivity promotes the exchange of genetic material to occur between populations, which is important in preserving genetic diversity within and between populations. Fourth, connectivity is critical for large ranging mammals...which require thousands of acres of habitat to survive.

Critical wildlife movement areas within and adjacent to the project area Consist of the Santa Ana River and its tributary streams within the Chino Basin; the foothills, canyons and washes of the San Gabriel mountains to the north; the Prado Basin Reservoir Area; and Chino Hills State Park.

4.8.3 Project Impacts

Implementation of this project has some potential to impact biological resources. The type and the severity of the impacts are dependent on the site(s) selected and the amount of site disturbance required to install the infrastructure, wells and facilities outlined in the project description (Chapter 3 of this document). The impact evaluation discussion below has been conducted on a relatively broad and general level, leaving room for further site specific biological surveys in the future to address projects as they become better defined. A suite of mitigation measure is provided to ensure that all necessary environmental review is conducted for specific projects so as to minimize or remove impacts to sensitive biological resources.

4.8.3.1 Thresholds of Significance

The Initial Study Environmental Checklist Form (Appendix G of the State's CEQA Guidelines) provides recommendations for determining the significance of project-related impacts. The Checklist Form (Issue #IV, Biological Resources identifies the following criteria for determining whether a project may cause a significant adverse biological resource impact:

a. have a substantial adverse direct or indirect effect on any species identified as a candidate, sensitive, or special status species;

b. have a substantial adverse effect on riparian habitat or other sensitive natural community;

c. have a substantial adverse effect on federally protected wetlands;

d. substantially interfere with the movement of native fish or wildlife species, migratory wildlife corridors, or impede the use of native wildlife nursery sites;

e. conflict with local policies or ordinances protecting biological resources; or

f. conflict with provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved habitat conservation plan.

These thresholds of significance will be utilized in this PEIR to evaluate the potential impacts associated with implementation of this project.

The CNPS publishes and regularly updates the "Inventory or Rare and endangered Vascular Plants of California." CNPS gathers information from the CNDDB, the CDFG, and amateur and professional botanists throughout the state. Plants listed by CNPS, but not officially listed by the State, nevertheless receive protection under CEQA: that is, impacts to CNPS listed species may be considered to be significant. The CNPS plant list is attached as Appendix 8.5 of Chapter 8 to this document.

a. Will the project substantially impact candidate, sensitive or special status species of riparian or other sensitive natural communities?

Virtually any of the study area's plant associations may be considered "sensitive," given the fact that so much of the project area has already been impacted by urban development or other human activities. Additionally, areas may considered particularly sensitive if they occur with a significant ecological or migratory corridor as described in the subsection on Habitat Linkages and Biological Preserves; further, areas that provide habitat for listed or otherwise sensitive species should be considered particularly susceptible to potential adverse impacts relating to project implementation. Particularly sensitive areas that have been identified in relation to several endangered species such as the Arroyo Toad, Least Bell's Vireo, Southwestern Willow Flycatcher, Quino Checkerspot Butterfly, San Bernardino Kangaroo Rat, and Coastal California Gnatcatcher are shown on Figures 4.8-2 through 4.8-6 for each respective species. Any projects constructed within these areas has the potential to cause a significant impact to an endangered species, and further biological studies and mitigation are required in accordance with the mitigation measures listed below, which will avoid or mitigate impacts to a less than significant level. In addition to the sensitive areas identified in Figures 4.8-2 to 4.8-6, the Delhi Sands Flower-loving Fly is also a sensitive species with potential habitat areas identified in pink on Figure 4.8-7. Other sensitive species that have potential habitat areas defined on the map in Figure 4.8-7 are Quino Checkerspot Butterfly, San Bernardino Kangaroo Rat. These areas occupy a large portion of the Chino Basin, and thus future OBMP projects have a significant risk of impacting these species. Mitigation measures are proposed below to help minimize impacts to these species, however, the impacts must still be considered significant since the extent to which sensitive biological resources may be impacted is unknown given that the nature and location of all projects under the OBMP have not yet been fully defined.

The OBMP project has the potential to adversely impact all of the plant communities described in the environmental setting. Since the extent to which these communities may be impacted is yet unknown, potential adverse impacts must be considered significant until it can be demonstrated otherwise. Certain mitigation measures that are already in place for some habitat types are described below.

Within the project area, woodland communities are regulated by specific laws and ordinances to minimize impacts. Specifically, some riparian communities and communities containing oak trees are regulated by county or city ordinances. There are additional federal and state regulations regarding riparian/wetland areas.

Coastal sage scrub is also considered a sensitive community based on widespread awareness that this community has undergone widespread losses in the past and that this habitat type is closely related to several sensitive species. Further, the state is conducting an ongoing effort to create regionally important coastal sage scrub preserves under the Natural Communities Conservation Plan. Other regional habitat conservation plan efforts are also supportive of preserving this community type.

Grassland communities, especially non-native grasslands, have traditionally been considered less sensitive than woodlands and coastal sage scrub because they are more common. With increasing urbanization, however, their importance has increased, especially for raptors and other wide-ranging species. Native grasslands, especially, are uncommon and are considered to be particularly sensitive. The Chino Hills State Park is mostly comprised of non-native grasslands and is a preserve area. Thus, impacts to this particular community type from project implementation are not likely to be significant.

Chaparral is generally the least sensitive of the native communities within the project area since is it the most common, widespread community type. In some cases, however, chaparral may support other sensitive resources, and thus it has the potential to be considered a sensitive ecological area. It is considered a potentially significant impact if a sensitive ecological area is adversely affected by OBMP facilities.

Impacts to plant life, in general, are potentially significant since the project may result in the reduction of habitat area if land is converted from natural habitat to other uses. The impact to plant resources and sensitive species must be evaluated on a project by project basis, and could be significant given the high sensitivity of plant species both locally and regionally in the natural open space areas of the project area. The OBMP has the potential to decrease biological diversity. While construction of the OBMP facilities could have a direct impact on plant life and sensitive species if such facilities are located in or adjacent to important habitat areas, it is important to note that overall impacts to land in the Chino Basin are minimal from full implementation of the OBMP. In Section 4.2, it should be reiterated that construction of all desalter and well facilities contemplated under the OBMP would at most disturb 100 acres of the 225, 937 acres in the Chino Basin, of which over 75,000 was vacant in 1990. Thus over the next 20 years, the OBMP would potentially consume only one tenth of one percent of the open space acreage that existed in the Chino Basin in 1990.

General impacts to faunal life in the project area include potential reduction in suitable habitat types which could directly affect sensitive animal species. It would be expected that some animal species would be displaced or succumb to construction due to direct impacts or otherwise be impacted due to competition from limited adjacent holding capacities. Other animal species which are urban-adapted and not considered sensitive may be forced to relocate to other areas. Consequently a change in diversity and number of species due to build out within the project area could be a potentially significant impact resulting from the OBMP. Existing policies designed to project wildlife corridors will assist in protecting species diversity. These species would be protected through the state and federal Endangered Species Act and through future project-specific environmental review processes that could require detailed evaluations of wildlife habitat to determine the extent of project specific impacts and necessary mitigation requirements.

The amount of water that enters into the Prado Basin is an issue that must be analyzed in relation to biological resources within this area. The water level within the Prado Basin has a great potential to affect the surrounding riparian resources within this area, thus it must be closely regulated.

According to the 1978 Judgement, Orange County Water District (OCWD) has a legal entitlement to 42,000 acre-feet per year (acre-ft/year) of water from the Prado Reservoir, in addition to all stormwater flows that reach the Prado Basin. As a five year moving average, the baseflow at Prado has ranged from approximately 250,000 to 310,000 acre-ft/year since 1992. The diversion of 40,000 acre-ft/year of recycled water from discharging into Prado Basin to recharge locations within Chino Basin will not adversely impact the ability to meet any downstream entitlements since the baseflow will remain significantly greater than OCWD's entitlement. Also, several factors in the future will contribute to increases in the baseflow quantity. As the baseflow increases in volume, the diversion of 40,000 acre-ft/year of recycled water will be even less substantial proportionally, and impacts to the Prado Basin area and to OCWD will be minimal. The factors that will be contributing to future base flow increases are increases in surface runoff due to greater urbanization, and increases in total amounts of wastewater generated within the project area. The impacts to the riparian resources at Prado Dam are thus considered to be less than significant. Currently, regulators are more concerned with the possibility that too much water, rather than not enough, is reaching the Prado Basin (PEIR for Proposed Regional Plan Number 5 Project, May 1999). As the OBMP will cause a small decrease in wastewater flows reaching the Prado area, the net impacts may actually be considered to be beneficial, as opposed to adverse, for biological resources in the area.

The shift of 40,000 acre-ft/year of recycled water from discharge to recharge will be occurring gradually over the course of the OBMP timeframe. As this water is being diverted, wastewater flows will be increasing to the Prado Basin area. The following analysis provides data for both current and 2020 projected wastewater volumes. The Los Angeles County Sanitation district predicts an increase in wastewater discharge for the cities of Pomona and Upland from 22,000 to 30,000 acre-ft/year. The IEUA service area generation of wastewater flow will increase from 57,000 acre-ft/year to 112,000 acre-ft/year. Project areas within Riverside County are forecast to have increased wastewater generation by 5,000 acre-ft/year, an increase from 10,000 acre-ft/year to 15,000 acre-ft/year. In total, wastewater will increase, regardless of the proposed OBMP project, by approximately 68,000 acre-ft/year. Consequently, even with the diversion of 40,000 acre-ft/year of wastewater flows, there will still be a net increase in flows to Prado Dam, potentially on the order of 28,000 acre-ft/year (the relative amount will ultimately depend on the amount of direct beneficial use by industrial and irrigation users in the future). Regardless, however, the OBMP project has the potential to reduce the 2020 volume of water tributary to Prado Dam by 40,000 acre-ft/year of recycled water, and this action is not forecast to cause any significant environmental impacts. The decrease in the amount of total future flows reaching Prado Basin resulting from the OBMP will benefit riparian resources since the riparian resources would otherwise be flooded and destroyed due to increases in wastewater flows that will occur regardless of OBMP implementation.

A final potentially significant impact to biological resources is that new construction has the potential to introduce non-native plant materials that could prevent the reestablishment of native plant material in locations where either the species had historical range or the species has the potential to be replenished given the physical conditions of a particular setting.

All of the aforementioned potentially significant impacts can be mitigated to a less than significant level through the implementation of the proposed mitigation measures proposed below. If the project is implemented in a manner consistent will all of the applicable mitigation measures, the project will adhere with all of the already established processes and procedures guiding the protection of biological resources within the project area. If the circumstances surrounding a particular species or biological resource are different in the future and should cause biological resource impacts within the area to be deemed significant in the future, subsequent environmental documentation will be prepared and reviewed by the appropriate state agencies and/or federal agencies with jurisdiction.

4.8.4 Mitigation Measures

The following policies are the proposed guidelines that will function as mitigation measures to reduce impacts to biological resources in and adjacent to the Chino Basin project area. They have been abstracted and modified to fit the OBMP project fro the DEIR for the Ventura Freeway Corridor Areawide Plan.

4.8-1 Place primary emphasis on the preservation of large, unbroken blocks of natural open space and wildlife habitat area, and protect the integrity of habitat linkages. As part of this emphasis, incorporate programs for purchase of lands, clustering of development to increase the amount of preserved open space, and assurances that the construction of pipelines and other facilities or infrastructure improvements meet standards identical to the environmental protection policies applicable to the specific project.

4.8-2 When determining which portion of a facility sit should be retained in open space, give emphasis to the preservation of habitat areas and linkages, avoiding destruction of viable, sensitive habitat areas and linkages as a trade-off for preserving open space for purely aesthetic purposes. Further, whenever feasible, avoid impacts and disturbances to individuals and species considered sensitive by jurisdictional agencies.

4.8-3 Require facility designs to be planned to protect habitat values and to preserve significant, viable habitat areas and habitat connection in their natural conditions.

a. Within designated habitat areas of rare, threatened or endangered species, prohibit disturbance of protected biotic resources.

b. Within riparian areas and wetlands subject to state or federal regulations (e.g. blue line streams); riparian woodlands, oak and walnut woodland, and habitat linkages, require that the vegetative resources which contribute to habitat carrying capacity (vegetative diversity, faunal resting sites, foraging areas, and food sources) are preserved in place or replaced so as no to result in an measurable reduction in the reproductive capacity of sensitive biotic resources.

c. Within habitats of plants listed by the CNDDB or CNPS as "special" or "of concern," require that new facilities not result in a reduction in the number of these plants, if they are present.

4.8-4 Maximize the preservation of individual oak, sycamore and walnut trees within proposed development sites.

4.8-5 Prohibit the use of motorized vehicles within sensitive habitat areas and linkages except for crucial maintenance and/or construction activities.

4.8-6 Require the establishment of buffer zones adjacent to areas of preserved biological resources. Such buffer zones shall be of adequate width to protect biological resources from grading and construction activities, as well as from the long-term use of adjacent lands. Permitted land modification activities with preservation and buffer areas are to be limited to those that are consistent with the maintenance of the reproductive capacity of the identifies resources. The land uses and design of project facilities adjacent to a vegetative preservation area, as well as activities within the designated buffer area are not to be permitted to disturb natural drainage patterns to the point that vegetative resources receive too much or too little water to permit their ongoing health. In addition, landscape adjacent to areas of preserved biological resources shall be designed so as to avoid invasive species which could negatively impact the value of the preserved resource.

4.8-7 Require conservation or open space easements, granting of development rights, or other similar protections over biological habitats, and habitat linages being preserved in their natural state.

4.8-8 Prior to facility construction or installation, project specific biological resource surveys will be conducted onsite when any previously undeveloped areas may be disturbed by project implementation. If any sensitive species have the potential to occur on the site where OBMP facilities are proposed, or if previous environmental studies have not been conducted, IEUA will conduct all surveys in accordance with all established state, federal and generally accepted biological survey protocols for each potential species that may be located onsite. Further, IEUA will implement all mitigation measures recommended by jurisdictional agencies.

4.8-9 Mitigation measures should be determined on a project by project basis. Potential mitigation measures may include avoidance or minimization of impacts. One means of minimizing impacts to sensitive plants, for example, has included transplanting individuals out of harm's way.

4.8-10 The amount of water taken from or added to the Santa Ana River will be coordinated where possible to maintain the water level below the 505' elevation mark but above the 498' mark. If weather and hydrologic forecasts and reservoir conditions indicate that the pool elevation may exceed 505' because of a projected disparity between inflow and outflow, the water control manager at the Reservoir Operation Center shall take all steps necessary (including immediate release of water at the maximum possible rate to prevent the pool elevation from exceeding 505', or to reduce the amount of time the pool is above 505' (if, in fact, the maximum possible release rate does not succeed in keeping the pool elevation below 505'). This mitigation measure will help to ensure the preservation of critical habitat for the least Bell's vireo, and preservation of associated riparian resources.*

4.8-11 Mitigation must be designed so that development of a given project will effectively benefit the species. The 2081 and 10(a) permits should be complimentary of one another to avoid conflicts between state and federal mitigation requirements. These permits will likely require land purchase, endowment funds, fencing funds, and mitigation measures. Section 7 consultations also usually include a land acquisition component.*

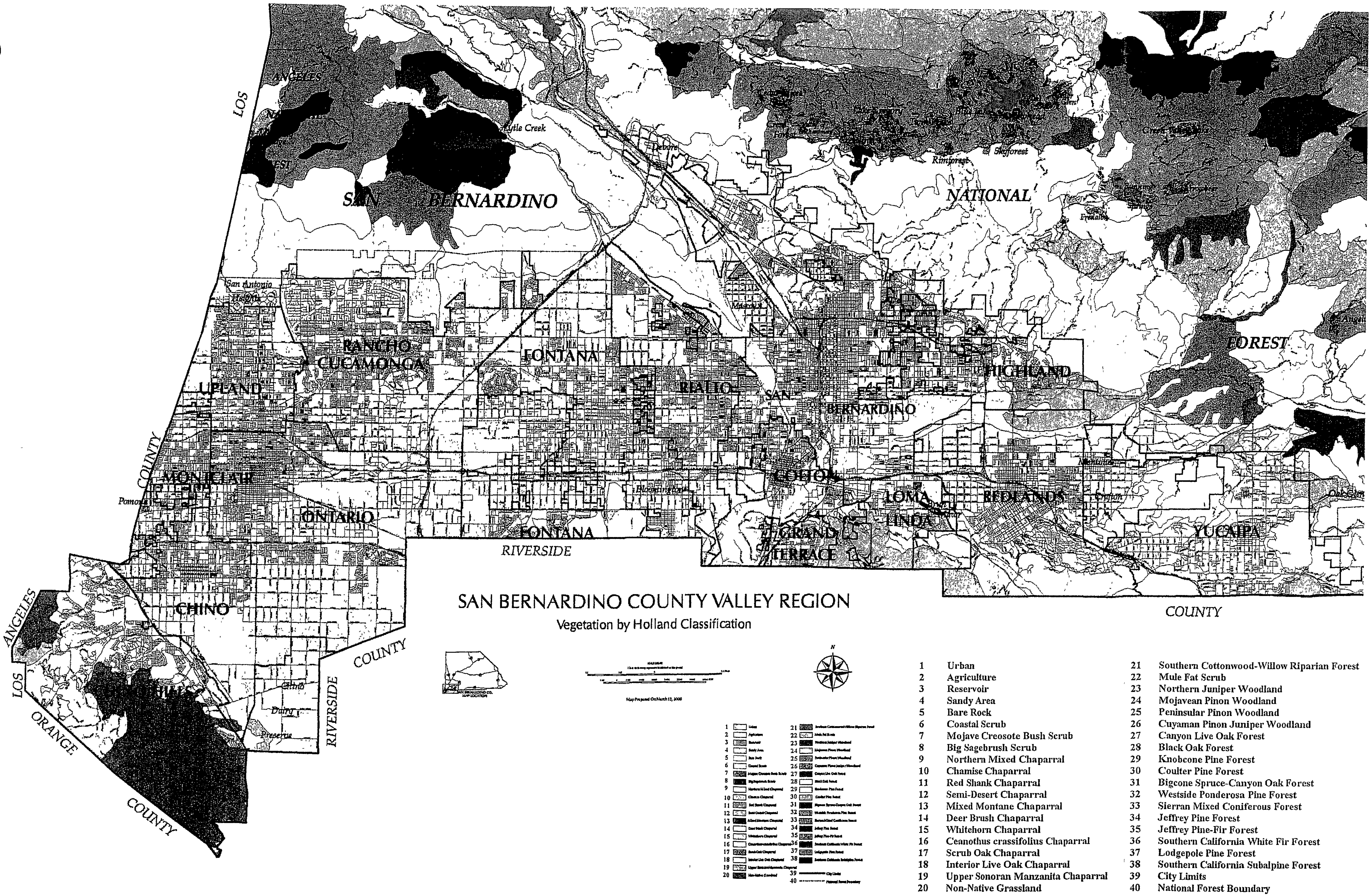
* Indicates that a modification to the mitigation measure has been made for clarification purposes in response to comments received on the DEIR.

4.8.5 Cumulative Impacts

Based on the evaluation in this subchapter, no significant biological resource impacts are forecast to occur due to OBMP implementation. If all potential biological impacts are fully mitigated according to all required mitigation ratio established by jurisdictional agencies, then the net cumulative impacts to these resources will be less than significant.

4.8.6 Unavoidable Adverse Impact

The biological resource evaluation presented above indicates that since biological impacts can be fully mitigated to a level of non-significance, no unavoidable significant adverse impacts to biological resources are forecast to occur as a result of project implementation.

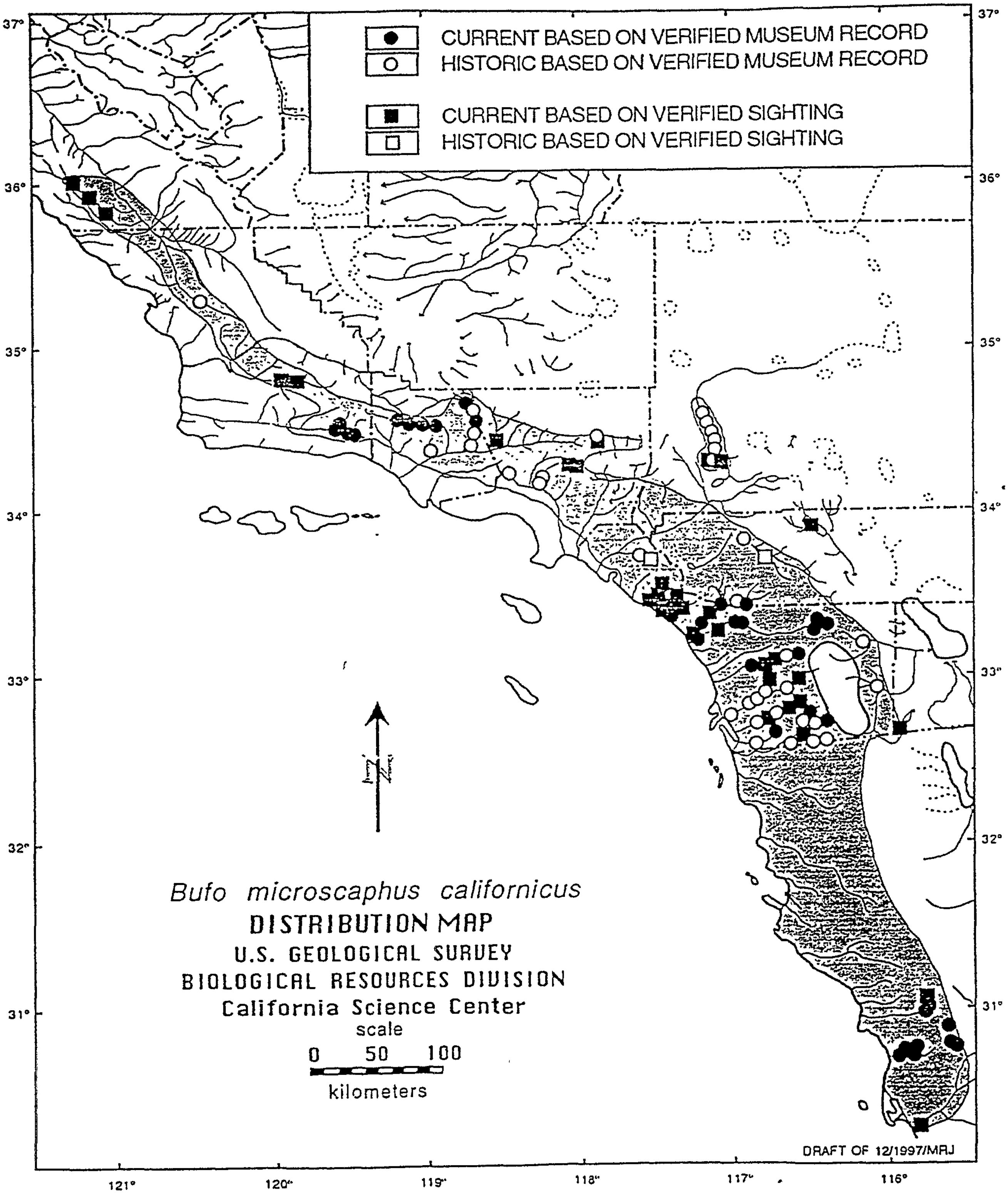


SAN BERNARDINO COUNTY VALLEY REGION
VEGETATION BY HOLLAND CLASSIFICATION

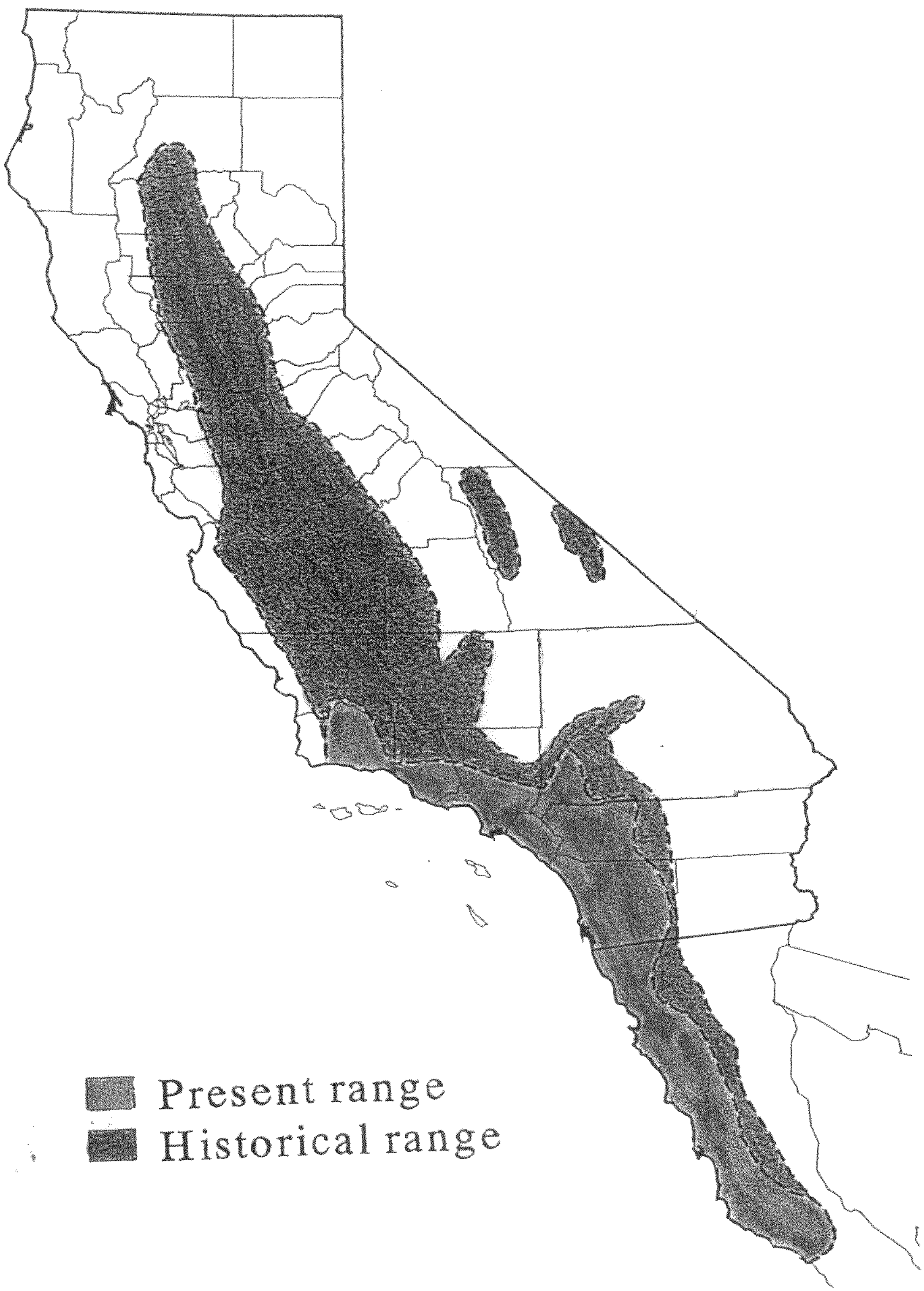
Source. GIMS San Bernardino County, March 2000

TOM DODSON & ASSOCIATES
Environmental Consultants

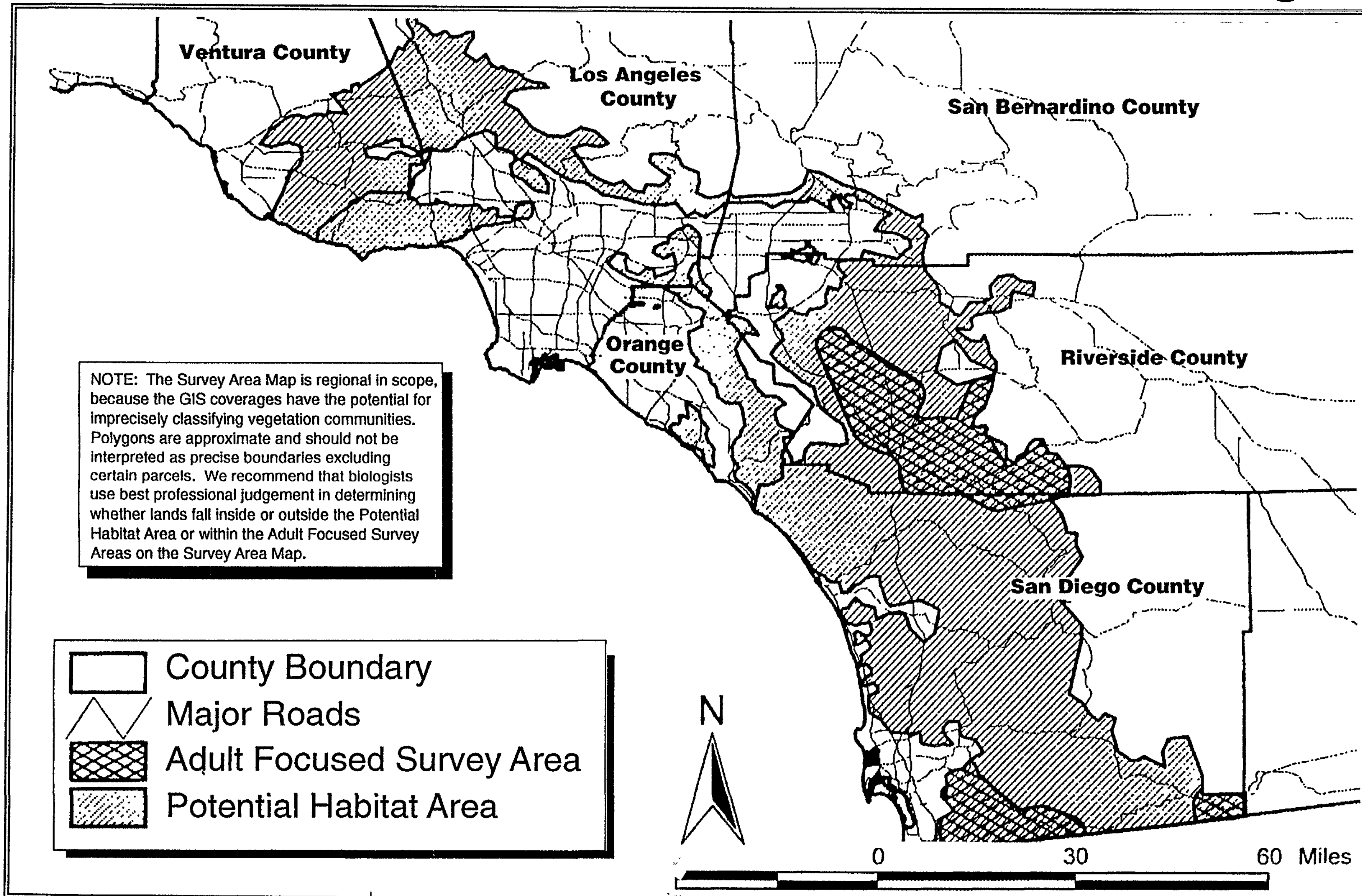
FIGURE 4.8-1



SENSITIVE AREAS FOR ARROYO TOAD Source: San Bernardino County Planning Department and U.S. Fish and Wildlife Service	**TOM DODSON & ASSOCIATES** Environmental Consultants	**FIGURE 4.8-2**



SENSITIVE AREAS FOR LEAST BELL'S VIREO Source: San Bernardino County Planning Department	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.8-3**

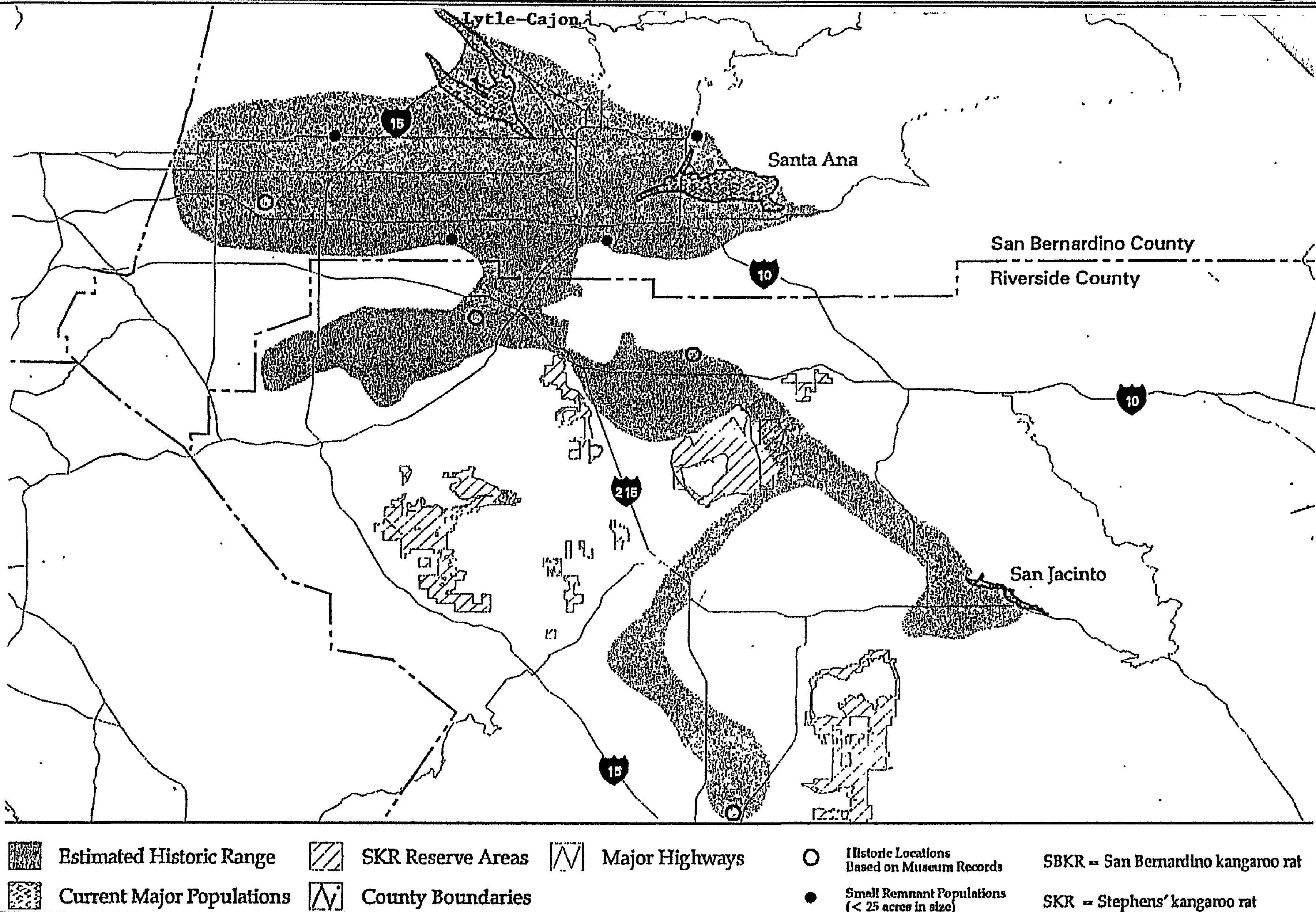


SENSITIVE AREAS FOR QUINO CHECKERSPOT BUTTERFLY

Source: U.S. Fish and Wildlife Service

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.8-4

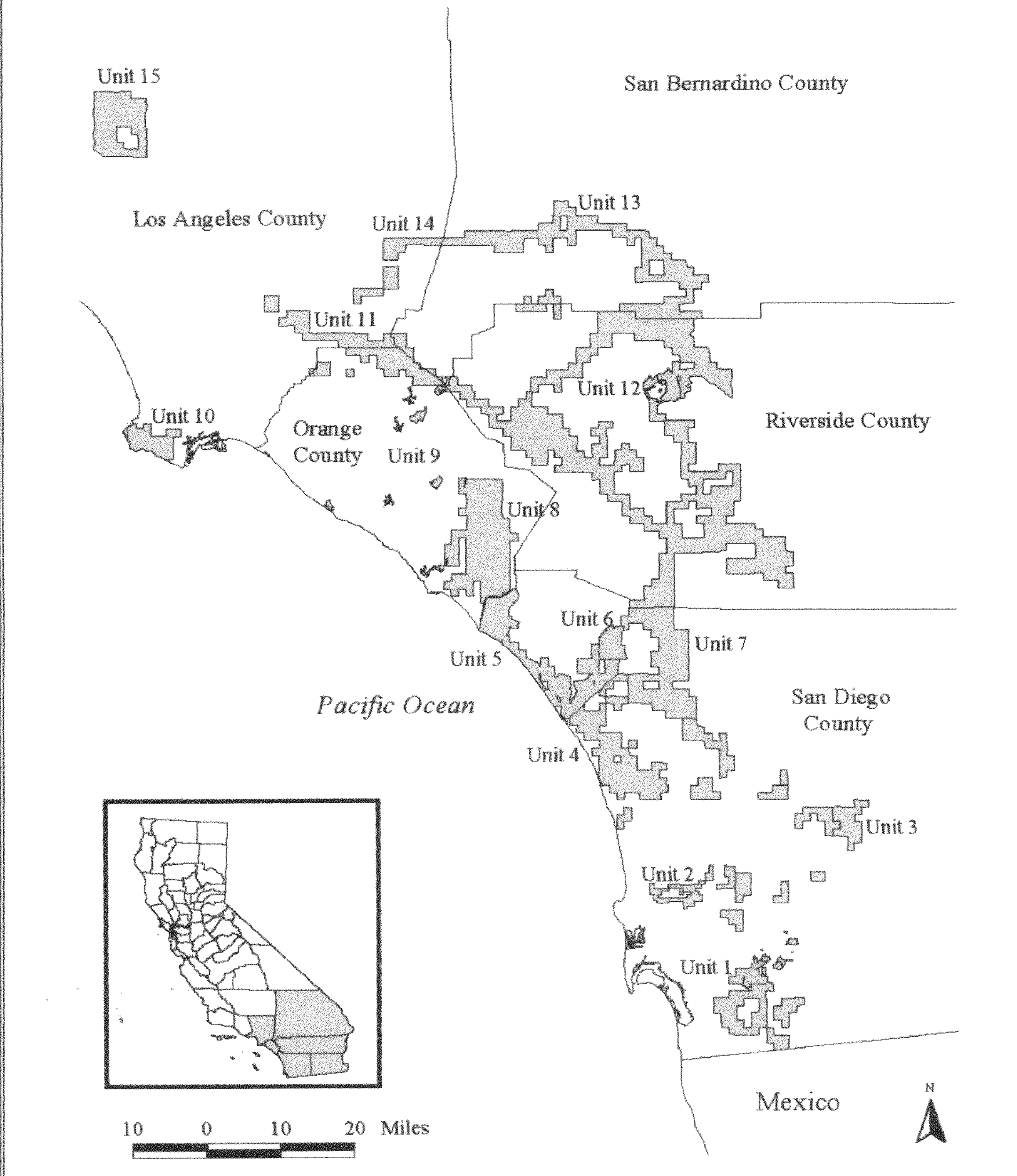


SENSITIVE AREAS FOR SAN BERNARDINO KANGAROO RAT

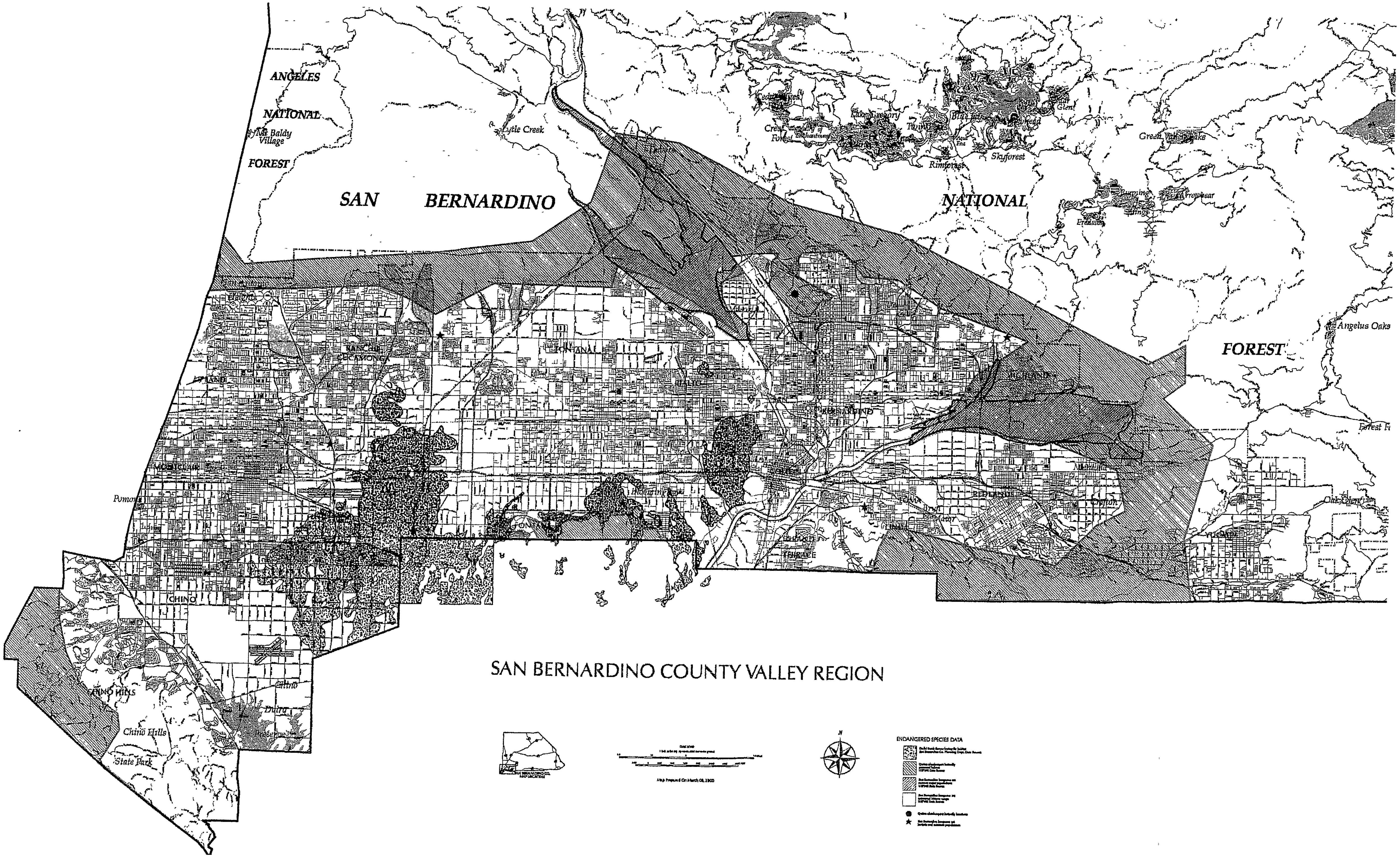
Source: U.S. Fish and Wildlife Service

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.8-5



SENSITIVE AREAS FOR COASTAL CALIFORNIA GNATCATCHER Source: U.S. Fish and Wildlife Service Federal Register Notice	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.8-6**



SENSITIVE AREAS FOR ENDANGERED SPECIES IN THE VALLEY AREA

Source: GIMS San Bernardino County, March 2000

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.8-7

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4.9 ENERGY

4.9.1 Introduction

This subchapter relies on data contained in the OBMP to attempt to forecast energy consumption associated with implementation of the program. The evaluation focuses on the type of energy required and the potential impacts to the systems that supply the energy.

4.9.2 Environmental Setting

The project area is located within the Chino Basin. While portions of the OBMP area are rural in character, the majority of the area is urbanized with energy sources readily available. Electricity is supplied by Southern California Edison Company (SCE) and natural gas is supplied by Southern California Gas Company (SCGC). Petroleum products are available in sufficient quantities throughout the area.

4.9.3 Project Impacts

Implementation of the OBMP will result in the consumption of energy over both the long and short term. In the short term, construction activities will consume primarily petroleum products by equipment and vehicles constructing and expanding water facilities. While construction will be ongoing for much of the life of the OBMP, construction activities are considered short term because they are not a permanent consumer of energy at any given facility or site.

Over the long term, energy will be consumed primarily by the pumps and motors needed to transport water and to operate water treatment facilities. The primary source of energy for these long-term consumptive uses will be electricity. The facilities proposed by the OBMP are not consumers of substantial amounts of natural gas.

The ultimate buildout usage of electrical power supply for OBMP facilities is estimated to be the combined total of kilowatt hour usage for desalter source water system pumps, desalter RO pumps (assuming Alternative 6A-RO only for the East, West, and SAWPA desalters), and for the treated water distribution system pumps (again for Alternative 6A with three fully operational desalters). The energy requirements for these pumping activities, respectively, are as follows. 31,649,292 kW hours (kWh); 21,510,910 kW hours; and 13,251,000 kW hours. The cost for this electrical energy is estimated to be $5,812,816. If these facilities treat a combined total of 40,000 acre-ft/year, the cost breakdown is approximately $145 per acre-foot of treated water, and approximately 1660 kW hours per acre-foot of water that is pumped, treated and delivered. The average pumping costs associated with bringing in SPW average about 3,200 kW hours per acre-foot of water delivered, and this SPW water may still require additional treatment before use. Thus the energy requirements associated with implementing the OBMP are less than without the OBMP, since a much greater volume of SPW would be necessary if many water purveyors had to import water to meet obligations. The cost associated with the OBMP water supply plan would also be less than a water supply plan that would rely primarily on imported water sources. (personal communication with IEUA, April 19, 2000)

The total energy requirement of 66,411,202 kW hours for OBMP desalter and distribution operations is within the projected energy forecasts for the year 2007. The latest Electricity Report prepared in November of 1997 by the California Energy Commission states that SCE has existing and committed resource capacity to meet obligations up to 20,546 Megawatts for any peak demand period of time. The OBMP energy requirements are well within this capacity and will be spread out over a year's time.

Another possible idea that has been entertained under the OBMP is the capture, storage and transport of storm water from the southern portion of the basin to recharge areas above the Interstate-10 Freeway. To transport approximately 10,000 acre-ft/year of water from a recharge basin in the south over a 3-month time frame, approximately 2.2 million kWh of energy would be required, along with sizable pumps and a storage facility (possibly and existing basin). Again, this energy requirement is within the supply capacity of SCE as outlined in the 1997 Electricity Report.

4.9.3.1 Significance Criteria

The public service issues of concern in this evaluation are increased demand for utility capacity without adequate existing capacity or comparable increases in capacity from implementing the OBMP. The following criterion will be used to determine whether a significant utility impact will be created by the proposed project:

- The project will result in significant impacts to utilities if it causes demand for a utility to exceed the system's capacity and creates a need to develop new utility service system capacity without a means of funding the required system capacity expansion.

4.9.3.2 Construction Impacts

Construction activities will consume petroleum products. These products will be diesel and gasoline to power construction equipment. Virtually none of the construction activities will utilize electricity or natural gas. Based on projections provided in subsection 4.6, Air Quality, construction activities will require a relatively few pieces of equipment and based on the amount and the availability of petroleum products in the region, it is concluded that construction activities associated with this project have no potential to result in a demand that exceeds supply of petroleum products in the region.

4.9.3.3 Operation Impacts

Implementation of the OBMP will result in the utilization of electricity to power most of the pumps and motors required to transport and treat water. Virtually no natural gas or petroleum products will be utilized. According to data provided in Chapter 12 of the California Energy Commissions Electricity Report, November 1997, SCE has adequate existing capacity to meet the demands for electricity through the year 2007 which is the extent of forecasting by the Energy Report.

Based on these data it is concluded that implementation of the OBMP will not create a demand for electricity that exceeds the systems capacity.

4.9.4 Mitigation Measures

No mitigation is proposed.

4.9.5 Unavoidable Adverse Impact

No unavoidable adverse impacts are identified in relation to energy supply issues.

4.9.6 Cumulative Impact

Implementation of the OBMP will contribute to the demand for electricity in the SCE service area. However, available data indicates that adequate existing capacity is available to meet this demand into the foreseeable future, and this is not considered to be a significant impact.

4.10 HAZARDS AND RISK OF UPSET

4.10.1 Introduction

The analysis in this section focuses on potential hazards and risks associated with implementing the OBMP ranging from construction activities to operation of facilities such as wells, desalters and other facilities. This section of the PEIR summarizes the major areas of groundwater contamination based on information contained in the OBMP for use in evaluating potential environmental impacts on contaminated areas from implementing the OBMP. This section also addresses the transport and handling of hazardous materials as part of the proposed business and industrial operations. Aside from the OBMP, the San Bernardino County Hazardous Waster Management Plan and local agency general plans have been reviewed for policies regarding management of hazardous materials and wastes and contaminated areas. Extensive additional information has been abstracted and presented with minor modifications, where appropriate, from the Kaiser Commerce Center Specific Plan EIR certified by San Bernardino County in 1999.

4.10.2 Environmental Setting

4.10.2.1 Existing Policies and Regulations

The principal agency for managing contamination from illegal or accidental releases of hazardous materials and wastes in the State of California is the Department of Toxic Substances Control (DTSC). In addition to enforcing state regulations (California Code of Regulations (CCR) Titles 17, 19, and 22), the DTSC was granted authorization from the federal EPA in 1992 to be the agency responsible for regulating the generation, transport, and disposal of hazardous waste under the authority of the Resource Conservation and Recovery Act (RCRA) in California. Other agencies that may periodically coordinate with DTSC or with the enforcement of regulations that address site activities include: Hazardous Materials Division, the San Bernardino County Fire Department, the Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board, the SCAQMD, the Department of Transportation, and the California Highway Patrol.

4.10.2.2 Risk Associated with the Use of Hazardous Materials

Hazard vs. Risk

Worker and public health are potentially at risk whenever hazardous materials are present or will be used. It is important to differentiate between the "hazard" of these materials and the acceptability of the "risk" they pose to human health and the environment. A hazard is any situation that has the potential to cause damage to human health and the environment. The risk to human health and the environment is determined by the probability of exposure to the hazardous substance and the severity of harm such exposure would pose. The likelihood and means of exposure, in addition to the inherent toxicity of a substance, determine the degree of risk to human health. When the risk of an activity is judged acceptable by society in relation to perceived benefits, the activity is judged to be safe.

Means of Exposure

Exposure to hazardous materials could occur in the following manner: (1) improper handling or use of hazardous materials during the course of business, particularly by untrained personnel; (2) failure of storage containment systems; (3) environmentally unsound treatment/disposal methods; (4) transportation accidents; (5) fire, explosion or other emergencies; or (6) permitted release of hazardous materials by regulatory agencies. The following factors influence the health effects of exposure to hazardous materials: the dose to which the person is exposed, the frequency of exposure, the duration of exposure, the exposure pathway (route by which a chemical enters a person's body), and the individual's unique biological susceptibility.

The means of exposure as outlined above would determine the way in which toxic materials are absorbed into the body and, therefore, the bodily organs or systems affected. The major ways in which toxic materials may enter and be absorbed by the body are through the mouth (ingestion), the skin (penetration), or the lungs (inhalation). How a hazardous substance gets into the body and what damage it causes depends on the form or physical properties of the substance (i.e., liquid, solid, gas, dust, fibers, fumes or mist). A chemical may be toxic by one route and not another.

Health effects from exposure to toxic materials may be acute or chronic. Acute effects, usually resulting from a single exposure to a toxic material, may include significant immediate damage to organs and systems in the body, and possibly death. Chronic effects, usually resulting from long term exposure to a toxic or hazardous substance, may also include systemic and organ damage, as well as birth defects, genetic damage and cancer.

Hazardous Material Handling

Hazardous materials could be utilized for operation of desalting facilities constructed as one component of implementing the OBMP. Table 4.10-1 lists federal, state and local regulatory agencies that oversee hazardous substances handling and management, and the statutes and regulations that these agencies administer. The following discussion contains a summary review of regulatory controls pertaining to hazardous materials.

Table 4.10-1
SUMMARY OF HAZARDOUS MATERIALS REGULATORY AUTHORITY

Regulatory Agency	Jurisdiction	Authority
FEDERAL AGENCIES		
Dept. of Transportation	Federal	Hazardous Materials Transportation Act - Code of Federal Regulations (CFR) 49
Environmental Protection Agency	Federal	Federal Water Pollution Control Act Clean Air Act Resource Conservation & Recovery Act (RCRA) Comprehensive Environmental Response, Compensation & Liability Act Superfund Amendments & Reauthorization Act (SARA) Federal Insecticide, Fungicide & Rodenticide Act
Occupational Safety and Health Administration	Federal	Occupational Safety and Health Act & CFR 29
STATE AGENCIES		
Dept. of Toxic Substances Control	State	California Code of Regulations (CCR) Titles 17, 19, & 22
Dept. of Industrial Relations (CAL-OSHA)	State	California Occupational Safety & Health Act, CCR Title 8
State Water Resources Control Board & Regional Water Quality Control Board	State	Porter-Cologne Water Quality Control Act Underground Storage Tank Law
Health & Welfare Agency	State	Safe Drinking Water & Toxic Enforcement Act
Air Resources Board & Air Pollution Control District	State	Air Resources Act AB 1807 Air Toxics "Hot Spots" Information and Assessment Act
Office of Emergency Services	State	Hazardous Materials Release Response Plans/Inventory Law Acutely Hazardous Materials Law
Dept. of Fish and Game	State	Fish and Game Code
Dept. of Food and Agriculture	State	Food and Agriculture Code
State Fire Marshal	State	Uniform Fire Code, CCR Title 19
COUNTY / REGIONAL AGENCIES		
South Coast Air Quality Management District	South Coast Air Basin	Air Toxics "Hot Spots" Information and Assessment Act
San Bernardino County Fire Department of Hazardous Materials Division	County	Uniform Fire Code Hazardous Waste Control Statutes, H&S 25100 et. seq. Hazardous Materials Release Response Plans/Inventory Statutes, H&S 25500 et. seq. Acutely Hazardous Materials Regulations, CCR Titles 19, 22, & 23 San Bernardino County Code

Source: Urban Logic Consultants 1/98

4.10.2.3 Federal

Federal agencies that regulate hazardous and toxic materials include the EPA, the Occupational Safety and Health Administration (OSHA), the Nuclear Regulatory Commission (NRC), the U.S. Department of Transportation (DOT), and the National Institutes of Health (NIH). The following federal laws and guidelines govern hazardous materials. Hazardous materials handling and management associated with the proposed project must comply with applicable regulations as follows:

- Federal Water Pollution Control Act
- Clean Air Act
- Occupational Safety and Health Act
- Federal Insecticide, Fungicide, and Rodenticide Act
- Comprehensive Environmental Response, Compensation, and Liability Act
- Guidelines for Carcinogens and Biohazards
- Superfund Amendments and Reauthorization Act Title III
- Resource Conservation and Recovery Act
- Safe Drinking Water Act
- Toxic Substances Control Act

Until August 1992, the principal agency at the federal level regulating the generation, transport and disposal of hazardous waste was the EPA under the authority of the RCRA. However, effective August 1, 1992, the California Environmental Protection Agency (Cal-EPA) and the DTSC, was authorized to implement the State's hazardous waste management program in lieu of the EPA.

4.10.2.4 State

The Cal-EPA and the State Water Resources Control Board generally govern the use of hazardous materials and the management of hazardous waste. The California Highway Patrol (CHP) and the California Department of Transportation (Caltrans) enforce hazardous substance transportation regulations. Chemical suppliers must comply with all applicable packaging, labeling and shipping regulations.

Applicable state and local laws include the following:

- Public Safety/Fire Regulations/Building Codes
- Hazardous Waste Control Law
- Hazardous Substances Information and Training Act
- Hazardous Materials Release Response Plans and Inventory Act
- Porter-Cologne Water Quality Control Act
- Tanner Toxics Act

DTSC has primary regulatory responsibility for the management of hazardous materials/substances and the generation, transport and disposal of hazardous waste under the authority of the Hazardous Waste Control Law (HWCL). DTSC can delegate enforcement to local jurisdictions that enter into agreements with the State agency. State regulations applicable to hazardous materials are indexed agreements in Title 26 of the CCR.

4.10.2.5 Regional

The SCAQMD works with the CARB and is responsible for developing and implementing rules and regulations to control the emission of air toxics on a local level. The SCAQMD establishes permitting requirements, inspects emission sources, and enforces measures through educational programs and/or fines. The Santa Ana RWQCB controls the discharge of toxic materials in wastewater and from disposal facilities through the issuance of waste discharge requirements and NPDES permits under authority from the State Water Resources Control Board and the federal EPA.

4.10.2.6 Local

The San Bernardino County General Plan has a Hazardous Waste/Materials element which sets forth policies and actions that are meant to achieve the following goals:

- reduce the risks posed by the storage of hazardous materials in above ground tanks and containers;
- minimize the threat to residential areas from the use of hazardous materials;
- ensure that businesses locating within the County incorporate available risk management and waste minimization practices into their operations;
- minimize the risk of exposure to hazardous materials by residential and immobile populations; and
- ensure the safe transportation of hazardous materials and waste in and through San Bernardino County.

The San Bernardino County Fire Department (SBCFD) is responsible, on both the city and county level, for enforcing the State regulations governing hazardous waste generators, hazardous waste storage, and underground storage tanks, including inspections and enforcement. The SBCFD also regulates the use, storage, and disposal of hazardous materials in San Bernardino County by issuing permits, monitoring regulatory compliance, investigating complaints, and other enforcement activities. In addition to providing fire protection and emergency services to unincorporated areas of San Bernardino County, the SBCFD regulates the use and storage of hazardous materials for the County and provides emergency response in the event of accidental release of hazardous materials.

The SCCFD also administers the local Fire Code which incorporates articles of the Uniform Fire Code (UFC). The UFC is a model code setting construction standards for buildings and associated fixtures, in order to prevent or mitigate hazards resulting from fire or explosion. The SBCFD reviews technical aspects of hazardous waste site cleanups, and oversees remediation of certain contaminated sites resulting from leaking underground storage tanks. The SBCFD is also responsible for providing technical assistance to public and private entities which seek to minimize the generation of hazardous waste.

4.10.2.7 Hazardous Materials Transportation

Federal

The DOT has the regulatory responsibility for the safe transportation of hazardous materials between states and to foreign countries. DOT regulations govern all means of hazardous materials transportation (except for those packages shipped by mail, which are covered by the U.S. Postal Service regulations), including transportation by rail. DOT regulations are contained in the Code of Federal Regulations Title 49.

Under RCRA, the EPA sets standards for transporters of hazardous waste. In turn, the federal government authorized the State of California to carry out EPA regulations concerning transportation of hazardous wastes originating in, or passing through, the State.

State

The State of California has adopted regulations for the intrastate movement of hazardous materials. State regulations are indexed in the CCR Title 26.

The CHP has primary responsibility for enforcing federal and State regulations related to the transport of hazardous materials over streets and highways, including hazardous materials labeling and packaging regulations. The CHP also responds to hazardous materials transportation emergencies. The goal of these regulations is to prevent leakage and spills of material in transit and to provide detailed information to clean-up crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance.

Common carriers which transport hazardous materials on roadways are licensed by the CHP under conditions specified in CCR Title 26, Division 14.1 Transportation of Hazardous Material, Section 32000.5, License to Transport Hazardous Materials. This section requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time, and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous materials of the type requiring placards. If the supplier or distributor carries fewer than 1,000 pounds of material, a license is not required.

Interstates 10, 15 and 215 are designated explosives routes according to the CHP manual ***Explosive Routes and Stopping Places.***

4.10.2.8 Hazardous Materials Worker Safety Requirements

Federal

The Federal Occupational Safety and Health Administration (Fed/OSHA) is the agency responsible for ensuring worker safety. Fed/OSHA sets federal standards for implementation of training in the work place, exposure limits, and safety procedures in the handling of hazardous materials (as well as other hazards). Fed/OSHA also establishes criteria by which each state can implement its own health and safety program.

State

The California Department of Industrial Relations, Division of Occupational Safety and Health Administration (Cal/OSHA), assumes primary responsibility for developing and enforcing work place safety regulations within the State. Cal/OSHA standards are often more stringent than federal regulations.

Cal/OSHA regulations concerning the management of hazardous materials include requirements for safety training, availability of safety equipment, hazardous materials exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces the hazard communication program regulations, which include provisions for identifying and labeling hazardous materials, providing employees with Material Safety Data Sheets (MSDSs), describing the hazards of chemicals, and documenting employee training programs.

Both federal and state laws include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. The training, must include safe methods for handling hazardous materials, an explanation of MSDSs, use of emergency response equipment, and building emergency response plans and procedures.

4.10.2.9 Potentially Contaminated Areas Within the Chino Basin

As part of the OBMP's State of the Basin assessment, those wells and locations with contaminants at high enough levels to be of concern were identified. The discussion of the locations with existing concentrations of contaminant pollution from man-made sources is discussed in this section of the PEIR, rather than the Water Resource and Water Quality (Subchapter 4.5). Human activities over the past 100+ years have cause a variety of contamination within the Chino Basin. Most of the organic contaminants and several other pollution plumes that occur within the Basin were caused by industrial activities and related population growth that began with World War II and continues through the present. The information from the OBMP is presented below with minor editing as appropriate.

Table 4.10-2 summarizes the inorganic and organic constituents that have been detected in groundwater samples from wells in the Chino Basin through July 1998. The data collection methodology and sources of data are described in detail in the OBMP, Page 2-22, but based on the total picture of contamination provided in Table 4.10-1, the contamination data represent the most comprehensive data base available to date. These data are represented in maps of the Chino Basin that illustrate the locations where the concentration of contaminants has been detected at 1/2 or above the established maximum contaminant levels. Wells with constituent concentrations greater than one-half the MCL represent areas that warrant concern and inclusion in a long-term monitoring program. Groundwater in the vicinity of wells with samples greater than the MCL may be impaired from a beneficial use standpoint.

Perchlorate

Perchlorate has recently been detected in several wells in the Chino Basin (Figure 4.10-1), in other basins in California and other states in the West. The probable reason that perchlorate was not detected in groundwater until recently is that analytical methodologies did not previously exist that could attain a low enough detection limit. Prior to 1996, the method detection limit for perchlorate was 400 µg/L. By March 1997, an ion chromatographic method was developed with a detection limit of one µg/L and a reporting limit of 4 µg/L.

Perchlorate (ClO4-) originates as a contaminant in the environment from the solid salts of ammonium perchlorate (NH4ClO4), potassium perchlorate (KClO4), or sodium perchlorate (NaClO4). The perchlorate salts are quite soluble in water. The perchlorate anion (ClO4-) is exceedingly mobile in soil and groundwater environments. It can persist for many decades under typical groundwater and surface water conditions, because of its resistance to react with other available constituents. Since perchlorate is chemically stable in the environment, natural chemical reduction in the environment is not expected to be significant.

At very high levels, perchlorate interferes with the function of the thyroid gland and the production of hormones necessary for normal human development. In the extreme cases, it can cause brain damage in fetuses and a potentially fatal form of anemia in adults. However, effects of chronic exposures to lower levels currently detected in groundwater are not known.

Table 4.10-2
CONSTITUENTS DETECTED AT OR GREATER THAN THEIR MCLs

Constituents	Observations At or Above 1/2* MCL	Wells with Observations At or Above 1/2* MCL	Observations At or Above MCL	Wells with Observations At or Above MCL	MCL
Inorganic Constituents					
Aluminum	2	2	0	0	1 mg/L
Arsenic	8	1	0	0	0.05 mg/L
Beryllium	7	5	2	1	0.004 mg/L
Boron	122	47	48	19	1 mg/L
Cadmium	17	8	5	4	0.005 mg/L
Chromium	16	10	7	5	0.05 mg/L
Copper	1	1	0	0	1 mg/L
Fluoride	302	51	160	30	2 mg/L
Iron	104	48	54	28	0.3 mg/L
Lead	62	25	24	14	0.015 mg/L
Manganese	317	45	285	24	0.05 mg/L
Mercury	4	3	2	2	0.002 mg/L
Nickel	2	2	0	0	0.1 mg/L
Nitrate (as N)	4,165	513	2,053	322	10 mg/L
Perchlorate	7	4	1	1	0.018 mg/L
Selenium	3	1	3	1	0.05 mg/L
Silver	1	1	1	1	0.1 mg/L
Total Dissolved Solids (TDS)[a]	2,978	522	1,077	219	500 mg/L
Total Dissolved Solids (TDS)[b]	1,077	219	119	44	1,000 mg/L
Zinc	1	1	0	0	5 mg/L
Radioactivity					
Gross Alpha Particle Activity	39	16	11	7	15 pCi/L
Uranium	5	3	0	0	20 pCi/L
Volatile Organic Chemicals					
1,1-Dichloroethane	34	7	22	7	0.005 mg/L
1,1-Dichloroethylene	497	18	355	13	0.006 mg/L
1,2-Dichloroethane	134	77	122	76	0.0005 mg/L
1,2-Dichloropropane	1	1	0	0	0.005 mg/L
1,4-Dichlorobenzene	3	2	2	1	0.005 mg/L
Benzene	155	89	43	23	0.001 mg/L
Carbon Tetrachloride	1	1	1	1	0.0005 mg/L
cis-1,2-Dichloroethylene	9	3	4	1	0.006 mg/L
Phenol	6	2	5	2	0.005 mg/L
Tetrachloroethene (PCE)	521	59	198	54	0.005 mg/L
Trichloroethene (TCE)	1,022	85	699	74	0.005 mg/L
Vinyl chloride	154	81	136	79	0.0005 mg/L
Semi-Volatile Organic Chemical					
Di(2-Ethlhexyl)Phthalate	25	10	25	10	0.004 mg/L
Pesticides/Herbicides					
Dibromochloropropane (DBCP)	1,068	45	758	41	0.0002 mg/L
Ethylene Dibromide (EDB)	3	3	1	1	0.00005 mg/L
Lindane (gamma-BHC)	61	46	20	15	0.0002 mg/L
Aesthetic Standards					
Foaming Agents (MBAS)	41	22	37	19	0.5 mg/L

(a) Recommended Secondary MCL Range of 500 mg/L
(b) Upper Secondary MCL Range of 1,000 mg/L

Ammonium perchlorate is manufactured for use as an oxygenating component in solid propellant for rockets, missiles, and fireworks. Because of its limited shelf life, inventories of ammonium perchlorate must be periodically replaced with a fresh supply. Thus, large volumes of the compound have been disposed of since the 1950s in Nevada, California, Utah, and likely other states. While ammonium perchlorate is also used in certain munitions, fireworks, the manufacture of matches, and in analytical chemistry, perchlorate manufacturers estimate that about 90 percent of the substance is used for solid rocket fuel

Perchlorate is of concern because of the existing uncertainties in: the toxicological database documenting its health effects at low levels in drinking water; the actual extent of the occurrence of perchlorate in ground and surface waters, which is compounded by some uncertainty in the validation of the analytical detection method; the efficacy of different treatment technologies for various water uses such as drinking water or agricultural application; and the extent and nature of ecological impact or transport and transformation phenomena in various environmental media.

The requisite toxicology data available to evaluate the potential health effects of perchlorate are extremely limited. The U.S. Environmental Protection Agency (EPA) Superfund Technical Support Center issued a provisional reference dose (RfD) in 1992 and a revised provisional RfD in 1995. Standard assumptions for ingestion rate and body weight were then applied to the RfD to calculate the reported range in the groundwater cleanup guidance levels of 4 to 18 (µg/L). In 1997, the DHS and California EPA's Office of Environmental Health Hazard Assessment reviewed the EPA risk assessment reports for perchlorate. Consequently, California established its provisional action level of 18 µg/L. On August 1, 1997, DHS informed drinking water utilities of its intention to develop a regulation to require monitoring for perchlorate as an unregulated chemical. Legislative action to establish a state drinking water standard for perchlorate has been introduced but has not been brought to a vote (CA Senate Bill 1033).

Volatile Organic Compounds

Six volatile organic chemicals (VOCs) were detected at or above their MCL in more than 10 wells: 1,1-dichloroethene; 1,2-dichloroethane; benzene; tetrachloroethene (PCE); trichloroethene (TCE); and vinyl chloride.

TCE and PCE were/are widely used industrial solvents. TCE was commonly used for metal degreasing and was also used as a food extractant. PCE is commonly used in the dry-cleaning industry. About 80 percent of all dry cleaners used PCE as their primary cleaning agent (Oak Ridge National Laboratory, 1989). The areal distributions of PCE and TCE are shown in Figures 4.10-2 and 4.10-3. 1,1-Dichloroethane, 1,1-Dichloroethene, cis-1, 2-dichloroethene, 1,2-dichloroethane, and vinyl chloride are degradation by-products of PCE and TCE and their areal distributions are shown in Figures 4.10-4 though 4.10-8.

The spatial distributions of TCE and PCE appear to be correlatable to identified point sources in the Chino Basin (see the following discussion and Figure 4.10-12.) The areal distributions of 1,2-dichloroethane and vinyl chloride appear to be more extensive than can be attributed to the point sources. 1,2-Dichloroethane is used as a lead-scavenging agent in gasoline (Oak Ridge National Laboratories, 1989) and the greater areal distribution of 1,2-dichloroethane and vinyl chloride may reflect numerous minor releases from gasoline stations, automobile service stations, et cetera. This hypothesis appears to be corroborated, in part, by the distribution of benzene, which is a minor contaminant in gasoline (see Figure 4.10-9). Gasoline used in the United States contains between 0.8 and 2 percent benzene (Oak Ridge National Laboratories, 1989).

Two pesticides/herbicides were detected at or above their MCL in more than 10 wells: dibromochloropropane (DBCP); and lindane. DBCP was used as a fumigant for citrus, other orchards and some field crops prior to being banned in 1987. The areal distribution of DBCP appears to be related to historical citrus crop production in Chino Basin (see Figures 4.10-10). Lindane is used as an insecticide on foliar plants and fruit and vegetable crops; its areal distribution is shown in Figure 4.10-11.

Point Sources of Concern

The previous discussion discussed man-made groundwater contamination conditions broadly across the entire basin. The discussion presented below describes the point source contamination anomalies associated with known point source discharges to groundwater. Figure 4.10-12 shows the location of various point sources and areas of water quality degradation associated with these sources. Each point source of contamination is described in the following text.

Chino Airport. The Chino Airport is located approximately four miles east of the City of Chino downtown area and six miles southwest of Ontario International Airport, and occupies an area of about 895 acres. From the early 1940s until 1948, the airport was owned by the federal government and used for flight training and aircraft storage. The County of San Bernardino acquired the airport in 1948 and has operated and/or leased portions of the facility ever since. Since 1948, past and present businesses and activities at the airport include modification of military aircraft, crop dusting, aircraft-engine repair, aircraft painting, stripping and washing, dispensing of fire-retardant chemicals to fight forest fires, and general aircraft maintenance. The use of organic solvents for various manufacturing and industrial purposes has been widespread throughout the airport's history (Regional Board, 1990). From 1986 to 1988, a number of groundwater quality investigations were performed in the vicinity of Chino Airport. Analytical results from groundwater sampling revealed the presence of VOCs above MCLs in six wells downgradient of Chino Airport. The most common VOC detected above its MCL is TCE. TCE concentrations in the contaminated wells ranged from 6.0 to 75.0 μg/L. Figure 4.10-12 shows the approximate areal extent of TCE in groundwater in the vicinity of Chino Airport at concentrations exceeding its MCL as of 1990. The plume is elongate in shape, about 2,200 feet wide and extends approximately 8,000 feet from the airport's northern boundary in a south to southwestern direction.

California Institute for Men. The California Institute for Men (CIM) located in Chino is bounded on the north by Edison Avenue, on the east by Euclid Avenue, on the south by Kimball Avenue and on the west by Central Avenue. CIM is a state correctional facility and has been in existence since 1939. It occupies approximately 2,600 acres – about 2,000 acres are used for dairy and agricultural uses and about 600 acres are used for housing inmates and related support activities (Geomatrix Consultants, 1996). In 1990, PCE was detected at a concentration of 26 µg/L in a sample of water collected from a CIM drinking water supply well. Analytical results from groundwater sampling indicate that the most common VOCs detected in groundwater underlying CIM are PCE and TCE. Other VOCs detected include carbon tetrachloride, chloroform, 1,2-dichloroethene, bromodichloromethane, 1,1,1-trichloroethane, and toluene. The maximum PCE concentration in groundwater detected at an individual monitoring well (GWS-12) was 290 µg/L. The maximum TCE concentration in groundwater detected at an individual monitoring well (MW-6) was 160 µg/L (Geomatrix Consultants, 1996). Figure 4.10-12 shows the approximate areal extent of VOCs in groundwater at concentrations exceeding MCLs as of May 1996. The plume is approximately 1,000 feet wide and extends about 3,600 feet southwest.

General Electric Flatiron Facility. The General Electric Flatiron Facility (Flatiron Facility) occupied a site at 234 East Main Street, Ontario, California from the early 1900s to 1982. Its operations consisted primarily of the manufacturing of clothes irons. Currently, the site is occupied by an industrial park. The Regional Board issued an investigative order to General Electric in 1987 after an inactive well in the City of Ontario was found to contain TCE and chromium above drinking water standards. Analytical results from groundwater sampling indicated that VOCs and total dissolved chromium were the major groundwater contaminants. The most common VOC detected at levels significantly above its MCL is TCE, which reached a measured maximum concentration of 3,700 µg/L. Other VOCs periodically detected, but commonly below MCLs, include PCE, toluene, and total xylenes, (Geomatrix Consultants, 1997). Figure 4.10-12 shows the approximate areal extent of TCE in groundwater at concentrations exceeding MCLs, as of November 1997. The plume is approximately 3,000 feet wide and extends about 8,400 feet south-southwest (hydraulically downgradient) from the southern border of the site.

General Electric Test Cell Facility. The General Electric Company's Engine Maintenance Center Test Cell Facility (Test Cell Facility) is located at 1923 East Avion, Ontario, California. Primary operations at the Test Cell Facility include the testing and maintenance of aircraft engines. A soil and groundwater investigation, followed by a subsequent quarterly groundwater-monitoring program, began in 1991 (Dames & Moore, 1996). The results of these investigations showed that VOCs exist in the soil and groundwater beneath the Test Cell Facility and that the released VOCs have migrated off site. Analytical results from subsequent investigations indicate that the most common and abundant VOC detected in groundwater is TCE. Other VOCs detected include PCE, cis-1,2-dichloroethene, 1,2-dicholoropropane, 1,1-dichloroethene, 1,1-dichloroethane, benzene, toluene and xylenes, among others. The historical maximum TCE concentration measured at an on-site monitoring well (directly beneath the Test Cell Facility) is 1,240 µg/L. The historical maximum TCE concentration measured at an off-site monitoring well (downgradient) is 190 µg/L (BDM

International, 1997). Figure 4.10-12 shows the areal extent of VOC contamination exceeding federal MCLs as of March 1997. The plume is elongate in shape, about 1,000 to 1,200 feet wide and extends approximately 8,000 feet from the Test Cell Facility in a southwesterly direction.

Kaiser Steel Fontana Steel Site. Between 1943 and 1983, Kaiser Steel Corporation (Kaiser), operated an integrated steel manufacturing facility in Fontana. During the first 30 years of the facility's operation (1945-1974), a portion of the Kaiser brine wastewater was discharged to surface impoundments and allowed to percolate into the soil. In the early 1970s, the surface impoundments were lined to eliminate percolation to groundwater (Wildermuth, 1991). In July of 1983, Kaiser initiated a groundwater investigation that revealed the presence of a plume of degraded groundwater under the facility. In August of 1987, the Regional Board issued Cleanup and Abatement Order Number 87-121, which required additional groundwater investigation and remediation activities. The results of these investigations showed that the major constituents of the release to groundwater were inorganic dissolved solids and low molecular weight organic compounds. Wells sampled during the groundwater investigations measured concentrations of total dissolved solids (TDS) ranging from 500-1,200 mg/L and concentrations of total organic carbon (TOC) ranging from 1 to 70 mg/L. Figure 4.10-12 shows the approximate areal extent of the TDS/TOC groundwater plume as of November 1991. The plume is approximately 3,000 feet wide and extends about 17,000 feet southwest. As of November 1991, the plume had migrated almost entirely off the Kaiser site.

Milliken Sanitary Landfill. The Milliken Sanitary Landfill (MSL) is a Class III Municipal Solid Waste Management Unit located near the intersections of Milliken Avenue and Mission Boulevard in the City of Ontario. The facility is owned by the County of San Bernardino and managed by the County's Waste System Division. The facility was opened in 1958 and continues to accept waste within an approximate 140-acre portion of the 196-acre permitted area (GeoLogic Associates, 1998). At the present time the facility is in the process of being closed. Groundwater monitoring at the MSL began in 1987 with five monitoring wells as part of a Solid Waste Assessment Test investigation (IT, 1989). The results of this investigation indicated that the MSL has released organic and inorganic compounds to the underlying groundwater. At the completion of an Evaluation Monitoring Program (EMP) investigation (GeoLogic Associates, 1998), a total of 29 monitoring wells were drilled to evaluate the nature and extent of groundwater impacts identified in the vicinity of the MSL. Analytical results from groundwater sampling indicate that VOCs are the major constituents of the release. The most common VOCs detected are TCE, PCE, and dichlorodifluoromethane. Other VOCs detected above MCLs include vinyl chloride, benzene, 1,1-dichloroethane, and 1,2-dichloropropane. The historical maximum total VOC concentration in an individual monitoring well is 159.6 μg/L (GeoLogic Associates, 1998). Figure 4.10-12 shows the approximate areal extent of VOCs in groundwater at concentrations exceeding MCLs as of April 1998. The plume is approximately 1,900 feet wide and extends about 2,000 feet south of the MSL's southern border (GeoLogic Associates, 1998).

Municipal Wastewater Disposal Ponds. Treated municipal wastewater has been disposed into ponds located near the current Inland Empire Utilities Agency (IEUA), at Regional Plant 1 (RP1), located in south Ontario, and the former Regional Plant 3 (RP3), located in south Fontana. The ponds located just east of RP1, commonly called the Cucamonga ponds, were used to dispose of untreated effluent collected by the Cucamonga County Water District (CCWD) and IEUA. RP3 and its disposal ponds are located on the southwest corner of Beech and Jurupa Avenues in the City of Fontana. Discharge to the Cucamonga ponds and the ponds of RP3 ceased between the early 1970s and the mid-1980s. The areas downgradient of these recharge ponds typically have elevated TDS and nitrate concentrations. The locations of these ponds are shown in Figure 4.10-12. Contaminant plumes emanating from these ponds have never been fully characterized.

Upland Sanitary Landfill. The closed and inactive Upland Sanitary Landfill (USL) is located on the site of a former gravel quarry at the southeastern corner of 15th Street and Campus Avenue in the City of Upland. The facility operated from 1950 to 1979 as an unlined Class II and Class III municipal solid waste disposal site. In 1982, USL was covered with a 10-inch thick, low permeability layer of sandy silt over the entire disposal site (GeoLogic Associates, 1997). Groundwater monitoring at the USL began in 1988 and now includes three on-site monitoring wells (an upgradient well, a cross-gradient well, and a downgradient well) (City of Upland, 1998). The results of groundwater monitoring indicate that USL has released organic and inorganic compounds to underlying groundwater (GeoLogic Associates, 1997). Groundwater samples from the downgradient monitoring well consistently contain higher concentrations of organic and inorganic compounds than samples from the upgradient and cross-gradient monitoring wells. Analytical results from groundwater sampling indicate that VOCs are the major constituents of the organic release. All three monitoring wells have shown detectable levels of VOCs. The most common VOCs detected above MCLs are dichlorodifluoromethane, PCE, TCE, and vinyl chloride. Other VOCs that have been periodically detected above MCLs include methylene chloride, cis-1,2 dichloroethene, 1,1-dichloroethane, and benzene. The 1990-95 average total VOC concentration in the downgradient monitoring well is 125 µg/L (GeoLogic Associates, 1997). Figure 4.10-12 shows the approximate areal extent of VOCs in groundwater at concentrations exceeding MCLs as of April 1998. However, the plume is defined only by the three on-site monitoring wells. The plume extent may be greater than is depicted on Figure 4.10-12.

National Priorities List Sites. Three facilities in, or directly tributary to, the Chino Basin are on the current National Priorities List (NPL) of Superfund sites: Stringfellow; Dodson Brothers; Pacific Polishing (Figure 4.10-12). Elevated levels of TCE and its degradation by-products have been detected in groundwater in the vicinity of the Dodson Brothers Superfund site.

TCE/PCE Anomaly – South of the Ontario Airport. A plume containing TCE and PCE exists south of the Ontario Airport. The plume extends from approximately State Route 60 on the north, Turner Avenue on the east to Schaeffer Avenue on the south and Vineyard Avenue on the west. Figure 4.10-12 shows the approximate areal extent of the plume. The plume appears to be approximately 6,000 feet wide and 9,000 feet long. The maximum reported TCE and PCE concentrations are 142 µg/L and 2 µg/L, respectively.

4.10.3 Project Impacts

Implementation of the OBMP has the potential to increase hazards and risk of upset from its construction activities, limited utilization of hazardous materials, and operation of production wells in support of the desalters. Anytime construction activities are carried out, a potential exists for accidental releases of hazardous or toxic materials, particularly petroleum products. Operation of desalters in support of the OBMP may also require utilization of hazardous materials as part of routine operations. In addition, recharging groundwater in the upper and middle portions of the Chino Basin and pumping groundwater in the lower portion of the Basin for treatment to remove dissolved salts all have the ability to cause the existing groundwater contamination described above to be spread over a greater area than would occur naturally. Finally, the recharge of recycled water (treated effluent) is managed very cautiously by the State Health Department to ensure that concentrations of recycled water do not exceed a certain percentage of water pumped for municipal purposes and to ensure that the recycled water has a minimum detention time of 6-months in the ground before it is utilized for municipal water supplies. The purpose is to minimize the risk from reusing the recycled water for potable water purposes. Each of these issues is discussed below.

4.10.3.1 Significance Criteria

In accordance with *CEQA Guidelines,* the effects of a project are evaluated to determine if they will result in a significant adverse impact on the environment. The criteria or standards, used to determine the significance of impacts may vary depending on the nature of the project. Impacts resulting from the implementation of the OBMP will be considered significant if they cause any of the following:

- Handling, production, disposal or treatment of hazardous materials that puts public health and safety at risk, including exposure of sensitive receptors to substantial pollutant concentrations or creation of unsafe conditions for workers or the general public.

- New hazards or additional human exposure to hazards will be created that cannot be managed so as not to pose a threat to the environment or people.

- Project-related activities increase the risk of upset (accidents) in a manner that exposes the Project Area population to greater health risks.

4.10.3.2 Discussion of Hazard and Risk of Upset Impacts

a. Will the project create a risk of accidental explosion or release of hazardous substances, including, but not limited to oil, pesticides, chemicals or radiation?

Inherent to the use of hazardous materials is the risk of an accidental release. Because of this risk, Federal, State and local agencies have established regulations to minimize the likelihood of such occurrences. During construction or maintenance activities in support of the OBMP and during operations at primary facilities, such as desalters, fuels, oils, solvents, and other petroleum materials classified as "hazardous" will be used to support these operations. Similarly, if chlorine for the desalter facilities is stored as chlorine gas in tanks on a desalter site, the potential exists for accidental releases of this disinfection chemical.

Mitigation measures designed to reduce, control or remediate potential accidental releases must be implemented to prevent the creation of new contaminated areas that may require remediation and to minimize exposure of humans to public health risks from accidental releases. Such measures are presented in the following section. These measures are provided to reduce the potential for such accidents to occur (use of best management practices to minimize potential for accidental releases); to immediately collect and store or remove the primary source of contamination, including soils; and to remediate any residual contamination to levels that do not exceed regulatory thresholds for use, generally unrestricted use, in the future. By implementing these measures potentially significant adverse environmental impacts from accidental releases associated with implementing the OBMP can be reduced to a non-significant level of impact.

b. Does the project have a possibility to interfere with an emergency response plan or emergency evacuation plan?

Major evacuation routes are located within the Chino Basin along major interstates, freeways and major north-south and east-west roads. The proposed project activities and facilities have no potential to permanently impact emergency evacuation plans or emergency response plans over the long-term. In the short-term, construction activities related to pipeline and other infrastructure system improvements located within existing road rights-of-way have a potential to interfere with such plans. Mitigation is identified below to ensure that roads under construction remain passable or that alternative routes are available both during daily construction and at the end of the day after construction is completed. These measures ensure that the proposed project will not significantly interfere with the existing emergency response plans or the emergency evacuation plans maintained by the local jurisdictions.

c. Will the project create any health hazards or potential health hazards?

There are several activities associated with implementation of the OBMP that have a potential, or a perception, of creating a potential health hazard. The first activity is chemical treatment of water produced by the desalters for direct domestic use. There are a variety of treatment systems that can meet the requirements for potable water supplies. Typically, chlorine is used to treat water to ensure that bacterial concentrations are eliminated. The current desalter utilizes chlorine for treatment. If chlorine gas in storage tanks is used, as opposed to other chlorine storage mechanisms, such as hypochlorite solution, then a potential exists for an acute health risk to occur if the chlorine gas is accidentally released. Technology, either in the form of alternative sources of chlorine or a totally different water treatment system (ultraviolet light or ozone), or through the construction of a secondary containment structure, can fully mitigate any potential significant public health risks from operating a water disinfection system. Measures are identified below which will ensure that treatment at desalters will not cause any significant health risk.

The second activity that poses a potential health risk is the recharge of recycled water to the groundwater aquifer in the Chino Basin. To minimize potential health risks from such addition of recycled water to the aquifer, the State Health Department requires a minimum 6-month detention time before the recycled water/natural groundwater mix can be extracted. Further, the maximum concentration of recycled water to natural groundwater that can be produced is 20 percent. In both cases the simple solution is to ensure that both criteria for protecting public health are met by either installing the recycled water recharge facilities at a location that will allow these criteria to be met, or by ensuring that any wells within the boundary of the 20 percent and 6-month recharge area will not be pumped for domestic purposes. Mitigation is identified below to ensure that these thresholds are protected and the recharge of recycled water can be carried out without causing any significant health risk.

No other OBMP activities have been identified as having any potential for causing significant health risks to the public.

d. Will the project cause exposure of people to existing sources of potential health hazards?

The activities and facilities that will be implemented if the OBMP is approved do not have any potential to directly expose people to existing sources of potential health hazards. Indirectly, recharging stormwater, State Project Water or recycled water has a potential to mobilize existing contaminated plumes of groundwater and potentially cause more rapid expansion of such plumes, artificially enlarge contaminated areas, mobilize contaminants in the vadose zone as water table rises, accelerate and redirect existing plumes (both known and unknown), and/or expose existing or future wells to contamination that could cause them to be removed from production. This potential impact can be fully mitigated in two ways. First, any wells exposed to expanding contaminated plumes can be closed and their volume of production replaced. Second, and more appropriate, is to conduct modeling for recharge plumes before approving a recharge site to determine if a specific recharge site and volume of recharge can cause adverse expansion of a contaminated plume. Any locations that would cause such an adverse impact will be avoided. It is also important to monitor the recharge plume and its interaction with any nearby contaminated plume. If an adverse impact is detected in the future, the recharge can be terminated and the potential impact can be gradually abated, assuming that the monitoring system provides sufficient warning. Further production at affected wells could be terminated or alternatively, treated to a quality suitable for municipal supply. With implementation of such measures the potential for exposing people to existing sources of potential health hazards can be reduced to a non-significant level.

e. Will the project increase fire hazards in wildland areas or in the Project Area?

The proposed project has no potential to increase fire hazards in wildland areas or in the Project Area. The proposed project is designed to enhance the existing water infrastructure systems in the Chino Basin, which is forecast to reduce fire hazards in the Project Area, not increase such hazards. Therefore, the proposed project is not forecast to adversely impact fire hazards within the Project Area. No mitigation is required.

4.10.4 Mitigation Measures

The following mitigation measures are recommended as conditions of project implementation:

4.10.1 For OBMP facilities that handle hazardous materials or generate hazardous waste the Business Plan prepared and submitted to the county or local city shall incorporate best management practices designed to minimize the potential for accidental release of such chemicals. The facility managers shall implement these measures to reduce the potential for accidental releases of hazardous materials or wastes.

4.10-2 The business plan shall assess the potential accidental release scenarios and identify the equipment and response capabilities required to provide immediate containment, control and collection of any released material. Adequate funding shall be provided to acquire the necessary equipment, train personnel in responses and to obtain sufficient resources to control and prevent the spread of any accidentally released hazardous or toxic materials.

4.10-3 For the storage of any acutely hazardous material at an OBMP facility, such as chlorine gas, modeling of pathways of release and potential exposure of the public to any released material shall be completed and specific measures, such as secondary containment, shall be implemented to ensure that sensitive receptors will not be exposed to significant health threats based on the toxic substance involved.

4.10-4 All contaminated material shall be delivered to a licensed treatment, disposal or recycling facility that has the appropriate systems to manage the contaminated material without significant impact on the environment.

4.10-5 Before determining that an area contaminated as a result of an accidental release is fully remediated, specific thresholds of acceptable clean-up shall be established and sufficient samples shall be taken within the contaminated area to verify that these clean-up thresholds have been met.

4.10-6 During construction activities within existing road rights-of-way or other easements where continuous access is required, a road operation management plan shall be prepared and implemented. At a minimum this plan shall define how to minimize the amount of time spent on construction activities; how to minimize disruption of vehicle and alternative modes of traffic at all times, but particularly during periods of high traffic volumes; adequate signage and other controls, including flagpersons, to ensure that traffic can flow adequately during construction; the identification of alternative routes that can meet the traffic flow requirements of a specific area, including communication (signs, webpages, etc.) with drivers and neighborhoods where construction activities will occur; and at the end of each construction day roadways shall be prepared for continued utilization without any significant roadway hazards remaining.

4.10-7 To the extent feasible, installation of pipelines or other construction activities in support of the OBMP shall not be located on major evacuation or emergency response routes within any communities in the Chino Basin. Where construction on such routes is necessary, local emergency response providers shall be contacted and emergency access and evacuation requirements shall be maintained at a level sufficient to meet their needs.

4.10-8 Where alternative treatment systems are available to reduce potential health risks at OBMP facilities, such alternatives shall be selected if they meet defined technical, logistical and economic requirements for operation of such facilities.

4.10-9 Prior to approving specific recycled water recharge facility locations and volumes, the extent of the aquifer area that would be removed from water production to meet potable water production requirements (6-month detention and 20% concentration in groundwater) shall be defined. If it conflicts with significant water production wells (existing or proposed), an alternative recharge location shall be selected, or wells will be closed and a new supply developed.

4.10-10 Hydrogeologic studies, including modeling, will be doen for each recharge site to define the recharge impacts on existing known contaminated plumes. If modeling demonstrates that the rate of contaminated plume expansion or secondary effects associated with such expansion will adversely impact groundwater or water production capabilities, the recharge facility shall be moved to an alternative location where such impacts will not occur or impacted production facilities will be replaced.

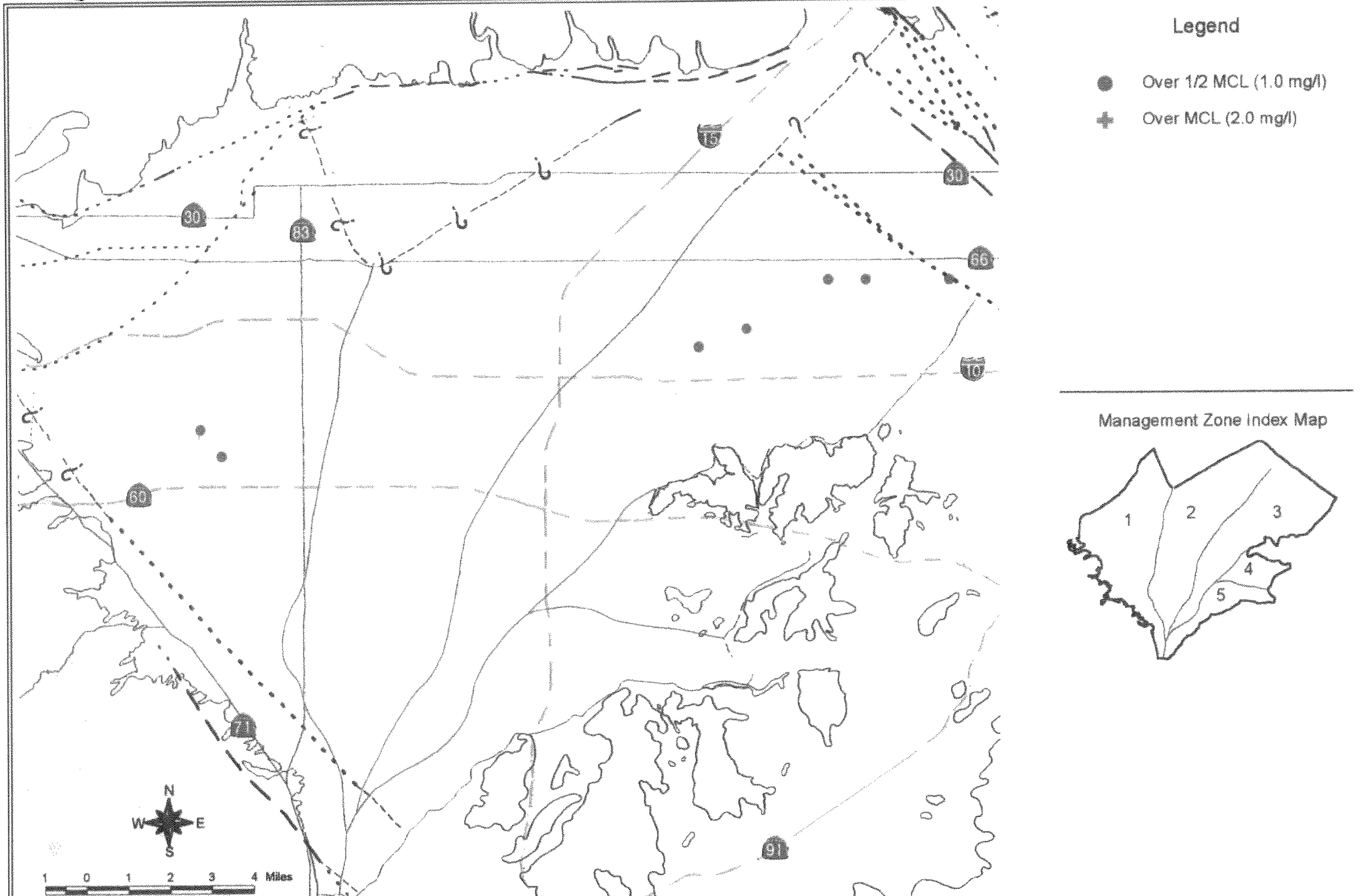
4.10-11 All recycled water recharge operations shall be monitored, and if impacts that were not forecast to occur demonstrate that the recharge operations are causing a significant adverse impact on the groundwater aquifer, the recycled recharge operations shall be terminated or modified to eliminate the adverse impact.

4.10.5 Unavoidable Adverse Impact

The hazards, risk of upset and human health evaluation presented above indicates that the proposed project has a potential to cause adverse health risk impacts from implementing OBMP facilities and activities. It is possible to control or avoid the potential these potential health risk impacts by implementing the identified mitigation measures. Therefore, no significant unavoidable adverse hazard, risk of upset or human health impacts are forecast to occur if the proposed project and identified mitigation is implemented.

4.10.6 Cumulative Impact

Hazards, risk of upset and human health impacts within the Project Area are not forecast to be cumulatively significant and adverse. Each accidental release is required to be managed in a fashion that will not leave any significant residual contamination that can contribute to increased public health risk. Therefore, the proposed project has no identified potential to significantly increase the risk of such impacts beyond current levels. The proposed project will not contribute to any new cumulative adverse impacts.



WELLS WITH ONE OR MORE HISTORICAL PERCHLORATE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-47

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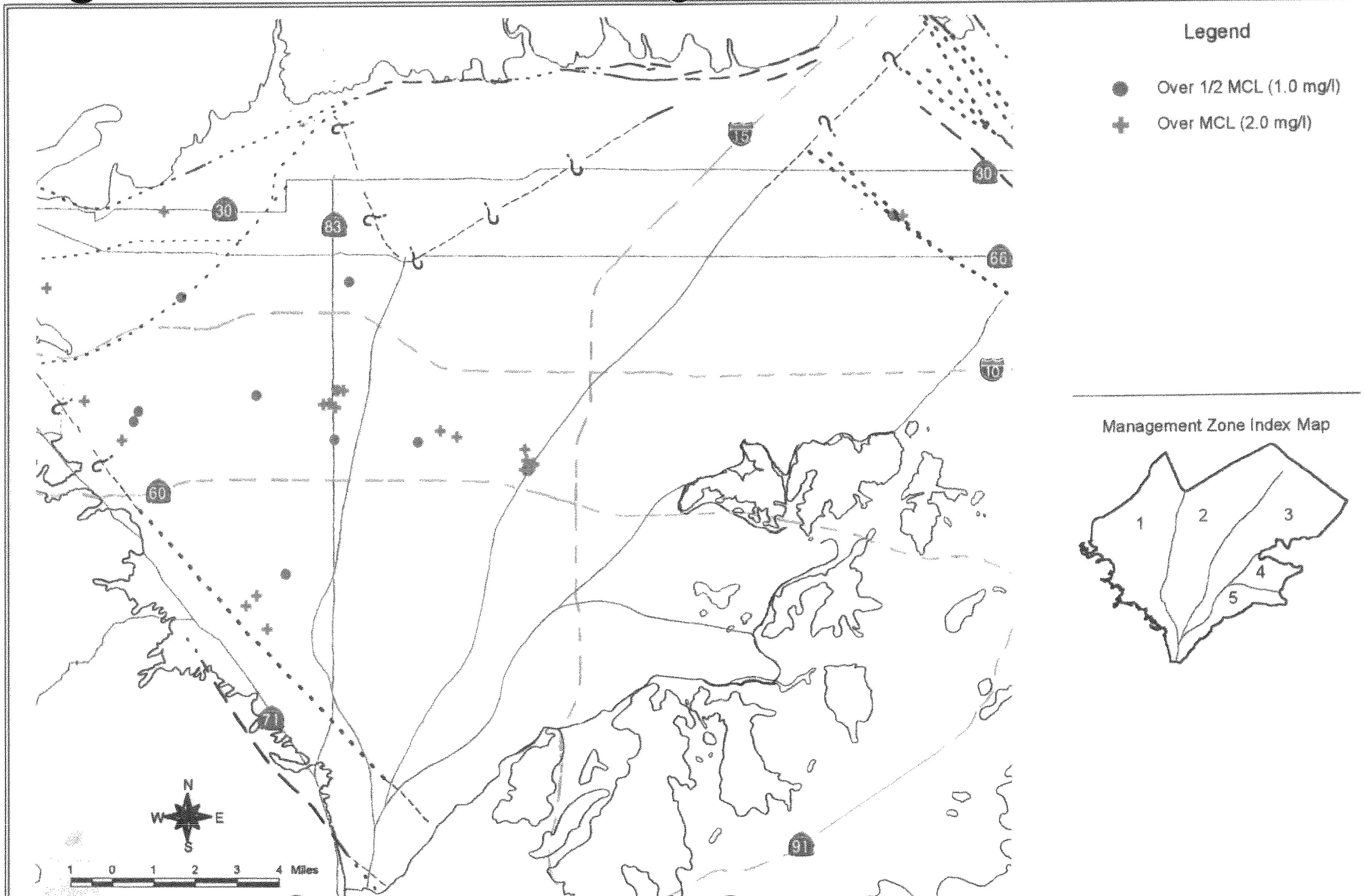
FIGURE 4.10-1



WELLS WITH ONE OR MORE HISTORICAL TETRACHLOROETHENE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-48

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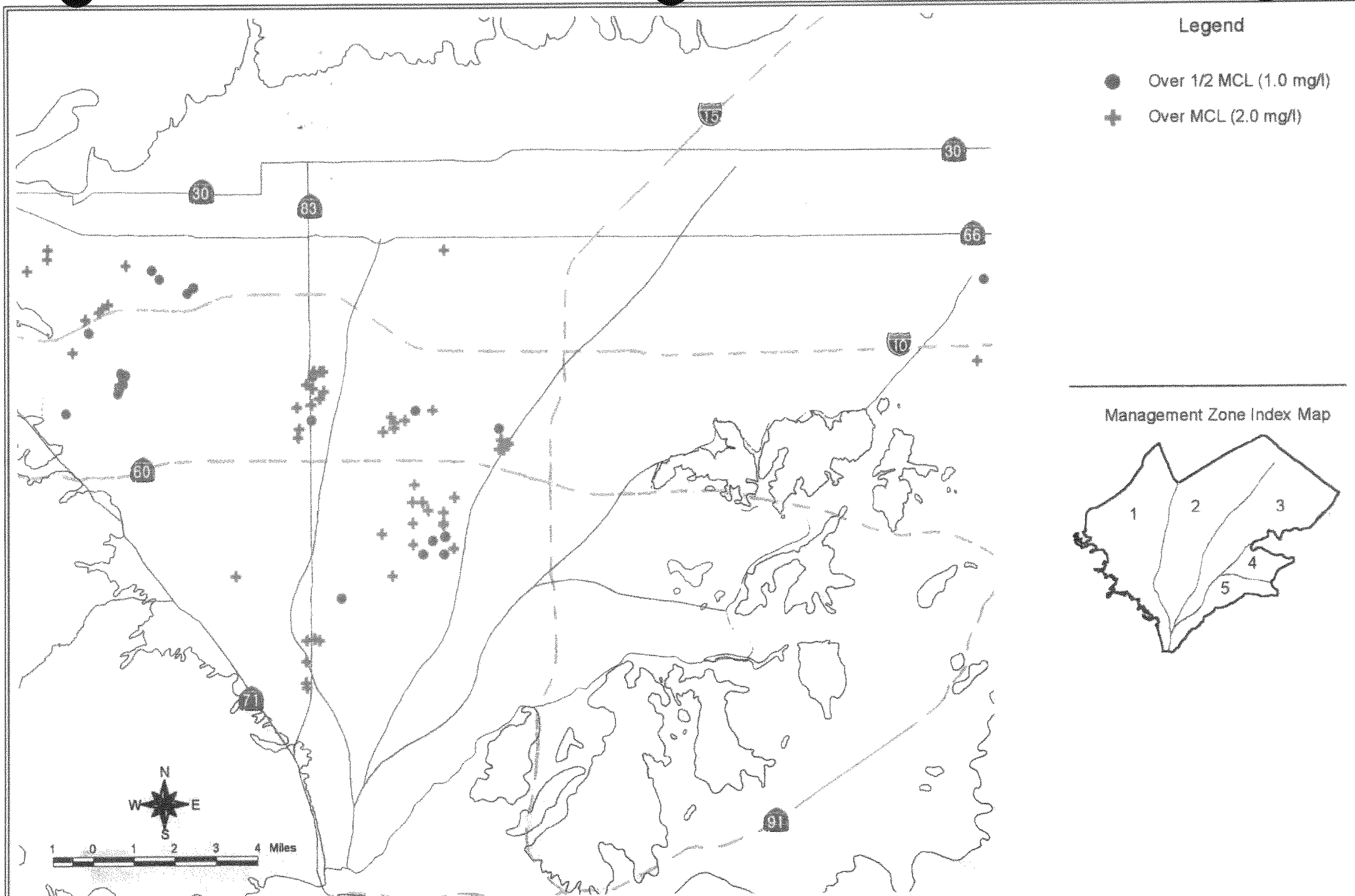
FIGURE 4.10-2



WELLS WITH ONE OR MORE HISTORICAL TRICHLOROETHENE VALUES ABOVE 1/2 THE EXISTING MCL

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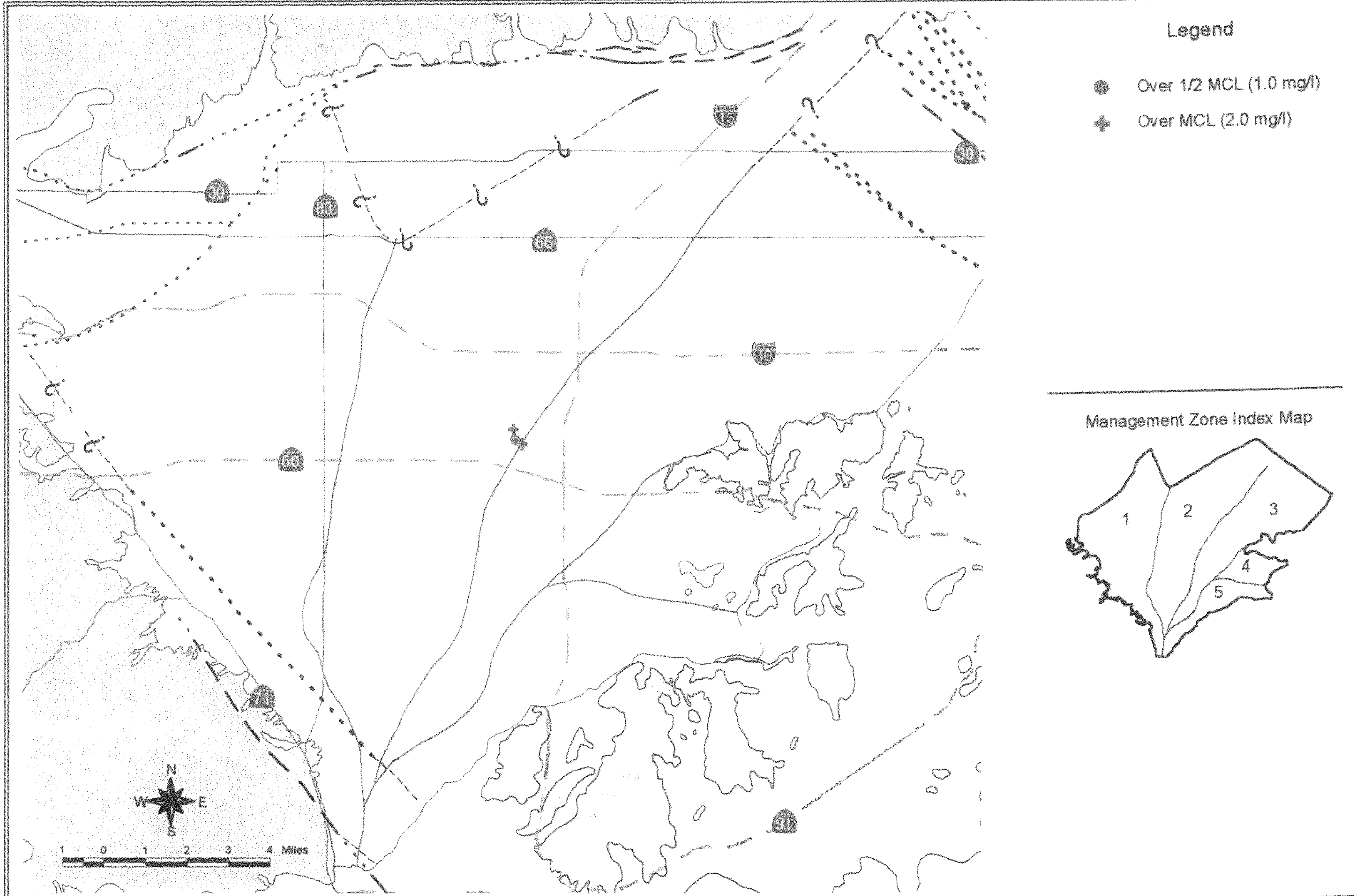
FIGURE 4.10-3

Source: OBMP Phase I Report, Figure 2-49



WELLS WITH ONE OR MORE HISTORICAL 1,1-DICHLOROETHANE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-50

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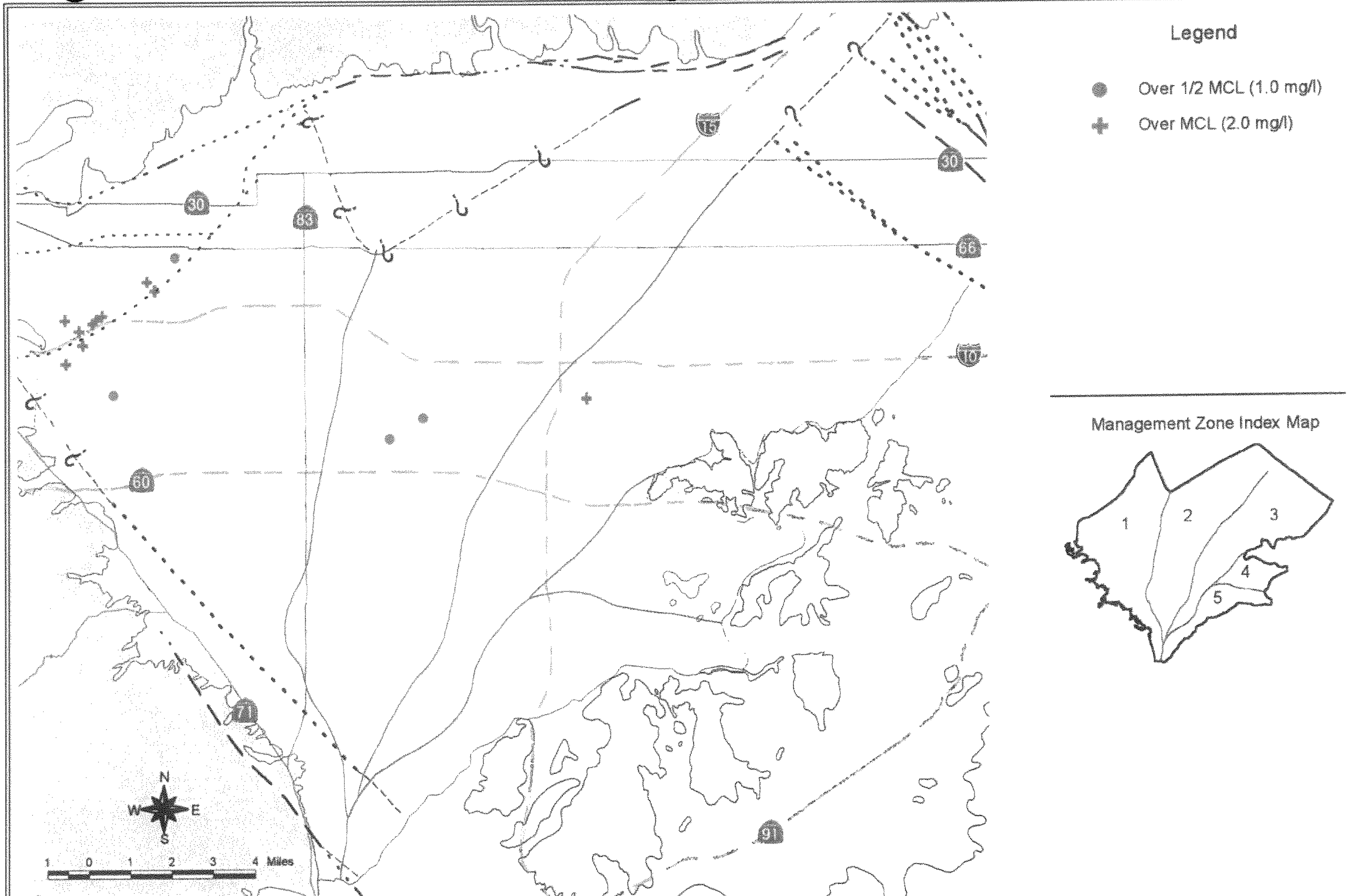
FIGURE 4.10-4



WELLS WITH ONE OR MORE HISTORICAL 1,1-DICHLOROETHENE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-51

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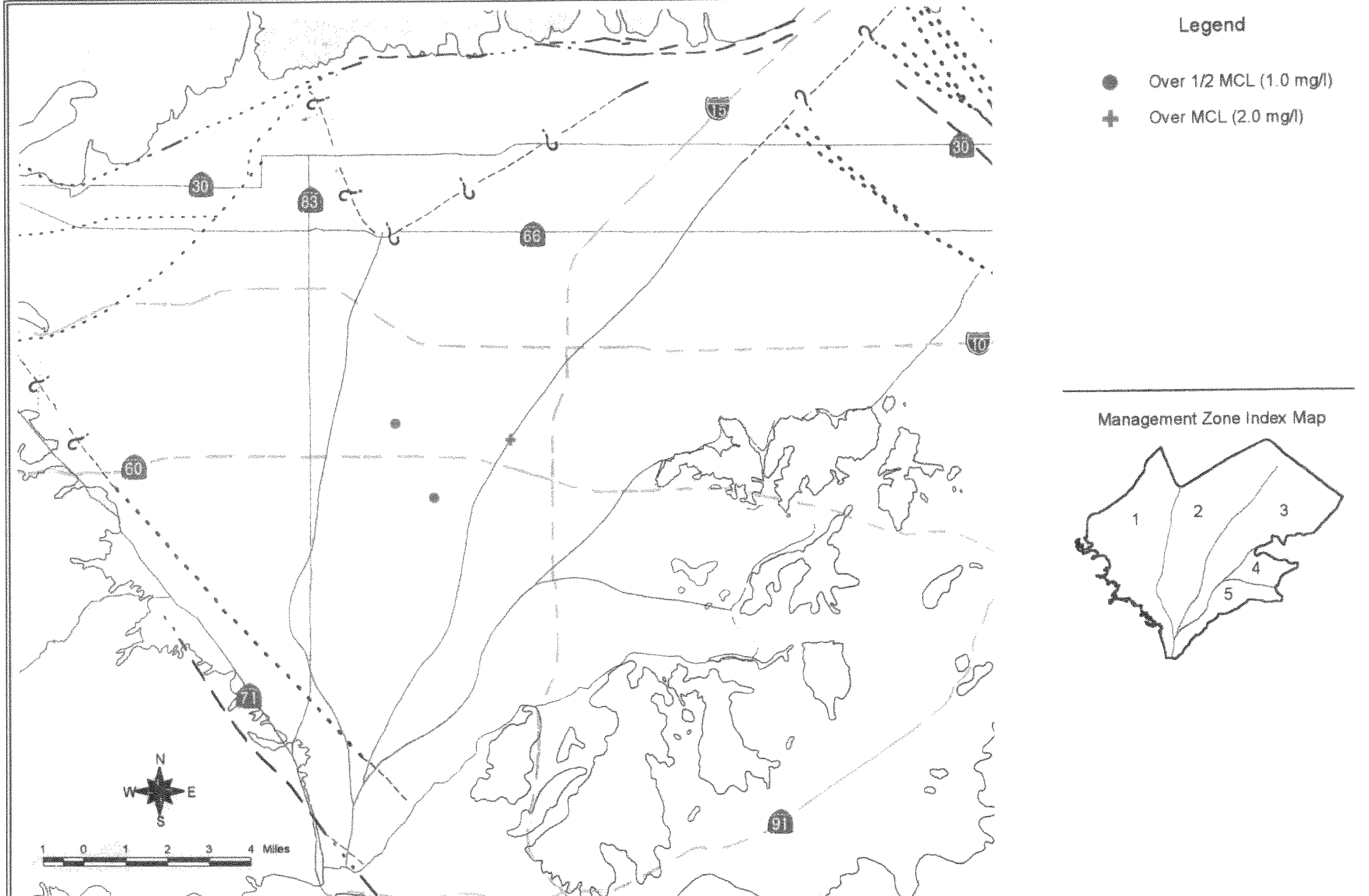
FIGURE 4.10-5



WELLS WITH ONE OR MORE HISTORICAL CIS-1,2-DICHLORO-ETHENE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-52

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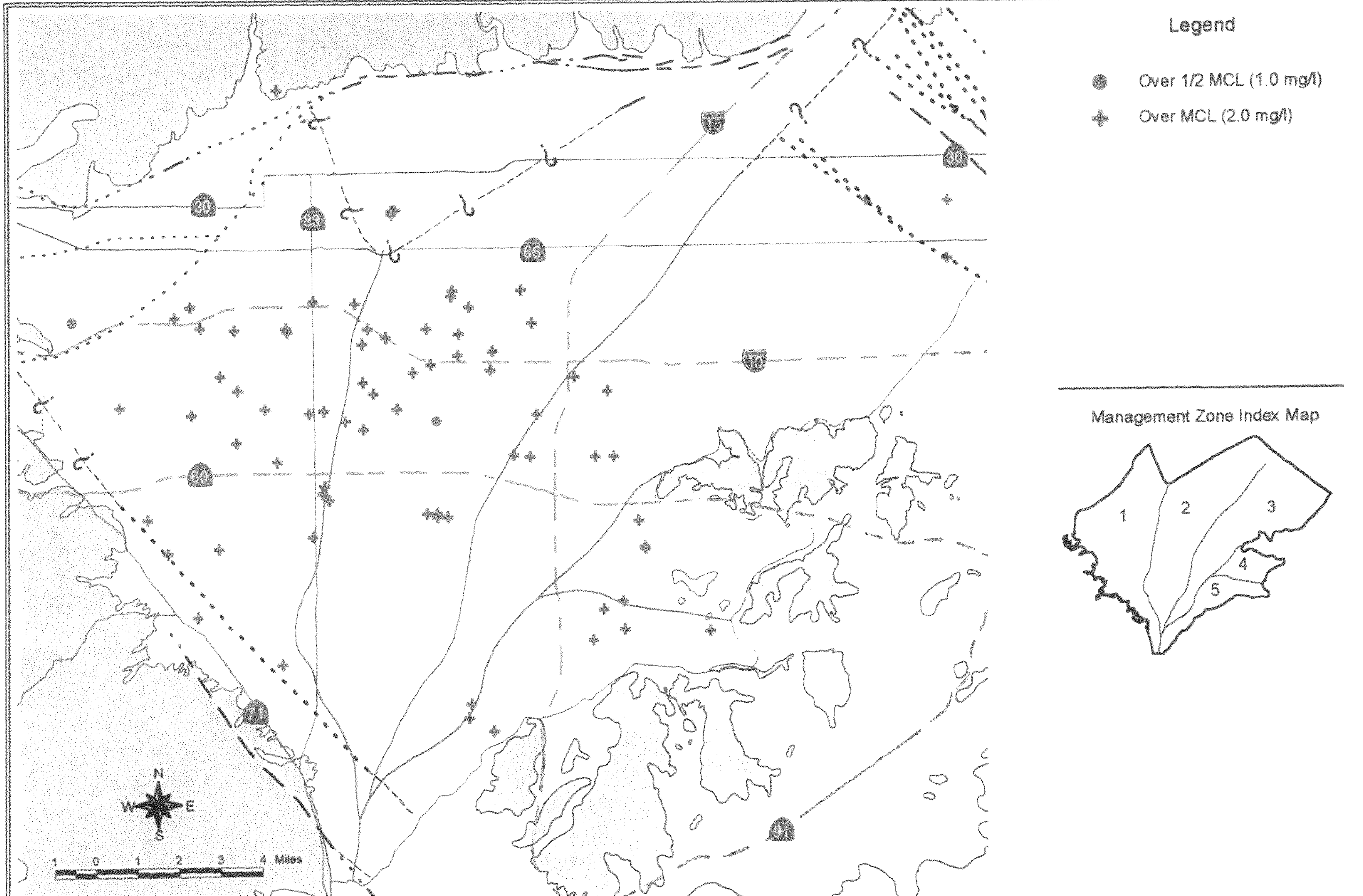
FIGURE 4.10-6



WELLS WITH ONE OR MORE HISTORICAL 1,2-DICHLOROETHANE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-53

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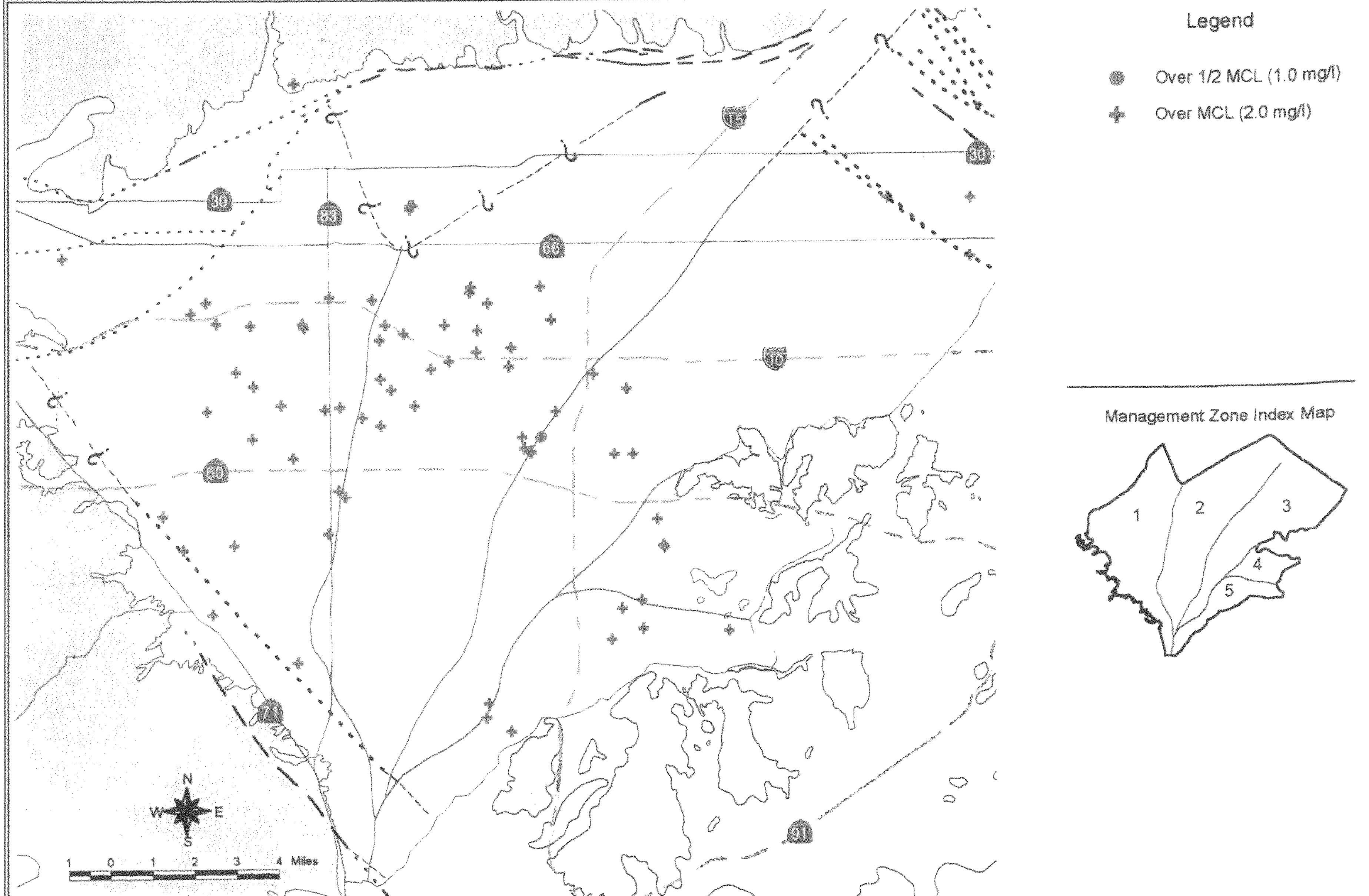
FIGURE 4.10-7



WELLS WITH ONE OR MORE HISTORICAL VINYL CHLORIDE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-54

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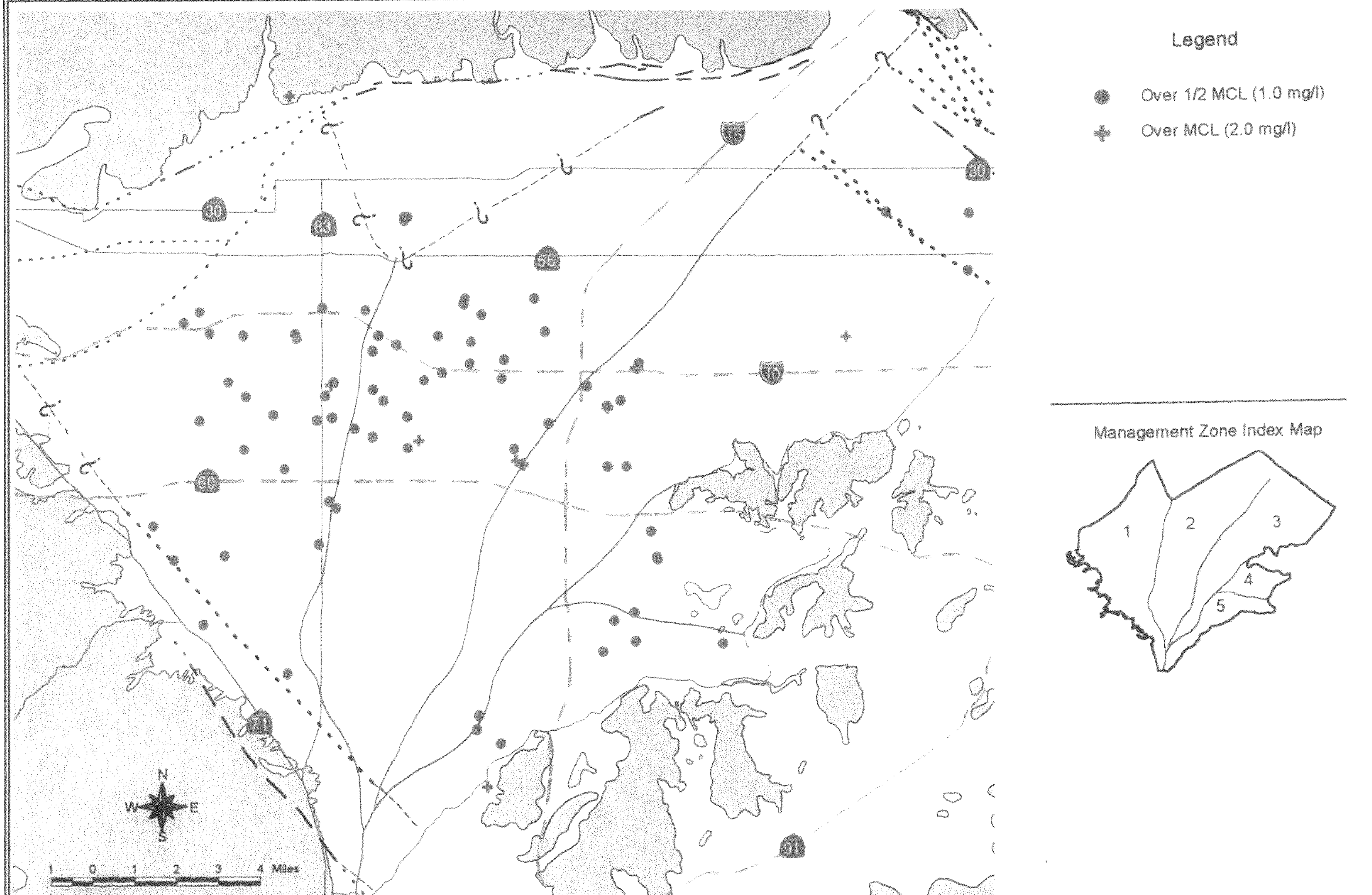
FIGURE 4.10-8



WELLS WITH ONE OR MORE HISTORICAL BENZENE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-55

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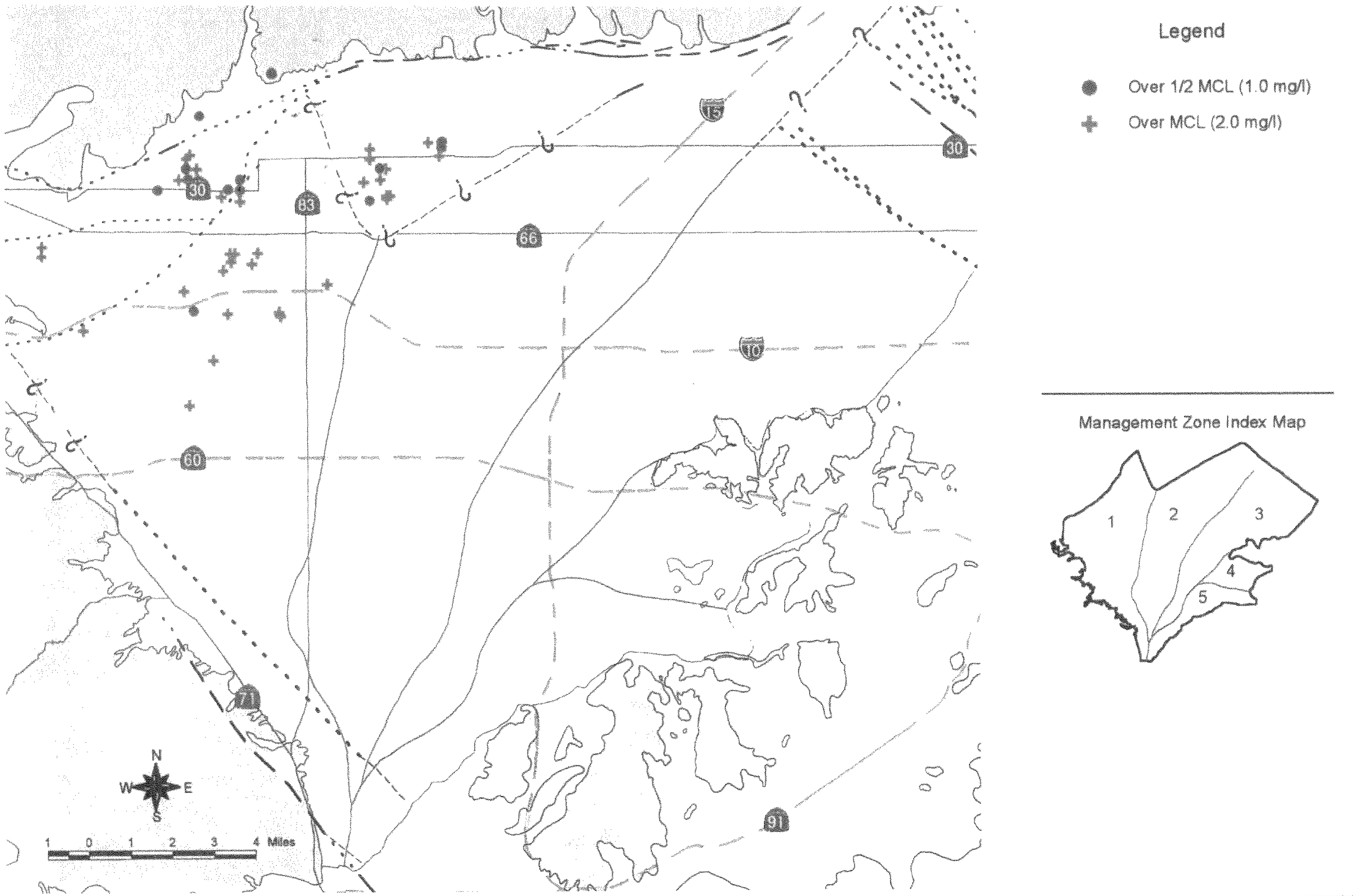
FIGURE 4.10-9



WELLS WITH ONE OR MORE HISTORICAL DIBROMOCHLORO-PROPANE VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-56

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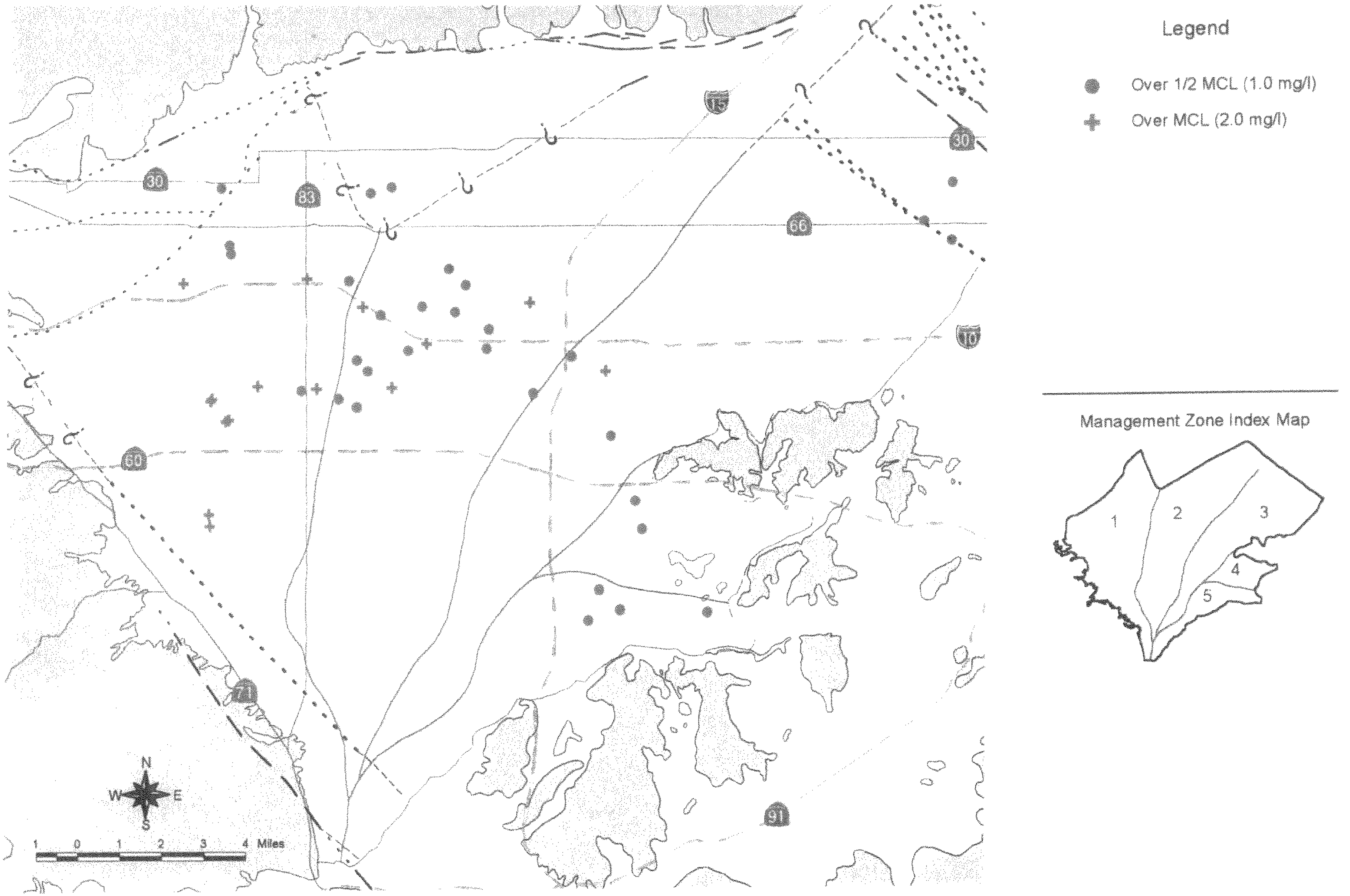
FIGURE 4.10-10



WELLS WITH ONE OR MORE HISTORICAL LINDANE VALUES VALUES ABOVE 1/2 THE EXISTING MCL

Source: OBMP Phase I Report, Figure 2-57

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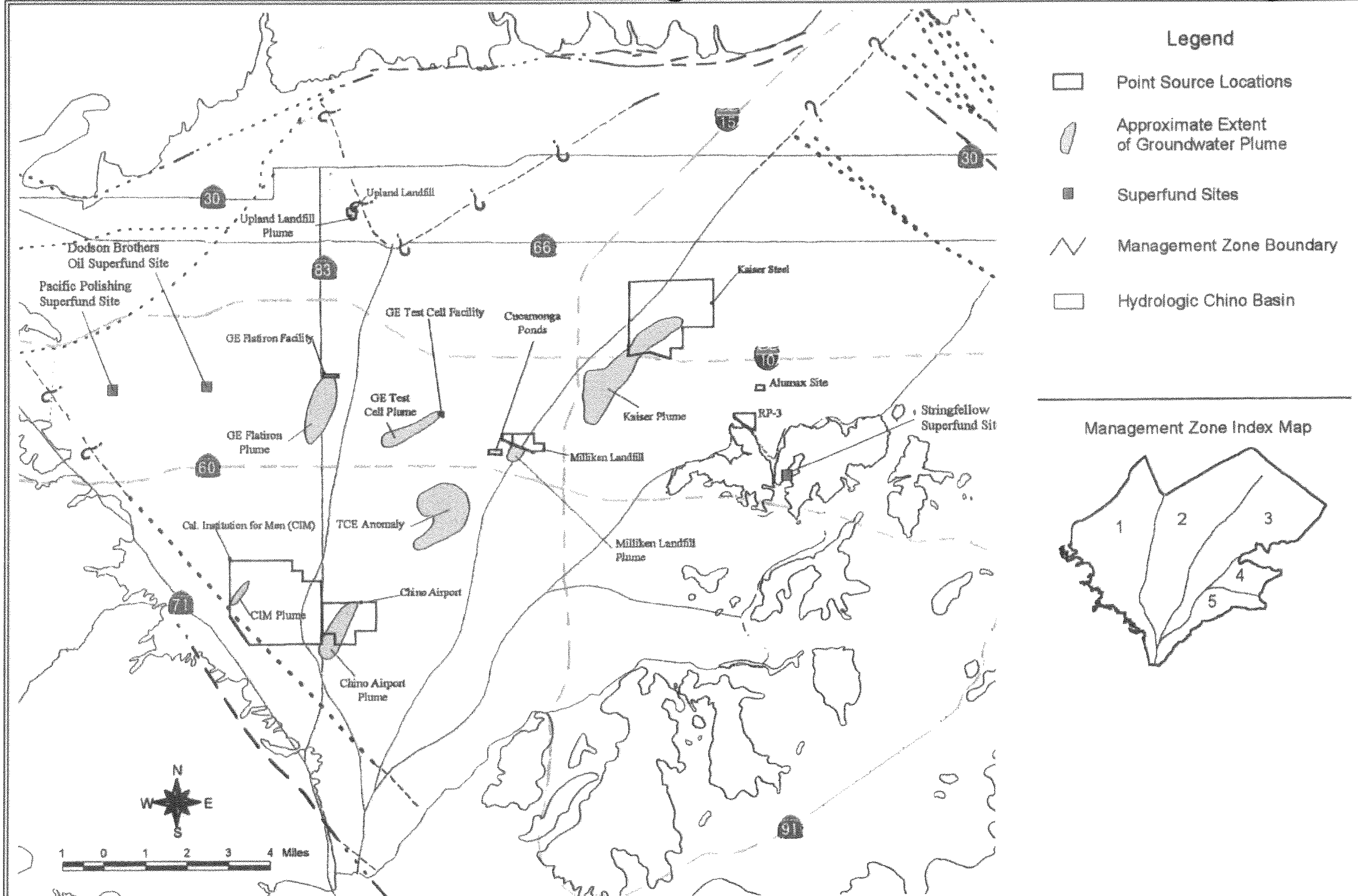
FIGURE 4.10-11



LOCATION OF KNOWN POINT SOURCES IN THE CHINO BASIN

Source: OBMP Phase I Report, Figure 2-58

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.10-12

4.11 NOISE

4.11.1 Introduction

The project's potential to affect the existing noise environment was included in this PEIR based on the increased level of noise generating activities associated with implementing the OBMP. Implementation of the proposed project could result in increased noise levels over both the short and long term. Short-term noise increases will be caused by construction activities and the long-term noise increases could be associated with facilities and activities operated in support of the OBMP, such as production well pumps, booster pumps and desalter operations. This subchapter relies extensively on the noise evaluations and data contained in the general plans of all the local jurisdictions within the Chino Basin and the related general plan EIRs. This evaluation focuses on the existing noise environment of the Chino Basin, particularly transportation related noise levels that occur in the area, and the potential impacts to this environment from implementing the OBMP. None of the responses to the NOP raised noise as an issue of concern, so the focus of the noise evaluation presented below is the project specific facilities and activities that may physically change the noise environment and the potential contribution of the OBMP to areawide growth on increases of noise in the future.

4.11.2 Environmental Setting

4.11.2.1 Noise Rating Terminology

A-weighted decibels (dBA, a measure of sound energy) are the most common units used for measuring the loudness of a noise source/event. The human ear has different sensitivity to different frequencies of sound (noise). A-weighting is an attempt to give the noise monitor the same frequency sensitivity as the human ear. Technically, it is the measurement of the energy being received when listening to (or monitoring) a source of noise. For example, the loudness of a highway may be 65 dBA when measured 50 feet away. The sound decreases (less energy is received by the ear) as one moves away from the source, and the same highway would have a noise level of about 62 dBA at 100 feet. The relationship between how one perceives a sound and the actual sound energy emitted by the source of noise is very complex. However, a good rule of thumb is that if a noise increases 10 dBA, its apparent loudness will double. Therefore, a noise that is 70 dBA will appear twice as loud as a 60 dBA noise.

A number of noise rating scales using A-weighted decibels are used in California for land use compatibility assessment and are described as follows:

- The Equivalent Noise Level (L_{eq}) scale represents the energy average noise level over a sample period of time. It represents the average decibel sound level that would contain the same amount of energy as a fluctuating sound level over the sample time period.

- The Day-Night Noise Level (L_{dn}) scale represents a time weighted 24-hour average noise level based on the A-weighted decibel scale. Time weighted refers to the fact that noise which occurs during certain sensitive time periods (such a the night) is penalized for occurring at these times. For the L_{dn} scale, the nighttime period (10 p.m. and 7 a.m.) noises are penalized by 10 dBA.

- The Community Noise Equivalent Level (CNEL) scale is similar to the L_{dn} scale except that it includes an additional 5 dBA penalty for the evening time period (7 p.m. to 10 p.m.). Both noise rating scales are used by the local jurisdictions and the State in evaluating transportation noise, including airports and roadways..

4.11.2.2 Noise Standards and Criteria

Noise rating scales, noise standards, community noise assessment criteria and noise mitigation measures are discussed below to provide a brief overview of how noise is evaluated and to explain the noise standards used in the Noise Elements Participating Jurisdiction's within the Project Area. This information is needed in order to understand the existing background noise conditions in the project area.

The CNEL scale is used as the criterion for assessing the compatibility of residential land uses with transportation-related noise sources by utilizing an interior and exterior noise standard. Typical noise standards within the local jurisdiction's general plans in the Chino Basin encourage interior noise standards of 45 dBA CNEL and an exterior standard of 60-65 dBA CNEL. The local jurisdictions use land use planning decisions relative to chronic noise exposure. An annual average noise level in excess of 60-65 dB CNEL is considered an excessive exterior exposure for most residential or other noise sensitive uses, unless mitigation is implemented to achieve this level where feasible. CNEL can be expressed as a daily average or as an annual average exposure to smooth out any day to day variations in noise generation.

Although CNEL is considered when using an annual average noise exposure such as along roadways or adjacent to airports, it is also calculated over a 24-hour period. Levels above 60-65 dB CNEL are considered intrusive for outdoor recreation, relaxation or normal conversation. Such intrusion could be considered an environmentally adverse impact even if no long-term noise incompatibility is created by the noise source. Environmental studies often use a change in the noise level by some given increment as a criterion for potential impact significance. A change of 3 dBA in noise from a semi-continuous source, such as a roadway, is often defined as a perceptible, but non-significant increase. Changes of 5 dBA are commonly designated as "clearly noticeable" and may be considered a significant change in the background noise level.

Sources of noise can be divided into transportation sources and non-transportation sources. The existing noise environment within the Chino Basin is dominated primarily by transportation-related noise sources. These noise sources include traffic noise from nearby roadways, from adjacent railroad lines and the several airports within the project area, including Cable Airport, Chino Airport, Ontario Airport, and Rialto Municipal Airport. Secondary non-transportation noise sources include industrial activity, mining, music, amplified sound and activities on private property. For example, existing industrial activity noise is audible around the California Steel Plant in Fontana in the vicinity of this site from normal operation. Regardless, the predominant noise sources are those transportation related activities.

4.11.2.3 Existing Noise Environment

Each city and county within the Chino Basin project area has adopted a general plan which by law must incorporate a Noise Element to define acceptable noise levels for specific types of land uses. A summary of existing noise (as depicted in each city's general plan), typical noise thresholds, and future noise levels is provided in the following text. These summaries will be compared relative to a single community's noise element in order to reduce the volume of text and supporting material that is needed to establish background noise levels throughout the project area. The City of Rialto Noise Element is presented to establish a baseline for consideration, because it includes

The primary background noise sources within the City of Rialto include vehicle traffic on roadways, aircraft operations at Rialto Municipal Airport and train traffic on the railroad tracks in the central and southern portions of the City. Table 4.11-1 provides an overview of different sound levels that could be encountered throughout the Chino Basin. Figure 4.11-1 provides a summary of the California Land Use/Noise Guidelines for exposure of specific land uses to community noise exposure. These exhibits provide background information on noise that can be used to evaluate noise impacts from future development.

Figure 4.11-2 illustrates the CNEL contours for existing roadways and railroad tracks and Table 4.11-2 provides an indication of the background noise associated with specific roadways, traffic volumes and vehicle speeds in the City of Rialto. Figure 4.11-3 illustrates the CNEL noise contours for aircraft operations at Rialto Municipal Airport in 1990. The Rialto Noise Element also includes forecasts of future noise levels which reflect the buildout of the community. Table 4.11-3 summarizes the changes in CNEL noise levels (dBA) relative to existing noise levels along roadways within the City. Note that many of the increases are absolutely significant (greater than 5 dB) and many of the roadways will have substantial additional area encompassed within the 60 and 65 dBA CNEL contours. Finally, Figure 4.11-4 shows the 2010 future airport operation contours. The area (acreage) impacted by noise contours from aircraft operations increases by only a small amount compared to roadway noise. This is because aircraft noise is being controlled and even though more operations will occur, the sound level of each operation is reduced so the area impacted remains relatively the same.

Table 4.11-1
TYPICAL A-WEIGHTED SOUND LEVELS

Sound Levels and Loudness of Illustrative Noises in Indoor and Outdoor Environments
(A-Scale Weighted Sound Levels)

db(A)	Overall Level (Sound Pressure Level ~0.0002 Microbar)	Community (Outdoor)	Home or Industry	Loudness (Human Judgment of Different Sound Levels)
130	Uncomfortably	Military jet aircraft takeoff with after-burner from aircraft carrier @ 50 ft. (130)	Oxygen torch (121)	120 dbA, 32 times as loud
120 110	Loud	Turbo-fan aircraft @ takeoff power @ 200 ft. (90)	Riveling machine (110) Rock-n-Roll band (108-114)	110 dbA, 16 times as loud
100	Very	Jet flyover @ 1,000 ft. (103) Boeing 707, DC-8 @ 6,080 ft. before landing (106) Bell J-2A helicopter @ 100 ft. (100)		100 dbA, 8 times as loud
90	Loud	Power mower (96) Boeing 737, DC-9 @ 6,080 ft. before landing (97) Motorcycle @ 25 ft. (90)	Newspaper press (97)	90 dbA, 4 times as loud
80		Car wash @ 20 ft. (89) Prop. airplane flyover @ 1,000 ft. (88) Diesel truck, 40 mph @ 50 ft. (84) Diesel train, 45 mph @ 100 ft. (83)	Food blender (88) Milling machine (85) Garbage disposal (80)	80 dbA, 2 times as loud
70	Moderately Loud	High urban ambient sound (80) Passenger car, 65 mph @ 25 ft. (77) Freeway @ 50 ft. from pavement edge, 10:00 a.m. (76 + or -6)	Living room music (76) TV-audio, vacuum cleaner	70 dbA
60		Air conditioning unit @ 100 ft. (60)	Cash register @ 10 ft. (65-70) Electric typewriter @ 10 ft. (64) Dishwasher (rinse) @ 10 ft. (60) Conversation (60)	60 dbA, 1/2 as loud
50	Quiet	Large transformers @ 100 ft. (50)		50 dbA, 1/4 as loud
40		Bird calls (44) Lower limit urban ambient sound (40)		40 dbA, 1/8 as loud
	Just Audible	db(A) scale interrupted		
10	Threshold of Hearing			

Source: City of Rialto General Plan Update Draft MEIR, November 1991

Table 4.11-2
EXISTING TRAFFIC NOISE CONTOURS

Roadway	Link	ADT ('000)	Speed (mph)	Distance to CNEL Contour (feet)		
				70 CNEL	65 CNEL	60 CNEL
Interstate 10	East of Riverside Avenue	31.49	55	132	285	614
Route 30	Siera to Alder	15.15	50	65	141	303
	Alder to Locust	10.584	50	51	111	238
	Locust to Ayala	14.863	50	54	139	299
	Ayala to Riverside	19.822	50	78	168	362
	Riverside to Pepper	24.486	55	110	236	509
	East of Pepper	28	55	120	258	556
Baseline Road	Sierra to Palmetto	14.988	50	RW	105	225
	Palmetto to Ayala	16.237	50	51	110	238
	Ayala to Cactus	17.846	45	RW	99	213
	Cactus to Riverside	18.735	45	RW	102	220
	East of Riverside	18.835	45	RW	102	220
Foothill Road	West of Palmetto Avenue	28.5	45	67	144	310
	Palmetto to Ayala	26.5	45	64	137	295
	Ayala to Cactus	26	45	63	135	291
	Cactus to Riverside	24.605	45	60	130	281
	Riverside to Acacia	25.5	45	60	130	280
	Acacia to Pepper	24.4	45	59	126	272
	East of Pepper	25.652	45	61	130	281
Randall Avenue	Maple to Cactus	1.798	40	RW	RW	RW
	East of Cactus	2.123	40	RW	RW	RW
San Bernardino Avenue	Alder to Riverside Avenue	1.873	40	RW	RW	RW
	East of Riverside	6.245	40	RW	RW	87
Valley Boulevard	West of Linden	20.67	40	RW	90	193
	Linden to Riverside	12.577	40	RW	64	139
	East of Riverside	11.69	40	RW	61	132
Slover Avenue	West of Riverside	5.533	40	RW	RW	80
Santa Ana Avenue	West of Riverside	1.581	40	RW	RW	RW
Jurupa Avenue	East of Cedar	0.79	40	RW	RW	RW
Agua Mansa Road	South of Riverside	7.272	45	RW	54	117
	North of Riverside	3.952	45	RW	RW	78
Ayala Drive	Route 30 to Riverside	3.351	45	RW	RW	70
Locust Avenue	South of Riverside	.53	45	RW	RW	RW
	North of Riverside	.53	45	RW	RW	RW
Sierra Avenue	Baseline to Route 30	5.162	45	RW	RW	93
	Route 30 to Casa Grande	4.493	45	RW	RW	85
	Casa Grande to Riverside	3.656	45	RW	RW	74
Cedar Avenue	Santa Ana to Slover	21.357	45	52	111	240
	South of Santa Ana	10.693	45	RW	70	151
Larch Avenue	Jurupa to Santa Ana	0.381	35	RW	RW	RW
Spruce	Santa Ana to Slover	0.831	40	RW	RW	RW
	Valley to San Bernardino	3.127	40	RW	RW	55
Cactus Avenue	Foothill to Baseline	8.936	45	RW	62	134
	South to Jurupa	2.531	45	RW	RW	58
	Baseline to Route 30	7.819	45	RW	57	123
Lilac Avenue	Valley to Foothill	2.401	35	RW	RW	RW
Willow Avenue	Valley to Foothill	3.35	35	RW	RW	RW
Riverside Avenue	Agua Mansa to I-10	19.703	45	RW	106	227

Roadway	Link	ADT ('000)	Speed (mph)	Distance to CNEL Contour (feet)		
				70 CNEL	65 CNEL	60 CNEL
	I-10 to Merrill	24.675	45	57	123	264
	Merrill to Foothill	18	40	RW	82	176
	Foothill to Route 30	11.1113	45	RW	72	155
	Route 30 to Cactus	10.635	50	86	186	400
	Cactus to Ayala	3.68	50	RW	92	197
	Ayala to Locust	3.68	55	63	135	290
	Locust to Sierra	3.62	55	62	133	287
Pepper Avenue	South of I-10	2.291	45	RW	RW	54
Bloomington Avenue	Valley to San Bernardino	13.9	50	RW	100	215
	San Bernardino to Merrill	6.619	50	RW	61	131

RW – Contour falls on roadway right-of-way.

Source: City of Rialto General Plan Update Draft MEIR, November 1991

Table 4.11-3
FUTURE INCREASE IN TRAFFIC NOISE OVER EXISTING

Roadway	Link	Change in CNEL Noise Level (dBA) Over Existing
Interstate 10	East of Riverside Avenue	3.3
Route 30	Siera to Alder	4.8
	Alder to Locust	5.9
	Locust to Ayala	4.9
	Ayala to Riverside	2.4
	Riverside to Pepper	3.3
	East of Pepper	3.0
Baseline Road	Sierra to Palmetto	3.0
	Palmetto to Ayala	2.7
	Ayala to Cactus	3.1
	Cactus to Riverside	3.0
	East of Riverside	2.6
Foothill Road	West of Palmetto Avenue	2.5
	Palmetto to Ayala	2.5
	Ayala to Cactus	2.5
	Cactus to Riverside	2.5
	Riverside to Acacia	2.5
	Acacia to Pepper	2.5
	East of Pepper	2.2
Randall Avenue	Maple to Cactus	7.8
	East of Cactus	7.2
San Bernardino Avenue	Alder to Riverside Avenue	7.2
	East of Riverside	2.9
Valley Boulevard	West of Linden	1.9
	Linden to Riverside	2.1
	East of Riverside	2.3
Slover Avenue	West of Riverside	3.2

Roadway	Link	Change in CNEL Noise Level (dBA) Over Existing
Santa Ana Avenue	West of Riverside	5.5
Jurupa Avenue	East of Cedar	3.6
Agua Mansa Road	South of Riverside	2.3
	North of Riverside	1.0
Ayala Drive	Route 30 to Riverside	7.4
Locust Avenue	South of Riverside	14.0
	North of Riverside	12.9
Sierra Avenue	Baseline to Route 30	5.9
	Route 30 to Casa Grande	6.6
	Casa Grande to Riverside	2.5
Cedar Avenue	Santa Ana to Slover	3.6
	South of Santa Ana	8.0
Larch Avenue	Jurupa to Santa Ana	8.0
Spruce	Santa Ana to Slover	7.0
Cactus Avenue	Foothill to Baseline	3.3
	South of Jurupa	6.2
	Baseline to Route 30	4.9
Lilac Avenue	Valley to Foothill	4.5
Willow Avenue	Valley to Foothill	2.5
Riverside Avenue	Agua Mansa to I-10	2.5
	I-10 to Merrill	2.5
	Merrill to Foothill	2.4
	Foothill to Route 30	3.1
	Route 30 to Cactus	6.8
	Cactus to Ayala	7.1
	Ayala to Locust	8.5
	Locust to Sierra	2.7
Pepper Avenue	South of I-10	2.5
Bloomington Avenue	Valley of San Bernardino	3.3
	San Bernardino to Merrill	

Source: City of Rialto General Plan Update Draft MEIR, November 1991

The picture that is portrayed by the data is that as transportation related noises increase with buildout of a community, the amount of sensitive land uses exposed to unacceptable noise levels will significantly increase, certainly within the City of Rialto and more generally within the remainder of the communities in the Chino Basin. Note that stationary sources of noise, such as industrial operations, can generally be controlled to meet local noise standards because they are located within areas of similar use, where the noise does not pose an adverse impact, or where noise attenuation is mandatory and the impacts on any adjacent sensitive noise receptors is reduced to an acceptable level. Within the remaining communities the following noise environment was characterized in the local general plan noise elements.

City of Fontana: The City of Fontana has adopted a land use matrix (Table N-1) and interior and exterior noise standards (Table N-2) that reflect the noise guidelines contained in Figure 4.11-1. The noise environment in Fontana is dominated by motor vehicle transportation noise sources, including Interstates 10 and 15 and major east-west and north-south arterials. The existing noise contours are shown in Figure 4.11-5 (Exhibit N-1 of the General Plan). Fontana does not have an airport, but both east-west railroad tracks traverse the City and create noise impacts, that, like Rialto, exceed 70 dBA CNEL adjacent to the track.

City of Rancho Cucamonga: The City of Rancho Cucamonga has adopted a land use matrix (Figure V-10) that reflects the noise guidelines contained in Figure 4.11-1. The noise environment in Rancho Cucamonga is also dominated by motor vehicle transportation noise sources, including Interstate 15 and major east-west and north-south arterials. The future noise contours (buildout) are shown in Figure 4.11-6 (Figure V-9 of the General Plan). Rancho Cucamonga does not have an airport, but one of the east-west railroad tracks traverses the City and creates noise impacts, that, like Rialto, exceed 70 dBA CNEL adjacent to the track.

City of Ontario: The City of Ontario has adopted a land use matrix (Figure HA-9) and interior and exterior noise standards (Table HA-2) that reflect the noise guidelines contained in Figure 4.11-1. The noise environment in Ontario is dominated by motor vehicle transportation noise sources, including Interstate 10 and Highway 60 and major east-west and north-south arterials. The existing noise contours are shown in Figure 4.11-7 (Figure HA-7 of the General Plan). The City of Ontario is impacted by the east-west railroad tracks (Union Pacific) which traverse the City and create noise impacts, that, like Rialto, exceed 70 dBA CNEL adjacent to the track. The City is also impacted by Ontario Airport (Figure 4.11-8) and, following annexation of the 8,200 acres of the Chino Agricultural Preserve, the City is impacted by aircraft operations at Chino Airport (see the following discussion).

City of Chino: The City of Chino has adopted a land use matrix (Exhibit VI-4) and interior and exterior noise standards (Exhibit VI-5) that reflect the noise guidelines contained in Figure 4.11-1. The noise environment in Chino is dominated by motor vehicle transportation noise sources, including Interstate 10 and Highway 60 and major east-west and north-south arterials. The existing noise contours are shown in Figure 4.11-9 (Exhibit VI-1 of the General Plan). The City of Chino is impacted by the east-west railroad tracks (Union Pacific) which traverse the City and create noise impacts, that, like Rialto, exceed 70 dBA CNEL adjacent to the track. The City is also impacted by aircraft operations at Chino Airport (see Figure 4.11-10).

City of Chino Hills: The City of Chino Hills has adopted a land use matrix (Table N-1) that reflects the noise guidelines contained in Figure 4.11-1. The noise environment in Chino Hills is also dominated by motor vehicle transportation noise sources, including the Chino Valley Freeway and major east-west and north-south arterials. The future noise contours (buildout) are shown in Figure 4.11-11 (Figure N-2 of the General Plan). Rancho Cucamonga does not have an airport, and none of the east-west railroad tracks traverses the City to create noise impacts.

City of Montclair: The City of Montclair's General Plan has not been updated since 1983 and the only noise data for the City is presented in Table 4.11-4 which identifies the exposure of the City's population to forecast noise levels in 1981 and 1995. No quantitative noise guidelines are contained in the Montclair General Plan. The noise environment in Montclair is also dominated by motor vehicle transportation noise sources, including the Intestate 10 and major east-west and north-south arterials. Ontario Airport operation also impact the eastern portion of the City. Both major railways have tracks through the community which also create noise impacts comparable to that identified in the City of Rialto.

City of Upland: The City of Upland has adopted a land use matrix (Figure 10-1) that reflects the noise guidelines contained in Figure 4.11-1. The noise environment in Upland is dominated by motor vehicle transportation noise sources, including Interstate 10 and major east-west and north-south arterials. There is no existing noise contour map. The City of Upland is impacted by the east-west railroad tracks (Pacific Electric) which traverse the City and create noise impacts, that, like Rialto, exceed 70 dBA CNEL adjacent to the track. The City is also impacted by aircraft operations at Cable Airport (see Figure 4.11-12).

City of Pomona: The City of Pomona's General Plan has not been updated since 1977 and there is no current noise data for the City. No quantitative noise guidelines are contained in the Pomona General Plan. The noise environment in Pomona is also dominated by motor vehicle transportation noise sources, including the Intestate 10, Highway 60 and major east-west and north-south arterials. Brackett Field, just west of the City of Pomona, also impact the western portion of the City. Both major railways have tracks through the community which also create noise impacts comparable to that identified in the City of Rialto.

Riverside County and Norco: The Riverside County (including Norco and surrounding area) General Plan has not been updated since 1984 and there is no current noise data for these areas. Quantitative noise guidelines are contained on Figure VI-11 of the County General Plan. The noise environment in this area is also dominated by motor vehicle transportation noise sources, including the Intestate 15, Highway 60 and major east-west and north-south arterials. Noise from three airports, Corona, Ontario and Chino impact this portion of the project area. Major railways have tracks traverse these areas which also create noise impacts comparable to that identified in the City of Rialto.

San Bernardino County: San Bernardino County noise levels are evaluated as part of the Cities of Ontario and Chino which assumed responsibility for planning in these areas in 1994 as a result of expanding each City's sphere into the Chino Agricultural Preserve. The City of Ontario has annexed the whole 8,200 acres of its sphere, and the City of Chino has annexed approximately 1,500 acres to date. Noise impacts and policies are as outlined above for these cities.

Table 4.11-4
NOISE IMPACTS
EXISTING CONDITIONS 1981 AND PROJECTED IMPACTS 1995

Range of CNEL	Ontario International Airport	I-10 Freeway	Major and Secondary Arterials	Railroads	Lower Levels of Aircraft, Arterial and/or RR Noise	Total # of People Exposed to Various Levels of Noise	Percent of Total
EXISTING - 1981							
Less than 60 dB	—	—	—	—	4,780	4,780	17.0
60 - 65	10,090	1,570	1,170	—	—	12,830	45.8
65 - 70	7,780	860	1,090	40	—	9,770	34.9
70 - 75	—	430	120	30	—	580	2.1
75 - 80	—	50	—	—	—	50	0.2
Total:	17,870	2,910	2,380	70	4,780	28,010	100.0
Percent of Total:	63.8%	10.4%	8.5%	0.3%	17.0%	100%	
PROJECTED - 1995							
Less than 60 dB	—	—	—	—	19,270	19,270	49.0
60 - 65	9,450	970	3,120	—	—	13,540	34.6
65 - 70	2,580	920	1,940	40	—	5,480	13.9
70 - 75	—	730	160	30	—	920	2.3
75 - 80	—	90	—	—	—	90	0.2
Total:	12,030	2,710	5,220	70	19,270	39,300	100.0
Percent of Total:	30.6%	6.9%	13.3%	0.2%	49.0%	100%	

Source: City of Montclair General Plan 1983

4.11.3 Project Impacts

The project's potential to generate noise was included in this PEIR based on the potential for specific project to cause short-term and long-term changes in the noise environment surrounding these facilities. A second issue of concern was the potential for the OBMP to contribute to the cumulative or general increase in noise that accompanies urban growth and development. Short-term noise increases could result from construction activities and the long-term noise increases could be associated with operating desalters, production well pumps and booster pumps. The implementation of the OBMP would include modifying existing and installing new recharge basins, installing monitoring wells, production wells, booster pumps (to move recycled water and desalted water), and supporting installation and operation of desalters in the southern portion of the Chino Basin. The noise issues of focus in this evaluation are those changes due to the project that may increase the existing noise levels or alter future potential noise levels along major transportation corridors within the Chino Basin.

4.11.3.1 Significance Criteria

Noise impact criteria are described in detail in section 4.11.2.2 above. The following criteria will be used to determine whether noise levels have been significantly increased:

For residential areas, an exterior noise level of up to 65 dBA CNEL is permitted, if the exterior areas are substantially mitigated and the interior noise exposures do not exceed 45 dBA CNEL with windows and doors closed. If windows and doors are required to be closed to achieve an acceptable interior noise level, then the use of air conditioning or mechanical ventilation will be required.

In community noise assessments, a long-term change in noise levels greater than 3 dBA is often identified as significant, while changes less than one dBA will not be discernible to the human ear. In the range of one dBA to 3 dBA, people who are very sensitive to noise may perceive a slight change in noise level. No scientific evidence is available to support the use of 3 dBA as the significance threshold. In laboratory testing situations, humans are able to detect noise level changes of slightly less than one dBA. However, in a community situation the noise exposure is extended over a long time period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become intrusive, rather than discernible, is some value greater than one dBA, and 3 dBA is generally accepted as the appropriate threshold for most community noise situations.

For purposes of this evaluation, noise impacts are considered significant if the project is forecast to increase noise levels by 3 dBA (CNEL) where: (1) the existing noise levels already exceed the 65 dBA (CNEL) residential standard or (2) the project increases noise levels from below the 65 dBA (CNEL) standard to above 65 dBA (CNEL).

4.11.3.2 Potential OBMP Contributions to Growth Related Noise Impacts

A detailed discussion of potential growth inducing impacts from implementing the OBMP is presented in subchapters 4.2 and 4.3. Fundamentally, regardless of whether the OBMP is implemented, individual Water Serving Agency's have identified individual actions that they can implement to meet future water demands within the Chino Basin. The OBMP provides an alternative water supply plan that provides for more efficient and effective enhancement of safe yield and water quality that will fully comply with the judgment that established the physical solution for the Chino Basin. In essence, the OBMP follows a similar path in forecasting future water supply needs and includes many of the practices and programs cited within the individual agencies Urban Water Management Plans. It is complimentary to numerous goals within the individual Plans. The OBMP, as an example seeks to promote utilizing reclaimed water supplies, developing water conservation programs and expanding recycling opportunities for the Basin.

The OBMP takes a more global approach to water demand and supply issues compared to the evaluations at a general plan or Urban Water Management Plan level and looks toward providing more effective and efficient ways to protect the viability of the entire basin. Furthermore, emphasis is placed upon programs such as recycling of water, improving water quality and the extraction of salts. The OBMP functions as one path of fulfilling the water supply demands outlined in local jurisdiction general plans and Urban Water Management Plans. As such it is growth accommodating as outlined in subchapter 4.2, but it does not in and of itself create opportunities for additional people to move to the region nor to construct additional facilities beyond those previously under consideration to accommodate the population that will locate in the area in accordance with adopted general plan visions of ultimate development within each community located in the Chino Basin.

Based on this analysis, no potential exists for implementation of the OBMP to cause or contribute to significant adverse growth in the Chino Basin, nor to any different future noise environment than forecast within each local agency's general plans discussed above.

4.11.3.3 Potential Project Specific Noise Impacts

a. Will the project increase noise exposure for sensitive receptors from new noise sources?

Short-Term Noise Sources

Construction noise would be generated by any of the facilities or activities supported by the OBMP within the Chino Basin. Construction activities in support of redevelopment would have a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, back-hoes, bull-dozers, concrete mixers and portable generators can reach high levels and is typically one of the sources for the highest potential noise impact of a project. The most effective method of controlling construction noise is by local limitation of construction hours to normal week-day working hours, typically from daylight to dusk.

Noise levels at a distance of 50 feet from equipment which might be used for the excavation and construction of the proposed project are presented in Figure 4.11-13. These noise levels decrease at a rate of approximately 6 dBA for each doubling of distance. Therefore, at 100 feet from the equipment, noise levels would be about 6 dBA less than shown in Figure 4.11-13. Similarly, at 200 feet from the equipment, noise levels would be 12 dBA less than indicated in the exhibit. Intervening structures and topography would act as noise barriers and reduce noise levels further.

Since construction noise is of a temporary nature, most jurisdictions do not require such noise to be mitigated to the specific threshold levels outlined above. However, they do require operational considerations (i.e., limitation of construction hours, the muffling of construction equipment, noise complaint response programs, etc.) to minimize noise impacts during the construction process. Construction noise levels affecting sensitive receptors may exceed the significance thresholds during the day, but eliminating this source of noise at night and reducing any noise levels that might be damaging to hearing can reduce these short-term impacts to a non-significant level. Mitigation measures are identified below which ensure that construction activities do not intrude on sensitive receptors in the evening or expose such receptors to damaging levels of noise at any time. With implementation of these measures, short-term construction activities are not forecast to cause significant adverse noise impact.

Permanent Noise Sources

The OBMP (see Table 4.2-3) identifies a variety of future projects and activities that may cause or contribute to changes in the existing background noise levels.

For recharge basins, once operation begins the activity of discharging water and allowing it to percolate into the ground does not generate any noise that if forecast to exceed background noise levels. No adverse impact is forecast to occur from implementing recharge. Note that occasional maintenance activities associated with operating recharge basins will be similar in volume to construction activities. Such activities will be restricted to daylight hours and the level of noise generation will be comparable to that described under the discussion of short-term noise impacts above.

The installation and operation of monitoring wells is also a fairly passive source of noise generation. Once installed such wells either have automatic monitoring equipment or are visited periodically to obtain the desired data. Such activities are not forecast to exceed the sound levels of surrounding activities, such as traffic or urban activities (typically about 55 dB) from children playing, music playing, or gardening activities.

The operation of both production wells and booster pumps can generate noise levels greater than the 60-65 dBA CNEL values that are considered acceptable for noise sensitive uses. Based on extensive experience in locating production wells within urban settings, adequate sound attenuation structures are available to reduce sounds from production wells and booster pumps to levels well within the significant noise impact thresholds, including those noise levels protective of sleep during nighttime hours. Mitigation is provided below to ensure that future production well and booster pump noise is reduced below a significance threshold in each of the communities of the Chino Basin.

The desalter will function more or less as an industrial facility (water treatment facility). Noises associated with this type of facility will range from traffic caused by arriving vehicles (employees, visitors, and deliveries) to equipment operation in the structure. If located adjacent to or in the vicinity of a sensitive noise receptor, a potential exists for future desalters to exceed the noise thresholds of a community and cause a significant adverse impact. This impact can be avoided by implementing mitigation that either incorporates noise attenuation into the design of the facility, or by locating the facility at a location where it will not conflict with adjacent uses (residential, schools, or wildlife preserves) and by either acquiring sufficient land to provide an adequate noise buffer from sensitive neighbors or constructing man-made noise attenuation buffers. After implementing such measures, any potential for significant noise impact can be reduced below the thresholds outlined above.

b. Will the project expose people to severe noise levels?

None of the permanent activities associated with implementing the OBMP are forecast to generate any severe noise levels that could adversely impact the sensitive residential population within the Chino Basin. It is possible, but not probable, that short-term construction activities could generate severe noise levels (such as use of pile drivers), but mitigation can be implemented to reduce noise levels from such activities to levels that will not damage hearing. No additional mitigation is required.

4.11.4 Mitigation Measures

The evaluation of potential noise impacts presented above identified potentially significant noise impacts. The potential noise impacts from implementing the proposed project range from non-significant without mitigation to potentially significant unless mitigation or other measures are implemented. During construction, grading, site clearance and building construction activities generate the most noise. During operations/occupancy the noise analysis concluded that offsite noise impacts do have a potential to cause significant adverse impact to adjacent sensitive land uses. The following mitigation measures will be implemented to reduce noise impacts to the minimum level achievable.

4.11-1 **Construction shall be limited to the hours of 7 a.m. to 7 p.m. on Monday through Friday, and between 9 a.m. to 6 p.m. on Saturday, and shall be prohibited on Sundays and federal holidays.**

4.11-2 **All construction vehicles and fixed or mobile equipment shall be equipped with properly operating and maintained mufflers.**

4.11-3 **All employees that will be exposed to noise levels greater than 75 dB over an 8-hour period shall be provided with adequate hearing protection devices to ensure no hearing damage will result from construction activities.**

4.11-4 If equipment is being used that can cause hearing damage at adjacent noise receptor locations (distance attenuation shall be taken into account), portable noise barriers shall be installed that are demonstrated to be adequate to reduce noise levels at receptor locations below hearing damage thresholds.

4.11-5 All production wells or booster pumps shall have their noise levels attenuated to 50 dBA CNEL at 50 feet from the well head.

4.11-6 Project design will include measures which assure adequate interior noise levels as required by Title 25 (California Noise Insulation Standards).

4.11-7 Require that all parking for desalter uses adjacent to residential areas be enclosed within a structure or separated by a solid wall with quality landscaping as a visual buffer.

4.11-8 Desalters shall be constructed and operated so that noise levels from operations do not exceed 50 dB during night hours and 65 dB averaged over the 12 hours of day time when located adjacent to existing or future sensitive land uses. This can be achieved by siting desalters a sufficient distance from sensitive noise receptors; by incorporating attenuation features in the facility or designing attenuation features at the boundary of the property.

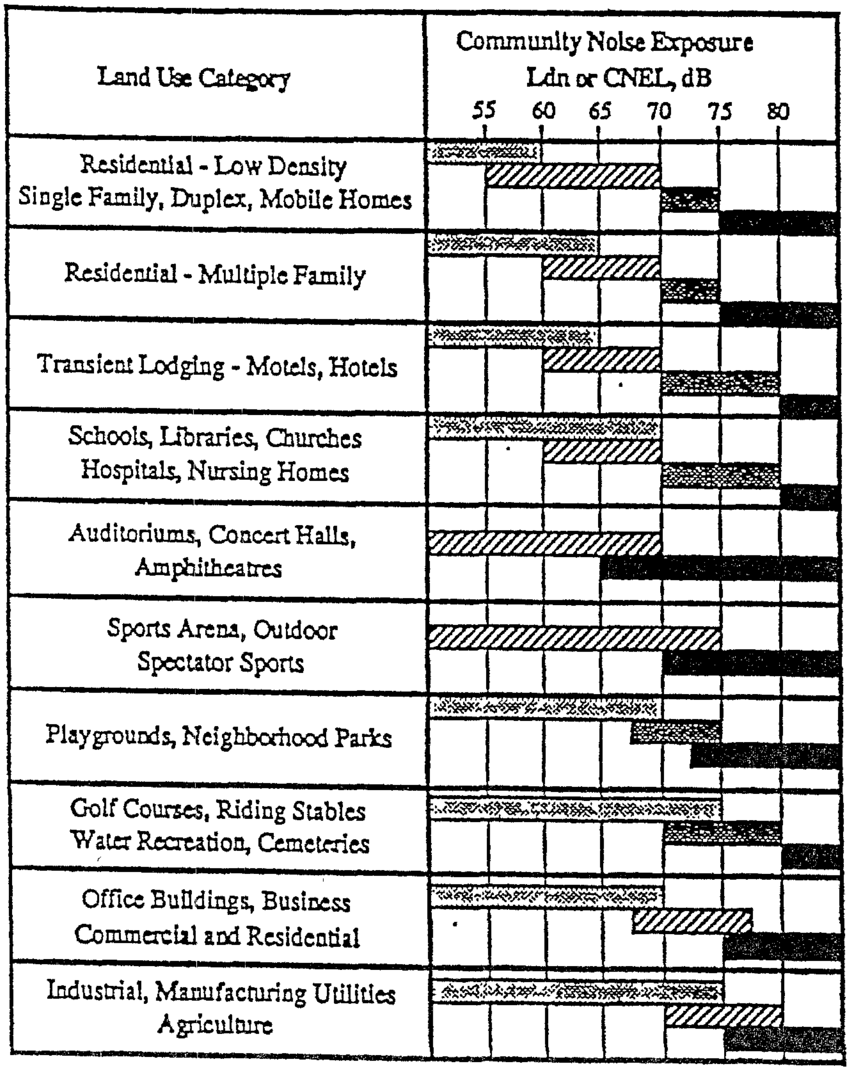
These measures ensure that implementation of the OBMP will not cause significant noise impacts during construction or cause hearing damage to employees or nearby receptors from severe noise levels. Potentially significant noise impacts where residential uses or other sensitive uses abut major facilities will have noise impacts reduced to a non-significant level by implementing the above measures.

4.11.5 Unavoidable Adverse Impact

The noise evaluation presented above indicates that the proposed project has a potential to cause potentially significant and unavoidable adverse noise impact from implementing certain facilities and activities.. As noted above, mitigation measures have been identified that can reduce both short-term and permanent noise impacts below a significant level.

4.11.6 Cumulative Impact

The noise forecast data contained in the local agency general plans demonstrates that future traffic noise levels from general growth (cumulative traffic increases) within the Chino Basin will result in significant noise impacts. However, the OBMP is not forecast to cause or contribute to such cumulative noise impacts which can be attributed to the land use mix contained in the local agency general plans and the inability to reduce potential traffic noise impacts to a non-significant level. Any traffic generated by OBMP operations (a few hundred trips per day) are considered *de minimis* contributions to this traffic related noise impact. Because implementation of the OBMP will not contribute to the cumulative increases in traffic, the proposed project is not forecast to cause a contribute to cumulatively significant noise impacts.



Interpretation

Normally Acceptable

Specified Land Use is Satisfactory, Based Upon the Assumption that Any Buildings Involved are of Normal Conventional Construction, Without Any Special Noise Insulation Requirements.

Conditionally Acceptable

New Construction or Development Should be Undertaken Only After a Detailed Analysis of the Noise Reduction Requirement is Made and Needed Noise Insulation Features Included in the Design. Conventional Construction, but with Closed Windows and Fresh Air Supply Systems or Air Conditioning, Will Normally Suffice.

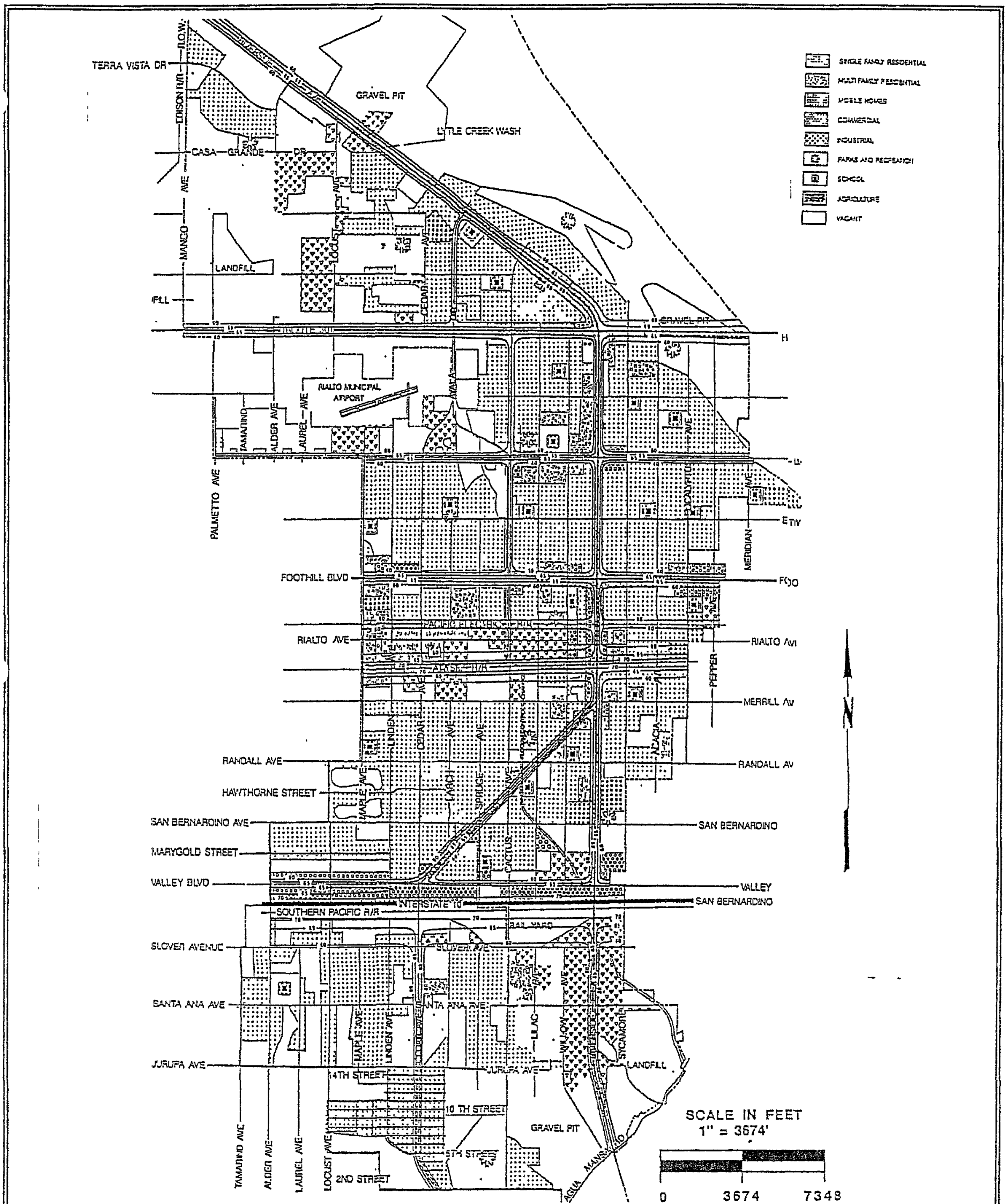
Normally Unacceptable

New Construction or Development Should Generally be Discouraged. If New Construction or Development Does Proceed, a Detailed Analysis of the Noise Reduction Requirements Must be Made and Needed Noise Insulation Features Included in the Design.

Clearly Unacceptable

New Construction or Development Should Generally not be Undertaken.

CALIFORNIA LAND USE / NOISE GUIDELINES Source: City of Rialto GP Update Draft MEIR	TOM DODSON & ASSOCIATES Environmental Consultants	FIGURE 4.11-1

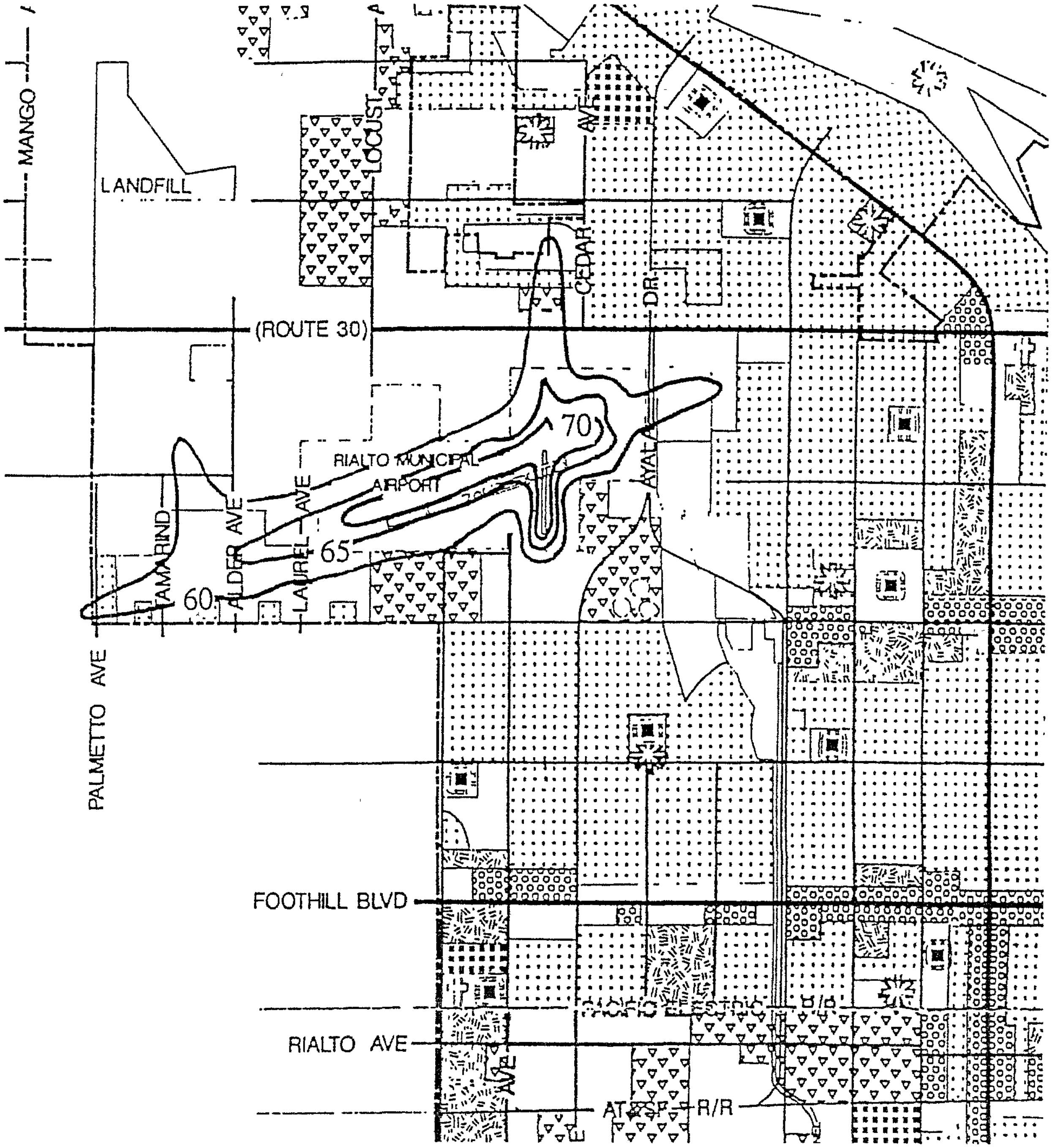


EXISTING CNEL NOISE CONTOURS

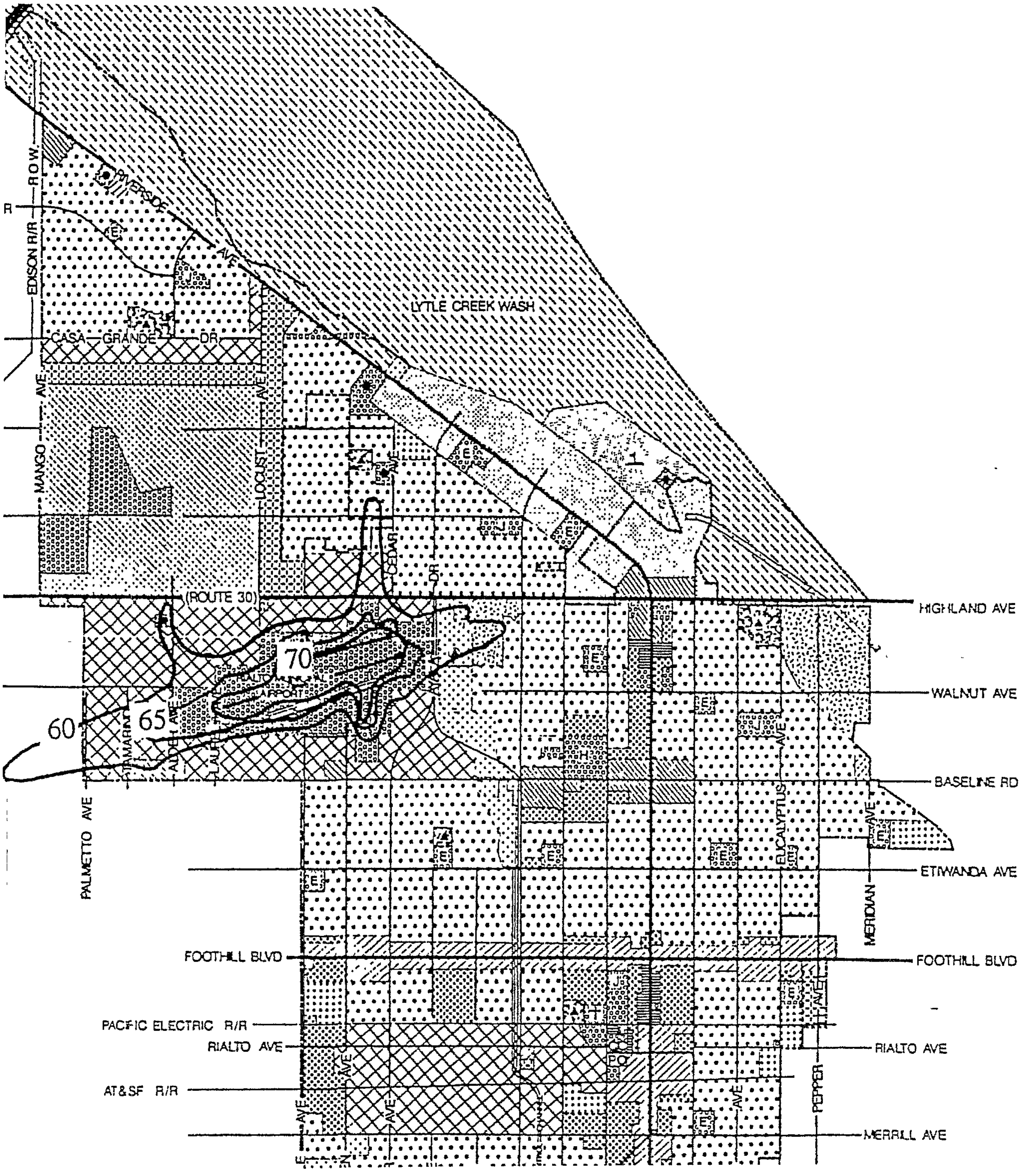
Source: City of Rialto GP Update Draft MEIR

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-2



AIRCRAFT CNEL NOISE CONTOURS (1990) Source: City of Rialto GP Update Draft MEIR	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.11-3**



AIRCRAFT CNEL NOISE CONTOURS (2010)

Source: City of Rialto GP Update Draft MEIR

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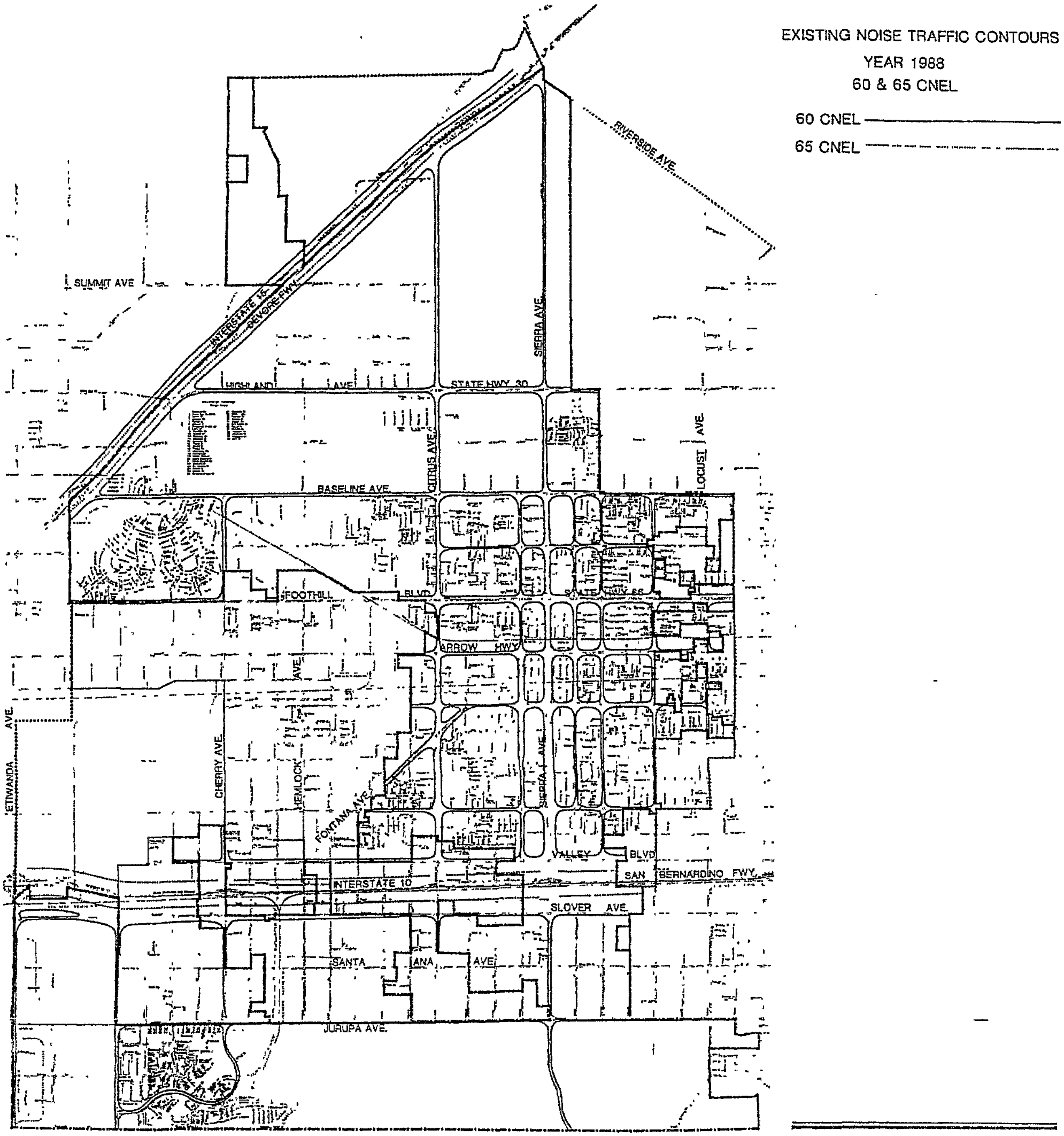
Environmental Consultants

FIGURE 4.11-4

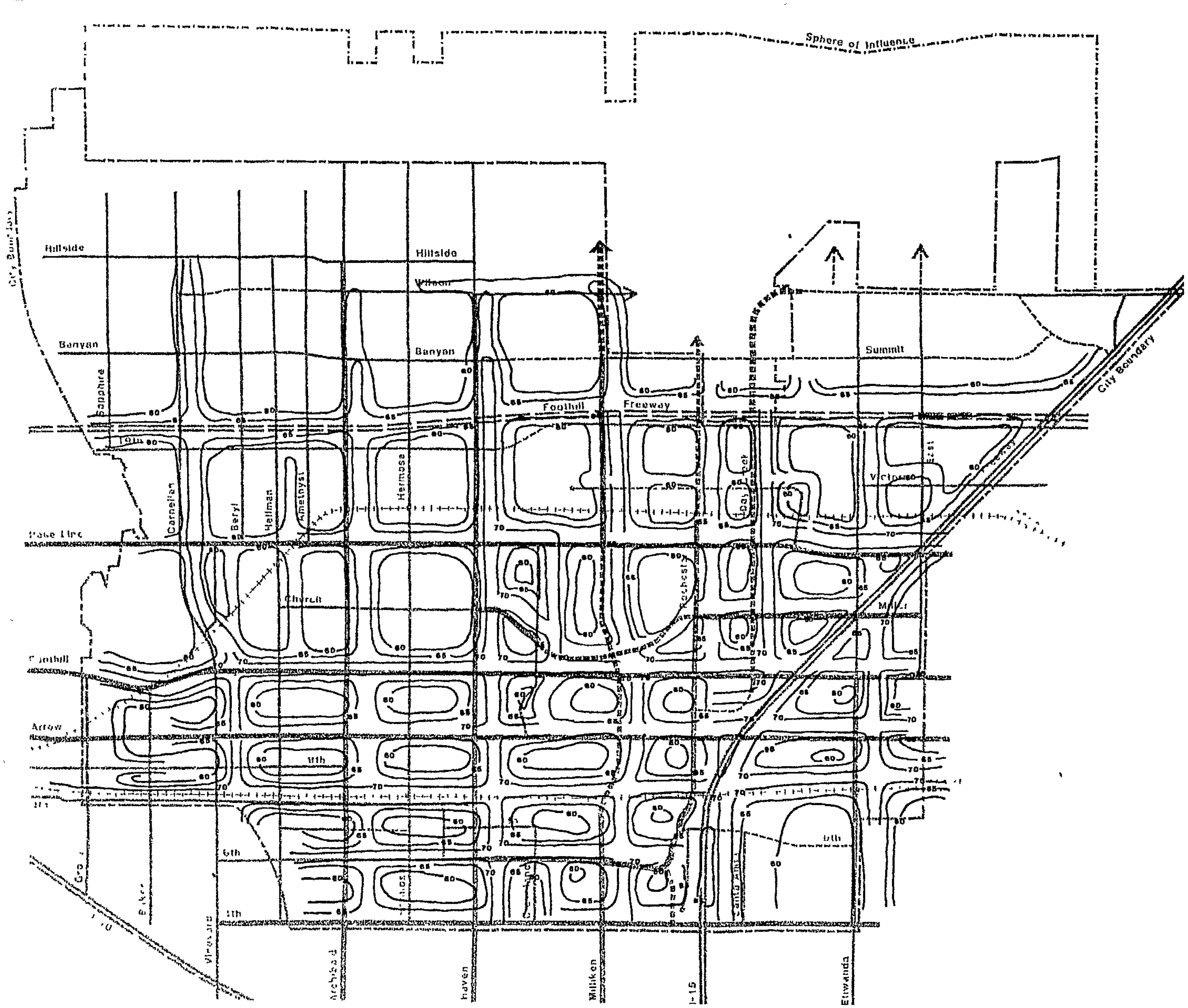


EXISTING TRAFFIC NOISE CONTOURS

Source: City of Fontana General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-5



FUTURE NOISE EXPOSURE CONTOURS
- - L_{dn} METRIC -60- NOISE CONTOUR

***PROPOSED FOOTHILL FREEWAY CONTOURS ASSUME 10dB ATTENUATION**

(MEASUREMENT DOES NOT INCLUDE TRAINS)

CITY OF RANCHO CUCAMONGA

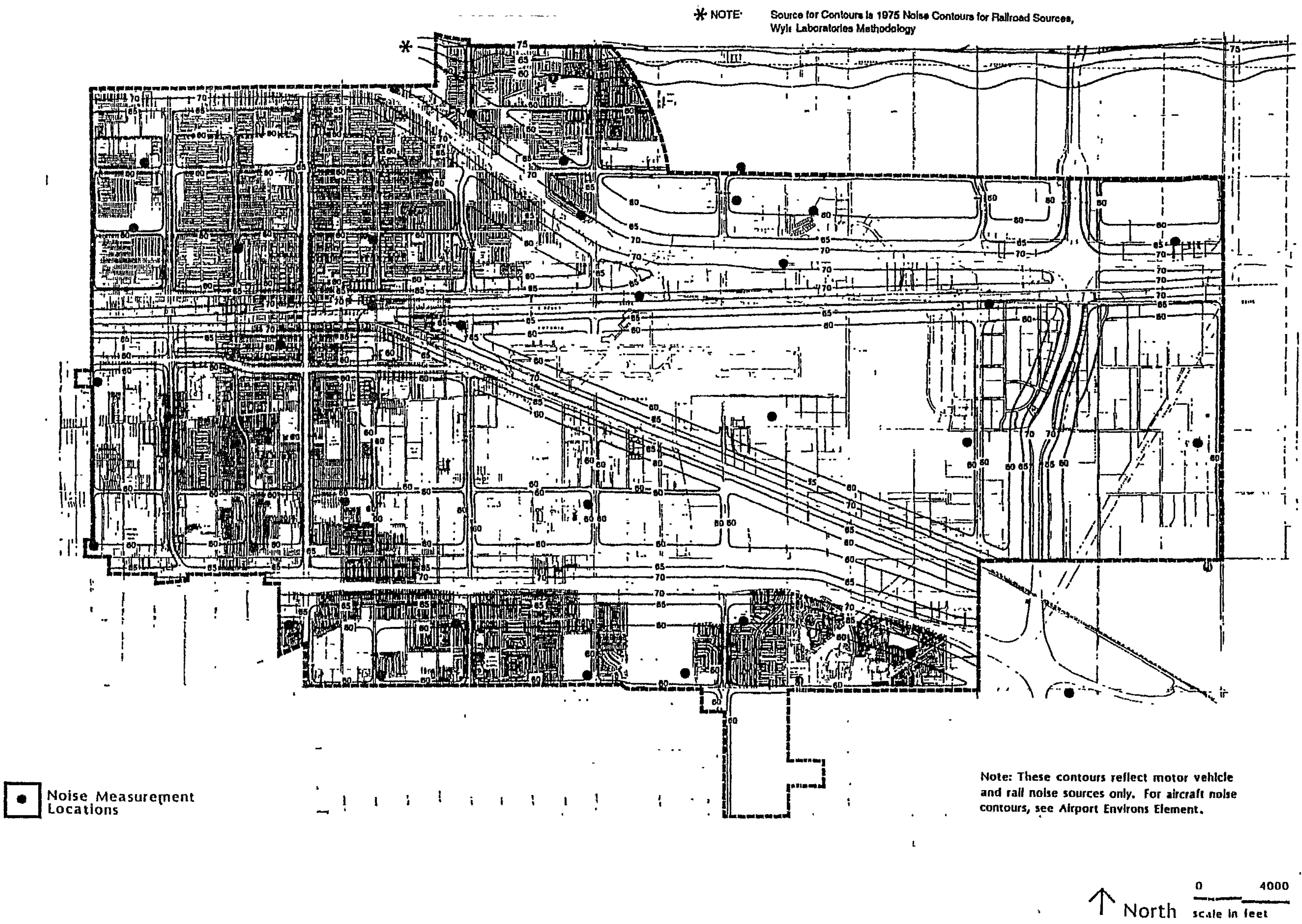
0 1000' 5000'

FUTURE NOISE CONTOURS

Source: City of Rancho Cucamonga General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-6

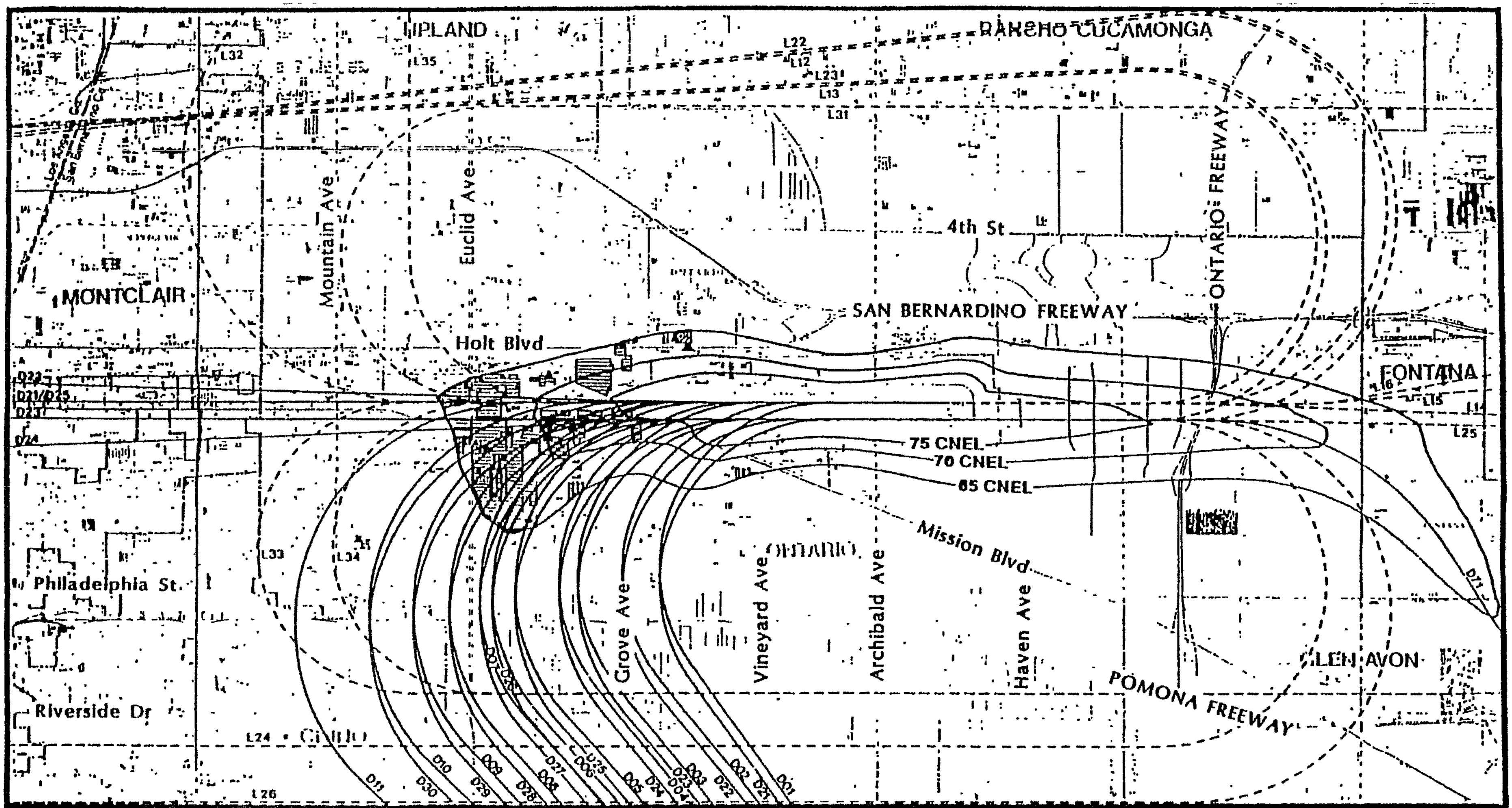


EXISTING CNEL NOISE CONTOURS OF FREEWAYS, MAJOR ARTERIALS AND RAILROADS

Source: City of Ontario General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-7



Official Noise Exposure Map
1995 Five Year Map

125,000 Annual Air Carrier Operations
Prado Departures Turn Left As Early As Possible
65% FAR Part 36 Stage III Operations
Modified East Bound Nighttime Departure

LAND USE IMPACT DATA

	65 CNEL			70 CNEL			75 CNEL		
	Pop.	Units	Acres	Pop.	Units	Acres	Pop.	Units	Acres
Single	6107	2035	491	1332	444	160	39	13	4
Duplex	1168	388	13	151	50	8	6	2	2
Multi Family	935	311	122	75	25	2			0
Mobile	259	84	9			0			0
Schools			34			0			0
Churches			8			4			0
Hosp/Nurs			0			0			0
TOTAL	8470	2818	707	1558	519	174	45	15	6

LEGEND

Incompatible Land Use
- Single Family
- Multi-Family
- Mobile Homes
- Schools
- Churches
- Hospitals

Flight Tracks
- Arrivals
- Departures

SCALE

Feet

Miles

Boundaries
- City
- County

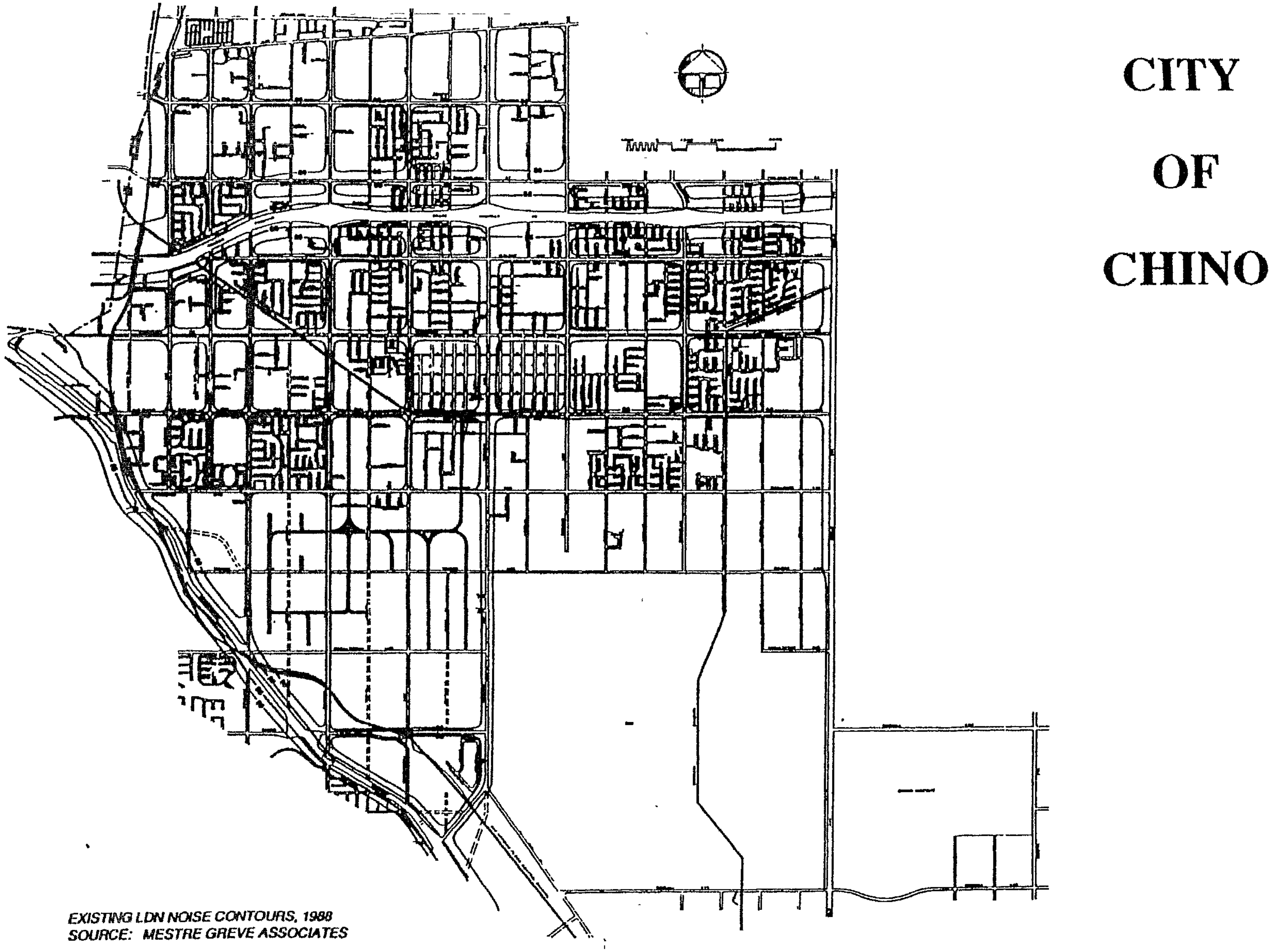
Ontario International Airport
FAR Part 150 Study

OFFICIAL NOISE EXPOSURE MAP - 1995 FIVE YEAR MAP

Source: City of Ontario General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-8

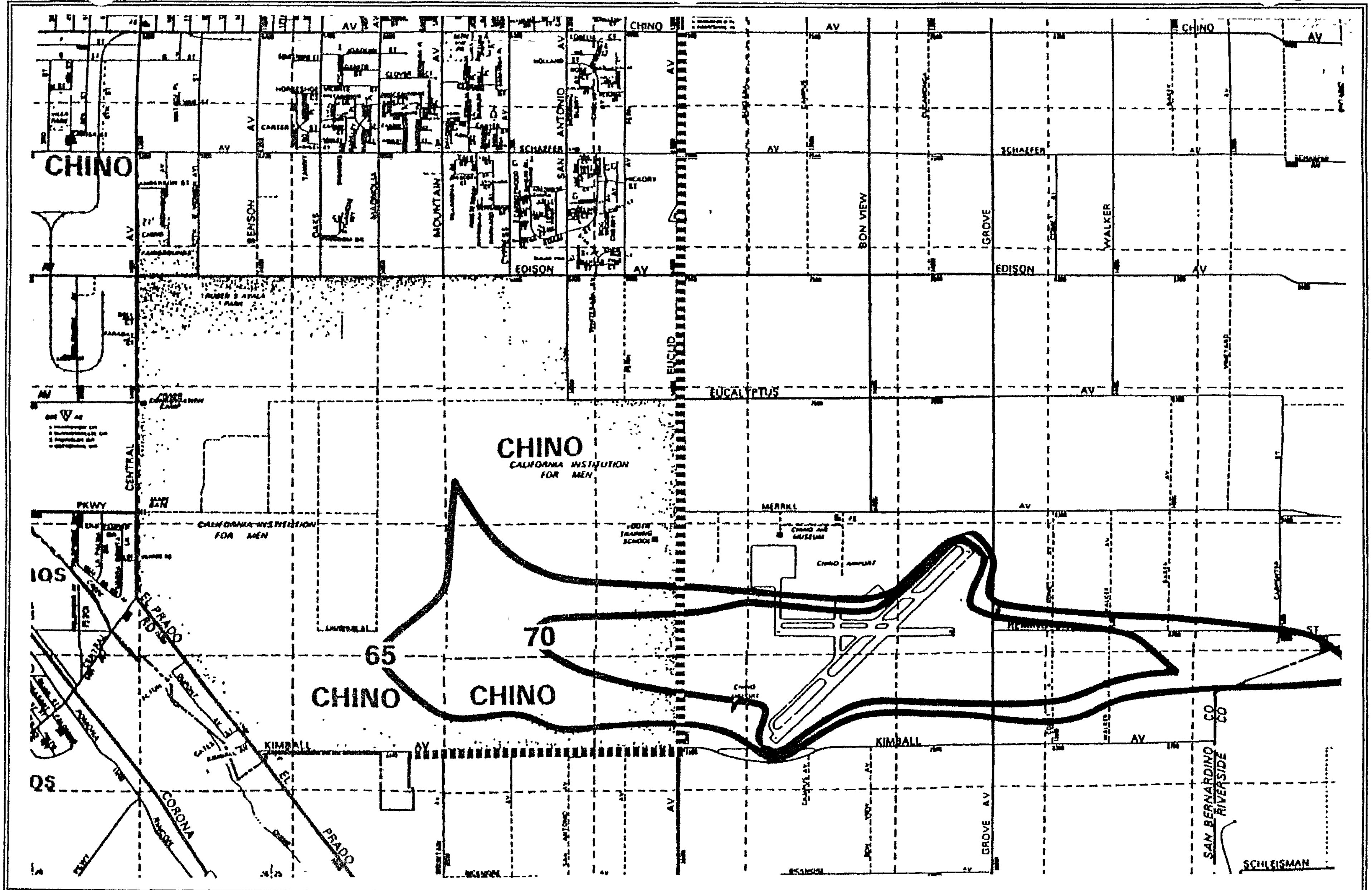


EXISTING LDN TRAFFIC NOISE CONTOURS

Source. City of Chino General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-9

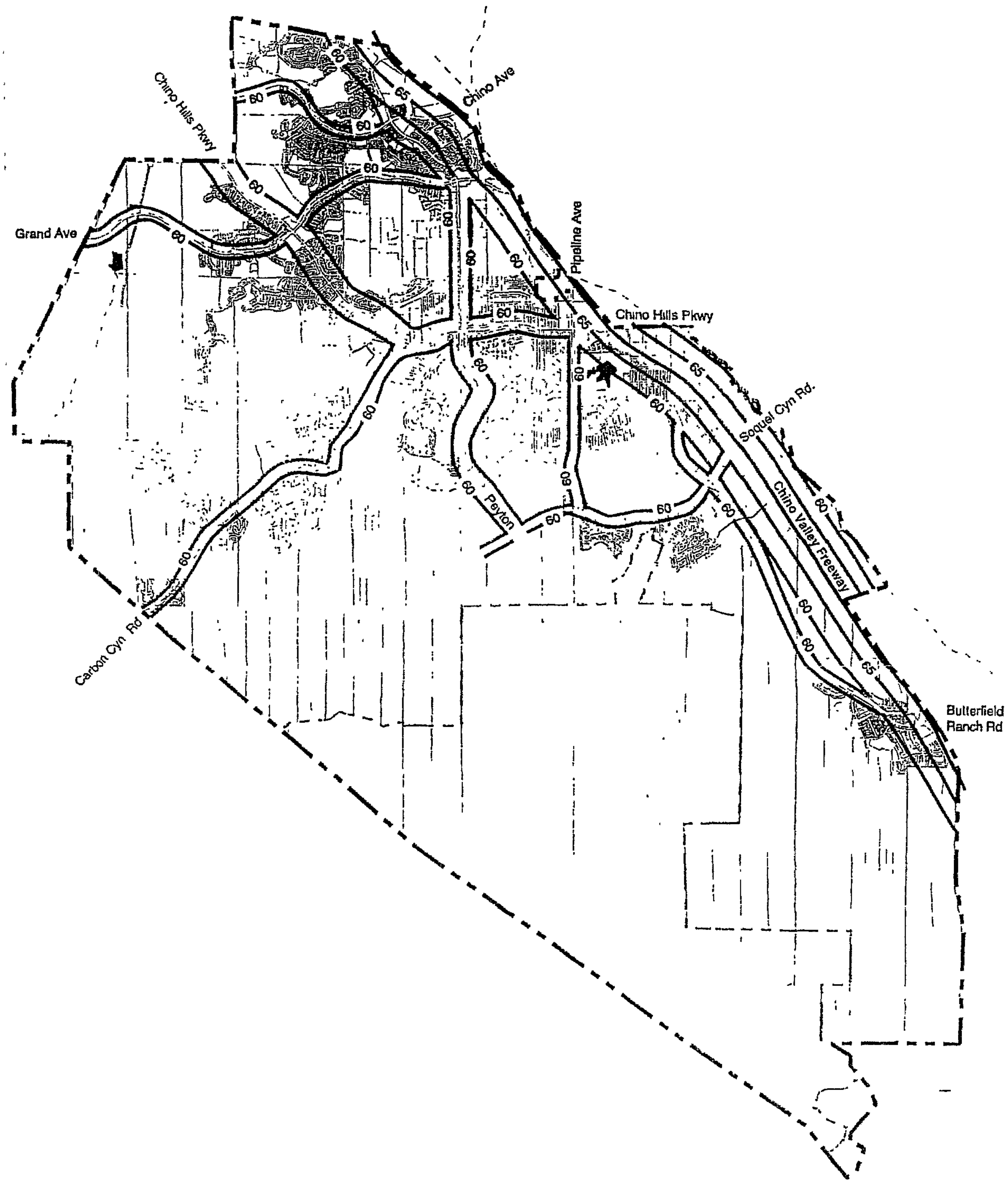


CHINO AIRPORT FUTURE CNEL NOISE CONTOURS

Source City of Chino General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-10

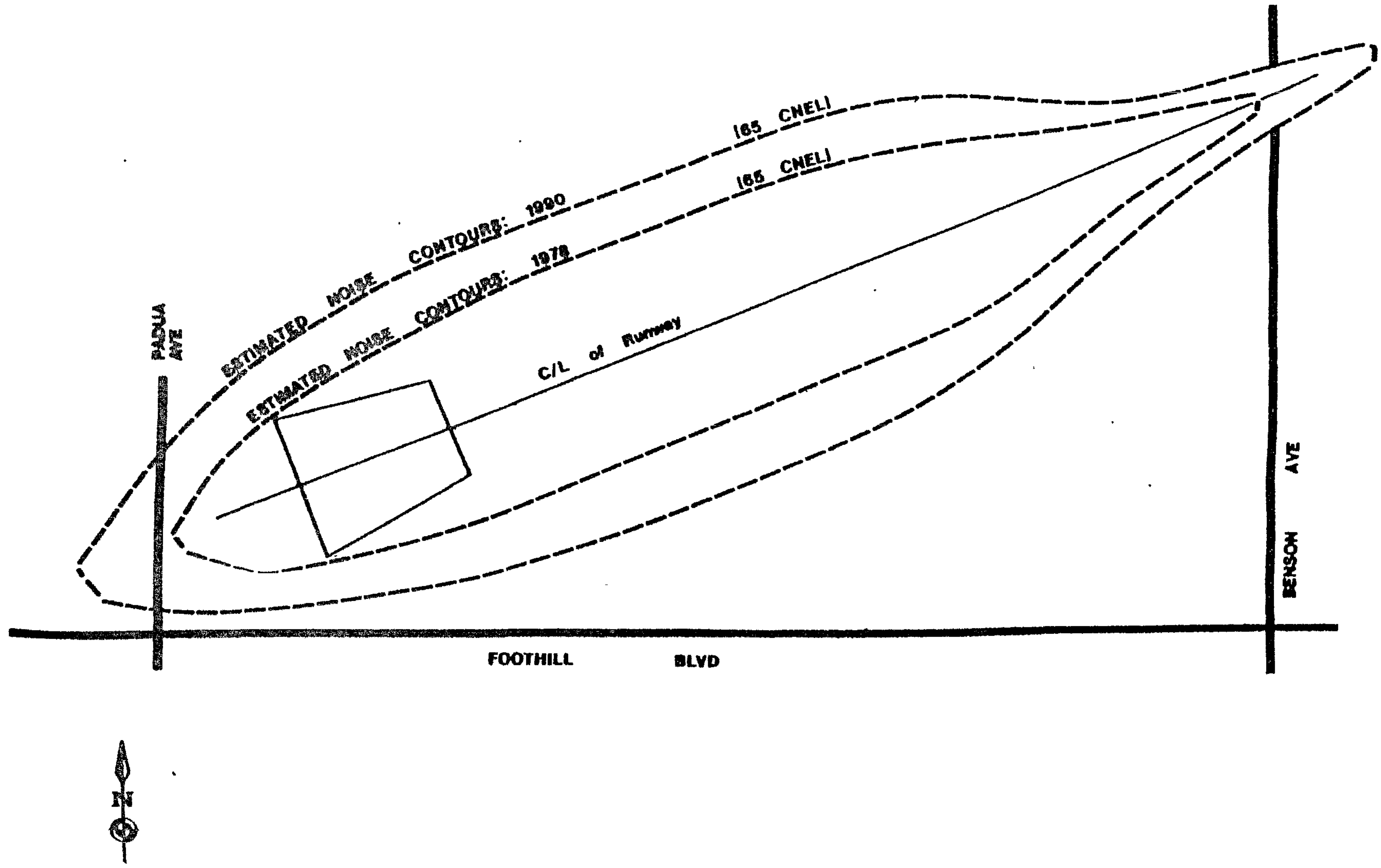


FUTURE NOISE ENVIRONMENT

Source: City of Chino Hills General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-11

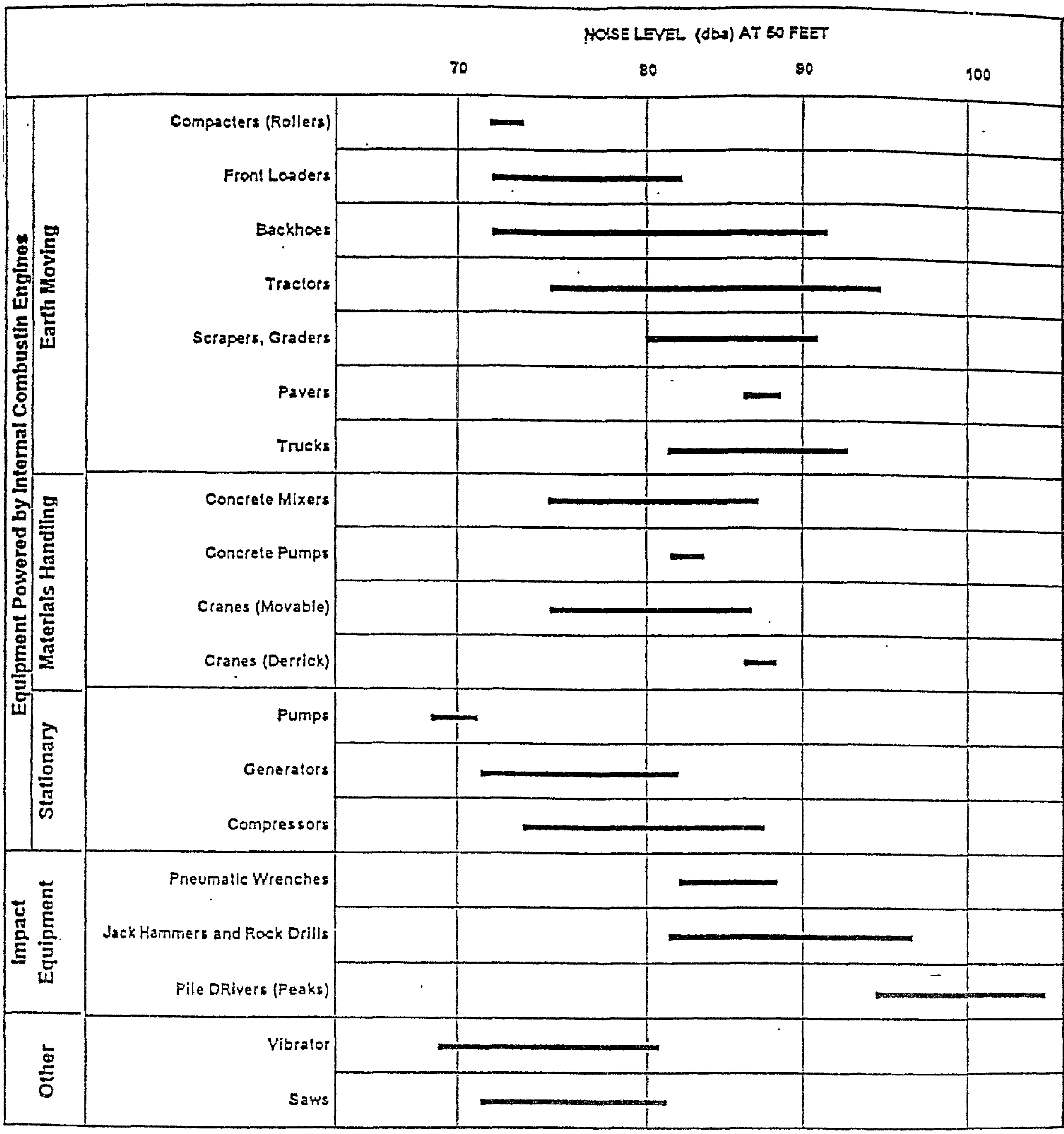


CABLE AIRPORT NOISE CONTOURS

Source: City of Upland General Plan

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-12



Source: EPA PB 206717, Environmental Protection Agency, Dec. 31, 1971, "Noise from Construction

CONSTRUCTION EQUIPMENT NOISE

Source: Amendment to the Southwestern Industrial Park Specific Plan EIR

TOM DODSON & ASSOCIATES
Environmental Consultants

FIGURE 4.11-13

4.12 PUBLIC SERVICES

4.12.1 Introduction

This subchapter of the PEIR relies primarily upon data contained in a previous planning document prepared in support of the Chino Basin Water Resources Management Study and the general plans and other pertinent planning documents for the project area. These planning documents include the "Final Task 1 Memorandum, Water and Wastewater Planning Environment" (1993) and the general plans for the following agencies: cities of Chino Hills, Chino, Fontana, Ontario, Montclair, Norco, Pomona, Rancho Cucamonga, and Rialto; the counties of Riverside and San Bernardino; and the Southern California Association of Government publications: RCPG and RMP. The evaluation focuses on the public services supplied to the Study Area and the potential impacts to these service systems from implementing the OBMP.

4.12.2 Environmental Setting: Public Services

4.12.2.1 Police

Police protection within the proposed Study Area is provided by forces from the cities, the Riverside County Sheriff, the San Bernardino County Sheriff and the California Highway Patrol. Levels of Service are established within the General Plans for the cities and unincorporated portions of the two counties and these are met based upon the overall population of the specific jurisdiction.

4.12.2.2 Fire and Emergency Services

Fire and Emergency Services within the Study Area are provided by forces from the individual cities, area fire protection agencies, the Riverside County Fire Department and the San Bernardino County Fire Department. As with police protection, levels of service are established within the General Plans for the cities and unincorporated portions of the two counties and these are met based upon the overall population of the specific jurisdiction.

4.12.2.3 Schools

School facilities are administered through the school districts within the Study Area. The school districts work closely with the cities and unincorporated portions of the counties to ensure that adequate facilities are provided and future facilities are planned to meet the growth within their respective districts.

4.12.2.4 Libraries

Like parks, open space, recreational facilities and cultural opportunities, libraries contribute to the quality of life in a community. These community facilities can enhance a region's character as a good place to live and raise a family. In addition, a good library system contributes to the quality of educational opportunities in the area. Library facilities are provided throughout the Study Area by the cities and counties. Again, these are provided according to levels of service established through the respective jurisdictions General Plans.

4.12.3 Project Impacts: Public Services

The implementation of the OBMP will result in direct physical change to existing land uses within the Study Area by providing a more efficient and effective water supply to meet long-term, ultimate growth and development projections within the Study Area. The public service issues of focus in this evaluation are those changes in the environment due to the project that may increase demand for public services that would exceed the capacity of the existing service system to provide at an adequate level of service.

4.12.3.1 Threshold of Significance

The public service issues of concern in this evaluation are increased demand for services without adequate existing capacity or comparable increases in capacity from implementing the OBMP. The following criterion will be used to determine whether a significant public service impact will be created by the proposed project:

- The project will result in significant impacts to public services if it causes demand for a service to exceed a system's capacity and creates a need to develop new service system capacity without a means of funding the required system capacity expansion.

a. Will the project cause a significant demand for police protection services?

The project will not cause a significant demand for police protection services. Implementation of the OBMP will result in direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for additional police protection services beyond that anticipated in the jurisdiction’s General Plans. The Study Area is currently served by police departments and agencies under authority of the various jurisdictions that comprise the Study Area. Aside from a threat of trespass, the type of facilities being proposed by the OBMP do not have a potential to create new demand for police services. Although probably not significant, illegal trespass can be minimized by controlling access to OBMP construction areas and operating facilities, such as recharge basins or desalters. Overall levels of police service will also be increased based upon the future population based demands of the local agencies. No potential for any significant demand for police protection services is identified. Mitigation is proposed to address trespass issues.

b. Will the project cause a significant demand for fire protection services?

The project will not cause a significant demand for fire protection services. Implementation of the OBMP will result in direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for additional fire protection services beyond that anticipated in their General Plans. Fire protection is currently provided by fire departments and agencies under authority of the various jurisdictions that comprise the Study Area. Any OBMP project requiring structures will be required to meet building codes, including those related to fire protection. Mitigation is not required to reduce potential structural fire hazards to a non-significant level. Overall levels of fire service will also be increased based upon the future population based demands of the local agencies. No potential for any significant demand for fire protection services is identified and no mitigation is required.

c. Will the project cause a significant demand for school room capacity?

The project will not cause a significant demand for school room capacity. As stated above, implementation of the OBMP will result in direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for additional school room capacity beyond that anticipated in the local agency's general plans. Implementation of the OBMP is not forecast to change existing land uses or increase either the number of residential units located within the Study Area or the number of students generated from the Study Area beyond that anticipated in the local agency general plans. School districts in the Study Area have adopted classroom loading standards (number of students per classroom) and collect development fees per square foot of residential, commercial and industrial development. Because the proposed project is not forecast to change land uses, or create activities that can increase demand for additional school capacity beyond that anticipated in the jurisdiction's General Plans, and because there are adopted classroom loading standards (number of students per classroom) and development fees are collected for new development, no potential for adverse impacts to schools is identified. No mitigation is required for schools on behalf of OBMP projects..

d. Will the project cause a significant demand for library capacity?

The project will not cause a significant demand for library capacity. Implementation of the OBMP will result in direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for additional library capacity services beyond that anticipated in local agency general plans. Libraries are currently provided by the County and local agencies under authority of the various jurisdictions that comprise the Study Area. OBMP projects will not produce any direct demand for library capacity or contribute to indirect demand for such services. Mitigation is not required to reduce potential library capacity impacts to a non-significant level since none is forecast to occur. Overall levels of library service will also be increased based upon the future population based the demands of the local agencies. No potential for any significant demand for library services is identified and no mitigation is required.

4.12.4 Mitigation Measures

The following mitigation measures are recommended as a condition of Project approval to mitigate impacts to library resources:

4.12-1 OBMP facilities shall be fenced or otherwise have access controlled to prevent illegal trespass to attractive nuisances, such as construction sites or recharge sites.

4.12.5 Unavoidable Adverse Impact

The public services impact evaluation presented above indicates that implementation of the proposed project will be consistent with the Study Area jurisdiction's general plan land use designations. Implementing the proposed project is not forecast to cause any direct or indirect significant adverse public service impacts after implementation of the mitigation measure outlined above. Therefore, no significant unavoidable adverse public services impacts are forecast to occur if the OBMP is approved and implemented for the Chino Basin.

4.12.6 Cumulative Impact

The OBMP activities are specifically designed to provide a more efficient and effective program for managing all of the water resources that occur within the Chino Basin. The proposed project has been evaluated as being fully consistent with the Study Area general plans and has been determined not to contribute to future growth as envisioned in the Study Area land use planning documents. This conclusion is based on two lines of reasoning: first, the OBMP replaces existing sources of water and water resources management that would have been used by individual water serving agencies to meet future growth that is envisioned in the general plans and therefore, implementing the OBMP does not remove any constraint on growth; and second, the provision of water to future development within the Chino Basin is determined to be growth accommodating, not growth inducing. The OBMP can be implemented without causing or contributing to future significant cumulative growth or development within the Chino Basin. Based upon this analysis, implementation of the proposed project is not forecast to contribute to any significant increases in demand for public service that could be considered cumulatively significant and adverse.

4.13 UTILITIES

4.13.1 Introduction

This subchapter of the PEIR addresses the above issues and has been compiled by relying primarily upon data contained in a previous planning document prepared in support of the Chino Basin Water Resources Management Study and the general plans and other pertinent planning documents for the project area. These planning documents include the "Final Task 1 Memorandum, Water and Waste-water Planning Environment" (1993) and the general plans for the following agencies: cities of Chino Hills, Chino, Fontana, Ontario, Montclair, Norco, Pomona, Rancho Cucamonga, and Rialto; the counties of Riverside and San Bernardino; and the Southern California Association of Government publications: RCPG and RMP. The evaluation focuses on the utilities supplies to utilized by the proposed project and the potential impacts to these utility systems from implementing the proposed project.

4.13.2 Environmental Setting: Utilities

4.13.2.1 Electricity/Natural Gas

Electricity

Electricity in the Study Area is provided by SCE. Utility policies allow the individual connections to purchase electricity from a variety of sources, but this electricity will still be distributed to consumers over SCE's electricity distribution system. The existing consumption of electrical energy within the Study Area has not been quantified.

The energy consumption of new buildings in California is regulated by the State Building Energy Efficiency Standards, embodied in Title 24 of the California Code of Regulations. The efficiency standards apply to new construction of both residential and non-residential buildings, and regulate energy consumption for heating, cooling, ventilation, water heating, and lighting. These building efficiency standards are enforced through the local building permit process.

Natural Gas

Available natural gas supplies are sufficient to meet the existing needs of the community. However, the availability of natural gas supplies can be affected by external influences and may not always be accessible. The amount of natural gas consumed by users within the Study Area have not been quantified.

4.13.2.2 Communication Services

Telephone service is provided to the Study Area by General Telephone (GTE). The total number of phone connections in the Study Area have not been quantified. GTE's system is demand responsive and it expands its phone system capacity based on commercial demand for service which it identifies through continuous evaluation and forecasts of service.

Cable television services are provided by a variety of companies through a franchise granted by the various jurisdictions. Cable television is demand responsive and the company has not encountered any constraints in providing service to residents of the Study Area. The total number of cable connections in the Study Area have not been quantified.

4.13.2.3 Wastewater Collection and Treatment Facilities

The following summary of wastewater collection and treatment facilities is abstracted from Chapter 2 of the OBMP. This section summarizes existing and proposed municipal wastewater treatment and disposal plans for the Chino Basin study area for the planning period of 2000 through 2020. Existing municipal wastewater treatment facilities are described briefly along with a review of present and projected wastewater flows. Future treatment and disposal plans for the study area are also discussed.

Wastewater Flow Projections

Wastewater flow projections are made using a combination of methods similar to water demand projections. Depending on the planning data available, wastewater flow projections are made using per capita-based, EDU-based, area-based, and water consumption-based methods. The per capita method uses projected populations and average unit wastewater flows per person (90-110 gallons per day per person). EDU-based projections use unit flows per equivalent dwelling unit (EDU), where an EDU is the average amount of sewage generated by a single-family residential household (about 270 gallons per day). EDUs are estimated for commercial and industrial land uses using fixture unit counts or estimated wastewater flows. Flow projections are computed by projecting future EDUs and multiplying by the unit flow per EDU. Area-based methods typically use unit flow factors for each land use type. Flows are computed by multiplying the unit factor for each land use type by the corresponding acreage and totaling the individual flows for each land use type. Water consumption-based methods compute wastewater flows based on the difference between water demand and water consumption. Water consumption is the amount of water that does not return to the sewer system and is a function of the particular land use type and water use group. Currently, most wastewater flow projections in the study area are based on either per capita or EDU methods.

LACSD Service Area. The Los Angeles County Sanitation Districts (LACSD) furnishes wastewater services for Pomona and Claremont. Using the SCAG-98 growth projections and a wastewater generation factor of 110 gpcd, the wastewater flows for this area are estimated to increase from 22,000 acre-ft/yr to 30,000 acre-ft/yr in 2020.

IEUA Service Area. IEUA develops ten-year wastewater forecasts for its service area in conjunction with its annual capital improvement plan (CIP). As part of its current CIP, IEUA also prepared a fifty-year projection of wastewater flows. These projections indicate wastewater flows will increase from 57,000 acre-ft/yr in 1997 to 112,000 acre-ft/yr in 2020. This represents an increase of 96 percent.

Riverside County Service Area. Wastewater collection for the portion of the study area in Riverside County is provided by several agencies including Jurupa Community Services District and Norco. Other portions are unsewered. Wastewater flows for the Riverside County area are estimated to increase from 10,000 acre-ft/yr in 1997 to 15,000 acre-ft/yr by 2020 based on projected population increases. This includes wastewater generated by unsewered areas. Additional wastewater from outside the study area is expected to be treated at the Western Riverside Regional Water Reclamation Plant. However, no estimates of these additional flows were received.

Treatment and Disposal

Seven agencies are responsible for wastewater treatment and disposal for their respective areas. In Los Angeles County, LACSD is the treatment and disposal agency. In western San Bernardino County, IEUA and the City of Upland perform this role. In the easterly portion of the study area, the City of Rialto provides this service. In Riverside County, several agencies are responsible for wastewater treatment, including the cities of Riverside and Corona, and JCSD.

There are three basic wastewater service areas within the study area. These areas include:

- LACSD System (Los Angeles County)
- IEUA System (Western San Bernardino County)
- Riverside County

LACSD System. The LACSD provides regional wastewater collection and treatment for most of Los Angeles County. LACSD is divided into districts that handle wastewater management within their service areas. LACSD No. 21 provides this service for the Claremont, La Verne, and Pomona service areas. Urban and industrial wastewater flows from the Los Angeles County portion of the study area are collected by the cities of Claremont, La Verne, and Pomona. This wastewater is routed to LACSD No. 21 for treatment at LACSD's Pomona Water Reclamation Plan (WRP) and San Jose Creek WRP. With the exception of recycled water used by the City of Pomona from the Pomona WRP, all wastewater reaching the sewer system is exported out of the study area. The Pomona WRP has capacity of 15 million gallons per day (MGD) and is expected to operate at that level during the planning period.

IEUA System. IEUA has constructed a Regional Sewerage System within its service area to collect, treat and dispose of wastewater delivered by contracting local agencies. The contracting cities and water districts are responsible for wastewater collection within their individual service areas. A system of regional trunk and interceptor sewers that convey sewage to regional wastewater treatment plants is owned and operated by IEUA. IEUA's wastewater collection system is divided into two major service areas: the Northern Service Area and the Southern Service Area.

IEUA currently operates four wastewater treatment plants: Regional Plant No. 1 (RP1), Regional Plant No. 2 (RP2) Regional Plant No. 4 (RP4), and Carbon Canyon Water Reclamation Plant (CCWRP). A fifth regional plant, known as Regional Plant No. 3 (RP3), is no longer in service. One new treatment plant, Regional Plant No. 5 (RP5), is in the planning stages. All of these plants are or will be capable of producing effluent that meets Title 22 requirements for water reclamation. Figure 2-62 illustrates the projected flows and capacity staging of these plants. Each of these plants are described below.

Regional Plant No. 1. Although RP1 is designed to treat 44 MGD, the capacity was downrated to 32 MGD in 1992 due to more stringent permit requirements. The plant has been expanded and is presently operating at 44 MGD. A 1996 Regional Board cease and desist order requires the plant to be restored to its design capacity by 1999. RP1 is expected to operate at near its design capacity and treat wastewater flows from its service area and excess flows from RP4 until 2014. A plant expansion to about 56 MGD is planned to be on-line by 2014 to meet increased flows from its service area.

Regional Plant No. 2. RP2 serves the City of Chino and surrounding areas. A 1994 cease and desist order by the Regional Board requires the plant to be flood protected or relocated. Consequently, the plant will be potentially abandoned and its capacity replaced by a new RP5 by 2003. Solids handling facilities will continue to operate at this site.

Regional Plant No. 4. RP4 is a 7-MGD wastewater treatment facility that recently began operation. The plant will be expanded to 14 MGD by 2008 and 21 MGD by 2021. Population growth and corresponding wastewater production in the northeastern region of the District, including portions of City of Fontana and Cucamonga County Water District will determine the rate of expansion.

Carbon Canyon Water Reclamation Plant. Carbon Canyon Water Reclamation Plant (CCWRP) became operational in May 1992. CCWRP is designed to produce recycled water that can be used for non-potable purposes including industrial and irrigation uses in the western region of the Chino Basin. The initial design capacity of 10.2 MGD is planned for increase to 15.3 MGD in the year 2014. Sludge generated at the CCWRP is treated at the RP2 sludge processing facilities and will be for the foreseeable future.

Regional Plant No. 5. Growth in the southern portion of the IEUA service area will require additional treatment capacity. IEUA plans to construct a new RP5 by 2001. The initial phase of this plant will be 12 MGD of which 5 MGD will replace capacity at RP2. The new RP5 is expected to serve the San Bernardino Agricultural Preserve area as well as treating 3.6 MGD from southern Ontario. A second phase expansion to 22.5 MGD is projected to be completed by 2008 with a third phase expansion by 2021.

Western Riverside County Regional Wastewater Treatment System. The Western Riverside County Regional Wastewater Authority, a Joint Powers Authority, has constructed a regional wastewater treatment facility to serve portions of Jurupa CSD, Norco, Home Gardens Sanitary District and Western MWD. This facility is located in Western Riverside County near the intersection of McCarty Road and Hellman Avenue. This facility has an initial treatment capacity of 8.5 MGD. The treatment plant will be expanded to an ultimate capacity of 13.3 MGD. The facility provides tertiary filtration and nitrogen removal to meet projected discharge requirements. Effluent from this plant will be discharged to the Santa Ana River. Projections of flows to this plant are not available as of the date of this report.

4.13.2.4 Solid Waste Disposal

Solid waste disposal sites are those facilities used for the final disposition of wastes onto land. Wastes are categorized by the State into four general types: Class I (Hazardous), Class II (Designated Wastes), Class III (Municipal) and Inert Wastes.

Solid waste from the Study Area is disposed of one of several landfills, located in both San Bernardino and Riverside Counties. The Cities and Counties are encouraging source reduction and recycling objectives that meet or exceed the requirements of State Assembly Bill 939, which mandates a 50 percent reduction in waste volumes from 1990 levels by the year 2010. In addition, hazardous waste can be landfilled or recycled at several facilities throughout the State. Any hazardous wastes generated within the Study Area are managed in accordance with existing laws and regulations. These materials are stored and handled in accordance with federal and state requirements.

4.13.2.5 Water Supplies

The following summary of wastewater collection and treatment facilities is abstracted from Chapter 2 of the OBMP.

Current and Future Water Demands

The purpose of this subsection is to describe the current and projected water demands and supplies for agencies that produce groundwater from the Chino Basin. This information will serve as the basis for identifying future water resources issues in the Chino Basin area. Updated forecasts of water demands and supplies were requested from each Chino Basin water agency and industrial producer. Requested data included demands, water supply plans by individual well or source, well construction and operating data, and water production and treatment costs. Many agencies provided updated information. Where responses were incomplete, previous information developed as part of the 1995 Chino Basin Water Resources Management Study (CBWRMS) was used. The planning period for this evaluation is 2000 to 2020.

Growth Projections. There are several indicators of potential growth within the Chino Basin study area. These include population, housing, employment, and land use. The Southern California Association of Governments (SCAG) periodically develops population, housing, and employment projections. SCAG prepares growth projections as part of its regional transportation planning for Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. The most recent SCAG projection is SCAG-98, which was adopted in April 1998.

The SCAG-98 projection indicates the six-county region will grow from 15.6 million people in 1994 to 22.4 million in 2015. This represents an increase 6.7 million people between 1994 and 2015 and a growth rate of 43 percent. San Bernardino and Riverside counties are projected to grow at a rate that is more than double the regional average. San Bernardino County is projected to grow from 1,558,000 people in 1994 to 2,830,000 in 2020. Riverside County is projected to increase from 1,377,000 people in 1994 to 2,816,000 in 2020.

Subchapter 4.3, Tables 4.3-1 through 4.3-3 summarize the population projections for the Chino Basin area. The SCAG projections were desegregated by city and census tract and combined by water purveyor service area. These projections indicate population will increase from 971,000 in 1994 to 1,631,000 in 2020. This is a growth rate of 68 percent or 2.6 percent per year. The population in some water service areas in the San Bernardino County portion of the Basin are projected to increase by as much as 125 percent.

Total housing is projected to increase from 284,000 units in 1994 to 496,000 in 2020, a growth rate of 75 percent. By comparing population and housing, the average occupancy is projected to decrease slightly from 3.4 to 3.3 persons per dwelling unit.

Employment is projected to increase from 316,000 jobs in 1994 to 702,000 jobs in 2020, a growth rate of 122 percent.

Water Demand Projections. Current water demands and supply projections form the basis for evaluating future water management programs in the Chino Basin area. Water demands are developed based on the water service areas shown in Subchapter 4.5, Table 4.5-15.

Water demand projections can be developed by several different methods. These include per capita, water duty and units of use approaches. The most frequently used methods are the per capita consumption method and the water duty method.

For this assessment, all water demands are based on information provided by the water agencies. In the absence of agency data, the assumptions in the CBWRMS have been used. These projections have been compared with the current SCAG projections. However, no adjustments to he demands have been made.

Projected water demands for the Chino Basin are presented in Subchapte 4.5, Table 4.5-17. This table indicates that Chino Basin area water demands will reach 348,000 acre-ft/yr in 2000 to 418,000 acre-ft/yr in 2020. Significant municipal water demand growth is expected to occur in the agricultural preserve area. This will result in increased demands for the Cities of Chino, Chino Hills and Ontario, and Jurupa Community Services District. Agricultural water demands are expected to decrease during the planning period as land is converted to urban uses.

Water Supply Plans

The principal water supplies in the Chino Basin area are groundwater pumped from the Chino Basin, other local groundwater and surface water, imported water purchased from Metropolitan Water District of Southern California (MWDSC) and recycled water. The amounts of water utilized from each source are based on data provided by each water purveyor. If data was not provided, the supplies area based on projections developed for the Chino Basin Water Resources Management Study (1995). Each of these sources is discussed below. Tables 4.5-19 and 4.5-20 present projected water supply plans for appropriators in the Chino Basin area. Table 4.5-16 summarizes the water demands by major source categories. Review of Table 4.5-16 shows that there will be about 40,000 to 50,000 acre-ft/yr of Chino Basin production that will incur a replenishment obligation. The replenishment obligation can be met by the recharge of imported and reclaimed water, in-lieu replenishment involving imported water, and from water in local storage accounts. In the long run, the replenishment obligation of about 40,000 to 50,000 acre-ft/yr will need to be met with imported and recycled water. Thus the imported and recycled water components in Table 4.5-17 should sum to a total of 40,000 to 50,000 acre-ft/yr higher.

Chino Basin Groundwater. The Chino Basin is the largest groundwater basin in the Upper Santa Ana Watershed. Water is reallocated from the Overlying Agricultural Pool to the Appropriative Pool when it is not put to use by the agricultural users. As agricultural production declines, the reallocations to the Appropriative Pool will increase. Total production from the Chino Basin is projected to range between 180,000 to 190,000 acre-ft/yr over the planning period. Production in excess of safe yield must be replaced through the purchase of replenishment water, which is imported into the Chino Basin, by the Watermaster.

Other Local Supplies. Other local water sources provide a portion of the water supplies for Chino Basin water agencies. These supplies include surface water and groundwater.

Surface Water. A number of water supply agencies, which produce groundwater from the Chino Basin, obtain a portion of their water supplies from local surface water sources. These agencies include the: City of Pomona, City of Upland, Cucamonga County Water District, Fontana Water Company, San Antonio Water Company, West End Consolidated Water Company, and West San Bernardino County Water District. The principal surface water sources include San Antonio Canyon, Cucamonga Canyon, Day Creek, Deer Creek, Lytle Creek and several smaller surface sources. For the most part, these surface water sources are fully developed and no significant additional supplies are anticipated to be developed in the future. Usage is expected to rmain at 16,000-17,000 acre-ft/year.

Other Groundwater. Other local groundwater supplies represent a significant supplemental source of water for Chino Basin water agencies. Other groundwater supplies in the study area include the Claremont Heights, Live Oak, Pomona and Spadra Basins in Los Angeles County, the Riverside South and Temescal Basins in Riverside County, and the Colton-Rialto, Cucamonga, Lytle Creek Bunker Hill, and Riverside North Basins in San Bernardino County. Agencies using other local groundwater include: City of Pomona, City of Upland, Cucamonga County Water District, Fontana Water Company, San Antonio Water Company, Southern California Water Company, West End Consolidated Water Company, and West San Bernardino County Water District. These supplies may increase slightly in the future as additional wells are constructed. However, most of these sources are essentially fully developed. Descriptions of these groundwater basins were presented in the CBWRMS Final Report (1995). The aggregate supply from these basins is currently 63,000 acre-ft/yr and is projected to be 76,000 acre-ft/yr in 2020.

Imported Water. Two regional agencies are responsible for imported water deliveries within the study area: MWDSC and San Bernardino Valley Municipal Water District (SBVMWD). MWDSC is a wholesale water agency serving supplemental imported water to 27 members (city and water agencies) in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of more than 16 million people. Approximately one-half of the total water used throughout the entire MWDSC service area is imported water purchased from MWDSC to supplement the local water supplies in its service area. MWDSC obtains imported supplies from the Colorado River and the State Water Project (SWP). The demand for direct delivery of imported water for the Chino Basin purchased from MWDSC is projected to increase from about 68,000 acre-ft/yr in 1997 to 129,000 acre-ft/yr by 2020, an increase of about 90% percent. The demand for replenishment water in the Chino Basin could reach 40,000 acre-ft/yr by 2020 if reclaimed water is not used for replenishment or direct uses and water in local storage accounts is not available for use as replenishment.

SBVMWD is a wholesale water purveyor in the easternmost portion of the study area and adjacent portions of San Bernardino County. SBVMWD is a SWP Contractor having an entitlement of 102,600 acre-ft/yr. In addition, SBVMWD is responsible for basin management in the Bunker Hill basin. The City of Rialto and West San Bernardino County Water District obtain water from SBVMWD through its Baseline Feeder that supplies Bunker Hill groundwater (included in other groundwater above).

Recycled Water. There are several existing sources of recycled water in use within the Chino Basin study area. These are the Pomona Water Reclamation Plant (operated by the Los Angeles County Sanitation Districts), Regional Plants 1, 2 and 4, and Carbon Canyon Water Reclamation Plant operated by IEUA, Upland Hills Water Reclamation Plant operated by the City of Upland, CIM Water Reclamation Plant operated by the California Institution for Men at Chino, and Indian Hills

Water Reclamation Plant operated by Jurupa Community Services District. For this section, only existing and planned recycled water uses that will be implemented in the next two years are included in the water supply plans. This is about 11,500 acre-ft/yr.

Summary. The plans summarized in this section represent the current non-OBMP water supply plans of each individual water agency, as qualified previously. Future evaluation of these plans may indicate problems relative to their long-term feasibility. Availability of imported water supplies will have a significant effect on plan feasibility.

4.13.3 Project Impacts: Utilities

The implementation of the OBMP will result in direct physical change to existing land uses within the Study Area by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area. The utility issues of focus in this evaluation are those changes due to the project that may increase demand for utilities that would exceed the capacity of the existing service system to provide at an adequate level of service.

4.13.3.1 Threshold of Significance

The utility issues of concern in this evaluation are increased demand for utility capacity without adequate existing capacity or comparable increases in capacity from implementing the OBMP. The following criterion will be used to determine whether a significant utility impact will be created by the proposed project:

- The project will result in significant impacts to utilities if it causes demand for a utility to exceed the system's capacity and creates a need to develop new utility service system capacity without a means of funding the required system capacity expansion.

a. Will the project cause a significant demand for electricity and natural gas services?

The project will not cause a significant demand for electricity or natural gas services. Implementation of the OBMP will result in a direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for additional electricity or natural gas service beyond that anticipated in the jurisdiction's's General Plans. Portions of the Study Area are currently served by distribution lines. New lines will need to be installed into areas where services are not currently available. No potential for any significant electricity or natural gas service system impacts are identified. No mitigation is required; however, mitigation measures are recommended as conditions of Project approval to further insure the insignificance of Project related impacts upon utility purveyors and to insure that energy conservation is practiced.

b. Will the project cause a significant demand for communication system services?

The project will not cause a significant demand for communication service systems. Implementation of the OBMP will result in a direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for additional communication services beyond that anticipated in the jurisdiction's General Plans. Portions of the Project Area are already served by both GTE and cable service with adequate connections located in the Area. New services will need to be installed into areas where services are not currently available. The project is not forecast to create growth or new connections that would place additional demands on communication systems. No potential for any significant communication service system impacts are identified. No mitigation is required; however, mitigation measures are recommended as conditions of Project approval to further insure the insignificance of Project related impacts upon utility purveyors.

c. Will the project cause a significant demand for wastewater collection or treatment system capacity?

The project will not cause a significant demand for wastewater collection or treatment system capacity. Implementation of the OBMP will result in a direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for wastewater collection or treatment system capacity beyond that anticipated in the jurisdiction's General Plans. The project is not forecast to create growth or new connections that would place significant demand on either the existing wastewater collection or treatment systems. No mitigation is required; however, mitigation measures are recommended as conditions of Project approval to further insure the insignificance of Project related impacts upon utility purveyors.

d. Will the project cause a significant demand for solid waste disposal capacity?

The project will not cause a significant demand for solid waste disposal capacity. Implementation of the OBMP will result in a direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for solid waste disposal capacity beyond that anticipated in the jurisdiction's General Plans. Because the proposed project is not forecast to change land uses, increase population, or otherwise create activities that can increase demand for additional solid waste disposal capacity beyond that anticipated in the jurisdiction's General Plan land use designations, no potential for adverse impacts to the Study Area landfills are identified. No potential for any significant solid waste disposal impacts is identified. No mitigation is required; however, mitigation measures are recommended as conditions of Project approval to further insure the insignificance of Project related impacts upon utility purveyors.

e. Will the project cause a significant demand for water supply capacity?

The project will not cause a significant demand for water supply capacity. Implementation of the OBMP will result in a direct physical change to existing land uses within the Study Area which will facilitate indirect changes in land use by contributing to an adequate water supply to meet long-term, ultimate growth and development projections within the Study Area; however, it is not forecast to change land uses or otherwise create activities that can increase demand for water supply capacity beyond that anticipated in the jurisdiction's General Plans. The OBMP activities are specifically designed to provide a more efficient and effective program for managing all of the water resources that occur within the Chino Basin. This would serve to meet the existing and future demand of development and improve flow requirements for the Project Area. This activity could facilitate increased development; however it also designed to meet the existing development and land use designations within the Study Area. The project is not forecast to create growth or demand for new connections that would place additional demand on the existing water supply system beyond that anticipated in the jurisdiction's General Plans. No potential for any significant water supply impacts are identified. No mitigation is required; however, mitigation measures are recommended as conditions of Project approval to further insure the insignificance of Project related impacts upon utility purveyors.

4.13.4 Mitigation Measures

The following mitigation measures are required as conditions of Project approval, where appropriate, to further ensure the insignificance of Project related impacts upon utility purveyors and to insure that energy conservation is practiced, the following measures should be incorporated into individual projects as deemed appropriate:

Electricity

4.13-1 Developers in the proposed Project Area should coordinate with SCE and other power companies regarding the location and phasing of required on-site electrical facilities.

4.13-2 Proposed building construction should comply with Title 24 of the California Administrative Code (i.e., Uniform Building Code).

4.13-3 Onsite electrical lines should be installed underground.

4.13-4 Project planners and architects should consult with SCE regarding current energy conservation techniques.

4.13-5 Project planners and architects should also consider the use of energy-efficient architecture and landscape design concepts which will work to reduce the long-term demands for fossil fuels. Such measures should include the following:

- **Architectural planning and design, to the extent feasible, should take full advantage of such concepts as natural heating and/or cooling through sun and wind exposure and solar energy collection system opportunities when practical; and**

- **Landscape design should be tailored, where feasible, to the use requirements of individual structures, with the intent to minimize heat gain in summer, maximize heat gain in winter, and promote air circulation for heating and cooling purposes.**

Natural Gas

4.13-6 Natural gas service to the proposed Study Area should be in accordance with the appropriate purveyors policies and extension rules as required. These are on file with the California Public Utilities Commission. In addition, the following general measures are recommended:

- **The thermal insulation installed in walls and ceilings should meet the standards established by the State of California.**

- **All buildings should be constructed in conformance with Title 24, Part 6, Division T-20, Chapter 2 of the California Administrative Code.**

- **Windowless walls for western exposures and sill orientation of buildings to use solar heating systems and efficient heating-cooling systems should be installed whenever feasible.**

- **The use of landscaping to moderate building heat gain, such as the use of deciduous trees in parking areas and on the southern and western exposures of buildings to provide shade during the summer, yet allow maximum light and heat during the winter, should be encouraged.**

- **Energy conservation methods that could be readily incorporated into a development should be conceived during the design phase of Plan related development projects. Consultation with the appropriate purveyors during the design phase will facilitate the process of adapting the project's architectural design to maximize efficient energy use.**

Wastewater

The following mitigation measures are recommended as conditions of project approval:

4.13-7 Wastewater treatment facilities/distribution system improvement/expansion projects shall precede or be concurrent with all growth generating projects as required to maintain adequate system capacity levels.

While not recommended as conditions of Project approval, the following recommendations are presented for consideration and long-term implementation as appropriate:

4.13-8 Measure 4.13-8 was determined to not apply to the OBMP, the measure has been deleted. The deletion of the measure will not have any significant effect on the implementation of the OBMP since it only applied to developer capacity fees that are in no way related to the OBMP.

4.13-9 All industrial and commercial users should take on-site measures to reduce the load strength of their sewage.

Solid Waste

The following mitigation measure is recommended as a condition of project approval.

4.13-10 All proposed development/redevelopment projects within the proposed Study Area that will generate solid waste, shall be reviewed on a project-by-project basis by the permitting jurisdiction in coordination with County landfill officials to determine the degree of impact upon remaining landfill capacity. Projects should be approved only after it is determined that the additional solid waste generated can be disposed of within existing landfill facilities.

Water Supplies

The following mitigation measures are recommended as a conditions of approval for individual projects implemented under the OBMP:

4.13-11 All Plan-related development/redevelopment projects including exterior landscape elements shall employ xeriscape plant design and water conservation concepts. At a minimum xeriscape requirements shall include the following:

a. The use of drought-tolerant species, drip irrigation systems, soil moisture sensors, and automatic irrigation systems, when appropriate.

b. Extensive use of mulch in all landscaped areas. Use of mulch will improve water holding capacities of the soil by reducing evaporation and erosion.

c. A minimal use of lawn, except to accommodate-lawn dependent uses such as playing fields. Warm-season grasses shall be used.

d. The use of gray water separation storage and transmission systems when feasible for irrigation purposes.

The following measures are *not* recommended as conditions of project approval, but are presented for the decision-making body's consideration and long-term implementation, as appropriate.

4.13-12 The conservation of water should be of significant concern to all citizens in Southern California, and some conservation proceedings are presently mandated by state legislation. As such, the following measures should be implemented for all Plan related construction projects when appropriate to comply with state legislation:

- **Plumbing fixtures that reduce water usage should be utilized (i.e., low-volume toilet tanks, flow-control devices for faucets and shower heads) in accordance with Title 24 of the California Administrative Code.**

- **The use of drought-tolerant plant species and drip irrigation systems should be considered in order to reduce water usage.**

- **Installation of ultra-low flush toilets in all new construction should occur.**
- **Installation of low-flow showers and faucets in accordance with California Administrative Code, Title 24, Part 6, Article 1, T20-1406F should occur.***

Recommendations to be implemented where applicable:

Interior

- **Supply line pressure: recommend water pressure greater than 50 psi be reduced to 50 psi or less by means of pressure-reducing valve.**

- **Flush valve operated water closets: recommend three gallons per flush.**

- **Drinking fountains: recommend installation of self-closing valves.**

- **Pipe insulation: recommend all hot water lines in dwelling units be insulated to provide hot water quickly with less water and to prevent hot pipes from heating cold pipes.***

Exterior

- **Preserve and protect existing trees and shrubs. Established plants are often adapted to low water conditions and their use saves water needed to establish replacement vegetation.**

- **Group plants of similar water use to reduce over-irrigation of low-water-using plants.**

- **Provide information to occupants regarding benefits of low-water-using landscaping and sources of additional assistance.**

- **Use pervious paving material whenever feasible to reduce surface water runoff and to aid in ground water recharge.**

- **Grade slopes so that runoff of surface water is minimized.***

* Indicates that a modification to the mitigation measure has been made for clarification purposes in response to comments received on the DEIR.

4.13.5 Unavoidable Adverse Impact

The utility impact evaluation presented above indicates that implementation of the proposed project will be consistent with the Study Area jurisdiction's general plan land use designations. Implementing the proposed project is not forecast to cause any direct or indirect significant adverse land use impacts after implementation of the mitigation measures outlined above. Therefore, no significant unavoidable adverse utility impacts are forecast to occur if the OBMP is approved and implemented for the Chino Basin.

4.13.6 Cumulative Impact

The OBMP activities are specifically designed to provide a more efficient and effective program for managing all of the water resources that occur within the Chino Basin. The proposed project has been evaluated as being fully consistent with the Study Area jurisdictions general plans and has been determined not to contribute to future growth as envisioned in the Study Area jurisdictions general plans. This conclusion is based on two lines of reasoning: first, the OBMP replaces existing sources of water and water resources management that would have been used by individual water serving agencies to meet future growth that is envisioned in the general plans and therefore, implementing the OBMP does not remove any constraint on growth; and second, the provision of water to future is determined to be growth accommodating, not growth inducing. The OBMP can be implemented without causing or contributing to future significant cumulative growth or development within the Chino Basin. Based upon this analysis, implementation of the proposed project is not forecast to contribute to any significant increases in demand for utilities that could be considered cumulatively significant and adverse.

4.14 CULTURAL RESOURCES

4.14.1 Introduction

"Cultural Resources" is a term meant to encompass both archaeological, historic, and prehistoric resources. Archaeological and historic resources may occur together on the same site. Although cultural resources are in fat man-made, they occur on the landscape as a result of previous human activities, and thus must be addressed in the CEQA process in a manner similar to natural resources.

Archaeological resources are the physical remains of past human activities, and can be either prehistoric or historic in origin. Such resources include artifacts, refuse, and features in both surface and subsurface contexts, an are greater than 50 years in age and/or meet other established criteria to qualify as historic in nature.

- Prehistoric archaeological resources may include the remains of villages and campsites, food processing locations, lithic (stone) resource procurement and tool-making location, and burial and cremation areas. They may also consist of trails, rock are and geoglyphs (ground figures) and isolated artifacts. Prehistoric archaeological resources are the result of cultural activities of the ancestors and predecessors of contemporary Native Americans, and in many cases, retain special traditional and sacred significance for those people.

- Historic archaeological resources include refuse deposits such as can and bottle dumps, filled-in privy pits and cisterns, melted adobe walls and foundations, collapsed structures and associated features, and roads and trails. They may relate to mission activities, travel an exploration, early settlement, homestead activities, cattle and sheep herding, lumbering, and mining, among other themes. In San Bernardino County, historical archeological resources date from the earliest Spanish Mission activities (ca. 1770) to the turn of the century.

Historic resources are intact structures of any type that are 50 years or more of age. These resources are sometimes called the "built environment" and include houses or other structures, irrigation works, and engineering features, among other items.

Paleontological Resources are the fossil remains or traces of past life forms, including both vertebrate and invertebrate species, as well as plants. These resources are found in geologic strata conducive to their preservation, typically sedimentary formations.

All vertebrate fossils are considered to be significant; other kinds of paleontologic resources must be evaluated individually for significance depending on their potential scientific value.

Known cultural resources are those which have been identified through formal recognition on one or more of the following inventories: National Register of Historic Places, California Archaeological Inventory, California Historic Resources Inventory, California Historical Landmarks, and Points of Historic Interest.

The purpose of this EIR is to provide the Inland Empire Utilities Agency (IEUA) and other interested parties with the necessary information and analysis to determine whether the proposed undertaking would have any adverse effects on cultural resources, as defined by the National Historic Preservation Act (NHPA) Section 106 and CEQA, that may exist within the APE.

4.14.2 Existing Environmental Setting

The proposed project involves the possible construction and/or modification of both new and/or existing facilities; with activities including pipeline installation and possible earthmoving operations. The nature and potential location of projects within the project area is relatively uncertain at this time, however along the Baseline Feeder, the pipeline will be installed in an area that has already been previously disturbed and excavated. In most cases, pipelines will be installed along existing roadways and easements where development has already occurred, thus the chances of uncovering previously unidentified cultural resources are diminished. During desalter, well and basin construction, the chances of encountering cultural resources are greater than along existing roadways, however the actual potential of discovery at each location is substantially different in nature, and is highly site/project specific. The locations within the project area boundaries with known sensitivity for cultural resources have been identified as a result of the archival records search discussed below.

4.14.2.1 Project Area History

The project area lies mostly within the traditional territory of the Gabrielino, a Native American group generally considered to be the most populous and most powerful ethnic nationality in aboriginal southern California. The Gabrielino's territory was centered in the Los Angeles Basin, but their influence spread as far as the San Joaquin Valley, the Colorado River, and Baja California. Along the eastern edge of the project area, the Gabrielino's territorial claim overlapped with the those of two other Native American groups: the Serrano of the San Bernardino Mountains, and the Luiseño of the Perris-Elsinore region. During the 19th century, a late influx of Cahuilla from the San Gorgonio Pass and Coachella Valley occurred in the present-day Riverside-San Bernardino region, further complicating the ethnic composition of the native population in the early historic period.

Although the first European explorers traveled through the vicinity as early as the 1770s, for more than half a century the arid inland area received little physical impact from the Spanish colonization activities along the Pacific coast. After the establishment of Mission San Gabriel in 1771, the project area gradually became a loosely defined mission rancho used for food production, including crops and cattle, but no Europeans are known to have settled in the area until the late 1830s. In 1834, the Mexican government, which had inherited Alta California from Spain when it gained independence in 1821, began to dismantle the mission system through the process of secularization. Like all other former mission land holdings throughout Alta California, the rancho was divided and granted to various prominent citizens of the territory. Between 1838 and 1846, several large private ranchos was created in and around the project area, including Santa Ana del Chino, Cucamonga, Jurupa, La Sierra (Sepulveda), La Sierra (Yorba), and El Rincon. As elsewhere in southern California during the Rancho Period, cattle raising was the most prevalent economic activity on these ranchos, until the influx of American settlers eventually brought an end to this now-romanticized lifestyle during the second half of the 19th century.

In the 1880s, spurred by the completion of the competing Southern Pacific and the Santa Fe Railroads, a land boom swept through much of southern California. A large number of towns, surrounded by irrigated agricultural land, were laid out in the project area before the end of the 19th century. Following the successful introduction of the naval orange in the mid-1870s, the project area became an important part of southern California's prosperous citrus industry. In the meantime, different communities in the project area also developed distinctive local characteristics in their economic and social life. The Chino area, for example, was long known as the dairy capital of southern California, while the Rancho Cucamonga area was closely associated with vineyard cultivation and wine-making. By the mid-20th century, however, the forces of industrialization and urbanization began to rapidly alter this predominantly agrarian setting of the project area. In particular, the establishment of the Kaiser Steel Mill in the early 1940s dramatically changed the cultural landscape of the Fontana area. During the more recent decades, due to the ever increasing demand for affordable housing by commuters who work in the Greater Los Angeles area, citrus groves and vineyards have given way to housing tracts, as the cities and towns in the project area took on more and more of the characteristics of "bedroom communities."

4.14.2.2 Archival Records Search

The Archaeological Information Center (AIC) at the San Bernardino County Museum, Redlands, provided the records search service for this study. The AIC is the official cultural resource records repository for San Bernardino County, and as part of the California Historical Resource Information System, is established and maintained under the auspices of the Office of Historic Preservation.

During the records search, Robin Laska, AIC Assistant Coordinator, checked the Center’s electronic database for previously identified historical/archaeological resources in or near the project area, and existing cultural resources reports pertaining to the vicinity. Previously identified historical/archaeological resources include properties designated as California Historical Landmarks, Points of Historical Interest, or San Bernardino County Historical Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resource Information System. Also, areas of known and potential paleontologic sensitivity have been evaluated for this project. Maps are available at the County Museum Curator.

In addition to the search conducted for San Bernardino County, CRM Tech conducted the cultural resources search for the portion of the project area located within the boundaries of Riverside County. This summary to follow describes the results of the background research that was conducted. The results of record searches for both counties are depicted in Figures 4.14-1. The detailed reports of the record searches are available at the San Bernardino County Museum Archeological Information Center and at IEUA headquarters in Fontana.

4.14.2.3 Summary of Findings

Figure 4.14-1 shows the general location of sensitive cultural resource sites within the Project Area. The purple areas are known to contain sites that may be historic and prehistoric in nature. Prehistoric sites are typically food processing sites, which contain metates, manos, pestles, and mortars; campsites that contain flakes, flaked tools, food processing equipment, and possible pottery; village sites which contain a whole range of artifactual material; and other assorted isolated finds. The historic site types are usually sites where structures used to stand; farming occurred; mining took place; lumber was milled; powerlines, telephones and telegraph lines were located; power was generated; walls, canals, ditches or flood control sites were constructed; or where refuse was disposed. These sites typically contain foundations, pipes, trash, privy pits, orchards, barns, corrals, animal pens, dams and/or historic trash.

There are whole communities that have been subsumes into larger ones or just left to deteriorate. Additionally, railroad stations, railroads, and railroad grades may occur under roadways of more recent construction.

On Figure 4.14-1, several of the oldest streets in the area have been highlighted. Being some of the oldest transportation routes in the County, streets such as Foothill Boulevard, Baseline Road, Summit Avenue, etc. all have numerous old structures located along their path. Many of these structures are greater than 50 years old and qualify for consideration in the Historical Register. Areas highlighted in green on Figure 4.14-1 are known to have historic standing structures. A few of these structures are listed as California Points of Historic Interest, California Historic Landmarks, or are eligible or listed on the California Historic Register. The Bloomington Garage, the Yorba Slaughter Adobe, and the Boulder 1,2,3 Powerlines up at the northern portion of the project area are all listed on the National Register. Other historic structures locate along these old roadways include wineries, vineyards, cemeteries (both historic and prehistoric), and some old family plots and ethic plots that do not appear on any current maps.

Sensitive areas for cultural resources within Riverside County also appear on Figure 4.14-1. These areas contain similar resources to those described above for San Bernardino County.

Throughout the Chino Basin there is a significant potential for encountering cultural resources, even in pre-existing roadways where pipelines might be installed. Also, areas that have not been surveyed, but where sites can be reasonably expected to be encountered are any creek, river, waterway, spring, foothill area, or flat area on the hills and mountains. Site in these types of locations are generally pre-historic. Historic sites can be found anywhere there is flat, arable land, old streets, old railroads, old roads, or close proximity to water or mountain areas (which are historically used for resorts, summer cattle ranching, and mining areas). (SBC AIC, April 2000)

4.14.3 <u>Project Impacts</u>

Activities requiring the excavation or movement of soil material at any location within the project area have the potential to adversely effect cultural resources. The impact evaluation presented below focuses on the proposed physical changes to site landscape and any potential adverse impacts these changes may have on the cultural resources that exist on the site. For purposes of the following analysis of cultural resource impacts, it is assumed that the project will be approved and implemented as proposed and described in the Project Description, Chapter 3 of this document.

The development of land within the project area would include installing new infrastructure systems. These water supply facilities are consistent with any land use designation, and thus could conceivably be located anywhere within the basin. The cultural resource issues of focus in this evaluation are related to the types of possible alterations in the existing substrate from construction of OBMP facilities, and the potential damage or loss of historical structures that exist within the Project Area that may be impacted from implementing this project. The project proposes construction of new facilities on approximately 728 acres of land within the project area. The exact location of project component facilities is not yet defined, thus a general evaluation of cultural resources will be conducted in order to provide guidance for the siting of future project facilities.

4.14.3.1 Thresholds of Significance

The purpose of this study is to identify any cultural resources within or adjacent to the project area, and to assist the IEUA in determining whether such resources meet the official definitions of "historic resources," as provided in the California Public Resources Code, in particular CEQA.

According to PRC §5020.1(j), "historical resource' includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." Specifically, CEQA guidelines states that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing the California Register of Historical Resources, included in the local register of historical resources, or determined to be historically significant by the Lead Agency (Title 14 CCR §15064.5(a) (1)-3)).

Regarding the proper criteria for the evaluation of historical significance, CEQA guidelines mandate that "a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR

§15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

A significant cultural resource impact would be any one impact that resulted in the damage, disturbance or destruction of an archeological, paleontological, or other historic/cultural resource.

a. Will the project disturb, damage, or destroy cultural resources?

The proposed project is designed to enhance and maintain water supplies and water quality within the Chino Basin, and to create the necessary infrastructure and supporting facilities to achieve these goals within the Project Area. Implementation of project-related facilities in the Project Area could encounter, destroy, or permanently alter the paleontologic sites and resources known to exist within the Project Area. The loss or significant damage to resources or their information value would be a significant impact of the proposed project. Mitigation measures have been identified below that will minimize paleontologic site damage and disturbance. Implementation of these measures can ensure that paleontological resources are managed in a manner that does not cause significant adverse impacts.

The cultural resource analysis completed for the project area indicates that there is a high probability for encountering prehistoric archaeological resources, historic archaeological resources and historic resources in certain localities within the project area boundaries. The potential for encountering cultural landscapes and ethnic landscapes is unknown at this time, as the exact site locations for OBMP facilities have yet to be defined. The mitigation measures proposed below require a thorough cultural resource evaluation prior to project implementation and provide measures to minimize impacts through avoidance, and at worst, through recovery and preservation. In this way, the potential impact to cultural resources is considered to be less than significant with the implementation of the identified measures.

Mitigation measures ensure that archaeological and historical sites and resources will not be damaged or disturbed without preserving the resources and their information value. Implementation of these measures can ensure that archaeological and historical resources are managed in a manner that reduces impacts to a less than significant level by working through the established process defined below, by avoiding the site, or if impacts could still remain significant, then further site specific environmental documentation will be prepared by a qualified professional.

4.14.4 Mitigation Measures

Mitigation measures are required to reduce potential archaeological, paleontological and historical resource impacts to a non-significant level. The following mitigation measures are recommended as conditions of Project approval for projects being developed in areas that have not been previously evaluated for cultural resources.

4.14.4.1 Archaeology

4.14-1 Inventory: A required basic archaeological inventory should encompass the following guidelines:

a. Literature and Records Search - Existing maps, site reports, site records, and previous EIRs in the region of the subject area should be researched to identify known archaeological sites and works completed in the region. All maps, EIRs, historical maps and documents, and site records should be cited in text and references. Local historical societies should also be contacted and referenced. State Information Centers will provide the bulk of this information. The San Bernardino County Archives or the Eastern Information Center at UC Riverside should be contacted.

b. Field Reconnaissance - Conduct a surface survey to obtain comprehensive examination of current status of the area and gather general understanding of the kinds of cultural and related phenomena present. At a minimum, all ground surfaces chosen for survey should be walked over in such a way that every foot of ground can be visually scanned. All previously recorded cultural resources should be revisited to determine their current status, and all newly discovered sites should be recorded on either State Form 422 or 523 and supplements, as appropriate. Trinomial designations will be obtained from the Information Center. For the inventory process, a compilation of all historical resources, including archaeological and historic resources older than 50 years, using appropriate State record forms, following guidelines in the California Office of Historic Preservation's handbook should be completed for all new discoveries. Two copies should be submitted to the San Bernardino County Archeological Information Center for the assignment of trinomials if discovered within San Bernardino County. Otherwise, the appropriate comparable agency in Riverside County shall be the recipient of these reports.

c. Report - A technical report should be prepared which fully describes both the methods and results of all efforts. Research sources should be listed, and the information summarized. The field work should be presented in detail, with all appropriate maps and graphics. Any areas not inspected with full intensity should be specified, preferably using clear, easily understood maps, and the reasons for the deficiency presented. Site records should be prepared for all new discoveries, and amendments prepared to update old records where necessary; since locational data are shielded from public access, the actual forms should be provided in the separable appendix, but the sites should be described in the main text. Each resource description should include a professional opinion of significance, with reference to the qualities or research potential which make it worthy of further consideration. Archaeological sites which need test excavation to confirm signifi-

cance, integrity, and boundaries should be identified, and a sampling program recommended.

For each potentially significant cultural resource, possible impacts should be listed and mitigating measures developed. All standards for compliance with the CEQA requirements and those of the lead agencies should be addressed.

4.14-2 Assessment

Properties shall be evaluated using a well-understood cultural context that describes the cultural development of an area and identifies the significant patterns that properties represent. This same historic context is used to organize all identification, registration, and preservation decisions within the planning framework. To be useful in subsequent stages of the planning process, evaluation decisions must make clear the significance of the property with the historic context. Potential preservation treatments should not influence the evaluation of significance (National Park Service n.d.:35).

The nature and type of assessment will depend on the particular resource(s) and level of information for a particular region. Consequently, it is not possible to prescribe specific methods to be utilized. However, there are certain basic elements that should be included and are as follows:

a. Preparation of a Research Design - Archaeological documentation can be carried out only after defining explicit goals and a methodology for reaching them. The goals of the documentation effort directly reflect the goals of the preservation plan and the specific needs identified for the relevant historic contexts.

b. Field Studies - The implementation of the research design in the field must be flexible enough to accommodate the discovery of new or unexpected data classes or properties, or changing field conditions. An important consideration in choosing methods to be used in the field studies should be assuring full, clear, and accurate description of all field operations and observations, including excavation and recording techniques and stratigraphic or inter-site relationships.

c. Report - The assessment report should evaluate the significance and integrity of all historical resources within the project area, using criteria established in Appendix K of the CEQA Guidelines for important archaeological resources and/or CFR 60.4 for eligibility for listing on the National Register of Historic Places. The report should contain the following information and should be submitted to the San Bernardino county Archaeological Information Center or to the Eastern Information Center at UC Riverside for permanent archiving:

   (1) Description of the study area;
   (2) Relevant historical documentation/background research;
   (3) The research design;
   (4) The field studies as actually implemented, including any deviation from the research design and the reason for the changes;
   (5) All field observations;
   (6) Analysis and results, illustrated as appropriate with tables, maps, and graphs;
   (7) Evaluation of the study in terms of the goals and objectives of the investigation, including discussion of how well the needs dictated by the planning process were served;

(8) Information on where recovered materials are curated and the satisfactory condition of those facilities to protect and to preserve the artifacts and supporting data. The County of San Bernardino requests that historical resource data and artifacts collected within this project area be permanently curated at a repository within the County.

d. In the event that a prehistoric or historic artifact over 50 years in age is encountered within the project area, especially during construction activities, all land modification activities in the immediate area of the finds should be halted and an onsite inspection should be performed immediately by a qualified archaeologist. This professional will be able to assess the find, determine its significance, and make recommendations for appropriate mitigation measures. Further, if human remains of any kind are encountered on the property, the San Bernardino or Riverside County Coroner's Office must be contacted within 24 hours of the find, and all work should be halted until a clearance is given by that office and any other involved agencies.

4.14-3 Monitoring

In situations where resources are potentially subject to direct or indirect impact and testing or data recovery is not proposed, an archaeological monitor and Native American observer/consultant should be present during subsurface work. One circumstance under which this might occur would be if a known resource was close to a area of impact and the site boundaries were ambiguous. Monitors help insure that exposed data or materials are collected and that if potentially significant cultural materials or features are encountered, they will be preserved either by realignment of the proposed facilities or by prompt evaluation and recommendations for any necessary mitigative measures.

4.14-4 Data Recovery

If an archaeological resource is found to be significant and no other preservation option is possible, mitigation of adverse effects by scientific data recovery, including analysis and reporting is the method of last resort. Such a mitigation program is usually only developed after an assessment test has been completed to identify physical parameters and cultural complexity, and formulate a research design. Each specific program would have to be developed in response to the site and potential impact, with the concurrence of the appropriate agencies and in consultation with Native American representatives.

4.14-5 Future Project Siting

Future project shall be located, whenever possible or feasible, outside of the highly sensitive cultural resource areas depicted in Figures 4.14-1. Before any projects are located, and before any construction activities begin, any proposed project that will result in ground disturbance to any area that does not have a complete cultural resource survey on record with either the AIC or the EIC offices will conduct a site specific cultural resource evaluation and report prior to any ground breaking activity. Further, if cultural resources have been identified on the site, a qualified archeologist or paleontologist will be retained to devise an excavation and/or curation plan for the resources, and a qualified cultural resource monitor will be present onsite during all construction-related activities that could potentially uncover previously undiscovered resources. This monitor will examine excavated soils and have the authority to cease construction activities if resources are un-earthed.

4.14.4.2 Architectural Resources

4.14-6 Based solely upon this level of investigation and at this stage of project planning, it would be premature to propose specific mitigation measures. However, certain options can be presented presupposing a general level of knowledge regarding impacts. These options can be utilized to avoid impacts upon the cultural resources - the preferred result - or to lessen adverse effects. It should be emphasized that these options are not the only ones that may be applied. As such, these measures are not recommended as conditions of Project approval but are included for the Authority's consideration and implementation as appropriate.

a. Conduct a comprehensive historic building survey which is integrated with economic development programs;

b. Adopt a preservation ordinance and create a preservation board;

c. Ensure other planning programs, plans, and ordinances are compatible to the historic preservation goals and policies;

d. Direct existing funding sources and loan programs to historic neighborhoods in need of revitalization;

e. Provide incentives and direction encouraging preservation and revitalization; and

f. Develop ongoing programs for enhancing public appreciation of historic resources.

g. Project Redesign

A proposed project may be redesigned in either of two ways:

(1) Outside of site boundaries, thus avoiding impact to the site; or
(2) Restricting impacts to those areas of a site where previous impacts have already destroyed the integrity and research potential.

Other options may also apply and may include capping of the site, relocation of structures, and integration of extant buildings into project design.

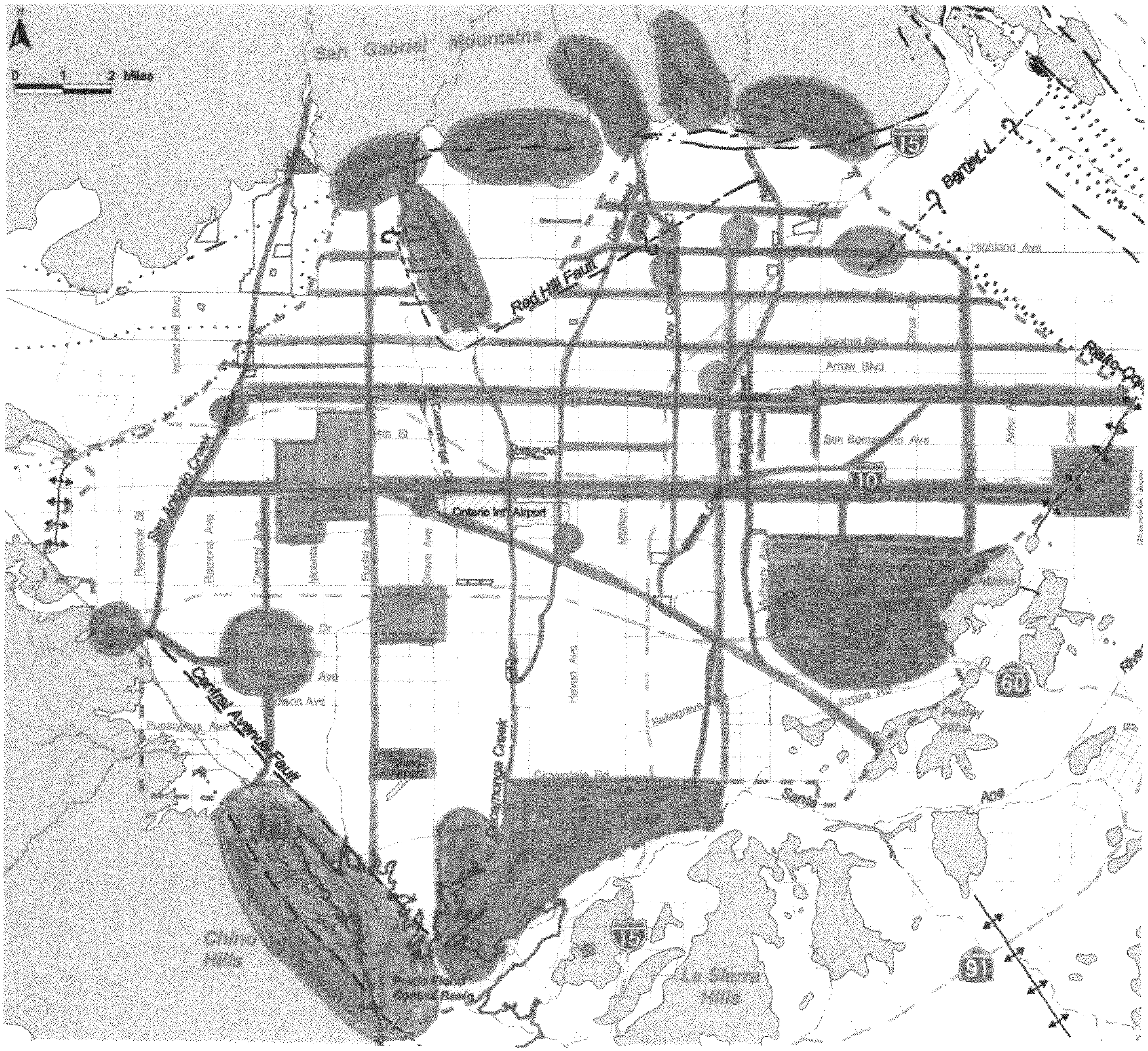
These measures ensure that the project area amendment will not cause significant impact to cultural resources. Mitigation will be accomplished through avoidance or recovery of all pertinent data from identified cultural resources sites within the Project Area. Implementing the above measures will contribute to routine environmental impacts associated with disturbing the ground during artifact and data collection.

4.14.5 Cumulative Impact

Cumulative cultural resource impacts can only occur when such resources are not avoided or are not recovered, evaluated and their data value placed in the broader contest of such resources. Based on the requirement to ensure that such resources are avoided or otherwise protected and evaluated, no cumulative significant cultural resource impacts are forecast to occur if the proposed project is implemented.

4.14.6 Unavoidable Adverse Impact

The cultural resource evaluation presented above indicates that, with implementation of appropriate mitigation measures, the proposed project will not cause any significant unavoidable adverse impacts. Therefore, no significant adverse cultural resource impacts are forecast to occur if the proposed project is implemented.



Legend

- Sensitive Areas for Prehistoric and Historic Resources
- Sensitive Areas for Historic Structures

SENSITIVE AREAS FOR CULTURAL RESOURCES Source: Archaeological and Eastern Information Centers	TOM DODSON & ASSOCIATES Environmental Consultants	**FIGURE 4.14-1**

4.15 AESTHETICS AND VISUAL RESOURCES

4.15.1 Introduction

Visual resources include natural and man-made features that give a particular environment its aesthetic qualities. Criteria used in the analysis of these resources include visual sensitivity, which is the degree of public interest in a visual resource and concern over adverse changes in its quality. Visual sensitivity is categorized in terms of high, medium or low levels.

High visual sensitivity exists in areas where views are rare, unique, or in other ways special, such as in remote or pristine environments. High-sensitivity views would generally include landscapes that have landforms, vegetative patterns, water bodies, or rock formations of unusual or outstanding quality (USAF, 1991).

This subchapter relies extensively on the aesthetics/scenic resources/open space evaluations contained in the general plans for the following: the cities of Chino, Chino Hills, Fontana, Montclair, Norco, Ontario, Pomona, Rancho Cucamonga, Rialto, and Upland; and the counties of Riverside and San Bernardino. The evaluation focuses on the potential aesthetic and visual resource impacts from implementing the OBMP.

4.15.2 Environmental Setting

4.15.2.1 Aesthetic and Visual Resources

Chino

The City is relatively flat as it lies on the alluvial valley floor of the Chino Basin. The City of Chino has visual access to the San Gabriel and San Bernardino Mountains to the north, the Jurupa Hills and Santa Ana Mountains to the east and south, respectively, and the Chino Hills to the west. The General Plan identifies the local mountains as providing the major scenic diversity and quality for the area. Further, it establishes General Plan Policy P5-16.1 in support of maintaining vistas. Policy P5-16.1 states "To ensure that vistas of the San Bernardino and San Gabriel Mountains and the Chino Hills are maintained for aesthetic enjoyment by City residents.

Chino Hills

Grass covered oak savannah woodland hillsides dominate the western and southern portion of the community and are a key aspect to the area's character. The hills are visible from nearly every neighborhood and major street within this community. Single-family neighborhoods penetrate into the hills in the northern half of the City, while most of the southern half is preserved as undeveloped open space. The principal component of the southern area is the Chino Hills State Park; a wilderness park of rangeland, oak woodlands, and chaparral of which 11.7 square miles is located within the City of Chino Hills.

Fontana

The central portion of the City of Fontana is located on an alluvial plain that gently slopes south from the San Gabriel Mountains. The northern portion of the City extends into the San Gabriel foothills and the southern portion of the City extends into the Jurupa Hills. The topography varies from, characteristically flat in the central portion of the City, to gently to steep sloping hillsides in the San Gabriel foothills and Jurupa Mountains to the south. For Fontana, views of the mountains at the northern and southern borders of the City are an important component of the City's aesthetic quality.

Montclair

The Community Design Objectives of the Montclair General Plan encourage the design of road and street improvements that protect or enhance the scenic vistas and values along the city's roadsides. Additionally, the City's objectives include the development of procedures to require aesthetic treatment on all new developments.

Ontario

The City of Ontario's General Plan identifies three primary visual resources: the Euclid Corridor, Mission Boulevard and the view of the San Gabriel Mountains. It is a goal of the City to preserve and protect Ontario's scenic highways and vistas as community assets. The general plan identifies implementation policies to address scenic resources. Two such policies are within Chapter 6.3 Scenic Highways/Vistas. General Plan Policy 5.1 requires that new development respect and preserve the view opportunities of existing development in the area. General Plan Policy 5.6 requires new development to place utilities underground to the maximum extent feasible.

Pomona

Most of the developed land within the City of Pomona is located on a gently sloping alluvial fan which originates at the mouth of the San Antonio Canyon and slopes gradually to the south and southwest. Within the city limits, the average slope consists of an average two percent grade. In the Pomona area, the San Antonio alluvial fan laps into the base on the San Jose and Puente Hills. The highest point in the Pomona, at 1,381 feet above sea level, is located in the portion of the Puente Hills known as the Westmont Hills. Elephant Hill, a well-known local landmark, attains an elevation of 1,165 above sea level.

Rancho Cucamonga

The City of Rancho Cucamonga lies on the sloping alluvial plain and extends into the foothills of the San Gabriel Mountains. As the City's most prominent natural feature , the mountains run east-west and form an impressive visual boundary to the north. From the base of the mountains, in the foothills, long, open vista to the south provide spectacular views of the City and the Chino Basin watershed. Another visual topographic feature within the City is Red Hill. At approximately 1,470 feet above mean sea level, Red Hill occupies a portion of the City's western boundary directly north of Foothill Boulevard.

Rialto

The City of Rialto is located on a wide alluvial plain at the base of the Cajon Pass which separates the San Gabriel Mountains and San Bernardino Mountains. Lytle Creek forms a major open area that bounds the eastern edge of the City.. The City of Rialto included as an optional element within their General Plan a Community Design Element. The element among other issues focuses on the protection and enhancement of existing aesthetic attributes and the promotion of community design. Primary visual resources include views to the north towards the San Gabriel and San Bernardino Mountains.

Upland

As the City of Upland's name implies, it is located on the upper alluvial fan of San Antonio Creek (northern and most elevated portion of the Chino Basin) where the City extends into the San Gabriel Mountain foothills. One goal of the City of Upland is to protect and enhance the scenic attributes of Euclid Avenue, Mountain Avenue, Foothill Boulevard and Benson Avenue. An additional goal is to achieve a system of potential scenic routes that will provide for increased enjoyment and opportunity for scenic pleasure driving and travel.

Riverside County

The County of Riverside addresses aesthetic resources in their Scenic Highways Element of their General Plan. Specifically, they see the enhancement of aesthetic opportunities for residents and visitors as playing an important role in promoting tourism. The participate in the State Scenic Highways Program and have identified State Route 71 as an eligible scenic route. The portion of Riverside County located in the Chino Basin encompasses a portion of the last remaining agricultural or pastoral landscape that occurs in the Basin. The area is essentially flat, bounded on the west and south by the Chino Hills, on the east by the Jurupa Hills and on the south by the Santa Ana Mountains. Aside from the visual assets of the pastoral landscape in this area, the open landscape without structures along each street provides good quality views to the surrounding hills and mountains in all directions.

San Bernardino County

The West Valley is the most heavily developed subregion in the County of San Bernardino. The County has designated the Cucamonga Flood Channel, San Gabriel MWD Aqueduct, and the proposed State Route 30, State Route 71 and State Route 83 as official scenic corridors. The County has established a process through their General Plan to make determinations as to scenic value on a case-by-case basis. There is only limited areas in the Chino Basin, primarily in the Fontana area and the City of Chino Sphere of Influence, where extensive areas remain under County jurisdiction. The former area is dominated by an urban landscape of primarily industrial land uses and the latter area can be characterized as pastoral, very similar to the description for Riverside County.

4.15.2.2 Light and Glare

Light and glare within the Chino Basin project area comes from public and private lighting used generally in the commercial and industrial districts, the street lighting in residential districts, and glare from vehicular headlights. Light and glare is a problem principally when exterior lighting shines on adjacent properties and either conflicts with adjacent existing uses or creates light pollution the diminishes the quality of the night-time visual setting for an area. In addition, light and glare can create hazards if not controlled adjacent to roadways.

Chino

Lighting issues are discussed within the Chino General Plan in Chapter 5 Conservation and Open Space Element. Specifically, Action Item A5-7.3.1 states "The City shall pursue the feasibility of requiring low pressure sodium lamps for all street lights and public parking lots."

Chino Hills

Lighting and glare issues are discussed within the Chino Hills General Plan in Chapter 6 Parks, Recreation and Open Space Element. Specifically, Policy 6-4 states "Maintain lighting levels suitable for safety as well as the nighttime use of community and city-wide facilities without undue glare impacts on nearby residential areas."

Fontana

Light and glare in the City are created by a number of sources both from public and private lighting. Traffic traveling on Interstates 10 and 15 and major local roadways, creates a large amount of glare and stray light. Exterior building lights usually used for security or promotional purposes, street lights, and school outdoor lighting all create additional light and glare. While adequate lighting is necessary for traffic and safety, security, and night activities, nearby residences and undeveloped areas are sensitive to high levels of light and glare during nighttime hours. Excess glare presents a safety hazard to drivers by restricting their vision.

Rialto

The City of Rialto within its General Plan has adopted polices and guidelines to address and control impacts from light and glare that may result from new construction and the introduction of new light/glare and shade/shadow sources.

Riverside County

The County of Riverside has adopted General Plan Policies to deal with lighting and glare impacts to the Mount Palomar Observatory. Projects within a 45-mile radius of the Observatory must adhere to special standards relating to the use of low-pressure sodium lights. Additionally, it is policy of the County of Riverside to require that all new developments shield and direct lighting sources downward to minimize conflicts with adjacent land uses.

The cities of Montclair, Norco, Ontario, Pomona, Rancho Cucamonga and Upland and the County of San Bernardino do not have specific General Plan guidelines or policies dealing with light and glare issues.

4.15.3 Project Impacts

4.15.3.1 Aesthetics and Visual Resources

The implementation of the OBMP would include installing new infrastructure systems within existing communities and providing water in a more efficient and effective manner to support development of existing land uses consistent with the existing general plan and zone designations. The aesthetic and visual resource issues of focus in this evaluation are related to the alterations in the existing visual character of the visual setting that exists within the Project Area or views to external areas that may be impacted from implementing the OBMP.

The preservation and enhancement of the positive visual aspects, as well as the assurance that new development is aesthetically pleasing, are key features of the general plans within the project area. New construction has the potential to conflict with the views of and from existing neighborhoods and structures. Determination of the visual impact of new development will ultimately have to be made at the specific project level, but guidelines are discussed and established below to ensure that future OBMP facilities and activities do not cause significant adverse aesthetic impacts..

4.15.3.2 Significance Criteria

For this analysis the proposed project will be determined to cause significant aesthetic, visual or light/glare impacts if its implementation will cause any of the following physical changes in the environment:

- The project is not consistent with the design guidelines contained in the local jurisdiction's general plan and other local plans;

- The change in the visual setting caused by a future specific project creates a substantial contrast or negative change to the existing visual setting; and

- The installation of night lighting creates a substantial conflict with adjacent uses or causes negative changes to an existing nighttime visual setting.

4.15.3.3 Aesthetic and Light/Glare Impact Analysis

a. Will the project have a significant affect on a scenic vista or scenic highway?

Future OBMP facilities will be underground (pipes), at ground level (recharge basins) and above ground in the form of typical structures that will be used to house wells or support desalter operations. The proposed project facilities and activities are not forecast to cause any significant adverse impacts to a scenic vista or scenic highway because these facilities will not be located in areas or be of a size to adversely impact such vistas or scenic highways.

There are eligible scenic highways within the OBMP project area, but no officially designated scenic highways. The County of San Bernardino does have scenic corridors within the project area and established planning standards that should be employed with development. With implementation of mitigation outlined below, development under the OBMP will be consistent with current general plan requirements for protecting scenic vistas and scenic highway visual values.

The most significant visual resources are the hills and mountains surrounding the Chino Basin and the pastoral landscape that occurs in the southern portion of the Chino Basin. The activity with the highest potential to conflict with local agency design guidelines is construction disturbance of the landscape. Such disturbance can be reduce to an acceptable level by landscaping or revegetating disturbed areas (pipelines, well pads, recharge basins, and structural developments (desalters)) either with landscaping that is consistent with local design guidelines or with native vegetation consistent with that which occurs naturally in the area.

b. Will the project have a demonstrable negative aesthetic effect?

The proposed OBMP facilities will utilize a combination of existing facilities, underground systems and new facility (desalter and recharge basin) construction to meet its objectives. Installation of surface facilities has a potential to modify the existing view or visual setting at future specific project sites which could cause a negative visual impact. Measures outlined above can ensure that construction disturbance is mitigated by replacing vegetation and controlling potential negative aesthetic effects due to landscapes scarring. For structures, such as desalters and well housings, compliance with local agency design guidelines will ensure that new facilities do not cause significant negative aesthetic effects..

c. Will the project create light or glare?

Some of the proposed OBMP facilities will require the installation of night lighting, possibly including areas where little or no night lighting currently exists. Glare from new light fixtures that may be installed as part of proposed Chino Basin OBMP improvements has a potential to cause a significant negative impact upon adjacent uses, including sensitive receptors such as residential, rural or wildlife habitat portions of the Project Area. Such impacts can be fully mitigated by implementing measures for street lighting and down shielded commercial lighting which are generally an accepted element of urbanization. Lighting can increase nighttime visibility and thereby achieve a greater degree of safety for motorists, residents, and business owners.

Future specific projects will include desalters and isolated well sites and these facilities may require the installation of infrastructure improvements and roadway improvements. Night lighting installed in support of future OBMP development projects will be mitigated to a non-significant level consistent with existing regulations controlling lighting requirements in each jurisdiction by controlling the amount of night light (lumens), by positioning of night lights, by selecting the appropriate type of lighting for the specific site and location, and by directing the lights through use of hoods and other directional controls.

The last potentially significant adverse light-and-glare impact relates to headlights from vehicles traveling on project area roadways. The majority of increased vehicle trips will be attributable to daytime construction and maintenance related trips to OBMP facilities in the future. The small number of nighttime trips (unquantifiable at this stage of review) is so small relative to existing trips on roadway that no significant cumulative contribution to headlight glare is anticipated to affect light sensitive receptor areas. No unusual or unique sources of light and glare are anticipated to be required in support of the OBMP..

4.15.4 Mitigation Measures

The scenic views from and toward the foothill and mountain areas should be protected against development impacts. This can be accomplished by carefully planning the location and extent of development and, in some cases, by clustering development to maximize open space and by encouraging the underground placement of utilities, where practicable.

4.15-1 All surface areas disturbed by OBMP construction activities, except those area used structures or hardscapes) shall be revegetated, either with native vegetation in natural landscapes or in accordance with a landscape plan in man-made landscape areas (note that native vegetation is also eminently suited to man-made landscapes and requires less maintenance). Once construction is completed, revegetation shall begin immediately and, where a formal landscape plan is being implemented, it shall be coordinated with the local agency and the local design guidelines for consistency.

4.15-2 Where facilities are proposed to be located adjacent to scenic highways, corridors or other scenic features identified in local agency planning documents, OBMP facility implementation will conform with design requirements established in these planning documents.

4.15-3 Where facilities will disrupt views from occupied areas with significant scenic vistas, a visual simulation analysis shall be performed of the facility's impact on the important view. If the analysis identifies a significant impact on a scenic vista, the facility shall be relocated, redesigned to reduce the impact to a non-significant level, or a subsequent environmental evaluation shall be prepared.

4.15-4 When OBMP above ground facilities are constructed in the future, the local agency design guidelines for the project site shall be followed to the extent that they do not conflict with the engineering and budget constraints established for the facility.

4.15-5 All utilities for OBMP facilities shall be placed underground unless such undergrounding is not technically feasible.

4.15-6 Future project review and implementation shall implement the following:

- **Use of low pressure sodium lights where security needs require such lighting to minimize impacts of glare.**
- **Height of lighting fixtures shall be lowered to the lowest level consistent with the purpose of the lighting to reduce unwanted illumination.**
- **Directing light and shielding shall be used to minimize off-site illumination.**
- **No light shall be allowed to intrude into sensitive light receptor areas.**

4.15.5 Unavoidable Adverse Impact

The aesthetics and visual resources evaluation presented above indicates that although the proposed project has a potential to cause changes in visual settings, no significant adverse impact to aesthetics or visual resources are forecast to occur based on implementation of mitigation measures. Therefore, no significant unavoidable adverse aesthetic or visual resource impacts are forecast to occur if the proposed project is implemented as outlined above.

4.15.6 Cumulative Impact

Since the proposed project has no potential to adversely impact any existing aesthetic qualities of the project area or significant views to or from the area after implementing mitigation measures, the proposed project cannot contribute to any cumulative adverse aesthetic or visual resource impacts.

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CHAPTER 5
ALTERNATIVES

5.1 INTRODUCTION

The California Environmental Quality Act (CEQA) and the State CEQA Guidelines require an evaluation of alternatives to the proposed action. Section 15126(d) indicates that the "discussion of alternatives shall focus on alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of not significant..." In this case no significant adverse impacts have been identified. The State Guidelines also state that "a range of reasonable alternatives to the project....which could feasiblely attain the basic objectives of the project" and "The range of alternatives required in an EIR is governed by "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice."

The proposed project would implement a groundwater management program that is designed to enhance the safe yield, to improve water quality, and enhance overall management of the water resources in the ~235 square mile Chino Groundwater Basin. The objective is to enable all groundwater users to produce water from the Basin in a cost-effective manner through the implementation of the Optimum Basin Management Program (OBMP) Elements.

Much of this discussion regarding alternatives to the proposed project is abstracted from the OBMP, Phase I Report dated August 19, 1999 and the Santa Ana Watershed Authority Watershed Plan and Water Resources Plan (WRP). One of the alternatives that must be evaluated is a "no project alternative" regardless of whether it is a feasible alternative to the proposed project, i.e., would meet the project objectives or requirements. Under this alternative the environmental impacts that would occur if the proposed project is not approved and implemented are identified. Under a "baseline" or no project alternative the individual water serving agencies would proceed with implementation of their agency water master plans as these documents are currently configured. In addition to the no project alternative, two other alternatives are evaluated in this chapter. These alternatives are:

1. No Project
2. Conjunctive Use Alternative
3. Santa Ana Watershed Project Authority (SAWPA) Alternative

The following evaluation will also include identification of an environmentally superior alternative as required by the State CEQA Guidelines.

5.2 NO PROJECT

Under the no project alternative, the safe yield and improvement to water quality could not be assured and the program elements and activities identified in Chapter 3 of this Program Environmental Impact Report (PEIR) would not be implemented as a cohesive program. Failure to implement the OBMP would result in a violation of the Chino Basin Judgement Ruling of February 19, 1998 which directed that the OBMP be developed and ultimately implemented. The management of the Basin would revert to the water serving agencies (WSAs) listed in Table 4.5-20 under this alternative.

In most circumstances, a "no project alternative" means that no development occurs and the status quo is maintained whether it be development at a lower density or the retention of land in a natural state. In this instance, the "no project alternative" means merely that the OBMP and its program elements would not be implemented as currently envisioned and the goal of equitably financing the OBMP would not be realized. It does not negate the need for WSAs to provide water, but it will shift the context in which water can be provided to water consumers in the Chino Basin. Ultimately the Judgment will mandate that water supplies be provided in a manner that will not adversely impact Basin safe yield. However, given the forecast for loss of agricultural pool production to rising surface water the safe yield of the Basin is forecast (Subchapter 4.5) to be reduced by approximately 40,000 acre-feet per year (af/y) to about 116,000 af/y. A concurrent impact of the reduction or elimination of agricultural pool production will be a comparable increase in rising water (this assumes that desalters are not funded or constructed by other agencies) which will substantially degrade discharge into the Santa Ana River at Prado. Wildermuth's analysis concludes that a consequence of this action is likely to be a requirement by the Regional Board to reduce the concentrations of TDS and nitrates from wastewater discharges to near zero in order to balance the increase in rising water.

The ultimate vision of future growth and development within the project area has been established in the governing Study area general plans, and it is assumed in these general plans that the WSA's have identified the infrastructure required to support the growth as it occurs in the future. The WSA's are effectively forced to create urban water management plans that can accommodate such growth, at least within the limits of current or future resources that may be available. At present the WSA water supply plans rely to a large extent on water importation. As a result, the cost of future water production is likely to rise substantially, and if State Project Water has concentrations of TDS higher than 300 mg/L, a potentially significant increase in salt can occur within the Basin.

Without the OBMP, WSA's would ultimately find it necessary or be forced to construct and install facilities similar to those proposed in the OBMP, such as installation of pipelines, new wells, new spreading basins, pump stations, desalter units, storage facilities and water treatment facilities to meet future water demand and water quality needs. If not implemented through the OBMP, the Court could be forced to utilize the Department of Water Resources to impose a comparable water management plan in the future. The costs of construction would not necessarily be economically feasible to individual jurisdictions or WSA's without the benefit of regional financing mechanisms.

It should be anticipated that implementation of groundwater management programs would occur more slowly, might never be fully realized and might have a diminished regional benefit if left to individual WSA's. There would be no difference in permitted land uses or development densities in the project area. This is because the land uses will be developed in accordance with the land use designations and development policies contained in the affected jurisdiction's general plans. One difference between the proposed project and the no project alternative is the inability to cohesively bring competing interests into alignment so that future water resources are managed to meet the overall benefit of the whole Basin, i.e., high quality and adequate water supplies to meet future needs. Some of the improvements identified within the OBMP might be developed by the individual WSA's, but not to a similar level of regional benefit.

Impacts of most natural and manmade resources that are dependent upon location would be similar under both the no project and project alternatives, but some impacts could be accelerated under the proposed project.

Under the no project scenario, the ability to attain the goals and objectives as described under Chapter 3, Project Description, in this PEIR would be virtually eliminated. The stakeholders in the Basin would be disabled in their attempt to collectively correct and mitigate conditions of water quality impairment and reduced water supplies (safe yield) to meet their build out development needs.

Project-related impacts are forecast to increase under the no project alternative in the short and mid-terms because of the lack of a coordinated approach to needed facilities within the individual service areas. Over the long-term mandatory programs could be imposed by the State to meet the Judgment's requirements and water resources and water quality might be brought under control, although this is not a foregone conclusion.

In the final analysis, the no project alternative clearly cannot be considered the environmentally superior alternative from a total environmental standpoint to the proposed project because the environmental damage from implementing water supply on a case-by-case basis is forecast to be substantially more significant than implementing the OBMP.

5.3 CONJUNCTIVE USE ALTERNATIVE

The conjunctive use alternative was selected by the IEUA based on a desire to meet as many of the management goals identified in the OBMP and to maintain/enhance safe yield for the Basin. The key elements of a conjunctive use program for the Basin would include:

- No maximum storage limit will be placed on local storage accounts for a period of five years ending on June 30, 2004, and water that becomes eligible for storage can be stored.

- The need for storage limits will be re-evaluated in five years based on the ability of the storing party to use the water in storage (ability to use concept) and on Watermaster's need for storage programs that provide regional benefits.

- Storage is not assignable.

- All water in local storage and other storage accounts will incur losses at a rate of 2 percent of water in storage each year starting in fiscal year 2002/03.

- The storage loss rate and safe yield will be estimated in the year 2012/13 and every ten years thereafter.

- Watermaster will develop regional conjunctive-use programs to store supplemental water for MWDSC and other entities that can cause supplemental water to be stored in the Basin.

- The regional conjunctive-use programs will provide benefits to <u>all</u> producers in the Basin, the people of California and the nation. Watermaster's conjunctive-use programs will take priority over conjunctive-use programs developed by others.

- Storage committed to conjunctive-use programs may consist of two parts, storage within the safe storage capacity and storage in excess of safe storage. Storage in excess of safe storage capacity will preemptively require mitigation.

- The initial target storage for Watermaster's conjunctive-use program will be 150,000 to 300,000 acre-ft within the safe storage capacity.

- Cyclic storage will be folded into conjunctive-use storage.

The Watermaster's conjunctive-use program envisions the following steps:

a. completion of an existing short-term conjunctive-use project;
b. identification of a seasonal peaking program for in Basin use and a dry year program to reduce the demand on Metropolitan Water District to 10 percent of normal summer demand (requiring 150,000 acre-ft of storage);
c. establishment of a dry-year export program; and
d. establishment of a seasonal peaking export program.

A conjunctive use program of this nature could have environmental impacts due to its operational characteristics as follows:

The placement of water into any conjunctive use storage account would be accomplished by several different means such as by in-lieu exchange, by spreading water in spreading basins or by injection wells. The delivery of water from the account to satisfy local demands or for export would be accomplished by pumping groundwater and placing it in delivery pipelines. The potential impacts from activities for the placement or delivery of water by these means were identified in Section 4.5 of the PEIR.

For a conjunctive use program with a storage account of 150,000 acre-feet, several injection wells, additional spreading basins and some system interconnections would be necessary. With regard to deliveries to a storage account, a significant amount of the deliveries could be accomplished by using surface deliveries in the winter months to satisfy local demands in-lieu of pumping groundwater to satisfy the demands. Production rates to make deliveries of water from an account of this size are not anticipated to be significantly higher than they currently are for normal peak deliveries. During times of drought when sources of supplemental water are reduced, deliveries to the account would not need to be made in the same year in which withdrawals are made, thus providing regional and statewide drought benefits in addition to the local benefits.

There are several impacts of concern for any conjunctive use program relate to localized water quality impacts, including mobilization of water quality anomalies, the number of recharge sites and site specific impacts, and the overall salt balance and rising water issues. But the most important concern is the potential for the additional water in the aquifer to rise to a sufficient elevation and encroach into the vadose zone where existing contaminants await dissolution with associated degradation of groundwater quality, particularly in the two upper subbasins.

The original analyses for the volume of water that could be stored in a conjunctive use program within the Chino Basin is 500,000 acre-feet (net). Given that the Basin is assumed to have approximately 200,000 acre-feet of *in lieu* storage at this time, the maximum conjunctive use water storage remaining in the Basin is 300,000 acre-feet.

For an expanded conjunctive use program of up to 300,000 acre-feet, it is not anticipated that significant mitigation would be required due to water quality or rising water concerns. This is because a program of this size is anticipated to be within the estimated “safe storage” area of the Basin. A program of this size, however, could require as much as 250 acres of spreading basins or a substantial number of injection wells. It could also require several miles of large pipelines to deliver water from the account, or to place water in the account. These pipelines are anticipated to be installed within existing easements and rights-of-way for this purpose. Production rates for a program of this size could be significantly higher than those necessary to satisfy local demands. However, it is anticipated that higher pumping rates will be necessary to maintain hydraulic control of the basin and minimize potential impacts from increased rising groundwater or high water levels.

There would be no difference in permitted land uses or development densities in the project area. This is because the land uses will be developed in accordance with the land use designations and development policies contained in the affected jurisdiction's General Plans.

Impacts of most natural and manmade resources would be increased by approximately 50% (estimated to be a total of about 750 acres), but as in the case of the OBMP the impacts to site specific resources would be dependent upon location as in the case of the OBMP. If the mitigation measures outlined in this PEIR are implemented for a conjunctive use program of 300,000 acre-feet, the environmental impacts should not be significantly different than that proposed by the OBMP, which would be implemented as proposed, in conjunction with the conjunctive use program.

Three potential issues will require substantial additional management attention if such a conjunctive use program is implemented. First, with so much water coming into the Basin, water managers would have to ensure that salt balance could be maintained in a concurrent time frame. The Regional Board has indicated that it does not believe the Basin has any remaining assimilative capacity and recharge with water that exceeds the existing groundwater TDS in the area of recharge will constitute a net salt increment to the Basin, regardless of whether the local water quality objectives are met. This issue is readily resolvable by monitoring TDS water quality and providing adequate desalinization of high TDS water in the lower portion of the Basin, while ensuring that Basin Plan objectives are met at the recharge site.

The second issue of concern is the effect of such a large volume of recharged water on rising water in Prado. Modeling of the Basin indicates that water recharged in the Basin will cause an increase in rising water unless the points of recharge and discharge are isolated from one another. The concept in the Basin Plan is to recharge water in the upper basins, pump some of the recharge in these areas for production, and then isolate the rising water by offsetting the difference in storage by pumping in the lower basin, in balance with reductions in agricultural production, to ensure that rising water does not increase substantially and cause a downstream impact. This is a critical balance that will require substantial modeling and monitoring data to develop. These issues are believed to be manageable, but there are numerous unknowns that will require substantial resources to effectively model, and then manage.

Finally, the recharge of 300,000 acre-feet of water in the Basin for conjunctive use will make it difficult to avoid mobilizing some of the major contaminated groundwater plumes within the Basin. This issue can be modeled and potential impacts associated with rapid expansion of plumes and loss of recharged water may be avoidable. However, it may be necessary to speed up the remediation of a contaminated groundwater plume in conjunction with a 300,000 af/y conjunctive use program. Such decisions can only be made after carefully evaluating the sites that may be used for recharging the groundwater stored as part of a conjunctive use program.

Under the expanded conjunctive use alternative there could also be additional impacts associated with air quality, biological resources, cultural resources noise, and traffic and circulation. The air quality impacts as a result of the conjunctive use alternative could increase emissions over short to mid-term time frame, but ultimately build-out would result in the same level of emissions. There would be increased noise resulting from increased construction anticipated as a result of additional basins and greater lengths of pipelines to be installed. Further, due to the increases in pipeline installations over those anticipated within the OBMP, there could be additional short-term hazards to vehicular traffic and pedestrians within construction zones.

The ability to attain the goals and objectives as described Chapter 3, Project Description in this PEIR, would be maintained under this alternative. For any conjunctive use program it would be necessary to establish some protective conditions, perhaps performance bonds, that could be used to mitigate adverse groundwater quality or rising water impacts. In any case, although the impacts for a conjunctive use program may be mitigated to a nonsignificant level, the scale of risk from such a program makes it a less environmental superior alternative compared to implementing the OBMP by itself.

In the final analysis, the conjunctive use alternative cannot be considered the environmentally superior alternative from a total environmental standpoint to the proposed project because the potential environmental damage from implementing the conjunctive use program poses greater risks, albeit similar to that from implementing the OBMP.

5.4 SANTA ANA WATERSHED PROJECT AUTHORITY ALTERNATIVE

The Santa Ana Watershed Project Authority (SAWPA) was formed in 1972 to plan and build facilities to protect water quality in the Santa Ana River watershed. The Santa Ana River watershed covers over 2,650 square miles of widely varying terrain within parts of San Bernardino, Riverside and Orange Counties. The organization is a joint powers agency composed of the five major water districts that share the Santa Ana River. The Authority includes the Inland Empire Utilities Agency (formerly Chino Basin Municipal Water District), Eastern Municipal Water District, Orange County Water District, San Bernardino Valley Municipal Water District, and Western Municipal Water District. Note that based on recent agreements among participants, this alternative could likely be implemented in conjunction with the OBMP and its participants.

The Santa Ana Watershed Project Authority alternative is meant to be implemented in conjunction with participating agencies in the Chino Basin. It would be implemented through a coordinated program with the Watermaster and contains additional projects that could augment the OBMP. The actual agency implementing specific components of this alternative would be determined on a case-by-case basis in the future. In its responses to OBMP Draft PEIR, SAWPA indicated that, in contrast to being two totally different alternatives, their "Chino Basin Cleanup and Conjunctive Use Plan" is more reasonably considered to be a complimentary watershed-wide strategy.

Similar to the OBMP, the SAWPA program is watershed based proposing a regional program to assure a sustainable water supply for the future, while at the same time seeking to enhance the environment. The goal of the program is to make the region entirely self sufficient during drought cycles, thereby firming up the region's ability to assure a stable economy, while improving water quality, and also allowing more of the State's scarce water resources to be allocated to wildlife and agriculture during those times. The program has four major elements:

a. Enhancement of the native habitat along the river and its tributaries;
b. Desalting and treatment of contaminated brackish water to allow poor quality water to be reclaimed and used;
c. Storage of water from wet years in groundwater storage basins to be used in drought; and,
d. Conservation, including water use efficiency and reclamation

The program seeks to manage the whole of the environment by placing equal importance on native habitat enhancement while managing water supply and quality. The SAWPA alternative proposes some of the same and other similar improvements as the OBMP in that new recharge basins, new wells, pipelines and desalters are proposed for construction. The Program includes Basin clean-up, conjunctive use, ground water replenishment in addition to watershed improvement plans, habitat enhancement and wetland development programs. The environmental impacts resulting from implementation of the SAWPA alternative would be similar to those occurring as a result of the OBMP implementation.

The environmental benefits of SAWPA alternative improvements would be an expansion of native habitat restoration programs and the creation of wetlands or open space designed as part of a long-term program.

In the final analysis, the SAWPA alterative would have comparable impacts to the OBMP and is therefore not a superior environmental alternative to the OBMP in terms of the facilities and management of water resources in the Basin. However, it does include a commitment to habitat enhancement, which if actually supported, could make it the environmentally superior alternative.

5.5 CONCLUSION

The three alternatives to the proposed project would be feasible but, as discussed above, they would not fully meet all OBMP goals and objectives as summarized in Chapter 3. Each of the three alternatives have associated environmental impacts that will not eliminate the single significant impact identified in this PEIR, air quality. The no project and conjunctive use programs are forecast to cause worse air quality impacts due to duplication of facilities under the former alternative and increased ground disturbance under the latter alternative. The impacts of the SAWPA alternative are comparable to the OBMP. Based on the analysis contained in this chapter, the proposed project, the

OBMP, is considered along with the SAWPA alternative to be comparably the environmentally superior alternatives available that will meet project goals and objectives.

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CHAPTER 6
TOPICAL ISSUES

6.1 GROWTH INDUCEMENT

Traditionally, significant growth is induced in one of three ways. In the first instance, a project is located in an isolated area and when developed it brings sufficient urban infrastructure to cause new or additional development pressure on the intervening and surrounding land. This type of induced growth leads to conversion of adjacent acreage to higher intensity uses, either unexpectedly or through accelerated development. This conversion occurs because the adjacent land becomes more suitable for development and, hence, more valuable because of the availability of the new infrastructure. This type of growth inducement is typically termed "leap frog" or "premature" development because it creates an island of higher intensity developed land within a larger area of lower intensity land use.

The OBMP will not cause or contribute to "leap frog" or "premature" development because the purpose of the OBMP is to provide an overall management strategy, tied to specific facilities and management actions, that will provide the Chino Basin with "*a groundwater management program that enhances the safe yield and the water quality of the Basin, enabling all groundwater users to produce water from the Basin in a cost-effective manner.*" (Page 3-1, OBMP). The OBMP is not intended to be directly involved in supplying municipal water supplies to customers. Thus, the Program and its implementation are one step removed from actual development and provisions of adequate water supplies in support of building-out each jurisdictions' general plan.

A second type of growth inducement is caused when a project of large size, relative to the surrounding community or area, is developed within a community and impacts the surrounding community by producing a "multiplier effect," which results in substantial indirect community growth, not necessarily adjacent to the development site or of the same type of use as the project itself. This type of stimulus to community growth is typified by the development of major destination recreation facilities, such as Disney World near Orlando, Florida, or around a military base, such as the Marine Corps Air Ground Combat Center near Twentynine Palms. The proposed OBMP is not a new development that will cause growth through a "multiplier effect." Development within the project area will be consistent with growth decisions already made by local agencies governing land use decisions, and further, that the OBMP does not remove any existing constraint on future development because existing water serving agencies (WSA's) have alternative means (perhaps not as cost or environmentally effective as the OBMP) to meet future water demands. No new "large" projects are proposed and no potential for this type of growth inducement will be caused by the proposed project.

A third and more subtle type of growth inducement occurs when land use plans are established that create a potential for growth because the available land and the land uses permitted result in the attraction of new development. This type of growth inducement is also attributed to other plans developed to provide the infrastructure necessary to meet the land use objectives, or community vision, contained in the governing land use agency's General Plan. In this case, the ultimate vision of future growth and development within the project area was established in the governing Study area general plans, and it is assumed in these general plans that the WSA's have identified the infrastructure required to support the population which will be in place as growth occurs in the future. The net effect of these general plans is to create a set of expectations regarding future land use and growth that may or may not occur depending upon the actual carrying capacity of the various utility and service resources required to meet future growth. It also seems clear that the established planning process and the overall growth pressures in southern California are the primary causes of future growth, i.e. they induce the actual growth that occurs, and the various utilities, such as the WSA's, are effectively forced to create urban water management plans that can accommodate such growth, at least within the limits of current or future resources that may be available. As the RCPG analysis of water resources indicates in Section 4.2.3.1.g., there are sufficient water resources to meet future demand for the foreseeable future.

As noted above, the position taken in this document is that the utility planning process is more appropriately playing a passive (accommodating) role, not an active (inducing) role, in future growth that is dictated by local land use plans and the continuing growth of population throughout southern California. If communities within the project area chose to restrict growth and maintain a certain vision of the future as a static or slowly growing entity, the land use planning agencies (cities and counties) had the opportunity during the general planning process to establish such plans. Under such circumstances, the utility providers, including the WSA's would have designed their future service plans to accommodate a level of future growth consistent with available resources

In reality, however, the WSA's, acting as responsible water planning agencies, must plan for a level of future growth that appears to match available water resources with forecast growth through the 2010 planning horizon. At present the WSA water supply plans rely to a large extent on water importation. The OBMP provides an alternative management program for the Chino Basin that will reduce reliance on imported water and still allow the WSA to accommodate growth as envisioned in the Study area general plans. Based on this analysis, implementation of the OBMP is not considered to be a significant growth inducing action.

6.2 CUMULATIVE IMPACTS

The following text summarizes the cumulative impact analysis provided in Chapter 4. The intent of a cumulative impact evaluation is to provide the public and decision-makers with an understanding of a given project's contributions to area-wide or community environmental impacts when added to other or all development proposed in an area. The state CEQA Guidelines provide two alternative methods for making cumulative impact forecasts: (1) a list of past, present and reasonably anticipated projects in the project area, or (2) the broad growth impact forecast contained in general or regional plans. Because of the planning character of this project, it will be evaluated in the context of adopted General Plans. No other projects were identified within the Project Area or vicinity that would contribute to cumulative impacts or cumulative demand for local infrastructure.

The cumulative impacts of implementing the proposed project is outlined in Chapter 4 for each environmental issue. The proposed project was evaluated in the context of the affected jurisdiction's current adopted General Plans which concluded that no significant adverse cumulative impacts would result except for the loss of agricultural lands, air quality and noise. Based on evaluations of individual issues and, specifically the OBMP's contribution to cumulative impacts, the following was concluded:

6.2.1 Agriculture

The project's contribution to cumulative removal of agricultural operations could be considered significant, but mitigation is provided that will allow OBMP implementation to avoid contributing to a cumulative significant loss of land currently dedicated to agricultural operations and to cumulative conversion of important farmlands and prime agricultural soils located in the southern portion of the Basin. The recent allocation of agricultural areas to the Cities of Ontario and Chino, in conjunction with recent annexations, have already committed the former agricultural preserve in the southern portion of the Chino Basin to urban uses. This commitment is not driven directly by water related issues, but indirectly the cost to continue diary operations in the Chino Basin are among the causes of agriculture shifting to alternative locations. As stated above, the OBMP could make a small contribution to demise of agriculture in the Basin, but mitigation can be implemented to reduce this cumulative contribution to a non-significant level.

6.2.2 Air Quality

Implementation of the OBMP will contribute pollutants into the SCAB from construction and operation of the facilities. The facilities are designed to provide an adequate water supply for the land uses and intensities identified in applicable general plans. The AQMD assumes that if growth occurs that is consistent with applicable general plans then, ambient air quality standards can be met. Because this project does not propose amendments to existing general plan land uses, it is in conformity with the AQMD and will not result in significant adverse cumulative air quality impacts.

6.2.3 Noise

The noise forecast data contained in the local agency general plans demonstrates that future traffic noise levels from general growth (cumulative traffic increases) within the Chino Basin will result in significant noise impacts. However, the OBMP is not forecast to cause or contribute to such cumulative noise impacts which can be attributed to the land use mix contained in the local agency general plans and the inability to reduce potential traffic noise impacts to a non-significant level.

Any traffic generated by OBMP operations (a few hundred trips per day) are considered *de minimus* contributions to this traffic related noise impact. Because implementation of the OBMP will not contribute to significantly to cumulative increases in traffic, the proposed project is not forecast to cause a contribute to cumulatively significant noise impacts.

With implementation of mitigation measures to ensure that implementation of the OBMP will not contribute to cumulative degradation of groundwater quality in the Chino Basin, the proposed project is not forecast to contribute to any significant cumulative environmental impacts.

6.3 IRREVERSIBLE ENVIRONMENTAL CHANGES

If the OBMP (Program) is effectively implemented, the following irreversible and/or environmental changes would be involved:

a. The construction, installation and maintenance of pipelines, new wells, pump stations, desalter units, storage facilities and water treatment facilities and other public facilities, as proposed in the Program, will involve the irreversible consumption of natural resources in the form of construction materials, water, and energy sources. Money and manpower will be expended to develop and maintain the facilities.

b. The development of individual properties in accordance with land uses designated in the Program will, for all intents and purposes, eliminate the possibility of development of the land for other uses.

c. A commitment of economic and manpower resources will be required for the long-term implementation of the Program.

d. Building materials, including forest and mineral products, will be permanently committed in construction projects related to the long-term implementation of the proposed Program.

e. Expenditures of money, manpower, and materials will be made to maintain adequate levels of public service to the greater community while those services are undergoing disruption and modification within the proposed project area.

All other potential adverse impacts from implementing the proposed project are reversible. Air emissions and water resources and water quality can be changed by both humans and nature over time by cleaning air and water and by reducing or providing alternative sources of water. Soils and geologic resources will be modified but can be modified in the future to suit different purposes. As long as the proposed project does not contribute to the loss of any endangered plant or animal species, biological resources can be maintained or enhanced with sufficient resources.

Land uses and population growth can be considered irreversible on the short term, but the growth forecast for these two issue is not considered to be attributable to the proposed project. Thus, through the incorporation of recommended mitigation measures together with the implementation of the OBMP, no significant irreversible environmental changes will be caused within the project area that can be attributable to the proposed project, and implementation of the extensive suite of mitigation measures in this document will insure that all irreversible and/or unavoidable environmental impacts, as identified above and described within Chapter 4 of this PEIR, can be adequately mitigated to a level of insignificance.

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CHAPTER 7
PREPARATION RESOURCES

7.1 REPORT PREPARATION

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CHAPTER 8
APPENDICES

APPENDIX 8.1

NOTICE OF PREPARATION, COMMENT LETTERS & RESPONSES, AND SUMMARY TABLE

Inland Empire
UTILITIES AGENCY*

9400 Cherry Ave., Bldg. A • Fontana, CA 92335
P.O. Box 697 • Rancho Cucamonga, CA 91729
TEL (909) 357-0241 • FAX (909) 357-3884
* A Municipal Water District

Richard W. Atwater
Chief Executive Officer
General Manager

MEMORANDUM

November 9, 1999

From: Inland Empire Utilities Agency

To: Responsible and Trustee Agencies/Interested Organizations and Individuals

Re: **Notice of Preparation of a Program Environmental Impact Report to Address Implementation of the Optimum Basin Management Program for the Chino Basin**

The Inland Empire Utilities Agency (IEUA or Agency) will serve as the Lead Agency under the California Environmental Quality Act (CEQA) and will coordinate the preparation of a program Environmental Impact Report (EIR) that will evaluate the implementation of the Optimum Basin Management Program for the Chino Basin. The IEUA will serve as the Lead Agency for this document based on mutual agreement with the Chino Basin Watermaster and its member agencies. This letter constitutes a Notice of Preparation (NOP) for the proposed program EIR and serves as a request for environmental information that you or your organization believes should be addressed in the program EIR. In addition to any general comments, please be sure to address the scope and content of environmental information or issues that relate to your agency's statutory responsibilities in connection with the proposed project.

Comment Period: Based on time limits defined by CEQA, your response should be sent at the earliest possible date, but no later than 30 days from receipt of this notice. All comments and any questions should directed to:

Inland Empire Utilities Agency
Attn: Neil W. Clifton
9400 Cherry Avenue, Bldg. A
Fontana, CA 92335

Project Location and Characteristics: The Optimum Basin Management Program (OBMP) encompasses the Chino Basin as shown in the attached figure. This figure illustrates the boundary of the Chino Groundwater Basin as it is legally defined in the stipulated Judgement in the case of Chino Basin Municipal Water District *vs.* the City of Chino *et. al.* The figure also shows the hydrologic boundary of the Chino Groundwater Basin, which is slightly different from the adjudicated boundary. Chino Basin is an alluvial valley that is relatively flat from east to west, sloping from north to south at a one to two percent grade. Valley elevation ranges from about 2,000 feet in the foothills to about 500 feet near Prado Dam. The principal drainage course for the Basin is the Santa Ana River. While still considered to be a single basin, the Chino Groundwater Basin has been divided up into five management zones, based upon hydrologic conditions, and into three sub-basins.

The Chino Groundwater Basin is one of the largest groundwater basins in southern California, containing about 5,000,000 acre-ft of water in storage, with an additional, unused storage capacity of about 1,000,000 acre-ft. Cities and other water supply entities produce groundwater for all or part of their municipal and industrial supplies from the Chino Groundwater Basin. The average annual well production is approximately 140,000 acre-feet for the Chino Groundwater Basin An additional 300 to 400 agricultural users also produce groundwater from the Basin.

The purpose of this Notice of Preparation, a project description, and a discussion of probable environmental effects are provided below for use in focusing your or your agencies comments for consideration in the program EIR.

Purpose of the Notice of Preparation: The purpose of this NOP is to fulfill legal notification requirements, and inform the public and CEQA Responsible and Trustee Agencies that a program EIR will be prepared. This NOP solicits agency and interested party concerns regarding the potential environmental effects of the proposed project, i.e. implementation of the OBMP. CEQA also encourages early consultation with private persons and organizations that may have information or may be concerned with any potential adverse environmental effects related to physical changes in the environment that may be caused by implementing the OBMP. Responses to the NOP that specifically focus on potentially significant environmental issues are of particular interest to the IEUA.

All written responses to the NOP will be included in the appendices to the program EIR. The content of the responses will help guide the focus and scope of the EIR in accordance with State and local agency CEQA Guidelines.

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Project Description: An OBMP for the Chino Groundwater Basin (Chino Basin or the Basin) has been developed pursuant to a Judgement entered in the Superior Court of the State of California on February 19, 1998. The overseeing body for guidance in the development and implementation of the OBMP is the Chino Basin Watermaster (Watermaster). This body was effectively established on July 1, 1977. The Inland Empire Utilities Agency (IEUA or the Agency) has agreed to serve as the CEQA Lead Agency for the preparation and administration of a program Environmental Impact Report (EIR).

A program EIR document has been selected for the OBMP based on the definition of a program document contained in Section 15168 of the State CEQA Guidelines which states: "A program EIR is an EIR which may be prepared on a series of actions that can be characterizes as one large project and are related either: (1) Geographically, (2) A logical parts in the chain of contemplated actions,". The OBMP clearly establishes a program that falls within the scope of a programmatic document because it defines a series of actions that are tied together within the Chino Groundwater Basin; and the proposed program actions are all designed to fulfill the goal of enhanced safe yield and improved water quality for the basin.

In order to administer water-usage for the long-term beneficial use of all component members of Watermaster, an OBMP consisting of two phases is being developed for implementation. Phase I of the OBMP consists of defining the state of the Chino Groundwater Basin, establishing goals concerning major issues identified by stakeholders, and affirming a management plan for the achievement of said goals. Phase 1 also provides a process that facilitates periodical reviews, public comments, and necessary updates. Section 2 of Phase I of the OBMP includes the identification of the physical state of the Chino Groundwater Basin, the predicted future water demands, and the determination of problematic issues associated with the management of the Chino Groundwater Basin.

Section 3 establishes the goals of the OBMP. A mission statement combined with a listing of values, issues, needs and interests deemed important by member stakeholders is also contained within this section of the OBMP. The mission statement for the OBMP is as follows:

> *The purpose of the Optimum Basin Management Program is to develop a groundwater management program that enhances the safe yield and the water quality of the basin, enabling all groundwater users to produce water from the Basin in a cost-effective manner.*

The Goals for the OBMP are as follows:

Goal Number One is to enhance Chino Basin groundwater supplies. This goal applies not only to local groundwater, but also to all sources of water available for the enhancement of the Chino Groundwater Basin. The Program will attempt to utilize the following activities to increase basin supplies:

- Enhance recharge of storm water runoff
- Increase the recharge of recycled water
- Develop new sources of supplemental water
- Promote the direct use of recycled water
- Promote the treatment and use of degraded groundwater
- Reduce groundwater outflow
- Re-determine safe yield

Goal Number Two is to protect and enhance water quality. This goal will be accomplished by implementing activities that capture and dispose of degraded groundwater, treat degraded groundwater for beneficial use, and encourage better management of waste discharges that may adversely impact groundwater. The following are management options that have been identified to achieve this goal:

- Treat degraded groundwater to meet beneficial uses
- Monitor and manage the basin to reduce contaminants and to improve water quality
- Manage salt accumulation through dilution or blending and the export of salt
- Address problems posed by specific contaminants.

Goal Number Three is to enhance management of the Chino Groundwater Basin by means of the following activities:

- Develop policies and procedures that will encourage stable, creative and fair water resource management in the Basin
- Optimize the use of local groundwater storage
- Develop and/or encourage production patterns, well fields, treatment and water transmission facilities and alternative water supply sources to ensure maximum and equitable availability of groundwater and to minimize land subsidence
- Develop conjunctive-use programs with others to optimize the use of the Chino Basin for in-basin producers and the people of California.

Goal Number Four is to Equitably Finance the OBMP.

Included in the scoping process for the identification of OBMP goals, issues, needs, and interests, the Watermaster stakeholders' identified concerns with respect to the following categories:

- safe yield
- native and imported water recharge
- quality and quantity
- reclaimed water
- conjunctive-use storage
- costs
- human resources and administration

Section 4 of the OBMP describes the recommended Management Program intended to oversee all aspects of the OBMP's implementation and operation. To meet the goals of the OBMP, nine program elements were established. The function of each of these program elements in the Phase I stage of the OBMP is to serve as an initial scoping exercise for the establishment of a general series of comprehensive action plans that will ultimately become the working framework under which specific projects can be evaluated and implemented. The exact methodological details for the development of each program element will be further elaborated upon as part of Phase II of the OBMP. Task Memorandums for each program element were prepared and are available in the Watermaster offices, however they are summarized in Section 4 of the OBMP. For each element, these documents describe the need and function for a specific element, a description of program element actions, element costs, implementation entities, scheduling, and phasing. The individual program elements are listed below. This list comprises the ultimate focus of Watermaster's future actions, agendas, and policies.

- Program Element 1 – Develop and Implement Comprehensive Monitoring Program
- Program Element 2 – Develop and Implement Comprehensive Recharge Program
- Program Element 3 – Develop and Implement Water Supply Plan for the Impaired Areas of the Basin
- Program Element 4 – Develop and Implement Groundwater Management Plan for Management Zone 1
- Program Element 5 – Develop and Implement Regional Supplemental Water Program
- Program Element 6 – Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region (Regional Board) and Other Agencies to Improve Basin Management
- Program Element 7 – Develop and Implement Salt Management Program
- Program Element 8 – Develop and Implement Groundwater Storage Management Program
- Program Element 9 – Develop and Implement Conjunctive-Use Programs

It is the implementation of the listed program elements where the potential occurs for the OBMP to cause physical changes in the environment and to produce potential adverse impacts to the environment. The purpose of

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preparing this program EIR is to evaluate potentially significant adverse environmental impacts from implementation of the OBMP facilities required to support the Program, and to provide means for the minimization of adverse impacts to both the natural and manmade environment.

Potential Environmental Effects: The OBMP outlines an overall program for managing the Chino Groundwater Basin with the goal of providing greater benefit to both human users and the environmental resources dependent upon water and groundwater. The specific capital projects that will need to be approved in the future constitute *"a series of actions that can be characterized as one large project and are related either: (1) Geographically, (2) As logical parts in the chain of contemplated actions, (3) In connection with issuance of rules, regulations, plans, or other general criteria to govern conduct of a continuing program, or (4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways."* (Section 15168(a) of the State CEQA Guidelines)

To provide a comprehensive evaluation in the program EIR, which will be used to examine cumulative environmental impact issues and issues not necessarily appropriate for individual projects, IEUA proposes to prepare a full scope environmental evaluation that will address all issues on a standard Initial Study Environmental Checklist Form. These issues include:

Land Use	Transportation/Circulation	Public Services
Population & Housing	Biological Resources	Utilities & Service Systems
Geological Problems	Energy & Mineral Resources	Aesthetics
Water	Hazards	Cultural Resources
Air Quality	Noise	Recreation

Because IEUA is proceeding with a full scope program EIR a decision was made not to compile an Initial Study Environmental Checklist Form as permitted by State CEQA Guidelines Section 15060(d). Of the issues identified above, the following issues are considered to have the highest potential to experience significant environmental impacts that may require mitigation:

- geologic problems (subsidence or liquefaction) may be caused or exacerbated due to extraction and recharge of groundwater in support of OBMP objectives;
- biological resource impacts may be caused by ground disturbance undertaken to install the facilities required to implement the OBMP physical facilities;
- the creation and expansion of water-related facilities may affect future growth in undeveloped areas;

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- recycling reclaimed water has the potential to increase levels of Total Dissolved Solids (TDS) and adversely impact groundwater quality in the Basin;
- construction of additional facilities has the potential to conflict with existing land uses;
- operation of de-salting and treatment facilities will generate salt and other waste products that may be problematic for disposal;
- the unplanned use of flood control basins for percolation of storm water and recycled water could result in the potential for exposure of people and surrounding areas to flooding hazards;
- treatment of degraded water has the potential to generate hazardous wastes (both solid waste and air pollutants) and the potential to expose people hazardous conditions;
- construction and operation of facilities to implement program elements may have air quality impacts (fugitive dust or other emissions);
- visual resources may be affected by construction of element facilities;
- construction activities and new facility operations may generate noise that will conflict with adjacent land uses; and
- cultural resource impacts may be caused by ground disturbance undertaken to install the facilities required to implement the OBMP physical facilities.

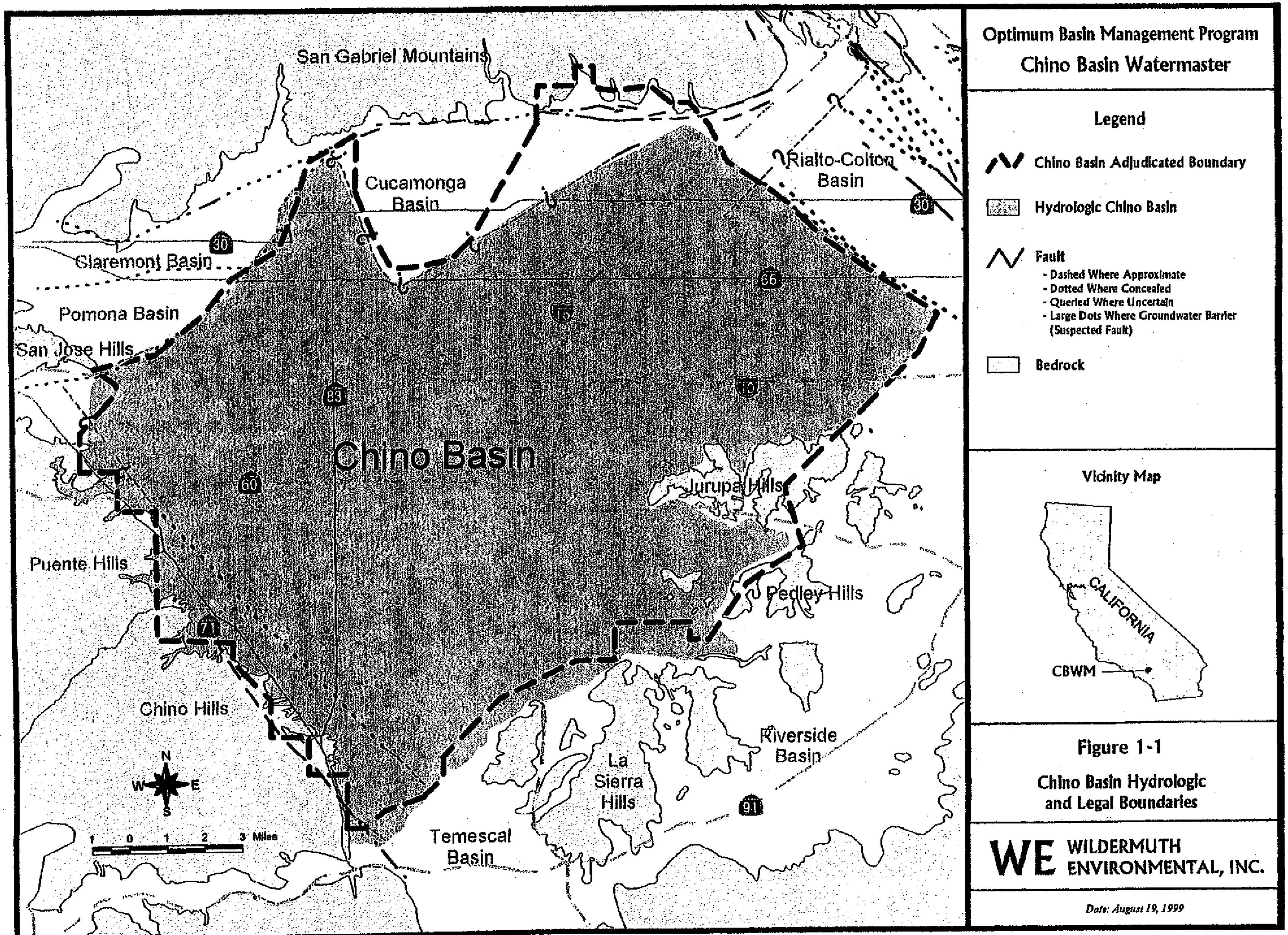
All of the above issues will be examined in as much detail as permitted in the program EIR based on the level of detail contained in the programs identified above and based on those specific implementation projects that are sufficiently defined to allow site specific evaluation. The IEUA intends to hold both a technical agency and a public scoping meeting during the thirty day NOP comment period. A comprehensive distribution list for this NOP is attached and all agencies and interested parties on this list will be notified of the date for the scoping meetings and afforded an opportunity to attend.

Thank you in advance for any comments you may submit in response to this NOP. For agencies please include the name of a contact person in your agency. If you have any questions, please contact me at (909) 387-4124.

Sincerely,

Neil W. Clifton
Manager of Engineering
Energy and Water Resources

Attachments: Map, Chino Basin Hydrologic and Legal Boundaries
NOP Distribution List


San Gabriel Mountains
Cucamonga Basin
Rialto-Colton Basin
Claremont Basin
Pomona Basin
San Jose Hills
Chino Basin
Jurupa Hills
Puente Hills
Pedley Hills
Chino Hills
Riverside Basin
La Sierra Hills
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Optimum Basin Management Program
Chino Basin Watermaster
Legend
Chino Basin Adjudicated Boundary
Hydrologic Chino Basin
Fault
- Dashed Where Approximate
- Dotted Where Concealed
- Queried Where Uncertain
- Large Dots Where Groundwater Barrier (Suspected Fault)
Bedrock
Vicinity Map
CALIFORNIA
CBWM
Figure 1-1
Chino Basin Hydrologic and Legal Boundaries
WE WILDERMUTH ENVIRONMENTAL, INC.
Date: August 19, 1999

RECEIVED: 12-10-99; 8:53; 909 357 3884 => TOM DODSON & ASSOC.; #2
DEC-10-1999 FRI 08:03 AM IEUA FAX NO. 909 357 3884 P. 02/02
DEC. 9.1999 4:03PM (213)217 6119 NO.965 P.1/1

MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Office of the General Manager

INLAND EMPIRE UTILITIES AGENCY
RECEIVED
... - 9 1999
Original to: Lemanuity
Route to: Blaustein, Elrod, Clifton, Delgado, Morgan

December 9, 1999

Mr. Neil W. Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Building A
Fontana, CA 92335

Dear Mr. Neil W. Clifton:

Notice of Preparation of a Program Environmental Impact Report to Address
Implementation of the Optimum Basin Management Program for the Chino Basin

We have received the Notice of Preparation for a Program Environmental Impact Report that will evaluate the implementation of the Optimum Basin Management Program for the Chino Basin. The Metropolitan Water District of Southern California (Metropolitan) is a potentially affected public agency. Please add my name to the mailing list to receive future documents related to this project. Metropolitan is supportive of your efforts to protect and enhance the groundwater supplies. We are looking forward to the opportunity to review your environmental document.

If you have any questions, please contact me at (213) 217-6242.

Very truly yours,

[signature] for

Laura J. Simonek
Principal Environmental Specialist

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Chino Basin Water Conservation District

December 8, 1999

Inland Empire Utilities Agency
c/o Tom Dodson & Associates
2150 N. Arrowhead Avenue
San Bernardino, CA 92405

Re: PEIR for the Chino Basin Watermaster's OBMP

Dear Mr. Dodson:

The Conservation District is hereby requesting that as a part of the CEQA "No Project" evaluation you determine under current (1999) pumping, recharge, and storage conditions, how much water can be annually pumped from the Chino Groundwater Basin without causing water mining to occur. Furthermore, we would ask that you evaluate what environmental and economic impacts would result from a continuation of the current pumping, recharge, and storage conditions absent any of the projects contemplated by the OBMP.

Sincerely yours,

Barrett Kehl

Barrett Kehl,
General Manager

Cc: Board of Directors
Watermaster

4594 SAN BERNARDINO STREET
P.O. BOX 2400
MONTCLAIR, CA 91763-0900
(909) 626-2711
FAX (909) 626-5974

Chino Basin Water Conservation District

December 9, 1999

Inland Empire Utilities Agency
c/o Tom Dodson & Associates
2150 N. Arrowhead Avenue
San Bernardino, CA 92405

Re: PEIR for the Chino Basin Watermaster's OBMP
Potential Projects Requiring Evaluation

Dear Mr. Dodson:

In addition to the subject matter of the Conservation District's letter dated December 8, 1999, the Conservation District is hereby submits the following list of potential projects and activities that it believes should be discussed under the PEIR.

1. The environmental consequences associated with the construction and operation of new diversion works along the San Antonio Channel for the purpose of diverting, and ultimately recharging, imported water to and within the Brooks Street Basin, Montclair Basins #3 and 4, and the College Heights and Upland Basins.
2. The environmental consequences associated with the excavation, shaping and reconfiguring of the College Heights and Upland Basins to enhance their usefulness for recharge purposes.

Sincerely yours,

Barrett Kehl

Barrett Kehl,
General Manager

Cc: Board of Directors
Watermaster

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GE Corporate
Environmental Programs

David W. Thompson
Manager, Mid-Atlantic/Southeast Region
Environmental Remediation Program

General Electric Company
640 Freedom Business Center
King of Prussia, PA 19406
*610 992-7890, Dial Comm 8*566-7890*
Fx 610 992-7898

December 8, 1999
Project 1796.001 AT

Mr. Neil W. Clifton
Manager of Engineering
Energy and Water Resources
Inland Empire Utilities Agency
9400 Cherry Avenue, Bldg. A
Fontana, CA 92335

Subject: Comments on Notice of Preparation
Environmental Impact Report
Optimum Basin Management Program for the Chino Basin

Dear Mr. Clifton:

This letter sets forth General Electric's (GE's) response to the Inland Empire Utility Agency's (IEUA's) Notice of Preparation of a Program Environmental Impact Report to Address Implementation of the Optimum Basin Management Program for the Chino Basin.

GE is implementing a long-term groundwater cleanup program in Ontario, in the northwest of the Basin. The objective of the program, which started in 1987, is to contain and treat a zone of groundwater approximately 1.5 miles long by 0.5 miles wide, which contains the chemicals TCE and chromium at concentrations above drinking water standards. GE is conducting this work with the approval of the Regional Water Quality Control Board, Santa Ana Region.

GE pumps the affected groundwater, treats it to remove the chemicals in an environmentally safe manner, and then restores the beneficial use of the water to the Basin by recharging it into the Basin's aquifers. Our extraction and recharge operation is coordinated to maximize our ability to prevent the spread of the affected groundwater beyond our containment well. We have made large investments in physical facilities and operation and maintenance, and expect to make further such investments in the future, such that chemically impaired groundwater is contained and the Basin is protected.

We believe the EIR scope should include consideration of beneficial projects such as ours and potential impacts to these projects that could occur as a result of implementation of the OBMP. We are concerned that changes in recharge or extraction patterns in the Basin could change groundwater flow patterns and could cause negative impacts on cleanup projects such as loss of containment of the affected groundwater in the Basin. Therefore, we request that the scope of IEUA's EIR be expanded to include an analysis of the potential for projects contemplated by the OBMP to adversely impact the ability to contain affected groundwater, and the potential impacts associated with loss of containment. We request that particular attention be paid to the potential impacts of proposals for increased pumping and recharge as well as shifts in the location of pumping and recharge.

If your analysis should show that the Basin could suffer adverse impacts from projects contemplated by the OBMP then we request that the EIR present potential mitigation measures.

We offer our full cooperation in the preparation of the EIR. Please do not hesitate to call Mark Gage of Geomatrix Consultants on 510-663-4202 with any questions regarding our project.

Sincerely,

DWThompson

David W. Thompson
Manager, Environmental Remediation Programs

DWT\nji

cc: Mark Gage, Geomatrix Consultants

FONTANA WATER COMPANY

A DIVISION OF SAN GABRIEL VALLEY WATER COMPANY

8440 NUEVO AVENUE • P.O. BOX 987, FONTANA, CALIFORNIA 92334 • (909) 822-2201

December 2, 1999

DEC 6 1999

Inland Empire Utilities Agency
9400 Cherry Avenue, Building A
Fontana, California 92335

Attention: Mr. Neil W. Clifton
Manager of Engineering
Energy and Water Resources

Subject: Notice of Preparation of a Program Environmental Impact Report to Address Implementation of the Optimum Basin Management Program for the Chino Basin

Gentlemen:

This refers to the Notice of Preparation of a Program Environmental Impact Report to address Implementation of the Optimum Basin Management Program for the Chino Basin. The Notice, dated November 9, 1999, was received by Fontana Water Company on November 15, 1999. The purpose of this letter is to provide general comments for the Program EIR. However, until specific implementation activities associated with the OBMP are identified in detail, the company reserves the right to provide additional comments as specific OBMP activities occur.

Fontana Water Company, a public utility regulated by the California Public Utilities Commission, serves a population of over 120,000 in portions of the cities of Fontana, Rialto, Rancho Cucamonga, and unincorporated parts of San Bernardino County. Fontana Water Company owns and operates 17 domestic water supply wells within the Chino Basin boundary.

The EIR must fully address the potential adverse water quality and quantity impacts that may result with implementation of any of the OBMP proposed activities. It must be demonstrated that OBMP implementation will not in any way directly or indirectly limit, prohibit, curtail or otherwise affect the continued use of our existing wells, nor our ability to drill and pump new wells as needed within the company's service area.

The EIR should also examine the need for abatement of sources of groundwater contamination, such as ongoing cattle and dairy operations. For example, Program Element 6 generally refers to developing and implementing cooperative programs with the Regional Water Quality Control Board. But that element lacks definition – namely, the effects of seeking cease and desist and cleanup and abatement orders to stop groundwater contamination and further salt loading of the basin from the dairy operations. It is axiomatic that any discussion of constructing and operating de-salting treatment facilities must also include a serious examination of what can be done to greatly reduce or eliminate further salt-loading activities of the ongoing dairy operations.

The foregoing comments are provided to assist the Inland Empire Utilities Agency in preparing the Program Environmental Impact Report for implementation of the Chino Basin Optimum Basin Management Program. So that we may remain informed about the progress of the program, the Draft EIR and the final EIR and related information and materials should be sent to me at the following address:

Fontana Water Company
Attention: Mr. Michael J. McGraw, Manager
8440 Nuevo Avenue
Post Office Box 987
Fontana, California 92334

If you have any question or need additional information, please call me.

Very truly yours,

Michael J. McGraw
Manager

MJM:bl

SOUTHERN CALIFORNIA

ASSOCIATION of GOVERNMENTS

Main Office

818 West Seventh Street

12th Floor

Los Angeles, California

90017-3435

t (213) 236-1800

f (213) 236-1825

www.scag.ca.gov

December 6, 1999

DEC 8 1999

Mr. Neil W. Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Bldg. A
Fontana, CA 92335

RE: **Comments on the Notice of Preparation for the Draft Program Environmental Impact Report to address the Implementation of the Optimum Basin Management Program for the Chino Basin - SCAG No. I 19990539**

Dear Mr. Clifton:

Thank you for submitting the **Notice of Preparation for the Draft Program Environmental Impact Report to address the Implementation of the Optimum Basin Management Program for the Chino Basin** to SCAG for review and comment. As areawide clearinghouse for regionally significant projects, SCAG assists cities, counties and other agencies in reviewing projects and plans for consistency with regional plans.

In addition, The California Environmental Quality Act requires that EIRs discuss any inconsistencies between the proposed project and the applicable general plans and regional plans (Section 15125 [d]). If there are inconsistencies, an explanation and rationalization for such inconsistencies should be provided.

Policies of SCAG's Regional Comprehensive Plan and Guide, which may be applicable to your project, are outlined in the attachment. **We expect the Draft EIR to specifically cite the appropriate SCAG policies and address the manner in which the Project is consistent with applicable core policies or supportive of applicable ancillary policies. Please use our policy numbers to refer to them in your DEIR. Also, we would encourage you to use a side-by-side comparison of SCAG policies with a discussion of the consistent or support of the policy with the Proposed Project.**

Please provide a minimum of 45 days for SCAG to review the DEIR when this document is available. If you have any questions regarding the attached comments, please contact Jeffrey Smith, Senior Planner at (213) 236-1867. Thank you.

Sincerely,

J. DAVID STEIN
Manager, Performance Assessment and Implementation

**COMMENTS ON THE PROPOSAL
TO DEVELOP A
DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT
TO ADDRESS THE IMPLEMENTATION OF THE
OPTIMUM BASIN MANAGEMENT PROGRAM
FOR THE
CHINO BASIN
SCAG NO. I 19990539**

PROJECT DESCRIPTION

An Optimum Basin Management Program (OBMP) has been developed pursuant to a judgement entered in the Superior Court of the State of California in February 1999. The overseeing body for the guidance in the development and implementation of the OBMP is the Chino Basin Watermaster. The OBMP will consist of two phases. Phase One, consists of defining the state of the Chino Groundwater Basin, establishing goals concerning major issues by stake holders, and affirming a management plan for the achievement of said goals. Phase Two, outlines the methodological details for the development of each program element. The Project proposes to evaluate the implementation of the Optimum Basin Management Program for the Chino Groundwater Basin.

CONSISTENCY WITH REGIONAL COMPREHENSIVE PLAN AND GUIDE POLICIES

Growth Management

The **Growth Management Chapter (GMC)** of the Regional Comprehensive Plan and Guide (RCPG) contains the following policies that are particularly applicable and should be addressed in the Draft EIR for the Project.

3.01 The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review

Regional Growth Forecasts

The Draft Program EIR should reflect the most current SCAG forecasts which are the 1998 RTP (April 1998) Population, Household and Employment forecasts for the San Bernardino Associated Governments (SANBAG) subregion and Unincorporated San Bernardino County. These forecasts follow:

SANBAG Subregion Forecasts	2000	2005	2010	2015	2020
Population	1,772,700	2,005,400	2,239,600	2,512,800	2,829,800
Households	565,000	639,200	716,800	805,700	904,900
Employment	617,000	734,800	860,700	983,400	1,103,600

Unincorporated San Bernardino County (SANBAG) Forecasts	2000	2005	2010	2015	2020
Population	424,500	522,200	623,200	735,600	874,900
Households	136,300	167,200	199,500	233,500	275,100
Employment	70,200	92,500	116,400	140,100	161,300

3.03 The timing, financing, and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies.

GMC Policies Related To The RCPG Goal To Improve The Regional Standard Of Living

The Growth Management goals to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy. The evaluation of the proposed project in relation to the following policies would be intended to guide efforts toward achievement of such goals and does not infer regional interference with local land use powers.

3.04 *Encourage local jurisdictions' efforts to achieve a balance between the types of jobs they seek to attract and housing prices.*

3.05 *Encourage patterns of urban development and land use which reduce costs on infrastructure construction and make better use of existing facilities.*

3.08 *Encourage subregions to define an economic strategy to maintain the economic vitality of the subregion, including the development and use of marketing programs, and other economic incentives, which support attainment of subregional goals and policies.*

3.09 *Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services.*

3.10 *Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.*

<u>GMC Policies Related To The RCPG Goal To Improve The Regional Quality Of Life</u>

The Growth Management goals to attain mobility and clean air goals and to develop urban forms that enhance quality of life, that accommodate a diversity of life styles, that preserve open space and natural resources, and that are aesthetically pleasing and preserve the character of communities, enhance the regional strategic goal of maintaining the regional quality of life. The evaluation of the proposed project in relation to the following policies would be intended to provide direction for plan implementation, and does not allude to regional mandates.

3.11 *Support provisions and incentives created by local jurisdictions to attract housing growth in job rich subregions and job growth in housing rich subregions.*

3.12 *Encourage existing or proposed local jurisdictions' programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike.*

3.13 *Encourage local jurisdictions' plans that maximize the use of existing urbanized areas accessible to transit through infill and redevelopment.*

3.14 *Support local plans to increase density of future development located at strategic points along the regional commuter rail, transit systems, and activity centers.*

3.15 *Support local jurisdictions strategies to establish mixed-use clusters and other transit-oriented developments around transit stations and along transit corridors.*

3.16 *Encourage developments in and around activity centers, transportation corridors, underutilized infrastructure systems, and areas needing recycling and redevelopment.*

3.17 *Support and encourage settlement patterns which contain a range of urban densities.*

3.18 *Encourage planned development in locations least likely to cause environmental impact.*

3.20 *Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.*

3.21 *Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.*

3.22 *Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards.*

3.23 *Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources ,measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.*

GMC Policies Related To The RCPG Goal To Provide Social, Political, and Cultural Equity

The Growth Management Goal to develop urban forms that avoid economic and social polarization promotes the regional strategic goal of minimizing social and geographic disparities and of reaching equity among all segments of society. The evaluation of the proposed project in relation to the policy stated below is intended guide direction for the accomplishment of this goal, and does not infer regional mandates and interference with local land use powers.

3.24 *Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs Assessment.*

3.25 *Encourage the efforts of local jurisdictions, employers and service agencies to provide adequate training and retraining of workers, and prepare the labor force to meet the challenges of the regional economy.*

3.26 *Encourage employment development in job-poor localities through support of labor force retraining programs and other economic development measures.*

3.27 *Support local jurisdictions and other service providers in their efforts to develop* *sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.*

Air Quality Chapter Core Actions

The **Air Quality Chapter** core actions related to the proposed project includes:

5.07 *Determine specific programs and associated actions needed (e.g., indirect source rules, enhanced use of telecommunications, provision of community based shuttle services, provision of demand management based programs, or vehicle-miles-traveled/emission fees) so that options to command and control regulations can be assessed.*

5.11 *Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional and local) consider air quality, land use, transportation and economic relationships to ensure consistency and minimize conflicts.*

Water Quality Chapter Recommendations and Policy Options

The **Water Quality Chapter** core recommendations and policy options relate to the two water quality goals: to restore and maintain the chemical, physical and biological integrity of the nation's water; and, to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of all waters.

11.02 *Encourage "watershed management" programs and strategies, recognizing the primary role of local governments in such efforts.*

11.03 *Coordinate watershed management planning at the subregional level by (1) providing consistent regional data; (2) serving as a liaison between affected local, state, and federal watershed management agencies; and (3) ensuring that watershed planning is consistent with other planning objectives (e.g., transportation, air quality, water supply).*

11.05 *Support regional efforts to identify and cooperatively plan for wetlands to facilitate both sustaining the amount and quality of wetlands in the region and expediting the process for obtaining wetlands permits.*

11.06 *Clean up the contamination in the region's major groundwater aquifers since its water supply is critical to the long-term economic and environmental health of the* *region. The financing of such clean-ups should leverage state and federal resources and minimize significant impacts on the local economy.*

11.07 *Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed.*

Open Space Chapter Ancillary Goals

Outdoor Recreation

9.01 *Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region.*

9.02 *Increase the accessibility to open space lands for outdoor recreation.*

9.03 *Promote self-sustaining regional recreation resources and facilities.*

Public Health and Safety

9.04 *Maintain open space for adequate protection of lives and properties against natural and man-made hazards.*

9.05 *Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.*

9.06 *Minimize public expenditure for infrastructure and facilities to support urban type uses in areas where public health and safety could not be guaranteed.*

Resource Production

9.07 *Maintain adequate viable resource production lands, particularly lands devoted to commercial agriculture and mining operations.*

Resource Protection

9.08 *Develop well-managed viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands.*

Conclusions

All feasible measures needed to mitigate any potentially negative regional impacts associated with the proposed project should be implemented and monitored, as required by CEQA.

CITY of CHINO

December 16, 1999

Mr. Neil W. Clifton
Inland Empire Utilities Agency
P. O. Box 697
Rancho Cucamonga, CA 91729-0697

Subject: Optimum Basin Management Program – Notice of Preparation

Dear Mr. Clifton:

We have reviewed the Notice of Preparation of a Program Environmental Impact Report to Address Implementation of the Optimum Basin Management Program (OBMP) for the Chino Basin, dated November 9, 1999, and have the following comments describing contemplated City projects and requested additions to the scope and content:

<u>Scope of the Environmental Review</u>

1. The scope of the described environmental review should include adoption of the Optimum Basin Management Program by including, but not limited to, the Chino Basin Watermaster and any party to the Chino Basin Judgement.

2. The scope of the environmental review should include adoption of Memorandums of Agreement defining the actions necessary to achieve the goals of the Optimum Basin Management Program, and potential Joint Powers Agreements by including, but not limited to, the Chino Basin Watermaster and parties to the Chino Basin Judgement.

3. The scope of the environmental review should include consideration of the general plans and master facilities plans of the agencies located in the Chino Basin, and address the compatibility of these plans with the Optimum Basin Management Program.

4. The City is concerned that potential Optimum Basin Management Program projects and facilities that may be located within the City would occupy acreage that might otherwise be available for other City development. The impacts of this, including, but not limited to economic impact, should be included in the environmental review.

City Projects and Activities

5. The types of activities/projects contemplated by the City that may fall under the umbrella of the Optimum Basin Management Program are as follows:

   A. Groundwater production and elevation monitoring

   B. Groundwater quality monitoring

   C. Groundwater production well construction

   D. Construction of a treatment facility to remove nitrate from groundwater

   E. Construction of injection well facilities or modification of existing groundwater production well facilities for injection of water to the underlying groundwater basin (part of a conjunctive use program)

   F. Construction of recycled water distribution facilities and direct beneficial use of recycled water

   G. Recharge of recycled water (part of a regional program)

   H. Land subsidence investigations and data collection

   I. Chino Desalter retail water agency

We request that the subjects/projects/activities described in our comments above be included in the program environmental impact review for the Chino Basin Optimum Basin Management Program.

We appreciate the opportunity to review the Notice of Preparation and provide comments, and request that we receive a copy of the draft Program Environmental Impact Report document when it is available for review and comment.

We welcome the opportunity to meet with you or your consultants to discuss our plans in greater detail. Should you have any questions regarding our comments, please contact me at (909) 591-9823.

Sincerely,

DGCros

DAVID G. CROSLEY, P.E.
Water & Environmental Manager

cc: Traci Stewart, Chino Basin Watermaster
Tom Dodson, Tom Dodson & Associates

THE CITY OF
POMONA

Department of Economic Development
William L. Bopf
Director

Planning Division

Neil W. Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Building A
Fontana, CA 92335

DEC 20 1999

December 17, 1999

Subject: **Notice of Preparation for Optimum Basin Management Program for the Chino Basin**

Dear Mr. Clifton:

Thank you for inviting the City of Pomona to comment on the Notice of Preparation for the above referenced project. We have reviewed the Notice of Preparation and have the following comments:

- The following issues were listed within the NOP as having the most potential to create significant impacts:

    - Geologic impacts relating to subsidence or liquefaction
    - Biological impacts
    - Impacts from recycling reclaimed water to groundwater quality
    - Construction of new facilities impacts to existing land uses
    - Increased flood hazards from percolation of storm water and recycled water
    - Increased exposure of people to hazardous waste from the treatment of degraded water
    - Air quality impacts from construction to surrounding neighborhoods within Pomona
    - Noise impacts from construction to surrounding neighborhoods within Pomona
    - Cultural impacts from ground disturbance relating to installation of new facilities

    Please include specific information and analysis within the DEIR on how the City of Pomona will be affected by these potentially significant impacts.

- The City of Pomona's drinking water is provided by underground water supplies within the City. Please evaluate within the DIER how the

City's water quality and supply will be impacted by the implementation of OBMP for the Chino Basin.

- Include information on proposed mitigation measures for those issues that have the potential to cause significant impacts to the City of Pomona.

Thank you again for allowing us to comment on the NOP for the proposed project. We look forward to reviewing the DEIR. If you need further information or have questions regarding the above comments, I can be reached at 909 620-2435.

Sincerely,

Sandra Campbell

Sandra Campbell
Assistant Planner

Cc: CN, file

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BILL LOCKYER
Attorney General

State of California
DEPARTMENT OF JUSTICE

RONALD REAGAN BUILDING
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LOS ANGELES, CA 90013
Public: (213) 897-2000

Facsimile: (213) 897-2802
(213) 897-2612

December 16, 1999

Neil Clifton
INLAND EMPIRE UTILITIES AGENCY
Post Office Box 698
Rancho Cucamonga, California 91729-0697

RE: Notice of Preparation of a Program Environmental Impact Report to Address Implementation of the Optimum Basin Management Program for the Chino Basin

Dear Mr. Clifton :

The following comments are provided in response to the above-referenced Notice of Preparation dated November 9, 1999, on behalf of the State of California and its departments or agencies that own land and/or produce groundwater in the Chino Basin. The State of California is a member of the Agricultural Pool as defined in the 1978 Chino Basin Judgment. It is my understanding that receipt of comments has been extended to December 17, 1999. Individual state agencies and departments may be submitting separate comment letters.

DESCRIPTION OF STATE OF CALIFORNIA INTERESTS

The California Department of Corrections owns approximately 2600 acres in the Southern portion of the Chino Basin. Three correctional facilities operate on the State held property in the Basin. These facilities are the California Institution for Men(CIM), the California Institution for Women (CIW), and the Herman G. Stark Youth Training School (YTS). Among the other facilities on the CIM site is the Prison Industries dairy (PIA) that utilizes significant acreage for agricultural operations.

The California Institution for Men has nine (9) agricultural wells - (8 active) , four (4) domestic water wells, and a sewage treatment plant that provides secondary treatment to the wastewater effluent for its Minimum Support Facility, Reception Center Central and its Reception Center West facility. The CIM Reception Center East and the YTS are connected to the City of Chino's Wastewater System. CIW has four (4) inactive wells and one (1) active well and discharges its waste to the Santa Ana Regional Interceptor line to Orange County. There are plans to drill two additional domestic wells south of the Central facility and reduce pumping from two other domestic wells. These changes are being implemented to address a localized PCE contamination problem at the CIM site and, we believe, may have a positive effect on the subsidence issue.

The Department of Corrections is constructing an Ion Exchange Treatment Plant east of the water storage reservoir on the site to address water quality problems among the three correctional facilities, including nitrates and total dissolved solids. The plant will provide domestic water treatment to soften water, lower the TDS to comply with sewage treatment plant effluent discharge requirements, will lower nitrate levels and will include a Granular Activated Carbon component for PCE and TCE removal. The plant will produce brine waste to be discharged into the SARI line.

The State of California, Department of General Services, has initiated a study of the CIM Waste Water Treatment System to determine whether the treatment plant should be expanded to accept additional sewage flows from the CIM East facility and the Youth Training School and whether tertiary treatment should be considered so that CIM's recycled water can be utilized for additional non-potable uses.

In addition to the Department of Corrections activities, the California Department of Transportation purchases its water from municipal entities instead of pumping groundwater and the California Department of Fish and Game previously utilized one well on its property. The Department of Fish and Game has filed separate comments dated December 14, 1999. The State of California, on behalf of the Department of Toxic Substances Control, presently owns the land identified as the Stringfellow superfund site and is involved in a major cleanup of the area.

PROGRAM EIR

The Program EIR should specifically identify the State of California and its agencies and departments owning land and producing water from the Chino Basin. The EIR should include identification of potential beneficial projects identified by the state and potential impacts to these projects, including adverse water quality and quantity impacts. The EIR should additionally address the impact of the proposed projects on the continued use of the State's existing wells and its ability to drill new wells in the vicinity of its land. Specifically, the State is interested in a discussion of the impact of the proposed wellfields and the water supply projects proposed in the Draft Water Supply Facilities Report dated November 9, 1999 on the State's wells and the surrounding groundwater.

The Program EIR should address the impact of the OBMP proposals for recharge (storm water, supplemental water, recycled water), extraction, development of new sources of supplemental water, direct use of recycled water, treatment and use of degraded groundwater, reduction of groundwater outflow, conjunctive use, basin yield maintenance, and all the additional goals identified in the Notice of Preparation, including the Program Elements 1 through 9.

The State encourages you to review prior environmental documents prepared for the Chino Basin Groundwater Storage Program by the Metropolitan Water District in 1988. Some of the concerns identified in that document may need to be revisited, including raised elevations of ground water

Neil Clifton
December 16, 1999
Page 3

and increased degradation of water quality, especially in the lower portions of Chino Basin where the State of California is mainly situated.

Lastly, the EIR should address the impacts and mitigation for issues identified in the November 9th Notice of Preparation, including geologic problems, biological resource impacts, impacts from creation and expansion of water-related facilities, impact of recycling reclaimed water from increased levels of TDS and increased impairment of groundwater quality, disposal from desalting and treatment facilities, use of flood control basins for percolation of storm water and recycled water, treatment of degraded water, air quality impacts, visual, noise and cultural resource impacts by construction of program element facilities. Thank you for this opportunity to comment. The State reserves its right to submit additional comments following a more specific description of the projects to be implemented in the Program EIR.

Sincerely,

Marilyn H Levin

MARILYN H. LEVIN
Deputy Attorney General

For BILL LOCKYER
Attorney General

MHL:dm

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tragerlaw@earthlink.net

December 17, 1999

Mr. Neil W. Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Bldg. A
Fontana, CA 92335

Re: Notice of Preparation of a Program Environmental Impact Report to Address Implementation of the Optimum Basin Management Program for the Chino Basin

Dear Mr. Clifton:

We represent the Chino Land and Water Company, and have received notice of the preparation of a Program Environmental Impact Report on the Chino Basin Watermaster's Optimum Basin Management Program for the Chino Basin.

Implementation of such a program is long overdue. Chino Land and Water Company would be pleased to provide whatever information is requested.

Please forward all communications to this address.

Sincerely,

LAW OFFICES OF SUSAN M. TRAGER
A Professional Corporation

Susan M. Trager

SMT:my

cc: Mr. Jay Greening
Ms. Traci Stewart
Wayne Lemieux, Esq.

CITY OF ONTARIO
303 EAST "B" STREET, CIVIC CENTER ONTARIO CALIFORNIA 91764-4196 (909) 986-1151
FAX (909) 391-2567

December 15, 1999

Mr. Neil W. Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Building A
Fontana, CA 92335

RE: **Notice of Preparation of a Program EIR to Address Implementation of the Optimum Basin Management Program for the Chino Basin**

Dear Mr. Clifton:

Thank you for giving us the opportunity to review the Notice of Preparation of a Program EIR to Address Implementation of the Optimum Basin Management Program for the Chino Basin. We have reviewed the project and have the following comments regarding this project.

On November 30, 1999, the City of Ontario annexed 8,200 acres of the former San Bernardino County Agricultural Preserve. The City currently has an approved General Plan for the area that will allow the development of non-agricultural uses. The EIR should address the impacts of involved with urban uses such as water run-off that is allowed in the General Plan, and the impacts associated with the anticipated population of 101,000 and their use of services and utilities such as water.

We look forward to reviewing the Program EIR to Address Implementation of the Optimum Basin Management Program for the Chino Basin. Should you have any question please call me at (909) 319-2506.

Sincerely,

ONTARIO PLANNING DEPARTMENT
Jerry L. Blum, City Planner

James A. Ragsdale

James A. Ragsdale, AICP
Principal Planner

JR:GS

THE CITY OF
RANCHO CUCAMONGA

December 15, 1999

DEC 17 1999

Neil W. Clifton, Manager of Engineering
Inland Empire Utilities Agency
P.O. Box 697
Rancho Cucamonga, CA 91729

RE: NOTICE OF PREPARATION (NOP) OF A PROGRAM ENVIRONMENTAL IMPACT REPORT TO ADDRESS IMPLEMENTATION OF THE OPTIMUM BASIN MANAGEMENT PROGRAM FOR THE CHINO BASIN.

Dear Mr. Clifton,

Thank you for the opportunity to comment on the subject NOP. We have no comments at this time but request to remain on your mailing list regarding this matter. Also, we request to receive a copy of the Draft Environmental Impact Report when it becomes available for public review.

Once again, thank you for the notification.

COMMUNITY DEVELOPMENT DEPARTMENT
PLANNING DIVISION

Sincerely,

Brad Buller
City Planner

BB:AW\ma

JOHN J. SCHATZ
ATTORNEY AT LAW
P.O. BOX 7775
LAGUNA NIGUEL, CA. 92607-7775
(949) 495-3176

December 13, 1999

Neil W. Clifton
Manager of Engineering
Energy and Water Resources
Inland Empire Utilities Agency
P.O. Box 697
Rancho Cucamonga, Ca. 91729

VIA FACSIMILE

RE: JURUPA COMMUNITY SERVICES DISTRICT'S COMMENTS CONCERNING NOTICE OF PREPARATION OF PROGRAM ENVIRONMENTAL IMPACT REPORT TO ADDRESS IMPLEMENTATION OF THE OPTIMUM BASIN MANAGEMENT PROGRAM FOR THE CHINO BASIN

Dear Mr. Clifton:

Jurupa Community Services District provides the following comments in connection with the above captioned matter.

1. In evaluating any environmental impacts associated with recycling reclaimed water, which among other things may increase levels of Total Dissolved Solids (TDS) and adversely impact groundwater quality in the Basin, any impacts should be determined on both a specific (local) and mass-balance (regional) basis. This will provide information necessary in order to consider decisions which may be made in connection with the implementation of the OBMP that may otherwise be based on overall Basin benefits which may nonetheless result in or contribute to the degradation of individual supplies.

2. Impacts should be specifically determined for individual agency wells, with the benchmark for such determinations being historical and current salt/nitrogen concentration levels for those wells in conjunction with Regional Water Quality Control Board Subbasin discharge criteria.

3. Any cumulative TDS increases associated with recycled water recharge that may occur through the implementation of the OBMP, however mitigated through increased stormwater recharge or other means, should be determined on the basis of total volume of salts added to the Basin rather than solely in the context of the combination of mitigation and recycled water.

JOHN J. SCHATZ
ATTORNEY AT LAW

4. Determination should be made with respect to whether groundwater quality mitigation, including increased stormwater recharge and/or the location of high-quality water recharge, should presently be occurring to mitigate for existing groundwater quality conditions rather than as mitigation for additional TDS loading associated with recycled water recharge. Accompanying the determination should be an evaluation of the appropriate allocation of TDS mitigation credit, particularly considering whether such mitigation is for existing Basin water quality conditions or for additional salt loading associated with recycled water recharge.

5. To the extent this item will be addressed within the EIR, evaluation should occur with respect to overall Basin benefits derived from the implementation of OBMP projects which may negatively impact existing water supplies if such impact can be effectively mitigated on a long-term basis. Such mitigation costs should be compared against existing water supply costs and comparable alternative supplies.

Thank you for your consideration of the foregoing comments. Please contact me if clarification or discussion is desired.

Sincerely,

John J. Schatz

John J. Schatz
for: Jurupa Community Services District

JJS:bam

CCWD

Cucamonga County Water District
9641 San Bernardino Road
Rancho Cucamonga, CA 91729-0638
P.O. BOX 638 • (909) 987-2591 • FAX (909) 941-8069

ROBERT A. DeLOACH
Secretary / General Manager

November 17, 1999

Neil W. Clifton
INLAND EMPIRE UTILITIES AGENCY
P.O. Box 697
Rancho Cucamonga, CA 91729-0697

Subject: *Notice of Proposal – Program Environmental Impact Report for Optimum Basin Management Plan*

Dear Mr. Clifton:

I have received the Notice of Preparation ("NOP") for the subject Environmental Impact Report ("EIR"). I look forward to participating in this process.

Cucamonga County Water District is very is very supportive of IEUA acting as the lead agency in this process, and offer our assistance where required. We are concerned with the comment period specified on the first page, which is limited to 30 days upon receipt of the notice. Due to circumstances beyond our control (specifically the availability of certain key personnel who will be required to review the NOP) I would respectfully request that we be allowed to extend the comment period to January 10, 2000. It is essential that we be allowed the opportunity to respond in a thorough manner.

Please contact me so that we can discuss this in more detail.

Respectfully,

Robert A. DeLoach
General Manager

cc: Best Best & Krieger (G. Tanaka)

CERTIFIED # Z402 369 473

CCWD

Cucamonga County Water District
9641 San Bernardino Road
Rancho Cucamonga, CA 91729-0638
P.O. BOX 638 • (909) 987-2591 • FAX (909) 941-8069

ROBERT A. DeLOACH
Secretary / General Manager

December 13, 1999

Ms. Tami Fincher
TOM DODSON & ASSOCIATES
2150 N. Arrowhead Ave.
San Bernardino, Ca. 92405

Subject: *OBMP Projects*

Dear Ms. Fincher:

The Cucamonga County Water District herein responds to the noticed dated December 1, 1999, requesting preliminary information on future OBMP related projects. Under the current Phase I report, our District would envision a variety of capital projects that would specifically be constructed as a part of our long-term plans. These projects are generally described below:

* Construction of transmission lines to distribute potable and recycled water across and through our jurisdiction to other agencies;

* Expansion of our Lloyd Michael Water Treatment Plant from 45 mgd to 90 mgd;

* Conversion of our treatment facilities from conventional treatment to either 'enhanced coagulation' or ozone;

* Construction of distribution pipelines for both potable and recycled water;

* Acquisition of property to construct additional storage facilities;

* Construction of additional storage facilities for both potable and recycled water;

* Development and construction of raw water/recycled water spreading facilities (including DHS approval);

* Construction of DHS approved blending stations and treatment facilities for nitrate & TDS mitigation;

* Construction of booster stations to facilitate transfer of potable and recycled water to higher elevations and across existing facilities;

* Construction of additional groundwater production wells;

* Development and construction of well manifold system to pump groundwater in and through MWD transmission lines; and

* Development and construction of a connection to existing MWD transmission facilities.

These projects represent a broad scope of action or implementation plan for our District resulting from the OBMP. I hope that the program EIR would be flexible enough to contemplate these and other projects. If you need additional information, please call me at your convenience.

Respectfully,

Robert A. DeLoach

cc: Best Best & Krieger

RAD:bt

STATE OF CALIFORNIA - THE RESOURCES AGENCY GRAY DAVIS, *Governor*

DEPARTMENT OF FISH AND GAME
Eastern Sierra - Inland Deserts Region
4775 Bird Farm Road
Chino Hills, California 91709
(909) 393-0635

December 14, 1999

Neil W. Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Bldg. A
Fontana, CA 92335

DEC 15 1999

Re: **Notice of Preparation of a Program Environmental Impact Report Optimum Basin Management Program for the Chino Basin 111299-1**

Dear Mr. Clifton:

The California Department of Fish and Game (Department) thanks you for the opportunity to comment on the proposed development. The stated purpose of the Optimum Basin Management Program (OBMP) is to develop a groundwater management program that enhances the safe yield and the water quality of the basin. The proposed project has several goals: 1) enhance Chino Basin groundwater supplies, 2) protect and enhance water quality, 3) enhance management of the Chino Groundwater Basin, and 4) equitably finance the OBMP. The project includes a set of nine program elements, whose implementation may cause physical changes in the environment and produce potential adverse impacts to the environment.

In connection with this project the Department will be acting as a Trustee agency for fish, plant and wildlife resources and as a Responsible Agency regarding impacts to endangered species and issuance of 1601-1603 Streambed Alteration Agreements. Obviously, this project has the potential to significantly impact riparian resources. The Department is concerned about the increasing appropriation of in-stream flows and loss of natural riparian systems through flood control and water recharge activities. In addition, the State of California has an official policy of no net loss of wetlands.

The Department is concerned that in the project description, goals, and key elements there is no mention of biological resources. Riparian areas contain a number of endangered species and species of special concern (birds, amphibians, reptiles and plants). This project may require permits from the Army Corps of Engineers, United States Fish and Wildlife Service and the Regional Water Quality Control Board. The Department is asking the lead agency to consult with the Department concerning the plan.

Many of the activities proposed in this project will require 1601-1603 Lake and Streambed Alteration Agreements from the Department. In order to issue these agreements the Lead Agency shall have to provide: 1) specific and detailed project descriptions, 2) inventory of direct and indirect project impacts on riparian resources, 3) alternatives analysis focusing on biological resources, 4) cumulative impact analysis on area biological resources;5) mitigation measures to avoid or reduce impacts on existing riparian resources, and 6); mitigated measures to protect riparian resources. Mitigation for the loss of riparian resources generally is at a 3:1 ratio of in-kind resources.

The Department is advising the lead agency that all potential impacts to biological resources and sensitive habitat areas be analyzed in the DEIR document, along with specific measures and alternatives to avoid or mitigate for the loss of sensitive biological resources. A 1989 statute requires that public agencies adopt reporting or monitoring programs to ensure mitigation measures are implemented. In this connection, mitigation measures have to be specific, have to be capable of being implemented and must be capable of being monitored.

The Department has several suggestions for the preparation of the DEIR:

1. Document specific direct and indirect impacts on the number and kinds of species of concern;

2. Outline specific alternatives, mitigation measures or project changes to reduce the project impact on federally endangered and State of California listed species or species of concern;

3. Discuss how open space can be used to preserve on-site biological resources;

4. Discuss avoidance measures to reduce impacts on the riparian corridors and other sensitive habitat and plant and animal species;

5. Discuss acquisition of off-site riparian and other habitat at appropriate mitigation ratios;

6. Discuss how the project does or does not conform with the state policy of no net loss of wetlands;

7. Identify potential areas of open space which might be beneficial for habitat.

8. Differentiate between multi-purpose open space and open space for habitat purposes;

9. Identify alternatives and specific mitigation measures which were considered which would reduce the significant impacts on endangered species and state species of concern;

10. The area contains critical habitat for a number of endangered species and species of special concern. How does the removal of the natural habitat and species of concern affect the regional conservation process. In critical habitat areas the preferred method of mitigation is on-site preservation not off-site mitigation or payment of fees;

The Department is a Responsible Agency if a Streambed Alteration Agreement is required. This fact should be ascertained and specified in the EIR. As a responsible agency the Department must rely on the information and analysis provided in the CEQA document to base its regulatory decisions and legal responsibility under CEQA. The Department is often unable to do so because the DEIR defers this analysis to future negotiations with the USFWS and the Department. Under CEQA the lead agency has an obligation to determine the significant impacts of a project and measures to avoid or mitigate the loss of significant resources.

Finally, the proposed Draft Environmental Impact Report should assess any impacts the proposed circulation update may have on the formulation of the Western Riverside Multi-Species Habitat Conservation Plan.

The Department concurs that an environmental impact report for this project is warranted. The following sections of this letter detail the types and content of studies necessary to evaluate the biological resources which may be present on the project site. Section 15021 of the CEQA Guidelines states:

CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible.

(1) In regulating public or private activities, agencies are required to give major consideration to preventing environmental damage.

(2) A public agency should not approve a project as proposed if there are feasible alternatives or mitigation measures available that would substantially lessen any significant effects that the project

would have on the environment.

This particular project has the potential to have significant environmental impacts on sensitive flora and fauna resources, including Federally listed endangered species. Therefore, critical aspects of the DEIR should include an alternatives analysis which focuses on environmental resources and in-kind mitigation measures for impacts identified as significant. To enable Department staff to adequately review and comment on the proposed project, we suggest that an intensive biological study be conducted prior to any environmental or discretionary approvals. The following information should be included in any focused biological report or supplemental environmental report:

1. A complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats.

   a. A thorough assessment of rare plants and rare natural communities, following the Department's May 1984 Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities (Attachment 1).

   b. A complete assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and the U.S. Fish and Wildlife Service.

   c. Rare, threatened, and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (See CEQA Guidelines, 15380)

   d. The Department's California Natural Diversity Data Base in Sacramento should be contacted at (916) 327-5960 to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code.

2. A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts.

a. CEQA Guidelines, 15125(a), direct that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region.

b. Project impacts should be analyzed relative to their effects on off-site habitats. Specifically, this should include nearby public lands, open space, adjacent natural habitats, and riparian ecosystems. Impacts to and maintenance of wildlife corridor/movement areas, including access to undisturbed habitat in adjacent areas, should be fully evaluated and provided.

c. The zoning of areas for development projects or other uses that are nearby or adjacent to natural areas may inadvertently contribute to wildlife-human interactions. A discussion of possible conflicts and mitigation measures to reduce these conflicts should be included in the environmental document.

d. A cumulative effects analysis should be developed as described under CEQA Guidelines, 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

e. The document should include an analysis of the effect that the project may have on completion and implementation of regional and/or subregional conservation programs. Under 2800-2840 of the Fish and Game Code, the Department, through the Natural Communities Conservation Planning (NCCP) program is coordinating with local jurisdictions, landowners, and the Federal Government to preserve local and regional biological diversity. Coastal sage scrub is the first natural community to be planned for under the NCCP program. The Department recommends that the lead agency ensure that the development of this and other proposed projects does not preclude long-term preserve planning options and that projects conform with other requirements of the NCCP program. Jurisdictions participating in the NCCP should assess specific projects for consistency with the NCCP Conservation Guidelines.

3. A range of alternatives should be analyzed to ensure that alternatives to the proposed project are fully considered and evaluated. A range of alternatives which avoid or otherwise minimize impacts to sensitive biological resources should be included. Specific alternative locations should also be evaluated in areas with lower resource sensitivity where appropriate.

a. Mitigation measures for project impacts to sensitive plants, animals, and habitats should emphasize evaluation and selection of alternatives which avoid or otherwise minimize project impacts. Off-site compensation for unavoidable impacts through acquisition and protection of high-quality habitat elsewhere should be addressed.

b. The Department considers Rare Natural Communities as threatened habitats having both regional and local significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts (Attachment 2).

c. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful.

4. A California Endangered Species Act (CESA) Permit must be obtained, if the project has the potential to result in "take" of species of plants or animals listed under CESA, either during construction or over the life of the project. CESA Permits are issued to conserve, protect, enhance, and restore State-listed threatened or endangered species and their habitats. Early consultation is encouraged, as significant modification to the proposed project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, require that the Department issue a separate CEQA document for the issuance of a CESA permit unless the project CEQA document addresses all project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA permit. For these reasons, the following information is requested:

a. Biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.

b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.

5. The Department opposes the elimination of watercourses and/or their channelization or conversion to subsurface drains. All wetlands and watercourses, whether intermittent or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic values and

maintain their value to on-site and off-site wildlife populations.

a. The Department has direct authority under Fish and Game Code 1600 set seq. In regard to any proposed activity which would divert, obstruct, or affect the natural flow or change the bed, channel, or bank of any river, stream, or lake. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources.

b. A discussion of potential adverse impacts from any increased runoff, sedimentation, soil erosion, and/or urban pollutants on streams and watercourses on or near the project site, with mitigation measures proposed to alleviate such impacts must be included.

Thank you for this opportunity to comment. Questions regarding this letter and further coordination on these issues should be directed to Robin Maloney-Rames, Environmental Specialist III, Chino Hills, (714) 817-0585.

Sincerely,

Glenn Black

Glenn Black
Supervisor
Habitat Conservation - South
Region 6

cc: Jeff Newman, USFWS, Carlsbad

Monte Vista

Mark N. Kinsey
GENERAL MANAGER

December 17, 1999

Mr. Neil Clifton
INLAND EMPIRE UTILITIES AGENCY
9400 Cherry Avenue
Fontana, California 92335

DEC 21 1999

Notice of Preparation of a Program Environmental Impact Report
<u>for the Optimum Basin Management Program for the Chino Groundwater Basin</u>

Dear Mr. Clifton:

Thank you for the opportunity to provide input to the Notice of Preparation of a Program Environmental Impact Report for the Optimum Basin Management Program (OBMP). The Monte Vista Water District is a party to the adjudication of the Chino Groundwater Basin. Our service responsibilities include the water supply delivery for distribution to consumers located within the cities of Montclair, Chino, Chino Hills, and the county of San Bernardino. Water supply to meet this demand includes a significant reliance on the Chino Groundwater Basin. Our ability to continue to rely on the Basin will, in large part, be dependent on the success of the OBMP.

As currently drafted, the OBMP provides an analysis of the existing conditions and Basin management issues facing Watermaster. It further identifies facilities to increase recharge and to improve water quality in the southern portion of the Basin. It does not, however, include the necessary procedures and mechanisms to implement Basin operational changes that are required to implement the OBMP and mitigate existing yield and water quality problems. Without implementation of several operational changes, water quality and yield within portions of the Basin will continue to degrade.

By the attached correspondence, dated September 8, 1999, the District previously submitted comments regarding Sections 1-4 of the Draft OMBP. As appropriate, please incorporate these comments into the scoping of the Draft EIR. Additional District comments for scoping purposes are provided below.

Water District
10575 Central Avenue, Post Office Box 71 • Montclair, California 91763 • (909) 624-0035 • FAX (909) 624-4725

- **<u>Goundwater Recharge:</u>** The OBMP envisions the implementation of a comprehensive program to increase the capture and recharge of the Chino Groundwater Basin with "native" runoff tributary to the groundwater basin. The recharge program further identifies the need for a projected artificial recharge capacity of 80,000 acre-feet per year to maintain Basin yield.

  The need and benefits of increased natural and artifical recharge are well documented in the OBMP. The Draft EIR should complete the following analysis to establish the amount of recharge that is necessary to maintain Basin yield and water quality by hydrologic or management zone within the Basin.

  1. Determine the existing yield of each hydrologic or management zone of the Basin under two separate operational conditions; present day (baseline), and "native" recharge component of the proposed recharge master plan. Compare this information to the estimated year 2020 groundwater production for the individual hydrologic zones to determine potential hydrologic imbalances that may be present.

  2. For any identified hydrologic zone shortfall, identify the proposed method to mitigate this imbalance. The identified mitigation measures should be clearly implementable under the existing Judgment for the Chino Groundwater Basin.

  3. Repeat the analysis for the water quality component of the recharge master plan. Changes in water quality for the two noted operational conditions should be estimated, and mitigation measures established for those portions of the Basin in which the resulting water quality does not meet drinking water standards.

  4. Complete a financial assessment of the mitigation measures recommended addressing any impacts identified during the completion of the analyses identified above.

- **<u>Impaired Areas of the Basin:</u>** In general, the OBMP focuses almost exclusively on addressing the water quality issues associated with the southern or "agricultural" region of the Basin. The OBMP does not address other areas of the Basin that have, or face significant water quality impairment.

  Review of OBMP Report Figure 2-71 identifies a large nitrate plume located in the northwestern portion of the Basin. The plume is identified as having contaminant levels in excess of 80 percent of the Maximum Contaminant Level for nitrate (36 mg/l).

  As noted in prior District correspondence, the leading edge of the plume currently encompasses approximately 40 percent of the District's service area and threatens other producers including the cities of Upland, Pomona, Chino, and Chino Hills. Currently, several District wells have been abandoned or closed due to nitrate levels that are 2.5 to 3.5 times drinking water standards. Groundwater flow vectors in the northwestern portion of the Basin indicate that this plume will continue to move in a southwesterly direction toward the city of Pomona's groundwater production well field.

The potential impacts for this and other major water quality plumes present in the Chino Groundwater Basin should be identified, and their potential operational impacts to existing and future groundwater production established. Measures to mitigate any identified impacts should be established in the Draft EIR.

Complete implementation of the OBMP will require modification to current operational practices in the Basin. These changes are necessary to fully address and mitigate the existing water quality and yield problems in the Basin. Because the policies and mechanisms required to implement these operational changes have not been developed, the EIR process faces many challenges successfully identifying and mitigating the environmental impacts of the OBMP.

The District appreciates your efforts to support the OBMP process. Should you have any questions regarding our comments, please contact the District at your convenience.

Monte Vista Water District

Mark N. Kinsey
General Manager

Attachment

cc: Monte Vista Water District Board of Directors

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Monte Vista

September 8, 1999

Mark N. Kinsey
GENERAL MANAGER

Calvin W. Good Jr.
CONTROLLER

Bruce Lance
LEGAL COUNSEL

Ms. Traci Stewart, Chief of Watermaster Services
CHINO BASIN WATERMASTER
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Optimum Basin Management Plan Report for the Chino Groundwater Basin

The Monte Vista Water District ("District") submits the following correspondence for inclusion into the September 15, 1999 public hearing record for the Optimum Basin Management Program (OBMP) Report. District comments are designed to identify components of the OBMP Report that limit the Program's goal of optimizing the beneficial use of the Chino Groundwater Basin. The District anticipates that it will provide oral testimony at the September 15, 1999 hearing, and reserves the right to submit additional written testimony on the OBMP process.

District comments are based on review of OBMP documentation, previous written and oral comments provided by other agencies, Article X, Section 2 of the California Constitution, and review of the Judgment and its supporting documentation. Our comments have been organized into two separate categories. General comments to the OBMP Report and OBMP Summary Matrix and Recommended Action Plan are provided below. Specific comments to a given page of Section 4 of the OBMP Report are included as Attachment 1, and should be reviewed along with the referenced page, and program element of the OBMP Report.

The District is also concerned about submitting an incomplete OBMP document to the Court. The OBMP Report scheduled for review by the Court in October 1999 is lacking the necessary sections addressing OBMP Plan implementation, and cost distribution. These sections the Plan may result in modification to the scope of the OBMP actually implemented by Watermaster; the Judgment recognizes that economic considerations are part of criteria utilized in Basin management.

Given the above, the OBMP Report should be submitted to the Court as only a progress report, with a request that the Court takes action to only receive the Report.

Water District
10575 Central Avenue, Post Office Box 71 • Montclair, California 91763 • (909) 624-0035 • FAX (909) 624-4725

OBMP REPORT

1. Groundwater Recharge. An active groundwater recharge program is necessary to ensure the optimum beneficial use of the Chino Groundwater Basin. Physical recharge as a means of maintaining Basin yield and water quality has been discussed since the beginning of the OBMP process An active groundwater recharge program is a critical component of the OBMP affecting yield, water quality, Basin storage, and conjunctive use programs.

   The Court in the *City of Chino v. Chino Basin Municipal Water District* Judgment ("Judgment") retained continuing jurisdiction over the Chino Basin adjudication under authority of Article X, Section 2 of the California Constitution which requires the waters of California to be put to beneficial use to the fullest extent of which they are capable. Current operations under the Judgment do not achieve the directive of the Constitution because, among other reasons, (1) insufficient emphasis is given to actual physical wet-water recharge of the Basin and (2) insufficient management of substitutions for wet-water recharge, such as *in lieu* recharge and production right transfers.

With minor exceptions, the Chino Basin receives recharge only through percolation of naturally occurring surface waters, primarily in the northeastern and north-central parts of the Basin. Since a major portion of total production in the Basin also occurs in the northeastern and north-central sector of the Basin, other areas of the Basin are largely cut off from the benefits of this natural recharge. Concurrently, natural recharge, which formerly occurred in the northwestern portion of the Basin, has been largely lost due to the channelization of the San Antonio Creek which conveys local runoff past the best recharge areas and generally past any possibility of beneficial use within the Chino Basin.

These physical facts are exacerbated by the failure of the current operating scheme under the Judgment to adequately regulate *in lieu* recharge and intra-basin water transfers. *In lieu* recharge does not bring in wet-water to replace overproduction within the Basin. Water is "recharged" *in situ*, while the replacement water is used on the surface. Similarly, transfer of water production rights from a party who under-uses adjudicated rights to a party who over-uses adjudicated rights, denies to the Basin the benefit of wet-water recharge to offset the overproduction by the water right transferee.

The District completed a review of the Judgment to determine whether it expresses any preference for physical replenishment of the groundwater Basin, as opposed to in-lieu recharge or intra-pool transfers. Consistent with Article X, Section 2 of the California Constitution, Sections 39-41 of the Judgement clearly provide that the overall goal of the Judgment is to achieve maximum reasonable beneficial use of the waters of the Chino Basin, taking into account both water quantity and quality considerations. These sections further grant the Watermaster broad general powers and provide for flexibility in the Judgment to achieve this goal.

Subsequent sections of the Judgment also appear to allude to preference for wet water recharge. For example, Section 50 of the Judgment provides for methods of replenishment. The section states: "Watermaster may accomplish replenishment of overproduction from the Basin **by any reasonable method**, including:

a. Spreading and percolation or injection of water in existing or new facilities...
b. In-Lieu Procedures. Watermaster may make, or cause to be made, deliveries of water for direct surface use, in lieu of groundwater production."

The fact that wet water recharge is listed first implies a preference to in-lieu procedures.

Section 49 identifies possible sources of supplemental water that may be used to recharge the Basin. The Judgment states: "Maximum beneficial use of reclaimed water shall be given high priority by Watermaster." This again implies a preference to wet-water recharge.

Section 11 of Exhibit H of the Appropriative Pool Pooling Plan provides the criteria for accomplishing replenishment by in-lieu means. The section states: "there are, or may develop, certain areas within the Chino Basin where **good management practices** dictate that recharge of the Basin be accomplished, to the extent practical, by taking surface supplies of supplemental water in lieu of groundwater otherwise subject to production as an allocated share of the Operating Safe Yield." This section again alludes to the preference of wet water recharge over in lieu means, and requires that in lieu recharge be completed only when dictated by good Basin management practices.

Section 13 of Exhibit H of the Appropriative Pool Pooling Plan addresses the criteria for the assignment or lease of an appropriative Operating Safe Yield right. The section states: "Watermaster shall not approve transfer, lease, or license of a right for exercise in an area or under conditions where such production **would be contrary to sound Basin management or detrimental to the rights or operations of other producers.**"

The Judgment requires that the Basin be operated to achieve maximum reasonable beneficial use of the waters of the Chino Basin. The Court, under the authority of Article X, Section 2 of the California Constitution, retains the authority to compel Watermaster to operate the Basin to achieve this constitutional mandate. Serious groundwater management and equity issues exist within the current operating regimen under the Judgment. These management and equity issues interfere with the optimum management of the Chino Basin to achieve the directives of the California Constitution.

The OBMP Report does not provide the necessary program mandate to require Watermaster to complete wet-water recharge as part of the management of the Basin. The OBMP Report does not require the development of criteria to determine if in lieu replenishment or production right transfers constitute sound management practices under the Judgment and the OBMP.

Wet-water recharge should be enhanced, with both native and imported supplemental water, by the development of additional recharge facilities in the various recharge zones of the Basin. In lieu recharge and water right transfers should be better regulated under the Judgment and the OBMP in order to promote the health of the Basin and to facilitate the fullest beneficial use of its water.

2. Watermaster Role in OBMP Implementation. During the OBMP process, significant discussion has occurred regarding the role of Watermaster as an implementer of OBMP related projects and facilities. There appears to be a consensus of the parties to the Judgment that Watermaster is prohibited under the Judgment from owning property and substantial capital assets.

   Under Section 17 of the Judgment, Watermaster's authority is limited to matters in the Judgment and later court orders. "Watermaster shall have and may exercise the express powers, and shall perform the duties, **as provided in this Judgment or hereafter ordered or authorized by the Court** in the exercise of the Court's continuing jurisdiction." The Watermaster's powers are derived from the court and are subject to the same limitations as the court's jurisdiction. The court maintains jurisdiction over, and only over, the parties to the action and administers the relationship among the parties in connection with the subject matter addressed by the 1978 Judgment.

   The limited authority of the Watermaster is often characterized under the rubric of "The Watermaster cannot own property." In fact, the Judgment expressly prohibits ownership of real property by the Watermaster: "Watermaster may purchase, lease, acquire, and hold all necessary facilities and equipment; **provided that it is not the intent of the Court that Watermaster acquire any interest in real property or....**" The inherent limitation on the Watermaster's power, however, is really more fundamental. The Watermaster has no corporate existence. This is more clear now that the Watermaster is not the Chino Basin Municipal Water District. Since it has no corporate existence, the Watermaster may not contract, sue, or be sued, without court consent. Only by virtue of the court's authority to compel the parties in the case to guarantee the obligations incurred by the Watermaster can goods and services be secured to carry out the Judgment.

   As part of the OBMP process, a finding from the Watermaster legal counsel concerning this issue should be prepared and incorporated into the OBMP Report. Reference in the OMBP Report to Watermaster assuming responsibility for the construction or ownership of OBMP-related facilties should be modified to reflect the limitations established in the Judgment.

OBMP SUMMARY MATRIX AND RECOMMENDED ACTION PLAN

1. Program Element 2 – Groundwater Recharge. The District is supportive of the Chino Basin Water Conservation District's (CBWCD) efforts to provide for increased recharge of the Chino Groundwater Basin. Through their positive efforts, the Basin's knowledge and understanding of the importance of recharge has increased greatly. Program Element 2 is clearly one of the more critical components to the success of the OMBP.

By correspondence, dated August 5, 1999, the Cucamonga County Water District (CCWD) raises a number of issues regarding the CBWCD's role in implementing this element of the OBMP. As noted in the CCWD correspondence, the CBWCD service area does not encompass the larger Chino Basin region, and is generally limited to the western half of the groundwater Basin. Funding for CBWCD activities are generated through a property tax assessment levied within its service area boundaries. Use of this revenue to support recharge activities outside of the agency's service area could result in the transfer of this tax revenue to areas outside corporate boundaries of the agency. There appears to be a number of approaches available to address this issue and could include, but not be limited to, the following:

- Limit the role of the agency to those activities within its corporate boundaries. There are a number of recharge projects and activities within this area requiring implementation through the OBMP.
- Have the agency cooperatively participate with other agencies to implement OBMP recharge activities outside of the CBWCD boundaries. A cost-sharing approach could be established to address the funding issues presented above.
- Have the agency expand its service area and taxing authority to encompass the majority of the Basin's service area.

The District does not agreed with CCWD's suggestion that consideration be given to utilization of the CBWCD's tax revenue as an offset to desalter project costs. This approach could create the same issues identified above, and would result in the use of the agency's tax revenue for an activity possibly outside its service responsibilities.

2. Program Element 3/5 - Water Supply Plans For Impaired Areas of the Basin/Regional Water Supply Plans. The District is supportive of a program that maintains historic Basin production patterns and yield, while improving Basin water quality.

   Program Element 3, focuses almost exclusively on addressing the water quality issues associated with the southern or "agricultural" region of the Basin. The element does not address other areas of the Basin that have, or face significant water quality impairment. Review of OBMP Report Figure 2-71 identifies a large nitrate plume located in the northwestern portion of the Basin. The plume is identified as having contaminant levels in excess of 80 percent of the Maximum Contaminant Level for nitrate (36 mg/l).

   The leading edge of the plume currently encompasses approximately 40 percent of the District's service area. Several District wells have been abandoned due to nitrate levels that are 2.5 to 3.5 times drinking water standards. Groundwater flow vectors in the northwestern portion of the Basin indicate that this plume will continue to move in a southwesterly direction toward the city of Pomona's groundwater production well field. The identified plume affects implementation of OBMP Goal 1 - *Enhance Basin Water Supplies* and Goal 2 - *Protect and Enhance Water Quality*. Program Element 3 should be modified to address the other impaired regions of the Basin.

Program Element 5 - Regional Water Supply Plan, identifies facilities designed to maintain historic production patterns and yield, while improving water quality in the southern portion of the Basin. The Plan proposes to maintain current agricultural production patterns in the Basin through the delivery of groundwater supplies to meet increasing urban demand within the southern portion of the Basin. Facilities required to implement this water supply plan include groundwater production wells, water distribution systems and desalter facilities to remove excess levels of total dissolved salts and nitrates from the underlying groundwater basin. The success of this plan requires a difficult balance between program phasing and cost.

The phasing of the proposed facilities does not accurately reflect the water supply programs and demands of the identified purchasing agencies. For example, the identified water supply plan for the city of Chino Hills does not include deliveries under the water supply agreement between the District and the city. Under this agreement, the District is obligated to deliver up to 18,175 acre-feet of water to the city annually. Combined with the city's other existing water supply sources, the firm water supply for the city could exceed projected year 2020 demand by up to 10,000 acre-feet annually.

The OBMP Report should revise the regional water supply to more accurately reflect existing firm water supply plans of the identified purchasing agencies and their projected increased water demand from growth within the agricultural areas. The OBMP Report should also complete an analysis of the relationship between the proposed water supply plan and the acreage of agricultural land scheduled for annexation by these agencies. This analysis may be beneficial in determining the quantity of desalter product water purchased by the individual agencies, and in determining the phasing of proposed desalter facilities.

The District is supportive of the desalter program, and Watermaster efforts to establish a program based on equitable distribution of desalter capacity and costs. We are also encouraged and supportive of the efforts of SAWPA and IEUA to secure state and federal funding sources. Finally, we agree with CCWD that Orange County water agencies should be approached to determine their interest in either purchasing desalter product water or assisting in the funding of the project itself.

3. <u>Program Element 6/7 - Salt Budget/Manure Management</u>. As noted in District Attachment 1, and in CCWD's correspondence dated August 5, 1999, the Regional Water Quality Control Board is considering adoption of Tentative Order Number 99-11 for <u>General Waste Discharge Requirements for Dairies and Related Concentrated Animal Feeding Operation,</u> (NPDES Number CA8000336). If adopted, manure disposal practices in the Basin would become a regulatory compliance requirement for the dairy operators.

   The District does not feel that it is the responsibility of the Watermaster to subsidize regulatory compliance requirements of agencies or individual business operations. Watermaster may want to reconsider the OBMP Program Element 6/7 recommendation to subsidize manure removal within the Chino Basin region. Given the projected cost of full OBMP implementation, the proposed subsidy could be shifted to offset the cost of implementing the water supply plan envisioned in Program Elements 3/5. The identified water supply plan would provide a salt benefit to both the Basin and to dairy and agricultural interests.

Thank you for the opportunity to provide comments to the OBMP process. The District is supportive of the process and its goal to optimize the benefical use of the Chino Groundwater Basin. The success of this endevor will depend on our collective ability to craft a program that equitably distributes costs and benefits to the parties of the Judgment. The District will remain an active participant in the OBMP process. Again, on behalf of the Monte Vista Water District, thank you for your efforts.

Sincerely,

Mark N. Kinsey
General Manager

Attachment

cc: Monte Vista Water District Board of Directors
Mr. Art Kidman, McCormick, Kidman, and Behrens

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Attachment 1

Monte Vista Water District
Comments to OBMP Section 4 - Management and Implementation Plan

- Page 4-4: Production Monitoring Program: The text states that "about 600 agricultural wells will be equipped with in-line totalizing flow meters." Given the fact that alternatives to the complete metering of the agricultural wells are currently under review, consideration to modifying the text to reflect this fact should be given.

- Page 4-6: Well Construction, Abandonment, and Destruction Monitoring: The text should clarify that Watermaster involvement in well abandonment will be limited to non-Appropriative Pool producers. The Appropriative Pool agencies currently follow the necessary regulations for the abandonment of production wells, and should report this information to Watermaster as part its annual reporting requirements.

- Page 4-6: Groundwater Level Monitoring: The text states that for the Appropriative Pool, the data will be collected by the "*pool member or Watermaster staff at pool member discretion.*" It is clearly within the ability of each pool member to collect the necessary information for submittal to Watermaster. The District does not support the concept of subsidizing other agency operation through this type of activity; the other pools should individually pay for the cost of Watermaster providing these services.

- Page 4-9: Program Element 2: The statement that "*some recycled water projects that are currently being planned will increase recharge when groundwater production downgradient of these proposed recharge projects is decreasing. The result will be increased outflow to the Santa Ana River and no yield improvement*" should be modified or deleted from the text. The District feels that additional analysis is required to support this conclusion.

- Page 4-10: Program Element 2: The discussion regarding recharge needs could imply that "*in-lieu*" replenishment is the preferred approach to offsetting Basin over-draft conditions. Long-term use of in-lieu replenishment has the potential to create negative yield and water quality impacts to the Basin. From review of the water supply plans developed by Watermaster, it appears that the replenishment obligation may be understated.

  The District is currently delivering 16.2 mgd of water to the city to assist in meeting its demands. To meet this obligation, it is anticipated that the District could increase its groundwater production by approximately 10,000 acre-feet per year over what is currently identified in the OBMP water supply plan. Based on this additional demand, the estimated new recharge capacity required for Management Zone 1 would increase to approximately 28,000 acre-feet per year in 2020.

- Page 4-18: Program Element 4: The finding that the city of Chino Hills *firm* year 2020 water supply source is short by an estimated 5,600 acre-feet per year needs clarification. Under the water supply agreement between the city and the District, the city has "acquired" a right for deliveries from the District's system equal to 16.22 mgd (18,175 acre-feet per year).

  Facilities to provide deliveries to the city include groundwater production wells, nitrate blending stations, and District capacity at the WFA facility located in the city of Upland. Facilities are under construction to permit the District to increase the use of groundwater supplies to meet our water supply obligation to the city. After accounting for water supply deliveries from the District, and the assumption that the city's year 2020 deliveries of desalter water remain constant at 2,240 acre-feet per year (year 2000 estimate) in 2020, the city's water supply sources could exceed projected demand by approximately 10,000 acre-feet per year.

- Page 4-23: Program Element 3: The information regarding the Inland Empire Utilities Agency requires minor updating. The current population within the IEUA service area is estimated at 700,000 people. In addition to the identified service responsibilities, the agency will begin operating the SAWPA Desalter when its becomes operational in the year 2000.

- Page 4-28: Program Element 4: The District concurs with the statement that *"increases in Management Zone 1 production may need to be matched with increases in groundwater recharge to ensure that a balance in pumping and recharge is maintained."*

  Recharge should be provided annually to maintain both yield and water quality. It may be necessary for Watermaster to provide recharge through targeted injection to assist in yield maintenance within the subsidence zone or to provide water quality benefits to the larger MZ-1 area. Procedures have already been established in the Judgment to undertake and distribute the cost to complete these activities.

- Page 4-33: Program Element 6: The Regional Water Quality Control Board is currently in the process of considering the adoption of Tentative Order Number 99-11 for General Waste Discharge Requirements for Dairies and Related Concentrated Animal Feeding Operation, (NPDES Number CA8000336). The order, if adopted, would change manure removal practices within the Chino Basin region.

  The District does not feel that it is the responsibility of the Watermaster to subsidize regulatory compliance requirements of agencies or individual business operations. Watermaster may want to reconsider the OBMP Program Element 6/7 recommendation to subsidize manure removal within the Chino Basin region.

California Regional Water Quality Control Board

Santa Ana Region

Winston H. Hickox
Secretary for Environmental Protection

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Gray Davis
Governor

DEC 10 1999

December 8, 1999

Mr. Neil W. Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Bldg. A
Fontana, CA 92335

NOTICE OF PREPARATION OF A PROGRAM ENVIRONMENTAL IMPACT REPORT TO ADDRESS IMPLEMENTATION OF THE OPTIMUM BASIN MANAGEMENT PROGRAM FOR CHINO BASIN

Dear Mr. Clifton:

We have reviewed the Notice of Preparation of a Program Environmental Impact Report to Address Implementation of the Optimum Basin Management Program for Chino Basin (NOP). Regarding the statutory concerns of the Santa Ana Regional Water Quality Control Board (Regional Board), the Draft Program Environmental Impact Report (EIR) should address the following:

I. Water Quality and Beneficial Uses

A. Mitigation of adverse impacts should be addressed.

B. The description of potential impacts of the proposed projects on surface and ground water quality and beneficial uses should address the following:

1. Any activities that could cause violations of narrative or numeric water quality objectives contained in the Regional Board's 1995 Water Quality Control Plan for the Santa Ana River Basin.

2. Proposed projects occurring upstream of or discharging into impaired waterbodies listed on the Clean Water Act Section 303(d) list may be subject to additional controls (specifically Total Maximum Daily Loads or TMDLs) pursuant to federal regulation. Depending on the proposed project, these controls could include discharge prohibitions, revisions to discharge permits, or management plans to address water quality impacts. This is especially important in the Chino Basin Watershed. Environmental documents for proposed projects need to acknowledge that these additional requirements may be imposed in the future.

3. Construction activities (including grading) that could result in water quality impacts.

4. Soil characteristics related to water quality including the potential for erosion and subsequent siltation, and any increase or decrease in percolation.

5. Impacts of toxic substances handling and disposal (if appropriate).

6. If any of the projects impact riparian or wetland habitats, a complete description of the impacts, acreage of the impacts, and any proposed mitigation should be provided.

C. One of the goals of the Optimum Basin Management Program (OBMP) is to protect and enhance water quality. The parties to the Chino Basin Judgement and other interested agencies recognize that water quality in the Chino Basin has been adversely affected by urban and agricultural activities, and that there are important political, social, and economic reasons for addressing these adverse effects at this time. Current trends in the Chino Agriculture Preserve have significant implications for water supply and water quality in Chino Basin, the Santa Ana River, and Orange County. Pumping patterns and hydrologic conditions in the southern part of the Basin will be affected as agricultural operations cease in this area over the next 10 to 20 years. The OBMP contains proposals to address these changes and the environmental impacts of these proposals should be addressed. In addition, the EIR should evaluate the environmental impacts of failing to complete certain key OBMP projects (i.e., no action alternatives will result in significant environmental changes).

II. Wastewater Disposal and Treatment

A. Types and amounts of waste materials generated by various projects should be considered.

B. Proposed waste treatment and disposal methods should be evaluated in regards to the following:

1. Treatment facilities: location, current capacity, treatment standards, master treatment facilities expansion plan (if appropriate)

2. Treatment plant collection system: location of major trunk lines and tie-ins, current capacity

3. Disposal facilities: location, capacity

C. Applications or permits required to implement waste disposal should be addressed.

D. The impact of calculated project waste volume on the capacity of existing and proposed treatment and disposal facilities should be evaluated.

II. Permits

A. Storm water runoff in the area is currently regulated by an areawide discharge permit, issued to the cities and counties under the National Pollutant Discharge Elimination System (NPDES).

B. A notice of intent (NOI) with appropriate fees for coverage of any projects under the General Construction Activity Storm Water Runoff Permit must be submitted to the State Water Resources Control Board at least 30 days prior to initiation of construction activity. This is required for any construction activity covering at least five acres.

C. The Regional Board requires an NPDES permit for any discharge of wastes to surface waters or Waste Discharge Requirements for any discharge of wastes to land.

D. If reclaimed water is to be used, Water Reclamation Requirements must be issued by the Regional Board.

We look forward to reviewing the Draft Program EIR when it becomes available. If you have any questions, please contact me at (909)782-4459 or William M. Norton at (909)782-4381.

Sincerely,

Wm. B. Rice

William B. Rice, Associate Engineering Geologist
Chino Basin Watershed Management Section

WBR/obmpnop.ltr

WESTERN MUNICIPAL WATER DISTRICT

December 17, 1999

DEC 22 1999

Mr. Neil Clifton
Inland Empire Utilities Agency
9400 Cherry Avenue, Building A
Fontana CA 92335

NOTICE OF PREPARATION
PROGRAM EIR FOR OBMP

Western appreciates the opportunity to respond to the Notice of Preparation for the EIR for the OBMP. You will recall that we recently worked with the Utilities Agency to develop a Mitigation Agreement in connection with the Ely Basin recharge project, and to obtain necessary Court approval for that project. In December, 1998 we responded to the NOP for the Chino Basin Recycled Water Groundwater Recharge Project. The OBMP appears to include projects similar to these in nature.

It appears that the purpose of the program EIR is to assess the potential impacts of implementing a plan to manage the water resources in the Chino Basin. The plan includes interrelated projects which in the aggregate are intended to implement a management strategy expressed in terms of goals.

The OBMP concludes that the OBMP is a program that defines a series of actions that collectively have environmental consequences. The NOP further states that the actions are for the purpose of enhancing safe yield and improved water quality for the basin. The actions are delineated in the form of program elements.

The NOP concludes that implementation of program elements will create potential for physical change and adverse impacts to the environment. The NOP further concludes that specific projects that constitute a program element will require further environmental analysis in the future.

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Mr. Neil Clifton
Inland Empire Utilities Agency
December 17, 1999
Page 2

Our comments are relative to the list of issues that are considered to have the highest potential for significant environmental impact. The list is typical of project EIRs and may not be well suited for the proposed program EIR. It may prove to be very difficult to adequately address many of the issues identified because they require more project definition than is available.

More importantly, the list is deficient with respect to issues related to safe yield and improvement of water quality. Other issues with high potential to cause significant environmental impacts that may require mitigation are:

- Changes in pattern of extraction and/or recharge may change the amount and direction of flow of existing contaminated groundwater, and thereby adversely affect adjacent groundwater levels and quality to the detriment of existing producers.

- The cumulative effect of various programs and projects may cause degradation of the surface and groundwater resources and result in non-compliance with the Basin Plan.

- Substituting treated wastewater, recharged lower in the basin, for State Project water, recharged higher in the basin, may cause quality degradation and reduce safe yield.

Western supports development of the OBMP and programs and projects that increase safe yield and improve water quality. Western will continue to support recharge projects using reclaimed wastewater when appropriately mitigated to avoid adverse water quality impacts.

The contact person in Western for this project is Donald L. Harriger, General Manager.

DONALD L. HARRIGER
General Manager

DLH:jg

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
Metropolitan Water District Laura J. Simonek, Principal Environmental Specialist Letter dated December 9, 1999	• MWD is a potentially affected public agency and is supportive of efforts to protect and enhance groundwater supplies.	
Chino Basin Water Conservation District Barrett Kehl, General Manager Letter dated December 8 & 9, 1999	• The No Project evaluation should include an evaluation/determination under current pumping, recharge, and storage conditions how much water can annually be pumped from the Chino Groundwater Basin without causing water mining to occur (December 8, 1999 letter). • Environmental and Economic impacts resulting from a continuation of the current pumping, recharge, and storage conditions, absent any of the projects contemplated by the OBMP, should be evaluated in the EIR (December 8, 1999 letter).	• Construction and operation of new diversion works along the San Antonio Channel for the purpose of diverting, and ultimately recharging, imported water to and within the Brooks Street Basin, Montclair Basins #3 and #4, and the College Heights and Upland Basin (December 9, 1999 letter). • Excavation, shaping, and reconfiguration of College Heights and Upland Basin for recharge purposes (December 9, 1999 letter).
General Electric David W. Thompson, Manager Environmental Remediation Programs Letter dated December 8, 1999	• Consider Beneficial Projects such as the GE clean-up project of a region with high TCE and chromium concentrations in Ontario, California. • Consider how extraction/recharge patterns and changes in extraction/recharge patterns may affect groundwater flow patterns (possibly affecting containment of the localized area of degraded water quality currently being pumped, treated, and recharged by GE).	

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
Fontana Water Company Michael J. McGraw, Manager Letter dated December 2, 1999	• The EIR must fully address potentially adverse water quality and quantity impacts that may result from the implementation of any of the OBMP proposed activities. • The EIR must demonstrate that OBMP implementation will not in any way directly or indirectly limit, curtail or otherwise affect the continued use of our existing wells, nor our ability to drill and pump new wells as needed within the company's service area. • Examine the need for abatement of sources of groundwater contamination such as ongoing cattle and dairy operations. (Fontana Water Company feels a more extensive definition of PR #6 is needed, along with policies for cease and desist orders for salt loading operations in the basin and for consideration of desalting treatment facilities.)	
Southern California Associate of Governments David Stein, Manager Performance Assessment and Implementation Letter dated December 6, 1999	• Discuss any inconsistencies between the proposed project and applicable general plans and regional plans. • Cite and address appropriate SCAG core and ancillary policies using SCAG policy numbers and a side-by-side comparison format to evaluate consistency. • The following topics should be reviewed and evaluated for consistency under the Regional Comprehensive Plan: Growth Management, Living Standards, Quality of Life, Social/Political/Cultural Equity, Air Quality, Water Quality, and Open Space considerations.	

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
<u>California Regional Water Quality Control Board</u> William B. Rice, Associate Engineering Geologist Letter dated December 8, 1999	• Propose mitigation for adverse impacts. • Describe potential impacts on surface and groundwater quality and beneficial uses [specifically impacts on narrative or numeric water quality objectives listed in the 1995 Water Quality Control Plan (Region 8)]. • Consider proposed project placement and potential project impacts relative to impaired waterbodies listed under Section 303 (d) of the CWA, which may impose additional controls (e.g. TMDLs) on discharges. • Evaluate how construction activities may result in water quality impacts. • Describe/analyze soil characteristics related to water quality (i.e. erosion/siltation potential and changes in percolation rates). • Evaluate impacts of toxic substances handling and disposal (if appropriate). • Describe and provide mitigation for all impacts to riparian or wetland habitats. • Evaluate environmental impacts associated with the various proposals in the OBMP for dealing with the transition of agricultural operations to urban uses in the southern end of the basin. • Evaluate environmental impacts of failing to complete key OBMP projects (i.e. no-action alternatives will result in significant environmental changes.)	

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
California Regional Water Quality Control Board (continued)	• Consider types and amounts of waste materials generated by various projects and treatment and disposal methods (to be compared based on facility location, capacity, treatment standards, expansion plans for future, and position relative to major trunk lines and tie-ins). • Consider applications and/or permits require to implement waste disposal and the impact of project waste volumes on the capacity of existing and proposed treatment/disposal facilities. • Consider permits such as: stormwater runoff NPDES permits; NOIs; surface water or waste discharge requirements for NPDES permits; and water reclamation requirements.	
City of Chino David G. Crosley, Water and Environmental Manager Letter dated December 16, 1999	• The scope of the EIR should include adoption of the OBMP by including, but not limited to the Chino Basin Watermaster and any party to the Judgment. • Scope should include adoption of MOA's defining the action necessary to achieve OBMP goals and potential JPA's by including, but not limited to the Watermaster and Judgment parties. • Consider General Plans and Master Facilities Plan of the agencies in the basin and address compatibility with the OBMP. • Evaluate the impact (including economic) of OBMP projects occupying acreage that might otherwise be used for other City development.	Activities/project contemplated by the City of Chino for implementation under the OBMP: • Groundwater production elevation and quality monitoring. • Groundwater production well construction. • Treatment facility construction for nitrate removal from groundwater. • Construction of injection wells or modifications of existing groundwater production wells for injection (part of a conjunctive use program). • Construction of recycled water distribution facilities and direct beneficial use of recycled water. • Recycled water recharge (part of a regional program). • Land subsidence investigations and data collection. • Chino Desalter retail water agency.

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
City of Pomona Sandra Campbell, City Planner Letter dated December 17, 1999	• Requests that the issues listed in the NOP will be included in the EIR along with a discussion of how the City of Pomona will be affected. • Discuss how Pomona's water quality and supply will be affected by the OBMP. • Include mitigation measures for those issues that may cause significant impacts.	
Western Municipal Water District Donald L. Harriger, General Manager Letter dated December 17, 1999	• There may be a difficulty in adequately addressing many of the issues identified because they require more project definition than is available at this time. • Evaluate changes that extraction/recharge patterns may have on flow patterns of existing contaminated groundwater, and thereby adversely affect adjacent groundwater levels and quality to the detriment of existing producers. • Evaluate cumulative effects of various programs and projects that may cause degradation of surface and groundwater resources and result in non-compliance with the Basin Plan. • Evaluate substitution of treated wastewater, recharged lower in the basin for State Project Water, recharge higher in the basin. There may be a decrease in water quality and safe yield if this action continues.	

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
State of California Department of Justice Marilyn H. Levin, Deputy Attorney General for Bill Lockyer, Attorney General Letter dated December 16, 1999	• The California Department of Corrections owns approximately 2,600 acres in the Chino Basin. The CIM facility has 9 ag wells (8 active), 4 domestic wells, and a sewage treatment plant. The CIW facility has four inactive wells and one active well and discharges to the SARI line. • California DFG and Transportation purchase from municipal entities, and the California DFG previously utilized one well on its property. • Department of Toxic Substance Control owns the land identified as the Stringfellow superfund site and is involved in a major cleanup of the area. • The EIR should identify the State of California and its agencies and departments owning land and producing water from the Chino Basin. The EIR should include potential impacts to these projects by OBMP facilities/activities. • The EIR should address the impact of the proposed projects on the continued use of the state's existing wells and its ability to drill new wells in the vicinity of its land. • Specifically the State is interested in impacts of the proposed wellfields and the water supply projects proposed in the Draft Water Supply Facilities Plan.	• Plans to drill two new domestic wells south of the central facility and to reduce pumping from two other wells to have a positive impact on the subsidence issue. • Construction of an ion exchange treatment plant. • Study being conducted to see if the treatment plant should be expanded and to see if tertiary treatment should be implemented.

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
State of California Department of Justice (continued)	• The EIR should address the impact of the OBMP proposals for recharge, extraction, development of new sources of supplemental water, direct use of recycled water, treatment and use of degraded groundwater, reduction of groundwater outflow, conjunctive use, basin yield maintenance, and goals listed in the NOP. • Review the MWD's 1988 Chino Basin Ground-water Storage Program environmental documents and the increased degradation of water quality in the lower portions of Chino Basin.	
Chino Land and Water Company Susan M. Trager, Attorney Letter dated December 17, 1999	• Implementation of the program is long overdue and would be pleased to provide whatever information is requested.	
City of Ontario James A. Ragsdale, Principal Planner Letter dated December 15, 1999	• The EIR should address the impacts involved with urban land uses such as water runoff and the impacts associated with the anticipated population of 101,000 and their use of services and utilities (such as water) for the area recently annexed by the City (8,200 acre area of the former San Bernardino County Agricultural Preserve).	
City of Rancho Cucamonga Brad Buller, City Planner Letter dated December 15, 1999	• The City has no comments at this time but wishes to review the DEIR, when completed.	

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
Jurupa Community Services District John L. Schatz, Attorney Letter dated _____	• Evaluate impacts associated with recycling reclaimed water (e.g. TDS and groundwater quality impacts) using specific (local) and mass-balanced (regional) methodologies to conduct impact determinations. • Determine impacts for individual agency wells, using historical and current salt/nitrogen concentration levels and RWQCB sub-basin discharge criteria as benchmarks for evaluation. • Evaluate cumulative TDS increases associated with recycled water recharge allowed under the OBMP on the basis of total volume of salts added, however, mitigated by additional storm-water recharge or other means, rather than solely in the context of mitigation and recycled water. • Determine whether groundwater quality mitigation (including stormwater and/or other high-quality recharge) should presently be occurring to mitigate for existing groundwater quality rather than for additional TDS loading associated with recycled water recharge. • Evaluate benefits derived from OBMP projects versus negative impacts to existing water supplies and determine if such impacts can be effectively mitigated on a long-term basis. Mitigation costs should be compared against existing water supply costs and comparable alternative supplies.	

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
Cucamonga County Water District Robert A. DeLoach, General Manager (Letter dated November 17, 1999 requests extension of the 30-day comment period to January 10, 1999.) Comment letters dated December 13 and 17, 1999	(Letter dated December 13, 1999) • Consider indirect physical impacts of the financing of the OBMP to the extent that financing may affect future project implementation, and therefore, may have environmental consequences. • Consider and evaluate the "equitable distribution" of OBMP costs among member agencies and the foreseeable consequences of inequitable financing on growth and land use if certain classes of water users are unfairly saddled with large costs. Methods for assuring that all responsible parties have the legal capacity and obligation to contribute their fair share to OBMP costs should be included in the EIR. • If additional water is captured, stored and reused in the Basin under the OBMP, and if there is revenue generated by actions under the OBMP, the EIR should evaluate the physical impacts associated with this revenue and ensure that the parties implementing the OBMP can avail themselves of this financing option without undergoing separate CEQA review. • Evaluate the siting of new recharge facilities in the basin with a focus on the northern half of the Chino Basin so that recharge water is not lost to the SAR before it is put to beneficial use. • Consider the effects of possible over-extraction in the northern half of the Basin potentially preventing high-quality recharged water from flowing south and "flushing" the Basin to improve groundwater quality.	(Letter dated December 17, 1999) Capital projects that CCWD may implement under the OBMP: • Construction of transmission lines to distribute potable and recycled water throughout CCWD's jurisdiction and to other agencies. • Expansion of Lloyd Michael Water Treatment Plant from 45 to 90 MGD. • Conversion of treatment facilities from conventional treatment to either enhanced coagulation or ozone. • Construction of distribution pipelines for both potable and recycled water. • Acquisition of property to construct additional storage facilities followed by construction of such facilities. • Development and construction of raw water/ recycled water spreading facilities (with DHS approval). • Construction of DHS approved blending stations and treatment facilities for nitrate and TDS mitigation. • Construction of booster stations to facilitate transfer of potable and recycled water to higher elevations and across existing facilities. • Construction of groundwater production wells.

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
<u>Cucamonga County Water District (continued)</u>	• Examine the physical impacts of increased recharge or deceased pumping on both subsidence and non-subsidence zones within Management Zone 1. • Impacts of the OBMP on the Prado Dam/ Reservoir must be examined as the OBMP will change the water levels at the dam due to increased capture and recharge further up the basin. This may impact environmentally sensitive wetland areas that may exist around the reservoir. • Discuss other agency approvals such as DHS and RWQCB in light of how the OBMP fits in with their standards and regulations. • Evaluate the OBMP in conjunction with the effects of RWQCB's dairy discharge requirements and manure removal standards.	• Construction of well and manifold system to pump groundwater in and through MWD trans-mission lines. • Construct a connection to existing MWD transmission facilities.
<u>California Department of Fish and Game</u> Glenn Black, Supervisor, Region 6 Letter dated December 14, 1999	• DFG is concerned about the increasing appropriation of in-stream flow and loss of natural riparian systems through flood control and water recharge activities. • DFG asks that the lead agency consult with the Department regarding permits that may be required from the ACOE, USFWS and RWQCB (1601/1603 Agreements need detailed project descriptions, inventory of direct/indirect project impacts on riparian resources, cumulative impact analysis on area biological resources, mitigation measures to avoid/reduce impacts on existing riparian resources, mitigated measures t protect riparian resources).	

SUMMARY OF NOTICE OF PREPARATION, COMMENT LETTERS, ISSUES AND CONCERNS

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
California Department of Fish and Game (continued)	• The Department lists an extensive set of criteria to be considered in the EIR (especially open space, mitigation/monitoring plan, species of concern, and critical habitat areas). • The project should avoid/minimize environmental impacts using alternative analyses and direct, indirect and cumulative impact analyses (especially for the Western Riverside Multi-Species Habitat Conservation Plan and other NCCP programs for conservation). • Focused biological surveys, regarding sensitive habitats and species, should be conducted. All sensitive species/habitat in and around the area should be addressed where deemed appropriate by consultation with the Department and the USFWS. Also the NDDB search should be included. • The project description/mitigation monitoring plan/impact analysis should be complete enough to allow DFG, USFWS and other agencies to determine significant impacts and to make decisions regarding permit issuance (especially for a CESA permit) whenever possible. • DFG has jurisdiction over activities that would affect any river, lake or stream. • The EIR should include impacts for increased runoff, sedimentation, soil erosions, and/or urban pollution to any streams or watercourses on or near the project area.	

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
<u>Monte Vista Water District</u> Mark N. Kinsey, General Manager Letter dated December 17, 1999 (with attached September 8, 1999 comment letter)	(Letter dated December 17, 1999) • The Phase I OBMP report lacks the necessary procedures and mechanisms to implement Basin operational changes that are required to implement the OBMP and mitigate existing yield and water quality problems. • The Draft EIR should determine the existing yield of each management zone under present day (baseline), and native recharge component of the proposed recharge master plan. This should be compared to the estimated 2020 groundwater production for the individual management zones to determine potential hydrologic imbalances. • For any zonal shortfalls, the document should identify mitigation measures for the imbalances and specific implementation methods under the existing Judgment. • Repeat bullets 1-3 analysis for water quality. Changes in conditions for the two operational conditions should be estimated and mitigation measures established for areas not meeting drinking water standards. • Complete a financial assessment for mitigation measures recommended under the above analyses.	

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
<u>Monte Vista Water District (continued)</u>	• Address other areas in the basin besides the southern "agricultural" region that are impaired. For example: there is a large plume in the northern areas of the Basin with nitrate concentrations of 36 mg/l (2-3 times drinking water standards). Identify impacts to Upland, Pomona, Chino, and Chino Hills if the plume continues to move into groundwater production well fields. Propose measures to mitigate any identified impacts. *(Attached Letter dated September 8, 1999)* • The EIR should consider the impacts in-lieu of recharge versus wet-water recharge. • The role of Watermaster in implementation of projects should be established in a finding by Watermaster's legal council to establish a policy for future consideration when dealing with multiple-party agreements for project implementation. • For Program Element 2 (Recharge), recharge activities that are funded by member agencies should either occur within corporate boundaries or use a cost-sharing approach. • MVWD is against using tax revenues as a mitigation form to offset desalter costs since the monies would be used for facilities outside of service area responsibilities. • The OBMP and EIR need to address impaired areas other than the southern regions of the basin and provide mitigation/monitoring plans for these area.	

AGENCY OR INDIVIDUAL	ISSUES RAISED OR COMMENT	POTENTIAL PROJECTS TO BE CONSIDERED
Monte Vista Water District (continued)	• The EIR should consider the financial aspects of the phasing plan and that some of the phasing does not accurately reflect member agencies' projected needs. Plans may need to be reconsidered to better estimate/phase OBMP facilities and associated costs. • The EIR may want to consider the alternative to subsidizing manure removal under Program Elements 6/7 and shift this subsidy to water supply related Program Elements 3/5, which would both improve the salt balance and benefit dairy/ag operations.	

RESPONSES TO OBMP
NOTICE OF PREPARATION
COMMENT LETTERS

The comment letters submitted to the Inland Empire Utilities Agency (IEUA) in response to the Notice of Preparation (NOP) for the preparation of the Optimum Basin Management Program (OBMP) have been compiled in this Appendix (8.1) and summarized in the summary table enclosed with Appendix 8.1. To assist the commentors to find the text of the Program Environmental Impact Report (PEIR) that addresses issues or concerns raised in a comment, the following responses have been developed. In addition, where an issue could not be addressed in the PEIR because of insufficient definition or data this is noted in the responses below. These responses are organized in the same order as the agency is listed in the summary table.

Metropolitan Water District

- Metropolitan Water Districts comment letter expressed support for the OBMP and raised no issues or concerns.

Chino Basin Water Conservation District

- Section 4.5.2 of the PEIR identifies current pumping, recharge and storage conditions and the volume of water that can be pumped without contributing to Chino Basin overdraft. The current safe yield is estimated to be about 156,000 acre-feet per year (af/y), but under the no project alternative (baseline condition) the safe yield value could drop to approximately 116,000 af/y.

- Environmental effects of continuing baseline condition are presented in both Subchapter 4.5.3 and Chapter 5.

General Electric

- Although the remediation of a contaminated plume of water is the responsibility of the responsible party, the clean-up of any contamination, including that being carried out by the company, will clearly benefit the basin by making additional high quality water available within the Basin over time and it will eliminate a existing constraint to installation of domestic water production wells within the contaminated areas which are discussed in Subchapters 4.5 and 4.10.

- Please refer to the discussion of water quality and flow pattern impacts on groundwater quality anomalies in Subchapter 4.5 and 4.10.

Fontana Water Company

- Please refer to the water quality and quantity impact discussions in Subchapter 4.5.

- Please refer to Subchapter 4.5 for a discussion of the effects of recharging recycled water and related limitations on future access to groundwater in the Chino Basin.

- The need to abate water quality anomalies (contaminated groundwater plumes) is considered self-evident. Please refer to Subchapter 4.5 which discusses the OBMP effects on such anomalies. Potential OBMP efforts at remediating water quality anomalies are still being defined and specific abatement efforts and related environmental effects will have to be reviewed in future tier of review.

Southern California Association of Governments (SCAG)

- Refer to Subchapter 4.2 for a discussion of general plan consistency issues

- The OBMP does not lend itself to a side-by-side comparison with SCAG policies. Those policy issues pertinent to the OBMP are addressed in Subchapter 4.2.

- The growth management plan, air quality, and water quality issues are addressed in more detail in their respective subchapters.

- Aside from seeking to assure adequate future public water supply, the OBMP does not affect living standards, quality of life, socio-political or open space issues.

Santa Ana Regional Water Quality Control Board

- Mitigation measures are summarized in Chapter 1 of the PEIR and discussed in each subchapter in Chapter 4.

- Please refer to Subchapter 4.5 for a discussion of surface and groundwater quality issues.

- Please refer to Subchapters 4.5 and 4.10 for a discussion of OBMP effects on impaired water bodies.

- Please refer to Subchapter 4.5 which addresses construction impacts on water quality.

- Subchapters 4.4 and 4.5 address soil issues.

- Subchapters 4.5 and 4.10 addresses toxic substance issues.

- Subchapter 4.8 addresses biology issues and mitigation measures.

- Subchapter 4.5 addresses effects of agricultural land use transitions on water quality.

- The effects of not implementing the OBMP are addressed in Subchapter 4.5 and Chapter 5.

- Waste material issues are addressed in both Subchapters 4.5 and 4.10.

- Wastewater issues are discussed in Subchapters 4.5 and 4.13.

- Other permits are addressed in Subchapters 4.5, 4.8 and 4.10

City of Chino

- Please refer to Chapters 2 and 3. The PEIR has been structured to allow any party to adopt the OBMP and certify the EIR for their own programs.

- The programmatic character of this would allow it to be used for any future decisions in support of the OBMP.

- Please refer to Subchapter 4.2 for a discussion of general plan consistency and Subchapters 4.5 and 4.13 for a discussion of water facilities.

- A discussion of OBMP effects on acreage available for private development is presented in Subchapter 4.2. Until specific locations for facilities are identified it is not possible to evaluate whether any economic impact will occur or what the level of economic impact o a specific community may be in the future.

Monte Vista Water District

- The comment about procedures and mechanisms is noted. Actual implementation of the OBMP will be facilitated by completion of the CEQA review. Please refer to Chapter 4.5 for a discussion of all water issues. Where specific issues are not addressed, the data to conduct an evaluation is not yet available.

- Offsetting zonal shortfalls is a function of OBMP implementation in the future, and potential environmental effects from implementation will be mitigated as summarized in Chapter 1 of the PEIR.

- Please refer to Subchapter 4.5 and 4.10 for a discussion of water quality issues.

- Mitigation requirements will be determined by the specific characteristics of a proposed project and a specific location. It is not possible to generically assess the financial effects of mitigation measures since they will be dependent on date that is not available, and therefore, speculative.

- Water quality anomalies are addressed in Subchapters 4.5 and 4.10.

- The use of in-lieu water as recharge does not actually have any direct physical impact, it is solely an accounting process which could cause an inaccurate accounting of safe yield and actual water in the Basin. Wet water recharge issues are addressed in Subchapter 4.5 of the PEIR.

- The comment regarding Program Element 2 activities is acknowledged, but does not raise an environmental issue requiring response.

- Again, the comment regarding tax revenues is noted but does not have any identifiable physical effects on the environment.

- Subchapter 4.5 and 4.10 address the water quality anomalies in the whole Basin.

- The issue of phasing plans and financial aspects of such plans has no identifiable physical effects that can be evaluated in this PEIR.

- The manure removal subsidy has been eliminated and therefore is not considered in this PEIR.

City of Pomona

- Based on the whole of the analysis in the PEIR, the only potential impact that cannot be mitigated to a nonsignificant level from implementing the OBMP is short-term air quality impacts associated with construction activities. Therefore, the effects on the City (since no major facilities will be implemented in the City) are not forecast to be significant.

- The water supply and water quality issues for the City are linked to the implementation of the OBMP. The EIR analysis indicates that overall safe yield will be protected and enhanced by the proposed OBMP and water quality will also be preserved or enhanced.

- Detailed mitigation measures are summarized in Chapter 1 and listed in each of the Chapter 4 subchapters.

Western Municipal Water District

- Your comment regrading how "ripe" each of the issues is for evaluation is valid, but the PEIR contains a detailed evaluation of the potential impacts of the program outlined in the OBMP which allows adequate evaluation of impacts for the current level of definition.

- Please refer to Chapter 4.5 and 4.10 for a discussion of the effects on existing water quality anomalies.

- Please refer to Chapter 4.5 for a discussion of the effects on groundwater resources.

- Water quality issues associated with recharge of both State Project Water and recycled water is provided in Subchapter 4.5.

State Department of Justice

- Comments regarding existing Department of Corrections facilities is noted.

- Comments regarding DFG and DOT are also noted.

- Comments regarding DTSC projects associated with the Stringfellow superfund site are noted.

- The analysis of impacts in all of the PEIR sections characterizes OBMP impacts, including those impacts in the area of State facilities.

- Specific impacts such as those associated with a specific well or continued use of existing wells cannot be evaluated at a specific level. This can only occur when specific projects are proposed. However, the general impacts to groundwater throughout the Basin are characterized for OBMP programs in Subchapters 4.5 and 4.10.

- Please refer to the previous comment.
- Please refer to Subchapters 4.5 regarding the water resource impacts identified in this comment.
- The data indicates that a conjunctive use program as large in scope as evaluated in the 1988 document has a potential for significant impacts associated with capture and transport of contaminants in the vadose zone.

Chino Land and Water Company

- Your comment is noted and appreciated.

City of Ontario

- Growth impacts, impacts associated with conversion of agricultural lands and urbanization of Ontario's recent Chino Agricultural Preserve annexation area are addressed in Subchapters 4.2, 4.3, and 4.5.

City of Rancho Cucamonga

- Your comment is noted and a DEIR is being provided for the City's review.

Jurupa Community Services District

- Please refer to Subchapter 4.5 for an evaluation of recycled water recharge impacts. Note that general or program impacts can be forecast, but site specific impacts must be evaluated when specific projects are proposed.
- It is not possible to evaluate the effects of individual agency wells in a Basin the encompasses 351+ square miles of area. However, an overall salt and nitrogen balance for the Basin is discussed in Subchapter 4.5 and 5 regarding future activities of the OBMP and the baseline no project case for these constituents.
- Cumulative TDS increases are addressed from a perspective of offsetting the net increment of salt removal. The data regarding salt balance is provided in Subchapter 4.5.
- The OBMP identifies the need for substantial salt removal through operating several desalters, up to 40,000 af/y. The OBMP clearly indicates that recharge with stormwater, including urban generated stormwater, will benefit the Basin. See Subchapter 4.5.
- Please refer to Subchapter 4.5 which clearly indicates that with implementation of the OBMP water supplies will be maintained and no mitigation is required. If the no project, baseline condition, is maintained, it is highly likely that significant adverse impacts to the Basin are forecast to occur and substantial mitigation is likely to be required. Mitigation costs cannot be correlated with physical changes in the environment and are, therefore, not a subject for CEQA review.

Cucamonga County Water District

- The OBMP is too general at this stage of review allow a comparison of future project implementation schedules or financing commitments. Even indirect physical impacts of financing,, if they exist, are beyond the scope forecasting at this time.

- As the District is aware, an agreement on OBMP implementation principles has been reached and it is beyond the scope of the OBMP PEIR to evaluate the "equitable distribution" of OBMP costs, primarily because such costs cannot be effectively predicted at this stage of the OBMP review.

- Again, the sharing of revenue for increased safe yield is not a PEIR issue and this issue appears to have been addressed as part of the political process with the recent development of the memorandum of principles.

- Please refer to Subchapter 4.5 for a general evaluation of the OBMP recharge program.

- The isolation of the northern half of the Basin from the southern half of the Basin by overextraction was beyond the scope of the evaluation in this PEIR and it is not a component of the OBMP.

- The subsidence issues is evaluated as part of Subchapters 4.4 and 4.5.

- The water level issue at Prado Dam is evaluated as part of Subchapter 4.5.

- Other agency approvals are discussed in each of the relevant subchapters that discuss implementation of the OBMP. For example, DHS and RWQCB requirements are addressed as part of Subchapter 4.5 and biological agency requirements are addressed in Subchapter 4.8 and hazardous material handling issues are addressed in Subchapter 4.10.

- OBMP implementation assumes implementation of the dairy discharge and manure removal standards and the impacts forecast in Subchapter 4.5 reflect these considerations.

California Department of Fish and Game

- The data in Subchapter 4.5 clearly indicates that future surface flows, mostly produced by wastewater treatment will provide more water for riparian habitat, than less. The OBMP proposes to capture storm flows and to meet the goals of the U. S. Fish and Wildlife Service (see Subchapter 4.8) in reducing the total pool of water which at present may actually be harming riparian habitat and contributing to type conversion to aquatic habitat. The overall OBMP program is designed to benefit biological resources, and site specific biological resource impacts for future specific projects will be evaluated with a focus on potential impacts to endangered or otherwise sensitive biological resources.

- The commitment is made for consultation with appropriate agencies regarding permits for biological resource impacts in Subchapter 4.8.

- Please refer to Subchapter 4.8 for a discussion of mitigation, species of concern and critical habitat areas. Mitigation monitoring will be implemented as required by CEQA and open space issues will be fully considered when specific projects are evaluated in the future.

- Mitigation measures summarized in Chapter 1 and further discussed for biological resources in Subchapter 4.8 emphasize avoidance and minimization of site specific resource impacts, including biological resources. All conservation plans will be given careful consideration prior to implementation of any specific project as recommended in this comment and identified in mitigation measures in Subchapter 4.8.

- Focused surveys will be a key component of future site specific reviews for OBMP facilities as outlined in Subchapter 4.8.

- The proposed project is a program that will be implemented over a long-period of time. The PEIR identifies approximately 500+ acres of impact for all facilities in the future, including many sites that are already disturbed. The NDDB and FWS list of species for the project area are included in the PEIR, Subchapter 4.8.

- DFG jurisdiction over OBMP activities that would cause alterations in streams or lakes has been acknowledged and future OBMP activities will be coordinated with DFG as specific projects are defined.

- For potential impacts due to changes in runoff and potential soil erosion, impacts and mitigation measures, written as performance standards are incorporated into the PEIR, Subchapter 4.5.

APPENDIX 8.2

SECTIONS 15162 & 15168 OF STATE CEQA GUIDELINES

some effects for which mitigation will not be feasible at an early step of approving a particular development project, and the section would allow a Lead Agency to defer mitigation of that kind of effect to a later step. Such effects may include site specific effects such as aesthetics or parking, depending on the circumstances. At the same time, this section makes clear that tiering does not excuse the Lead Agency from analyzing reasonably foreseeable significant effects, or justify deferring analysis to a later tier EIR or Negative Declaration.

Where tiering is used, the Lead Agency will need to determine whether, in the light of changing circumstances, the EIR prepared earlier in the process would still provide an adequate description of the broad effects considered at that stage. Tiering enables an agency to rely upon the analysis contained in a previous document when it adequately addresses a later project. Subdivision (e) describes what is meant by 'adequately addressed' in such a way as to ensure that prior mitigation measures will be applied to the later project.

To make the process understandable, any EIR or Negative Declaration using the tiering principle must refer to the prior EIR, state where a copy of that document may be examined, and state that tiering is being used.

15153 Use of an EIR from an Earlier Project

(a) The lead agency may employ a single EIR to describe more than one project, if such projects are essentially the same in terms of environmental impact. Further, the lead agency may use an earlier EIR prepared in connection with an earlier project to apply to a later project, if the circumstances of the projects are essentially the same.

(b) When a lead agency proposes to use an EIR from an earlier project as the EIR for a separate, later project, the lead agency shall use the following procedures:

(1) The lead agency shall review the proposed project with an initial study, using incorporation by reference if necessary, to determine whether the EIR would adequately describe:

(A) The general environmental setting of the project,

(B) The significant environmental impacts of the project, and

(C) Alternatives and mitigation measures related to each significant effect.

(2) If the lead agency believes that the EIR would meet the requirements of subsection (1), it shall provide public review as provided in Section 15087 stating that it plans to use the previously prepared EIR as the draft EIR for this project. The notice shall include as a minimum:

(A) An identification of the project with a brief description;

(B) A statement that the agency plans to use a certain EIR prepared for a previous project as the EIR for this project;

(C) A listing of places where copies of the EIR may be examined; and

(D) A statement that the key issues involving the EIR are whether the EIR should be used for this project and whether there are any additional, reasonable alternatives or mitigation measures that should be considered as ways of avoiding or ... the project.

(3) The lead agency shall prepare responses to comments received during the review period.

(4) Before approving the project, the decision-maker in the lead agency shall:

(A) Consider the information in the EIR including comments received during the review period and responses to those comments,

(B) Decide either on its own or on a staff recommendation whether the EIR is adequate for the project at hand, and

(C) Make or require certification to be made as described in Section 15090.

(D) Make findings as provided in Sections 15091 and 15093 as necessary.

(5) After making a decision on the project, the lead agency shall file a notice of determination.

(c) An EIR prepared for an earlier project may also be used as part of an initial study to document a finding that a later project will not have a significant effect. In this situation a negative declaration will be prepared.

(d) An EIR prepared for an earlier project shall not be used as the EIR for a later project if any of the conditions described in Section 15162 would require preparation of a subsequent or supplemental EIR.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21100, 21151, and 21166, Public Resources Code.

Discussion: The purpose of this section is to grant Lead Agencies clear authority to use an EIR prepared for one project over again for a second project which has essentially the same impacts as the project for which the EIR was originally prepared. The section places necessary conditions on the use of a prior EIR to avoid abuse of this approach. Where two projects are essentially the same in terms of environmental impact, there is little reason to require preparation of a separate EIR for the second project.

Subsection (b) prescribes the procedures for an agency to use in implementing this authority. Use of a Negative Declaration is not appropriate. Although a Negative Declaration does state than an EIR will not be prepared, the reason for preparing a Negative Declaration is that the project will not have a significant effect. An EIR is needed if the project may have a significant effect although under some circumstances a previously prepared EIR may be used as the basis for review. The procedures prescribed in subsection (b) should reduce the confusion that has often been experienced in this situation.

This section is different from tiering in that this process does not involve a series of approvals moving from the general to the specific with EIRs omitting issues fully addressed at the earlier stages. The use of a previously prepared EIR is most appropriate where an EIR was prepared earlier for a project very similar to the one currently being examined by the Lead Agency.

15154 Projects Near Airports

(a) When a lead agency prepares an EIR for a project within the boundaries of a comprehensive airport land use plan or, if a comprehensive airport land use plan has not been adopted for a project within two nautical miles of a public airport or public use airport, the agency shall utilize the Airport Land Use Planning Handbook published by Caltrans' Division of Aeronautics to assist in the preparation of the EIR relative to potential airport-related safety hazards and noise problems.

(b) A lead agency shall not adopt a negative declaration or mitigated negative declaration for a project described in subsection (a) unless the lead agency considers whether the project will result in a safety hazard or noise problem for persons using the airport or for persons residing or working in the project area.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Section 21096, Public Resources Code.

Article 11. Types of EIRs Sections 15160 to 15170

15160 General

This article describes a number of examples of variations in EIRs as the documents are tailored to different situations and intended uses. These variations are not exclusive. Lead agencies may use other variations consistent with the guidelines to meet the needs of other circumstances. All EIRs must meet the content requirements discussed in Article 9 beginning with Section 15120.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21061, 21100, and 21151, Public Resources Code.

15161 Project EIR

The most common type of EIR examines the environmental impacts of a specific development project. This type of EIR should focus primarily on the changes in the environment that would result from the development project. The EIR shall examine all phases of the project including planning, construction, and operation.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21061, 21100, and 21151, Public Resources Code.

15162 Subsequent EIRs and Negative Declarations

(a) When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

   (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

   (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

   (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

   (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

(b) If changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent EIR if required under subsection (a). Otherwise the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation.

(c) Once a project has been approved, the lead agency's role in project approval is completed, unless further discretionary approval on that project is required. Information appearing after an approval does not require reopening of that approval. If after the project ~~was~~ is approved, any of ~~prior to the occurrence of~~ the conditions described in ~~S~~subsection (a) occurs, a ~~the~~ subsequent EIR or negative declaration shall only be prepared by the public agency which grants the next discretionary approval for the project, if any. In this situation no other responsible agency shall grant an approval for the project until the subsequent EIR has been certified or subsequent negative declaration adopted.

(d) A subsequent EIR or subsequent negative declaration shall be given the same notice and public review as required under Section 15087 or Section 15072. A subsequent EIR or negative declaration shall state where the previous document is available and can be reviewed.

Note: Authority cited: Public Resources Code Sections 21083 and 21087. Reference: Section 21166, Public Resources Code; *Bowman v. City of Petaluma* (1986) 185 Cal. App.3d 1065 ~~(1986)~~; ~~and~~ *Benton v. Board of Supervisors* (1991) 226 Cal.App.3d 1467 ~~(1991)~~; and *Fort Mojave Indian Tribe v. California Department of Health Services et al*, (1995) 38 Cal.App.4th 1574

Discussion: This section implements the requirements in Section 21166 of CEQA which limit preparation of a subsequent EIR to certain situations. This section provides interpretation of the three situations in which the statute requires preparation of a subsequent EIR. These interpretations are necessary to add certainty to the process.

This section also clarifies that a subsequent EIR may be prepared where a negative declaration had previously been adopted. Further, a subsequent negative declaration may be adopted where none of the situations described in subsection (a) have occurred.

Subsections (b) and (c) explain which agency would have responsibility for preparing a subsequent EIR under different circumstances. A subsequent EIR must, of course, receive the same circulation and review as the previous EIR.

Fund for Environmental Defense v. Orange (1988) 204 Cal.App.3d 1538, contains a discussion of the application of §15162 and §15163. The Court in *Bowman v. Petaluma* (1986) 185 Cal.App.3d 1065 distinguished requirements for a subsequent EIR from the threshold required for initial EIR preparation, saying "whereas §15064 (§21151 PRC) requires an EIR if the initial project may have a significant effect on the environment, §15162 (§21166 PRC) indicates a quite different intent, namely, to restrict the powers of agencies by prohibiting them from requiring a subsequent or supplemental EIR unless "substantial changes" in the project or its circumstances will require major revisions to the EIR. §15162 (§21166 PRC) comes into play precisely because in-depth review has already occurred, the time for challenging the sufficiency of the original EIR has long since expired, and the question is whether circumstances have changed enough to justify repeating a substantial portion of the process.

15163 Supplement to an EIR

(a) The lead or responsible agency may choose to prepare a supplement to an EIR rather than a subsequent EIR if:

   (1) Any of the conditions described in Section 15162 would require the preparation of a subsequent EIR, and

   (2) Only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation.

(b) The supplement to the EIR need contain only the information necessary to make the previous EIR adequate for the project as revised.

(c) A supplement to an EIR shall be given the same kind of notice and public review as is given to a draft EIR under Section 15087.

(d) A supplement to an EIR may be circulated by itself without recirculating the previous draft or final EIR.

(e) When the agency decides whether to approve the project, the decision-making body shall consider the previous EIR as revised by the supplemental EIR. A finding under Section 15091 shall be made for each significant effect shown in the previous EIR as revised.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Section 21166, Public Resources Code.

Discussion: This section provides a short-form method where only minor additions or changes would be necessary in the previous EIR to make that EIR apply in the changed situation. The section also provides essential interpretations of how to handle public notice, public review, and circulation of the supplement.

A supplement to an EIR may be distinguished from a subsequent EIR by the following: a supplement augments a previously certified EIR to the extent necessary to address the conditions described in section 15162 and to examine mitigation and project alternatives accordingly. It is intended to revise the previous EIR through supplementation. A subsequent EIR, in contrast, is a complete EIR which focuses on the conditions described in section 15162.

15164 Addendum to an EIR or Negative Declaration

(a) The lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

(b) An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.

(c) An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration.

(d) The decision-making body shall consider the addendum with the final EIR or adopted negative declaration prior to making a decision on the project.

(e) A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Section 21166, Public Resources Code; *Bowman v. City of Petaluma* (1986) 185 Cal.App.3d 1065 ~~(1986)~~; and *Benton v. Board of Supervisors* (1991) 226 Cal.App. 3d 1467 ~~(1991)~~

Discussion: This section is designed to provide clear authority for an addendum as a way of making minor corrections in EIRs and negative declarations without recirculating the EIR or negative declaration.

15165 Multiple and Phased Projects

Where individual projects are, or a phased project is, to be undertaken and where the total undertaking comprises a project with significant environmental effect, the lead agency shall prepare a single program EIR for the ultimate project as described in Section 15168. Where an individual project is a necessary precedent for action on a larger project, or commits the lead agency to a larger project, with significant environmental effect, an EIR must address itself to the scope of the larger project. Where one project is one of several similar projects of a public agency, but is not deemed a part of a larger undertaking or a larger project, the agency may prepare one EIR for all projects, or one for each project, but shall in either case comment upon the cumulative effect.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21061, 21100, and 21151, Public Resources Code; *Whitman v. Board of Supervisors*, 88 Cal.App.3d 397 (1979).

Discussion: This section follows the principle that the EIR on a project must show the big picture of what is involved. If the approval of one particular activity could be expected to lead to many other activities being approved in the same general area, the EIR should examine the expected effects of the ultimate environmental changes. This section is consistent with the *Whitman* decision cited in the note interpreting CEQA.

15166 EIR as Part of a General Plan

(a) The requirements for preparing an EIR on a local general plan, element, or amendment thereof will be satisfied by using the general plan, or element document, as the EIR and no separate EIR will be required, if:

(1) The general plan addresses all the points required to be in an EIR by Article 9 of these guidelines, and

(2) The document contains a special section or a cover sheet identifying where the general plan document addresses each of the points required.

(b) Where an EIR rather than a negative declaration has been prepared for a general plan, element, or amendment thereto, the EIR shall be forwarded to the State Clearinghouse for review. The requirement shall apply regardless of whether the EIR is prepared as a separate document or as a part of the general plan or element document.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Sections 21003, 21061, 21083, 21100, 21104, 21151, and 21152, Public Resources Code.

Discussion: A separate section is provided to authorize combining the general plan document with the EIR. This section allows the use of the general plan document as the EIR if the document contains a special section or a cover sheet identifying where each of the points required in an EIR may be found. This section also identifies the special requirement for an EIR on a general plan to be submitted to the State Clearinghouse for review as a project of areawide, regional, or statewide significance as provided in Section 15207.

15167 Staged EIR

(a) Where a large capital project will require a number of discretionary approvals from government agencies and one of the approvals will occur more than two years before construction will begin, a staged EIR may be prepared covering the entire project in a general form. The staged EIR shall evaluate the proposal in light of current and contemplated plans and produce an informed estimate of the environmental consequences of the entire project. The aspect of the project before the public agency for approval shall be discussed with a greater degree of specificity.

(b) When a staged EIR has been prepared, a supplement to the EIR shall be prepared when a later approval is required for the project, and the information available at the time of the later approval would permit consideration of additional environmental impacts, mitigation measures, or reasonable alternatives to the project.

(c) Where a statute such as the Warren-Alquist Energy Resources Conservation and Development Act provides that a specific agency shall be the lead agency for a project and requires the lead agency to prepare an EIR, a responsible agency which must grant an approval for the project before the lead agency has completed the EIR may prepare and consider a staged EIR.

(d) An agency requested to prepare a staged EIR may decline to act as the lead agency if it determines, among other factors, that:

(1) Another agency would be the appropriate lead agency; and

(2) There is no compelling need to prepare a staged EIR and grant an approval for the project before the appropriate lead agency will take its action on the project.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Section 21003, Public Resources Code.

Discussion: The staged EIR was developed as a device to deal with the problem of a large development project which would require many years for planning, engineering, and construction but would need a number of approvals from public agencies before the final plans for the project would be available. Where those final plans would not be available, the Lead Agency preparing an EIR for one of the early approvals would have difficulty providing enough information about the project to evaluate the effects of the entire project as would otherwise be required.

The device of the staged EIR provides a special relaxation of the requirement for the EIR on a development project to examine the entire project in detail. To make up for this lack of detail with the early approval, the section requires preparation of a supplement with later approvals when additional information becomes available. The section also allows this device to be used in the troublesome situation where an agency with limited control over the project is asked to grant the first approval for the project long before the normal Lead Agency would be called upon to act. The Responsible Agency needs some document to use in order to comply with CEQA. At the same time, due to its limited control over the project, it would not be a prime candidate for being Lead Agency. This approach allows the Responsible Agency to do a limited EIR examining the effects of its approval but noting in a general way the larger scope of the project and the general environmental effects expected.

15168 Program EIR

(a) General. A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:

(1) Geographically,

(2) As logical parts in the chain of contemplated actions,

(3) In connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or

(4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways.

(b) Advantages. Use of a program EIR can provide the following advantages. The program EIR can:

(1) Provide an occasion for a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action,

(2) Ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis,

(3) Avoid duplicative reconsideration of basic policy considerations,

(4) Allow the lead agency to consider broad policy alternatives and programwide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts,

(5) Allow reduction in paperwork.

(c) Use with Later Activities. Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.

(1) If a later activity would have effects that were not examined in the program EIR, a new initial study would need to be prepared leading to either an EIR or a negative declaration.

(2) If the agency finds that pursuant to Section 15162, no new effects could occur or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required.

(3) An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into subsequent actions in the program.

(4) Where the subsequent activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR.

(5) A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required.

(d) Use with Subsequent EIRs and Negative Declarations. A program EIR can be used to simplify the task of preparing environmental documents on later parts of the program. The program EIR can:

(1) Provide the basis in an initial study for determining whether the later activity may have any significant effects.

(2) Be incorporated by reference to deal with regional influences, secondary effects, cumulative impacts, broad alternatives, and other factors that apply to the program as a whole.

(3) Focus an EIR on a subsequent project to permit discussion solely of new effects which had not been considered before.

(e) Notice with Later Activities. When a law other than CEQA requires public notice when the agency later proposes to carry out or approve an activity within the program and to rely on the program EIR for CEQA compliance, the notice for the activity shall include a statement that:

(1) This activity is within the scope of the program approved earlier, and

(2) The program EIR adequately describes the activity for the purposes of CEQA.

Note: Authority cited: Sections 21083 and 21087, Public Resources Code. Reference: Section 21003,

APPENDIX 8.3

CURRENT REGULATORY CONTEXT FOR RECYCLED WATER RECHARGE PROJECTS

STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY GRAY DAVIS, Governor

DEPARTMENT OF HEALTH SERVICES
DRINKING WATER FIELD OPERATIONS BRANCH
1449 West Temple Street, Room 202
Los Angeles, CA 90026
(213) 580-5723
(213) 580-5711(FAX)

April 21, 2000

Mr. Dennis Dickerson
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 210
Los Angeles, CA 90013

Dear Mr. Dickerson:

SAN GABRIEL VALLEY RECYCLED WATER DEMONSTRATION PROJECT

The Upper San Gabriel Valley Municipal Water District (USGVMWD) and the San Gabriel Valley Municipal Water District (SGVMWD) have requested that the State of California, Department of Health Services (Department) consider the San Gabriel Valley Recycled Water Demonstration Project (Demonstration Project) for approval. The Demonstration Project involves the spreading of up to 10,000 acre-feet per year of tertiary treated effluent into the San Gabriel River for groundwater recharge of the San Gabriel Basin. The tertiary treated effluent will come from the San Jose Creek Water Reclamation Plant (SJCWRP), which is operated by the County Sanitation Districts of Los Angeles County (CSDLAC).

Enclosed is a summary of the Department's review and evaluation (Enclosure 1) of the Demonstration Project. The Department has reviewed the "Engineering Report" dated January 1998, the "Groundwater Impact Assessment" dated September 1996, the "Environmental Assessment and Initial Study" dated April 1998, the "Responses to Technical Issues Raised by California Department of Health Services" dated August 1998, the "Responses to the California Department of Health Services letter dated November 17, 1998" dated February 1999, and the Technical Memoranda Nos. 1, 2, and 3 dated January 2000, as later revised, to address the concerns raised at the Department's public hearing held on April 27, 1999. Based on these, the Department recommends that the Los Angeles Regional Water Quality Control Board (LARWQCB) adopt as requirements for the Demonstration Project all of the following conditions on which this Department's findings of non-impairment of the receiving aquifers are based. These conditions are as follows:

<u>RECYCLED WATER QUALITY REQUIREMENTS</u>

1. The recycled water spread shall meet all maximum contaminant levels and requirements as specified in Chapter 15, Title 22, California Code of Regulations (CCR), Domestic Water Quality and Monitoring, Table 64431-A, Section 64443

(Table 4) and Tables 64444-A and 64449-A and B. These requirements are for general mineral, general physical, inorganic chemicals (except nitrogen compounds), radiological chemicals and organic chemicals. The recycled water shall be monitored quarterly prior to spreading. Compliance shall be based on an annual average of quarterly grab or 24-hour composite samples. At least one sample shall be collected and analyzed for all the constituents above prior to the commencement of spreading of recycled water to demonstrate the effectiveness of the treatment process. The results of the analyses shall be submitted to the LARWQCB and the Department prior to the commencement of spreading.

2. The monitoring conducted in accordance with Condition No. 1 above shall include analysis of and reporting for any contaminant for which the Department has established an Action Level (AL). Any result at or above the AL or above a Public Health Goal (PHG) for the constituents listed in Condition No. 1 shall result in submission of a report describing the actions the USGVMWD and the CSDLAC will take to evaluate the sources, the levels, and the means to reliably reduce the levels of the contaminant identified.

3. The SJCWRP, operated by the CSDLAC, will provide the recycled water for the Demonstration Project. The SJCWRP provides disinfected tertiary treated water. The processes at the SJCWRP consists of primary sedimentation, secondary treatment through conventional air activated sludge and clarification, and tertiary treatment consisting of in-line coagulation and direct filtration, followed by disinfection by chlorine gas. Replacement of the equipment specified in the Engineering Report or major modifications to the treatment train as described shall be subject to review and approval by the Department and the LARWQCB.

4. At all times, all recycled water spread shall have been adequately oxidized, filtered, and disinfected.

5. There shall be no bypassing of untreated or partially treated wastewater from the SJCWRP or any intermediate unit processes for groundwater recharge to the San Gabriel River.

Source Control Program

6. The CSDLAC shall continue to maintain and make more effective their industrial waste pretreatment program to ensure the control of the discharge of toxic wastes from point sources. The pretreatment program is subject to the oversight, regulation, and approval of the United States Environmental Protection Agency (USEPA) and the LARWQCB.

SAN JOSE CREEK WATER RECLAMATION PLANT

7. Within 90 days of issuance of the water reclamation requirements (permit) by the LARWQCB, the monitoring program for the SJCWRP effluent shall be submitted to the LARWQCB and the Department for review and approval. This plan will describe in detail the sampling locations, the types of samples and analyses (including viruses, N-nitrosodimethylamine or NDMA, unregulated organic and inorganic chemicals) and the minimum frequency of analyses for all constituents to be monitored, detection limits and analytical test methods.

8. The effluent from the SJCWRP used for this project shall not exceed a total organic carbon (TOC) of 0.016 g/L (daily sampling), suspended solids (SS) of 15 mg/L (daily sampling), and biochemical oxygen demand (BOD) of 20 mg/L (weekly sampling), after the filtration process, determined from 24-hour composite samples. Compliance with this requirement shall be determined monthly based on the average of the results for all 24-hour samples collected during the month. If the above parameters exceed their respective levels, then the CSDLAC shall submit a report to the Department and the LARWQCB documenting the actions that will be undertaken to bring the parameters back to the appropriate levels and avoid future violations of these requirements.

9. The turbidity of the filtered wastewater shall not exceed an average of 2 Nephelometric Turbidity Units (NTU), based on a daily average of 4-hour readings, 5 NTU more than 5 percent of the time, or 10 NTU at any time. If the turbidity of the recycled water exceeds the respective levels, then the CSDLAC shall submit a report documenting the actions that will be undertaken to bring the turbidity back to the appropriate levels and avoid future violations of these requirements. The turbidity measurements shall be continuous.

10. The disinfected wastewater shall not exceed a 7-day median of 2.2 total coliform organisms per 100 mL and 23 total coliform organisms per 100 mL at any time. A chlorine contact time multiplied by a residual combined chlorine residual (CT) of 450 mg/L-minutes from a combination of SJCWRP CT plus the CT of the pipeline is required unless submitted documentation to the Department substantiates the reliability and effectiveness of virus interaction and coliform destruction at the SJCWRP with CTs less than 450 mg/L-minutes. Failure to meet these requirements shall require the submission of a report describing the cause of the failure and the corrective actions taken to avoid future violations of these requirements. Failure to meet the 7-day median coliform requirements for two consecutive days shall result in the suspension of the spreading of recycled water until such time that the cause of the failure has been identified and corrected.

11. The CSDLAC and /or the USGVMWD shall conduct a study to evaluate the presence of NDMA in SJCWRP recycled water used for groundwater recharge. One sample per quarter shall be collected and analyzed for NDMA after the disinfection process and prior to spreading. At any time NDMA is detected in the SJCWRP product water, resampling shall be implemented to confirm the detection. The study shall consider the effects of treatment, the effects of natural ultra-violet light during percolation, and the effects of soil aquifer treatment on NDMA concentrations. The study shall evaluate the potential sources of NDMA to the SJCWRP including industrial, commercial, residential users of the system and discharges from groundwater cleanups. The study shall consider the impact and significance of the findings and, as determined by the Department, reduction of the level of NDMA in the recycled water. The study and information obtained shall be compiled and submitted to the LARWQCB and the Department.

12. There shall be no cross-connection between the recycled water treatment, distribution or spreading system and the potable water supply. Proper separation and or backflow prevention devices shall be employed as appropriate.

REPORTING REQUIREMENTS

13. All results of analyses for compliance purposes shall be submitted monthly to the Department on a computer disk (or e-mail) and summarized in a Microsoft Excel spreadsheet. Similar submittals shall be made to the LARWQCB in the method as the LARWQCB determines. The data shall be summarized to demonstrate compliance with water recycling requirements.

14. The CSDLAC and the USGVMWD shall submit an annual report of the monitoring results to the LARWQCB and the Department. This report shall include an assessment of the current knowledge of the health effects, research status, analytical methods of the unknown or unquantified contaminants such as drugs and pharmaceuticals, endocrine disruptors, disinfection by-products, viruses, unregulated organic chemicals (Chapter 15, Title 22, CCR, Tables 64450-A, B, and C), unregulated inorganic chemicals (Chapter 15, Title 22, CCR, Table 64450-D), antibiotic resistant bacteria as well as the effects of residual antibiotics on environmental bacteria, and unknown organics.

RECHARGE SITE REQUIREMENTS

Maximum Recycled Water Contribution

15. The total nitrogen concentration of the recycled water spread shall not exceed 10 mg/L as nitrogen prior to reaching the regional groundwater table, based on weekly samples. If the total nitrogen concentration exceeds the 10 mg/L as nitrogen limit, confirmation sampling shall be implemented immediately, within 24 hours. If the average of the original sample and the confirmation sample is greater than 10 mg/L, then the Department, the LARWQCB, and potentially affected public water systems lying within a 5-year time of travel from the monitoring wells shall be notified. Any confirmed exceedance of the 10 mg/L as nitrogen limit shall require the submission of a report documenting the actions that will be undertaken to reduce the level of total nitrogen in the recycled water.

16. The effectiveness of the soil-aquifer treatment shall be verified once per year, and more intensely at the initiation of the Demonstration Project (the first year). This verification shall involve the recharge of 100% recycled water and tracking of the change in the TOC concentration in the groundwater mound over time. The intensive monitoring shall initiate before recharge, when there is no recycled water mound, continue as the recycled water recharge operation is implemented, as the recycled water mound is formed, continue as the steady state is achieved, as the recycled water mound is fully developed, and continue through and beyond the cessation of the recharge operation, as the recycled water mound dissipates. The intensive monitoring shall include, but not be limited to, monitoring of the recycled water mound and defining the limits of the soil aquifer treatment. The recycled water mound shall be monitored at representative locations, such as the location with the highest percolation rate. The intensity of the monitoring program may be reduced at later years as the consistency of the data allows. A monitoring plan for the verification testing shall be developed and submitted to the LARWQCB and the Department for review and approval. The initial plan shall be submitted prior to startup of the Demonstration Project.

    The allowable TOC in the recycled water mound above the regional groundwater table except during the verification testing shall not exceed 5 mg/L. If the TOC exceeds the 5 mg/L TOC limit, the Department and the LARWQCB shall be immediately notified. Further discharge of recycled water shall not occur without approval from the Department.

    During the periods when recycled water is spread (except during the verification testing), weekly samples shall be collected from the mound for TOC analyses. A determination shall be made of the percent recycled water in the mound at the time of sampling.

17. The Los Angeles County Department of Public Works (LACDPW), who is responsible for spreading local water in the river, shall recharge water to the extent practicable in the San Gabriel River. Refer to the attached map for the spreading area. Also, USGVMWD shall enter into an agreement to have the Mosquito and Vector Control District manage a program to prevent/mitigate possible vectors resulting from this project prior to commencement of spreading.

18. The amount of recycled water spread in the San Gabriel River within a 5-year period shall not exceed 20 percent of the blend of all waters in the river. The percentage of recycled water shall be based on a 5-year average of yearly determinations. Recycled water spreading operations shall be implemented only during times when the San Gabriel River is dry and shall be confined only within the defined recharge spreading area (see the attached schematic).

19. The maximum percentage of recycled water in any aquifer outside a 500-foot radius of the recharge area shall not exceed 20-percent.

20. An operations plan shall be developed and submitted annually by the USGVMWD and the CSDLAC to the LARWQCB and the Department for review and approval. This operations plan shall describe how the maximum percent recycled water requirement of 20-percent will be met for the coming year. This plan shall include, but not be limited to, monitoring wells, recycled water spreading, local water spreading and existing conditions in the groundwater basins. The operations plan shall also include routine testing procedures for the integrity of the recycled water treatment processes, maintenance and calibration schedules for all monitoring equipment, process alarm set points, and response procedures for all alarms. The operations plan shall be subject to the review and approval by the Department and the LARWQCB prior to the commencement of recycled water spreading.

21. The amount of recycled water that is spread in the defined spreading area as shown on the attached map, shall not exceed 10,000 acre-feet per year. Any proposal to increase the amount of recycled water spread shall be accompanied by an engineering report that addresses, at a minimum, treatment process reliability and redundancy, documentation that the project will continue to meet the 20 percent contribution and travel time requirements and an evaluation of cumulative impacts of the groundwater recharge activities.

22. All piping intended to carry recycled water shall be marked or identified in accordance with Section 116815 of the California Health and Safety Code (H&SC). All appurtenances and equipment intended for the delivery of reclaimed shall be identified in accordance with the Guidelines for Distribution of Nonpotable Water published by the California-Nevada Section of the American Water Works Association. All underground piping intended to carry recycled water shall be separated from potable water piping in accordance with Chapter 16 of Title 22, CCR and Department guidelines.

23. The proponents of the project must provide acceptable mitigation measures, such as replacement water supply, that are acceptable to any owner of a well that has been adversely impacted by this Demonstration Project and as approved by the Department.

Minimum Depth-to-Groundwater Requirement

24. A minimum depth-to-groundwater of 20 feet must be maintained from the bottom of the San Gabriel River to the top of the water table based on averaging the previous 30 daily depth-to-groundwater measurements taken when recycled water is being discharged into the San Gabriel River. Anytime the average depth-to-groundwater is less than 20 feet, the discharge of recycled water into the San Gabriel River shall be suspended until the depth-to-groundwater measurement exceeds 20 feet.

Minimum Retention Time Underground and Horizontal Separation

25. An ordinance, resolution or other means shall be adopted to prevent the use of groundwater for drinking water within an area where the retention time is less than 6 months, the amount of recycled water is greater than 20 percent, and within 500 horizontal feet of the recycled water spreading area, whichever is farthest, prior to commencement of spreading.

26. The recycled water shall be retained underground for a minimum of 6 months prior to being withdrawn at a domestic water supply well. Determination of retention time shall include monthly monitoring for general mineral concentrations at all monitoring wells and potentially affected downgradient domestic wells. Detailed procedures for determining retention time shall be included in the operations plan.

27. The horizontal separation from the San Gabriel River to the nearest domestic water supply well shall be greater than 500 feet, or the estimated 6-month travel distance, or where the aquifer has less than 20 percent recycled water,

whichever is the greatest distance. The area of separation shall be referred to as the "no-pump zone".

Monitoring Wells

28. Daily samples shall be collected from the recycled water mound monitoring and sampling wells, SW-A and SW-B, located in the recharge water mound, and analyzed for TOC. Samples shall also be collected weekly and analyzed for total nitrogen. These wells shall be constructed to collect samples from the recycled water mound above or at the top of the groundwater table.

29. Samples shall be collected from monitoring wells 1, 2, 3, 4, and 5, located along the banks of the San Gabriel River, at least monthly and analyzed for TOC. Samples shall also be collected weekly and analyzed for total nitrogen. As a minimum, the monitoring wells shall be located at points one quarter and one-half of the distance (plus or minus ten percent) from the recharge area to the nearest domestic water supply well.

30. The depth-to-groundwater shall be measured every day reclaimed water is present in the San Gabriel River by 5 existing monitoring wells located within 100 feet of the recharge area.

ENGINEERING REPORT

31. The USGVMWD shall submit an engineering report to the Department and the LARWQCB after one year of recycled water spreading operation to document and demonstrate that the criteria for treatment provided, effluent quality and quantity of recycled water spread, retention time underground and distance to the point of extraction are being met.

32. After five years of operation, the USGVMWD shall submit a completed engineering report to the LARWQCB and the Department evaluating the compliance with the minimum retention time underground and the maximum recycled water contribution requirements.

These recommendations are only for the duration of the demonstration study. After reviewing the engineering report required in Condition No. 32 above, the Department will make recommendations regarding future recharge activities in the San Gabriel River. The aforementioned conditions and the finding of non-impairment of the groundwater aquifer are based upon current knowledge. If conditions change or future information shows otherwise, the Department may recommend modification or cessation of the recharge project.

We would be available to discuss these recommendations prior to and during the Board meeting when this item is scheduled.

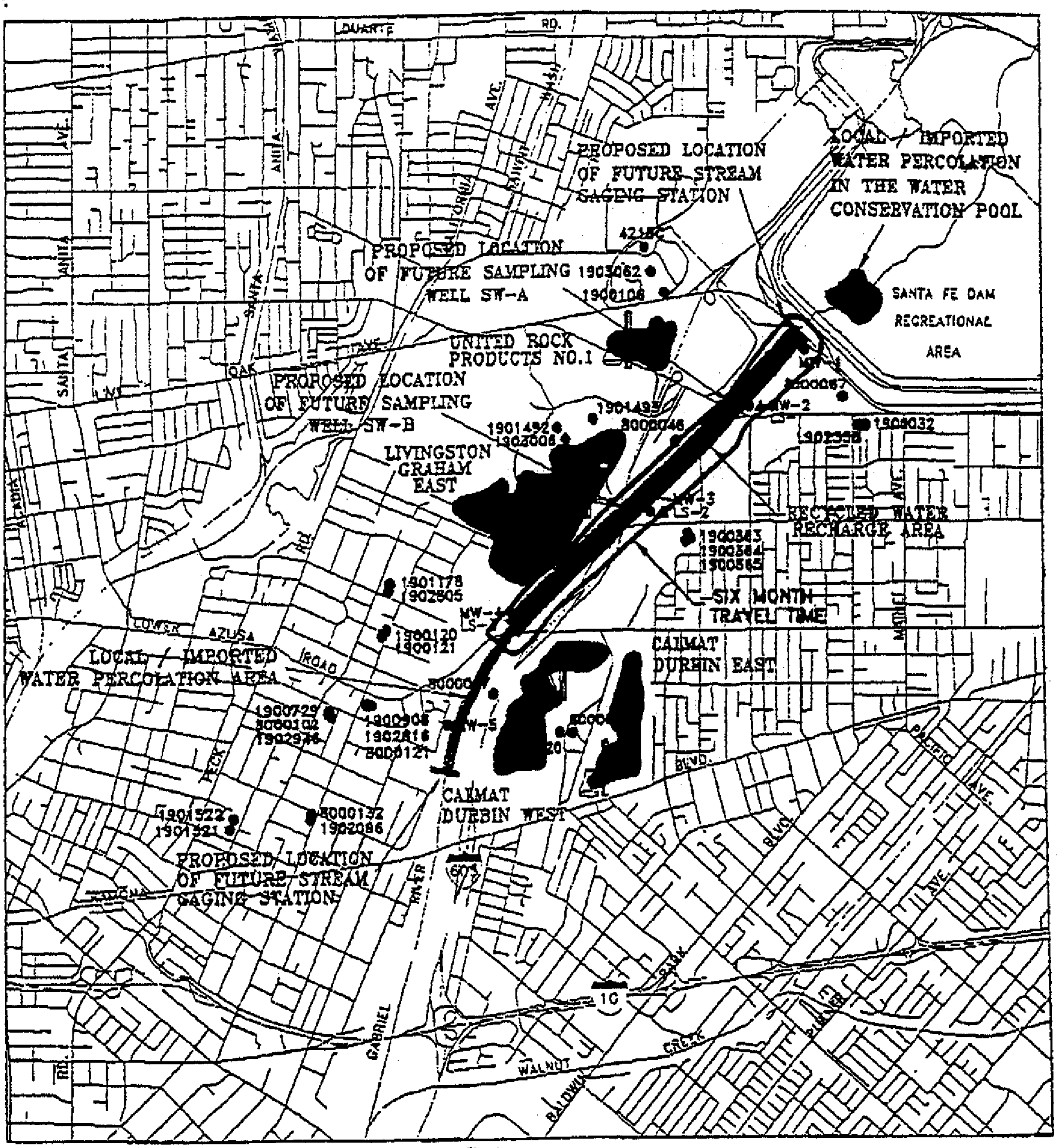
Sincerely,

Gary H. Yamamoto

Gary H. Yamamoto, P.E. Chief
South Coastal Region
Drinking Water Field Operations Branch

Enclosure (1)

cc: USGVMWD
SGVMWD
CSDLAC
LACDPW
ASL Consulting Engineers, Inc.



MW-2 GROUND-WATER MONITORING WELL

SW-A SAMPLING WELL

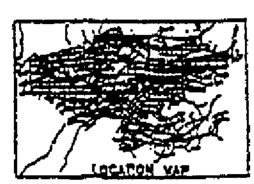
1902920 WATER PRODUCTION WELL AND RECORDATION NUMBER

LS-2 SOIL-WATER LYSIMETER CLUSTER

STAFF GAGE

WATER QUALITY STATION

APPROXIMATE SCALE: 1" = 3,500'



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UPPER SAN GABRIEL / SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICTS

SAN GABRIEL VALLEY RECYCLED WATER DEMONSTRATION PROJECT

SUMMARY OF THE DEPARTMENT OF HEALTH SERVICES REVIEW AND EVALUATION OF THE SAN GABRIEL VALLEY RECYCLED WATER DEMONSTRATION PROJECT

Enclosure No. 1

SUMMARY OF THE DEPARTMENT OF HEALTH SERVICES REVIEW AND EVALUATION OF THE SAN GABRIEL VALLEY RECYCLED WATER DEMONSTRATION PROJECT

The Upper San Gabriel Valley Municipal Water District (USGVMWD) and the San Gabriel Valley Municipal Water District (SGVMWD) have requested that the State of California, Department of Health Services (Department) consider the San Gabriel Valley Recycled Water Demonstration Project (Demonstration Project) for approval. The Demonstration Project involves the spreading of up to 10,000 acre-feet per year of tertiary treated effluent into the San Gabriel River for groundwater recharge of the San Gabriel Basin. The tertiary treated effluent will come from the San Jose Creek Water Reclamation Plant (SJCWRP), which is operated by the County Sanitation Districts of Los Angeles County (CSDLAC).

This is a summary of the Department's review and evaluation of the Demonstration Project. The Department has reviewed the "Engineering Report" dated January 1998, the "Groundwater Impact Assessment" dated September 1996, the "Environmental Assessment and Initial Study" dated April 1998, the "Responses to Technical Issues Raised by California Department of Health Services" dated August 1998, the "Responses to the California Department of Health Services Letter Dated November 17, 1998" dated February 1999.

On April 27, 1999, the Department conducted a public hearing in El Monte, California to consider the USGVMWD and the SGVMWD Demonstration Project. The hearing panel included:

Hearing Officer:
Gary H. Yamamoto, P.E., Chief of the South Coastal Region of the Drinking Water Field Operation Branch, Department of Health Services.

Panel Members:
Robert G. Berlien, P.E., General Manager of the USGVMWD
Michael G. Hoover, P.E., Program Manager, HYA/Dames & Moore Company
Tom Peters, Project Consultant, CH2M Hill
Earle Hartling, County Sanitation Districts of Los Angeles County

A presentation of the proposed Demonstration Project was made by Robert G. Berlien. This was followed by statements made by members of the audience in attendance. A complete recording of the hearing is available at the USGVMWD/SGVMWD. In addition, written comments were received during a two week period following the hearing. The written comments are also available for review.

In a letter to Mr. Berlien dated August 18, 1999, Mr. Yamamoto indicated that there were several issues mentioned in the public hearing and subsequent written comments that should be addressed by the project proponents through the development of technical memos. In January 2000, ASL Consulting Engineers (ASL) submitted three technical memos addressing the issues that had been raised. These memos comprise part of the written record of the hearing and the basis for the Findings of Fact attached hereto.

FINDINGS OF FACT
IN REGARD TO THE SAN GABRIEL VALLEY RECYCLED WATER DEMONSTRATION PROJECT

1. Section 60320, Title 22, of the California Code of Regulations (CCR), requires that recycled water may only be used for groundwater recharge of domestic water supply aquifers by surface spreading if the Department finds that the recharge water will be at all times of a quality that fully protects public health.

2. Section 60320, Title 22, CCR, requires the Department to make recommendations to the California Regional Water Quality Control Board after conducting a public hearing and considering all relevant aspects including treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time and distance to withdrawal.

3. The San Gabriel Valley water supply consists of both groundwater and imported Colorado River and State Water Project water. As imported water becomes more expensive and less accessible, and the population in the area increases, the Upper San Gabriel Valley Municipal Water District and the San Gabriel Valley Municipal Water District are pursuing water recycling projects so that the San Gabriel Valley is less dependent on an imported water supply.

4. The San Gabriel Valley Recycled Water Demonstration Project (Demonstration Project) involves recharging of up to 10,000 acre-feet of recycled water per year into the Main San Gabriel Groundwater Basin (Basin) through the San Gabriel River for five years. At the end of the five years of operation, the USGVMWD/SGVMWD will submit a complete engineering report to the LARWQCB and the Department to demonstrate that the recharge of recycled water does not significantly affect the hydrogeology, water quality, and management of water resources in the Basin.

5. In January 1998, a draft Engineering Report was prepared for the Demonstration Project. Subsequent to its submittal, two additional documents were prepared: "Responses to Technical Issues Raised by California Department of Health Services" dated August 1998, and "Responses to California Department of Health Services Letter dated November 17, 1998" dated February 1999. In January 2000, three additional technical memos were prepared to address issues and concerns raised during the public hearing (April 27, 1999) process and contained in a letter from the Department to USGVMWD dated August 18, 1999. The additional documents modify or expand for clarification certain elements of the Engineering Report and address the status of issues raised during the public hearing process.

6. The monitoring program for the Demonstration Project is described in Section 10 of the "Draft Engineering Report for the San Gabriel Valley Recycled Water Demonstration Project" dated January 1998.

7. The San Jose Creek Water Reclamation Plant (SJCWRP), operated by the County Sanitation Districts of Los Angeles County (CSDLAC), will provide the recycled water for the Demonstration Project. The SJCWRP provides disinfected tertiary treated water. The processes at the SJCWRP consist of primary sedimentation, secondary treatment through conventional air activated sludge and clarification, and tertiary treatment consisting of in-line coagulation and direct filtration, followed by disinfection by chlorine gas.

8. The recycled water leaving the SJCWRP meets all drinking water chemical standards.

9. The CSDLAC has established an industrial waste pretreatment program to ensure in part that their treatment facilities comply with waste discharge and water reclamation requirements. The source control program has been approved by the U.S. Environmental Protection Association (EPA).

10. Daily monitoring of the SJCWRP final effluent indicates that the daily average turbidity has ranged from 0.7 Nephelometric Turbidity Units (NTU) to 2.7 NTU over the period of 1/1/96 to 12/31/98.

11. A chlorine contact time multiplied by a residual combined chlorine residual (CT) of 450 mg/L-minutes can be obtained by combining the CT from the SJCWRP with the CT of the project transmission pipeline. However, CSDLAC has submitted documentation to the Department regarding the reliability and effectiveness of the virus inactivation and coliform destruction performance of the disinfection process utilized at SJCWRP with CTs less than 450 mg/L-minutes.

12. Daily monitoring of the SJCWRP final effluent indicates that the total coliform MPN per 100 ml has ranged from <1 to 158 over the period of 1/1/96 to 12/31/98, but that the 7-day median limit of 2.2 coliforms per 100 mL has not been exceeded. Only one confirmed positive virus identification has been made during the past 20 years with over 1,000 analyses performed.

13. Many in the scientific community have raised the issue of the development of antibiotic-resistant bacteria because of the extensive and sometimes improper use of antibiotics by people or in cleaning products. However, antibiotic resistant bacteria have not been found to be resistant to standard wastewater disinfection practices and properly treated wastewater effluent is not considered to be a pathway for their dissemination or propagation.

Concern has also been expressed for the possibility that unreacted antibiotics may pass through wastewater treatment facilities and enter the environment, thereby exposing natural bacteria to extremely low levels of antibiotics. It has been hypothesized that natural bacteria exposed to antibiotics in this manner may become resistant to the antibiotics and therefore be able to survive more effectively in the environment or in mammals with which they may come into contact. There is no known field data to substantiate this hypothesis, but the issue will be kept under surveillance.

14. To ensure that the SJCWRP West is producing water that meets the requirements contained in the RWQCB permit, CSDLAC proposes to analyze the constituents listed in the proposed draft Title 22 regulations during operation of the Demonstration Project. In addition, a draft operations plan titled "Filtration, Coagulation and Chlorination Alarms" describes the alarms for secondary effluent, effluent filters and disinfection system that directly relate to the production of high quality effluent for groundwater replenishment. This draft is contained in Section 4 of "Responses to California Department of Health Services Letter Dated November 17, 1998".

15. Recycled water contains varying amounts of unidentified trace organic compounds depending on the degree of treatment applied. The long-term health effects of the unidentified organic chemicals are not known. A Scientific Advisory Panel (SAP) assembled by the State of California to evaluate the recharge of groundwater with recycled water recommended in its 1987 report that the amount of organic chemicals in recycled water used to recharge groundwater used for drinking be limited because of health concerns.

16. In the absence of a generally accepted measure of organic compounds of public health significance, Total Organic Carbon (TOC) is considered by the Department to be a reasonable surrogate measure of the organic chemicals present in wastewater after treatment.

17. The SAP indicated that reducing TOC to one mg/L or less would minimize concern about the presence of individual chemicals that could pose a threat to health. The Department concurs with the SAP and that no domestic water supply well should extract groundwater with more than one mg/L TOC of wastewater origin.

18. Monitoring of the SJCWRP West effluent indicates that the TOC has ranged from 7.68 mg/L to 12 mg/L during the period of January 1996 to December 1998. Data from historic reclaimed water spreading operations indicates that TOC is significantly reduced during the percolation of the water through the unsaturated zone as well as during travel through aquifers.

19. Extremely low concentrations (parts per trillion) of drugs and pharmaceuticals, including endocrine disrupters, have been detected in streams, water supplies, and wastewater effluents in recent years. The U. S. Food and Drug Administration requires manufacturers to use models to predict environmental concentrations for drugs and to conduct an environmental assessment if

concentrations are expected to exceed 1 part per billion (ppb). There is currently no information on whether low level exposure through drinking water has any health implications. Research studies to evaluate such potential risks are currently being designed and will be initiated by year 2001. At this time, there is no reason to believe that products that are considered safe to ingest at high concentrations will cause any adverse health reaction at extremely low concentrations.

20. Concerns have been raised over the possible occurrence of low concentrations of organic compounds in reclaimed water that may have health significance as cancer causing agents at very high concentrations. Three that are currently being reviewed are perchlorate, methyl-tertiary-butyl ether (MTBE) and nitrosodimethylamine (NDMA). Perchlorate has not been found in the SJCWRP effluent based on a detection limit of 4 ug/L. MTBE is occasionally found but at concentrations that average less than the current secondary MCL of 5 ug/L. NDMA has been found in secondary effluent at concentrations from 5 to 38 ng/L but is not found in detectable concentrations in the spreading basins or in well waters after percolation. Additional research work will be done regarding the risks and persistence of NDMA during the operation of the demonstration project.

21. Draft Title 22 regulations include the criteria that the percentage of reclaimed water in drinking water aquifers must not be greater than 20 percent over a five year period (i.e. the ratio of reclaimed water to native groundwater at a potable water well must not exceed more than one part in five).

22. The USGVMWD performed infiltration tests at eight test sites located between the Santa Fe Dam and Ramona Boulevard. Test results indicate that initial (within the first hour) infiltration rates of soils tested range from 3 to 85 feet per day. The rate of 85 feet per day occurred in an area characterized by relatively uniform grain-sized sand just downstream of one of the several drop structures along the subject reach of the river. A subsequent test was performed in an area adjacent to this test site and the percolation rate was less than 36 feet per day.

23. The draft Title 22 revisions propose that the maximum permissible initial infiltration rate for surface spreading of recycled water will be 36 feet per day. Because this rate was exceeded at one of the test sites, it was instead agreed by the Department and USGVMWD to establish a TOC removal/performance requirement.

24. Monitoring of the SJCWRP West effluent indicates that the Total Nitrogen level has ranged from 11.07 mg/L to 19.01 mg/L during the period of January 1996 to December 1998.

25. The monitoring wells used for monitoring TOC will be used for weekly sampling of nitrogen concentration. These wells will be used to demonstrate that the Total Nitrogen content of the recycled water is less than the MCL of 10 mg/L prior to reaching the groundwater table.

26. For the Demonstration Project, the Department requires that the depth-to-groundwater must be at least 20 feet below the bottom of the San Gabriel River.

27. It is predicted that the height of water table mounding from the Demonstration Project will be well below (approximately 30 feet) the minimum depth-to-groundwater requirement of 20 feet. However, this depth will be monitored daily during the operation of the Demonstration Project utilizing data collected from five wells within 100 feet of the recharge area.

28. Establishment of the no-pumping zone will insure that there are no potable water supply wells within the 6-month travel area, 20 percent recycled water content, or 500 horizontal feet (which ever is the greater). The reclaimed water produced at any potable water well will traveled through the aquifer for longer than the required 6 months.

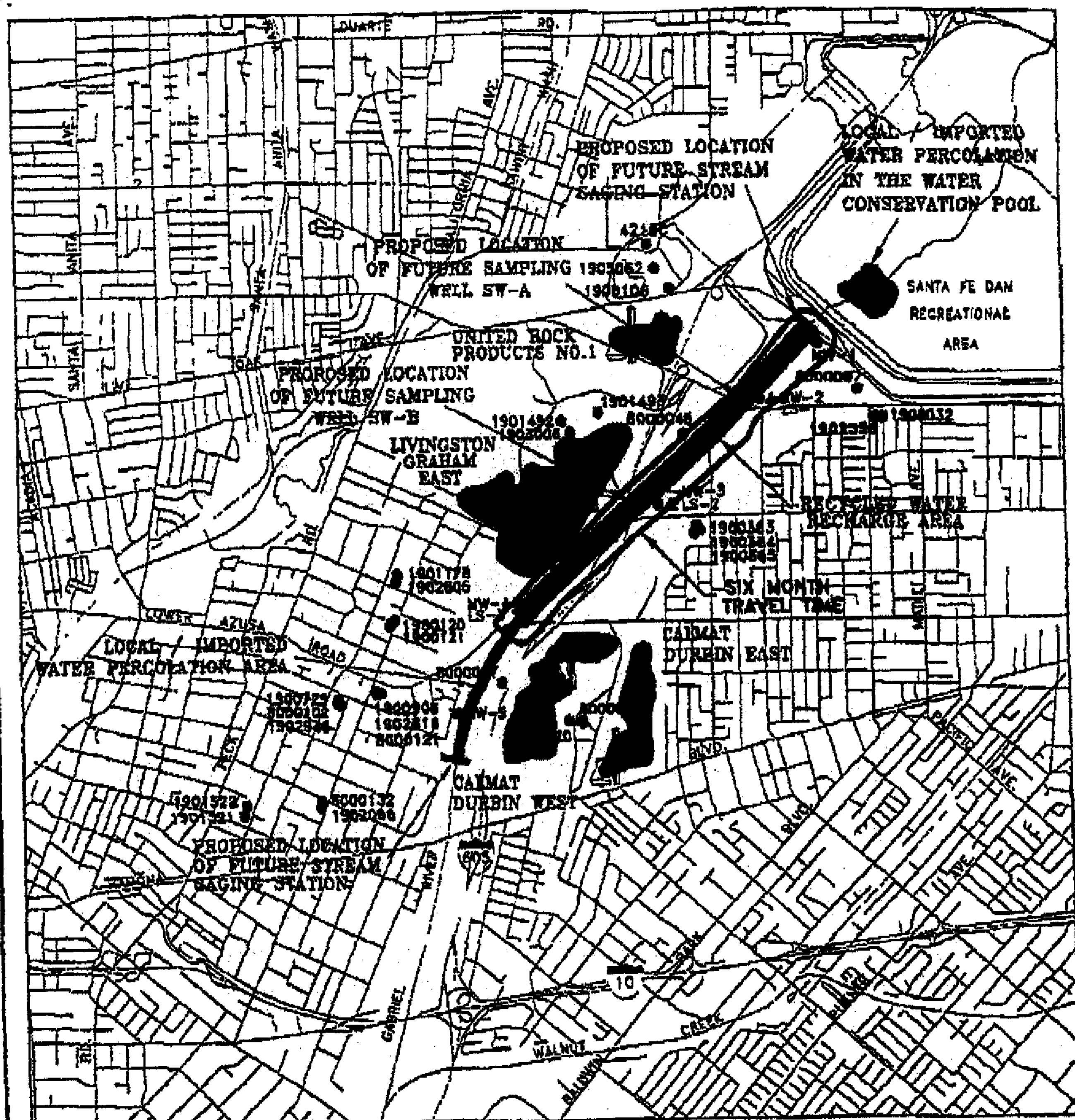
29. The USGVMWD and San Gabriel Valley Mosquito and Vector Control District (MVCD) have agreed to enter into an agreement to have the MVCD manage a program to prevent/mitigate mosquitoes, black flies, and any other possible vectors that may result from the Demonstration Project upon receiving regulatory approval.

30. The project will not violate any tenants of current environmental justice concerns because it will impact a large area and will not adversely impact any specific sub-group.

Gary H. Yamamoto

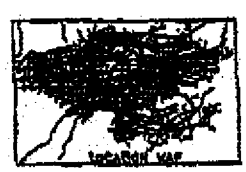
Gary H. Yamamoto, P.E., Chief
South Coastal Region
Drinking Water Field Operations Branch
Department of Health Services Hearing Officer

Apr. 21, 2000
Date



MW-2 GROUND-WATER MONITORING WELL
SW-A SAMPLING WELL
1902920 WATER PRODUCTION WELL AND RECORDATION NUMBER
LS-2 SOIL-WATER LYSIMETER CLUSTER
STAFF GAGE
WATER QUALITY STATION

APPROXIMATE SCALE: 1"=3,500'



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Mesa Arizona

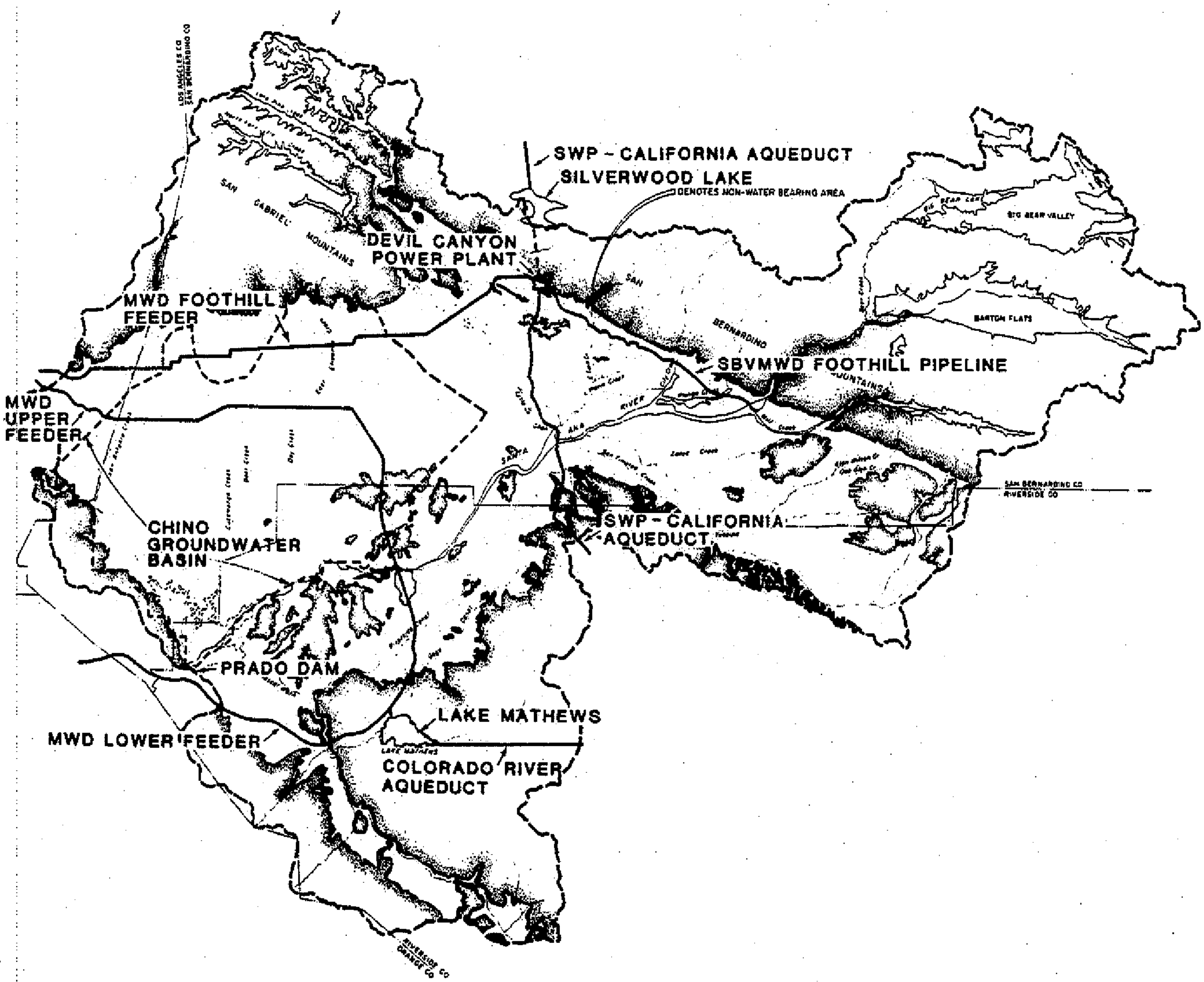
UPPER SAN GABRIEL / SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICTS

SAN GABRIEL VALLEY RECYCLED WATER DEMONSTRATION PROJECT

APPENDIX 8.4

MWDSC'S CHINO BASIN GROUNDWATER STORAGE EIR'S BIOLOGICAL SECTION

CHINO BASIN GROUNDWATER STORAGE PROGRAM
DRAFT ENVIRONMENTAL IMPACT REPORT



METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

JUNE 1988

REPORT NUMBER 975

Conservation alternatives at Prado Reservoir include the allowance of a maximum conservation pool of 514 ft above MSL rather than 512 ft above MSL (USACE, 1986). However, the previous feasibility study indicated that it was more economical to increase the diversion and recharge capacity of the spreading basins than to further increase the height of Prado Dam only for conservation benefits.

EXISTING BIOLOGICAL RESOURCES

This section describes biological resources in areas potentially affected by the Storage Program. These include Prado Basin and the Santa Ana River, along the Chino Valley Pipeline alignment, at existing spreading basins, and in proposed well field areas.

Prado Basin And Santa Ana River

The Storage Program area lies 30 to 40 miles upstream from the mouth of the Santa Ana River. The limited natural history literature available for the area deals almost exclusively with the Prado Basin portion of the area behind Prado Dam. This area could be affected by the Storage Program and is described below.

Prado Basin is defined as the area behind the dam to an elevation of 566 ft; an area of approximately 11,000 acres (Zembal and Kramer, 1984). Over 4,000 acres of this area is covered with riparian vegetation of which 2,000 to 2,500 acres is dense riparian habitat dominated by monotypic willow woodland (Salix goodingii), within the Prado Dam inundation area which historically was not present (USACE, 1980).

The primary effects of the Storage Program will, with increased water storage, be an increase in groundwater level and baseflow in recharge years and a return to existing baseflows and groundwater levels in extraction years when the stored water is withdrawn from the basin. The magnitude of groundwater storage and/or withdrawal will vary from year-to-year based on SWP water availability for recharge and demand from Metropolitan's member agencies. The baseline condition has been evaluated with these potential effects in mind.

Vegetation and Wildlife Habitat. A total of 311 species of vascular plants, belonging to 65 families, were identified by Zembal and Kramer (1980), who designated 15 habitat types within the Prado Basin. Of these, there are three major vegetational communities within the basin. First is the extensive (>4,000 acres) riparian habitat that occurs in the low lying sections of the basin and along the Santa Ana River and streams running into the basin. The riparian habitat is dominated by extensive stands of black willow (Salix goodingii) with occasional smaller stands of arroyo willow (Salix lasiolepis). There are scattered stands of tall cottonwoods (Populus fremontii) and a single stand of sycamore (Platanus racemosa). The second major vegetation type is upland habitat, found on the surrounding hills, that consists of low shrubs characteristic of coastal sage scrub, plus grasses and exotic weeds, and has been heavily impacted by agriculture and grazing of cattle. A third distinct community consists of the aquatic and semi-aquatic plants living in permanent streams and artificial duck ponds, and in intermittently filled reservoirs and streams within the basin.

Wildlife. The wildlife in the Prado Basin occurs in association with specific habitats and can readily be characterized for the three major vegetational communities discussed above. This section is based on two days of general field work and the recent thorough study of the wildlife within the Prado Basin and adjacent Santa Ana River canyon by the U.S. Fish and Wildlife Service (USFWS) (Zembal and Kramer, 1984), and other references as noted.

The aquatic habitat is host to ten species of fish, but these consist entirely of species introduced either accidentally, such as goldfish (Carassius auratus), or intentionally purpose for sportfishing, such as Brown bullhead (Ictalurus nebulosus), bluegill (Lepomis macrochirus), and largemouth bass (Micropterus salmoides) (Wells and Diana, 1975). Among the amphibians there are also two introduced species, the bullfrog (Rana catesbeiana) and African clawed frog (Xenopus laevis). The latter, a common inhabitant of ponds within the basin, is highly predacious and has caused the near extinction of a number of aquatic species, including the native red-legged frog (Rana aurora), a very rare resident in the basin. The western pond turtle (Clemmys marmorata) is also resident in the basin. Waterbirds associated with the aquatic community include breeding colonies of great blue heron (Ardea herodias) and black-crowned night heron (Nycticorax nycticorax), as well as many wintering species of herons, geese, and 16 species of ducks. Osprey (Pandion haliaetus) have been observed occasionally.

The wildlife of the upland shrublands consists of a variety of reptiles, mammals, and birds characteristic of open areas and grasslands. Among the reptiles is the San Diego horned lizard (Phrynosoma coronatum blainvillei), a category 2 candidate for Federal endangered species listing (Table 4-16). Birds of this habitat include a variety of insectivorous and granivorous species. These include western meadowlark (Sturnella neglecta), western kingbird (Tyrannus vociferans) and several species of sparrows. During winter months, a large number and variety of raptors regularly hunt over the open upland fields within the Prado Basin. These include several sensitive species such as black-shouldered kite (Elanus caeruleus), northern harrier (Cicus cyaneus) and golden eagle (Aquila chrysaetos). Burrowing owls (Athena cunicularia), also considered sensitive, are resident within the grassy areas of the basin, and a flock of Canada geese (Branta canadensis)

TABLE 4-16
LISTING OF SPECIAL STATUS SPECIES
FOUND IN THE STORAGE PROGRAM STUDY AREA

	Listed Species		Federal Candidates[3,4]	
	Federal[1]	State[2]	Category 1	Category 2
Bald Eagle	X	X		
Peregrine Falcon	X	X		
Yellow-billed Cuckoo		X		X
Least Bell's Vireo		X	X	
San Diego Horned Lizard				X
Many-stemmed Live-Forever				X
Swainson's Hawk		X		

	Sensitive Species			Audubon 7
	FWS[5]	CDFG[6]	Blue List	Special Concern
Western Greve			X	
Double-crested Cormorant		X		
American Bittern			X	
Least Bittern		X	X	
White-faced Ibis	X	X		
Turkey Vulture				X
Osprey		X		X
Northern Harrier		X	X	
Sharp-shinned Hawk		X	X	
Cooper's Hawk		X		X
Red-shouldered Hawk			X	
Swainson's Hawk		X	X	
Golden Eagle		X		
Common Barn-owl				X
Western Screech-owl				X
Burrowing Owl		X		X
Long-eared Owl		X		
Willet				X
Hairy Woodpecker			X	
Willow Flycatcher	X	X	X	
Bewick's Wren			X	
Western Bluebird	X			X
Mountain Bluebird				X
Loggerhead Shrike	X		X	
Yellow Warbler	X	X	X	
Yellow-breasted Chat		X		

[1]USFWS 1983a [2]CDFG 1980 [3]USFWS 1983b [4]USFWS 1983c
[5]USFWS 1982a [6]Remsen 1979 [7]Tate and Tate 1982
[7]From Zembel and Kramer, 1984

regularly winters in the basin, feeding on shoots of grasses i the upland areas. Mammals of the upland areas include many rodents, with pocket gophers (Thomomys bottae) and California ground squirrel (Spermophilus beecheyi) abundant. Coyote (Canis latrans) is the one common large predator.

The riparian area within the Prado Basin is extensive, coverin the low lying areas just above Prado Dam as well as stream and river channels entering the basin. Most of the riparian habitat is covered by dense monotypic willow woodland. The region regularly inundated behind the dam contains a low diversity of weedy species and dead willows.

Wildlife of the riparian community includes a variety of amphibians, such as garden slender salamander (Batrachoseps major) and Pacific tree frog (Hyla regilla). Mammals within this habitat include bobcat (Felis rufus), mule deer (Odocoileus hemionus), racoon (procyon lotor) and opossum (Didelphis virginians).

Birds are numerous in the willow riparian habitat both as wintering and breeding species. Among the breeding birds are several species of special concern which are considered in the following section. Of the 171 species of birds observed in Prado Basin by Zembal and Kramer (1984), 100 were associated with riparian and open-water habitats. Several species nesting near or on the ground are adversely affected when the willow woodland is inundated during the breeding season. Affected species include common yellowthroat (Geothlypis trichas), song sparrow (Melospiza melodia), yellow-breasted chat (Icteria virens) and least Bell's vireo (Vireo bellii pusillus).

Threatened, Endangered, and Other Special Status Species. Special status species found in the Prado Basin are summarized in Table 4-16. Three species of birds are listed as both State and Federal endangered species: bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus) and least

Bell's vireo, which although listed as a category 2 candidate species in the table from Zembal and Kramer (1984) was listed as Federally endangered in June, 1986. Two other birds, Swainson's hawk (Buteo swainsoni) and yellow-billed cuckoo (Coccyzus americanus) are listed by the State as Endangered; the latter species is also a category 2 candidate for Federal listing. There are two additional category 2 candidate species for Federal listing: the San Diego horned lizard and a plant, the many-stemmed live-forever (Dudleya multicaulis).

An additional 25 species of birds occurring in the Prado Basin are listed as sensitive species by the U.S. Fish and Wildlife Service, California Department of Fish and Game, and/or Audubon Society (Table 4-16). Of the endangered and sensitive species, four species are known to breed in the willow woodland in the Prado Basin: yellow warbler (Dendroica petechia), willow flycatcher (Empidonax traillii), yellow-billed cuckoo, and least Bell's vireo. Least Bell's vireos were more numerous formerly but have been reduced in number throughout their range by two major factors. The common factors adversely impacting these species are loss of riparian habitat throughout their range and decrease in nesting success caused by parasitism from brown-headed cowbirds. Of all the special status species found within the Prado Basin, the least Bell's vireo deserves special attention as Prado basin contains a significant portion of the population of this species and the basin is proposed as critical habitat for the species.

Status of Least Bell's Vireo. The least Bell's vireo (Vireo bellii pusillus) is a small migratory songbird that breeds in riparian habitat from Central California southward into northern Baja California. The species has declined from its abundance in former times due to habitat loss and to brood parasitism by the brown-headed cowbird, a species that has increased in numbers since the introduction of horses and cattle to California. Because of its rarity, the least Bell's vireo was listed as endangered by the State of California in

1980 and as a Federal endangered species on June 2, 1986 (USFWS 1985, 1986). Critical habitat was not designated at the time, but under the Endangered Species Act must be designated within one year of listing of a species.

A species listed as endangered is protected by law from any harassment or harm. Areas designated as critical habitat are protected from disturbance or destruction whether or not vireos are present in the area. The amount of habitat designated as critical habitat is designed to be sufficient for an endangered species to increase in numbers to the point where it no longer requires endangered status.

The proposed critical habitat area for the least Bell's vireo consists of ten areas in Southern California; one in Santa Barbara County, one area (Santa Clara River) that involves both Los Angeles and Ventura Counties, one area (Prado Basin) that involves both Riverside and San Bernardino Counties, and seven areas in San Diego County. These ten proposed critical habitat areas involve about 43,000 acres and include about 75 percent of the known population of least Bell's vireo. The rest of the population occurs scattered in small areas that contain few vireos. A complete survey of one of the San Diego County areas, the Sweetwater River, is underway under the auspices of the San Diego Association of Governments and CALTRANS. This report will be finished in 1987. Although no general surveys of the other proposed critical habitat areas are currently in progress, biological studies of several of the other areas have been completed.

One of the proposed critical habitat areas for least Bell's vireo consists of the Prado Basin and a section of the Santa Ana River immediately upstream from Prado Dam. The proposed critical habitat area includes "All lands below the 543-foot contour....within the Prado Flood control Basin (upstream from Prado Dam)" (USFWS 1985, p. 18972). In addition, map coordinates that bound about 12 miles of the Santa Ana River upstream from Prado Dam also identify critical habitat area.

At the time the critical areas were proposed, it was thought that "vireos obtain all their survival [sic] needs (food, cover, nest sites, nestling and fledgling protection) within the riparian zone" (USFWS 1985, p. 18971). However, subsequent studies have provided additional information on vireo behavior. When the least Bell's vireo was listed, it was known that "birds forage in riparian and adjoining chaparral habitat" (USFWS 1986, p. 16474). Such foraging in adjoining habitat can extend up to 300 yards from the nest site.

Much of what is known about the behavior of least Bell's vireos was obtained from populations that were reduced in numbers by cowbird parasitism. In the last few years, studies of populations freed from parasitism by programs for trapping cowbirds have revealed additional information about vireo behavior. Some of this information is of great relevance to management plans for the least Bell's vireo.

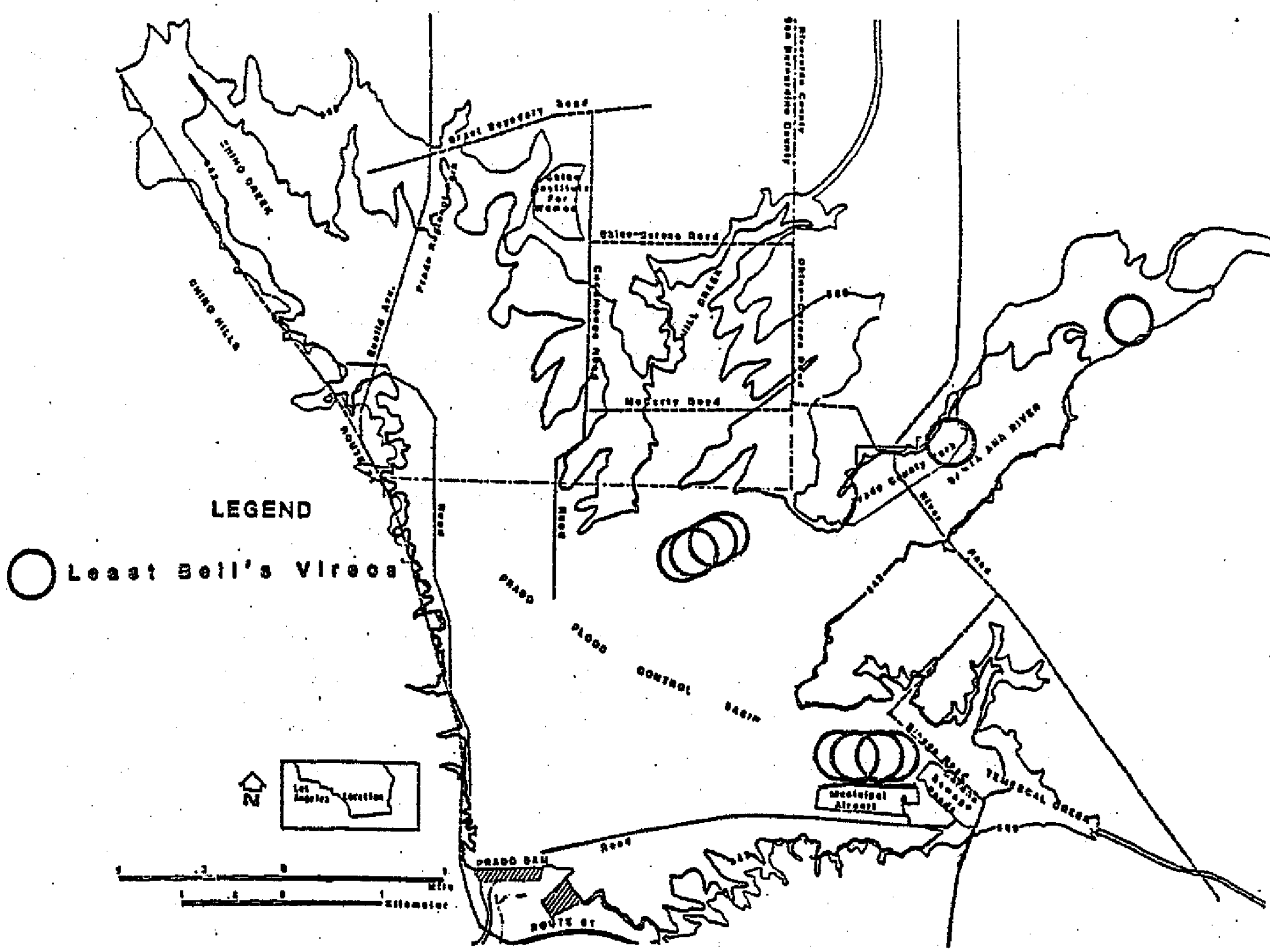
Recent studies have shown that as vireo nest success increased in an area due to cowbird elimination, the additional vireos tended to nest in the same area where they fledged, increasing the density in that area, rather than colonizing new areas. This phenomenon of site tenacity (preference for the area where an individual was fledged) means that while it will be fairly easy, through the elimination of cowbirds, to increase vireo density in areas where they already exist, it will be harder to get vireos to recolonize other areas of seemingly suitable habitat where they do not now exist. For this reason, plans to increase vireo populations have focused on a few large areas of suitable habitat where vireo populations are currently found rather than on other areas of suitable habitat that lack vireos. When critical habitat areas were proposed, it was known that least Bell's vireos nested preferentially in dense riparian habitat, preferring young willow thickets. As vireo numbers increased with the elimination of cowbirds, vireos were found to be less selective as to riparian habitat type. It would seem that their past preference for young, dense willow thickets was due in part to the vegetational density of this habitat being the best protection against cowbird parasitism. With the elimination of cowbirds, other riparian habitats became acceptable to vireos.

A biological survey of the Prado Basin was conducted by the USFWS during the summer of 1983 (Zembal and Kramer, 1984). This survey found 25 territorial male least Bell's vireos (a singing male is considered evidence of nesting). One of these was in riparian habitat along the Santa Ana River downstream from Prado Dam. All other males were within the proposed critical habitat area within the Prado Basin and along the Santa Ana River upstream of the basin (Figure 4-29).

The Prado Basin is home to one of the four largest remaining populations of least Bell's vireo. As it is also one of the largest areas of riparian habitat among the proposed critical habitat areas, the protection and improvement of this area for least Bell's vireo is an essential part of the recovery plan for this species.

Chino Valley Pipeline

For most of its length, the proposed alignment is in existing streets in residential or commercial areas, where no native vegetation or wildlife occur. Only the section between the southern end of Wheeler Avenue and the A.T. and S.F. Railroad right-of-way, where the alignment turns east, traverses an open graded field. This section is approximately 900 feet long. The field is characterized by a mix of native and introduce grasses, providing habitat, between discings, for grassland species of birds and rodents. The habitat is not considered to be significant because of its highly disturbed condition.



SOURCE: ZEMBAL AND KRAMER, 1986, Pg. 43

LOCATION OF TERRITORIAL MALE LEAST BELL'S VIREOS
FIGURE 4-29

If the alignment, alternatively, goes from 3rd and Wheeler, east to Park, then south on Park to Arrow Highway and east, then the entire pipeline would be laid in roadways and no biological resources would be expected to be encountered.

At the eastern end of the pipeline, all three alternatives would place the line in the streets.

For alignments in streets, potentially affected biologic resources would be negligible, the vegetation limited to ornamental plants and non-native grasses, and animals to suburban bird species. No rare, threatened, or endangered species would be impacted.

Existing Spreading Basins

If spreading basins were kept full of water and not maintained, a lake and lakeside habitat would develop. Fish do enter the basins from the aqueduct. Because the basins are periodically drained and sediment excavated, and weeds removed to maintain percolation rates, however, such habitat is effectively inhibited. Periodic draining is also necessary to control populations of midge flies and other water-associated flying insects. As a result, the basins are not considered to contain significant biological resources.

Well Field Areas

The wellfields have not been precisely defined and well sites have not yet been determined. The general areas are characterized by agriculture, with growing areas of industrial and suburban development. These land uses do not contain significant biological resources because virtually all natural vegetation has been removed.

There should be no loss of agricultural crops as the wells and pipelines would be in existing rights-of-way wherever possible. The finished wells would each occupy an area perhaps 20 ft by 20 ft adjacent to a roadway. The acreage required for the entire wellfield would be negligible.

Future Condition Of Biological Resources Without the Storage Program

Prado Reservoir. Future conditions of the riparian and aquatic vegetation and wildlife habitat may remain relatively unaltered in the future. Urbanization in and immediately adjacent to these habitat types in the Prado Basin area is unlikely because the land is owned or controlled by the USACE in the Prado Dam inundation area and the Dairy Trust in the surrounding upland. Urbanization in the upstream portions of San Bernardino County may result in increased flow of reduced water quality. Certain related projects will affect biological resources, as described below.

The proposed Seven Oaks Dam on the upper Santa Ana River would reduce the frequency and magnitude of flooding in the Chino Basin, USACE 1985). Reduced flooding is predicted to decrease the frequency and extent of removal of willows and other riparian vegetation by floods. These changes in surface flow regime should result in an increase in the extent and duration of mature willow woodland in the current riparian zone. There would be a concomitant decrease in the extent of young, dense, willow thickets that develop in the first few years after a flood has scoured away streamside vegetation. Such young dense willows are the preferred habitat of the endangered least Bells' vireo. Specific impacts of the Seven Oaks Dam on the biological resources downstream in the Prado Basin were not considered in the 1985 Final Supplemental Environmental Impact Statement (USACE 1985). Studies to assess the downstream impacts are planned for 1987 by the USACE.

Raising the Prado Dam spillway would significantly increase the potential inundation area behind the dam. Seasonal inundation of a greater portion of the riparian habitat would reduce the understory species and associated dense near-ground habitat, used by species such as the least Bell's vireo. Inundation during the growing season is known to have serious negative effects on many riparian plant species because of decreased oxygen concentration in the root zone in saturated soil (Teskey and Hinckley 1980). One unpublished study reports that black willows in the central valley of California had 100 percent survival after 60 days of constant total submersion (Walters, et al., 1980). No information on number and size of the willows or season of inundation in the study is available. However, this study suggests that temporary inundation in the winter in Prado Basin would probably not kill willows unless the water was present continuously for significantly more than two months.

Water conservation storage in Prado Reservoir as proposed by OCWD would result in inundation of extensive areas of Prado Basin for up to 10 months per year. Walters, et al. (1980) list black willow as a flood tolerant species, defined by them as "trees which can withstand flooding for most of one growing season. Some new root development can be expected during this period." They list sycamore and cottonwood as intermediately tolerant of flooding, defined by them as "species which are able to survive flooding for periods between one to three months during the growing season. The root systems of these plants may produce few new roots or will be dormant during the flooded period." Consequently, inundation of the duration required by a water conservation project probably would kill all willows and other riparian vegetation inundated and drastically reduce the extent and quality of the willow woodland adversely impacting the many species of vertebrates, including the endangered least Bell's vireo, dependent on willow woodland and extensive areas of associated riparian vegetation. The extensive inundation of the reservoir would probably enhance the use of the area by birds dependent on open water, such as ducks, geese, herons, and egrets.

Chino Valley Pipeline. The future biological conditions in the absence of the project along the Chino Valley Pipeline, at the spreading basins and well field area will be essentially as at present. As the wellfield area develops, land use will continue to change from agriculture to industrial and suburban. Natural biological resources will continue to be essentially absent.

CULTURAL RESOURCES

In June and July 1987, Scientific Resource Surveys, Inc. (SRS) conducted a literature search, records check, field reconnaissance and prepared a cultural resources survey report for the proposed project facilities sites, and for Prado Dam where cumulative impacts are a consideration. This report is included as Appendix F hereafter, and contains a detailed discussion of the cultural history of the Storage Program area. A summary of the results of these investigations follows.

The cultural resources analysis was organized into several tasks based on the facilities locations proposed and potential related impact areas as outlined below.

- well field and connecting pipelines routes,
- Chino Valley Pipeline alignment,
- Wells along the Etiwanda Pipeline alignment, and
- Prado Basin.

Well Field and Pipelines

No prehistoric cultural resources were identified within the well field and pipeline potential site areas as a result of the survey. Twenty historical structures more than 50 years old were identified based on stylistic characteristics, but none appear to be significant, based on National Register criteria.

APPENDIX 8.5

CALIFORNIA NATIVE PLANT SOCIETY (CNPS) PLANT LIST

California Department of Fish and Game
Natural Diversity Database

SPECIAL PLANTS LIST

January 2000

Citation: California Department of Fish and Game, Natural Diversity Database. January, 2000 Special Plants List. Biannual publication, Mimeo., 119p.

SPECIAL PLANTS

"Special Plants" is a broad term used to refer to all the plant taxa inventoried by the Department of Fish and Game's California Natural Diversity Database (CNDDB), regardless of their legal or protection status. Special Plant taxa are species, subspecies, or varieties that fall into one or more of the following categories:

- Officially listed by California or the Federal Government as Endangered, Threatened, or Rare;

- A candidate for state or federal listing as Endangered, Threatened, or Rare;

- Taxa which meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the California Environmental Quality Act (CEQA) Guidelines;

- A Bureau of Land Management, U.S. Fish and Wildlife Service, or U.S. Forest Service Sensitive Species;

- Taxa listed in the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California*;

- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range but not currently threatened with extirpation;

- Population(s) in California that may be peripheral to the major portion of a taxon's range but are threatened with extirpation in California; and

- Taxa closely associated with a habitat that is declining in California at an alarming rate (e.g., wetlands, riparian, old growth forests, desert aquatic systems, native grasslands, valley shrubland habitats, vernal pools, etc.).

This list contains taxa that are actively inventoried by the CNDDB (Note: a "yes" in the right column of the list) as well as an almost equal number of taxa which it tracks but as yet has no computerized site information. For the latter taxa, we maintain site and other information in manual files. These plants will be added to the computerized inventory as time permits or when we have enough information to determine that they fulfill our rarity and/or endangerment criteria. For more copies of this list or other CNDDB information, call (916) 324-3812.

ELEMENT RANKING

GLOBAL RANKING

The *global rank* (G-rank) is a reflection of the overall condition of an element throughout its global range.

SPECIES OR NATURAL COMMUNITY LEVEL

G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-100 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

SUBSPECIES LEVEL
Subspecies receive a **T-rank** attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety.
For example: *Chorizanthe robusta* var. *hartwegii*. This plant is ranked G2TI. The G-rank refers to the whole species range i.e., *Chorizanthe robusta*. The T-rank refers only to the global condition of var. *hartwegii*.

STATE RANKING

The *state rank* (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres
- S1.1 = very threatened
- S1.2 = threatened
- S1.3 = no current threats known

S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres
- S2.1 = very threatened
- S2.2 = threatened
- S2.3 = no current threats known

S3 = 21-100 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres
- S3.1 = very threatened
- S3.2 = threatened
- S3.3 = no current threats known

S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.

S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.

Notes:

1. Other considerations used when ranking a species or natural community include the pattern of distribution of the element on the landscape, fragmentation of the population/stands, and historical extent as compared to its modern range. It is important to take a **bird's eye or aerial view** when ranking sensitive elements rather than simply counting EOs.

2. Uncertainty about the rank of an element is expressed in two major ways:

   By expressing the rank as a **range** of values: e.g., S2S3 means the rank is somewhere between S2 and S3.

   By adding a **?** to the rank: e.g., S2? This represents more certainty than S2S3, but less than S2.

3. Other symbols

   GH All sites are **historical**; the element has not been seen for at least 20 years, but suitable habitat still exists (SH = All California sites are historical).
   GX All sites are **extirpated**; this element is extinct in the wild (SX = All California sites are extirpated).
   GXC Extinct in the wild; exists in cultivation.
   G1Q The element is very rare, but there are **taxonomic questions** associated with it.

The California Native Plant Society's (CNPS) Lists and R-E-D Code[1]

1A.	Presumed extinct in California
1B.	Rare or Endangered in California and elsewhere
2.	Rare or Endangered in California, more common elsewhere
3.	Plants for which we need more information - Review list
4.	Plants of limited distribution - Watch list

List 1A: Plants presumed Extinct in California

The 37 plants of List 1A are presumed extinct because they have not been seen or collected in the wild in California for many years. Although most of them are restricted to California, a few are found in other states as well. In many cases, repeated attempts have been made to rediscover these plants by visiting known historical locations. Note the difference between "extinct" and "extirpated." A plant is extirpated if it has been locally eliminated, but it may be doing well elsewhere in its range. The NDDB further splits this group of plants into those that are statewide historical (SH) and those that are extinct in the state (SX).

All of the plants constituting List 1A meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. If these taxa are rediscovered, they should be fully considered during preparation of environmental documents relating the California Environmental Quality Act (CEQA).

List 1B: Plants Rare, Threatened, or Endangered in California and elsewhere.

The 857 plants of List 1B are rare throughout their range. All but a few are endemic to California. All of them are judged to be vulnerable under present circumstances or to have a high potential for becoming so because of their limited or vulnerable habitat, their low numbers of individuals per population (even though they may be wide ranging), or their limited number of populations. Most of the plants of List 1B have declined significantly since the arrival of non-indigenous humanity in California.

All of the plants constituting List 1B meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. List 1B plants should be fully considered during preparation of environmental documents relating to CEQA.

List 2: Plants Rare, Threatened, or Endangered in California, but more common elsewhere

Except for being common beyond the boundaries of California, the 272 plants of List 2 would have appeared on List 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Endangered Species Act. Until 1979, a similar policy was followed in California. However, after the passage of the Native Plant Protection Act, plants were considered for protection without regard to their distribution outside the state.

All of the plants constituting List 2 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. List 2 plants should be fully considered during preparation of environmental documents relating to CEQA.

List 3: Plants about which we need more information - A Review list

The 47 plants that comprise List 3 are united by one common theme--we lack the necessary information to assign them to one of the other lists or to reject them.

Some of the plants constituting List 3 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. We recommend that List 3 plants be evaluated for consideration during preparation of environmental documents relating to CEQA.

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[1] Excerpted and modified from Skinner, M.W. and B.M. Pavlik. 1994. *CNPS Inventory of Rare and Endangered Vascular Plants of California*, Fifth edition. CNPS Special Publication No. 1, Sacramento, California.

List 4: Plants of limited distribution - A Watch list

The 532 plants in this category are of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low at this time. While CNPS cannot call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a List 4 plant change, it will be transferred to a more appropriate list or deleted from consideration.

Very few of the plants constituting List 4 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for state listing. Nevertheless, many of them are significant locally, and we recommend that List 4 plants be evaluated for consideration during preparation of environmental documents relating to CEQA. This may be particularly appropriate for the type locality of a List 4 plant, for populations at the periphery of a species' range or in areas where the taxon is especially uncommon or has sustained heavy losses, or for populations exhibiting unusual morphology or occurring on unusual substrates.

The R-E-D Code

Even before the publication of the first edition of the *CNPS Inventory*, CNPS determined that attempts to categorize plants solely on the degree of threat, as embodied in such terms as rare, threatened, or endangered, were too restrictive. This is so primarily because the question of rarity frequently interferes with the question of endangerment. With few exceptions, endangered plants are also rare. However, some plants of more widespread occurrence are endangered and their numbers have declined because of commercial or private exploitation for horticultural use. Many cacti, lilies, orchids, succulents, and insectivorous plants fall into this category. In other cases, very rare plants occur in stable habitants such as alpine fell fields. Typically these plants cannot realistically be described as endangered, except perhaps through stochastic extinction associated with small population sizes or numbers.

In an attempt to increase the refinement of assigning plants to categories, CNPS uses a scheme that combines three complementary elements that are scored independently. These components are: **rarity (R)**, which addresses the extent of the plant, both in terms of numbers of individuals and the nature and extent of distribution; **endangerment(E)**, which embodies the perception of the plant's vulnerability to extinction for any reason; and **distribution (D)**, which focuses on the overall range of the plant.

Together these three elements form the R-E-D Code. Each element in the code is divided into three classes or degrees of concern, represented by the numbers 1, 2, or 3. In each case, higher numbers indicate greater concern. The system is summarized as follows:

R (Rarity)

1 Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time

2 Distributed in a limited number of occurrences, occasionally more if each occurrence is small

3 Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported

E (Endangerment)

1 Not endangered

2 Endangered in a portion of its range

3 Endangered throughout it range

D (Distribution)

1 More or less widespread outside California

2 Rare outside California

3 Endemic to California

For example, an R-E-D Code of 3-3-3 indicates that the plant in question is limited to one population or several restricted ones, that it is endangered throughout its range, and that it is endemic to California.

State of California
THE RESOURCES AGENCY
Department of Fish and Game
May 4, 1984
Revised August 15, 1997

GUIDELINES FOR ASSESSING THE EFFECTS OF PROPOSED DEVELOPMENTS ON RARE AND ENDANGERED PLANTS AND PLANT COMMUNITIES

The following recommendations are intended to help those who prepare and review environmental documents determine when a botanical survey is needed, who should be considered qualified to conduct such surveys, how field surveys should be conducted, and what information should be contained in the survey report. The Department may recommend that lead agencies not accept the results of surveys that are not conducted according to these guidelines.

1. Botanical surveys that are conducted to determine the environmental effects of a proposed development should be directed to all rare, threatened and endangered plants and plant communities. Rare, threatened, and endangered plants are not necessarily limited to those species which have been "listed" by state and federal agencies but should include any species that, based on all available data, can be shown to be rare and/or endangered under the following definitions:

   A species, subspecies, or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition, or disease. A plant is "threatened" when it is likely to become endangered in the foreseeable future in the absence of protection measures. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.

   Rare plant communities are those communities that are of highly limited distribution. These communities may or may not contain rare, threatened, or endangered species. The most current version of the California Natural Diversity Data Base's Outline of Terrestrial Communities in California may be used as a guide to the names and status of communities.

2. It is appropriate to conduct a botanical field survey to determine if, or the extent that, rare, threatened, or endangered plants will be affected by a proposed project when:

   a. Based on an initial biological assessment, natural vegetation occurs on the site and it is unknown if rare, threatened, or endangered plants or habitats occur on the site; or

   b. Rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking.

3. Botanical consultants should possess the following qualifications:

   a. Experience conducting floristic field surveys;

   b. Knowledge of plant taxonomy and plant ecology;

   c. Familiarity with the plants of the area, including rare, threatened, and endangered species; and

   d. Familiarity with the appropriate state and federal statutes related to plants and plant collecting.

4. Field surveys should be conducted in a manner that will locate any rare, threatened, or endangered species that may be present. Specifically, rare, threatened, or endangered plant surveys should be:

   a. Conducted in the field at the proper time of year when rare, threatened, or endangered species are both evident and identifiable. Usually, this is when the plants are flowering.

      Additionally, field surveys should be conducted with a sufficient number of visits spaced throughout the growing season to accomplish a floristic survey of the site (see 4.b.). When rare, threatened, or endangered plants are known to occur in the type(s) of habitat present in the project area, nearby accessible occurrences of the plants (reference sites) should be observed to determine that the species are identifiable at the time of the survey.

b. Floristic in nature. A complete species list should be included in every botanical survey report.

c. Conducted in a manner that is consistent with conservation ethics. Collections of rare, threatened, or endangered species, or suspected rare, threatened, or endangered species (voucher specimens) should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable state and federal permit requirements. A collecting permit from the Plant Conservation Program of DFG is required for collection of state-listed plant species. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using systematic field techniques in all habitats of the site to ensure a thorough coverage of potential impact areas.

e. Well documented. When a rare, threatened, or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form, accompanied by a copy of the appropriate portion of a 7.5' minute topographic map with the occurrence mapped, should be completed and submitted to the Natural Diversity Database.

5. Reports of botanical field surveys should be included in or with environmental assessments, negative declarations, EIRs and EISs, and should contain the following information:

a. Project description, including a detailed map of the project location and study area.

b. A written description of biological setting referencing the community nomenclature used and a vegetation map.

c. Detailed description of survey methodology.

d. Dates of field surveys and total person-hours spent on field surveys.

e. Results of survey (including detailed maps).

f. An assessment of potential impacts.

g. Discussion of the importance of rare, threatened, or endangered plant populations with consideration of nearby populations and total species distribution.

h. Recommended measures to avoid impacts.

I. List of all species occurring on the project site.

j. Description of reference site(s) visited and phenological development of rare, threatened, or endangered plant(s).

k. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms.

l. Name(s) of field investigator(s).

l. References cited, persons contacted, herbaria visited, and disposition of voucher specimens.

California Department of Fish and Game, Natural Diversity Data Base
Special Plants List

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ABIES AMABILIS		Federal:	None	Global:	G5	List:	2
PACIFIC SILVER FIR		State:	None	State:	S3.3	Code:	211
PGPIN01010	Records in NDDB: *Yes*						
ABIES BRACTEATA		Federal:	None	Global:	G2?	List:	4
BRISTLECONE FIR		State:	None	State:	S2?	Code:	113
PGPIN01030	Records in NDDB: *No*						
ABIES LASIOCARPA VAR LASIOCARPA		Federal:	None	Global:	G5T5	List:	2
SUBALPINE FIR		State:	None	State:	S3.3	Code:	211
PGPIN01072	Records in NDDB: *Yes*						
ABRONIA ALPINA		Federal:	Candidate	Global:	G1	List:	1B
RAMSHAW MEADOWS ABRONIA		State:	None	State:	S1.1	Code:	333
PDNYC01020	Records in NDDB: *Yes*						
ABRONIA MARITIMA		Federal:	None	Global:	G3?	List:	4
RED SAND-VERBENA		State:	None	State:	S3?	Code:	122
PDNYC010E0	Records in NDDB: *No*						
ABRONIA NANA SSP COVILLEI		Federal:	None	Global:	G4T3T4	List:	4
COVILLE'S DWARF ABRONIA		State:	None	State:	S3.2	Code:	121
PDNYC010H1	Records in NDDB: *No*						
ABRONIA UMBELLATA SSP BREVIFLORA		Federal:	Species of concern	Global:	G5T2	List:	1B
PINK SAND-VERBENA		State:	None	State:	S2.1	Code:	222
PDNYC010N2	Records in NDDB: *Yes*						
ACANTHOMINTHA DUTTONII		Federal:	Endangered	Global:	G1	List:	1B
SAN MATEO THORN-MINT		State:	Endangered	State:	S1.1	Code:	333
PDLAM01040	Records in NDDB: *Yes*						
ACANTHOMINTHA ILICIFOLIA		Federal:	Threatened	Global:	G1	List:	1B
SAN DIEGO THORN-MINT		State:	Endangered	State:	S1.1	Code:	232
PDLAM01010	Records in NDDB: *Yes*						
ACANTHOMINTHA LANCEOLATA		Federal:	None	Global:	G3	List:	4
SANTA CLARA THORN-MINT		State:	None	State:	S3.2	Code:	123
PDLAM01020	Records in NDDB: *No*						
ACANTHOMINTHA OBOVATA SSP CORDATA		Federal:	None	Global:	G3T3?	List:	4
HEART-LEAVED THORN-MINT		State:	None	State:	S3.2?	Code:	123
PDLAM01033	Records in NDDB: *No*						
ACANTHOMINTHA OBOVATA SSP OBOVATA		Federal:	Species of concern	Global:	G3T3	List:	4
SAN BENITO THORN-MINT		State:	None	State:	S3.2?	Code:	123
PDLAM01032	Records in NDDB: *No*						
ACHNATHERUM ARIDUM		Federal:	None	Global:	G5	List:	2
MORMON NEEDLE GRASS		State:	None	State:	S2?	Code:	211
PMPOA5X010	Records in NDDB: *Yes*						
ACHNATHERUM DIEGOENSE		Federal:	None	Global:	G3	List:	4
SAN DIEGO COUNTY NEEDLE GRASS		State:	None	State:	S3.2	Code:	121
PMPOA5X0B0	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ACHNATHERUM LEMMONII VAR PUBESCENS PUBESCENT NEEDLE GRASS PMPOA5X0F2	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T2 S1.2?	List: Code:	3 323
ACLEISANTHES LONGIFLORA ANGEL TRUMPETS PDNYC02040	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.3	List: Code:	2 311
ADOLPHIA CALIFORNICA CALIFORNIA ADOLPHIA PDRHA01010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3 S2.1	List: Code:	2 121
AGAVE SHAWII SHAW'S AGAVE PMAGA010P0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3 S1.1	List: Code:	2 331
AGAVE UTAHENSIS UTAH AGAVE PMAGA010S0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4 S3?	List: Code:	4 122
AGERATINA SHASTENSIS SHASTA AGERATINA PDASTBX0R0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G2G3 S2S3	List: Code:	4 113
AGROSTIS BLASDALEI BLASDALE'S BENT GRASS PMPOA04060	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 323
AGROSTIS CLIVICOLA VAR CLIVICOLA COASTAL BLUFF BENT GRASS PMPOA040A1	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G3T3 S3?	List: Code:	
AGROSTIS CLIVICOLA VAR PUNTA-REYESENSIS PT REYES BENT GRASS PMPOA040A2	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3T1 S1.2	List: Code:	
AGROSTIS HENDERSONII HENDERSON'S BENT GRASS PMPOA040K0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1Q S1.1	List: Code:	3 322
AGROSTIS HOOVERI HOOVER'S BENT GRASS PMPOA040M0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.2?	List: Code:	4 123
AGROSTIS HUMILIS MOUNTAIN BENT GRASS PMPOA040P0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S1.3	List: Code:	2 311
ALLIUM ATRORUBENS VAR ATRORUBENS GREAT BASIN ONION PMLIL02061	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4T4 S3.3	List: Code:	2 211
ALLIUM BOLANDERI VAR MIRABILE WONDERFUL ONION PMLIL02093	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4G5T3 S2?	List: Code:	
ALLIUM FIMBRIATUM VAR PURDYI PURDY'S ONION PMLIL020Y7	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3G4T3 S3.3?	List: Code:	4 113

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ALLIUM HICKMANII		Federal:	Species of concern	Global:	G2	List:	1B
HICKMAN'S ONION		State:	None	State:	S2.2	Code:	223
PMLIL02140	Records in NDDB: *Yes*						
ALLIUM HOFFMANII		Federal:	None	Global:	G3	List:	4
BEEGUM ONION		State:	None	State:	S3.3	Code:	113
PMLIL02150	Records in NDDB: *No*						
ALLIUM HOWELLII VAR CLOKEYI		Federal:	None	Global:	G3T3	List:	4
MT. PINOS ONION		State:	None	State:	S3?	Code:	113
PMLIL02161	Records in NDDB: *No*						
ALLIUM JEPSONII		Federal:	Species of concern	Global:	G1	List:	1B
JEPSON'S ONION		State:	None	State:	S1.2	Code:	323
PMLIL022V0	Records in NDDB: *Yes*						
ALLIUM MUNZII		Federal:	Endangered	Global:	G1	List:	1B
MUNZ'S ONION		State:	Threatened	State:	S1.1	Code:	333
PMLIL022Z0	Records in NDDB: *Yes*						
ALLIUM NEVADENSE		Federal:	None	Global:	G4	List:	2
NEVADA ONION		State:	None	State:	S1.3	Code:	311
PMLIL021J0	Records in NDDB: *Yes*						
ALLIUM PARISHII		Federal:	None	Global:	G3	List:	4
PARISH'S ONION		State:	None	State:	S3.3?	Code:	112
PMLIL021N0	Records in NDDB: *No*						
ALLIUM PENINSULARE VAR FRANCISCANUM		Federal:	None	Global:	G5T2?	List:	
SAN FRANCISCO ONION		State:	None	State:	S2?	Code:	
PMLIL021R1	Records in NDDB: *No*						
ALLIUM SANBORNII VAR CONGDONII		Federal:	None	Global:	G3T3	List:	4
CONGDON'S ONION		State:	None	State:	S3.3	Code:	113
PMLIL02211	Records in NDDB: *No*						
ALLIUM SANBORNII VAR SANBORNII		Federal:	None	Global:	G3T3	List:	4
SANBORN'S ONION		State:	None	State:	S3.2	Code:	122
PMLIL02212	Records in NDDB: *No*						
ALLIUM SHARSMITHAE		Federal:	None	Global:	G2	List:	1B
SHARSMITH'S ONION		State:	None	State:	S2?	Code:	213
PMLIL020Y9	Records in NDDB: *Yes*						
ALLIUM SHEVOCKII		Federal:	Species of concern	Global:	G1	List:	1B
SPANISH NEEDLE ONION		State:	None	State:	S1.3	Code:	313
PMLIL022M0	Records in NDDB: *Yes*						
ALLIUM SISKIYOUENSE		Federal:	None	Global:	G4	List:	4
SISKIYOU ONION		State:	None	State:	S3.3?	Code:	111
PMLIL02280	Records in NDDB: *No*						
ALLIUM TRIBRACTEATUM		Federal:	Species of concern	Global:	G2	List:	1B
THREE-BRACTED ONION		State:	None	State:	S2.2	Code:	323
PMLIL022D0	Records in NDDB: *Yes*						
ALLIUM TUOLUMNENSE		Federal:	Species of concern	Global:	G2	List:	1B
RAWHIDE HILL ONION		State:	None	State:	S2.2	Code:	223
PMLIL022W0	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ALLIUM YOSEMITENSE YOSEMITE ONION PMLIL022L0	Records in NDDB: *Yes*	Federal: State:	None Rare	Global: State:	G2 S2.3	List: Code:	1B 213
ALOPECURUS AEQUALIS VAR SONOMENSIS SONOMA ALOPECURUS PMPOA07012	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G5T1 S1.1	List: Code:	1B 333
AMBROSIA CHENOPODIIFOLIA SAN DIEGO BUR-SAGE PDAST0C080	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.1	List: Code:	2 221
AMBROSIA PUMILA SAN DIEGO AMBROSIA PDAST0C0M0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.1	List: Code:	1B 332
AMMOSELINUM GIGANTEUM DESERT SAND-PARSLEY PDAPI05020	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3 SH	List: Code:	2 311
AMSINCKIA GRANDIFLORA LARGE-FLOWERED FIDDLENECK PDBOR01050	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G1 S1.1	List: Code:	1B 333
AMSINCKIA LUNARIS BENT-FLOWERED FIDDLENECK PDBOR01070	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3?	List: Code:	4 113
AMSINCKIA VERNICOSA VAR FURCATA FORKED FIDDLENECK PDBOR01030	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G5T3 S3.2	List: Code:	4 123
ANDROSACE ELONGATA SSP ACUTA CALIFORNIA ANDROSACE PDPRI02031	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G?T3? S3.2?	List: Code:	4 122
ANDROSACE FILIFORMIS SLENDER-STEMMED ANDROSACE PDPRI02040	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S1?	List: Code:	2 311
ANDROSTEPHIUM BREVIFLORUM SMALL-FLOWERED ANDROSTEPHIUM PMLIL06010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.3	List: Code:	2 311
ANGELICA CALLII CALL'S ANGELICA PDAPI07060	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3?	List: Code:	4 113
ANTENNARIA FLAGELLARIS STOLONIFEROUS PUSSYTOES PDAST0H0W0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5? S3.2	List: Code:	4 121
ANTENNARIA MARGINATA WHITE-MARGINED EVERLASTING PDAST0H1G0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4? S1.3	List: Code:	2 311
ANTENNARIA PULCHELLA BEAUTIFUL PUSSY-TOES PDAST0H1H0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 112

Scientific Name, Common Name, Element Code	Records in NDDB	Listing Status: Federal	Listing Status: State	Rank: Global	Rank: State	CNPS List	CNPS Code
ANTENNARIA SUFFRUTESCENS EVERGREEN EVERLASTING PDAST0H0S0	*No*	None	None	G4	S3.3?	4	112
ANTIRRHINUM CYATHIFERUM DEEP CANYON SNAPDRAGON PDSCR2R010	*Yes*	None	None	G3G4	S1.3	2	311
ANTIRRHINUM OVATUM OVAL-LEAVED SNAPDRAGON PDSCR2K010	*Yes*	None	None	G3	S3.2	4	123
ANTIRRHINUM SUBCORDATUM DIMORPHIC SNAPDRAGON PDSCR2S070	*Yes*	None	None	G3	S3.2	1B	223
ANTIRRHINUM VIRGA TALL SNAPDRAGON PDSCR2S090	*No*	None	None	G3	S3.3?	4	113
APHANISMA BLITOIDES APHANISMA PDCHE02010	*Yes*	Species of concern	None	G2	S1.2	1B	222
ARABIS ACULEOLATA WALDO ROCK CRESS PDBRA06010	*Yes*	None	None	G4	S2.2	2	321
ARABIS BLEPHAROPHYLLA COAST ROCK CRESS PDBRA06040	*No*	None	None	G3	S3.3?	4	113
ARABIS BODIENSIS BODIE HILLS ROCK CRESS PDBRA06240	*Yes*	Species of concern	None	G1	S1.3	1B	212
ARABIS BREWERI VAR PECUNIARIA SAN BERNARDINO ROCK CRESS PDBRA06053	*Yes*	Species of concern	None	G4?T1	S1.2	1B	323
ARABIS COBRENSIS MASONIC ROCK CRESS PDBRA06080	*Yes*	None	None	G5	S1S2	2	311
ARABIS CONSTANCEI CONSTANCE'S ROCK CRESS PDBRA06090	*Yes*	None	None	G2	S2.2	1B	123
ARABIS DISPAR PINYON ROCK CRESS PDBRA060F0	*Yes*	None	None	G3	S2.3	2	211
ARABIS FERNALDIANA VAR STYLOSA STYLOSE ROCK CRESS PDBRA060K2	*Yes*	None	None	G3G4T2	S1.3	1B	312
ARABIS HOFFMANNII HOFFMANN'S ROCK CRESS PDBRA060V0	*Yes*	Endangered	None	G1	S1.2	1B	333

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
ARABIS JOHNSTONII JOHNSTON'S ROCK CRESS PDBRA060Y0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 323
ARABIS KOEHLERI VAR STIPITATA KOEHLER'S STIPITATE ROCK CRESS PDBRA060Z2 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3T3 **State:** S1.3	**List:** 1B **Code:** 312
ARABIS MACDONALDIANA MCDONALD'S ROCK CRESS PDBRA06150 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G2 **State:** S2.1	**List:** 1B **Code:** 232
ARABIS MICROPHYLLA VAR MICROPHYLLA SMALL-LEAVED ROCK CRESS PDBRA06162 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T4? **State:** S3.3	**List:** 4 **Code:** 111
ARABIS MODESTA MODEST ROCK CRESS PDBRA06180 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3Q **State:** S3.3?	**List:** 4 **Code:** 112
ARABIS OREGANA OREGON ROCK CRESS PDBRA061A0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3G4Q **State:** S3.3?	**List:** 4 **Code:** 111
ARABIS PARISHII PARISH'S ROCK CRESS PDBRA061C0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
ARABIS PINZLAE PINZL'S ROCK CRESS PDBRA06270 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.3	**List:** 1B **Code:** 312
ARABIS PULCHRA VAR MUNCIENSIS DARWIN ROCK CRESS PDBRA061M3 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T4? **State:** S1.3	**List:** 2 **Code:** 311
ARABIS PYGMAEA TULARE COUNTY ROCK CRESS PDBRA061N0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G1G2 **State:** S1S2	**List:** 4 **Code:** 113
ARABIS RIGIDISSIMA VAR DEMOTA CARSON RANGE ROCK CRESS PDBRA061R1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3T2 **State:** S1.2	**List:** 1B **Code:** 322
ARABIS RIGIDISSIMA VAR RIGIDISSIMA TRINITY MOUNTAINS ROCK CRESS PDBRA061R2 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3T3 **State:** S3.3	**List:** 4 **Code:** 113
ARABIS SERPENTINICOLA PRESTON PEAK ROCK CRESS PDBRA061U0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1Q **State:** S1.3	**List:** 1B **Code:** 313
ARABIS SHOCKLEYI SHOCKLEY'S ROCK CRESS PDBRA061V0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3 **State:** S2.2	**List:** 2 **Code:** 321
ARABIS TIEHMII TIEHM'S ROCK CRESS PDBRA06280 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.3	**List:** 1B **Code:** 312

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ARCTOMECON MERRIAMII		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
WHITE BEAR POPPY		**State:**	None	**State:**	S2.2	**Code:**	222
PDPAP02030	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS ANDERSONII		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
SANTA CRUZ MANZANITA		**State:**	None	**State:**	S2?	**Code:**	223
PDERI04030	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS AURICULATA		**Federal:**	None	**Global:**	G2	**List:**	1B
MT. DIABLO MANZANITA		**State:**	None	**State:**	S2.2	**Code:**	313
PDERI04040	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS BAKERI SSP BAKERI		**Federal:**	Species of concern	**Global:**	G2T2	**List:**	1B
BAKER'S MANZANITA		**State:**	Rare	**State:**	S2.1	**Code:**	333
PDERI04221	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS BAKERI SSP SUBLAEVIS		**Federal:**	None	**Global:**	G2T2	**List:**	1B
THE CEDARS MANZANITA		**State:**	Rare	**State:**	S2.2	**Code:**	323
PDERI04222	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS CANESCENS SSP SONOMENSIS		**Federal:**	None	**Global:**	G3T2	**List:**	1B
SONOMA MANZANITA		**State:**	None	**State:**	S2.2	**Code:**	223
PDERI04066	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS CATALINAE		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
SANTA CATALINA ISLAND MANZANITA		**State:**	None	**State:**	S2.2	**Code:**	223
PDERI04070	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS CONFERTIFLORA		**Federal:**	Endangered	**Global:**	G1	**List:**	1B
SANTA ROSA ISLAND MANZANITA		**State:**	None	**State:**	S1	**Code:**	323
PDERI040A0	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS CRUZENSIS		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
ARROYO DE LA CRUZ MANZANITA		**State:**	None	**State:**	S2.2	**Code:**	223
PDERI040B0	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS DENSIFLORA		**Federal:**	Species of concern	**Global:**	G1	**List:**	1B
VINE HILL MANZANITA		**State:**	Endangered	**State:**	S1.1	**Code:**	333
PDERI040C0	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS EDMUNDSII		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
LITTLE SUR MANZANITA		**State:**	None	**State:**	S2.2	**Code:**	323
PDERI04260	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS GABRIELENSIS		**Federal:**	Species of concern	**Global:**	G1	**List:**	1B
SAN GABRIEL MANZANITA		**State:**	None	**State:**	S1.2	**Code:**	323
PDERI042P0	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS GLANDULOSA SSP CRASSIFOLIA		**Federal:**	Endangered	**Global:**	G5T1	**List:**	1B
DEL MAR MANZANITA		**State:**	None	**State:**	S1.1	**Code:**	332
PDERI040E8	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS GLUTINOSA		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
SCHREIBER'S MANZANITA		**State:**	None	**State:**	S2.2	**Code:**	323
PDERI040G0	**Records in NDDB:** *Yes*						
ARCTOSTAPHYLOS HISPIDULA		**Federal:**	None	**Global:**	G3	**List:**	4
HOWELL'S MANZANITA		**State:**	None	**State:**	S3.2	**Code:**	122
PDERI04230	**Records in NDDB:** *No*						

Scientific Name, Common Name, Element Code	Records in NDDB	Listing Status Federal	Listing Status State	Rank Global	Rank State	CNPS List	CNPS Code
ARCTOSTAPHYLOS HOOKERI SSP FRANCISCANA FRANCISCAN MANZANITA PDERI040J3	*Yes*	Species of concern	None	G3TXC	SX	1A	*
ARCTOSTAPHYLOS HOOKERI SSP HEARSTIORUM HEARST'S MANZANITA PDERI040J4	*Yes*	Species of concern	Endangered	G3T1	S1.2	1B	323
ARCTOSTAPHYLOS HOOKERI SSP HOOKERI HOOKER'S MANZANITA PDERI040J1	*Yes*	None	None	G3T2	S2?	1B	223
ARCTOSTAPHYLOS HOOKERI SSP MONTANA MT. TAMALPAIS MANZANITA PDERI040J5	*Yes*	Species of concern	None	G3T2	S2.3	1B	313
ARCTOSTAPHYLOS HOOKERI SSP RAVENII PRESIDIO MANZANITA PDERI040J2	*Yes*	Endangered	Endangered	G3T1	S1.1	1B	333
ARCTOSTAPHYLOS HOOVERI HOOVER'S MANZANITA PDERI040K0	*No*	None	None	G3	S3.3?	4	113
ARCTOSTAPHYLOS IMBRICATA SAN BRUNO MOUNTAIN MANZANITA PDERI040L0	*Yes*	Species of concern	Endangered	G1	S1.1	1B	333
ARCTOSTAPHYLOS KLAMATHENSIS KLAMATH MANZANITA PDERI041R0	*Yes*	Species of concern	None	G1	S1.2	1B	323
ARCTOSTAPHYLOS LUCIANA SANTA LUCIA MANZANITA PDERI040N0	*Yes*	Species of concern	None	G2	S2.2	1B	223
ARCTOSTAPHYLOS MALLORYI MALLORY'S MANZANITA PDERI04065	*No*	None	None	G3Q	S3.3?	4	113
ARCTOSTAPHYLOS MANZANITA SSP LAEVIGATA CONTRA COSTA MANZANITA PDERI04273	*Yes*	None	None	G5T2	S2	1B	323
ARCTOSTAPHYLOS MENDOCINOENSIS PYGMY MANZANITA PDERI04280	*Yes*	None	None	G1	S1?	1B	323
ARCTOSTAPHYLOS MEWUKKA SSP TRUEI TRUE'S MANZANITA PDERI041P0	*No*	None	None	G4?T3Q	S3.2	4	123
ARCTOSTAPHYLOS MONTARAENSIS MONTARA MANZANITA PDERI040L2	*Yes*	Species of concern	None	G2	S2.2	1B	323
ARCTOSTAPHYLOS MONTEREYENSIS MONTEREY MANZANITA PDERI040R0	*Yes*	Species of concern	None	G2	S2.2	1B	323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ARCTOSTAPHYLOS MORROENSIS MORRO MANZANITA PDERI040S0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 233
ARCTOSTAPHYLOS MYRTIFOLIA IONE MANZANITA PDERI04240	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ARCTOSTAPHYLOS NISSENANA NISSENAN MANZANITA PDERI040V0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
ARCTOSTAPHYLOS NORTENSIS DEL NORTE MANZANITA PDERI04092	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4? S3.3?	**List:** **Code:**	4 113
ARCTOSTAPHYLOS OBISPOENSIS BISHOP MANZANITA PDERI040X0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3?	**List:** **Code:**	4 113
ARCTOSTAPHYLOS OSOENSIS OSO MANZANITA PDERI042S0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2?	**List:** **Code:**	1B 333
ARCTOSTAPHYLOS OTAYENSIS OTAY MANZANITA PDERI040Y0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
ARCTOSTAPHYLOS PACIFICA PACIFIC MANZANITA PDERI040Z0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G?Q S?	**List:** **Code:**	
ARCTOSTAPHYLOS PAJAROENSIS PAJARO MANZANITA PDERI04100	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 233
ARCTOSTAPHYLOS PALLIDA PALLID MANZANITA PDERI04110	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Endangered	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 333
ARCTOSTAPHYLOS PECHOENSIS PECHO MANZANITA PDERI04140	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2?	**List:** **Code:**	1B 233
ARCTOSTAPHYLOS PENINSULARIS SSP PENINSULARIS PENINSULAR MANZANITA PDERI04151	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2T2 S2?	**List:** **Code:**	2 311
ARCTOSTAPHYLOS PILOSULA SANTA MARGARITA MANZANITA PDERI04160	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
ARCTOSTAPHYLOS PUMILA SANDMAT MANZANITA PDERI04180	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
ARCTOSTAPHYLOS PURISSIMA LA PURISIMA MANZANITA PDERI041A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2? S2?	**List:** **Code:**	1B 233

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ARCTOSTAPHYLOS RAINBOWENSIS RAINBOW MANZANITA PDERI042T0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 333
ARCTOSTAPHYLOS REFUGIOENSIS REFUGIO MANZANITA PDERI041B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2?	**List:** **Code:**	1B 223
ARCTOSTAPHYLOS REGISMONTANA KINGS MOUNTAIN MANZANITA PDERI041C0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3?	**List:** **Code:**	4 113
ARCTOSTAPHYLOS RUDIS SAND MESA MANZANITA PDERI041E0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ARCTOSTAPHYLOS SILVICOLA BONNY DOON MANZANITA PDERI041F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ARCTOSTAPHYLOS STANFORDIANA SSP DECUMBENS RINÇON MANZANITA PDERI041G4	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3T1 S1.1	**List:** **Code:**	1B 333
ARCTOSTAPHYLOS STANFORDIANA SSP RAICHEI RAICHE'S MANZANITA PDERI041G2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2? S2?	**List:** **Code:**	1B 233
ARCTOSTAPHYLOS TOMENTOSA SSP DACITICOLA DACITE MANZANITA PDERI041HD	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 333
ARCTOSTAPHYLOS TOMENTOSA SSP EASTWOODIANA EASTWOOD'S MANZANITA PDERI041H4	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2? S2?	**List:** **Code:**	1B 233
ARCTOSTAPHYLOS TOMENTOSA SSP INSULICOLA ISLAND MANZANITA PDERI041H5	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	4 123
ARCTOSTAPHYLOS TOMENTOSA SSP SUBCORDATA SANTA CRUZ ISLAND MANZANITA PDERI041H7	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	4 123
ARCTOSTAPHYLOS VIRGATA MARIN MANZANITA PDERI041K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ARCTOSTAPHYLOS VIRIDISSIMA WHITE-HAIRED MANZANITA PDERI041L0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2?	**List:** **Code:**	4 123
ARCTOSTAPHYLOS WELLSII WELLS'S MANZANITA PDERI042B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.1?	**List:** **Code:**	1B 233
ARENARIA MACRADENIA VAR KUSCHEI FOREST CAMP SANDWORT PDCAR040K4	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T2? S2?	**List:** **Code:**	3 ??3

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ARENARIA PALUDICOLA MARSH SANDWORT PDCAR040L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 332
ARENARIA URSINA BIG BEAR VALLEY SANDWORT PDCAR040R0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ARGYROCHOSMA LIMITANEA VAR LIMITANEA CLOAK FERN PPADI0N051	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G?T3T4 S2.3	**List:** **Code:**	2 311
ARISTOCAPSA INSIGNIS INDIAN VALLEY SPINEFLOWER PDPGN0U010	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2?	**List:** **Code:**	4 123
ARNICA CERNUA SERPENTINE ARNICA PDAST0Q040	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 112
ARNICA FULGENS HILLSIDE ARNICA PDAST0Q090	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S2.2	**List:** **Code:**	2 311
ARNICA SORORIA TWIN ARNICA PDAST0Q0L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4G5 S2.3	**List:** **Code:**	2 211
ARNICA SPATHULATA KLAMATH ARNICA PDAST0Q0M0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3? S3.3	**List:** **Code:**	4 112
ARNICA VENOSA SHASTA COUNTY ARNICA PDAST0Q0Q0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
ARNICA VISCOSA MT. SHASTA ARNICA PDAST0Q0R0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** **Code:**	4 112
ARTEMISIA PALMERI SAN DIEGO SAGEWORT PDAST0S160	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2? S2.1	**List:** **Code:**	2 221
ASARUM MARMORATUM MARBLED WILD-GINGER PDARI02070	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3G4 S1.3	**List:** **Code:**	2 311
ASCLEPIAS SOLANOANA SERPENTINE MILKWEED PDASC021R0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
ASPIDOTIS CARLOTTA-HALLIAE CARLOTTA HALL'S LACE FERN PPADI07020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
ASPLENIUM SEPTENTRIONALE NORTHERN SPLEENWORT PPASP021F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3G4 S2.3	**List:** **Code:**	2 311

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ASPLENIUM TRICHOMANES SSP TRICHOMANES MAIDENHAIR SPLEENWORT PPASP021K2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T5 S2.3	**List:** **Code:**	2 311
ASPLENIUM TRICHOMANES-RAMOSUM GREEN SPLEENWORT PPASP02250	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S1.3	**List:** **Code:**	2 311
ASTER GREATAE GREATA'S ASTER PDAST0T1F0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
ASTER LENTUS SUISUN MARSH ASTER PDAST0T540	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ASTRAGALUS AGNICIDUS HUMBOLDT MILK-VETCH PDFAB0F080	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
ASTRAGALUS ALBENS CUSHENBURY MILK-VETCH PDFAB0F0A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
ASTRAGALUS ALLOCHROUS VAR PLAYANUS PLAYA MILK-VETCH PDFAB0F0C1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3?Q S1.2	**List:** **Code:**	2 221
ASTRAGALUS ANXIUS TROUBLED MILK-VETCH PDFAB0FBD0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 313
ASTRAGALUS ARGOPHYLLUS VAR ARGOPHYLLUS SILVER-LEAVED MILK-VETCH PDFAB0F0S1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4 S1.2	**List:** **Code:**	2 321
ASTRAGALUS ATRATUS VAR MENSANUS DARWIN MESA MILK-VETCH PDFAB0F0Z3	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T1 S1.3	**List:** **Code:**	1B 313
ASTRAGALUS BICRISTATUS CRESTED MILK-VETCH PDFAB0F1A0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
ASTRAGALUS BRAUNTONII BRAUNTON'S MILK-VETCH PDFAB0F1G0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
ASTRAGALUS BREWERI BREWER'S MILK-VETCH PDFAB0F1J0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
ASTRAGALUS CIMAE VAR CIMAE CIMA MILK-VETCH PDFAB0F231	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2T2 S2.2	**List:** **Code:**	1B 322
ASTRAGALUS CLARIANUS CLARA HUNT'S MILK-VETCH PDFAB0F240	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Threatened	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ASTRAGALUS CLEVELANDII CLEVELAND'S MILK-VETCH PDFAB0F250	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3?	**List:** **Code:**	4 113
ASTRAGALUS CROTALARIAE SALTON MILK-VETCH PDFAB0F2K0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4G5 S3.3	**List:** **Code:**	4 112
ASTRAGALUS DEANEI DEAN'S MILK-VETCH PDFAB0F2R0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 333
ASTRAGALUS DOUGLASII VAR PERSTRICTUS JACUMBA MILK-VETCH PDFAB0F303	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 222
ASTRAGALUS ERTTERAE WALKER PASS MILK-VETCH PDFAB0FB30	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
ASTRAGALUS FUNEREUS BLACK MILK-VETCH PDFAB0F3K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 322
ASTRAGALUS GEYERI VAR GEYERI GEYER'S MILK-VETCH PDFAB0F3M1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T5 S2.2	**List:** **Code:**	2 321
ASTRAGALUS GILMANII GILMAN'S MILK-VETCH PDFAB0F3R0	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3? S3.2	**List:** **Code:**	4 122
ASTRAGALUS INSULARIS VAR HARWOODII HARWOOD'S MILK-VETCH PDFAB0F491	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S2.2?	**List:** **Code:**	2 221
ASTRAGALUS INVERSUS SUSANVILLE MILK-VETCH PDFAB0F4A0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
ASTRAGALUS JAEGERIANUS LANE MOUNTAIN MILK-VETCH PDFAB0F4F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
ASTRAGALUS JOHANNIS-HOWELLII LONG VALLEY MILK-VETCH PDFAB0F4H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None Rare	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 222
ASTRAGALUS KENTROPHYTA VAR DANAUS SWEETWATER MOUNTAINS MILK-VETCH PDFAB0F4J2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2T3 S?	**List:** **Code:**	4 113
ASTRAGALUS KENTROPHYTA VAR ELATUS SPINY-LEAVED MILK-VETCH PDFAB0F4J4	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4 S1.2	**List:** **Code:**	2 221
ASTRAGALUS LENTIFORMIS LENS-POD MILK-VETCH PDFAB0F4P0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ASTRAGALUS LENTIGINOSUS VAR ANTONIUS SAN ANTONIO MILK-VETCH PDFAB0FB92	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1?	**List:** **Code:**	1B 313
ASTRAGALUS LENTIGINOSUS VAR BORREGANUS BORREGO MILK-VETCH PDFAB0FB95	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4T5 S3.3	**List:** **Code:**	4 111
ASTRAGALUS LENTIGINOSUS VAR COACHELLAE COACHELLA VALLEY MILK-VETCH PDFAB0FB97	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 223
ASTRAGALUS LENTIGINOSUS VAR KERNENSIS KERN PLATEAU MILK-VETCH PDFAB0FB98	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3? S2.2?	**List:** **Code:**	2 221
ASTRAGALUS LENTIGINOSUS VAR MICANS SHINING MILK-VETCH PDFAB0FB9C	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1Q S1.2	**List:** **Code:**	1B 323
ASTRAGALUS LENTIGINOSUS VAR PISCINENSIS FISH SLOUGH MILK-VETCH PDFAB0FB9E	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333
ASTRAGALUS LENTIGINOSUS VAR SESQUIMETRALIS SODAVILLE MILK-VETCH PDFAB0FB9K	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 332
ASTRAGALUS LENTIGINOSUS VAR SIERRAE BIG BEAR VALLEY MILK-VETCH PDFAB0FB9L	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1?	**List:** **Code:**	1B 223
ASTRAGALUS LEUCOLOBUS BIG BEAR VALLEY WOOLLYPOD PDFAB0F4T0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ASTRAGALUS MACRODON SALINAS MILK-VETCH PDFAB0F520	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
ASTRAGALUS MAGDALENAE VAR PEIRSONII PEIRSON'S MILK-VETCH PDFAB0F532	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Endangered	**Global:** **State:**	G3G4T2 S2.2	**List:** **Code:**	1B 222
ASTRAGALUS MIGUELENSIS SAN MIGUEL ISLAND MILK-VETCH PDFAB0F5C0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3?	**List:** **Code:**	4 113
ASTRAGALUS MOJAVENSIS VAR HEMIGYRUS CURVED-POD MILK-VETCH PDFAB0F5J1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2 SH	**List:** **Code:**	1A *
ASTRAGALUS MONOENSIS VAR MONOENSIS MONO MILK-VETCH PDFAB0F5N1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G2T2 S2.2	**List:** **Code:**	1B 223
ASTRAGALUS MONOENSIS VAR RAVENII RAVEN'S MILK-VETCH PDFAB0F5N2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1Q S1.3	**List:** **Code:**	1B 313

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ASTRAGALUS NEVINII SAN CLEMENTE ISLAND MILK-VETCH PDFAB0F5X0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
ASTRAGALUS NUTANS PROVIDENCE MOUNTAINS MILK-VETCH PDFAB0F620	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
ASTRAGALUS OOCARPUS SAN DIEGO MILK-VETCH PDFAB0F6B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
ASTRAGALUS OOPHORUS VAR LAVINII LAVIN'S MILK-VETCH PDFAB0F6C4	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1	**List:** **Code:**	1B 322
ASTRAGALUS PACHYPUS VAR JAEGERI JAEGER'S MILK-VETCH PDFAB0F6G1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G?T1 S1.1	**List:** **Code:**	1B 333
ASTRAGALUS PAUPERCULUS DEPAUPERATE MILK-VETCH PDFAB0F6N0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
ASTRAGALUS PLATYTROPIS BROAD-KEELED MILK-VETCH PDFAB0F6X0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S1.2	**List:** **Code:**	2 221
ASTRAGALUS PREUSSII VAR LAXIFLORUS LANCASTER MILK-VETCH PDFAB0F721	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2T3 S1.1	**List:** **Code:**	1B 332
ASTRAGALUS PREUSSII VAR PREUSSII PREUSS'S MILK-VETCH PDFAB0F722	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T4 S1.2	**List:** **Code:**	2 311
ASTRAGALUS PSEUDIODANTHUS TONOPAH MILK-VETCH PDFAB0F750	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 322
ASTRAGALUS PULSIFERAE VAR PULSIFERAE PULSIFER'S MILK-VETCH PDFAB0F783	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2 S2.2	**List:** **Code:**	1B 212
ASTRAGALUS PULSIFERAE VAR SUKSDORFII SUKSDORF'S MILK-VETCH PDFAB0F782	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T3 S3?	**List:** **Code:**	1B 312
ASTRAGALUS PYCNOSTACHYUS VAR LANOSISSIMUS VENTURA MARSH MILK-VETCH PDFAB0F7B1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Proposed Endangered Candidate	**Global:** **State:**	G3?T1 S1.1	**List:** **Code:**	1A *
ASTRAGALUS RATTANII VAR JEPSONIANUS JEPSON'S MILK-VETCH PDFAB0F7E1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2 S2.2	**List:** **Code:**	1B 223
ASTRAGALUS RATTANII VAR RATTANII RATTAN'S MILK-VETCH PDFAB0F7E2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 113

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ASTRAGALUS SERENOI VAR SHOCKLEYI		Federal:	None	Global:	G4T3	List:	2
NAKED MILK-VETCH		State:	None	State:	S2?	Code:	221
PDFAB0F802	Records in NDDB: *Yes*						
ASTRAGALUS SHEVOCKII		Federal:	None	Global:	G2	List:	1B
SHEVOCK'S MILK-VETCH		State:	None	State:	S2.3	Code:	313
PDFAB0F850	Records in NDDB: *Yes*						
ASTRAGALUS SUBVESTITUS		Federal:	None	Global:	G3	List:	4
KERN COUNTY MILK-VETCH		State:	None	State:	S3.3	Code:	113
PDFAB0F8M0	Records in NDDB: *No*						
ASTRAGALUS TENER VAR FERRISIAE		Federal:	Species of concern	Global:	G2T1	List:	1B
FERRIS'S MILK-VETCH		State:	None	State:	S1.1	Code:	333
PDFAB0F8R3	Records in NDDB: *Yes*						
ASTRAGALUS TENER VAR TENER		Federal:	None	Global:	G2T1	List:	1B
ALKALI MILK-VETCH		State:	None	State:	S1.2	Code:	323
PDFAB0F8R1	Records in NDDB: *Yes*						
ASTRAGALUS TENER VAR TITI		Federal:	Endangered	Global:	G2T1	List:	1B
COASTAL DUNES MILK-VETCH		State:	Endangered	State:	S1.1	Code:	333
PDFAB0F8R2	Records in NDDB: *Yes*						
ASTRAGALUS TRASKIAE		Federal:	Species of concern	Global:	G2	List:	1B
TRASK'S MILK-VETCH		State:	Rare	State:	S2.2	Code:	323
PDFAB0F910	Records in NDDB: *Yes*						
ASTRAGALUS TRICARINATUS		Federal:	Endangered	Global:	G1	List:	1B
TRIPLE-RIBBED MILK-VETCH		State:	None	State:	S1.2	Code:	313
PDFAB0F920	Records in NDDB: *Yes*						
ASTRAGALUS UMBRATICUS		Federal:	None	Global:	G4	List:	4
BALD MOUNTAIN MILK-VETCH		State:	None	State:	S3.3	Code:	112
PDFAB0F990	Records in NDDB: *No*						
ASTRAGALUS WEBBERI		Federal:	Species of concern	Global:	G1	List:	1B
WEBBER'S MILK-VETCH		State:	None	State:	S1.2	Code:	323
PDFAB0F9J0	Records in NDDB: *Yes*						
ASTROLEPIS COCHISENSIS		Federal:	None	Global:	G5?	List:	2
SCALY CLOAK FERN		State:	None	State:	S1S2	Code:	211
PPADI0P010	Records in NDDB: *Yes*						
ATRIPLEX CORDULATA		Federal:	Species of concern	Global:	G2?	List:	1B
HEARTSCALE		State:	None	State:	S2.2?	Code:	223
PDCHE040B0	Records in NDDB: *Yes*						
ATRIPLEX CORONATA VAR CORONATA		Federal:	None	Global:	G4T3	List:	4
CROWNSCALE		State:	None	State:	S3.2	Code:	123
PDCHE040C3	Records in NDDB: *No*						
ATRIPLEX CORONATA VAR NOTATIOR		Federal:	Endangered	Global:	G4T1	List:	1B
SAN JACINTO VALLEY CROWNSCALE		State:	None	State:	S1.1	Code:	333
PDCHE040C2	Records in NDDB: *Yes*						
ATRIPLEX COULTERI		Federal:	None	Global:	G2	List:	1B
COULTER'S SALTBUSH		State:	None	State:	S2.2	Code:	222
PDCHE040E0	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ATRIPLEX DEPRESSA		Federal:	None	Global:	G2Q	List:	1B
BRITTLESCALE		State:	None	State:	S2.2	Code:	223
PDCHE042L0	Records in NDDB: *Yes*						
ATRIPLEX GARDNERI VAR FALCATA		Federal:	None	Global:	G4Q	List:	
FALCATE SALTBUSH		State:	None	State:	S1.2	Code:	
PDCHE040J0	Records in NDDB: *Yes*						
ATRIPLEX JOAQUINIANA		Federal:	Species of concern	Global:	G2	List:	1B
SAN JOAQUIN SALTBUSH		State:	None	State:	S2.2	Code:	223
PDCHE041F3	Records in NDDB: *Yes*						
ATRIPLEX MINUSCULA		Federal:	None	Global:	G1Q	List:	1B
LESSER SALTSCALE		State:	None	State:	S1.1	Code:	333
PDCHE042M0	Records in NDDB: *Yes*						
ATRIPLEX PACIFICA		Federal:	Species of concern	Global:	G3G4	List:	1B
SOUTH COAST SALTSCALE		State:	None	State:	S2.2	Code:	322
PDCHE041C0	Records in NDDB: *Yes*						
ATRIPLEX PARISHII		Federal:	Species of concern	Global:	G2?	List:	1B
PARISH'S BRITTLESCALE		State:	None	State:	S1.1	Code:	332
PDCHE041D0	Records in NDDB: *Yes*						
ATRIPLEX PERSISTENS		Federal:	None	Global:	G1	List:	
PERSISTENT-FRUITED SALTSCALE		State:	None	State:	S?	Code:	
PDCHE042P0	Records in NDDB: *Yes*						
ATRIPLEX SERENANA VAR DAVIDSONII		Federal:	None	Global:	G5T2?	List:	1B
DAVIDSON'S SALTSCALE		State:	None	State:	S2?	Code:	322
PDCHE041T1	Records in NDDB: *Yes*						
ATRIPLEX SUBTILIS		Federal:	None	Global:	G1G2	List:	
		State:	None	State:	S1S2	Code:	
PDCHE042T0	Records in NDDB: *Yes*						
ATRIPLEX TULARENSIS		Federal:	Species of concern	Global:	G1Q	List:	1B
BAKERSFIELD SMALLSCALE		State:	Endangered	State:	S1.1	Code:	333
PDCHE04240	Records in NDDB: *Yes*						
ATRIPLEX VALLICOLA		Federal:	Species of concern	Global:	G1	List:	1B
LOST HILLS CROWNSCALE		State:	None	State:	S1.2	Code:	223
PDCHE04250	Records in NDDB: *Yes*						
AYENIA COMPACTA		Federal:	None	Global:	G4	List:	2
AYENIA		State:	None	State:	S3.3	Code:	211
PDSTE01020	Records in NDDB: *Yes*						
AZOLLA MEXICANA		Federal:	None	Global:	G5	List:	4
MEXICAN MOSQUITO FERN		State:	None	State:	S3.2?	Code:	121
PPAZO01030	Records in NDDB: *No*						
BACCHARIS MALIBUENSIS		Federal:	None	Global:	G1	List:	
MALIBU BACCHARIS		State:	None	State:	S1.1	Code:	
PDAST0W0W0	Records in NDDB: *Yes*						
BACCHARIS PLUMMERAE SSP GLABRATA		Federal:	None	Global:	G3G4T1	List:	1B
SAN SIMEON BACCHARIS		State:	None	State:	S1.2	Code:	223
PDAST0W0D1	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
BACCHARIS PLUMMERAE SSP PLUMMERAE PLUMMER'S BACCHARIS PDAST0W0D2	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3G4T3 S3.2	List: Code:	4 113
BACCHARIS VANESSAE ENCINITAS BACCHARIS PDAST0W0P0	Records in NDDB: *Yes*	Federal: State:	Threatened Endangered	Global: State:	G1 S1.1	List: Code:	1B 233
BALSAMORHIZA HOOKERI VAR LANATA WOOLLY BALSAMROOT PDAST11047	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T1 S1.2	List: Code:	1B 333
BALSAMORHIZA MACROLEPIS VAR MACROLEPIS BIG-SCALE BALSAMROOT PDAST11061	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3T2 S2.2	List: Code:	1B 223
BALSAMORHIZA SERICEA SILKY BALSAMROOT PDAST110C0	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G4Q S2.3?	List: Code:	4 212
BENSONIELLA OREGONA BENSONIELLA PDSAX02010	Records in NDDB: *Yes*	Federal: State:	Species of concern Rare	Global: State:	G2 S2.2	List: Code:	1B 332
BERBERIS FREMONTII FREMONT BARBERRY PDBER06060	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S2?	List: Code:	3 ??1
BERBERIS NEVINII NEVIN'S BARBERRY PDBER060A0	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G2 S2.1	List: Code:	1B 333
BERBERIS PINNATA SSP INSULARIS ISLAND BARBERRY PDBER060B2	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G5T1 S1.2	List: Code:	1B 323
BERGEROCACTUS EMORYI GOLDEN-SPINED CEREUS PDCAC11010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3 S2.1	List: Code:	2 221
BLENNOSPERMA BAKERI SONOMA SUNSHINE PDAST1A010	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G1 S1.1	List: Code:	1B 233
BLENNOSPERMA NANUM VAR ROBUSTUM POINT REYES BLENNOSPERMA PDAST1A022	Records in NDDB: *Yes*	Federal: State:	Species of concern Rare	Global: State:	G4T1 S1.2	List: Code:	1B 323
BLEPHARIDACHNE KINGII KING'S EYELASH GRASS PMPOA0X020	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S1.3	List: Code:	2 211
BLEPHARIZONIA PLUMOSA SSP PLUMOSA BIG TARPLANT PDAST1C011	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4T1 S1.1	List: Code:	1B 333
BLOOMERIA HUMILIS DWARF GOLDENSTAR PMLIL0B020	Records in NDDB: *Yes*	Federal: State:	Species of concern Rare	Global: State:	G1 S1.1	List: Code:	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
BOLANDRA CALIFORNICA SIERRA BOLANDRA PDSAX03010	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
BOSCHNIAKIA HOOKERI SMALL GROUNDCONE PDORO01010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1S2	List: Code:	2 311
BOTRYCHIUM ASCENDENS UPSWEPT MOONWORT PPOPH010S0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3? S1.3?	List: Code:	2 311
BOTRYCHIUM CRENULATUM SCALLOPED MOONWORT PPOPH010L0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3 S1.2	List: Code:	1B 212
BOTRYCHIUM LUNARIA COMMON MOONWORT PPOPH01080	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S2?	List: Code:	2 311
BOTRYCHIUM MINGANENSE MINGAN MOONWORT PPOPH010R0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S1.3	List: Code:	2 311
BOTRYCHIUM MONTANUM WESTERN GOBLIN PPOPH010K0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3? S1.3?	List: Code:	2 311
BOTRYCHIUM PINNATUM NORTHWESTERN MOONWORT PPOPH010V0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5? S1.3?	List: Code:	2 311
BOUTELOUA TRIFIDA RED GRAMA PMPOA100L0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4G5 S2?	List: Code:	2 311
BOYKINIA ROTUNDIFOLIA ROUND-LEAVED BOYKINIA PDSAX04050	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
BRODIAEA CORONARIA SSP ROSEA INDIAN VALLEY BRODIAEA PMLIL0C032	Records in NDDB: *Yes*	Federal: State:	Species of concern Endangered	Global: State:	G4T1 S1.1	List: Code:	1B 333
BRODIAEA FILIFOLIA THREAD-LEAVED BRODIAEA PMLIL0C050	Records in NDDB: *Yes*	Federal: State:	Threatened Endangered	Global: State:	G2 S2.1	List: Code:	1B 333
BRODIAEA INSIGNIS KAWEAH BRODIAEA PMLIL0C060	Records in NDDB: *Yes*	Federal: State:	Species of concern Endangered	Global: State:	G2 S2.2	List: Code:	1B 223
BRODIAEA KINKIENSIS SAN CLEMENTE ISLAND BRODIAEA PMLIL0C080	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 323
BRODIAEA ORCUTTII ORCUTT'S BRODIAEA PMLIL0C0B0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3 S3.1	List: Code:	1B 132

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
BRODIAEA PALLIDA CHINESE CAMP BRODIAEA PMLIL0C0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
BURSERA MICROPHYLLA ELEPHANT TREE PDBUR01020	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S2.3	**List:** **Code:**	2 321
CALAMAGROSTIS BOLANDERI BOLANDER'S REED GRASS PMPOA17010	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CALAMAGROSTIS CRASSIGLUMIS THURBER'S REED GRASS PMPOA17070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S1.1	**List:** **Code:**	2 331
CALAMAGROSTIS FOLIOSA LEAFY REED GRASS PMPOA170C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None Rare	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
CALAMAGROSTIS OPHITIDIS SERPENTINE REED GRASS PMPOA170V0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CALANDRINIA BREWERI BREWER'S CALANDRINIA PDPOR01020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.2?	**List:** **Code:**	4 122
CALANDRINIA MARITIMA SEASIDE CALANDRINIA PDPOR09020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3G4 S3.2	**List:** **Code:**	4 121
CALLIANDRA ERIOPHYLLA FAIRYDUSTER PDFAB0N040	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S2.3?	**List:** **Code:**	2 311
CALOCHORTUS CATALINAE CATALINA MARIPOSA LILY PMLIL0D080	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
CALOCHORTUS CLAVATUS VAR AVIUS PLEASANT VALLEY MARIPOSA LILY PMLIL0D095	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	1B 223
CALOCHORTUS CLAVATUS VAR CLAVATUS CLUB-HAIRED MARIPOSA LILY PMLIL0D091	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 113
CALOCHORTUS CLAVATUS VAR GRACILIS SLENDER MARIPOSA LILY PMLIL0D096	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1.1?	**List:** **Code:**	1B 323
CALOCHORTUS CLAVATUS VAR RECURVIFOLIUS ARROYO DE LA CRUZ MARIPOSA LILY PMLIL0D098	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1.2	**List:** **Code:**	1B 323
CALOCHORTUS DUNNII DUNN'S MARIPOSA LILY PMLIL0D0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 222

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CALOCHORTUS EXCAVATUS INYO COUNTY STAR-TULIP PMLIL0D0F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S3.1	**List:** **Code:**	1B 233
CALOCHORTUS GREENEI GREENE'S MARIPOSA LILY PMLIL0D0H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 322
CALOCHORTUS LONGEBARBATUS VAR LONGEBARBATUS LONG-HAIRED STAR-TULIP PMLIL0D0R1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T3 S3.2	**List:** **Code:**	1B 122
CALOCHORTUS MONANTHUS SINGLE-FLOWERED MARIPOSA LILY PMLIL0D0W0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GH SH	**List:** **Code:**	1A *
CALOCHORTUS OBISPOENSIS SAN LUIS MARIPOSA LILY PMLIL0D110	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
CALOCHORTUS PALMERI VAR MUNZII MUNZ'S MARIPOSA LILY PMLIL0D121	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323
CALOCHORTUS PALMERI VAR PALMERI PALMER'S MARIPOSA LILY PMLIL0D122	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T2 S2.2	**List:** **Code:**	1B 223
CALOCHORTUS PANAMINTENSIS PANAMINT MARIPOSA LILY PMLIL0D130	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CALOCHORTUS PERSISTENS SISKIYOU MARIPOSA LILY PMLIL0D140	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CALOCHORTUS PLUMMERAE PLUMMER'S MARIPOSA LILY PMLIL0D150	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	1B 223
CALOCHORTUS PULCHELLUS MT. DIABLO FAIRY-LANTERN PMLIL0D160	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
CALOCHORTUS RAICHEI THE CEDARS FAIRY-LANTERN PMLIL0D1L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
CALOCHORTUS SIMULANS SAN LUIS OBISPO MARIPOSA LILY PMLIL0D170	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CALOCHORTUS STRIATUS ALKALI MARIPOSA LILY PMLIL0D190	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 222
CALOCHORTUS TIBURONENSIS TIBURON MARIPOSA LILY PMLIL0D1C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Threatened	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CALOCHORTUS UMBELLATUS OAKLAND STAR-TULIP PMLIL0D1E0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
CALOCHORTUS WEEDII VAR INTERMEDIUS INTERMEDIATE MARIPOSA LILY PMLIL0D1J1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2 S2.2	**List:** **Code:**	1B 223
CALOCHORTUS WEEDII VAR VESTUS LATE-FLOWERED MARIPOSA LILY PMLIL0D1J2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2 S2.2	**List:** **Code:**	1B 223
CALOCHORTUS WESTONII SHIRLEY MEADOWS STAR-TULIP PMLIL0D1M0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
CALYCADENIA HOOVERI HOOVER'S CALYCADENIA PDAST1P040	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 213
CALYCADENIA OPPOSITIFOLIA BUTTE COUNTY CALYCADENIA PDAST1P070	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CALYCADENIA TRUNCATA SSP MICROCEPHALA SNOW MOUNTAIN CALYCADENIA PDAST1P0A1	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T1 S1.2?	**List:** **Code:**	
CALYCADENIA VILLOSA DWARF CALYCADENIA PDAST1P0B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CALYPTRIDIUM PARRYI VAR HESSEAE SANTA CRUZ MOUNTAINS PUSSYPAWS PDPOR09052	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G2?T? S?	**List:** **Code:**	3 ??3
CALYPTRIDIUM PULCHELLUM MARIPOSA PUSSYPAWS PDPOR09060	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CALYPTRIDIUM QUADRIPETALUM FOUR-PETALED PUSSYPAWS PDPOR09080	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CALYSTEGIA ATRIPLICIFOLIA SSP BUTTENSIS BUTTE COUNTY MORNING-GLORY PDCON04012	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G?T? S?	**List:** **Code:**	3 ??3
CALYSTEGIA COLLINA SSP OXYPHYLLA MT. SAINT HELENA MORNING-GLORY PDCON04032	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T3 S3.2	**List:** **Code:**	4 123
CALYSTEGIA COLLINA SSP VENUSTA SOUTH COAST RANGE MORNING-GLORY PDCON04034	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T3 S3.2	**List:** **Code:**	4 113
CALYSTEGIA MACROSTEGIA SSP AMPLISSIMA ISLAND MORNING-GLORY PDCON04081	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4G5T3 S3.3	**List:** **Code:**	4 113

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
CALYSTEGIA MALACOPHYLLA VAR BERRYI BERRY'S MORNING-GLORY PDCON040K2 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.3	**List:** 4 **Code:** 113
CALYSTEGIA PEIRSONII PEIRSON'S MORNING-GLORY PDCON040A0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 123
CALYSTEGIA SEPIUM SSP BINGHAMIAE SANTA BARBARA MORNING-GLORY PDCON040E6 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4G5T **State:** SH	**List:** 1B **Code:** 333
CALYSTEGIA STEBBINSII STEBBINS'S MORNING-GLORY PDCON040H0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
CALYSTEGIA SUBACAULIS SSP EPISCOPALIS CAMBRIA MORNING-GLORY PDCON040J1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G?T1 **State:** S1?	**List:** 1B **Code:** 323
CAMISSONIA BENITENSIS SAN BENITO EVENING-PRIMROSE PDONA03030 **Records in NDDB:** *Yes*	**Federal:** Threatened **State:** None	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
CAMISSONIA BOOTHII SSP ALYSSOIDES PINE CREEK EVENING-PRIMROSE PDONA03051 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.3	**List:** 4 **Code:** 111
CAMISSONIA BOOTHII SSP BOOTHII BOOTH'S EVENING-PRIMROSE PDONA03052 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T4 **State:** S3.3	**List:** 4 **Code:** 111
CAMISSONIA GUADALUPENSIS SSP CLEMENTINA SAN CLEMENTE ISLAND EVENING-PRIMROSE PDONA030M1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2T1 **State:** S1.2	**List:** 1B **Code:** 323
CAMISSONIA HARDHAMIAE HARDHAM'S EVENING-PRIMROSE PDONA030N0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1Q **State:** S1.2	**List:** 1B **Code:** 323
CAMISSONIA INTEGRIFOLIA KERN RIVER EVENING-PRIMROSE PDONA030T0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
CAMISSONIA KERNENSIS SSP KERNENSIS KERN COUNTY EVENING-PRIMROSE PDONA030V2 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.3	**List:** 4 **Code:** 113
CAMISSONIA LEWISII LEWIS'S EVENING-PRIMROSE PDONA030X0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G? **State:** S?	**List:** 3 **Code:** ??2
CAMISSONIA MINOR NELSON'S EVENING-PRIMROSE PDONA03110 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.3	**List:** 4 **Code:** 111
CAMISSONIA SIERRAE SSP ALTICOLA MONO HOT SPRINGS EVENING-PRIMROSE PDONA031H1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2G3T1 **State:** S1.2	**List:** 1B **Code:** 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CAMISSONIA TANACETIFOLIA SSP QUADRIPERFORATA SIERRA VALLEY EVENING-PRIMROSE PDONA031M1	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T3 S3.2	List: Code:	4 113
CAMPANULA CALIFORNICA SWAMP HAREBELL PDCAM02060	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 123
CAMPANULA EXIGUA CHAPARRAL HAREBELL PDCAM020A0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
CAMPANULA SCABRELLA ROUGH HAREBELL PDCAM020U0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S3.3	List: Code:	4 112
CAMPANULA SHARSMITHIAE SHARSMITH'S HAREBELL PDCAM02100	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.2	List: Code:	1B 333
CAMPANULA SHETLERI CASTLE CRAGS HAREBELL PDCAM020W0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2 S2.3	List: Code:	1B 313
CAMPANULA WILKINSIANA WILKIN'S HAREBELL PDCAM020Z0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 223
CANBYA CANDIDA PYGMY POPPY PDPAP05020	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2 S2.2	List: Code:	1B 223
CARDAMINE NUTTALLII VAR GEMMATA YELLOW-TUBERED TOOTHWORT PDBRA0K180	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G5T2? S2.2	List: Code:	1B 312
CARDAMINE PACHYSTIGMA VAR DISSECTIFOLIA DISSECTED-LEAVED TOOTHWORT PDBRA0K1B1	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G?T3? S2S3	List: Code:	3 ??3
CAREX ALBIDA WHITE SEDGE PMCYP030D0	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G1 S1.1	List: Code:	1B 333
CAREX CALIFORNICA CALIFORNIA SEDGE PMCYP032D0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S2?	List: Code:	2 311
CAREX COMOSA BRISTLY SEDGE PMCYP032Y0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.1	List: Code:	2 331
CAREX CONGDONII CONGDON'S SEDGE PMCYP03320	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
CAREX DAVYI DAVY'S SEDGE PMCYP033H0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CAREX ELEOCHARIS SPIKERUSH SEDGE PMCYP03450	Records in NDDB: *Yes*	Federal:	None	Global:	G4G5	List:	2
		State:	None	State:	S2?	Code:	211
CAREX GEYERI GEYER'S SEDGE PMCYP03540	Records in NDDB: *No*	Federal:	None	Global:	G4	List:	4
		State:	None	State:	S3.2	Code:	121
CAREX GIGAS SISKIYOU SEDGE PMCYP03560	Records in NDDB: *No*	Federal:	None	Global:	G3?	List:	4
		State:	None	State:	S3.3	Code:	112
CAREX HALLIANA HALL'S SEDGE PMCYP035M0	Records in NDDB: *Yes*	Federal:	None	Global:	G4G5	List:	2
		State:	None	State:	S1.3?	Code:	311
CAREX HYSTRICINA BOTTLEBRUSH SEDGE PMCYP036D0	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	2
		State:	None	State:	S1?	Code:	331
CAREX INCURVIFORMIS VAR DANAENSIS DANA'S SEDGE PMCYP036G1	Records in NDDB: *No*	Federal:	None	Global:	G5?T4	List:	4
		State:	None	State:	S3.3	Code:	111
CAREX LASIOCARPA SLENDER SEDGE PMCYP03720	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	2
		State:	None	State:	S1.3?	Code:	311
CAREX LEPTALEA FLACCID SEDGE PMCYP037E0	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	2
		State:	None	State:	S2?	Code:	321
CAREX LIMOSA SHORE SEDGE PMCYP037K0	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	2
		State:	None	State:	S3?	Code:	221
CAREX LIVIDA LIVID SEDGE PMCYP037L0	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	1A
		State:	None	State:	SH	Code:	*
CAREX NORVEGICA SCANDINAVIAN SEDGE PMCYP039D0	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	2
		State:	None	State:	S1.3?	Code:	311
CAREX OBISPOENSIS SAN LUIS OBISPO SEDGE PMCYP039J0	Records in NDDB: *Yes*	Federal:	None	Global:	G2	List:	1B
		State:	None	State:	S2.2	Code:	223
CAREX PARRYANA VAR HALLII HALL'S SEDGE PMCYP035N0	Records in NDDB: *Yes*	Federal:	None	Global:	G4?T4?	List:	2
		State:	None	State:	S1.3	Code:	211
CAREX PETASATA LIDDON'S SEDGE PMCYP03AE0	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	2
		State:	None	State:	S1S2	Code:	211
CAREX PRATICOLA MEADOW SEDGE PMCYP03B20	Records in NDDB: *Yes*	Federal:	None	Global:	G5	List:	2
		State:	None	State:	S2S3	Code:	221

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CAREX SCOPARIA POINTED BROOM SEDGE PMCYP03C90	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S2S3	List: Code:	2 321
CAREX SHELDONII SHELDON'S SEDGE PMCYP03CE0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S2.2	List: Code:	2 211
CAREX TIOGANA TIOGA PASS SEDGE PMCYP03GP0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G1 S1.3	List: Code:	1B 313
CAREX TOMPKINSII TOMPKINS'S SEDGE PMCYP03DR0	Records in NDDB: *Yes*	Federal: State:	None Rare	Global: State:	G2 S2.2	List: Code:	1B 223
CAREX VULPINOIDEA FOX SEDGE PMCYP03EN0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S3?	List: Code:	2 221
CARLOWRIGHTIA ARIZONICA ARIZONA CARLOWRIGHTIA PDACA07010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S1.3	List: Code:	2 321
CARNEGIEA GIGANTEA SAGUARO PDCAC12010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.2	List: Code:	2 321
CARPENTERIA CALIFORNICA TREE-ANEMONE PDHDR04010	Records in NDDB: *Yes*	Federal: State:	Species of concern Threatened	Global: State:	G2 S2.2	List: Code:	1B 323
CASTELA EMORYI CRUCIFIXION THORN PDSIM03030	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S2.2	List: Code:	2 211
CASTILLEJA AFFINIS SSP NEGLECTA TIBURON INDIAN PAINTBRUSH PDSCR0D260	Records in NDDB: *Yes*	Federal: State:	Endangered Threatened	Global: State:	G5T1 S1.2	List: Code:	1B 323
CASTILLEJA AMBIGUA SSP HUMBOLDTIENSIS HUMBOLDT BAY OWL'S-CLOVER PDSCR0D402	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G4T2 S2.2	List: Code:	1B 223
CASTILLEJA CAMPESTRIS SSP SUCCULENTA SUCCULENT OWL'S-CLOVER PDSCR0D3Z1	Records in NDDB: *Yes*	Federal: State:	Threatened Endangered	Global: State:	G4?T2 S2.2	List: Code:	1B 223
CASTILLEJA CINEREA ASH-GRAY INDIAN PAINTBRUSH PDSCR0D0H0	Records in NDDB: *Yes*	Federal: State:	Threatened None	Global: State:	G2 S2.2	List: Code:	1B 223
CASTILLEJA GLEASONII MT. GLEASON INDIAN PAINTBRUSH PDSCR0D140	Records in NDDB: *Yes*	Federal: State:	Species of concern Rare	Global: State:	G2 S2.2	List: Code:	1B 323
CASTILLEJA GRISEA SAN CLEMENTE ISLAND INDIAN PAINTBRUSH PDSCR0D160	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G2 S2.2	List: Code:	1B 123

Scientific Name, Common Name, Element Code	Listing Status		Rank		CNPS	
CASTILLEJA HISPIDA SSP BREVILOBATA SHORT-LOBED INDIAN PAINTBRUSH PDSCR0D0A0 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3? S3.2	**List:** **Code:**	4 121
CASTILLEJA LANATA SSP HOLOLEUCA WHITE-FELTED INDIAN PAINTBRUSH PDSCR0D1L1 **Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	1B 223
CASTILLEJA LASIORHYNCHA SAN BERNARDINO MOUNTAINS OWL'S-CLOVER PDSCR0D410 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 123
CASTILLEJA LATIFOLIA MONTEREY INDIAN PAINTBRUSH PDSCR0D1P0 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CASTILLEJA MENDOCINENSIS MENDOCINO COAST INDIAN PAINTBRUSH PDSCR0D3N0 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
CASTILLEJA MINIATA SSP ELATA SISKIYOU INDIAN PAINTBRUSH PDSCR0D0T0 **Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3? S3.2	**List:** **Code:**	2 121
CASTILLEJA MOLLIS SOFT-LEAVED INDIAN PAINTBRUSH PDSCR0D230 **Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CASTILLEJA MONTIGENA HECKARD'S INDIAN PAINTBRUSH PDSCR0D3G0 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CASTILLEJA PLAGIOTOMA MOJAVE INDIAN PAINTBRUSH PDSCR0D2J0 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CASTILLEJA SCHIZOTRICHA SPLIT-HAIR INDIAN PAINTBRUSH PDSCR0D2Y0 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 112
CASTILLEJA ULIGINOSA PITKIN MARSH INDIAN PAINTBRUSH PDSCR0D380 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	GXQ SX	**List:** **Code:**	1A *
CAULANTHUS AMPLEXICAULIS VAR BARBARAE SANTA BARBARA JEWEL-FLOWER PDBRA0M012 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3?T1 S1.3	**List:** **Code:**	1B 313
CAULANTHUS CALIFORNICUS CALIFORNIA JEWEL-FLOWER PDBRA31010 **Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CAULANTHUS HETEROPHYLLUS VAR PSEUDOSIMULANS BUCK'S JEWEL-FLOWER PDBRA0M0B1 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2T3 S2S3	**List:** **Code:**	
CAULANTHUS SIMULANS PAYSON'S JEWEL-FLOWER PDBRA0M0H0 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CAULANTHUS STENOCARPUS		Federal:	Species of concern	Global:	G?Q	List:	
SLENDER-POD JEWEL-FLOWER		State:	Rare	State:	S?	Code:	
PDBRA0M0J0	Records in NDDB: *Yes*						
CAULOSTRAMINA JAEGERI		Federal:	Species of concern	Global:	G1	List:	1B
JAEGER'S CAULOSTRAMINA		State:	None	State:	S1.2	Code:	323
PDBRA0N010	Records in NDDB: *Yes*						
CEANOTHUS CONFUSUS		Federal:	Species of concern	Global:	G5T2Q	List:	1B
RINCON RIDGE CEANOTHUS		State:	None	State:	S2.1	Code:	333
PDRHA041K0	Records in NDDB: *Yes*						
CEANOTHUS CUNEATUS VAR RIGIDUS		Federal:	Species of concern	Global:	G5T3	List:	4
MONTEREY CEANOTHUS		State:	None	State:	S3.2	Code:	123
PDRHA04067	Records in NDDB: *No*						
CEANOTHUS CYANEUS		Federal:	Species of concern	Global:	G2	List:	1B
LAKESIDE CEANOTHUS		State:	None	State:	S2.2	Code:	322
PDRHA04070	Records in NDDB: *Yes*						
CEANOTHUS DIVERGENS		Federal:	Species of concern	Global:	G2	List:	1B
CALISTOGA CEANOTHUS		State:	None	State:	S2.2	Code:	323
PDRHA04161	Records in NDDB: *Yes*						
CEANOTHUS FERRISAE		Federal:	Endangered	Global:	G1	List:	1B
COYOTE CEANOTHUS		State:	None	State:	S1.1	Code:	333
PDRHA040C0	Records in NDDB: *Yes*						
CEANOTHUS FOLIOSUS VAR VINEATUS		Federal:	Species of concern	Global:	G3T1	List:	1B
VINE HILL CEANOTHUS		State:	None	State:	S1?	Code:	333
PDRHA040D6	Records in NDDB: *Yes*						
CEANOTHUS FRESNENSIS		Federal:	None	Global:	G3	List:	4
FRESNO CEANOTHUS		State:	None	State:	S3.3	Code:	113
PDRHA040E0	Records in NDDB: *No*						
CEANOTHUS GLORIOSUS VAR GLORIOSUS		Federal:	None	Global:	G5T3	List:	4
POINT REYES CEANOTHUS		State:	None	State:	S3.3	Code:	113
PDRHA040F2	Records in NDDB: *No*						
CEANOTHUS GLORIOSUS VAR PORRECTUS		Federal:	Species of concern	Global:	G3T2	List:	1B
MT. VISION CEANOTHUS		State:	None	State:	S2.2	Code:	313
PDRHA040F7	Records in NDDB: *Yes*						
CEANOTHUS HEARSTIORUM		Federal:	Species of concern	Global:	G1	List:	1B
HEARST'S CEANOTHUS		State:	Rare	State:	S1.2	Code:	323
PDRHA040J0	Records in NDDB: *Yes*						
CEANOTHUS MARITIMUS		Federal:	Species of concern	Global:	G2	List:	1B
MARITIME CEANOTHUS		State:	Rare	State:	S2.2	Code:	323
PDRHA040T0	Records in NDDB: *Yes*						
CEANOTHUS MASONII		Federal:	Species of concern	Global:	G1	List:	1B
MASON'S CEANOTHUS		State:	Rare	State:	S1.3	Code:	323
PDRHA040F6	Records in NDDB: *Yes*						
CEANOTHUS MEGACARPUS VAR INSULARIS		Federal:	None	Global:	G5T3	List:	4
ISLAND CEANOTHUS		State:	None	State:	S3.3	Code:	113
PDRHA040W1	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CEANOTHUS OPHIOCHILUS VAIL LAKE CEANOTHUS PDRHA041M0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CEANOTHUS PURPUREUS HOLLY-LEAVED CEANOTHUS PDRHA04160	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CEANOTHUS RODERICKII PINE HILL CEANOTHUS PDRHA04190	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Rare	**Global:** **State:**	G2Q S2.2	**List:** **Code:**	1B 323
CEANOTHUS SONOMENSIS SONOMA CEANOTHUS PDRHA04068	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
CEANOTHUS VERRUCOSUS WART-STEMMED CEANOTHUS PDRHA041J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S2.2	**List:** **Code:**	2 121
CERCOCARPUS BETULOIDES VAR BLANCHEAE ISLAND MOUNTAIN-MAHOGANY PDROS08022	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 113
CERCOCARPUS TRASKIAE CATALINA ISLAND MOUNTAIN-MAHOGANY PDROS08030	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CHAENACTIS CARPHOCLINIA VAR PEIRSONII PEIRSON'S PINCUSHION PDAST20042	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T1 S1.3	**List:** **Code:**	1B 213
CHAENACTIS DOUGLASII VAR ALPINA ALPINE DUSTY MAIDENS PDAST20065	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T5 S2.3?	**List:** **Code:**	2 211
CHAENACTIS PARISHII PARISH'S CHAENACTIS PDAST200D0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 112
CHAENACTIS SUFFRUTESCENS SHASTA CHAENACTIS PDAST200H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2?	**List:** **Code:**	1B 213
CHAMAEBATIA AUSTRALIS SOUTHERN MOUNTAIN MISERY PDROS0A010	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.2	**List:** **Code:**	4 121
CHAMAESYCE ARIZONICA ARIZONA SPURGE PDEUP0D060	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S1.3	**List:** **Code:**	2 211
CHAMAESYCE HOOVERI HOOVER'S SPURGE PDEUP0D150	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
CHAMAESYCE OCELLATA SSP RATTANII STONY CREEK SPURGE PDEUP0D1P1	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G?T3 S3.3	**List:** **Code:**	4 113

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CHAMAESYCE PLATYSPERMA FLAT-SEEDED SPURGE PDEUP0D1X0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3 S1.2?	List: Code:	1B 322
CHEILANTHES WOOTONII WOOTON'S LACE FERN PPADI090S0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.3	List: Code:	2 211
CHENOPODIUM SIMPLEX LARGE-SEEDED GOOSEFOOT PDCHE091P0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S3.3	List: Code:	4 111
CHLOROGALUM GRANDIFLORUM RED HILLS SOAPROOT PMLIL0G020	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 223
CHLOROGALUM POMERIDIANUM VAR MINUS DWARF SOAPROOT PMLIL0G042	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T1 S1.2	List: Code:	1B 223
CHLOROGALUM PURPUREUM VAR PURPUREUM PURPLE AMOLE PMLIL0G051	Records in NDDB: *Yes*	Federal: State:	Proposed Threatened None	Global: State:	G1T1 S1.1	List: Code:	1B 333
CHLOROGALUM PURPUREUM VAR REDUCTUM CAMATTA CANYON AMOLE PMLIL0G052	Records in NDDB: *Yes*	Federal: State:	Proposed Threatened Rare	Global: State:	G1T1 S1.1	List: Code:	1B 333
CHORIZANTHE BILOBA VAR IMMEMORA SAN BENITO SPINEFLOWER PDPGN04025	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3T1? S1?	List: Code:	1B 223
CHORIZANTHE BLAKLEYI BLAKLEY'S SPINEFLOWER PDPGN04030	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
CHORIZANTHE BREWERI BREWER'S SPINEFLOWER PDPGN04050	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2 S2.2	List: Code:	1B 313
CHORIZANTHE CUSPIDATA VAR CUSPIDATA SAN FRANCISCO BAY SPINEFLOWER PDPGN04081	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3T2 S2.2	List: Code:	1B 223
CHORIZANTHE CUSPIDATA VAR VILLOSA WOOLLY-HEADED SPINEFLOWER PDPGN04082	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3T1 S1.2	List: Code:	1B 223
CHORIZANTHE DOUGLASII DOUGLAS'S SPINEFLOWER PDPGN040A0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
CHORIZANTHE HOWELLII HOWELL'S SPINEFLOWER PDPGN040C0	Records in NDDB: *Yes*	Federal: State:	Endangered Threatened	Global: State:	G1 S1.2	List: Code:	1B 323
CHORIZANTHE LEPTOTHECA PENINSULAR SPINEFLOWER PDPGN040D0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4 S3.2	List: Code:	4 122

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
CHORIZANTHE ORCUTTIANA ORCUTT'S SPINEFLOWER PDPGN040G0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
CHORIZANTHE PALMERI PALMER'S SPINEFLOWER PDPGN040H0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3? **State:** S3.2?	**List:** 4 **Code:** 123
CHORIZANTHE PARRYI VAR FERNANDINA SAN FERNANDO VALLEY SPINEFLOWER PDPGN040J1 **Records in NDDB:** *Yes*	**Federal:** Candidate **State:** None	**Global:** G2T1 **State:** S1.1	**List:** 1A **Code:** *
CHORIZANTHE PARRYI VAR PARRYI PARRY'S SPINEFLOWER PDPGN040J2 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2T2? **State:** S2.2	**List:** 3 **Code:** ?23
CHORIZANTHE POLYGONOIDES VAR LONGISPINA LONG-SPINED SPINEFLOWER PDPGN040K1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T3 **State:** S2.2	**List:** 1B **Code:** 222
CHORIZANTHE PROCUMBENS PROSTRATE SPINEFLOWER PDPGN040L0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4G5 **State:** S3.2?	**List:** 4 **Code:** 122
CHORIZANTHE PUNGENS VAR HARTWEGIANA BEN LOMOND SPINEFLOWER PDPGN040M1 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** None	**Global:** G1G2T1 **State:** S1.1	**List:** 1B **Code:** 233
CHORIZANTHE PUNGENS VAR PUNGENS MONTEREY SPINEFLOWER PDPGN040M2 **Records in NDDB:** *Yes*	**Federal:** Threatened **State:** None	**Global:** G2T2 **State:** S2.2	**List:** 1B **Code:** 223
CHORIZANTHE RECTISPINA STRAIGHT-AWNED SPINEFLOWER PDPGN040N0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 313
CHORIZANTHE ROBUSTA VAR HARTWEGII SCOTT'S VALLEY SPINEFLOWER PDPGN040Q1 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** None	**Global:** G2T1 **State:** S1.1	**List:** 1B **Code:** 333
CHORIZANTHE ROBUSTA VAR ROBUSTA ROBUST SPINEFLOWER PDPGN040Q2 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** None	**Global:** G2T1 **State:** S1.1	**List:** 1B **Code:** 333
CHORIZANTHE SPINOSA MOJAVE SPINEFLOWER PDPGN040R0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 123
CHORIZANTHE VALIDA SONOMA SPINEFLOWER PDPGN040V0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
CHORIZANTHE WHEELERI WHEELER'S SPINEFLOWER PDPGN040Y0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
CHORIZANTHE XANTI VAR LEUCOTHECA WHITE-BRACTED SPINEFLOWER PDPGN040Z1 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.2	**List:** 4 **Code:** 123

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CHRYSOTHAMNUS GRAMINEUS PANAMINT ROCK-GOLDENROD PDAST2C0H0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4? S3.3	List: Code:	4 111
CIRSIUM ANDREWSII FRANCISCAN THISTLE PDAST2E050	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
CIRSIUM CILIOLATUM ASHLAND THISTLE PDAST2E0P0	Records in NDDB: *Yes*	Federal: State:	None Endangered	Global: State:	G3Q S1.1	List: Code:	2 331
CIRSIUM CRASSICAULE SLOUGH THISTLE PDAST2E0U0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.1	List: Code:	1B 323
CIRSIUM FONTINALE VAR CAMPYLON MT. HAMILTON THISTLE PDAST2E0F0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2T2 S2.2	List: Code:	1B 223
CIRSIUM FONTINALE VAR FONTINALE FOUNTAIN THISTLE PDAST2E161	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G2T1 S1.1	List: Code:	1B 333
CIRSIUM FONTINALE VAR OBISPOENSE CHORRO CREEK BOG THISTLE PDAST2E162	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G2T1 S1.2	List: Code:	1B 323
CIRSIUM HYDROPHILUM VAR HYDROPHILUM SUISUN THISTLE PDAST2E1G1	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G1T1 S1.1	List: Code:	1B 333
CIRSIUM HYDROPHILUM VAR VASEYI MT. TAMALPAIS THISTLE PDAST2E1G2	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1T1 S1.2	List: Code:	1B 323
CIRSIUM LONCHOLEPIS LA GRACIOSA THISTLE PDAST2E1N0	Records in NDDB: *Yes*	Federal: State:	Proposed Endangered Threatened	Global: State:	G2 S2.1	List: Code:	1B 323
CIRSIUM OCCIDENTALE VAR COMPACTUM COMPACT COBWEBBY THISTLE PDAST2E1Z1	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3G4T2 S2.2	List: Code:	1B 223
CIRSIUM PRAETERIENS PALO ALTO THISTLE PDAST2E2B0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	GX SX	List: Code:	
CIRSIUM RHOTHOPHILUM SURF THISTLE PDAST2E2J0	Records in NDDB: *Yes*	Federal: State:	Species of concern Threatened	Global: State:	G2 S2.2	List: Code:	1B 223
CLARKIA AMOENA SSP WHITNEYI WHITNEY'S FAREWELL-TO-SPRING PDONA05025	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3 S3.3	List: Code:	4 113
CLARKIA AUSTRALIS SMALL'S SOUTHERN CLARKIA PDONA05040	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2 S2.2	List: Code:	1B 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CLARKIA BILOBA SSP AUSTRALIS MARIPOSA CLARKIA PDONA05051	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2 S2.2	**List:** **Code:**	1B 323
CLARKIA BOREALIS SSP ARIDA SHASTA CLARKIA PDONA05061	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G?T1Q S1.1	**List:** **Code:**	1B 333
CLARKIA BOREALIS SSP BOREALIS NORTHERN CLARKIA PDONA05062	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 113
CLARKIA BREWERI BREWER'S CLARKIA PDONA05080	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
CLARKIA CONCINNA SSP AUTOMIXA SANTA CLARA RED RIBBONS PDONA050A1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4?T1 S1.2	**List:** **Code:**	1B 223
CLARKIA CONCINNA SSP RAICHEI RAICHE'S RED RIBBONS PDONA050A2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4?T1 S1.1?	**List:** **Code:**	1B 313
CLARKIA DELICATA DELICATE CLARKIA PDONA050D0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2G3 S1?	**List:** **Code:**	2 121
CLARKIA EXILIS SLENDER CLARKIA PDONA050G0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CLARKIA FRANCISCANA PRESIDIO CLARKIA PDONA050H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CLARKIA GRACILIS SSP ALBICAULIS WHITE-STEMMED CLARKIA PDONA050J1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S2.2?	**List:** **Code:**	1B 323
CLARKIA IMBRICATA VINE HILL CLARKIA PDONA050K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CLARKIA JOLONENSIS JOLON CLARKIA PDONA050L0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CLARKIA LEWISII LEWIS'S CLARKIA PDONA050N0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CLARKIA LINGULATA MERCED CLARKIA PDONA050P0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CLARKIA MILDREDIAE MILDRED'S CLARKIA PDONA050Q0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CLARKIA MOSQUINII SSP MOSQUINII MOSQUIN'S CLARKIA PDONA050S1	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1T1 S1.1	List: Code:	1B 333
CLARKIA MOSQUINII SSP XEROPHILA ENTERPRISE CLARKIA PDONA050S2	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1T1 S1.1	List: Code:	1B 333
CLARKIA ROSTRATA BEAKED CLARKIA PDONA050Y0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 213
CLARKIA SPECIOSA SSP IMMACULATA PISMO CLARKIA PDONA05111	Records in NDDB: *Yes*	Federal: State:	Endangered Rare	Global: State:	G3T1 S1.1	List: Code:	1B 333
CLARKIA SPRINGVILLENSIS SPRINGVILLE CLARKIA PDONA05120	Records in NDDB: *Yes*	Federal: State:	Threatened Endangered	Global: State:	G1 S1.1	List: Code:	1B 323
CLARKIA TEMBLORIENSIS SSP CALIENTENSIS VASEK'S CLARKIA PDONA05141	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3T1 S1.1	List: Code:	1B 333
CLARKIA VIRGATA SIERRA CLARKIA PDONA05160	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
CLARKIA XANTIANA SSP PARVIFLORA KERN CANYON CLARKIA PDONA05181	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T1 S1.2	List: Code:	1B 323
CLAYTONIA LANCEOLATA VAR PEIRSONII PEIRSON'S SPRING BEAUTY PDPOR03097	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G5T1 S1.1	List: Code:	1B 333
CLAYTONIA MEGARHIZA FELL-FIELDS CLAYTONIA PDPOR030A0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4? S2S3	List: Code:	2 211
CLAYTONIA PALUSTRIS MARSH CLAYTONIA PDPOR030S0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
CLAYTONIA UMBELLATA GREAT BASIN CLAYTONIA PDPOR030P0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5? S1.3	List: Code:	1B 312
CLEOMELLA HILLMANII HILLMAN'S CLEOMELLA PDCPP04030	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3? S1?	List: Code:	
COCHLEARIA OFFICINALIS VAR ARCTICA ARCTIC SPOONWORT PDBRA0S032	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T3T4 S1.3	List: Code:	2 311
COLLINSIA CORYMBOSA ROUND-HEADED CHINESE HOUSES PDSCR0H060	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G1 S1.2	List: Code:	1B 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
COLLINSIA MULTICOLOR SAN FRANCISCO COLLINSIA PDSCR0H0B0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2?	**List:** **Code:**	4 113
COLLOMIA DIVERSIFOLIA SERPENTINE COLLOMIA PDPLM02020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
COLLOMIA LARSENII TALUS COLLOMIA PDPLM02014	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S1.2	**List:** **Code:**	2 321
COLLOMIA RAWSONIANA FLAMING TRUMPET PDPLM02080	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
COLLOMIA TRACYI TRACY'S COLLOMIA PDPLM020B0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
COLUBRINA CALIFORNICA LAS ANIMAS COLUBRINA PDRHA05030	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 112
COMAROSTAPHYLIS DIVERSIFOLIA SSP DIVERSIFOLIA SUMMER HOLLY PDERI0B011	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2 S2.2	**List:** **Code:**	1B 222
CONDALIA GLOBOSA VAR PUBESCENS SPINY ABROJO PDRHA06031	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 121
CONVOLVULUS SIMULANS SMALL-FLOWERED MORNING-GLORY PDCON05060	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 122
CORALLORHIZA TRIFIDA NORTHERN CORALROOT PMORC0M050	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S1.1	**List:** **Code:**	2 331
CORDYLANTHUS CAPITATUS YAKIMA BIRD'S-BEAK PDSCR0J030	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S2.2	**List:** **Code:**	2 121
CORDYLANTHUS EREMICUS SSP EREMICUS DESERT BIRD'S-BEAK PDSCR0J042	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3T3 S3?	**List:** **Code:**	4 113
CORDYLANTHUS EREMICUS SSP KERNENSIS KERN PLATEAU BIRD'S-BEAK PDSCR0J043	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3T3 S3.3?	**List:** **Code:**	4 113
CORDYLANTHUS MARITIMUS SSP MARITIMUS SALT MARSH BIRD'S-BEAK PDSCR0J0C2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G3T2 S2.2	**List:** **Code:**	1B 222
CORDYLANTHUS MARITIMUS SSP PALUSTRIS POINT REYES BIRD'S-BEAK PDSCR0J0C3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2 S2.2	**List:** **Code:**	1B 222

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CORDYLANTHUS MOLLIS SSP HISPIDUS HISPID BIRD'S-BEAK PDSCR0J0D1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T2 S2.1	**List:** **Code:**	1B 233
CORDYLANTHUS MOLLIS SSP MOLLIS SOFT BIRD'S-BEAK PDSCR0J0D2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Rare	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323
CORDYLANTHUS NIDULARIUS MT. DIABLO BIRD'S-BEAK PDSCR0J0F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 333
CORDYLANTHUS ORCUTTIANUS ORCUTT'S BIRD'S-BEAK PDSCR0J0G0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2? S1.1	**List:** **Code:**	2 331
CORDYLANTHUS PALMATUS PALMATE-BRACTED BIRD'S-BEAK PDSCR0J0J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CORDYLANTHUS PARVIFLORUS PURPLE BIRD'S-BEAK PDSCR0J0K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4G5 S1S2	**List:** **Code:**	2 311
CORDYLANTHUS RIGIDUS SSP LITTORALIS SEASIDE BIRD'S-BEAK PDSCR0J0P2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 233
CORDYLANTHUS TECOPENSIS TECOPA BIRD'S-BEAK PDSCR0J0Q0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S1.2	**List:** **Code:**	1B 322
CORDYLANTHUS TENUIS SSP BARBATUS FRESNO COUNTY BIRD'S-BEAK PDSCR0J0S4	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T3 S3.3?	**List:** **Code:**	4 113
CORDYLANTHUS TENUIS SSP BRUNNEUS SERPENTINE BIRD'S-BEAK PDSCR0J0S1	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 113
CORDYLANTHUS TENUIS SSP CAPILLARIS PENNELL'S BIRD'S-BEAK PDSCR0J0S2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Rare	**Global:** **State:**	G4T1 S1.2	**List:** **Code:**	1B 323
CORDYLANTHUS TENUIS SSP PALLESCENS PALLID BIRD'S-BEAK PDSCR0J0S3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1.2	**List:** **Code:**	1B 323
COREOPSIS HAMILTONII MT. HAMILTON COREOPSIS PDAST2L0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
COREOPSIS MARITIMA SEA DAHLIA PDAST2L0L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S2.2	**List:** **Code:**	2 221
CORETHROGYNE FILAGINIFOLIA VAR INCANA SAN DIEGO SAND ASTER PDAST2M025	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 222

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CORETHROGYNE FILAGINIFOLIA VAR LINIFOLIA DEL MAR MESA SAND ASTER PDAST2M027 **Records in NDDB:** *Yes*		**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 323
CORETHROGYNE LEUCOPHYLLA BRANCHING BEACH ASTER PDAST2M030 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G3? S3.2	**List:** **Code:**	4 113
CORYDALIS CASEANA SSP CASEANA SIERRA CORYDALIS PDFUM03043 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 113
CREPIS RUNCINATA SSP HALLII HALL'S MEADOW HAWKSBEARD PDAST2R0KB **Records in NDDB:** *Yes*		**Federal:** **State:**	None None	**Global:** **State:**	G5T3? S2?	**List:** **Code:**	2 331
CROSSOSOMA CALIFORNICUM CATALINA CROSSOSOMA PDCRO02020 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 122
CROTON WIGGINSII WIGGINS'S CROTON PDEUP0H140 **Records in NDDB:** *Yes*		**Federal:** **State:**	None Rare	**Global:** **State:**	G3 S1.2	**List:** **Code:**	2 221
CRYPTANTHA CLEVELANDII VAR DISSITA SERPENTINE CRYPTANTHA PDBOR0A0H2 **Records in NDDB:** *Yes*		**Federal:** **State:**	None None	**Global:** **State:**	G5TH SH	**List:** **Code:**	1B 223
CRYPTANTHA CLOKEYI CLOKEY'S CRYPTANTHA PDBOR0A211 **Records in NDDB:** *Yes*		**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
CRYPTANTHA COSTATA RIBBED CRYPTANTHA PDBOR0A0M0 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G4G5 S3.3	**List:** **Code:**	4 112
CRYPTANTHA CRINITA SILKY CRYPTANTHA PDBOR0A0Q0 **Records in NDDB:** *Yes*		**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
CRYPTANTHA CRYMOPHILA SUBALPINE CRYPTANTHA PDBOR0A0R0 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CRYPTANTHA EXCAVATA DEEP-SCARRED CRYPTANTHA PDBOR0A0W0 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CRYPTANTHA GANDERI GANDER'S CRYPTANTHA PDBOR0A120 **Records in NDDB:** *Yes*		**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S1.1	**List:** **Code:**	1B 332
CRYPTANTHA HOLOPTERA WINGED CRYPTANTHA PDBOR0A180 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G3G4 S?	**List:** **Code:**	4 112
CRYPTANTHA HOOVERI HOOVER'S CRYPTANTHA PDBOR0A190 **Records in NDDB:** *No*		**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CRYPTANTHA MARIPOSAE MARIPOSA CRYPTANTHA PDBOR0A1Q0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CRYPTANTHA RATTANII RATTAN'S CRYPTANTHA PDBOR0A2H0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
CRYPTANTHA ROOSIORUM BRISTLECONE CRYPTANTHA PDBOR0A2L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
CRYPTANTHA SCOPARIA GRAY CRYPTANTHA PDBOR0A2Q0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
CRYPTANTHA TRASKIAE TRASK'S CRYPTANTHA PDBOR0A370	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
CRYPTANTHA TUMULOSA NEW YORK MOUNTAINS CRYPTANTHA PDBOR0A380	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4? S3.3	**List:** **Code:**	4 112
CUPRESSUS ABRAMSIANA SANTA CRUZ CYPRESS PGCUP04080	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 323
CUPRESSUS ARIZONICA SSP NEVADENSIS PIUTE CYPRESS PGCUP04012	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 223
CUPRESSUS BAKERI BAKER'S CYPRESS PGCUP04020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 122
CUPRESSUS FORBESII TECATE CYPRESS PGCUP040C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 322
CUPRESSUS GOVENIANA SSP GOVENIANA GOWEN CYPRESS PGCUP04031	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323
CUPRESSUS GOVENIANA SSP PIGMAEA PYGMY CYPRESS PGCUP04032	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 123
CUPRESSUS MACROCARPA MONTEREY CYPRESS PGCUP04060	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
CUPRESSUS NOOTKATENSIS ALASKA CEDAR PGCUP03020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** **Code:**	4 111
CUPRESSUS STEPHENSONII CUYAMACA CYPRESS PGCUP040B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
CUSICKIELLA QUADRICOSTATA		Federal:	Species of concern	Global:	G3	List:	1B
BODIE HILLS CUSICKIELLA		State:	None	State:	S2.2	Code:	222
PDBRA2V010	Records in NDDB: *Yes*						
CYMOPTERUS DESERTICOLA		Federal:	Species of concern	Global:	G2	List:	1B
DESERT CYMOPTERUS		State:	None	State:	S2.2	Code:	323
PDAPI0U090	Records in NDDB: *Yes*						
CYMOPTERUS GILMANII		Federal:	None	Global:	G3?	List:	2
GILMAN'S CYMOPTERUS		State:	None	State:	S2.2	Code:	211
PDAPI0U0C0	Records in NDDB: *Yes*						
CYMOPTERUS RIPLEYI		Federal:	None	Global:	G3	List:	2
RIPLEY'S CYMOPTERUS		State:	None	State:	S1.2	Code:	321
PDAPI0U0X0	Records in NDDB: *Yes*						
CYNANCHUM UTAHENSE		Federal:	None	Global:	G4	List:	4
UTAH VINE MILKWEED		State:	None	State:	S3.3	Code:	111
PDASC050M0	Records in NDDB: *No*						
CYPRIPEDIUM CALIFORNICUM		Federal:	None	Global:	G3G4	List:	4
CALIFORNIA LADY'S-SLIPPER		State:	None	State:	S3.2	Code:	122
PMORC0Q040	Records in NDDB: *No*						
CYPRIPEDIUM FASCICULATUM		Federal:	Species of concern	Global:	G4	List:	4
CLUSTERED LADY'S-SLIPPER		State:	None	State:	S3.2	Code:	122
PMORC0Q060	Records in NDDB: *No*						
CYPRIPEDIUM MONTANUM		Federal:	None	Global:	G4	List:	4
MOUNTAIN LADY'S-SLIPPER		State:	None	State:	S3.2	Code:	112
PMORC0Q080	Records in NDDB: *No*						
DALEA ORNATA		Federal:	None	Global:	G4G5	List:	2
ORNATE DALEA		State:	None	State:	S1.3	Code:	331
PDFAB1A150	Records in NDDB: *Yes*						
DARLINGTONIA CALIFORNICA		Federal:	None	Global:	G4	List:	4
CALIFORNIA PITCHERPLANT		State:	None	State:	S3.2	Code:	121
PDSAR01010	Records in NDDB: *No*						
DEDECKERA EUREKENSIS		Federal:	Species of concern	Global:	G2	List:	1B
JULY GOLD		State:	Rare	State:	S2.2	Code:	213
PDPGN06010	Records in NDDB: *Yes*						
DELPHINIUM BAKERI		Federal:	Proposed Endangered	Global:	G1	List:	1B
BAKER'S LARKSPUR		State:	Rare	State:	S1.1	Code:	333
PDRAN0B050	Records in NDDB: *Yes*						
DELPHINIUM CALIFORNICUM SSP INTERIUS		Federal:	Species of concern	Global:	G3T2	List:	1B
HOSPITAL CANYON LARKSPUR		State:	None	State:	S2?	Code:	323
PDRAN0B0A2	Records in NDDB: *Yes*						
DELPHINIUM GYPSOPHILUM SSP GYPSOPHILUM		Federal:	None	Global:	G4T3	List:	4
GYPSUM-LOVING LARKSPUR		State:	None	State:	S3.3	Code:	113
PDRAN0B0S1	Records in NDDB: *No*						
DELPHINIUM GYPSOPHILUM SSP PARVIFLORUM		Federal:	None	Global:	G4T3	List:	4
SMALL-FLOWERED GYPSUM-LOVING LARKSPUR		State:	None	State:	S3.3	Code:	113
PDRAN0B0S2	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
DELPHINIUM HANSENII SSP EWANIANUM EWAN'S LARKSPUR PDRAN0B0T2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	4 123
DELPHINIUM HESPERIUM SSP CUYAMACAE CUYAMACA LARKSPUR PDRAN0B0U1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G4T2 S2.2	**List:** **Code:**	1B 223
DELPHINIUM HUTCHINSONIAE HUTCHINSON'S LARKSPUR PDRAN0B0V0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
DELPHINIUM INOPINUM UNEXPECTED LARKSPUR PDRAN0B0W0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	1B 223
DELPHINIUM LUTEUM YELLOW LARKSPUR PDRAN0B0Z0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Proposed Endangered Rare	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
DELPHINIUM PARISHII SSP SUBGLOBOSUM SONORAN DESERT LARKSPUR PDRAN0B1A3	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 112
DELPHINIUM PARRYI SSP BLOCHMANIAE DUNE LARKSPUR PDRAN0B1B1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T2 S2.2	**List:** **Code:**	1B 323
DELPHINIUM PARRYI SSP PURPUREUM MT. PINOS LARKSPUR PDRAN0B1B5	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 113
DELPHINIUM PURPUSII KERN COUNTY LARKSPUR PDRAN0B1G0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
DELPHINIUM RECURVATUM RECURVED LARKSPUR PDRAN0B1J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 123
DELPHINIUM STACHYDEUM SPIKED LARKSPUR PDRAN0B1Q0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
DELPHINIUM ULIGINOSUM SWAMP LARKSPUR PDRAN0B1V0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
DELPHINIUM UMBRACULORUM UMBRELLA LARKSPUR PDRAN0B1W0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
DELPHINIUM VARIEGATUM SSP KINKIENSE SAN CLEMENTE ISLAND LARKSPUR PDRAN0B1X3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 333
DELPHINIUM VARIEGATUM SSP THORNEI THORNE'S ROYAL LARKSPUR PDRAN0B1X2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
DENDROMECON HARFORDII VAR HARFORDII		**Federal:**	Species of concern	**Global:**	G4T3Q	**List:**	4
CHANNEL ISLAND TREE POPPY		**State:**	None	**State:**	S3.2	**Code:**	123
PDPAP08020	**Records in NDDB:** *No*						
DENDROMECON HARFORDII VAR RHAMNOIDES		**Federal:**	Species of concern	**Global:**	G4T1Q	**List:**	1B
ISLAND TREE POPPY		**State:**	None	**State:**	S1.1	**Code:**	333
PDPAP08012	**Records in NDDB:** *Yes*						
DESCHAMPSIA ATROPURPUREA		**Federal:**	None	**Global:**	G5	**List:**	4
MOUNTAIN HAIR GRASS		**State:**	None	**State:**	S3.3	**Code:**	111
PMPOA6M010	**Records in NDDB:** *No*						
DICENTRA FORMOSA SSP OREGANA		**Federal:**	None	**Global:**	G5T4	**List:**	4
OREGON BLEEDING HEART		**State:**	None	**State:**	S3.2	**Code:**	122
PDFUM04052	**Records in NDDB:** *No*						
DICENTRA NEVADENSIS		**Federal:**	None	**Global:**	G3	**List:**	4
TULARE COUNTY BLEEDING HEART		**State:**	None	**State:**	S3.3	**Code:**	113
PDFUM04060	**Records in NDDB:** *No*						
DICHANTHELIUM LANUGINOSUM VAR THERMALE		**Federal:**	Species of concern	**Global:**	G5T1	**List:**	1B
GEYSERS DICHANTHELIUM		**State:**	Endangered	**State:**	S1.1	**Code:**	333
PMPOA24025	**Records in NDDB:** *Yes*						
DICHONDRA OCCIDENTALIS		**Federal:**	None	**Global:**	G4?	**List:**	4
WESTERN DICHONDRA		**State:**	None	**State:**	S3.2	**Code:**	121
PDCON08060	**Records in NDDB:** *No*						
DIMERESIA HOWELLII		**Federal:**	None	**Global:**	G4?	**List:**	4
DOUBLET		**State:**	None	**State:**	S3.3	**Code:**	111
PDAST2Z010	**Records in NDDB:** *Yes*						
DIRCA OCCIDENTALIS		**Federal:**	None	**Global:**	G2G3	**List:**	1B
WESTERN LEATHERWOOD		**State:**	None	**State:**	S2S3	**Code:**	223
PDTHY03010	**Records in NDDB:** *Yes*						
DISSANTHELIUM CALIFORNICUM		**Federal:**	Species of concern	**Global:**	GH	**List:**	1A
CALIFORNIA DISSANTHELIUM		**State:**	None	**State:**	SH	**Code:**	*
PMPOA29010	**Records in NDDB:** *Yes*						
DITAXIS CALIFORNICA		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
CALIFORNIA DITAXIS		**State:**	None	**State:**	S2.2	**Code:**	323
PDEUP08050	**Records in NDDB:** *Yes*						
DITAXIS CLARIANA		**Federal:**	None	**Global:**	G4G5	**List:**	2
GLANDULAR DITAXIS		**State:**	None	**State:**	S1S2	**Code:**	321
PDEUP080L0	**Records in NDDB:** *Yes*						
DITHYREA MARITIMA		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
BEACH SPECTACLEPOD		**State:**	Threatened	**State:**	S2.1	**Code:**	332
PDBRA10020	**Records in NDDB:** *Yes*						
DODECAHEMA LEPTOCERAS		**Federal:**	Endangered	**Global:**	G1	**List:**	1B
SLENDER-HORNED SPINEFLOWER		**State:**	Endangered	**State:**	S1.1	**Code:**	333
PDPGN0V010	**Records in NDDB:** *Yes*						
DOWNINGIA CONCOLOR VAR BREVIOR		**Federal:**	Species of concern	**Global:**	G4T1	**List:**	1B
CUYAMACA LAKE DOWNINGIA		**State:**	Endangered	**State:**	S1.1	**Code:**	333
PDCAM06041	**Records in NDDB:** *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
DOWNINGIA PUSILLA		Federal:	None	Global:	G3	List:	2
DWARF DOWNINGIA		State:	None	State:	S3.2	Code:	121
PDCAM060C0	Records in NDDB: *Yes*						
DRABA ASTEROPHORA VAR ASTEROPHORA		Federal:	None	Global:	G4T2	List:	1B
TAHOE DRABA		State:	None	State:	S1.3	Code:	312
PDBRA110D1	Records in NDDB: *Yes*						
DRABA ASTEROPHORA VAR MACROCARPA		Federal:	Species of concern	Global:	G4T1	List:	1B
CUP LAKE DRABA		State:	None	State:	S1.2	Code:	313
PDBRA110D2	Records in NDDB: *Yes*						
DRABA AUREOLA		Federal:	None	Global:	G4	List:	1B
GOLDEN DRABA		State:	None	State:	S1.3	Code:	312
PDBRA110F0	Records in NDDB: *Yes*						
DRABA CALIFORNICA		Federal:	None	Global:	G3	List:	4
CALIFORNIA DRABA		State:	None	State:	S3.2	Code:	123
PDBRA11380	Records in NDDB: *No*						
DRABA CANA		Federal:	None	Global:	G5	List:	2
HOARY DRABA		State:	None	State:	S1.3	Code:	311
PDBRA110M0	Records in NDDB: *Yes*						
DRABA CARNOSULA		Federal:	Species of concern	Global:	G2	List:	1B
MT. EDDY DRABA		State:	None	State:	S2.3	Code:	313
PDBRA112T0	Records in NDDB: *Yes*						
DRABA CRUCIATA		Federal:	None	Global:	G3	List:	4
MINERAL KING DRABA		State:	None	State:	S3.3	Code:	113
PDBRA110U0	Records in NDDB: *No*						
DRABA HOWELLII		Federal:	None	Global:	G4	List:	4
HOWELL'S DRABA		State:	None	State:	S3.3	Code:	112
PDBRA11150	Records in NDDB: *No*						
DRABA INCRASSATA		Federal:	None	Global:	G3	List:	4
SWEETWATER MOUNTAINS DRABA		State:	None	State:	S3.2	Code:	123
PDBRA113G0	Records in NDDB: *No*						
DRABA MONOENSIS		Federal:	None	Global:	G1	List:	1B
WHITE MOUNTAINS DRABA		State:	None	State:	S1.2	Code:	223
PDBRA113B0	Records in NDDB: *Yes*						
DRABA PTEROSPERMA		Federal:	None	Global:	G3	List:	4
WINGED-SEED DRABA		State:	None	State:	S3.3	Code:	113
PDBRA11230	Records in NDDB: *No*						
DRABA SHARSMITHII		Federal:	None	Global:	G1	List:	1B
MT. WHITNEY DRABA		State:	None	State:	S1.3	Code:	313
PDBRA113F0	Records in NDDB: *Yes*						
DRABA SIERRAE		Federal:	None	Global:	G3	List:	4
SIERRA DRABA		State:	None	State:	S3.3	Code:	113
PDBRA112A0	Records in NDDB: *No*						
DRABA SUBUMBELLATA		Federal:	None	Global:	G3	List:	4
MOUND DRABA		State:	None	State:	S3.3	Code:	113
PDBRA11370	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
DROSERA ANGLICA		Federal:	None	Global:	G5	List:	2
ENGLISH SUNDEW		State:	None	State:	S2S3	Code:	211
PDDRO02010	Records in NDDB: *Yes*						
DRYOPTERIS FILIX-MAS		Federal:	None	Global:	G5	List:	2
MALE FERN		State:	None	State:	S1.3	Code:	311
PPDRY0A0B0	Records in NDDB: *Yes*						
DUDLEYA ABRAMSII SSP AFFINIS		Federal:	Species of concern	Global:	G3T2	List:	1B
SAN BERNARDINO MOUNTAINS DUDLEYA		State:	None	State:	S2.2	Code:	223
PDCRA04013	Records in NDDB: *Yes*						
DUDLEYA ABRAMSII SSP BETTINAE		Federal:	Species of concern	Global:	G3T1	List:	1B
SAN LUIS OBISPO SERPENTINE DUDLEYA		State:	None	State:	S1.2	Code:	313
PDCRA04011	Records in NDDB: *Yes*						
DUDLEYA ABRAMSII SSP MURINA		Federal:	None	Global:	G3T3	List:	4
SAN LUIS OBISPO DUDLEYA		State:	None	State:	S3.2	Code:	113
PDCRA04012	Records in NDDB: *No*						
DUDLEYA ABRAMSII SSP PARVA		Federal:	Threatened	Global:	G3T2	List:	1B
CONEJO DUDLEYA		State:	None	State:	S2.1	Code:	323
PDCRA04016	Records in NDDB: *Yes*						
DUDLEYA ALAINAE		Federal:	None	Global:	G1Q	List:	3
BANNER DUDLEYA		State:	None	State:	S1?	Code:	323
PDCRA040X0	Records in NDDB: *No*						
DUDLEYA ATTENUATA SSP ORCUTTII		Federal:	Species of concern	Global:	G4T2	List:	2
ORCUTT'S DUDLEYA		State:	None	State:	S1.1	Code:	331
PDCRA04031	Records in NDDB: *Yes*						
DUDLEYA BLOCHMANIAE SSP BLOCHMANIAE		Federal:	Species of concern	Global:	G2T2	List:	1B
BLOCHMAN'S DUDLEYA		State:	None	State:	S2.1	Code:	222
PDCRA04051	Records in NDDB: *Yes*						
DUDLEYA BLOCHMANIAE SSP BREVIFOLIA		Federal:	Species of concern	Global:	G2T1	List:	1B
SHORT-LEAVED DUDLEYA		State:	Endangered	State:	S1.1	Code:	333
PDCRA04060	Records in NDDB: *Yes*						
DUDLEYA BLOCHMANIAE SSP INSULARIS		Federal:	Species of concern	Global:	G2T1	List:	1B
SANTA ROSA ISLAND DUDLEYA		State:	None	State:	S1.1	Code:	333
PDCRA04052	Records in NDDB: *Yes*						
DUDLEYA CALCICOLA		Federal:	None	Global:	G3	List:	4
LIMESTONE SIERRA DUDLEYA		State:	None	State:	S3.3	Code:	113
PDCRA04014	Records in NDDB: *No*						
DUDLEYA CANDELABRUM		Federal:	Species of concern	Global:	G2	List:	1B
CANDLEHOLDER DUDLEYA		State:	None	State:	S2.2	Code:	223
PDCRA04080	Records in NDDB: *Yes*						
DUDLEYA CYMOSA SSP COSTAFOLIA		Federal:	Species of concern	Global:	G5T2	List:	1B
PIERPOINT SPRINGS DUDLEYA		State:	None	State:	S2.2	Code:	323
PDCRA040A2	Records in NDDB: *Yes*						
DUDLEYA CYMOSA SSP CREBRIFOLIA		Federal:	Species of concern	Global:	G5T1	List:	1B
SAN GABRIEL RIVER DUDLEYA		State:	None	State:	S1.2	Code:	313
PDCRA040A8	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
DUDLEYA CYMOSA SSP MARCESCENS MARCESCENT DUDLEYA PDCRA040A3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Rare	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 323
DUDLEYA CYMOSA SSP OVATIFOLIA SANTA MONICA MOUNTAINS DUDLEYA PDCRA040A5	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G5T2Q S2.2	**List:** **Code:**	1B 223
DUDLEYA DENSIFLORA SAN GABRIEL MOUNTAINS DUDLEYA PDCRA040B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Candidate None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
DUDLEYA GNOMA MUNCHKIN DUDLEYA PDCRA040W0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	
DUDLEYA GREENEI GREENE'S DUDLEYA PDCRA040E0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
DUDLEYA MULTICAULIS MANY-STEMMED DUDLEYA PDCRA040H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 123
DUDLEYA NESIOTICA SANTA CRUZ ISLAND DUDLEYA PDCRA040J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Rare	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 333
DUDLEYA SAXOSA SSP SAXOSA PANAMINT DUDLEYA PDCRA040N2	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	4 123
DUDLEYA SETCHELLII SANTA CLARA VALLEY DUDLEYA PDCRA040AC	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
DUDLEYA STOLONIFERA LAGUNA BEACH DUDLEYA PDCRA040P0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Threatened	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
DUDLEYA TRASKIAE SANTA BARBARA ISLAND DUDLEYA PDCRA040Q0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 333
DUDLEYA VARIEGATA VARIEGATED DUDLEYA PDCRA040R0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 222
DUDLEYA VERITYI VERITY'S DUDLEYA PDCRA040U0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 323
DUDLEYA VIRENS BRIGHT GREEN DUDLEYA PDCRA040S0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 222
DUDLEYA VISCIDA STICKY DUDLEYA PDCRA040T0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ECHINOCEREUS ENGELMANNII VAR HOWEI		Federal:	Species of concern	Global:	G5T1	List:	1B
HOWE'S HEDGEHOG CACTUS		State:	None	State:	S1.1	Code:	333
PDCAC06035	Records in NDDB: *Yes*						
ELEOCHARIS PARVULA		Federal:	None	Global:	G5	List:	4
SMALL SPIKERUSH		State:	None	State:	S3.3	Code:	111
PMCYP091G0	Records in NDDB: *No*						
ELEOCHARIS QUADRANGULATA		Federal:	None	Global:	G4	List:	2
FOUR-ANGLED SPIKERUSH		State:	None	State:	S1S2	Code:	321
PMCYP091J0	Records in NDDB: *Yes*						
ELYMUS CALIFORNICUS		Federal:	None	Global:	G3	List:	4
CALIFORNIA BOTTLE-BRUSH GRASS		State:	None	State:	S3.3	Code:	113
PMPOA2H0W0	Records in NDDB: *No*						
ELYMUS SCRIBNERI		Federal:	None	Global:	G5	List:	2
SCRIBNER'S WHEAT GRASS		State:	None	State:	S2?	Code:	211
PMPOA2H170	Records in NDDB: *Yes*						
EMPETRUM NIGRUM SSP HERMAPHRODITUM		Federal:	None	Global:	G5T5	List:	2
BLACK CROWBERRY		State:	None	State:	S2?	Code:	321
PDEMP03021	Records in NDDB: *Yes*						
ENCELIOPSIS COVILLEI		Federal:	Species of concern	Global:	G3	List:	1B
PANAMINT DAISY		State:	None	State:	S3.2	Code:	323
PDAST3G020	Records in NDDB: *Yes*						
ENCELIOPSIS NUDICAULIS		Federal:	None	Global:	G5T5	List:	4
NAKED-STEMMED DAISY		State:	None	State:	S2S3	Code:	111
PDAST3G030	Records in NDDB: *No*						
ENNEAPOGON DESVAUXII		Federal:	None	Global:	G5	List:	2
NINE-AWNED PAPPUS GRASS		State:	None	State:	S2?	Code:	311
PMPOA2J010	Records in NDDB: *Yes*						
EPILOBIUM HOWELLII		Federal:	None	Global:	G1	List:	1B
SUBALPINE FIREWEED		State:	None	State:	S1.3	Code:	313
PDONA06180	Records in NDDB: *Yes*						
EPILOBIUM LUTEUM		Federal:	None	Global:	G5	List:	2
YELLOW WILLOWHERB		State:	None	State:	S2?	Code:	311
PDONA060H0	Records in NDDB: *Yes*						
EPILOBIUM NIVIUM		Federal:	None	Global:	G2	List:	1B
SNOW MOUNTAIN WILLOWHERB		State:	None	State:	S2.2	Code:	223
PDONA060M0	Records in NDDB: *Yes*						
EPILOBIUM OREGANUM		Federal:	Species of concern	Global:	G2	List:	1B
OREGON FIREWEED		State:	None	State:	S2.2	Code:	222
PDONA060P0	Records in NDDB: *Yes*						
EPILOBIUM RIGIDUM		Federal:	None	Global:	G3?	List:	4
SISKIYOU MOUNTAINS WILLOWHERB		State:	None	State:	S3.3	Code:	112
PDONA060V0	Records in NDDB: *No*						
EPILOBIUM SEPTENTRIONALE		Federal:	None	Global:	G3	List:	4
HUMBOLDT COUNTY FUCHSIA		State:	None	State:	S3.3	Code:	113
PDONA06110	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code	Records in NDDB	Listing Status		Rank		CNPS	
EPILOBIUM SISKIYOUENSE SISKIYOU FIREWEED PDONA06100	*Yes*	Federal: None	State: None	Global: G3	State: S2.2	List: 1B	Code: 312
EQUISETUM PALUSTRE MARSH HORSETAIL PPEQU01050	*No*	Federal: None	State: None	Global: G5	State: S1S2	List: 3	Code: 3?1
EREMALCHE KERNENSIS KERN MALLOW PDMAL0C031	*Yes*	Federal: Endangered	State: None	Global: G1Q	State: S1.1	List: 1B	Code: 333
ERIASTRUM BRANDEGEAE BRANDEGEE'S ERIASTRUM PDPLM03020	*Yes*	Federal: Species of concern	State: None	Global: G3	State: S3.2	List: 1B	Code: 223
ERIASTRUM DENSIFOLIUM SSP SANCTORUM SANTA ANA RIVER WOOLLYSTAR PDPLM03035	*Yes*	Federal: Endangered	State: Endangered	Global: G4T1	State: S1.1	List: 1B	Code: 333
ERIASTRUM HOOVERI HOOVER'S ERIASTRUM PDPLM03070	*Yes*	Federal: Threatened	State: None	Global: G3	State: S3.2	List: 4	Code: 123
ERIASTRUM LUTEUM YELLOW-FLOWERED ERIASTRUM PDPLM03080	*No*	Federal: None	State: None	Global: G3	State: S3.3	List: 4	Code: 113
ERIASTRUM TRACYI TRACY'S ERIASTRUM PDPLM030C0	*Yes*	Federal: None	State: Rare	Global: G1	State: S1.1	List:	Code:
ERIASTRUM VIRGATUM VIRGATE ERIASTRUM PDPLM030D0	*No*	Federal: None	State: None	Global: G3	State: S3.3	List: 4	Code: 113
ERICAMERIA CUNEATA VAR MACROCEPHALA LAGUNA MOUNTAINS GOLDENBUSH PDAST3L062	*Yes*	Federal: None	State: None	Global: G5T2?	State: S2.3	List: 1B	Code: 213
ERICAMERIA FASCICULATA EASTWOOD'S GOLDENBUSH PDAST3L080	*Yes*	Federal: Species of concern	State: None	Global: G2	State: S2.1	List: 1B	Code: 333
ERICAMERIA GILMANII GILMAN'S GOLDENBUSH PDAST3L0P0	*Yes*	Federal: None	State: None	Global: G1	State: S1.3	List: 1B	Code: 313
ERICAMERIA OPHITIDIS SERPENTINE GOLDENBUSH PDAST3L0S0	*No*	Federal: None	State: None	Global: G3	State: S3.3	List: 4	Code: 113
ERICAMERIA PALMERI SSP PALMERI PALMER'S GOLDENBUSH PDAST3L0C1	*Yes*	Federal: Species of concern	State: None	Global: G4T2T3	State: S1.2	List: 2	Code: 221
ERIGERON AEQUIFOLIUS HALL'S DAISY PDAST3M030	*Yes*	Federal: None	State: None	Global: G2	State: S2.3	List: 1B	Code: 313

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ERIGERON ANGUSTATUS		Federal:	None	Global:	G2	List:	1B
NARROW-LEAVED DAISY		State:	None	State:	S2.2?	Code:	223
PDAST3M5G0	Records in NDDB: *Yes*						
ERIGERON BIOLETTII		Federal:	None	Global:	G3	List:	3
STREAMSIDE DAISY		State:	None	State:	S3?	Code:	??3
PDAST3M5H0	Records in NDDB: *No*						
ERIGERON BLOCHMANIAE		Federal:	None	Global:	G2	List:	1B
BLOCHMAN'S LEAFY DAISY		State:	None	State:	S2.2	Code:	123
PDAST3M5J0	Records in NDDB: *Yes*						
ERIGERON BLOOMERI VAR NUDATUS		Federal:	None	Global:	G4T4	List:	2
WALDO DAISY		State:	None	State:	S2?	Code:	211
PDAST3M0M2	Records in NDDB: *Yes*						
ERIGERON BREWERI VAR BISANCTUS		Federal:	None	Global:	G4G5T1	List:	1B
PIOUS DAISY		State:	None	State:	S1.2	Code:	223
PDAST3M0P5	Records in NDDB: *Yes*						
ERIGERON BREWERI VAR JACINTEUS		Federal:	None	Global:	G4G5T3	List:	4
SAN JACINTO MOUNTAINS DAISY		State:	None	State:	S3.3	Code:	113
PDAST3M0P3	Records in NDDB: *No*						
ERIGERON CALVUS		Federal:	None	Global:	G1Q	List:	1B
BALD DAISY		State:	None	State:	S1	Code:	333
PDAST3M083	Records in NDDB: *Yes*						
ERIGERON CERVINUS		Federal:	None	Global:	G3	List:	4
SISKIYOU DAISY		State:	None	State:	S3.3	Code:	112
PDAST3M0U0	Records in NDDB: *No*						
ERIGERON DECUMBENS VAR ROBUSTIOR		Federal:	None	Global:	G4T3	List:	4
ROBUST DAISY		State:	None	State:	S3.3	Code:	113
PDAST3M134	Records in NDDB: *No*						
ERIGERON ELEGANTULUS		Federal:	None	Global:	G4G5	List:	4
VOLCANIC DAISY		State:	None	State:	S3.3	Code:	111
PDAST3M190	Records in NDDB: *No*						
ERIGERON INORNATUS VAR CALIDIPETRIS		Federal:	None	Global:	G5T3	List:	4
HOT ROCK DAISY		State:	None	State:	S3.3	Code:	113
PDAST3M1Z1	Records in NDDB: *No*						
ERIGERON INORNATUS VAR KEILII		Federal:	None	Global:	G5T1	List:	1B
KEIL'S DAISY		State:	None	State:	S1.2	Code:	223
PDAST3M1Z2	Records in NDDB: *Yes*						
ERIGERON MARIPOSANUS		Federal:	None	Global:	GH	List:	1A
MARIPOSA DAISY		State:	None	State:	SH	Code:	*
PDAST3M5L0	Records in NDDB: *Yes*						
ERIGERON MISER		Federal:	None	Global:	G2	List:	1B
STARVED DAISY		State:	None	State:	S2.3	Code:	213
PDAST3M2K0	Records in NDDB: *Yes*						
ERIGERON MULTICEPS		Federal:	Species of concern	Global:	G1	List:	1B
KERN RIVER DAISY		State:	None	State:	S1.2	Code:	323
PDAST3M2N0	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ERIGERON PARISHII PARISH'S DAISY PDAST3M310	Records in NDDB: *Yes*	Federal: State:	Threatened None	Global: State:	G2 S2.1	List: Code:	1B 233
ERIGERON PETROPHILUS VAR SIERRENSIS NORTHERN SIERRA DAISY PDAST3M351	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4T3 S3.3	List: Code:	4 113
ERIGERON PETROPHILUS VAR VISCIDULUS KLAMATH DAISY PDAST3M352	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4T3 S3.3	List: Code:	4 112
ERIGERON SANCTARUM SAINT'S DAISY PDAST3M3R0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.2	List: Code:	4 123
ERIGERON SERPENTINUS SERPENTINE DAISY PDAST3M5M0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G1 S1.3	List: Code:	1B 313
ERIGERON SUPPLEX SUPPLE DAISY PDAST3M3Z0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.2	List: Code:	1B 323
ERIGERON UNCIALIS VAR UNCIALIS LIMESTONE DAISY PDAST3M452	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G?T3? S1	List: Code:	2 321
ERIODICTYON ALTISSIMUM INDIAN KNOB MOUNTAINBALM PDHYD04010	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G2Q S2.1	List: Code:	1B 333
ERIODICTYON ANGUSTIFOLIUM NARROW-LEAVED YERBA SANTA PDHYD04020	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S3.3	List: Code:	4 111
ERIODICTYON CAPITATUM LOMPOC YERBA SANTA PDHYD04040	Records in NDDB: *Yes*	Federal: State:	Proposed Endangered Rare	Global: State:	G2 S2.2	List: Code:	1B 323
ERIOGONUM ALPINUM TRINITY BUCKWHEAT PDPGN08060	Records in NDDB: *Yes*	Federal: State:	Species of concern Endangered	Global: State:	G2 S2.2	List: Code:	1B 313
ERIOGONUM APRICUM VAR APRICUM IONE BUCKWHEAT PDPGN080F1	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G2T2 S2.1	List: Code:	1B 333
ERIOGONUM APRICUM VAR PROSTRATUM IRISH HILL BUCKWHEAT PDPGN080F2	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G2T1 S1.1	List: Code:	1B 333
ERIOGONUM ARGILLOSUM CLAY-LOVING BUCKWHEAT PDPGN080J0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
ERIOGONUM BIFURCATUM FORKED BUCKWHEAT PDPGN080R0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S1.2	List: Code:	1B 322

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ERIOGONUM BREEDLOVEI VAR BREEDLOVEI		**Federal:**	Species of concern	**Global:**	G3T2	**List:**	1B
BREEDLOVE'S BUCKWHEAT		**State:**	None	**State:**	S2.2	**Code:**	323
PDPGN080V1	**Records in NDDB:** *Yes*						
ERIOGONUM BREEDLOVEI VAR SHEVOCKII		**Federal:**	None	**Global:**	G3T3	**List:**	4
THE NEEDLES BUCKWHEAT		**State:**	None	**State:**	S3.3	**Code:**	113
PDPGN080V2	**Records in NDDB:** *Yes*						
ERIOGONUM BUTTERWORTHIANUM		**Federal:**	Species of concern	**Global:**	G1	**List:**	1B
BUTTERWORTH'S BUCKWHEAT		**State:**	Rare	**State:**	S1.3	**Code:**	313
PDPGN080X0	**Records in NDDB:** *Yes*						
ERIOGONUM CONGDONII		**Federal:**	None	**Global:**	G3	**List:**	4
CONGDON'S BUCKWHEAT		**State:**	None	**State:**	S3.3	**Code:**	113
PDPGN081A0	**Records in NDDB:** *No*						
ERIOGONUM CONTIGUUM		**Federal:**	None	**Global:**	G3G3	**List:**	2
REVEAL'S BUCKWHEAT		**State:**	None	**State:**	S2?	**Code:**	211
PDPGN081B0	**Records in NDDB:** *Yes*						
ERIOGONUM CROCATUM		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
CONEJO BUCKWHEAT		**State:**	Rare	**State:**	S2.2	**Code:**	223
PDPGN081G0	**Records in NDDB:** *Yes*						
ERIOGONUM DICLINUM		**Federal:**	None	**Global:**	G3	**List:**	4
JAYNES CANYON BUCKWHEAT		**State:**	None	**State:**	S3.3	**Code:**	112
PDPGN081S0	**Records in NDDB:** *No*						
ERIOGONUM EASTWOODIANUM		**Federal:**	None	**Global:**	G3Q	**List:**	4
EASTWOOD'S BUCKWHEAT		**State:**	None	**State:**	S3.3	**Code:**	113
PDPGN081V0	**Records in NDDB:** *No*						
ERIOGONUM EREMICOLA		**Federal:**	Species of concern	**Global:**	G1	**List:**	1B
WILDROSE CANYON BUCKWHEAT		**State:**	None	**State:**	S1.3	**Code:**	313
PDPGN08210	**Records in NDDB:** *Yes*						
ERIOGONUM ERICIFOLIUM VAR THORNEI		**Federal:**	Species of concern	**Global:**	G3T1	**List:**	1B
THORNE'S BUCKWHEAT		**State:**	Endangered	**State:**	S1.2	**Code:**	323
PDPGN08233	**Records in NDDB:** *Yes*						
ERIOGONUM FOLIOSUM		**Federal:**	None	**Global:**	G3	**List:**	1B
LEAFY BUCKWHEAT		**State:**	None	**State:**	SH	**Code:**	222
PDPGN08290	**Records in NDDB:** *Yes*						
ERIOGONUM GIGANTEUM VAR COMPACTUM		**Federal:**	Species of concern	**Global:**	G2T2	**List:**	1B
SANTA BARBARA ISLAND BUCKWHEAT		**State:**	Rare	**State:**	S2.3	**Code:**	313
PDPGN082A1	**Records in NDDB:** *Yes*						
ERIOGONUM GIGANTEUM VAR FORMOSUM		**Federal:**	Species of concern	**Global:**	G2T2	**List:**	1B
SAN CLEMENTE ISLAND BUCKWHEAT		**State:**	None	**State:**	S2.2	**Code:**	323
PDPGN082A2	**Records in NDDB:** *Yes*						
ERIOGONUM GILMANII		**Federal:**	None	**Global:**	G3	**List:**	4
GILMAN'S BUCKWHEAT		**State:**	None	**State:**	S3.3	**Code:**	113
PDPGN082B0	**Records in NDDB:** *No*						
ERIOGONUM GOSSYPINUM		**Federal:**	None	**Global:**	G3	**List:**	4
COTTONY BUCKWHEAT		**State:**	None	**State:**	S3.2	**Code:**	123
PDPGN082E0	**Records in NDDB:** *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ERIOGONUM GRANDE VAR GRANDE ISLAND BUCKWHEAT PDPGN082J1	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3T3 S3.2	List: Code:	4 123
ERIOGONUM GRANDE VAR RUBESCENS RED-FLOWERED BUCKWHEAT PDPGN082J2	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G3T3 S3.2	List: Code:	4 123
ERIOGONUM GRANDE VAR TIMORUM SAN NICOLAS ISLAND BUCKWHEAT PDPGN082J3	Records in NDDB: *Yes*	Federal: State:	Species of concern Endangered	Global: State:	G3T2 S1.1	List: Code:	1B 233
ERIOGONUM HEERMANNII VAR FLOCCOSUM CLARK MOUNTAIN BUCKWHEAT PDPGN082P3	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3 S3.3	List: Code:	4 113
ERIOGONUM HEERMANNII VAR OCCIDENTALE WESTERN HEERMANN'S BUCKWHEAT PDPGN082P6	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3 S3.2	List: Code:	4 123
ERIOGONUM HIRTELLUM KLAMATH MOUNTAIN BUCKWHEAT PDPGN082T0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2 S2.2	List: Code:	1B 213
ERIOGONUM HOFFMANNII VAR HOFFMANNII HOFFMANN'S BUCKWHEAT PDPGN082V1	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4T3 S3.3	List: Code:	4 113
ERIOGONUM HOFFMANNII VAR ROBUSTIUS ROBUST HOFFMANN'S BUCKWHEAT PDPGN082V2	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4T3 S3.3	List: Code:	4 113
ERIOGONUM INTRAFRACTUM JOINTED BUCKWHEAT PDPGN08360	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G3 S3.3	List: Code:	4 113
ERIOGONUM KELLOGGII KELLOGG'S BUCKWHEAT PDPGN083A0	Records in NDDB: *Yes*	Federal: State:	Candidate Endangered	Global: State:	G1 S1.2	List: Code:	1B 333
ERIOGONUM KENNEDYI VAR ALPIGENUM SOUTHERN ALPINE BUCKWHEAT PDPGN083B1	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4T2 S2.3	List: Code:	1B 213
ERIOGONUM KENNEDYI VAR AUSTROMONTANUM SOUTHERN MOUNTAIN BUCKWHEAT PDPGN083B2	Records in NDDB: *Yes*	Federal: State:	Threatened None	Global: State:	G4T2 S2.2	List: Code:	1B 223
ERIOGONUM KENNEDYI VAR PINICOLA KERN BUCKWHEAT PDPGN083B4	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G4T1 S1.1	List: Code:	1B 333
ERIOGONUM LIBERTINI DUBAKELLA MOUNTAIN BUCKWHEAT PDPGN083M0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.2	List: Code:	4 123
ERIOGONUM LUTEOLUM VAR CANINUM TIBURON BUCKWHEAT PDPGN083S1	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3Q S3.2	List: Code:	3 ?23

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ERIOGONUM MICROTHECUM VAR CORYMBOSOIDES SAN BERNARDINO BUCKWHEAT PDPGN083W3	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 113
ERIOGONUM MICROTHECUM VAR JOHNSTONII JOHNSTON'S BUCKWHEAT PDPGN083W5	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.3	**List:** **Code:**	1B 313
ERIOGONUM MICROTHECUM VAR LAPIDICOLA INYO MOUNTAINS BUCKWHEAT PDPGN083W6	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 112
ERIOGONUM MICROTHECUM VAR PANAMINTENSE PANAMINT MOUNTAINS BUCKWHEAT PDPGN083W9	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T2 S2.3	**List:** **Code:**	1B 313
ERIOGONUM NERVULOSUM SNOW MOUNTAIN BUCKWHEAT PDPGN08440	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
ERIOGONUM NORTONII PINNACLES BUCKWHEAT PDPGN08470	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 213
ERIOGONUM NUDUM VAR DECURRENS BEN LOMOND BUCKWHEAT PDPGN08492	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S2.1	**List:** **Code:**	1B 333
ERIOGONUM NUDUM VAR INDICTUM PROTRUDING BUCKWHEAT PDPGN08494	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 123
ERIOGONUM NUDUM VAR MURINUM MOUSE BUCKWHEAT PDPGN08495	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 223
ERIOGONUM NUDUM VAR PARALINUM DEL NORTE BUCKWHEAT PDPGN08498	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4? S2?	**List:** **Code:**	2 221
ERIOGONUM NUDUM VAR REGIRIVUM KINGS RIVER BUCKWHEAT PDPGN0849F	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 323
ERIOGONUM NUTANS NODDING BUCKWHEAT PDPGN084B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S2.2	**List:** **Code:**	2 211
ERIOGONUM OCHROCEPHALUM VAR ALEXANDERAE ALEXANDER'S BUCKWHEAT PDPGN084C5	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4?T3 S2?	**List:** **Code:**	2 321
ERIOGONUM OVALIFOLIUM VAR EXIMIUM BROWN-MARGINED BUCKWHEAT PDPGN084FD	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 111
ERIOGONUM OVALIFOLIUM VAR VINEUM CUSHENBURY BUCKWHEAT PDPGN084F8	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ERIOGONUM PENDULUM		Federal:	None	Global:	G4	List:	2
WALDO BUCKWHEAT		State:	None	State:	S2.2	Code:	321
PDPGN084Q0	Records in NDDB: *Yes*						
ERIOGONUM POLYPODUM		Federal:	None	Global:	G3	List:	4
TULARE COUNTY BUCKWHEAT		State:	None	State:	S3.3	Code:	113
PDPGN084U0	Records in NDDB: *No*						
ERIOGONUM PRATTENIANUM VAR AVIUM		Federal:	None	Global:	G4T3	List:	4
KETTLE DOME BUCKWHEAT		State:	None	State:	S3.2	Code:	123
PDPGN084V1	Records in NDDB: *No*						
ERIOGONUM PROCIDUUM		Federal:	Species of concern	Global:	G3	List:	1B
PROSTRATE BUCKWHEAT		State:	None	State:	S2.2	Code:	222
PDPGN084W0	Records in NDDB: *Yes*						
ERIOGONUM PUBERULUM		Federal:	None	Global:	G3?	List:	2
DOWNY BUCKWHEAT		State:	None	State:	S1.3	Code:	311
PDPGN084X0	Records in NDDB: *Yes*						
ERIOGONUM SHOCKLEYI VAR SHOCKLEYI		Federal:	None	Global:	G5T4?	List:	4
SHOCKLEY'S BUCKWHEAT		State:	None	State:	S3.3	Code:	111
PDPGN085E2	Records in NDDB: *No*						
ERIOGONUM SISKIYOUENSE		Federal:	None	Global:	G3	List:	4
SISKIYOU BUCKWHEAT		State:	None	State:	S3.3	Code:	113
PDPGN085F0	Records in NDDB: *No*						
ERIOGONUM STRICTUM VAR GREENEI		Federal:	None	Global:	G5T3	List:	4
GREENE'S BUCKWHEAT		State:	None	State:	S3.3	Code:	113
PDPGN085L3	Records in NDDB: *No*						
ERIOGONUM TEMBLORENSE		Federal:	Species of concern	Global:	G3	List:	4
TEMBLOR BUCKWHEAT		State:	None	State:	S3.3	Code:	113
PDPGN085P0	Records in NDDB: *No*						
ERIOGONUM TERNATUM		Federal:	None	Global:	G4	List:	4
TERNATE BUCKWHEAT		State:	None	State:	S3.3	Code:	112
PDPGN085R0	Records in NDDB: *No*						
ERIOGONUM TRIPODUM		Federal:	None	Global:	G3	List:	4
TRIPOD BUCKWHEAT		State:	None	State:	S3.2	Code:	123
PDPGN085Y0	Records in NDDB: *No*						
ERIOGONUM TRUNCATUM		Federal:	None	Global:	GH	List:	1A
MT. DIABLO BUCKWHEAT		State:	None	State:	SH	Code:	*
PDPGN085Z0	Records in NDDB: *Yes*						
ERIOGONUM TWISSELMANNII		Federal:	Species of concern	Global:	G2	List:	1B
TWISSELMANN'S BUCKWHEAT		State:	Rare	State:	S2.2	Code:	223
PDPGN08610	Records in NDDB: *Yes*						
ERIOGONUM UMBELLATUM VAR GLABERRIMUM		Federal:	None	Global:	G5T2?	List:	2
GREEN BUCKWHEAT		State:	None	State:	S1.2	Code:	311
PDPGN086U2	Records in NDDB: *Yes*						
ERIOGONUM UMBELLATUM VAR HUMISTRATUM		Federal:	None	Global:	G5T3	List:	4
MT. EDDY BUCKWHEAT		State:	None	State:	S3.3	Code:	113
PDPGN086U4	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
ERIOGONUM UMBELLATUM VAR JUNIPORINUM JUNIPER BUCKWHEAT PDPGN086U6 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T3? **State:** S1S2	**List:** 2 **Code:** 311
ERIOGONUM UMBELLATUM VAR MINUS ALPINE SULFUR-FLOWERED BUCKWHEAT PDPGN086U7 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.2	**List:** 4 **Code:** 123
ERIOGONUM UMBELLATUM VAR TORREYANUM DONNER PASS BUCKWHEAT PDPGN086U9 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T2 **State:** S2.2	**List:** 1B **Code:** 323
ERIOGONUM VESTITUM IDRIA BUCKWHEAT PDPGN08640 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3Q **State:** S3.3	**List:** 4 **Code:** 113
ERIOGONUM WRIGHTII VAR OLANCHENSE OLANCHA PEAK BUCKWHEAT PDPGN086D3 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T1 **State:** S1.3	**List:** 1B **Code:** 313
ERIONEURON PILOSUM HAIRY ERIONEURON PMPOA2S020 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S2S3	**List:** 2 **Code:** 211
ERIOPHYLLUM CONGDONII CONGDON'S WOOLLY SUNFLOWER PDAST3N030 **Records in NDDB:** *Yes*	**Federal:** None **State:** Rare	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 213
ERIOPHYLLUM JEPSONII JEPSON'S WOOLLY SUNFLOWER PDAST3N040 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2?	**List:** 4 **Code:** 113
ERIOPHYLLUM LANATUM VAR HALLII FORT TEJON WOOLLY SUNFLOWER PDAST3N058 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T1 **State:** S1.1	**List:** 1B **Code:** 333
ERIOPHYLLUM LANATUM VAR OBOVATUM SOUTHERN SIERRA WOOLLY SUNFLOWER PDAST3N05D **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.3	**List:** 4 **Code:** 113
ERIOPHYLLUM LATILOBUM SAN MATEO WOOLLY SUNFLOWER PDAST3N060 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
ERIOPHYLLUM MOHAVENSE BARSTOW WOOLLY SUNFLOWER PDAST3N070 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
ERIOPHYLLUM NEVINII NEVIN'S WOOLLY SUNFLOWER PDAST3N090 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.3	**List:** 1B **Code:** 213
ERIOPHYLLUM NUBIGENUM YOSEMITE WOOLLY SUNFLOWER PDAST3N0A0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.3	**List:** 1B **Code:** 213
ERYNGIUM ARISTULATUM VAR HOOVERI HOOVER'S BUTTON-CELERY PDAPI0Z043 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G5T1 **State:** S1.1?	**List:** 4 **Code:** 113

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
ERYNGIUM ARISTULATUM VAR PARISHII SAN DIEGO BUTTON-CELERY PDAPI0Z042 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G5T2 **State:** S2.1	**List:** 1B **Code:** 232
ERYNGIUM CONSTANCEI LOCH LOMOND BUTTON-CELERY PDAPI0Z0W0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
ERYNGIUM PINNATISECTUM TUOLUMNE BUTTON-CELERY PDAPI0Z0P0 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 123
ERYNGIUM RACEMOSUM DELTA BUTTON-CELERY PDAPI0Z0S0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Endangered	**Global:** G2Q **State:** S2.1	**List:** 1B **Code:** 233
ERYNGIUM SPINOSEPALUM SPINY-SEPALED BUTTON-CELERY PDAPI0Z0Y0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 323
ERYSIMUM AMMOPHILUM COAST WALLFLOWER PDBRA16010 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
ERYSIMUM CAPITATUM SSP ANGUSTATUM CONTRA COSTA WALLFLOWER PDBRA16052 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G5T1 **State:** S1.1	**List:** 1B **Code:** 333
ERYSIMUM CAPITATUM SSP LOMPOCENSE SAN LUIS OBISPO WALLFLOWER PDBRA160M3 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.2	**List:** 4 **Code:** 123
ERYSIMUM FRANCISCANUM SAN FRANCISCO WALLFLOWER PDBRA160A0 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 123
ERYSIMUM INSULARE SSP INSULARE ISLAND WALLFLOWER PDBRA160D1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3T2 **State:** S2.3	**List:** 1B **Code:** 213
ERYSIMUM INSULARE SSP SUFFRUTESCENS SUFFRUTESCENT WALLFLOWER PDBRA160D2 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3T3 **State:** S3.2	**List:** 4 **Code:** 123
ERYSIMUM MENZIESII SSP EUREKENSE HUMBOLDT BAY WALLFLOWER PDBRA160E2 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G3T1 **State:** S1.1	**List:** 1B **Code:** 333
ERYSIMUM MENZIESII SSP MENZIESII MENZIES'S WALLFLOWER PDBRA160E1 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G3T2 **State:** S2.1	**List:** 1B **Code:** 333
ERYSIMUM MENZIESII SSP YADONII YADON'S WALLFLOWER PDBRA160E4 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G3T1 **State:** S1.1	**List:** 1B **Code:** 323
ERYSIMUM TERETIFOLIUM SANTA CRUZ WALLFLOWER PDBRA160N0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G2 **State:** S2.1	**List:** 1B **Code:** 233

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ERYTHRONIUM CITRINUM VAR CITRINUM		**Federal:**	None	**Global:**	G4T4	**List:**	4
LEMON-COLORED FAWN LILY		**State:**	None	**State:**	S3.3	**Code:**	111
PMLIL0U041	**Records in NDDB:** *No*						
ERYTHRONIUM CITRINUM VAR RODERICKII		**Federal:**	None	**Global:**	G4T1	**List:**	1B
SCOTT MOUNTAINS FAWN LILY		**State:**	None	**State:**	S1.3	**Code:**	313
PMLIL0U042	**Records in NDDB:** *Yes*						
ERYTHRONIUM HELENAE		**Federal:**	None	**Global:**	G3	**List:**	4
ST. HELENA FAWN LILY		**State:**	None	**State:**	S3.2	**Code:**	123
PMLIL0U060	**Records in NDDB:** *No*						
ERYTHRONIUM HENDERSONII		**Federal:**	None	**Global:**	G4	**List:**	2
HENDERSON'S FAWN LILY		**State:**	None	**State:**	S1.3	**Code:**	311
PMLIL0U070	**Records in NDDB:** *Yes*						
ERYTHRONIUM HOWELLII		**Federal:**	None	**Global:**	G3	**List:**	4
HOWELL'S FAWN LILY		**State:**	None	**State:**	S2.2	**Code:**	112
PMLIL0U080	**Records in NDDB:** *No*						
ERYTHRONIUM KLAMATHENSE		**Federal:**	None	**Global:**	G4	**List:**	4
KLAMATH FAWN LILY		**State:**	None	**State:**	S3.3	**Code:**	111
PMLIL0U090	**Records in NDDB:** *No*						
ERYTHRONIUM PLURIFLORUM		**Federal:**	None	**Global:**	G1	**List:**	1B
SHUTEYE PEAK FAWN LILY		**State:**	None	**State:**	S1.3	**Code:**	213
PMLIL0U0Q0	**Records in NDDB:** *Yes*						
ERYTHRONIUM PUSATERII		**Federal:**	None	**Global:**	G2	**List:**	1B
KAWEAH FAWN LILY		**State:**	None	**State:**	S2.3	**Code:**	313
PMLIL0U0R0	**Records in NDDB:** *Yes*						
ERYTHRONIUM TAYLORI		**Federal:**	None	**Global:**	G1	**List:**	
PILOT RIDGE FAWN LILY		**State:**	None	**State:**	S1.1	**Code:**	
PMLIL0U0S0	**Records in NDDB:** *No*						
ERYTHRONIUM TUOLUMNENSE		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
TUOLUMNE FAWN LILY		**State:**	None	**State:**	S2.2	**Code:**	223
PMLIL0U0H0	**Records in NDDB:** *Yes*						
ESCHSCHOLZIA HYPECOIDES		**Federal:**	None	**Global:**	G3	**List:**	4
SAN BENITO POPPY		**State:**	None	**State:**	S3.3	**Code:**	113
PDPAP0A060	**Records in NDDB:** *No*						
ESCHSCHOLZIA LEMMONII SSP KERNENSIS		**Federal:**	None	**Global:**	G5T1	**List:**	1B
TEJON POPPY		**State:**	None	**State:**	S1.1?	**Code:**	333
PDPAP0A071	**Records in NDDB:** *Yes*						
ESCHSCHOLZIA MINUTIFLORA SSP TWISSELMANNII		**Federal:**	Species of concern	**Global:**	G5T2	**List:**	1B
RED ROCK POPPY		**State:**	None	**State:**	S2.2	**Code:**	323
PDPAP0A093	**Records in NDDB:** *Yes*						
ESCHSCHOLZIA PROCERA		**Federal:**	Species of concern	**Global:**	G1G2Q	**List:**	3
KERNVILLE POPPY		**State:**	None	**State:**	S1S2	**Code:**	??3
PDPAP0A0B0	**Records in NDDB:** *No*						
ESCHSCHOLZIA RAMOSA		**Federal:**	None	**Global:**	G3	**List:**	4
ISLAND POPPY		**State:**	None	**State:**	S3.3	**Code:**	112
PDPAP0A0C0	**Records in NDDB:** *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ESCHSCHOLZIA RHOMBIPETALA DIAMOND-PETALED CALIFORNIA POPPY PDPAP0A0D0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1A *
ESCOBARIA VIVIPARA VAR ALVERSONII FOXTAIL CACTUS PDCAC0X0G0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T3 S2.2	**List:** **Code:**	1B 222
ESCOBARIA VIVIPARA VAR ROSEA VIVIPAROUS FOXTAIL CACTUS PDCAC0X0G8	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S2.2	**List:** **Code:**	1B 322
EUCNIDE RUPESTRIS ROCK NETTLE PDLOA02020	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S2.2?	**List:** **Code:**	2 321
EUPHORBIA EXSTIPULATA VAR EXSTIPULATA CLARK MOUNTAIN SPURGE PDEUP0Q0P1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T5? S1.3	**List:** **Code:**	2 331
EUPHORBIA MISERA CLIFF SPURGE PDEUP0Q1B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.2	**List:** **Code:**	2 221
FENDLERELLA UTAHENSIS YERBA DESIERTO PDHDR08010	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
FEROCACTUS VIRIDESCENS SAN DIEGO BARREL CACTUS PDCAC08060	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4 S3.1	**List:** **Code:**	2 131
FIMBRISTYLIS THERMALIS HOT SPRINGS FIMBRISTYLIS PMCYP0B0N0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S2.2	**List:** **Code:**	2 221
FRANKENIA PALMERI PALMER'S FRANKENIA PDFRA01040	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3G4 S1.1	**List:** **Code:**	2 331
FREMONTODENDRON DECUMBENS PINE HILL FLANNELBUSH PDSTE03030	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Rare	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
FREMONTODENDRON MEXICANUM MEXICAN FLANNELBUSH PDSTE03020	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Rare	**Global:** **State:**	G2 S1.2	**List:** **Code:**	1B 322
FRITILLARIA AFFINIS VAR TRISTULIS MARIN CHECKER LILY PMLIL0V0P1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333
FRITILLARIA AGRESTIS STINKBELLS PMLIL0V010	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
FRITILLARIA BIFLORA VAR INEZIANA HILLSBOROUGH CHOCOLATE LILY PMLIL0V031	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3G4T1 S1.1	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
FRITILLARIA BRANDEGEI GREENHORN FRITILLARY PMLIL0V040	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 123
FRITILLARIA EASTWOODIAE BUTTE COUNTY FRITILLARY PMLIL0V060	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3Q S3.2	**List:** **Code:**	1B 223
FRITILLARIA FALCATA TALUS FRITILLARY PMLIL0V070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 333
FRITILLARIA LILIACEA FRAGRANT FRITILLARY PMLIL0V0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 123
FRITILLARIA OJAIENSIS OJAI FRITILLARY PMLIL0V0N0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
FRITILLARIA PLURIFLORA ADOBE-LILY PMLIL0V0F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 123
FRITILLARIA PURDYI PURDY'S FRITILLARY PMLIL0V0H0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 113
FRITILLARIA RODERICKII RODERICK'S FRITILLARY PMLIL0V0M0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None Endangered	**Global:** **State:**	G1Q S1.1	**List:** **Code:**	1B 323
FRITILLARIA STRIATA STRIPED ADOBE-LILY PMLIL0V0K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Threatened	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 333
FRITILLARIA VIRIDEA SAN BENITO FRITILLARY PMLIL0V0L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
GALIUM ANDREWSII SSP GATENSE SERPENTINE BEDSTRAW PDRUB0N032	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 123
GALIUM ANGUSTIFOLIUM SSP BORREGOENSE BORREGO BEDSTRAW PDRUB0N042	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G5T2 S2.3	**List:** **Code:**	1B 323
GALIUM ANGUSTIFOLIUM SSP GABRIELENSE SAN ANTONIO CANYON BEDSTRAW PDRUB0N044	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 113
GALIUM ANGUSTIFOLIUM SSP GRACILLIMUM SLENDER BEDSTRAW PDRUB0N04B	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 123
GALIUM ANGUSTIFOLIUM SSP JACINTICUM SAN JACINTO MOUNTAINS BEDSTRAW PDRUB0N04C	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T1 S1.3	**List:** **Code:**	1B 313

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
GALIUM ANGUSTIFOLIUM SSP ONYCENSE		Federal:	None	Global:	G5T3	List:	4
ONYX PEAK BEDSTRAW		State:	None	State:	S3.3	Code:	113
PDRUB0N048	Records in NDDB: *No*						
GALIUM BUXIFOLIUM		Federal:	Endangered	Global:	G2	List:	1B
BOX BEDSTRAW		State:	Rare	State:	S2.2	Code:	323
PDRUB0N0D0	Records in NDDB: *Yes*						
GALIUM CALIFORNICUM SSP LUCIENSE		Federal:	Species of concern	Global:	G5T2	List:	1B
CONE PEAK BEDSTRAW		State:	None	State:	S2.3	Code:	313
PDRUB0N0E3	Records in NDDB: *Yes*						
GALIUM CALIFORNICUM SSP MIGUELENSE		Federal:	None	Global:	G5T3	List:	4
SAN MIGUEL ISLAND BEDSTRAW		State:	None	State:	S3.2	Code:	123
PDRUB0N0E5	Records in NDDB: *No*						
GALIUM CALIFORNICUM SSP PRIMUM		Federal:	Species of concern	Global:	G5T1	List:	1B
CALIFORNIA BEDSTRAW		State:	None	State:	S1.1	Code:	323
PDRUB0N0E6	Records in NDDB: *Yes*						
GALIUM CALIFORNICUM SSP SIERRAE		Federal:	Endangered	Global:	G5T1	List:	1B
EL DORADO BEDSTRAW		State:	Rare	State:	S1.2	Code:	323
PDRUB0N0E7	Records in NDDB: *Yes*						
GALIUM CATALINENSE SSP ACRISPUM		Federal:	Species of concern	Global:	G4T2	List:	1B
SAN CLEMENTE ISLAND BEDSTRAW		State:	Endangered	State:	S2.2	Code:	323
PDRUB0N0F1	Records in NDDB: *Yes*						
GALIUM CATALINENSE SSP CATALINENSE		Federal:	None	Global:	G4T3	List:	4
SANTA CATALINA ISLAND BEDSTRAW		State:	None	State:	S3.2	Code:	123
PDRUB0N0F2	Records in NDDB: *No*						
GALIUM CLEMENTIS		Federal:	None	Global:	G3	List:	4
SANTA LUCIA BEDSTRAW		State:	None	State:	S3.3	Code:	113
PDRUB0N0H0	Records in NDDB: *No*						
GALIUM CLIFTONSMITHII		Federal:	None	Global:	G3	List:	4
SANTA BARBARA BEDSTRAW		State:	None	State:	S3.3	Code:	113
PDRUB0N0J0	Records in NDDB: *No*						
GALIUM GLABRESCENS SSP MODOCENSE		Federal:	None	Global:	G4?T2	List:	1B
MODOC BEDSTRAW		State:	None	State:	S2.2	Code:	223
PDRUB0N0T2	Records in NDDB: *Yes*						
GALIUM GRANDE		Federal:	Species of concern	Global:	G1	List:	1B
SAN GABRIEL BEDSTRAW		State:	None	State:	S1.2	Code:	313
PDRUB0N0V0	Records in NDDB: *Yes*						
GALIUM HARDHAMIAE		Federal:	None	Global:	G2	List:	1B
HARDHAM'S BEDSTRAW		State:	None	State:	S2.3	Code:	213
PDRUB0N0Y0	Records in NDDB: *Yes*						
GALIUM HILENDIAE SSP CARNEUM		Federal:	None	Global:	G4T3	List:	4
PANAMINT MOUNTAINS BEDSTRAW		State:	None	State:	S3.3	Code:	113
PDRUB0N0Z1	Records in NDDB: *No*						
GALIUM HILENDIAE SSP KINGSTONENSE		Federal:	Species of concern	Global:	G4T2	List:	1B
KINGSTON MOUNTAINS BEDSTRAW		State:	None	State:	S1.3	Code:	312
PDRUB0N0Z3	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code	Listing Status		Rank		CNPS	
GALIUM HYPOTRICHIUM SSP TOMENTELLUM	Federal:	None	Global:	G5T1	List:	1B
TELESCOPE PEAK BEDSTRAW	State:	None	State:	S1.3	Code:	313
PDRUB0N126 **Records in NDDB:** *Yes*						
GALIUM JEPSONII	Federal:	None	Global:	G3	List:	4
JEPSON'S BEDSTRAW	State:	None	State:	S3.3	Code:	113
PDRUB0N130 **Records in NDDB:** *No*						
GALIUM JOHNSTONII	Federal:	None	Global:	G3	List:	4
JOHNSTON'S BEDSTRAW	State:	None	State:	S3.3	Code:	113
PDRUB0N140 **Records in NDDB:** *No*						
GALIUM MUNZII	Federal:	None	Global:	G5	List:	4
MUNZ'S BEDSTRAW	State:	None	State:	S3.3	Code:	111
PDRUB0N1G0 **Records in NDDB:** *No*						
GALIUM NUTTALLII SSP INSULARE	Federal:	None	Global:	G5?T3	List:	4
NUTTALL'S ISLAND BEDSTRAW	State:	None	State:	S3.3	Code:	113
PDRUB0N1K1 **Records in NDDB:** *No*						
GALIUM OREGANUM	Federal:	None	Global:	G4	List:	3
OREGON BEDSTRAW	State:	None	State:	S2S3	Code:	3?1
PDRUB0N1N0 **Records in NDDB:** *No*						
GALIUM SERPENTICUM SSP SCOTTICUM	Federal:	None	Global:	G4G5T2	List:	1B
SCOTT MOUNTAIN BEDSTRAW	State:	None	State:	S2.2	Code:	223
PDRUB0N1Y6 **Records in NDDB:** *Yes*						
GALIUM SERPENTICUM SSP WARNERENSE	Federal:	None	Global:	G4G5T1	List:	1B
WARNER MOUNTAINS BEDSTRAW	State:	None	State:	S1.2	Code:	322
PDRUB0N1Y8 **Records in NDDB:** *Yes*						
GALIUM WRIGHTII	Federal:	None	Global:	G3G4	List:	2
WRIGHT'S BEDSTRAW	State:	None	State:	S1.3	Code:	311
PDRUB0N2F0 **Records in NDDB:** *Yes*						
GALVEZIA SPECIOSA	Federal:	Species of concern	Global:	G2	List:	1B
ISLAND SNAPDRAGON	State:	None	State:	S2.2	Code:	222
PDSCR2H010 **Records in NDDB:** *Yes*						
GENTIANA AFFINIS VAR PARVIDENTATA	Federal:	None	Global:	G4T3?Q	List:	3
SMALL-TOOTHED PRAIRIE GENTIAN	State:	None	State:	S1S2	Code:	??1
PDGEN06013 **Records in NDDB:** *No*						
GENTIANA FREMONTII	Federal:	None	Global:	G4	List:	2
MOSS GENTIAN	State:	None	State:	S2.3	Code:	311
PDGEN060Y0 **Records in NDDB:** *Yes*						
GENTIANA PLURISETOSA	Federal:	Species of concern	Global:	G3	List:	4
KLAMATH GENTIAN	State:	None	State:	S3.3	Code:	112
PDGEN060V0 **Records in NDDB:** *No*						
GENTIANA PROSTRATA	Federal:	None	Global:	G4	List:	4
PYGMY GENTIAN	State:	None	State:	S3.3	Code:	111
PDGEN060M0 **Records in NDDB:** *No*						
GENTIANA SETIGERA	Federal:	Species of concern	Global:	G2	List:	1B
MENDOCINO GENTIAN	State:	None	State:	S1.2	Code:	332
PDGEN060S0 **Records in NDDB:** *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
GERAEA VISCIDA STICKY GERAEA PDAST42020	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3 S2.3?	List: Code:	2 211
GEUM ALEPPICUM ALEPPO AVENS PDROS0S010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S2.2?	List: Code:	2 321
GILIA CARUIFOLIA CARAWAY-LEAVED GILIA PDPLM040C0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4? S3.3	List: Code:	4 111
GILIA LATIFLORA SSP CUYAMENSIS CUYAMA GILIA PDPLM040T2	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5?T3 S3.3	List: Code:	4 113
GILIA MACULATA LITTLE SAN BERNARDINO MOUNTAINS GILIA PDPLM041Y0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.1	List: Code:	1B 323
GILIA NEVINII NEVIN'S GILIA PDPLM04160	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 112
GILIA RIPLEYI RIPLEY'S GILIA PDPLM041E0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2G3 S1.3	List: Code:	2 311
GILIA TENUIFLORA SSP ARENARIA SAND GILIA PDPLM041P2	Records in NDDB: *Yes*	Federal: State:	Endangered Threatened	Global: State:	G3T2 S2.2	List: Code:	1B 323
GILIA TENUIFLORA SSP HOFFMANNII HOFFMANN'S SLENDER-FLOWERED GILIA PDPLM041P3	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G3T1 S1.3	List: Code:	1B 313
GILMANIA LUTEOLA GOLDEN CARPET PDPGN0A010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G1 S1.3	List: Code:	1B 313
GITHOPSIS DIFFUSA SSP FILICAULIS MISSION CANYON BLUECUP PDCAM07023	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G5T3T4 S1.1	List: Code:	1B 332
GLOSSOPETALON PUNGENS PUNGENT GLOSSOPETALON PDCRO04020	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G5T3 S1.2	List: Code:	1B 322
GLYCERIA GRANDIS AMERICAN MANNA GRASS PMPOA2Y080	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.3?	List: Code:	2 311
GOODMANIA LUTEOLA GOLDEN GOODMANIA PDPGN0B010	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.2	List: Code:	4 122
GRAPHIS SAXORUM BAJA ROCK LICHEN NLTES29470	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G1 S1.2?	List: Code:	

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
GRATIOLA HETEROSEPALA BOGGS LAKE HEDGE-HYSSOP PDSCR0R060	**Records in NDDB:** *Yes*	**Federal:** **State:**	None Endangered	**Global:** **State:**	G3 S3.2	**List:** **Code:**	1B 122
GRINDELIA FRAXINO-PRATENSIS ASH MEADOWS GUMPLANT PDAST47080	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2 S1.2	**List:** **Code:**	1B 322
GRINDELIA HIRSUTULA VAR HALLII SAN DIEGO GUMPLANT PDAST470D4	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 223
GRINDELIA HIRSUTULA VAR MARITIMA SAN FRANCISCO GUMPLANT PDAST470D3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T2 S2.1	**List:** **Code:**	1B 223
GRINDELIA STRICTA VAR ANGUSTIFOLIA MARSH GUMPLANT PDAST470Y2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4?T3 S3.3	**List:** **Code:**	4 113
HACKELIA AMETHYSTINA AMETHYST STICKSEED PDBOR0G010	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
HACKELIA BREVICULA POISON CANYON STICKSEED PDBOR0G040	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 313
HACKELIA CUSICKII CUSICK'S STICKSEED PDBOR0G090	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5? S3.3	**List:** **Code:**	4 111
HACKELIA SHARSMITHII SHARSMITH'S STICKSEED PDBOR0G0Q0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3? S3.3	**List:** **Code:**	2 211
HALIMOLOBOS VIRGATA VIRGATE HALIMOLOBOS PDBRA1A040	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S1.3?	**List:** **Code:**	2 311
HARPAGONELLA PALMERI PALMER'S GRAPPLINGHOOK PDBOR0H010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4 S3.1	**List:** **Code:**	2 121
HAZARDIA CANA SAN CLEMENTE ISLAND HAZARDIA PDAST4H020	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 322
HAZARDIA DETONSA ISLAND HAZARDIA PDAST4H030	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
HAZARDIA ORCUTTII ORCUTT'S HAZARDIA PDAST4H070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1G2 S1.1	**List:** **Code:**	1B 332
HELIANTHELLA CASTANEA DIABLO HELIANTHELLA PDAST4M020	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
HELIANTHEMUM GREENEI ISLAND RUSH-ROSE PDCIS02090	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
HELIANTHEMUM SUFFRUTESCENS BISBEE PEAK RUSH-ROSE PDCIS020F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2Q S2.2	**List:** **Code:**	3 223
HELIANTHUS EXILIS SERPENTINE SUNFLOWER PDAST4N1J0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.2	**List:** **Code:**	4 123
HELIANTHUS NIVEUS SSP TEPHRODES ALGODONES DUNES SUNFLOWER PDAST4N0Z2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G4T3 S1.2	**List:** **Code:**	1B 322
HELIANTHUS NUTTALLII SSP PARISHII LOS ANGELES SUNFLOWER PDAST4N102	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5TH SH	**List:** **Code:**	1A *
HEMIZONIA ARIDA RED ROCK TARPLANT PDAST4R010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
HEMIZONIA CLEMENTINA ISLAND TARPLANT PDAST4R040	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
HEMIZONIA CONGESTA SSP CALYCULATA MENDOCINO TARPLANT PDAST4R030	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 113
HEMIZONIA CONGESTA SSP LEUCOCEPHALA HAYFIELD TARPLANT PDAST4R0V0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2T3 S2S3	**List:** **Code:**	3 ??3
HEMIZONIA CONGESTA SSP TRACYI TRACY'S TARPLANT PDAST4R0H3	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 113
HEMIZONIA CONJUGENS OTAY TARPLANT PDAST4R070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 332
HEMIZONIA FLORIBUNDA TECATE TARPLANT PDAST4R0B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S2.2	**List:** **Code:**	1B 222
HEMIZONIA HALLIANA HALL'S TARPLANT PDAST4R0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
HEMIZONIA INCRESCENS SSP VILLOSA GAVIOTA TARPLANT PDAST4R0U3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Proposed Endangered Endangered	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333
HEMIZONIA MINTHORNII SANTA SUSANA TARPLANT PDAST4R0J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
HEMIZONIA MOHAVENSIS MOJAVE TARPLANT PDAST4R0K0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1A **Code:** *
HEMIZONIA PARRYI SSP AUSTRALIS SOUTHERN TARPLANT PDAST4R020 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T2 **State:** S2.1	**List:** 1B **Code:** 332
HEMIZONIA PARRYI SSP CONGDONII CONGDON'S TARPLANT PDAST4R0P1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T1 **State:** S1.1	**List:** 1B **Code:** 333
HEMIZONIA PUNGENS SSP LAEVIS SMOOTH TARPLANT PDAST4R0E0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T2 **State:** S2.1	**List:** 1B **Code:** 233
HERISSANTIA CRISPA CURLY HERISSANTIA PDMAL0F010 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S1.3?	**List:** 2 **Code:** 311
HESPEREVAX SPARSIFLORA VAR BREVIFOLIA SHORT-LEAVED EVAX PDASTE5011 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.2	**List:** 4 **Code:** 121
HESPEROLINON ADENOPHYLLUM GLANDULAR WESTERN FLAX PDLIN01010 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
HESPEROLINON BICARPELLATUM TWO-CARPELLATE WESTERN FLAX PDLIN01020 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
HESPEROLINON BREWERI BREWER'S WESTERN FLAX PDLIN01030 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
HESPEROLINON CONGESTUM MARIN WESTERN FLAX PDLIN01060 **Records in NDDB:** *Yes*	**Federal:** Threatened **State:** Threatened	**Global:** G2 **State:** S2.1	**List:** 1B **Code:** 333
HESPEROLINON DIDYMOCARPUM LAKE COUNTY WESTERN FLAX PDLIN01070 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Endangered	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 323
HESPEROLINON DRYMARIOIDES DRYMARIA-LIKE WESTERN FLAX PDLIN01090 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 323
HESPEROLINON SP NOV "SERPENTINUM" NAPA WESTERN FLAX PDLIN010D0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 323
HESPEROLINON TEHAMENSE TEHAMA COUNTY WESTERN FLAX PDLIN010C0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.3	**List:** 1B **Code:** 313
HETEROTHECA SHEVOCKII SHEVOCK'S HAIRY GOLDEN-ASTER PDAST4V0T0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2 **State:** S2.3	**List:** 1B **Code:** 213

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
HEUCHERA ABRAMSII ABRAMS'S ALUMROOT PDSAX0E010	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
HEUCHERA BREVISTAMINEA LAGUNA MOUNTAINS ALUMROOT PDSAX0E050	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 313
HEUCHERA CHLORANTHA GREEN-FLOWERED ALUMROOT PDSAX0E080	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4G5 SH	**List:** **Code:**	2 311
HEUCHERA DURANII DURAN'S ALUMROOT PDSAX0E0A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S2.3	**List:** **Code:**	1B 212
HEUCHERA ELEGANS URN-FLOWERED ALUMROOT PDSAX0E0C0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
HEUCHERA HIRSUTISSIMA SHAGGY-HAIRED ALUMROOT PDSAX0E0J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 313
HEUCHERA MAXIMA ISLAND ALUMROOT PDSAX0E0M0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
HEUCHERA PARISHII PARISH'S ALUMROOT PDSAX0E0S0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 213
HEUCHERA RUBESCENS VAR VERSICOLOR SAN DIEGO COUNTY ALUMROOT PDSAX0E106	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2T3 S1.3?	**List:** **Code:**	2 311
HIBISCUS LASIOCARPUS ROSE-MALLOW PDMAL0H0Q0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S2.2	**List:** **Code:**	2 221
HIEROCHLOE ODORATA VANILLA-GRASS PMPOA35040	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S1.3?	**List:** **Code:**	2 311
HOLOCARPHA MACRADENIA SANTA CRUZ TARPLANT PDAST4X020	**Records in NDDB:** *Yes*	**Federal:** **State:**	Proposed Threatened Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 233
HOLOCARPHA VIRGATA SSP ELONGATA GRACEFUL TARPLANT PDAST4X041	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 123
HORDEUM INTERCEDENS VERNAL BARLEY PMPOA380E0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G? S3S4	**List:** **Code:**	3 ?22
HORKELIA BOLANDERI BOLANDER'S HORKELIA PDROS0W010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
HORKELIA CONGESTA SSP NEMOROSA JOSEPHINE HORKELIA PDROS0W032	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4? S1.1	**List:** **Code:**	2 331
HORKELIA CUNEATA SSP SERICEA KELLOGG'S HORKELIA PDROS0W043	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 333
HORKELIA HENDERSONII HENDERSON'S HORKELIA PDROS0W090	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1G2 S1.1	**List:** **Code:**	1B 332
HORKELIA HISPIDULA WHITE MOUNTAINS HORKELIA PDROS0W0A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 313
HORKELIA MARINENSIS POINT REYES HORKELIA PDROS0W0B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 313
HORKELIA PARRYI PARRY'S HORKELIA PDROS0W0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
HORKELIA SERICATA HOWELL'S HORKELIA PDROS0W0D0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5? S3.3	**List:** **Code:**	4 111
HORKELIA TENUILOBA THIN-LOBED HORKELIA PDROS0W0E0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
HORKELIA TRUNCATA RAMONA HORKELIA PDROS0W0G0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S2.3	**List:** **Code:**	1B 312
HORKELIA TULARENSIS KERN PLATEAU HORKELIA PDROS0W0H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
HORKELIA WILDERAE BARTON FLATS HORKELIA PDROS0W0J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
HORKELIA YADONII SANTA LUCIA HORKELIA PDROS0W0K0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
HOWELLIA AQUATILIS WATER HOWELLIA PDCAM0A010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened None	**Global:** **State:**	G2 S1.2	**List:** **Code:**	
HULSEA BREVIFOLIA SHORT-LEAVED HULSEA PDAST4Z020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
HULSEA CALIFORNICA SAN DIEGO SUNFLOWER PDAST4Z030	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 213

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
HULSEA MEXICANA MEXICAN HULSEA PDAST4Z050	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3G4 S1.3	List: Code:	2 311
HULSEA VESTITA SSP CALLICARPHA BEAUTIFUL HULSEA PDAST4Z074	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3 S3.2	List: Code:	4 123
HULSEA VESTITA SSP GABRIELENSIS SAN GABRIEL MOUNTAINS SUNFLOWER PDAST4Z075	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3 S3.3	List: Code:	4 113
HULSEA VESTITA SSP INYOENSIS INYO HULSEA PDAST4Z073	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T2T3 S1.2	List: Code:	2 221
HULSEA VESTITA SSP PARRYI PARRY'S SUNFLOWER PDAST4Z076	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3 S3.3	List: Code:	4 113
ILIAMNA BAKERI BAKER'S GLOBE MALLOW PDMAL0K010	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4 S3.3	List: Code:	4 111
ILIAMNA LATIBRACTEATA CALIFORNIA GLOBE MALLOW PDMAL0K040	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 112
IPOMOPSIS EFFUSA BAJA CALIFORNIA IPOMOPSIS PDPLM060U0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3? S1.1	List: Code:	2 331
IPOMOPSIS TENUIFOLIA SLENDER-LEAVED IPOMOPSIS PDPLM060J0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3G4 S2.3?	List: Code:	2 211
IRIS BRACTEATA SISKIYOU IRIS PMIRI09020	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5? S3.3	List: Code:	4 111
IRIS HARTWEGII SSP COLUMBIANA TUOLUMNE IRIS PMIRI090D2	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G?T3 S3.2	List: Code:	4 113
IRIS INNOMINATA DEL NORTE COUNTY IRIS PMIRI090F0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5? S3.3	List: Code:	4 111
IRIS MUNZII MUNZ'S IRIS PMIRI090M0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
IRIS TENAX SSP KLAMATHENSIS ORLEANS IRIS PMIRI090Z2	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G? T3 S3.3	List: Code:	4 113
ISOCOMA ARGUTA CARQUINEZ GOLDENBUSH PDAST57050	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.1	List: Code:	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
ISOCOMA MENZIESII VAR DECUMBENS		**Federal:**	None	**Global:**	G5T3?	**List:**	1B
DECUMBENT GOLDENBUSH		**State:**	None	**State:**	S2.2	**Code:**	222
PDAST57091	**Records in NDDB:** *Yes*						
ISOCOMA MENZIESII VAR DIABOLICA		**Federal:**	None	**Global:**	G5T3	**List:**	4
SATAN'S GOLDENBUSH		**State:**	None	**State:**	S3.2	**Code:**	123
PDAST57092	**Records in NDDB:** *No*						
IVA HAYESIANA		**Federal:**	Species of concern	**Global:**	G3?	**List:**	2
SAN DIEGO MARSH-ELDER		**State:**	None	**State:**	S2.2?	**Code:**	221
PDAST580A0	**Records in NDDB:** *Yes*						
IVESIA APERTA VAR APERTA		**Federal:**	Species of concern	**Global:**	G2T2	**List:**	1B
SIERRA VALLEY IVESIA		**State:**	None	**State:**	S2.2	**Code:**	222
PDROS0X011	**Records in NDDB:** *Yes*						
IVESIA APERTA VAR CANINA		**Federal:**	Species of concern	**Global:**	G2T1	**List:**	1B
DOG VALLEY IVESIA		**State:**	None	**State:**	S1.1	**Code:**	333
PDROS0X012	**Records in NDDB:** *Yes*						
IVESIA ARGYROCOMA		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
SILVER-HAIRED IVESIA		**State:**	None	**State:**	S2.2	**Code:**	222
PDROS0X020	**Records in NDDB:** *Yes*						
IVESIA ARIZONICA VAR ARIZONICA		**Federal:**	None	**Global:**	G4	**List:**	3
YELLOW IVESIA		**State:**	None	**State:**	S2?	**Code:**	??1
PDROS0X0R1	**Records in NDDB:** *Yes*						
IVESIA BAILEYI VAR BAILEYI		**Federal:**	None	**Global:**	G5T4	**List:**	2
BAILEY'S IVESIA		**State:**	None	**State:**	S1.3	**Code:**	321
PDROS0X031	**Records in NDDB:** *Yes*						
IVESIA BAILEYI VAR BENEOLENS		**Federal:**	None	**Global:**	G5T5	**List:**	2
OWYHEE IVESIA		**State:**	None	**State:**	S1.3	**Code:**	311
PDROS0X032	**Records in NDDB:** *Yes*						
IVESIA CALLIDA		**Federal:**	Species of concern	**Global:**	G1	**List:**	1B
TAHQUITZ IVESIA		**State:**	Rare	**State:**	S1.3	**Code:**	313
PDROS0X040	**Records in NDDB:** *Yes*						
IVESIA CAMPESTRIS		**Federal:**	None	**Global:**	G3	**List:**	4
FIELD IVESIA		**State:**	None	**State:**	S3.2	**Code:**	113
PDROS0X050	**Records in NDDB:** *No*						
IVESIA JAEGERI		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
JAEGER'S IVESIA		**State:**	None	**State:**	S1.3	**Code:**	312
PDROS0X080	**Records in NDDB:** *Yes*						
IVESIA KINGII VAR KINGII		**Federal:**	None	**Global:**	G3T2	**List:**	1B
ALKALI IVESIA		**State:**	None	**State:**	S2.2	**Code:**	312
PDROS0X092	**Records in NDDB:** *Yes*						
IVESIA LONGIBRACTEATA		**Federal:**	Species of concern	**Global:**	G1	**List:**	1B
CASTLE CRAGS IVESIA		**State:**	None	**State:**	S1.3	**Code:**	313
PDROS0X0U0	**Records in NDDB:** *Yes*						
IVESIA PANICULATA		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
ASH CREEK IVESIA		**State:**	None	**State:**	S2.2	**Code:**	213
PDROS0X0S0	**Records in NDDB:** *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
IVESIA PATELLIFERA KINGSTON MOUNTAINS IVESIA PDROS0X0Z0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.3	List: Code:	1B 313
IVESIA PICKERINGII PICKERING'S IVESIA PDROS0X0D0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 323
IVESIA SERICOLEUCA PLUMAS IVESIA PDROS0X0K0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 123
IVESIA UNGUICULATA YOSEMITE IVESIA PDROS0X0N0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2 S2.2	List: Code:	1B 323
IVESIA WEBBERI WEBBER'S IVESIA PDROS0X0Q0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.1	List: Code:	1B 332
JAMESIA AMERICANA VAR ROSEA ROSY-PETALLED CLIFFBUSH PDHDR02019	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T3 S3.3	List: Code:	4 112
JEPSONIA HETERANDRA FOOTHILL JEPSONIA PDSAX0J010	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
JEPSONIA MALVIFOLIA ISLAND JEPSONIA PDSAX0J020	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G4 S3.3	List: Code:	4 112
JUGLANS CALIFORNICA SOUTHERN CALIFORNIA BLACK WALNUT PDJUG02020	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.2	List: Code:	4 123
JUGLANS HINDSII NORTHERN CALIFORNIA BLACK WALNUT PDJUG02040	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.1	List: Code:	1B 333
JUNCUS ACUTUS SSP LEOPOLDII SOUTHWESTERN SPINY RUSH PMJUN01051	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T5 S3.2	List: Code:	4 121
JUNCUS DUDLEYI DUDLEY'S RUSH PMJUN01390	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.3	List: Code:	2 311
JUNCUS DURANII DURAN'S RUSH PMJUN013T0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
JUNCUS HEMIENDYTUS VAR ABJECTUS CENTER BASIN RUSH PMJUN011F1	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T4 S3.3	List: Code:	4 111
JUNCUS LEIOSPERMUS VAR AHARTII AHART'S DWARF RUSH PMJUN011L1	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2T1 S1.2	List: Code:	1B 313

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
JUNCUS LEIOSPERMUS VAR LEIOSPERMUS RED BLUFF DWARF RUSH PMJUN011L2	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G2T2 S2.2	List: Code:	1B 323
JUNCUS MARGINATUS VAR MARGINATUS RED-ANTHERED RUSH PMJUN011S1	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T5 S2S3	List: Code:	2 321
JUNCUS NODOSUS KNOTTED RUSH PMJUN01210	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S3.3	List: Code:	4 111
JUNCUS REGELII REGEL'S RUSH PMJUN012D0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4? S1.3?	List: Code:	2 311
JUNCUS SUPINIFORMIS HAIR-LEAVED RUSH PMJUN012R0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4? S3.3	List: Code:	4 112
KOBRESIA BELLARDII SEEP KOBRESIA PMCYP0F050	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3? S1.3	List: Code:	2 311
KOEBERLINIA SPINOSA SSP TENUISPINA CROWN-OF-THORNS PDCPP05012	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4T4 S2.2	List: Code:	2 321
LASTHENIA BURKEI BURKE'S GOLDFIELDS PDAST5L010	Records in NDDB: *Yes*	Federal: State:	Endangered Endangered	Global: State:	G1 S1.1	List: Code:	1B 333
LASTHENIA CONJUGENS CONTRA COSTA GOLDFIELDS PDAST5L040	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G1 S1.1	List: Code:	1B 333
LASTHENIA GLABRATA SSP COULTERI COULTER'S GOLDFIELDS PDAST5L0A1	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G4T3 S2.1	List: Code:	1B 232
LASTHENIA LEPTALEA SALINAS VALLEY GOLDFIELDS PDAST5L0B0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
LATHYRUS BIFLORUS TWO-FLOWERED PEA PDFAB25180	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G1 S1.2	List: Code:	1B 313
LATHYRUS DELNORTICUS DEL NORTE PEA PDFAB25070	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4 S3.3	List: Code:	4 112
LATHYRUS GLANDULOSUS STICKY PEA PDFAB251A0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
LATHYRUS JEPSONII VAR JEPSONII DELTA TULE PEA PDFAB250D2	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G5T2 S2.2	List: Code:	1B 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LATHYRUS PALUSTRIS MARSH PEA PDFAB250P0	Records in NDDB: *Yes*	Federal:	None State: None	Global:	G5 State: S2S3	List:	2 Code: 221
LATHYRUS SPLENDENS PRIDE-OF-CALIFORNIA PDFAB250Z0	Records in NDDB: *No*	Federal:	None State: None	Global:	G3? State: S3.3	List:	4 Code: 112
LATHYRUS SULPHUREUS VAR ARGILLACEUS DUBIOUS PEA PDFAB25101	Records in NDDB: *No*	Federal:	None State: None	Global:	G5T? State: S1S2	List:	3 Code: 3?3
LAVATERA ASSURGENTIFLORA SSP ASSURGENTIFLORA ISLAND MALLOW PDMAL0N021	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G2T1 State: S1.1	List:	1B Code: 333
LAVATERA ASSURGENTIFLORA SSP GLABRA SOUTHERN ISLAND MALLOW PDMAL0N022	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G2T2 State: S2.1	List:	1B Code: 333
LAYIA CARNOSA BEACH LAYIA PDAST5N010	Records in NDDB: *Yes*	Federal:	Endangered State: Endangered	Global:	G1 State: S1.1	List:	1B Code: 333
LAYIA DISCOIDEA RAYLESS LAYIA PDAST5N030	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G2 State: S2.2	List:	1B Code: 233
LAYIA HETEROTRICHA PALE-YELLOW LAYIA PDAST5N070	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G1 State: S1.1	List:	1B Code: 333
LAYIA JONESII JONES'S LAYIA PDAST5N090	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G1 State: S1.2	List:	1B Code: 323
LAYIA LEUCOPAPPA COMANCHE POINT LAYIA PDAST5N0A0	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G1 State: S1.1	List:	1B Code: 333
LAYIA MUNZII MUNZ'S TIDY-TIPS PDAST5N0B0	Records in NDDB: *Yes*	Federal:	None State: None	Global:	G1 State: S1.2	List:	1B Code: 223
LAYIA SEPTENTRIONALIS COLUSA LAYIA PDAST5N0F0	Records in NDDB: *Yes*	Federal:	None State: None	Global:	G2 State: S2.2	List:	1B Code: 223
LEGENERE LIMOSA LEGENERE PDCAM0C010	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G2 State: S2.2	List:	1B Code: 233
LEMBERTIA CONGDONII SAN JOAQUIN WOOLLYTHREADS PDASTA8010	Records in NDDB: *Yes*	Federal:	Endangered State: None	Global:	G3 State: S3.2	List:	1B Code: 323
LEPECHINIA CARDIOPHYLLA HEART-LEAVED PITCHER SAGE PDLAM0V020	Records in NDDB: *Yes*	Federal:	Species of concern State: None	Global:	G2 State: S2.2	List:	1B Code: 322

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LEPECHINIA FRAGRANS FRAGRANT PITCHER SAGE PDLAM0V030	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
LEPECHINIA GANDERI GANDER'S PITCHER SAGE PDLAM0V040	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 312
LEPIDIUM FLAVUM VAR FELIPENSE BORREGO VALLEY PEPPER-GRASS PDBRA1M0B1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 323
LEPIDIUM JAREDII SSP ALBUM PANOCHE PEPPER-GRASS PDBRA1M0G2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1T1 S1.2	**List:** **Code:**	1B 323
LEPIDIUM JAREDII SSP JAREDII JARED'S PEPPER-GRASS PDBRA1M0G1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1T1 S1.2	**List:** **Code:**	1B 323
LEPIDIUM LATIPES VAR HECKARDII HECKARD'S PEPPER-GRASS PDBRA1M0K1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T1 S1.2	**List:** **Code:**	1B 323
LEPIDIUM VIRGINICUM VAR ROBINSONII ROBINSON'S PEPPER-GRASS PDBRA1M114	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2? SH	**List:** **Code:**	1B 322
LEPTODACTYLON CALIFORNICUM SSP TOMENTOSUM FUZZY PRICKLY PHLOX PDPLM08021	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 123
LEPTODACTYLON JAEGERI SAN JACINTO PRICKLY PHLOX PDPLM08030	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
LESQUERELLA KINGII SSP BERNARDINA SAN BERNARDINO MOUNTAINS BLADDERPOD PDBRA1N0W1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333
LESSINGIA ARACHNOIDEA CRYSTAL SPRINGS LESSINGIA PDAST5S0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
LESSINGIA GERMANORUM SAN FRANCISCO LESSINGIA PDAST5S0D0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
LESSINGIA GLANDULIFERA VAR TOMENTOSA WARNER SPRINGS LESSINGIA PDAST5S022	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4?T2? S1.1?	**List:** **Code:**	2 311
LESSINGIA HOLOLEUCA WOOLLY-HEADED LESSINGIA PDAST5S030	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3?	**List:** **Code:**	3 ??3
LESSINGIA MICRADENIA VAR GLABRATA SMOOTH LESSINGIA PDAST5S062	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LESSINGIA MICRADENIA VAR MICRADENIA		Federal:	Species of concern	Global:	G2T1	List:	1B
TAMALPAIS LESSINGIA		State:	None	State:	S1.2	Code:	323
PDAST5S063	Records in NDDB: *Yes*						
LESSINGIA OCCIDENTALIS		Federal:	None	Global:	G3	List:	4
WESTERN LESSINGIA		State:	None	State:	S3.3	Code:	113
PDAST15010	Records in NDDB: *No*						
LESSINGIA TENUIS		Federal:	None	Global:	G3	List:	4
SPRING LESSINGIA		State:	None	State:	S3.3	Code:	113
PDAST5S0B0	Records in NDDB: *No*						
LEWISIA BRACHYCALYX		Federal:	None	Global:	G5	List:	4
SHORT-SEPALED LEWISIA		State:	None	State:	S3.3	Code:	111
PDPOR04010	Records in NDDB: *No*						
LEWISIA CANTELOVII		Federal:	None	Global:	G3	List:	1B
CANTELOW'S LEWISIA		State:	None	State:	S3.2	Code:	223
PDPOR04020	Records in NDDB: *Yes*						
LEWISIA CONGDONII		Federal:	None	Global:	G1	List:	1B
CONGDON'S LEWISIA		State:	Rare	State:	S1.3	Code:	313
PDPOR04040	Records in NDDB: *Yes*						
LEWISIA COTYLEDON VAR HECKNERI		Federal:	Species of concern	Global:	G4T2	List:	1B
HECKNER'S LEWISIA		State:	None	State:	S2.2	Code:	223
PDPOR04052	Records in NDDB: *Yes*						
LEWISIA COTYLEDON VAR HOWELLII		Federal:	Species of concern	Global:	G4T4Q	List:	3
HOWELL'S LEWISIA		State:	None	State:	S3?	Code:	222
PDPOR04053	Records in NDDB: *No*						
LEWISIA DISEPALA		Federal:	None	Global:	G2	List:	1B
YOSEMITE LEWISIA		State:	None	State:	S2.3	Code:	213
PDPOR04060	Records in NDDB: *Yes*						
LEWISIA LONGIPETALA		Federal:	Species of concern	Global:	G2	List:	1B
LONG-PETALED LEWISIA		State:	None	State:	S2.2	Code:	313
PDPOR040K0	Records in NDDB: *Yes*						
LEWISIA OPPOSITIFOLIA		Federal:	None	Global:	G4	List:	1B
OPPOSITE-LEAVED LEWISIA		State:	None	State:	S2.2	Code:	222
PDPOR040B0	Records in NDDB: *Yes*						
LEWISIA SERRATA		Federal:	Species of concern	Global:	G2	List:	1B
SAW-TOOTHED LEWISIA		State:	None	State:	S2.2	Code:	333
PDPOR040E0	Records in NDDB: *Yes*						
LEWISIA STEBBINSII		Federal:	Species of concern	Global:	G1	List:	1B
STEBBINS'S LEWISIA		State:	None	State:	S1.2	Code:	323
PDPOR040G0	Records in NDDB: *Yes*						
LILAEOPSIS MASONII		Federal:	Species of concern	Global:	G3	List:	1B
MASON'S LILAEOPSIS		State:	Rare	State:	S3.2	Code:	223
PDAPI19030	Records in NDDB: *Yes*						
LILIUM BOLANDERI		Federal:	None	Global:	G4	List:	4
BOLANDER'S LILY		State:	None	State:	S3.2	Code:	121
PMLIL1A010	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LILIUM HUMBOLDTII SSP HUMBOLDTII HUMBOLDT LILY PMLIL1A071	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	4 123
LILIUM HUMBOLDTII SSP OCELLATUM OCELLATED HUMBOLDT LILY PMLIL1A072	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	4 123
LILIUM KELLOGGII KELLOGG'S LILY PMLIL1A0A0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 112
LILIUM MARITIMUM COAST LILY PMLIL1A0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 233
LILIUM OCCIDENTALE WESTERN LILY PMLIL1A0G0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 332
LILIUM PARDALINUM SSP PITKINENSE PITKIN MARSH LILY PMLIL1A0H3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 333
LILIUM PARDALINUM SSP VOLLMERI VOLLMER'S LILY PMLIL1A0H2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T4 S3.3	**List:** **Code:**	4 111
LILIUM PARDALINUM SSP WIGGINSII WIGGINS' LILY PMLIL1A0S0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T4 S3.3	**List:** **Code:**	4 112
LILIUM PARRYI LEMON LILY PMLIL1A0J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S2.2	**List:** **Code:**	1B 222
LILIUM RUBESCENS REDWOOD LILY PMLIL1A0N0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
LILIUM WASHINGTONIANUM SSP PURPURASCENS PURPLE-FLOWERED WASHINGTON LILY PMLIL1A0R2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T4 S3.3	**List:** **Code:**	4 111
LIMNANTHES BAKERI BAKER'S MEADOWFOAM PDLIM02020	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
LIMNANTHES DOUGLASII SSP SULPHUREA POINT REYES MEADOWFOAM PDLIM02038	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G4T1 S1.2	**List:** **Code:**	1B 323
LIMNANTHES FLOCCOSA SSP BELLINGERIANA BELLINGER'S MEADOWFOAM PDLIM02041	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T2 S1.2	**List:** **Code:**	1B 322
LIMNANTHES FLOCCOSA SSP CALIFORNICA BUTTE COUNTY MEADOWFOAM PDLIM02042	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LIMNANTHES FLOCCOSA SSP FLOCCOSA		**Federal:**	None	**Global:**	G4T3?	**List:**	2
WOOLLY MEADOWFOAM		**State:**	None	**State:**	S2.2	**Code:**	221
PDLIM02043	**Records in NDDB:** *Yes*						
LIMNANTHES GRACILIS SSP PARISHII		**Federal:**	Species of concern	**Global:**	G3T2	**List:**	1B
PARISH'S MEADOWFOAM		**State:**	Endangered	**State:**	S2.2	**Code:**	223
PDLIM02052	**Records in NDDB:** *Yes*						
LIMNANTHES VINCULANS		**Federal:**	Endangered	**Global:**	G2	**List:**	1B
SEBASTOPOL MEADOWFOAM		**State:**	Endangered	**State:**	S2.1	**Code:**	233
PDLIM02090	**Records in NDDB:** *Yes*						
LIMOSELLA SUBULATA		**Federal:**	None	**Global:**	G4?	**List:**	2
DELTA MUDWORT		**State:**	None	**State:**	S2.1	**Code:**	231
PDSCR10050	**Records in NDDB:** *Yes*						
LINANTHUS ACICULARIS		**Federal:**	None	**Global:**	G3	**List:**	4
BRISTLY LINANTHUS		**State:**	None	**State:**	S3.2	**Code:**	123
PDPLM09010	**Records in NDDB:** *No*						
LINANTHUS AMBIGUUS		**Federal:**	None	**Global:**	G3	**List:**	4
SERPENTINE LINANTHUS		**State:**	None	**State:**	S3.2	**Code:**	123
PDPLM09020	**Records in NDDB:** *No*						
LINANTHUS ARENICOLA		**Federal:**	None	**Global:**	G2?	**List:**	2
SAND LINANTHUS		**State:**	None	**State:**	S2.2	**Code:**	121
PDPLM09040	**Records in NDDB:** *Yes*						
LINANTHUS BELLUS		**Federal:**	None	**Global:**	G2G3	**List:**	2
DESERT BEAUTY		**State:**	None	**State:**	S2.3?	**Code:**	211
PDPLM09070	**Records in NDDB:** *Yes*						
LINANTHUS CONCINNUS		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
SAN GABRIEL LINANTHUS		**State:**	None	**State:**	S2?	**Code:**	323
PDPLM090D0	**Records in NDDB:** *Yes*						
LINANTHUS FLORIBUNDUS SSP HALLII		**Federal:**	None	**Global:**	G4T1	**List:**	1B
SANTA ROSA MOUNTAINS LINANTHUS		**State:**	None	**State:**	S1.3	**Code:**	313
PDPLM090J3	**Records in NDDB:** *Yes*						
LINANTHUS GRANDIFLORUS		**Federal:**	None	**Global:**	G3	**List:**	4
LARGE-FLOWERED LINANTHUS		**State:**	None	**State:**	S3.2	**Code:**	123
PDPLM090K0	**Records in NDDB:** *No*						
LINANTHUS JEPSONII		**Federal:**	None	**Global:**	G1	**List:**	
JEPSON'S LINANTHUS		**State:**	None	**State:**	S1.2	**Code:**	
PDPLM09140	**Records in NDDB:** *Yes*						
LINANTHUS KILLIPII		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
BALDWIN LAKE LINANTHUS		**State:**	None	**State:**	S2.2	**Code:**	223
PDPLM090N0	**Records in NDDB:** *Yes*						
LINANTHUS NUTTALLII SSP HOWELLII		**Federal:**	Species of concern	**Global:**	G5T1	**List:**	1B
MT. TEDOC LINANTHUS		**State:**	None	**State:**	S1.3	**Code:**	313
PDPLM090V4	**Records in NDDB:** *Yes*						
LINANTHUS OBLANCEOLATUS		**Federal:**	None	**Global:**	G3	**List:**	4
SIERRA NEVADA LINANTHUS		**State:**	None	**State:**	S3.3	**Code:**	113
PDPLM090W0	**Records in NDDB:** *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LINANTHUS ORCUTTII ORCUTT'S LINANTHUS PDPLM090X0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4 S2.3	**List:** **Code:**	1B 312
LINANTHUS PYGMAEUS SSP PYGMAEUS PYGMY LINANTHUS PDPLM09102	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2 S1.2	**List:** **Code:**	1B 322
LINANTHUS RATTANII RATTAN'S LINANTHUS PDPLM09110	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
LINANTHUS SERRULATUS MADERA LINANTHUS PDPLM09130	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1?	**List:** **Code:**	1B 223
LISTERA CORDATA HEART-LEAVED TWAYBLADE PMORC1N060	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.2	**List:** **Code:**	4 121
LITHOPHRAGMA MAXIMUM SAN CLEMENTE ISLAND WOODLAND STAR PDSAX0M070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
LOEFLINGIA SQUARROSA VAR ARTEMISIARUM SAGEBRUSH LOEFLINGIA PDCAR0E011	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S2.2	**List:** **Code:**	1B 222
LOMATIUM CILIOLATUM VAR HOOVERI HOOVER'S LOMATIUM PDAPI1B082	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G?T3 S3.3	**List:** **Code:**	4 113
LOMATIUM CONGDONII CONGDON'S LOMATIUM PDAPI1B0B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
LOMATIUM ENGELMANNII ENGELMANN'S LOMATIUM PDAPI1B0K0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 112
LOMATIUM FOENICULACEUM SSP INYOENSE INYO LOMATIUM PDAPI1B0M4	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 111
LOMATIUM HENDERSONII HENDERSON'S LOMATIUM PDAPI1B0T0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5? S2.2	**List:** **Code:**	2 311
LOMATIUM HOWELLII HOWELL'S LOMATIUM PDAPI1B0U0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
LOMATIUM INSULARE SAN NICOLAS ISLAND LOMATIUM PDAPI1B0W0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 222
LOMATIUM MARTINDALEI COAST RANGE LOMATIUM PDAPI1B140	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S2.3	**List:** **Code:**	2 211

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LOMATIUM OBSERVATORIUM		Federal:	None	Global:	G1	List:	
MT. HAMILTON LOMATIUM		State:	None	State:	S1.3	Code:	
PDAPI1B2J0	Records in NDDB: *Yes*						
LOMATIUM PARVIFOLIUM		Federal:	None	Global:	G3	List:	4
SMALL-LEAVED LOMATIUM		State:	None	State:	S3.2?	Code:	123
PDAPI1B1F0	Records in NDDB: *No*						
LOMATIUM PECKIANUM		Federal:	None	Global:	G4	List:	2
PECK'S LOMATIUM		State:	None	State:	S2.2	Code:	221
PDAPI1B1G0	Records in NDDB: *Yes*						
LOMATIUM RAVENII		Federal:	None	Global:	G4	List:	4
RAVEN'S LOMATIUM		State:	None	State:	S3.2	Code:	121
PDAPI1B1L0	Records in NDDB: *Yes*						
LOMATIUM REPOSTUM		Federal:	None	Global:	G3	List:	4
NAPA LOMATIUM		State:	None	State:	S3.3	Code:	113
PDAPI1B1M0	Records in NDDB: *No*						
LOMATIUM RIGIDUM		Federal:	None	Global:	G3	List:	4
STIFF LOMATIUM		State:	None	State:	S3.3	Code:	113
PDAPI1B1N0	Records in NDDB: *No*						
LOMATIUM SHEVOCKII		Federal:	Species of concern	Global:	G1	List:	1B
OWENS PEAK LOMATIUM		State:	None	State:	S1.3	Code:	313
PDAPI1B2C0	Records in NDDB: *Yes*						
LOMATIUM STEBBINSII		Federal:	Species of concern	Global:	G2	List:	1B
STEBBINS'S LOMATIUM		State:	None	State:	S2.2	Code:	323
PDAPI1B1V0	Records in NDDB: *Yes*						
LOMATIUM TRACYI		Federal:	None	Global:	G3	List:	4
TRACY'S LOMATIUM		State:	None	State:	S3.3	Code:	112
PDAPI1B1Y0	Records in NDDB: *No*						
LOTUS ARGOPHYLLUS VAR ADSURGENS		Federal:	Species of concern	Global:	G5T1	List:	1B
SAN CLEMENTE ISLAND BIRD'S-FOOT TREFOIL		State:	Endangered	State:	S1.1	Code:	333
PDFAB2A041	Records in NDDB: *Yes*						
LOTUS ARGOPHYLLUS VAR NIVEUS		Federal:	Species of concern	Global:	G5T2	List:	1B
SANTA CRUZ ISLAND BIRD'S-FOOT TREFOIL		State:	Endangered	State:	S2.2	Code:	223
PDFAB2A048	Records in NDDB: *Yes*						
LOTUS ARGYRAEUS VAR MULTICAULIS		Federal:	None	Global:	G4?T1	List:	1B
SCRUB LOTUS		State:	None	State:	S1.3	Code:	313
PDFAB2A052	Records in NDDB: *Yes*						
LOTUS ARGYRAEUS VAR NOTITIUS		Federal:	None	Global:	G4?T1	List:	1B
PROVIDENCE MOUNTAINS LOTUS		State:	None	State:	S1.3	Code:	213
PDFAB2A053	Records in NDDB: *Yes*						
LOTUS CRASSIFOLIUS VAR OTAYENSIS		Federal:	Species of concern	Global:	G5T1	List:	1B
OTAY MOUNTAIN LOTUS		State:	None	State:	S1.1	Code:	333
PDFAB2A092	Records in NDDB: *Yes*						
LOTUS DENDROIDEUS VAR DENDROIDEUS		Federal:	None	Global:	G4T3	List:	4
ISLAND BROOM		State:	None	State:	S3.2	Code:	123
PDFAB2A1G1	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
LOTUS DENDROIDEUS VAR TRASKIAE SAN CLEMENTE ISLAND LOTUS PDFAB2A1G2 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G4T2 **State:** S2.1	**List:** 1B **Code:** 333
LOTUS DENDROIDEUS VAR VEATCHII SAN MIGUEL ISLAND DEERWEED PDFAB2A1G3 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3? **State:** S3.3	**List:** 4 **Code:** 112
LOTUS HAYDONII PYGMY LOTUS PDFAB2A0H0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 112
LOTUS NUTTALLIANUS NUTTALL'S LOTUS PDFAB2A0V0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 332
LOTUS OBLONGIFOLIUS VAR CUPREUS COPPER-FLOWERED BIRD'S-FOOT TREFOIL PDFAB2A0W1 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.3	**List:** 4 **Code:** 113
LOTUS RUBRIFLORUS RED-FLOWERED LOTUS PDFAB2A150 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
LOTUS YOLLABOLLIENSIS YOLLA BOLLY MOUNTAINS BIRD'S-FOOT TREFOIL PDFAB2A1F0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
LUPINUS ALBIFRONS VAR ABRAMSII ABRAM'S LUPINE PDFAB2B010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T1Q **State:** S1.2	**List:** 3 **Code:** 323
LUPINUS ANTONINUS ANTHONY PEAK LUPINE PDFAB2B0C0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.3	**List:** 1B **Code:** 313
LUPINUS CERVINUS SANTA LUCIA LUPINE PDFAB2B0X0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
LUPINUS CITRINUS VAR CITRINUS ORANGE LUPINE PDFAB2B103 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2T2 **State:** S2.2	**List:** 1B **Code:** 123
LUPINUS CITRINUS VAR DEFLEXUS MARIPOSA LUPINE PDFAB2B102 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Threatened	**Global:** G2T1 **State:** S1.2	**List:** 1B **Code:** 323
LUPINUS CONSTANCEI THE LASSICS LUPINE PDFAB2B490 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 323
LUPINUS CROCEUS VAR PILOSELLUS SAFFRON-FLOWERED LUPINE PDFAB2B162 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G?T3 **State:** S3.3	**List:** 4 **Code:** 113
LUPINUS DALESIAE QUINCY LUPINE PDFAB2B1A0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 1B **Code:** 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LUPINUS DURANII MONO LAKE LUPINE PDFAB2B1E0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 223
LUPINUS ELATUS SILKY LUPINE PDFAB2B1F0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
LUPINUS EXCUBITUS VAR JOHNSTONII INTERIOR BUSH LUPINE PDFAB2B1J4	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4T3 S3.3	List: Code:	4 113
LUPINUS EXCUBITUS VAR MEDIUS MOUNTAIN SPRINGS BUSH LUPINE PDFAB2B1J5	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G4T2 S2.3	List: Code:	1B 213
LUPINUS EXIMIUS SAN MATEO TREE LUPINE PDFAB2B0E2	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G2?Q S2.2	List: Code:	3 223
LUPINUS GRACILENTUS SLENDER LUPINE PDFAB2B1R0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
LUPINUS GUADALUPENSIS GUADALUPE ISLAND LUPINE PDFAB2B1T0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 322
LUPINUS HOLMGRENANUS HOLMGREN'S LUPINE PDFAB2B1Y0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3? S2S3	List: Code:	2 211
LUPINUS LAPIDICOLA MT. EDDY LUPINE PDFAB2B280	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
LUPINUS LEPIDUS VAR CULBERTSONII HOCKETT MEADOWS LUPINE PDFAB2B171	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T1 S1.3	List: Code:	1B 313
LUPINUS LUDOVICIANUS SAN LUIS OBISPO COUNTY LUPINE PDFAB2B2G0	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G2 S2.2	List: Code:	1B 323
LUPINUS MAGNIFICUS VAR GLARECOLA COSO MOUNTAINS LUPINE PDFAB2B2K1	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3T3 S3.3	List: Code:	4 113
LUPINUS MAGNIFICUS VAR HESPERIUS MCGEE MEADOWS LUPINE PDFAB2B2K2	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3T3 S3.3	List: Code:	4 113
LUPINUS MAGNIFICUS VAR MAGNIFICUS PANAMINT MOUNTAINS LUPINE PDFAB2B2K3	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G3TH SH	List: Code:	1B 313
LUPINUS MILO-BAKERI MILO BAKER'S LUPINE PDFAB2B4E0	Records in NDDB: *Yes*	Federal: State:	Species of concern Threatened	Global: State:	G1Q S1.1	List: Code:	1B 233

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LUPINUS NIPOMENSIS NIPOMO MESA LUPINE PDFAB2B111	**Records in NDDB:** *Yes*	**Federal:** **State:**	Proposed Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
LUPINUS PADRE-CROWLEYI FATHER CROWLEY'S LUPINE PDFAB2B2Z0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
LUPINUS PEIRSONII PEIRSON'S LUPINE PDFAB2B330	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
LUPINUS SERICATUS COBB MOUNTAIN LUPINE PDFAB2B3J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
LUPINUS SPECTABILIS SHAGGYHAIR LUPINE PDFAB2B3P0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
LUPINUS TIDESTROMII TIDESTROM'S LUPINE PDFAB2B3Y0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 333
LUPINUS TRACYI TRACY'S LUPINE PDFAB2B3Z0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** **Code:**	4 112
LUPINUS UNCIALIS LILLIPUT LUPINE PDFAB2B410	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S1.1	**List:** **Code:**	
LYCIUM BREVIPES VAR HASSEI SANTA CATALINA ISLAND DESERT-THORN PDSOL0G0N0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T1 S1.1	**List:** **Code:**	1B 333
LYCIUM PARISHII PARISH'S DESERT-THORN PDSOL0G0D0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3? S2S3	**List:** **Code:**	2 211
LYCIUM VERRUCOSUM SAN NICOLAS ISLAND DESERT-THORN PDSOL0G0M0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	GXQ SX	**List:** **Code:**	1A *
LYCOPODIELLA INUNDATA BOG CLUB-MOSS PPLYC03060	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4? S1?	**List:** **Code:**	2 321
LYCOPODIUM CLAVATUM RUNNING-PINE PPLYC01080	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5? S2S3	**List:** **Code:**	2 211
LYCOPUS UNIFLORUS NORTHERN BUGLEWEED PDLAM0X080	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
LYCURUS PHLEOIDES VAR PHLEOIDES WOLFTAIL PMPOA3W011	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4? S1?	**List:** **Code:**	2 321

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
LYONOTHAMNUS FLORIBUNDUS SSP ASPLENIIFOLIUS SANTA CRUZ ISLAND IRONWOOD PDROS12011	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T2 S2.2	**List:** **Code:**	1B 223
LYONOTHAMNUS FLORIBUNDUS SSP FLORIBUNDUS SANTA CATALINA ISLAND IRONWOOD PDROS12012	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323
LYROCARPA COULTERI VAR PALMERI COULTER'S LYREPOD PDBRA1R012	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4 S3.3	**List:** **Code:**	4 111
MACHAERANTHERA ASTEROIDES VAR LAGUNENSIS MOUNT LAGUNA ASTER PDAST64131	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G5T2T3 S1.1	**List:** **Code:**	2 331
MACHAERANTHERA CANESCENS VAR ZIEGLERI ZIEGLER'S ASTER PDAST640B2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 323
MACHAERANTHERA JUNCEA RUSH-LIKE BRISTLEWEED PDAST641A0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
MADIA DORIS-NILESIAE NILES'S MADIA PDAST650L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
MADIA HALLII HALL'S MADIA PDAST650A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
MADIA NUTANS NODDING MADIA PDAST650D0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MADIA RADIATA SHOWY MADIA PDAST650E0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 233
MADIA STEBBINSII STEBBINS'S MADIA PDAST650K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
MADIA YOSEMITANA YOSEMITE MADIA PDAST650J0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G2G3 S2S3	**List:** **Code:**	3 ?23
MAHONIA SONNEI TRUCKEE BARBERRY PDBER060F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G?Q S?	**List:** **Code:**	
MALACOTHAMNUS ABBOTTII ABBOTT'S BUSH MALLOW PDMAL0Q010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
MALACOTHAMNUS ABORIGINUM INDIAN VALLEY BUSH MALLOW PDMAL0Q020	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	1B 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
MALACOTHAMNUS ARCUATUS ARCUATE BUSH MALLOW PDMAL0Q0E0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.3	**List:** **Code:**	4 113
MALACOTHAMNUS CLEMENTINUS SAN CLEMENTE ISLAND BUSH MALLOW PDMAL0Q030	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
MALACOTHAMNUS DAVIDSONII DAVIDSON'S BUSH MALLOW PDMAL0Q040	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 223
MALACOTHAMNUS FASCICULATUS VAR NESIOTICUS SANTA CRUZ ISLAND BUSH MALLOW PDMAL0Q061	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G4T1Q S1.1	**List:** **Code:**	1B 333
MALACOTHAMNUS GRACILIS SLENDER BUSH MALLOW PDMAL0Q0J0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.3	**List:** **Code:**	4 113
MALACOTHAMNUS HALLII HALL'S BUSH MALLOW PDMAL0Q0F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1Q S1.2	**List:** **Code:**	1B 323
MALACOTHAMNUS HELLERI HELLER'S BUSH MALLOW PDMAL0Q0G0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.3	**List:** **Code:**	4 113
MALACOTHAMNUS JONESII JONES'S BUSH MALLOW PDMAL0Q090	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MALACOTHAMNUS MENDOCINENSIS MENDOCINO BUSH MALLOW PDMAL0Q0D0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GX SX	**List:** **Code:**	1A *
MALACOTHAMNUS NIVEUS SAN LUIS OBISPO COUNTY BUSH MALLOW PDMAL0Q0H0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.3	**List:** **Code:**	4 113
MALACOTHAMNUS PALMERI VAR INVOLUCRATUS CARMEL VALLEY BUSH MALLOW PDMAL0Q0B1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T2Q S2.2	**List:** **Code:**	1B 123
MALACOTHAMNUS PALMERI VAR LUCIANUS ARROYO SECO BUSH MALLOW PDMAL0Q0B2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1Q S1.2	**List:** **Code:**	1B 323
MALACOTHAMNUS PALMERI VAR PALMERI SANTA LUCIA BUSH MALLOW PDMAL0Q0B5	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 113
MALACOTHAMNUS PARISHII PARISH'S BUSH MALLOW PDMAL0Q0C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GH SH	**List:** **Code:**	1A *
MALACOTHRIX FOLIOSA LEAFY MALACOTHRIX PDAST66060	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4? S3.2	**List:** **Code:**	4 122

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
MALACOTHRIX INCANA DUNEDELION PDAST66070	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
MALACOTHRIX INDECORA SANTA CRUZ ISLAND MALACOTHRIX PDAST660J0	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G1 S1.1	List: Code:	1B 333
MALACOTHRIX SAXATILIS VAR ARACHNOIDEA CARMEL VALLEY MALACOTHRIX PDAST660C2	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G5T2 S2.2	List: Code:	1B 323
MALACOTHRIX SQUALIDA ISLAND MALACOTHRIX PDAST660K0	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G1 S1.2	List: Code:	1B 333
MALAXIS MONOPHYLLOS SSP BRACHYPODA ADDER'S-MOUTH PMORC1R010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G?T4 S1.1	List: Code:	2 331
MALPERIA TENUIS BROWN TURBANS PDAST67010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4? S1.3	List: Code:	2 311
MARINA ORCUTTII VAR ORCUTTII CALIFORNIA MARINA PDFAB2F031	Records in NDDB: *Yes*	Federal: State:	Species of concern None	Global: State:	G?T1T2 S1.3	List: Code:	1B 312
MARSILEA OLIGOSPORA NELSON'S PEPPERWORT PPMAR010B0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S3?	List: Code:	3 ??1
MATELEA PARVIFOLIA SPEARLEAF PDASC0A0J0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5? S2.3	List: Code:	2 311
MAURANDYA ANTIRRHINIFLORA SSP ANTIRRHINIFLORA VIOLET TWINING SNAPDRAGON PDSCR2M011	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4?T3? S1.3	List: Code:	2 311
MAURANDYA PETROPHILA ROCK LADY PDSCR2J010	Records in NDDB: *Yes*	Federal: State:	Species of concern Rare	Global: State:	G1 S1.3	List: Code:	1B 323
MECONELLA OREGANA OREGON MECONELLA PDPAP0G030	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G? SH	List: Code:	
MELICA SPECTABILIS PURPLE ONION GRASS PMPOA3X0G0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S3.3	List: Code:	4 111
MENTZELIA HIRSUTISSIMA HAIRY STICKLEAF PDLOA030K0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3? S2S3	List: Code:	2 211
MERTENSIA BELLA OREGON LUNGWORT PDBOR0N040	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4 S2S3	List: Code:	2 321

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
MICROPUS AMPHIBOLUS		Federal:	None	Global:	G3	List:	4
MT. DIABLO COTTONWEED		State:	None	State:	S3.3	Code:	113
PDAST6D030	Records in NDDB: *No*						
MICROSERIS BOREALIS		Federal:	None	Global:	G5?	List:	2
NORTHERN MICROSERIS		State:	None	State:	S1.1	Code:	331
PDAST6E030	Records in NDDB: *Yes*						
MICROSERIS DOUGLASII VAR PLATYCARPHA		Federal:	None	Global:	G4T3	List:	4
SMALL-FLOWERED MICROSERIS		State:	None	State:	S3.2	Code:	122
PDAST6E062	Records in NDDB: *No*						
MIMULUS ACUTIDENS		Federal:	None	Global:	G2Q	List:	3
KINGS RIVER MONKEYFLOWER		State:	None	State:	S2?	Code:	??3
PDSCR1B010	Records in NDDB: *No*						
MIMULUS ARIDUS		Federal:	None	Global:	G4?	List:	4
LOW BUSH MONKEYFLOWER		State:	None	State:	S3.3	Code:	112
PDSCR22040	Records in NDDB: *No*						
MIMULUS BRACHIATUS		Federal:	None	Global:	G2Q?	List:	3
SERPENTINE MONKEYFLOWER		State:	None	State:	S2	Code:	??3
PDSCR1B0H0	Records in NDDB: *No*						
MIMULUS BRANDEGEI		Federal:	Species of concern	Global:	GX	List:	1A
SANTA CRUZ ISLAND MONKEYFLOWER		State:	None	State:	SX	Code:	*
PDSCR1B0K0	Records in NDDB: *Yes*						
MIMULUS CLEVELANDII		Federal:	None	Global:	G3G4	List:	4
CLEVELAND'S BUSH MONKEYFLOWER		State:	None	State:	S3.2	Code:	122
PDSCR22010	Records in NDDB: *No*						
MIMULUS DIFFUSUS		Federal:	None	Global:	G4Q	List:	4
PALOMAR MONKEYFLOWER		State:	None	State:	S3.3	Code:	111
PDSCR1B0Z0	Records in NDDB: *No*						
MIMULUS EXIGUUS		Federal:	Species of concern	Global:	G2	List:	1B
SAN BERNARDINO MOUNTAINS MONKEYFLOWER		State:	None	State:	S2.2	Code:	222
PDSCR1B140	Records in NDDB: *Yes*						
MIMULUS FILICAULIS		Federal:	Species of concern	Global:	G2	List:	1B
SLENDER-STEMMED MONKEYFLOWER		State:	None	State:	S2.2	Code:	223
PDSCR1B150	Records in NDDB: *Yes*						
MIMULUS FLEMINGII		Federal:	None	Global:	G3	List:	4
ISLAND BUSH MONKEYFLOWER		State:	None	State:	S3.3	Code:	113
PDSCR1B320	Records in NDDB: *No*						
MIMULUS GLABRATUS SSP UTAHENSIS		Federal:	None	Global:	G5T5?	List:	2
UTAH MONKEYFLOWER		State:	None	State:	S1.1	Code:	321
PDSCR1B1A6	Records in NDDB: *Yes*						
MIMULUS GLAUCESCENS		Federal:	None	Global:	G3	List:	4
SHIELD-BRACTED MONKEYFLOWER		State:	None	State:	S3.3	Code:	113
PDSCR1B1B0	Records in NDDB: *No*						
MIMULUS GRACILIPES		Federal:	None	Global:	G3	List:	4
SLENDER-STALKED MONKEYFLOWER		State:	None	State:	S3.3	Code:	113
PDSCR1B1C0	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
MIMULUS GRAYI GRAY'S MONKEYFLOWER PDSCR1B1D0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MIMULUS INCONSPICUUS SMALL-FLOWERED MONKEYFLOWER PDSCR1B1F0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MIMULUS LACINIATUS CUT-LEAVED MONKEYFLOWER PDSCR1B1L0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MIMULUS MICROPHYLLUS SMALL-LEAVED MONKEYFLOWER PDSCR1B300	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MIMULUS MOHAVENSIS MOJAVE MONKEYFLOWER PDSCR1B1V0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
MIMULUS NORRISII KAWEAH MONKEYFLOWER PDSCR1B2Y0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 313
MIMULUS NUDATUS BARE MONKEYFLOWER PDSCR1B200	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MIMULUS PICTUS CALICO MONKEYFLOWER PDSCR1B240	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
MIMULUS PULCHELLUS PANSY MONKEYFLOWER PDSCR1B280	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MIMULUS PURPUREUS PURPLE MONKEYFLOWER PDSCR1B2B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1? S1.1	**List:** **Code:**	2 231
MIMULUS PYGMAEUS EGG LAKE MONKEYFLOWER PDSCR1B2C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4 S3.2	**List:** **Code:**	1B 212
MIMULUS RATTANII SSP DECURTATUS SANTA CRUZ COUNTY MONKEYFLOWER PDSCR1B2D2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.2	**List:** **Code:**	4 123
MIMULUS RUPICOLA DEATH VALLEY MONKEYFLOWER PDSCR1B2H0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MIMULUS SHEVOCKII KELSO CREEK MONKEYFLOWER PDSCR1B2Z0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
MIMULUS SUBSECUNDUS ONE-SIDED MONKEYFLOWER PDSCR1B2K0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
MIMULUS TRASKIAE SANTA CATALINA ISLAND MONKEYFLOWER PDSCR1B2P0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GX SX	**List:** **Code:**	1A *
MIMULUS WHIPPLEI WHIPPLE'S MONKEYFLOWER PDSCR1B2U0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GX SX	**List:** **Code:**	1A *
MINUARTIA DECUMBENS THE LASSICS SANDWORT PDCAR0G0Y0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
MINUARTIA HOWELLII HOWELL'S SANDWORT PDCAR0G0F0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4? S3.3	**List:** **Code:**	4 112
MINUARTIA OBTUSILOBA ALPINE SANDWORT PDCAR0G0N0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
MINUARTIA ROSEI PEANUT SANDWORT PDCAR0G0R0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
MINUARTIA STOLONIFERA SCOTT MOUNTAIN SANDWORT PDCAR0G110	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
MIRABILIS TENUILOBA SLENDER-LOBED FOUR-O'CLOCK PDNYC0A150	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** **Code:**	4 111
MOBERGIA CALCULIFORMIS LIGHT GRAY LICHEN NLTES41770	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	
MONARDELLA ANTONINA SSP ANTONINA SAN ANTONIO HILLS MONARDELLA PDLAM18011	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3Q S3?	**List:** **Code:**	3 ??3
MONARDELLA ANTONINA SSP BENITENSIS SAN BENITO MONARDELLA PDLAM18012	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3 S3.3	**List:** **Code:**	4 113
MONARDELLA BENEOLENS SWEET-SMELLING MONARDELLA PDLAM180U0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
MONARDELLA CANDICANS SIERRA MONARDELLA PDLAM18050	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MONARDELLA CINEREA GRAY MONARDELLA PDLAM18060	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MONARDELLA CRISPA CRISP MONARDELLA PDLAM18070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
MONARDELLA DOUGLASII SSP VENOSA VEINY MONARDELLA PDLAM18082	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333
MONARDELLA FOLLETTII FOLLETT'S MONARDELLA PDLAM180W0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 313
MONARDELLA FRUTESCENS SAN LUIS OBISPO MONARDELLA PDLAM180X0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
MONARDELLA HYPOLEUCA SSP LANATA FELT-LEAVED MONARDELLA PDLAM180A2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5?T2 S2.2	**List:** **Code:**	1B 222
MONARDELLA LEUCOCEPHALA MERCED MONARDELLA PDLAM180C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GH SH	**List:** **Code:**	1A *
MONARDELLA LINOIDES SSP OBLONGA FLAX-LIKE MONARDELLA PDLAM180D2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T2 S2.3	**List:** **Code:**	1B 313
MONARDELLA LINOIDES SSP VIMINEA WILLOWY MONARDELLA PDLAM180D4	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G5T3 S2.1	**List:** **Code:**	1B 232
MONARDELLA MACRANTHA SSP HALLII HALL'S MONARDELLA PDLAM180E1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	1B 213
MONARDELLA NANA SSP LEPTOSIPHON SAN FELIPE MONARDELLA PDLAM180F2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4G5T2 S2.2	**List:** **Code:**	2 321
MONARDELLA PALMERI PALMER'S MONARDELLA PDLAM180H0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
MONARDELLA PRINGLEI PRINGLE'S MONARDELLA PDLAM180J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GX SX	**List:** **Code:**	1A *
MONARDELLA ROBISONII ROBISON'S MONARDELLA PDLAM180K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 313
MONARDELLA STEBBINSII STEBBINS'S MONARDELLA PDLAM180L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
MONARDELLA UNDULATA CURLY-LEAVED MONARDELLA PDLAM180N0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
MONARDELLA VILLOSA SSP GLOBOSA ROBUST MONARDELLA PDLAM180P7	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
MONARDELLA VIRIDIS SSP SAXICOLA		**Federal:**	None	**Global:**	G3T3	**List:**	4
ROCK MONARDELLA		**State:**	None	**State:**	S3.2	**Code:**	123
PDLAM180Q1	**Records in NDDB:** *No*						
MONARDELLA VIRIDIS SSP VIRIDIS		**Federal:**	None	**Global:**	G3T3	**List:**	4
GREEN MONARDELLA		**State:**	None	**State:**	S3.3	**Code:**	113
PDLAM180Q2	**Records in NDDB:** *No*						
MONOTROPA UNIFLORA		**Federal:**	None	**Global:**	G5	**List:**	2
INDIAN-PIPE		**State:**	None	**State:**	S2S3	**Code:**	221
PDMON03030	**Records in NDDB:** *Yes*						
MONTIA HOWELLII		**Federal:**	Species of concern	**Global:**	G2?	**List:**	1A
HOWELL'S MONTIA		**State:**	None	**State:**	SH	**Code:**	*
PDPOR05070	**Records in NDDB:** *Yes*						
MUCRONEA CALIFORNICA		**Federal:**	None	**Global:**	G3	**List:**	4
CALIFORNIA SPINEFLOWER		**State:**	None	**State:**	S3.2?	**Code:**	123
PDPGN0F010	**Records in NDDB:** *No*						
MUHLENBERGIA APPRESSA		**Federal:**	None	**Global:**	G4	**List:**	2
APPRESSED MUHLY		**State:**	None	**State:**	S3?	**Code:**	221
PMPOA48020	**Records in NDDB:** *Yes*						
MUHLENBERGIA ARSENEI		**Federal:**	None	**Global:**	G5	**List:**	2
TOUGH MUHLY		**State:**	None	**State:**	S1S2	**Code:**	211
PMPOA48060	**Records in NDDB:** *Yes*						
MUHLENBERGIA CALIFORNICA		**Federal:**	None	**Global:**	GH	**List:**	1B
CALIFORNIA MUHLY		**State:**	None	**State:**	SH	**Code:**	223
PMPOA480A0	**Records in NDDB:** *Yes*						
MUHLENBERGIA FRAGILIS		**Federal:**	None	**Global:**	G5?	**List:**	2
DELICATE MUHLY		**State:**	None	**State:**	S1.3?	**Code:**	311
PMPOA480Q0	**Records in NDDB:** *Yes*						
MUHLENBERGIA PAUCIFLORA		**Federal:**	None	**Global:**	G5	**List:**	2
FEW-FLOWERED MUHLY		**State:**	None	**State:**	S1.3?	**Code:**	311
PMPOA48170	**Records in NDDB:** *Yes*						
MUILLA CLEVELANDII		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
SAN DIEGO GOLDENSTAR		**State:**	None	**State:**	S2.1	**Code:**	222
PMLIL1H010	**Records in NDDB:** *Yes*						
MUILLA CORONATA		**Federal:**	None	**Global:**	G3	**List:**	4
CROWNED MUILLA		**State:**	None	**State:**	S3.3	**Code:**	122
PMLIL1H020	**Records in NDDB:** *No*						
MUNROA SQUARROSA		**Federal:**	None	**Global:**	G5	**List:**	2
FALSE BUFFALO-GRASS		**State:**	None	**State:**	S1S2	**Code:**	321
PMPOA49010	**Records in NDDB:** *Yes*						
MYOSURUS MINIMUS SSP APUS		**Federal:**	Species of concern	**Global:**	G5T2Q	**List:**	3
LITTLE MOUSETAIL		**State:**	None	**State:**	S2.2	**Code:**	232
PDRAN0H031	**Records in NDDB:** *Yes*						
NAMA DICHOTOMUM VAR DICHOTOMUM		**Federal:**	None	**Global:**	G4T?	**List:**	2
FORKED PURPLE MAT		**State:**	None	**State:**	S1.3?	**Code:**	311
PDHYD0A061	**Records in NDDB:** *Yes*						

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
NAMA STENOCARPUM MUD NAMA PDHYD0A0H0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4G5 **State:** S1S2	**List:** 2 **Code:** 321
NAVARRETIA ERIOCEPHALA HOARY NAVARRETIA PDPLM0C060 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
NAVARRETIA FOSSALIS SPREADING NAVARRETIA PDPLM0C080 **Records in NDDB:** *Yes*	**Federal:** Threatened **State:** None	**Global:** G2 **State:** S2.1	**List:** 1B **Code:** 232
NAVARRETIA HETERANDRA TEHAMA NAVARRETIA PDPLM0C0A0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3? **State:** S3.3	**List:** 4 **Code:** 112
NAVARRETIA JAREDII PASO ROBLES NAVARRETIA PDPLM0C0Y0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
NAVARRETIA JEPSONII JEPSON'S NAVARRETIA PDPLM0C0D0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
NAVARRETIA LEUCOCEPHALA SSP BAKERI BAKER'S NAVARRETIA PDPLM0C0E1 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3T2 **State:** S2.2	**List:** 1B **Code:** 223
NAVARRETIA LEUCOCEPHALA SSP PAUCIFLORA FEW-FLOWERED NAVARRETIA PDPLM0C0E4 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Threatened	**Global:** G3T1 **State:** S1.1	**List:** 1B **Code:** 333
NAVARRETIA LEUCOCEPHALA SSP PLIEANTHA MANY-FLOWERED NAVARRETIA PDPLM0C0E5 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G3T1 **State:** S1.2	**List:** 1B **Code:** 323
NAVARRETIA MYERSII SSP DEMINUTA PDPLM0C0X2 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G1T1 **State:** S1.1	**List:** **Code:**
NAVARRETIA MYERSII SSP MYERSII PINCUSHION NAVARRETIA PDPLM0C0X1 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G1T1 **State:** S1.1	**List:** 1B **Code:** 333
NAVARRETIA NIGELLIFORMIS SSP RADIANS SHINING NAVARRETIA PDPLM0C0J2 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4T1 **State:** S1.2	**List:** 1B **Code:** 223
NAVARRETIA PENINSULARIS BAJA NAVARRETIA PDPLM0C0L0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3? **State:** S2.2	**List:** 1B **Code:** 222
NAVARRETIA PROLIFERA SSP LUTEA YELLOW BUR NAVARRETIA PDPLM0C0N1 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.3	**List:** 4 **Code:** 113
NAVARRETIA ROSULATA MARIN COUNTY NAVARRETIA PDPLM0C0Z0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2? **State:** S2?	**List:** 1B **Code:** 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
NAVARRETIA SETILOBA PIUTE MOUNTAINS NAVARRETIA PDPLM0C0S0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
NAVARRETIA SUBULIGERA AWL-LEAVED NAVARRETIA PDPLM0C0U0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** **Code:**	4 112
NEMACAULIS DENUDATA VAR DENUDATA COAST WOOLLY-HEADS PDPGN0G011	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3? S1S2	**List:** **Code:**	2 221
NEMACAULIS DENUDATA VAR GRACILIS SLENDER WOOLLY-HEADS PDPGN0G012	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3? S2S3	**List:** **Code:**	2 221
NEMACLADUS GRACILIS SLENDER NEMACLADUS PDCAM0F030	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
NEMACLADUS TWISSELMANNII TWISSELMANN'S NEMACLADUS PDCAM0F0D0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
NEMOPHILA PARVIFLORA VAR QUERCIFOLIA OAK-LEAVED NEMOPHILA PDHYD0B073	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 112
NEOSTAPFIA COLUSANA COLUSA GRASS PMPOA4C010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Endangered	**Global:** **State:**	G3 S3.1	**List:** **Code:**	1B 133
NEVIUSIA CLIFTONII SHASTA SNOW-WREATH PDROS14020	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
NITROPHILA MOHAVENSIS AMARGOSA NITROPHILA PDCHE0G010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 332
NOLINA CISMONTANA CALIFORNIA BEARGRASS PMAGA080E0	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	
NOLINA INTERRATA DEHESA NOLINA PMAGA08070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G2 S1.1	**List:** **Code:**	1B 332
OENOTHERA CAESPITOSA SSP CRINITA CAESPITOSE EVENING-PRIMROSE PDONA0C063	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 121
OENOTHERA CALIFORNICA SSP EUREKENSIS EUREKA DUNES EVENING-PRIMROSE PDONA0C071	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Rare	**Global:** **State:**	G4?T1 S1.2	**List:** **Code:**	1B 323
OENOTHERA DELTOIDES SSP HOWELLII ANTIOCH DUNES EVENING-PRIMROSE PDONA0C0B4	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
OENOTHERA WOLFII WOLF'S EVENING-PRIMROSE PDONA0C1K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S1.1	**List:** **Code:**	1B 332
OPHIOGLOSSUM CALIFORNICUM CALIFORNIA ADDER'S-TONGUE PPOPH020G0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.2	**List:** **Code:**	4 122
OPHIOGLOSSUM PUSILLUM NORTHERN ADDER'S-TONGUE PPOPH020F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S1.2	**List:** **Code:**	1A *
OPUNTIA BASILARIS VAR BRACHYCLADA SHORT-JOINT BEAVERTAIL PDCAC0D053	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 323
OPUNTIA BASILARIS VAR TRELEASEI BAKERSFIELD CACTUS PDCAC0D055	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G5T2 S2.1	**List:** **Code:**	1B 333
OPUNTIA CURVOSPINA CURVED-SPINE BEAVERTAIL PDCAC0D270	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G? S2S3	**List:** **Code:**	2 221
OPUNTIA FRAGILIS BRITTLE PRICKLY-PEAR PDCAC0D0H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4G5 SH	**List:** **Code:**	2 331
OPUNTIA MUNZII MUNZ'S CHOLLA PDCAC0D0V0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 313
OPUNTIA PARRYI VAR SERPENTINA SNAKE CHOLLA PDCAC0D0Y2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2 S1.1	**List:** **Code:**	1B 332
OPUNTIA PULCHELLA BEAUTIFUL CHOLLA PDCAC0D120	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S2S3	**List:** **Code:**	2 221
OPUNTIA WIGGINSII WIGGINS'S CHOLLA PDCAC0D1P0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S1.2?	**List:** **Code:**	3 312
OPUNTIA WOLFII WOLF'S CHOLLA PDCAC0D2R0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4? S3.3	**List:** **Code:**	4 113
ORCUTTIA CALIFORNICA CALIFORNIA ORCUTT GRASS PMPOA4G010	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 332
ORCUTTIA INAEQUALIS SAN JOAQUIN VALLEY ORCUTT GRASS PMPOA4G060	**Records in NDDB:** *Yes*	**Federal:** **State:**	Threatened Endangered	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 233
ORCUTTIA PILOSA HAIRY ORCUTT GRASS PMPOA4G040	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G2 S2.1	**List:** **Code:**	1B 233

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
ORCUTTIA TENUIS SLENDER ORCUTT GRASS PMPOA4G050 **Records in NDDB:** *Yes*	**Federal:** Threatened **State:** Endangered	**Global:** G3 **State:** S3.1	**List:** 1B **Code:** 233
ORCUTTIA VISCIDA SACRAMENTO ORCUTT GRASS PMPOA4G070 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
OREONANA PURPURASCENS PURPLE MOUNTAIN-PARSLEY PDAPI1G020 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 1B **Code:** 223
OREONANA VESTITA WOOLLY MOUNTAIN-PARSLEY PDAPI1G030 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
ORNITHOSTAPHYLOS OPPOSITIFOLIA BAJA CALIFORNIA BIRDBUSH PDERI0W010 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4 **State:** S1.1	**List:** 2 **Code:** 331
OROBANCHE PARISHII SSP BRACHYLOBA SHORT-LOBED BROOM-RAPE PDORO040A2 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4?T2 **State:** S2.2	**List:** 1B **Code:** 222
OROBANCHE VALIDA SSP HOWELLII HOWELL'S BROOMRAPE PDORO040G1 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3T3 **State:** S3.3	**List:** 4 **Code:** 113
OROBANCHE VALIDA SSP VALIDA ROCK CREEK BROOMRAPE PDORO040G2 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3T1 **State:** S1.2	**List:** 1B **Code:** 323
ORTHOCARPUS CUSPIDATUS SSP CUSPIDATUS SISKIYOU MOUNTAINS ORTHOCARPUS PDSCR1H081 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3? **State:** S3.3	**List:** 4 **Code:** 112
ORTHOCARPUS PACHYSTACHYUS SHASTA ORTHOCARPUS PDSCR1H0L0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G1 **State:** S1.1	**List:** 1A **Code:** *
ORYCTES NEVADENSIS NEVADA ORYCTES PDSOL0Q010 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S1.1	**List:** 1B **Code:** 332
OXYTHECA CARYOPHYLLOIDES CHICKWEED OXYTHECA PDPGN0J010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
OXYTHECA EMARGINATA WHITE-MARGINED OXYTHECA PDPGN0J030 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
OXYTHECA PARISHII VAR ABRAMSII ABRAMS'S OXYTHECA PDPGN0J041 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4?T2 **State:** S2.2	**List:** 1B **Code:** 223
OXYTHECA PARISHII VAR CIENEGENSIS CIENEGA SECA OXYTHECA PDPGN0J042 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4?T1 **State:** S1.3	**List:** 1B **Code:** 313

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
OXYTHECA PARISHII VAR GOODMANIANA CUSHENBURY OXYTHECA PDPGN0J043	Records in NDDB: *Yes*	Federal: Endangered	State: None	Global: G4?T1	State: S1.1	List: 1B	Code: 333
OXYTHECA WATSONII WATSON'S OXYTHECA PDPGN0J070	Records in NDDB: *Yes*	Federal: None	State: None	Global: G2	State: S1.1	List: 2	Code: 321
OXYTROPIS DEFLEXA VAR SERICEA BLUE PENDENT-POD OXYTROPE PDFAB2X053	Records in NDDB: *Yes*	Federal: None	State: None	Global: G5T5	State: S1.1	List: 2	Code: 331
PALAFOXIA ARIDA VAR GIGANTEA GIANT SPANISH-NEEDLE PDAST6T012	Records in NDDB: *Yes*	Federal: Species of concern	State: None	Global: G5T3	State: S1.2	List: 1B	Code: 212
PARONYCHIA AHARTII AHART'S PARONYCHIA PDCAR0L0V0	Records in NDDB: *Yes*	Federal: Species of concern	State: None	Global: G2	State: S1.2	List: 1B	Code: 323
PARVISEDUM LEIOCARPUM LAKE COUNTY STONECROP PDCRA0F020	Records in NDDB: *Yes*	Federal: Endangered	State: Endangered	Global: G1	State: S1.1	List: 1B	Code: 333
PEDICULARIS BRACTEOSA VAR FLAVIDA YELLOWISH LOUSEWORT PDSCR1K044	Records in NDDB: *No*	Federal: None	State: None	Global: G5T4	State: S3.3	List: 4	Code: 111
PEDICULARIS CENTRANTHERA DWARF LOUSEWORT PDSCR1K070	Records in NDDB: *Yes*	Federal: None	State: None	Global: G4	State: S1.2	List: 2	Code: 311
PEDICULARIS CONTORTA CURVED-BEAK LOUSEWORT PDSCR1K090	Records in NDDB: *No*	Federal: None	State: None	Global: G5	State: S3.3	List: 4	Code: 111
PEDICULARIS CRENULATA SCALLOPED-LEAVED LOUSEWORT PDSCR1K0A0	Records in NDDB: *Yes*	Federal: None	State: None	Global: G4	State: S1.2	List: 2	Code: 311
PEDICULARIS DUDLEYI DUDLEY'S LOUSEWORT PDSCR1K0D0	Records in NDDB: *Yes*	Federal: Species of concern	State: Rare	Global: G2	State: S2.2	List: 1B	Code: 323
PEDICULARIS HOWELLII HOWELL'S LOUSEWORT PDSCR1K0J0	Records in NDDB: *No*	Federal: None	State: None	Global: G4	State: S3.3	List: 4	Code: 112
PELLAEA TRUNCATA CLIFF BRAKE PPADI0H0C0	Records in NDDB: *Yes*	Federal: None	State: None	Global: G5	State: S1S2	List: 2	Code: 211
PENSTEMON ALBOMARGINATUS WHITE-MARGINED BEARDTONGUE PDSCR1L070	Records in NDDB: *Yes*	Federal: Species of concern	State: None	Global: G2	State: S1.2	List: 1B	Code: 322
PENSTEMON BARNEBYI BARNEBY'S BEARDTONGUE PDSCR1L0Q0	Records in NDDB: *Yes*	Federal: None	State: None	Global: G3	State: S1.2	List: 2	Code: 331

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
PENSTEMON CALCAREUS LIMESTONE BEARDTONGUE PDSCR1L100	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	2 211
PENSTEMON CALIFORNICUS CALIFORNIA BEARDTONGUE PDSCR1L110	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3? S2.2	**List:** **Code:**	1B 322
PENSTEMON CINEREUS GRAY BEARDTONGUE PDSCR1L354	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** **Code:**	4 111
PENSTEMON CINICOLA ASH BEARDTONGUE PDSCR1L1B0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.2?	**List:** **Code:**	4 121
PENSTEMON CLEVELANDII VAR CONNATUS SAN JACINTO BEARDTONGUE PDSCR1L1D2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4 S3.3	**List:** **Code:**	4 111
PENSTEMON FILIFORMIS THREAD-LEAVED BEARDTONGUE PDSCR1L2A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	1B 213
PENSTEMON FRUTICIFORMIS VAR AMARGOSAE DEATH VALLEY BEARDTONGUE PDSCR1L2F2	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 112
PENSTEMON HETERODOXUS VAR SHASTENSIS SHASTA BEARDTONGUE PDSCR1L5Q0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** **Code:**	4 113
PENSTEMON NEWBERRYI VAR SONOMENSIS SONOMA BEARDTONGUE PDSCR1L483	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T1 S1.3	**List:** **Code:**	1B 313
PENSTEMON PAPILLATUS INYO BEARDTONGUE PDSCR1L4L0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
PENSTEMON PERSONATUS CLOSED-THROATED BEARDTONGUE PDSCR1L4Y0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
PENSTEMON PURPUSII SNOW MOUNTAIN BEARDTONGUE PDSCR1L590	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
PENSTEMON RATTANII VAR KLEEI SANTA CRUZ MOUNTAINS BEARDTONGUE PDSCR1L5B1	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T2 S2.2	**List:** **Code:**	1B 223
PENSTEMON STEPHENSII STEPHENS'S BEARDTONGUE PDSCR1L5W0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 223
PENSTEMON THURBERI THURBER'S BEARDTONGUE PDSCR1L680	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.2?	**List:** **Code:**	4 121

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
PENSTEMON TRACYI TRACY'S BEARDTONGUE PDSCR1L6A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
PENTACHAETA BELLIDIFLORA WHITE-RAYED PENTACHAETA PDAST6X030	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
PENTACHAETA EXILIS SSP AEOLICA SLENDER PENTACHAETA PDAST6X041	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 323
PENTACHAETA LYONII LYON'S PENTACHAETA PDAST6X060	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
PERIDERIDIA BACIGALUPII BACIGALUPI'S YAMPAH PDAPI1N020	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 123
PERIDERIDIA GAIRDNERI SSP GAIRDNERI GAIRDNER'S YAMPAH PDAPI1N062	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T3 S3.2	**List:** **Code:**	4 123
PERIDERIDIA LEPTOCARPA NARROW-SEEDED YAMPAH PDAPI1N0A0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.3	**List:** **Code:**	4 112
PERIDERIDIA PARISHII SSP PARISHII PARISH'S YAMPAH PDAPI1N0C2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3T4 S2.2?	**List:** **Code:**	2 221
PERIDERIDIA PRINGLEI ADOBE YAMPAH PDAPI1N0D0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
PERITYLE INYOENSIS INYO ROCK DAISY PDAST700F0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 323
PERITYLE VILLOSA HANAUPAH ROCK DAISY PDAST700V0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
PETALONYX THURBERI SSP GILMANII DEATH VALLEY SANDPAPER-PLANT PDLOA04041	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T2 S2.3	**List:** **Code:**	1B 323
PETERIA THOMPSONIAE SPINE-NODED MILK VETCH PDFAB32020	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S1.3?	**List:** **Code:**	2 311
PHACELIA AMABILIS SALINE VALLEY PHACELIA PDHYD0C040	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1Q S1	**List:** **Code:**	3 313
PHACELIA ANELSONII AVEN NELSON'S PHACELIA PDHYD0C060	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2G3 S2.3?	**List:** **Code:**	2 211

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
PHACELIA ARGENTEA SAND DUNE PHACELIA PDHYD0C070	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S1.1	**List:** **Code:**	1B 332
PHACELIA CILIATA VAR OPACA MERCED PHACELIA PDHYD0C0S2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 313
PHACELIA CINEREA ASHY PHACELIA PDHYD0C0T0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	GX SX	**List:** **Code:**	1A *
PHACELIA COOKEI COOKE'S PHACELIA PDHYD0C0Y0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
PHACELIA DALESIANA SCOTT MOUNTAIN PHACELIA PDHYD0C140	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	1B 123
PHACELIA EXILIS TRANSVERSE RANGE PHACELIA PDHYD0C4Y0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.3	**List:** **Code:**	4 113
PHACELIA FLORIBUNDA MANY-FLOWERED PHACELIA PDHYD0C1G0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S1.2	**List:** **Code:**	1B 322
PHACELIA GREENEI SCOTT VALLEY PHACELIA PDHYD0C1V0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
PHACELIA INSULARIS VAR CONTINENTIS NORTH COAST PHACELIA PDHYD0C2B1	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323
PHACELIA INSULARIS VAR INSULARIS NORTHERN CHANNEL ISLANDS PHACELIA PDHYD0C2B2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G2T1 S1.1	**List:** **Code:**	1B 323
PHACELIA INUNDATA PLAYA PHACELIA PDHYD0C2E0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S1.2	**List:** **Code:**	2 211
PHACELIA INYOENSIS INYO PHACELIA PDHYD0C2F0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
PHACELIA LEONIS SISKIYOU PHACELIA PDHYD0C2N0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 212
PHACELIA MOHAVENSIS MOJAVE PHACELIA PDHYD0C310	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3Q S3.3	**List:** **Code:**	4 113
PHACELIA MONOENSIS MONO COUNTY PHACELIA PDHYD0C4V0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3 S2.1	**List:** **Code:**	1B 332

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
PHACELIA MUSTELINA		**Federal:**	None	**Global:**	G2	**List:**	1B
DEATH VALLEY ROUND-LEAVED PHACELIA		**State:**	None	**State:**	S1.3	**Code:**	212
PDHYD0C330	**Records in NDDB:** *Yes*						
PHACELIA NASHIANA		**Federal:**	Species of concern	**Global:**	G3	**List:**	1B
CHARLOTTE'S PHACELIA		**State:**	None	**State:**	S3.2	**Code:**	123
PDHYD0C350	**Records in NDDB:** *Yes*						
PHACELIA NOVENMILLENSIS		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
NINE MILE CANYON PHACELIA		**State:**	None	**State:**	S2.2	**Code:**	323
PDHYD0C3A0	**Records in NDDB:** *Yes*						
PHACELIA OROGENES		**Federal:**	None	**Global:**	G3	**List:**	4
MOUNTAIN PHACELIA		**State:**	None	**State:**	S3.3	**Code:**	113
PDHYD0C3C0	**Records in NDDB:** *No*						
PHACELIA PARISHII		**Federal:**	Species of concern	**Global:**	G2	**List:**	2
PARISH'S PHACELIA		**State:**	None	**State:**	S1.1	**Code:**	331
PDHYD0C3G0	**Records in NDDB:** *Yes*						
PHACELIA PHACELIOIDES		**Federal:**	Species of concern	**Global:**	G1	**List:**	1B
MT. DIABLO PHACELIA		**State:**	None	**State:**	S1.2	**Code:**	223
PDHYD0C3Q0	**Records in NDDB:** *Yes*						
PHACELIA PULCHELLA VAR GOODDINGII		**Federal:**	None	**Global:**	G5T2T3	**List:**	2
GOODDING'S PHACELIA		**State:**	None	**State:**	S1.3?	**Code:**	311
PDHYD0C3V1	**Records in NDDB:** *Yes*						
PHACELIA SERICEA VAR CILIOSA		**Federal:**	None	**Global:**	G5T5	**List:**	2
BLUE ALPINE PHACELIA		**State:**	None	**State:**	S1.3?	**Code:**	211
PDHYD0C4A1	**Records in NDDB:** *Yes*						
PHACELIA STEBBINSII		**Federal:**	Species of concern	**Global:**	G3	**List:**	1B
STEBBINS'S PHACELIA		**State:**	None	**State:**	S3.2	**Code:**	223
PDHYD0C4D0	**Records in NDDB:** *Yes*						
PHACELIA STELLARIS		**Federal:**	None	**Global:**	G1G2	**List:**	1B
BRAND'S PHACELIA		**State:**	None	**State:**	S1.1	**Code:**	332
PDHYD0C510	**Records in NDDB:** *Yes*						
PHACELIA SUAVEOLENS SSP KECKII		**Federal:**	Species of concern	**Global:**	G5T1	**List:**	1B
SANTIAGO PEAK PHACELIA		**State:**	None	**State:**	S1.3	**Code:**	313
PDHYD0C4G1	**Records in NDDB:** *Yes*						
PHASEOLUS FILIFORMIS		**Federal:**	None	**Global:**	G5	**List:**	2
SLENDER-STEM BEAN		**State:**	None	**State:**	S1.3	**Code:**	311
PDFAB330P0	**Records in NDDB:** *Yes*						
PHLOX DISPERSA		**Federal:**	None	**Global:**	G3	**List:**	4
HIGH SIERRA PHLOX		**State:**	None	**State:**	S3.3	**Code:**	113
PDPLM0D0M0	**Records in NDDB:** *No*						
PHLOX DOLICHANTHA		**Federal:**	Species of concern	**Global:**	G2	**List:**	1B
BIG BEAR VALLEY PHLOX		**State:**	None	**State:**	S2.2	**Code:**	223
PDPLM0D0P0	**Records in NDDB:** *Yes*						
PHLOX HIRSUTA		**Federal:**	Proposed Endangered	**Global:**	G1	**List:**	1B
YREKA PHLOX		**State:**	Endangered	**State:**	S1.1	**Code:**	323
PDPLM0D100	**Records in NDDB:** *Yes*						

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
PHLOX MUSCOIDES MOSS PHLOX PDPLM0D115 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4 **State:** S2S3	**List:** 2 **Code:** 211
PHOLISMA SONORAE SAND FOOD PDLNN02020 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3 **State:** S1.2	**List:** 1B **Code:** 222
PHOLISTOMA AURITUM VAR ARIZONICUM ARIZONA PHOLISTOMA PDHYD0D011 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T1 **State:** S1.3	**List:** 2 **Code:** 311
PHYSALIS LOBATA LOBED GROUND-CHERRY PDSOL0T010 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S1.3?	**List:** 2 **Code:** 311
PICEA ENGELMANNII ENGELMANN SPRUCE PGPIN03030 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S2.2	**List:** 2 **Code:** 221
PILOSTYLES THURBERI THURBER'S PILOSTYLES PDRAF01010 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S3.3	**List:** 4 **Code:** 111
PINGUICULA VULGARIS SSP MACROCERAS HORNED BUTTERWORT PDLNT01041 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T2T3 **State:** S3.2?	**List:** 2 **Code:** 121
PINUS CONTORTA SSP BOLANDERI BOLANDER'S BEACH PINE PGPIN04081 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T3 **State:** S3.2	**List:** 1B **Code:** 123
PINUS EDULIS TWO-NEEDLE PINYON PINE PGPIN040C0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5Q **State:** S1.3?	**List:** 3 **Code:** 311
PINUS LONGAEVA BRISTLECONE PINE PGPIN04180 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.3	**List:** 4 **Code:** 111
PINUS RADIATA MONTEREY PINE PGPIN040V0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 322
PINUS TORREYANA SSP INSULARIS SANTA ROSA ISL. TORREY PINE PGPIN04151 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1T1 **State:** S1.2	**List:** 1B **Code:** 323
PINUS TORREYANA SSP TORREYANA TORREY PINE PGPIN04152 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1T1 **State:** S1.2	**List:** 1B **Code:** 323
PIPERIA CANDIDA WHITE-FLOWERED REIN ORCHID PMORC1X050 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 111
PIPERIA MICHAELII PURPLE-FLOWERED PIPERIA PMORC1X041 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3? **State:** S3.2	**List:** 4 **Code:** 123

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
PIPERIA YADONII YADON'S REIN ORCHID PMORC1X070 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** None	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
PIPTATHERUM MICRANTHUM SMALL-FLOWERED RICE GRASS PMPOA4J070 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S2S3	**List:** 2 **Code:** 211
PITYOPUS CALIFORNICUS CALIFORNIA PINEFOOT PDMON05010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.2	**List:** 4 **Code:** 121
PLAGIOBOTHRYS CHORISIANUS VAR CHORISIANUS CHORIS'S POPCORN-FLOWER PDBOR0V061 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3T2?Q **State:** S2?	**List:** 3 **Code:** 223
PLAGIOBOTHRYS DIFFUSUS SAN FRANCISCO POPCORN-FLOWER PDBOR0V080 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
PLAGIOBOTHRYS GLABER HAIRLESS POPCORN-FLOWER PDBOR0V0B0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** GH **State:** SH	**List:** 1A **Code:** *
PLAGIOBOTHRYS GLOMERATUS MAMMOTH POPCORN-FLOWER PDBOR0V1A0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G? **State:** S2S3	**List:** 2 **Code:** 221
PLAGIOBOTHRYS GLYPTOCARPUS VAR MODESTUS CEDAR CREST POPCORN-FLOWER PDBOR0V0C2 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G3THQ **State:** SH	**List:** 3 **Code:** 3?3
PLAGIOBOTHRYS HYSTRICULUS BEARDED POPCORN-FLOWER PDBOR0V0H0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** GH **State:** SH	**List:** 1A **Code:** *
PLAGIOBOTHRYS LITHOCARYUS MAYACAMAS POPCORN-FLOWER PDBOR0V0P0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** GH **State:** SH	**List:** 1A **Code:** *
PLAGIOBOTHRYS MOLLIS VAR VESTITUS PETALUMA POPCORN-FLOWER PDBOR0V0Q2 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4?TX **State:** SX	**List:** 1A **Code:** *
PLAGIOBOTHRYS MYOSOTOIDES FORGET-ME-NOT POPCORN-FLOWER PDBOR0V0R0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4Q **State:** S3.3	**List:** 4 **Code:** 111
PLAGIOBOTHRYS SALSUS DESERT POPCORN-FLOWER PDBOR0V0X0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3G4 **State:** S1.2?	**List:** 2 **Code:** 321
PLAGIOBOTHRYS STRICTUS CALISTOGA POPCORN-FLOWER PDBOR0V120 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Threatened	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
PLAGIOBOTHRYS UNCINATUS HOOKED POPCORN-FLOWER PDBOR0V170 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223

Scientific Name, Common Name, Element Code	Listing Status		Rank		CNPS	
PLATYSTEMON CALIFORNICUS VAR CILIATUS SANTA BARBARA ISLAND CREAM CUPS PDPAP0J022 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.3	**List:** 1B **Code:** 313	
PLEUROPOGON CALIFORNICUS VAR DAVYI DAVY'S SEMAPHORE GRASS PMPOA7Y012 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T3 S3.3	**List:** 4 **Code:** 113	
PLEUROPOGON HOOVERIANUS NORTH COAST SEMAPHORE GRASS PMPOA7Y031 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Rare	**Global:** **State:**	G1 S1.1	**List:** 1B **Code:** 323	
PLEUROPOGON REFRACTUS NODDING SEMAPHORE GRASS PMPOA7Y032 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.2?	**List:** 4 **Code:** 121	
POA ABBREVIATA SSP MARSHII MARSH'S BLUE GRASS PMPOA4Z013 **Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S1.3	**List:** 2 **Code:** 311	
POA ABBREVIATA SSP PATTERSONII PATTERSON'S BLUE GRASS PMPOA4Z1Y0 **Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5?T5 S1.3	**List:** 2 **Code:** 311	
POA ATROPURPUREA SAN BERNARDINO BLUE GRASS PMPOA4Z0A0 **Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G2 S2.2	**List:** 1B **Code:** 223	
POA NAPENSIS NAPA BLUE GRASS PMPOA4Z1R0 **Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** 1B **Code:** 333	
POA PIPERI PIPER'S BLUE GRASS PMPOA4Z200 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** 4 **Code:** 112	
POA RHIZOMATA TIMBER BLUE GRASS PMPOA4Z250 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** 4 **Code:** 111	
PODISTERA NEVADENSIS SIERRA PODISTERA PDAPI1T030 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** 4 **Code:** 123	
POGOGYNE ABRAMSII SAN DIEGO MESA MINT PDLAM1K010 **Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G2 S2.1	**List:** 1B **Code:** 233	
POGOGYNE CLAREANA SANTA LUCIA MINT PDLAM1K020 **Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G1 S1.2	**List:** 1B **Code:** 323	
POGOGYNE DOUGLASII SSP PARVIFLORA DOUGLAS'S POGOGYNE PDLAM1K032 **Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G?T3?Q S3.2	**List:** 3 **Code:** 123	
POGOGYNE FLORIBUNDA PROFUSE-FLOWERED POGOGYNE PDLAM1K070 **Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** 1B **Code:** 223	

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
POGOGYNE NUDIUSCULA OTAY MESA MINT PDLAM1K040	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 332
POLEMONIUM CHARTACEUM MASON'S SKY PILOT PDPLM0E060	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 312
POLIOMINTHA INCANA FROSTED MINT PDLAM1L020	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 SH	**List:** **Code:**	1A *
POLYGALA CORNUTA VAR FISHIAE FISH'S MILKWORT PDPGL020B2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4 S3.3	**List:** **Code:**	4 112
POLYGALA HETERORHYNCHA NOTCH-BEAKED MILKWORT PDPGL02270	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3? S1.3	**List:** **Code:**	1B 212
POLYGALA SUBSPINOSA SPINY MILKWORT PDPGL021Q0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4? S3.2	**List:** **Code:**	2 221
POLYGONUM BIDWELLIAE BIDWELL'S KNOTWEED PDPGN0L0C0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
POLYGONUM HICKMANII SCOTTS VALLEY POLYGONUM PDPGN0L310	**Records in NDDB:** *Yes*	**Federal:** **State:**	Candidate None	**Global:** **State:**	G1 S1.1?	**List:** **Code:**	
POLYGONUM MARINENSE MARIN KNOTWEED PDPGN0L1C0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1Q S1.1	**List:** **Code:**	3 333
POLYGONUM POLYGALOIDES SSP ESOTERICUM MODOC COUNTY KNOTWEED PDPGN0L1Y2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4G5T1 S1.1	**List:** **Code:**	1B 333
POLYSTICHUM KRUCKEBERGII KRUCKEBERG'S SWORD FERN PPDRY0R0C0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S3.3	**List:** **Code:**	4 111
POLYSTICHUM LONCHITIS HOLLY FERN PPDRY0R0F0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S2?	**List:** **Code:**	3 ??1
POPULUS ANGUSTIFOLIA NARROW-LEAVED COTTONWOOD PDSAL01020	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S2S3	**List:** **Code:**	2 321
PORTULACA HALIMOIDES DESERT PORTULACA PDPOR06040	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.3	**List:** **Code:**	4 121
POTAMOGETON EPIHYDRUS SSP NUTTALLII NUTTALL'S PONDWEED PMPOT03081	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T5Q S2.2?	**List:** **Code:**	2 221

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
POTAMOGETON FILIFORMIS		Federal:	None	Global:	G5	List:	2
SLENDER-LEAVED PONDWEED		State:	None	State:	S1S2	Code:	321
PMPOT03090	Records in NDDB: *Yes*						
POTAMOGETON FOLIOSUS VAR FIBRILLOSUS		Federal:	None	Global:	G5T2T3	List:	2
FIBROUS PONDWEED		State:	None	State:	S1S2	Code:	311
PMPOT030B1	Records in NDDB: *Yes*						
POTAMOGETON PRAELONGUS		Federal:	None	Global:	G5	List:	2
WHITE-STEMMED PONDWEED		State:	None	State:	S1S2	Code:	311
PMPOT030V0	Records in NDDB: *Yes*						
POTAMOGETON ROBBINSII		Federal:	None	Global:	G5	List:	2
ROBBINS'S PONDWEED		State:	None	State:	S2.3?	Code:	211
PMPOT030Z0	Records in NDDB: *Yes*						
POTAMOGETON ZOSTERIFORMIS		Federal:	None	Global:	G5	List:	2
EEL-GRASS PONDWEED		State:	None	State:	S2.2?	Code:	221
PMPOT03160	Records in NDDB: *Yes*						
POTENTILLA BASALTICA		Federal:	Species of concern	Global:	G1	List:	1B
BLACK ROCK POTENTILLA		State:	None	State:	S1.3	Code:	312
PDROS1B270	Records in NDDB: *Yes*						
POTENTILLA CONCINNA		Federal:	None	Global:	G5?	List:	2
ALPINE CINQUEFOIL		State:	None	State:	S1.3	Code:	311
PDROS1B0F0	Records in NDDB: *Yes*						
POTENTILLA CRISTAE		Federal:	None	Global:	G2	List:	1B
CRESTED POTENTILLA		State:	None	State:	S2.3	Code:	313
PDROS1B2F0	Records in NDDB: *Yes*						
POTENTILLA GLANDULOSA SSP EWANII		Federal:	None	Global:	G5T1	List:	1B
EWAN'S CINQUEFOIL		State:	None	State:	S1.3	Code:	313
PDROS1B0S3	Records in NDDB: *Yes*						
POTENTILLA HICKMANII		Federal:	Endangered	Global:	G1	List:	1B
HICKMAN'S CINQUEFOIL		State:	Endangered	State:	S1.1	Code:	333
PDROS1B0U0	Records in NDDB: *Yes*						
POTENTILLA MOREFIELDII		Federal:	None	Global:	G1	List:	1B
MOREFIELD'S CINQUEFOIL		State:	None	State:	S1.3	Code:	213
PDROS1B2R0	Records in NDDB: *Yes*						
POTENTILLA MULTIJUGA		Federal:	Species of concern	Global:	GX	List:	1A
BALLONA CINQUEFOIL		State:	None	State:	SX	Code:	*
PDROS1B120	Records in NDDB: *Yes*						
POTENTILLA NEWBERRYI		Federal:	None	Global:	G3G4	List:	2
NEWBERRY'S CINQUEFOIL		State:	None	State:	S2.3?	Code:	211
PDROS1B130	Records in NDDB: *Yes*						
POTENTILLA RIMICOLA		Federal:	None	Global:	G3	List:	1B
CLIFF CINQUEFOIL		State:	None	State:	S1S2	Code:	212
PDROS1B2G0	Records in NDDB: *Yes*						
PROBOSCIDEA ALTHAEIFOLIA		Federal:	None	Global:	G5	List:	4
DESERT UNICORN-PLANT		State:	None	State:	S3.3	Code:	111
PDPED06010	Records in NDDB: *No*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
PRUNUS FASCICULATA VAR PUNCTATA		Federal:	None	Global:	G5T3	List:	4
SAND ALMOND		State:	None	State:	S3.3	Code:	113
PDROS1C0E2	Records in NDDB: *No*						
PSEUDOBAHIA BAHIIFOLIA		Federal:	Endangered	Global:	G2	List:	1B
HARTWEG'S GOLDEN SUNBURST		State:	Endangered	State:	S2.1	Code:	233
PDAST7P010	Records in NDDB: *Yes*						
PSEUDOBAHIA PEIRSONII		Federal:	Threatened	Global:	G2	List:	1B
SAN JOAQUIN ADOBE SUNBURST		State:	Endangered	State:	S2.1	Code:	233
PDAST7P030	Records in NDDB: *Yes*						
PSILOCARPHUS BREVISSIMUS VAR MULTIFLORUS		Federal:	None	Global:	G4T3	List:	4
DELTA WOOLLY-MARBLES		State:	None	State:	S3.2?	Code:	123
PDAST7R012	Records in NDDB: *No*						
PSILOCARPHUS ELATIOR		Federal:	None	Global:	G4Q	List:	4
TALL WOOLLY-MARBLES		State:	None	State:	S3.3	Code:	111
PDAST7R020	Records in NDDB: *No*						
PSILOCARPHUS TENELLUS VAR GLOBIFERUS		Federal:	None	Global:	G4T4	List:	4
ROUND WOOLLY-MARBLES		State:	None	State:	S3.2	Code:	121
PDAST7R043	Records in NDDB: *No*						
PSORALIDIUM LANCEOLATUM		Federal:	None	Global:	G5	List:	
LANCE-LEAVED SCURF-PEA		State:	None	State:	S1	Code:	
PDFAB5M030	Records in NDDB: *Yes*						
PSOROTHAMNUS ARBORESCENS VAR ARBORESCENS		Federal:	None	Global:	G5T3	List:	4
MOJAVE INDIGO-BUSH		State:	None	State:	S3.3	Code:	111
PDFAB3C011	Records in NDDB: *No*						
PUCCINELLIA CALIFORNICA		Federal:	None	Global:	G3	List:	4
SIERRA NEVADA ALKALI GRASS		State:	None	State:	S3.3	Code:	113
PMPOA61010	Records in NDDB: *No*						
PUCCINELLIA HOWELLII		Federal:	Species of concern	Global:	G1	List:	1B
HOWELL'S ALKALI GRASS		State:	None	State:	S1.1	Code:	333
PMPOA531A0	Records in NDDB: *Yes*						
PUCCINELLIA PARISHII		Federal:	Species of concern	Global:	G2	List:	1B
PARISH'S ALKALI GRASS		State:	None	State:	S1.1	Code:	332
PMPOA530T0	Records in NDDB: *Yes*						
PUCCINELLIA PUMILA		Federal:	None	Global:	G4?	List:	2
DWARF ALKALI GRASS		State:	None	State:	S1.1?	Code:	321
PMPOA531B0	Records in NDDB: *Yes*						
PYRROCOMA LUCIDA		Federal:	None	Global:	G1	List:	1B
STICKY PYRROCOMA		State:	None	State:	S1.2	Code:	313
PDASTDT0E0	Records in NDDB: *Yes*						
PYRROCOMA RACEMOSA VAR CONGESTA		Federal:	None	Global:	G5T4	List:	4
DEL NORTE PYRROCOMA		State:	None	State:	S3.3	Code:	111
PDASTDT0F4	Records in NDDB: *No*						
PYRROCOMA UNIFLORA VAR GOSSYPINA		Federal:	Species of concern	Global:	G5T2	List:	1B
BEAR VALLEY PYRROCOMA		State:	None	State:	S2.2	Code:	223
PDASTDT0K1	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
QUERCUS DUMOSA NUTTALL'S SCRUB OAK PDFAG050D0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S1.1	**List:** 1B **Code:** 232
QUERCUS ENGELMANNII ENGELMANN OAK PDFAG050K0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 122
QUERCUS PARVULA VAR PARVULA SANTA CRUZ ISLAND OAK PDFAG051Q1 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.3	**List:** 4 **Code:** 113
QUERCUS TOMENTELLA ISLAND OAK PDFAG05250 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 122
RAILLARDELLA PRINGLEI SHOWY RAILLARDELLA PDAST7X030 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
RAILLARDIOPSIS MUIRII MUIR'S RAILLARDELLA PDASTDU010 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2 **State:** S2.3	**List:** 1B **Code:** 213
RAILLARDIOPSIS SCABRIDA SCABRID RAILLARDELLA PDASTDU020 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
RANUNCULUS HYDROCHAROIDES FROG'S-BIT BUTTERCUP PDRAN0L190 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4G5 **State:** SH	**List:** 1A **Code:** *
RANUNCULUS LOBBII LOBB'S AQUATIC BUTTERCUP PDRAN0L1J0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.2	**List:** 4 **Code:** 123
RHUS TRILOBATA VAR SIMPLICIFOLIA SINGLE-LEAVED SKUNKBRUSH PDANA080B5 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T? **State:** S1.3?	**List:** 2 **Code:** 311
RHYNCHOSPORA ALBA WHITE BEAKED-RUSH PMCYP0N010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5 **State:** S3.3	**List:** 4 **Code:** 111
RHYNCHOSPORA CALIFORNICA CALIFORNIA BEAKED-RUSH PMCYP0N060 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
RHYNCHOSPORA GLOBULARIS VAR GLOBULARIS ROUND-HEADED BEAKED-RUSH PMCYP0N0W1 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T5? **State:** S1.1	**List:** 2 **Code:** 331
RIBES AMARUM VAR HOFFMANNII BITTER GOOSEBERRY PDGRO02012 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G?T2T3 **State:** S2S3	**List:** 3 **Code:** ??3
RIBES CANTHARIFORME MORENO CURRANT PDGRO02070 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.3	**List:** 1B **Code:** 313

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
RIBES DIVARICATUM VAR PARISHII PARISH'S GOOSEBERRY PDGRO020F3 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4T1 **State:** S1.1	**List:** 1B **Code:** 333
RIBES HUDSONIANUM VAR PETIOLARE WESTERN BLACK CURRANT PDGRO020N2 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T3T4 **State:** S1.3	**List:** 2 **Code:** 311
RIBES LAXIFLORUM TRAILING BLACK CURRANT PDGRO020V0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5 **State:** S3.3	**List:** 4 **Code:** 111
RIBES MARSHALLII MARSHALL'S GOOSEBERRY PDGRO020Z0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.3	**List:** 4 **Code:** 112
RIBES MENZIESII VAR IXODERME AROMATIC CANYON GOOSEBERRY PDGRO02104 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.2	**List:** 4 **Code:** 123
RIBES SERICEUM SANTA LUCIA GOOSEBERRY PDGRO021F0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
RIBES THACHERIANUM SANTA CRUZ ISLAND GOOSEBERRY PDGRO02109 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
RIBES TULARENSE SEQUOIA GOOSEBERRY PDGRO021L0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 313
RIBES VIBURNIFOLIUM SANTA CATALINA ISLAND CURRANT PDGRO021P0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 112
RIBES VICTORIS VICTOR'S GOOSEBERRY PDGRO021Q0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
ROMNEYA COULTERI COULTER'S MATILIJA POPPY PDPAP0L010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 123
RORIPPA COLUMBIAE COLUMBIA YELLOW CRESS PDBRA27060 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3 **State:** S1.1	**List:** 1B **Code:** 322
RORIPPA GAMBELII GAMBEL'S WATER CRESS PDBRA270V0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Threatened	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 332
RORIPPA SUBUMBELLATA TAHOE YELLOW CRESS PDBRA270M0 **Records in NDDB:** *Yes*	**Federal:** Candidate **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 332
ROSA MINUTIFOLIA SMALL-LEAVED ROSE PDROS1J1B0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Endangered	**Global:** G3 **State:** S1.1	**List:** 2 **Code:** 331

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
RUBUS GLAUCIFOLIUS VAR GANDERI		Federal:	Species of concern	Global:	G5T1Q	List:	1B
CUYAMACA RASPBERRY		State:	None	State:	S1.2	Code:	313
PDROS1K2N1	Records in NDDB: *Yes*						
RUBUS NIVALIS		Federal:	None	Global:	G4?	List:	2
SNOW DWARF BRAMBLE		State:	None	State:	S1.3?	Code:	311
PDROS1K4S0	Records in NDDB: *Yes*						
RUMEX VENOSUS		Federal:	None	Global:	G5?	List:	
WINGED DOCK		State:	None	State:	S1.3	Code:	
PDPGN0P1K0	Records in NDDB: *Yes*						
RUPERTIA HALLII		Federal:	None	Global:	G1	List:	1B
HALL'S RUPERTIA		State:	None	State:	S1.2	Code:	323
PDFAB62010	Records in NDDB: *Yes*						
RUPERTIA RIGIDA		Federal:	None	Global:	G3	List:	4
PARISH'S RUPERTIA		State:	None	State:	S3.3	Code:	112
PDFAB62030	Records in NDDB: *No*						
SAGITTARIA SANFORDII		Federal:	Species of concern	Global:	G3	List:	1B
SANFORD'S ARROWHEAD		State:	None	State:	S3.2	Code:	223
PMALI040Q0	Records in NDDB: *Yes*						
SALIX BEBBIANA		Federal:	None	Global:	G5	List:	2
GRAY WILLOW		State:	None	State:	S2.3?	Code:	211
PDSAL020E0	Records in NDDB: *Yes*						
SALIX BRACHYCARPA SSP BRACHYCARPA		Federal:	None	Global:	G5T5	List:	2
SHORT-FRUITED WILLOW		State:	None	State:	S1.3?	Code:	311
PDSAL020H5	Records in NDDB: *Yes*						
SALIX DELNORTENSIS		Federal:	None	Global:	G4	List:	4
DEL NORTE WILLOW		State:	None	State:	S3.3	Code:	112
PDSAL023F0	Records in NDDB: *No*						
SALIX RETICULATA SSP NIVALIS		Federal:	None	Global:	G5T?	List:	2
SNOW WILLOW		State:	None	State:	S1.3	Code:	211
PDSAL022J2	Records in NDDB: *Yes*						
SALVIA BRANDEGEI		Federal:	None	Global:	G2	List:	1B
BRANDEGEE'S SAGE		State:	None	State:	S2.2	Code:	222
PDLAM1S080	Records in NDDB: *Yes*						
SALVIA DORRII VAR INCANA		Federal:	None	Global:	G5T5Q	List:	3
FLESHY SAGE		State:	None	State:	S1S2	Code:	??1
PDLAM1S0G8	Records in NDDB: *No*						
SALVIA EREMOSTACHYA		Federal:	None	Global:	G5	List:	4
DESERT SAGE		State:	None	State:	S3.3	Code:	111
PDLAM1S0K0	Records in NDDB: *No*						
SALVIA FUNEREA		Federal:	None	Global:	G4	List:	4
DEATH VALLEY SAGE		State:	None	State:	S3.3	Code:	112
PDLAM1S0M0	Records in NDDB: *No*						
SALVIA GREATAE		Federal:	Species of concern	Global:	G2	List:	1B
OROCOPIA SAGE		State:	None	State:	S2.2	Code:	213
PDLAM1S0P0	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code		Listing Status	Rank	CNPS
SALVIA MUNZII MUNZ'S SAGE PDLAM1S140	Records in NDDB: *Yes*	Federal: None State: None	Global: G3 State: S2.2	List: 2 Code: 221
SANGUISORBA OFFICINALIS GREAT BURNET PDROS1L060	Records in NDDB: *Yes*	Federal: None State: None	Global: G5? State: S2.2	List: 2 Code: 221
SANICULA HOFFMANNII HOFFMANN'S SANICLE PDAPI1Z090	Records in NDDB: *No*	Federal: None State: None	Global: G3 State: S3.3	List: 4 Code: 113
SANICULA MARITIMA ADOBE SANICLE PDAPI1Z0D0	Records in NDDB: *Yes*	Federal: Species of concern State: Rare	Global: G2 State: S2.2	List: 1B Code: 333
SANICULA PECKIANA PECK'S SANICLE PDAPI1Z0E0	Records in NDDB: *No*	Federal: None State: None	Global: G4 State: S3.3	List: 4 Code: 111
SANICULA SAXATILIS ROCK SANICLE PDAPI1Z0H0	Records in NDDB: *Yes*	Federal: Species of concern State: Rare	Global: G2 State: S2.2	List: 1B Code: 323
SANICULA TRACYI TRACY'S SANICLE PDAPI1Z0K0	Records in NDDB: *Yes*	Federal: Species of concern State: None	Global: G3 State: S3.2	List: 1B Code: 123
SANVITALIA ABERTII ABERT'S SANVITALIA PDAST89010	Records in NDDB: *Yes*	Federal: None State: None	Global: G5 State: S1S2	List: 2 Code: 321
SATUREJA CHANDLERI SAN MIGUEL SAVORY PDLAM08030	Records in NDDB: *Yes*	Federal: None State: None	Global: G4 State: S3.2?	List: 4 Code: 122
SAUSSUREA AMERICANA AMERICAN SAW-WORT PDAST8B020	Records in NDDB: *Yes*	Federal: None State: None	Global: G5 State: S1.2?	List: 2 Code: 321
SAXIFRAGA CESPITOSA TUFTED SAXIFRAGE PDSAX0U0C0	Records in NDDB: *Yes*	Federal: None State: None	Global: G5 State: S1.3	List: 2 Code: 311
SAXIFRAGA HOWELLII HOWELL'S SAXIFRAGE PDSAX0U0T0	Records in NDDB: *No*	Federal: None State: None	Global: G4 State: S3.3	List: 4 Code: 111
SAXIFRAGA NUTTALLII NUTTALL'S SAXIFRAGE PDSAX0U160	Records in NDDB: *Yes*	Federal: None State: None	Global: G4? State: S1.1	List: 2 Code: 331
SAXIFRAGA RUFIDULA RUSTY SAXIFRAGE PDSAX0U1H0	Records in NDDB: *Yes*	Federal: None State: None	Global: G5? State: S1.3	List: 2 Code: 311
SCHEUCHZERIA PALUSTRIS VAR AMERICANA AMERICAN SCHEUCHZERIA PMSCH02011	Records in NDDB: *Yes*	Federal: None State: None	Global: G5T5 State: S1.1	List: 2 Code: 331

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
SCIRPUS CLEMENTIS		Federal:	None	Global:	G3	List:	4
YOSEMITE BULRUSH		State:	None	State:	S3.3	Code:	113
PMCYP0Q090	Records in NDDB: *No*						
SCIRPUS HETEROCHAETUS		Federal:	None	Global:	G5	List:	2
SLENDER BULRUSH		State:	None	State:	S1.3	Code:	311
PMCYP0Q0T0	Records in NDDB: *Yes*						
SCIRPUS PUMILUS		Federal:	None	Global:	G5	List:	2
DWARF BULRUSH		State:	None	State:	S1.2	Code:	321
PMCYP0Q1B0	Records in NDDB: *No*						
SCIRPUS SUBTERMINALIS		Federal:	None	Global:	G4G5	List:	2
WATER BULRUSH		State:	None	State:	S2S3	Code:	211
PMCYP0Q1G0	Records in NDDB: *Yes*						
SCLEROCACTUS POLYANCISTRUS		Federal:	None	Global:	G4	List:	4
MOJAVE FISH-HOOK CACTUS		State:	None	State:	S3.2	Code:	122
PDCAC0J050	Records in NDDB: *No*						
SCLEROPOGON BREVIFOLIUS		Federal:	None	Global:	G5	List:	2
BURRO GRASS		State:	None	State:	S1.3	Code:	311
PMPOA5G010	Records in NDDB: *Yes*						
SCROPHULARIA ATRATA		Federal:	Species of concern	Global:	G2	List:	1B
BLACK-FLOWERED FIGWORT		State:	None	State:	S2.2	Code:	223
PDSCR1S010	Records in NDDB: *Yes*						
SCROPHULARIA VILLOSA		Federal:	Species of concern	Global:	G2	List:	1B
SANTA CATALINA FIGWORT		State:	None	State:	S2.2	Code:	323
PDSCR1S0D0	Records in NDDB: *Yes*						
SCUTELLARIA BOLANDERI SSP AUSTROMONTANA		Federal:	None	Global:	G4T2	List:	1B
SOUTHERN SKULLCAP		State:	None	State:	S2.2?	Code:	223
PDLAM1U0A1	Records in NDDB: *Yes*						
SCUTELLARIA GALERICULATA		Federal:	None	Global:	G5	List:	2
MARSH SKULLCAP		State:	None	State:	S2.2?	Code:	221
PDLAM1U0J0	Records in NDDB: *Yes*						
SCUTELLARIA HOLMGRENIORUM		Federal:	None	Global:	G3Q	List:	3
HOLMGREN'S SKULLCAP		State:	None	State:	S2.3	Code:	312
PDLAM1U1C0	Records in NDDB: *Yes*						
SCUTELLARIA LATERIFLORA		Federal:	None	Global:	G5	List:	2
BLUE SKULLCAP		State:	None	State:	S1.2	Code:	321
PDLAM1U0Q0	Records in NDDB: *Yes*						
SEDUM ALBOMARGINATUM		Federal:	None	Global:	G2	List:	1B
FEATHER RIVER STONECROP		State:	None	State:	S2.2	Code:	323
PDCRA0A030	Records in NDDB: *Yes*						
SEDUM DIVERGENS		Federal:	None	Global:	G5?	List:	2
CASCADE STONECROP		State:	None	State:	S1.3	Code:	311
PDCRA0A0B0	Records in NDDB: *Yes*						
SEDUM EASTWOODIAE		Federal:	Candidate	Global:	G1	List:	1B
RED MOUNTAIN STONECROP		State:	None	State:	S1.2	Code:	323
PDCRA0A1S0	Records in NDDB: *Yes*						

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
SEDUM LAXUM SSP FLAVIDUM PALE YELLOW STONECROP PDCRA0A0L2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3Q S3.3	**List:** **Code:**	4 113
SEDUM LAXUM SSP HECKNERI HECKNER'S STONECROP PDCRA0A0L3	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4T3Q S3.3	**List:** **Code:**	4 112
SEDUM NIVEUM DAVIDSON'S STONECROP PDCRA0A0R0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 122
SEDUM OBLANCEOLATUM APPLEGATE STONECROP PDCRA0A0T0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S1.2	**List:** **Code:**	1B 332
SEDUM PARADISUM CANYON CREEK STONECROP PDCRA0A0U3	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 323
SELAGINELLA ASPRELLA BLUISH SPIKE-MOSS PPSEL01060	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5? S3.3	**List:** **Code:**	4 112
SELAGINELLA CINERASCENS ASHY SPIKE-MOSS PPSEL01090	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S3.2	**List:** **Code:**	4 121
SELAGINELLA DENSA VAR SCOPULORUM ROCKY MOUNTAIN SPIKE-MOSS PPSEL010C2	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G5T4? S2S3	**List:** **Code:**	3 ??1
SELAGINELLA EREMOPHILA DESERT SPIKE-MOSS PPSEL010G0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S2.2?	**List:** **Code:**	2 221
SELAGINELLA LEUCOBRYOIDES MOJAVE SPIKE-MOSS PPSEL010P0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.2	**List:** **Code:**	4 113
SELINOCARPUS NEVADENSIS DESERT WING-FRUIT PDNYC0F040	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S1.3	**List:** **Code:**	2 311
SENECIO APHANACTIS RAYLESS RAGWORT PDAST8H060	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G3? S1.2	**List:** **Code:**	2 321
SENECIO BERNARDINUS SAN BERNARDINO RAGWORT PDAST8H0E0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
SENECIO CLEVELANDII VAR CLEVELANDII CLEVELAND'S RAGWORT PDAST8H0R1	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4?T3 S3.3	**List:** **Code:**	4 113
SENECIO CLEVELANDII VAR HETEROPHYLLUS RED HILLS RAGWORT PDAST8H0R2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4?T2 S2.2	**List:** **Code:**	1B 333

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
SENECIO EURYCEPHALUS VAR LEWISROSEI CUT-LEAVED RAGWORT PDAST8H182	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4T2 S2.2	List: Code:	1B 323
SENECIO GANDERI GANDER'S RAGWORT PDAST8H1F0	Records in NDDB: *Yes*	Federal: State:	Species of concern Rare	Global: State:	G2 S2.2	List: Code:	1B 323
SENECIO HYDROPHILOIDES SWEET MARSH RAGWORT PDAST8H400	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S2S3	List: Code:	3 ??1
SENECIO IONOPHYLLUS TEHACHAPI RAGWORT PDAST8H1T0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
SENECIO LAYNEAE LAYNE'S RAGWORT PDAST8H1V0	Records in NDDB: *Yes*	Federal: State:	Threatened Rare	Global: State:	G2 S2.2	List: Code:	1B 223
SENECIO MACOUNII SISKIYOU MOUNTAINS RAGWORT PDAST8H1Z0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5 S3.3	List: Code:	4 111
SENECIO PATTERSONENSIS MONO RAGWORT PDAST8H2C0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
SENNA COVESII COVES'S CASSIA PDFAB491X0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5? S2.2	List: Code:	2 221
SIBARA FILIFOLIA SANTA CRUZ ISLAND ROCK CRESS PDBRA2A020	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G1 S1.1	List: Code:	1B 333
SIBAROPSIS HAMMITTII HAMMITT'S CLAY-CRESS PDBRA32010	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G1G2 S1S2	List: Code:	
SIDALCEA CALYCOSA SSP RHIZOMATA POINT REYES CHECKERBLOOM PDMAL11012	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T2 S2.2	List: Code:	1B 223
SIDALCEA COVILLEI OWENS VALLEY CHECKERBLOOM PDMAL11040	Records in NDDB: *Yes*	Federal: State:	Species of concern Endangered	Global: State:	G2 S2.1	List: Code:	1B 233
SIDALCEA HICKMANII SSP ANOMALA CUESTA PASS CHECKERBLOOM PDMAL110A1	Records in NDDB: *Yes*	Federal: State:	Species of concern Rare	Global: State:	G3T1 S1.2	List: Code:	1B 323
SIDALCEA HICKMANII SSP HICKMANII HICKMAN'S CHECKERBLOOM PDMAL110A2	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G3T2 S2.3	List: Code:	1B 213
SIDALCEA HICKMANII SSP PARISHII PARISH'S CHECKERBLOOM PDMAL110A3	Records in NDDB: *Yes*	Federal: State:	Candidate Rare	Global: State:	G3T1 S1.2	List: Code:	1B 323

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
SIDALCEA HICKMANII SSP VIRIDIS MARIN CHECKERBLOOM PDMAL110A4	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G3T2 S2.2?	**List:** **Code:**	1B 313
SIDALCEA KECKII KECK'S CHECKERBLOOM PDMAL110D0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Proposed Endangered None	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
SIDALCEA MALACHROIDES MAPLE-LEAVED CHECKERBLOOM PDMAL110E0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2? S2.2	**List:** **Code:**	1B 222
SIDALCEA MALVIFLORA SSP PATULA SISKIYOU CHECKERBLOOM PDMAL110F9	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 322
SIDALCEA NEOMEXICANA SALT SPRING CHECKERBLOOM PDMAL110J0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G4? S2S3	**List:** **Code:**	2 221
SIDALCEA OREGANA SSP EXIMIA COAST CHECKERBLOOM PDMAL110K9	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 323
SIDALCEA OREGANA SSP HYDROPHILA MARSH CHECKERBLOOM PDMAL110K2	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5T2 S2?	**List:** **Code:**	1B 223
SIDALCEA OREGANA SSP VALIDA KENWOOD MARSH CHECKERBLOOM PDMAL110K5	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G5T1 S1.1	**List:** **Code:**	1B 333
SIDALCEA PEDATA BIRD-FOOT CHECKERBLOOM PDMAL110L0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
SIDALCEA ROBUSTA BUTTE COUNTY CHECKERBLOOM PDMAL110P0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
SIDALCEA STIPULARIS SCADDEN FLAT CHECKERBLOOM PDMAL110R0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G1 S1.1	**List:** **Code:**	1B 333
SILENE CAMPANULATA SSP CAMPANULATA RED MOUNTAIN CATCHFLY PDCAR0U0A2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern Endangered	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 333
SILENE INVISA CAMOUFLAGE CAMPION PDCAR0U0S0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G4 S4.2	**List:** **Code:**	4 123
SILENE MARMORENSIS MARBLE MOUNTAIN CAMPION PDCAR0U0Z0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 223
SILENE OCCIDENTALIS SSP LONGISTIPITATA WESTERN CAMPION PDCAR0U161	**Records in NDDB:** *No*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G4T1Q S1?	**List:** **Code:**	3 ??3

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
SILENE SUKSDORFII CASCADE ALPINE CAMPION PDCAR0U1W0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4 **State:** S2.3	**List:** 2 **Code:** 211
SILENE VERECUNDA SSP VERECUNDA SAN FRANCISCO CAMPION PDCAR0U213 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T2 **State:** S2.2	**List:** 1B **Code:** 323
SMELOWSKIA OVALIS VAR CONGESTA LASSEN PEAK SMELOWSKIA PDBRA2D041 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G5T1 **State:** S1.2	**List:** 1B **Code:** 323
SMILAX JAMESII ENGLISH PEAK GREENBRIAR PMSMI010D0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2 **State:** S2.3	**List:** 1B **Code:** 213
SOLANUM CLOKEYI ISLAND NIGHTSHADE PDSOL0Z281 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 123
SOLANUM WALLACEI WALLACE'S NIGHTSHADE PDSOL0Z280 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3Q **State:** S3.2	**List:** 4 **Code:** 122
SOLIDAGO GIGANTEA SMOOTH GOLDENROD PDAST8P0Q0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S1.2?	**List:** 2 **Code:** 321
SOLIDAGO GUIRADONIS GUIRADO'S GOLDENROD PDAST8P0T0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 123
SPARGANIUM NATANS SMALL BUR-REED PMSPA01090 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5 **State:** S3.3	**List:** 4 **Code:** 111
SPARTINA GRACILIS ALKALI CORD GRASS PMPOA5S060 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5 **State:** S3.2	**List:** 4 **Code:** 121
SPHAERALCEA RUSBYI VAR EREMICOLA RUSBY'S DESERT-MALLOW PDMAL140L1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4T1 **State:** S1.3	**List:** 1B **Code:** 323
SPHENOPHOLIS OBTUSATA PRAIRIE WEDGE GRASS PMPOA5T030 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S1.2	**List:** 2 **Code:** 211
STANLEYA VIRIDIFLORA GREEN PRINCE'S PLUME PDBRA2E060 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4 **State:** S2?	**List:** **Code:**
STEBBINSOSERIS DECIPIENS SANTA CRUZ MICROSERIS PDAST6E050 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
STELLARIA LONGIFOLIA LONG-LEAVED STARWORT PDCAR0X0M0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S1.2	**List:** 2 **Code:** 321

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
STELLARIA OBTUSA OBTUSE STARWORT PDCAR0X0U0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S2.3?	**List:** **Code:**	2 311
STENOTUS LANUGINOSUS WOOLLY STENOTUS PDASTCX010	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G5 S1.2	**List:** **Code:**	2 321
STEPHANOMERIA BLAIRII BLAIR'S STEPHANOMERIA PDAST8U0K0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2 S2.2	**List:** **Code:**	1B 323
STREPTANTHUS ALBIDUS SSP ALBIDUS METCALF CANYON JEWEL-FLOWER PDBRA2G011	**Records in NDDB:** *Yes*	**Federal:** **State:**	Endangered None	**Global:** **State:**	G2T1 S1.1	**List:** **Code:**	1B 333
STREPTANTHUS ALBIDUS SSP PERAMOENUS MOST BEAUTIFUL JEWEL-FLOWER PDBRA2G012	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T2 S2.2	**List:** **Code:**	1B 223
STREPTANTHUS BATRACHOPUS TAMALPAIS JEWEL-FLOWER PDBRA2G050	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.2	**List:** **Code:**	1B 313
STREPTANTHUS BERNARDINUS LAGUNA MOUNTAINS JEWEL-FLOWER PDBRA2G060	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 212
STREPTANTHUS BRACHIATUS SSP BRACHIATUS SOCRATES MINE JEWEL-FLOWER PDBRA2G072	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323
STREPTANTHUS BRACHIATUS SSP HOFFMANII FREED'S JEWEL-FLOWER PDBRA2G071	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G2T1 S1.2	**List:** **Code:**	1B 323
STREPTANTHUS CALLISTUS MT. HAMILTON JEWEL-FLOWER PDBRA2G0A0	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G1 S1.3	**List:** **Code:**	1B 313
STREPTANTHUS CAMPESTRIS SOUTHERN JEWEL-FLOWER PDBRA2G0B0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 212
STREPTANTHUS CORDATUS VAR PIUTENSIS PIUTE MOUNTAINS JEWEL-FLOWER PDBRA2G0D2	**Records in NDDB:** *Yes*	**Federal:** **State:**	Species of concern None	**Global:** **State:**	G5T1 S1.2	**List:** **Code:**	1B 323
STREPTANTHUS DREPANOIDES SICKLE-FRUIT JEWEL-FLOWER PDBRA2G200	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
STREPTANTHUS FARNSWORTHIANUS FARNSWORTH'S JEWEL-FLOWER PDBRA2G0G0	**Records in NDDB:** *No*	**Federal:** **State:**	None None	**Global:** **State:**	G3 S3.3	**List:** **Code:**	4 113
STREPTANTHUS FENESTRATUS TEHIPITE VALLEY JEWEL-FLOWER PDBRA2G0H0	**Records in NDDB:** *Yes*	**Federal:** **State:**	None None	**Global:** **State:**	G2 S2.3	**List:** **Code:**	1B 213

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
STREPTANTHUS GLANDULOSUS SSP PULCHELLUS MT. TAMALPAIS JEWEL-FLOWER PDBRA2G0J2 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4T1 **State:** S1.2	**List:** 1B **Code:** 313
STREPTANTHUS GLANDULOSUS VAR HOFFMANII SECUND JEWEL-FLOWER PDBRA2G0J4 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4T1Q **State:** S1.3	**List:** 1B **Code:** 313
STREPTANTHUS GRACILIS ALPINE JEWEL-FLOWER PDBRA2G0K0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
STREPTANTHUS HISPIDUS MT. DIABLO JEWEL-FLOWER PDBRA2G0M0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 313
STREPTANTHUS HOWELLII HOWELL'S JEWEL-FLOWER PDBRA2G0N0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2 **State:** S1.2	**List:** 1B **Code:** 322
STREPTANTHUS INSIGNIS SSP LYONII ARBURUA RANCH JEWEL-FLOWER PDBRA2G0Q1 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3G4T1 **State:** S1.2	**List:** 1B **Code:** 323
STREPTANTHUS MORRISONII SEE INDIVIDUAL SUBSPECIES! PDBRA2G0S0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2Q **State:** S2	**List:** **Code:**
STREPTANTHUS MORRISONII SSP ELATUS THREE PEAKS JEWEL-FLOWER PDBRA2G0S1 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G2T2 **State:** S2.2	**List:** 1B **Code:** 323
STREPTANTHUS MORRISONII SSP HIRTIFLORUS DORR'S CABIN JEWEL-FLOWER PDBRA2G0S2 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G2T1 **State:** S1.2	**List:** 1B **Code:** 323
STREPTANTHUS MORRISONII SSP KRUCKEBERGII KRUCKEBERG'S JEWEL-FLOWER PDBRA2G0S4 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G2T1 **State:** S1.2	**List:** 1B **Code:** 323
STREPTANTHUS MORRISONII SSP MORRISONII MORRISON'S JEWEL-FLOWER PDBRA2G0S3 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G2T2 **State:** S2.2	**List:** 1B **Code:** 323
STREPTANTHUS NIGER TIBURON JEWEL-FLOWER PDBRA2G0T0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
STREPTANTHUS OLIGANTHUS MASONIC MOUNTAIN JEWEL-FLOWER PDBRA2G0V0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3 **State:** S2.2	**List:** 1B **Code:** 222
STREPTANTHUS SP NOV "PIT RIVER" PIT RIVER JEWEL-FLOWER PDBRA2G300 **Records in NDDB:** *No*	**Federal:** Species of concern **State:** None	**Global:** G1? **State:** S1?	**List:** **Code:**
STYLOCLINE CITROLEUM OIL NESTSTRAW PDAST8Y070 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333

Scientific Name, Common Name, Element Code	Records in NDDB	Listing Status	Rank	CNPS
STYLOCLINE MASONII MASON'S NESTSTRAW PDAST8Y080	*Yes*	Federal: Species of concern State: None	Global: G1 State: S1.1	List: 1B Code: 333
STYLOCLINE SONORENSIS MESQUITE NESTSTRAW PDAST8Y060	*Yes*	Federal: None State: None	Global: G3G5 State: SH	List: 2 Code: 331
SUAEDA CALIFORNICA CALIFORNIA SEABLITE PDCHE0P020	*Yes*	Federal: Endangered State: None	Global: G1 State: S1.1	List: 1B Code: 333
SUAEDA ESTEROA ESTUARY SEABLITE PDCHE0P0D0	*No*	Federal: None State: None	Global: G4 State: S2.2	List: 4 Code: 121
SUAEDA TAXIFOLIA WOOLLY SEABLITE PDCHE0P0L0	*No*	Federal: None State: None	Global: G3? State: S2S3	List: 4 Code: 121
SULCARIA ISIDIIFERA SPLITTING YARN LICHEN NLTEST0020	*Yes*	Federal: Species of concern State: None	Global: G1 State: S1.1	List: Code:
SWALLENIA ALEXANDRAE EUREKA VALLEY DUNE GRASS PMPOA5Y010	*Yes*	Federal: Endangered State: Rare	Global: G1 State: S1.2	List: 1B Code: 323
SWERTIA FASTIGIATA CLUSTERED GREEN GENTIAN PDGEN05050	*Yes*	Federal: None State: None	Global: G4? State: S2.2	List: 2 Code: 321
SWERTIA NEGLECTA PINE GREEN-GENTIAN PDGEN05080	*No*	Federal: None State: None	Global: G3 State: S3?	List: 4 Code: 113
SYNTRICHOPAPPUS LEMMONII LEMMON'S SYNTRICHOPAPPUS PDAST90020	*No*	Federal: None State: None	Global: G3 State: S3.3	List: 4 Code: 113
SYSTENOTHECA VORTRIEDEI VORTRIEDE'S SPINEFLOWER PDPGN0W010	*No*	Federal: None State: None	Global: G3 State: S3.3	List: 4 Code: 113
TARAXACUM CALIFORNICUM CALIFORNIA DANDELION PDAST93050	*Yes*	Federal: Endangered State: None	Global: G2 State: S2.2	List: 1B Code: 323
TAUSCHIA GLAUCA GLAUCOUS TAUSCHIA PDAPI27020	*No*	Federal: None State: None	Global: G4 State: S3.3	List: 4 Code: 111
TAUSCHIA HOWELLII HOWELL'S TAUSCHIA PDAPI27050	*Yes*	Federal: Species of concern State: None	Global: G1 State: S1.3	List: 1B Code: 312
TETRACOCCUS DIOICUS PARRY'S TETRACOCCUS PDEUP1C010	*Yes*	Federal: Species of concern State: None	Global: G3 State: S2.2	List: 1B Code: 322

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
TETRACOCCUS ILICIFOLIUS HOLLY-LEAVED TETRACOCCUS PDEUP1C030 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G1 **State:** S1.3	**List:** 1B **Code:** 313
TETRADYMIA ARGYRAEA STRIPED HORSEBRUSH PDAST95010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4? **State:** S3.3	**List:** 4 **Code:** 111
TETRADYMIA SPINOSA SPINY HORSEBRUSH PDAST95080 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5 **State:** S1S2	**List:** **Code:**
TEXOSPORIUM SANCTI-JACOBI WOVEN-SPORED LICHEN NLTEST7980 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2? **State:** S1.1	**List:** **Code:**
THAMNOLIA VERMICULARIS THAMNOLIA LICHEN NLTES43860 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G? **State:** S1.1	**List:** **Code:**
THELYPODIUM BRACHYCARPUM SHORT-PODDED THELYPODIUM PDBRA2N010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 4 **Code:** 122
THELYPODIUM HOWELLII SSP HOWELLII HOWELL'S THEYLPODIUM PDBRA2N051 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2?T1 **State:** S1.3?	**List:** **Code:**
THELYPODIUM MILLEFLORUM THOUSAND-FLOWERED THELYPODIUM PDBRA2N0A0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S2.2?	**List:** **Code:**
THELYPODIUM STENOPETALUM SLENDER-PETALED THELYPODIUM PDBRA2N0F0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
THELYPTERIS PUBERULA VAR SONORENSIS SONORAN MAIDEN FERN PPTHE05192 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T3T4 **State:** S2.2?	**List:** 2 **Code:** 221
THERMOPSIS CALIFORNICA VAR ARGENTATA SILVERY FALSE LUPINE PDFAB3Z05A **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3Q **State:** S3.3	**List:** 4 **Code:** 113
THERMOPSIS CALIFORNICA VAR SEMOTA VELVETY FALSE LUPINE PDFAB3Z053 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4T2Q **State:** S2.2	**List:** 1B **Code:** 223
THERMOPSIS GRACILIS SLENDER FALSE LUPINE PDFAB3Z0C0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4Q **State:** S3.3	**List:** 4 **Code:** 111
THERMOPSIS MACROPHYLLA SANTA YNEZ FALSE LUPINE PDFAB3Z050 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Rare	**Global:** G1 **State:** S1.3	**List:** 1B **Code:** 313
THERMOPSIS ROBUSTA ROBUST FALSE LUPINE PDFAB3Z0D0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G2Q **State:** S2.2	**List:** 1B **Code:** 223

Scientific Name, Common Name, Element Code		Listing Status		Rank		CNPS	
THLASPI CALIFORNICUM KNEELAND PRAIRIE PENNYCRESS PDBRA2P041	Records in NDDB: *Yes*	Federal: State:	Proposed Endangered None	Global: State:	G1 S1.1	List: Code:	1B 333
THYSANOCARPUS CONCHULIFERUS SANTA CRUZ ISLAND FRINGEPOD PDBRA2Q060	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G1 S1.2	List: Code:	1B 323
TIARELLA TRIFOLIATA VAR TRIFOLIATA TRIFOLIATE LACEFLOWER PDSAX10031	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G5T5 S2S3	List: Code:	3 ??1
TONESTUS EXIMIUS TAHOE TONESTUS PDASTE0030	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4 S3.3	List: Code:	4 111
TONESTUS LYALLII LYALL'S TONESTUS PDASTE0050	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.3?	List: Code:	2 311
TOWNSENDIA PARRYI PARRY'S TOWNSENDIA PDAST9C0J0	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G4? S1.3?	List: Code:	2 311
TRACYINA ROSTRATA BEAKED TRACYINA PDAST9D010	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G1 S1.1	List: Code:	1B 313
TRICHOCORONIS WRIGHTII VAR WRIGHTII WRIGHT'S TRICHOCORONIS PDAST9F031	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5T5? S1.1	List: Code:	2 331
TRICHOSTEMA AUSTROMONTANUM SSP COMPACTUM HIDDEN LAKE BLUECURLS PDLAM22022	Records in NDDB: *Yes*	Federal: State:	Threatened None	Global: State:	G5T1 S1.1	List: Code:	1B 333
TRICHOSTEMA MICRANTHUM SMALL-FLOWERED BLUECURLS PDLAM22080	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G4 S3.3	List: Code:	4 111
TRICHOSTEMA OVATUM SAN JOAQUIN BLUECURLS PDLAM220A0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.2	List: Code:	4 123
TRICHOSTEMA RUBISEPALUM HERNANDEZ BLUECURLS PDLAM220C0	Records in NDDB: *No*	Federal: State:	None None	Global: State:	G3 S3.3	List: Code:	4 113
TRIENTALIS ARCTICA ARCTIC STARFLOWER PDPRI0A030	Records in NDDB: *Yes*	Federal: State:	None None	Global: State:	G5 S1.2	List: Code:	2 321
TRIFOLIUM AMOENUM SHOWY INDIAN CLOVER PDFAB40040	Records in NDDB: *Yes*	Federal: State:	Endangered None	Global: State:	G1 S1.1	List: Code:	1B 333
TRIFOLIUM BOLANDERI BOLANDER'S CLOVER PDFAB400G0	Records in NDDB: *No*	Federal: State:	Species of concern None	Global: State:	G3 S3.3	List: Code:	4 113

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
TRIFOLIUM BUCKWESTIORUM SANTA CRUZ CLOVER PDFAB402W0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
TRIFOLIUM GRACILENTUM VAR PALMERI SOUTHERN ISLAND CLOVER PDFAB40102 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.2	**List:** 4 **Code:** 122
TRIFOLIUM HOWELLII HOWELL'S CLOVER PDFAB40140 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.3	**List:** 4 **Code:** 111
TRIFOLIUM JOKERSTII BUTTE COUNTY GOLDEN CLOVER PDFAB40310 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G1 **State:** S1.2	**List:** **Code:**
TRIFOLIUM LEMMONII LEMMON'S CLOVER PDFAB401C0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4? **State:** S3.3	**List:** 4 **Code:** 112
TRIFOLIUM MACILENTUM VAR DEDECKERAE DEDECKER'S CLOVER PDFAB400Q0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G?T2 **State:** S2.3	**List:** 1B **Code:** 313
TRIFOLIUM POLYODON PACIFIC GROVE CLOVER PDFAB402H0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** Rare	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
TRIFOLIUM TRICHOCALYX MONTEREY CLOVER PDFAB402J0 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
TRILLIUM OVATUM SSP OETTINGERI SALMON MOUNTAINS WAKEROBIN PMLIL200M1 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.2	**List:** 4 **Code:** 123
TRIMORPHA ACRIS VAR DEBILIS NORTHERN DAISY PDASTE1012 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T4 **State:** S2S3	**List:** 2 **Code:** 211
TRIPHYSARIA FLORIBUNDA SAN FRANCISCO OWL'S-CLOVER PDSCR2T010 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
TRIPTEROCALYX CRUX-MALTAE KELLOGG'S SANDVERBENA PDNYC0G020 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4 **State:** S1.2	**List:** **Code:**
TRITELEIA CLEMENTINA SAN CLEMENTE ISLAND TRITELEIA PMLIL21020 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G1 **State:** S1.2	**List:** 1B **Code:** 323
TRITELEIA CROCEA VAR CROCEA YELLOW TRITELEIA PMLIL21031 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T4 **State:** S3.3	**List:** 4 **Code:** 112
TRITELEIA CROCEA VAR MODESTA TRINITY MOUNTAINS TRITELEIA PMLIL21032 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3 **State:** S3.3	**List:** 4 **Code:** 113

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
TRITELEIA GRANDIFLORA SSP HOWELLII HOWELL'S TRITELEIA PMLIL21080 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T5? **State:** S1.2?	**List:** **Code:**
TRITELEIA HENDERSONII VAR HENDERSONII HENDERSON'S TRITELEIA PMLIL21073 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G?T2? **State:** S1.2	**List:** 2 **Code:** 321
TRITELEIA IXIOIDES SSP COOKII COOK'S TRITELEIA PMLIL210A2 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5T3 **State:** S3.3	**List:** 4 **Code:** 113
TROPIDOCARPUM CAPPARIDEUM CAPER-FRUITED TROPIDOCARPUM PDBRA2R010 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** GH **State:** SH	**List:** 1A **Code:** *
TUCTORIA GREENEI GREENE'S TUCTORIA PMPOA6N010 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Rare	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 233
TUCTORIA MUCRONATA CRAMPTON'S TUCTORIA PMPOA6N020 **Records in NDDB:** *Yes*	**Federal:** Endangered **State:** Endangered	**Global:** G1 **State:** S1.1	**List:** 1B **Code:** 333
VACCINIUM COCCINEUM SISKIYOU MOUNTAINS HUCKLEBERRY PDERI181N0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5Q **State:** S2.2?	**List:** 3 **Code:** 21?
VACCINIUM SCOPARIUM LITTLE-LEAVED HUCKLEBERRY PDERI180Y0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S2.2?	**List:** 2 **Code:** 221
VANCOUVERIA CHRYSANTHA SISKIYOU INSIDE-OUT-FLOWER PDBER09010 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.3	**List:** 4 **Code:** 212
VERATRUM FIMBRIATUM FRINGED FALSE HELLEBORE PMLIL25030 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
VERATRUM INSOLITUM SISKIYOU FALSE HELLEBORE PMLIL25040 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.3	**List:** 4 **Code:** 111
VERBENA CALIFORNICA CALIFORNIA VERVAIN PDVER0N050 **Records in NDDB:** *Yes*	**Federal:** Threatened **State:** Threatened	**Global:** G2 **State:** S2.1	**List:** 1B **Code:** 333
VERBESINA DISSITA CROWNBEARD PDAST9R050 **Records in NDDB:** *Yes*	**Federal:** Threatened **State:** Threatened	**Global:** G3 **State:** S1.1	**List:** 1B **Code:** 332
VERONICA COPELANDII COPELAND'S SPEEDWELL PDSCR200B0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
VERONICA CUSICKII CUSICK'S SPEEDWELL PDSCR200C0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G5 **State:** S3.3	**List:** 4 **Code:** 111

Scientific Name, Common Name, Element Code	Listing Status	Rank	CNPS
VIGUIERA LACINIATA SAN DIEGO COUNTY VIGUIERA PDAST9T060 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4 **State:** S3.2	**List:** 4 **Code:** 121
VIOLA AUREA GOLDEN VIOLET PDVIO04420 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3G4 **State:** S2S3	**List:** 2 **Code:** 221
VIOLA LANGSDORFII LANGSDORF'S VIOLET PDVIO04100 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4 **State:** S1.1	**List:** 2 **Code:** 331
VIOLA PALUSTRIS MARSH VIOLET PDVIO041G0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S1S2	**List:** 2 **Code:** 321
VIOLA PINETORUM SSP GRISEA GREY-LEAVED VIOLET PDVIO04431 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G4G5T1 **State:** S1.3	**List:** 1B **Code:** 313
VIOLA PRIMULIFOLIA SSP OCCIDENTALIS WESTERN BOG VIOLET PDVIO040Y2 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G4T2 **State:** S2.2	**List:** 1B **Code:** 222
VIOLA TOMENTOSA WOOLLY VIOLET PDVIO04280 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.2	**List:** 1B **Code:** 223
WISLIZENIA REFRACTA SSP REFRACTA JACKASS-CLOVER PDCPP09013 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5T5? **State:** S1.2?	**List:** 2 **Code:** 321
WOODSIA PLUMMERAE PLUMMER'S WOODSIA PPDRY0U0A0 **Records in NDDB:** *Yes*	**Federal:** None **State:** None	**Global:** G5 **State:** S1.3?	**List:** 2 **Code:** 311
WYETHIA ELATA HALL'S WYETHIA PDAST9X050 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
WYETHIA LONGICAULIS HUMBOLDT COUNTY WYETHIA PDAST9X0A0 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G3 **State:** S3.3	**List:** 4 **Code:** 113
WYETHIA RETICULATA EL DORADO COUNTY MULE EARS PDAST9X0D0 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
XYLORHIZA COGNATA MECCA-ASTER PDASTA1010 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G2 **State:** S2.2	**List:** 1B **Code:** 223
XYLORHIZA ORCUTTII ORCUTT'S WOODY-ASTER PDASTA1040 **Records in NDDB:** *Yes*	**Federal:** Species of concern **State:** None	**Global:** G3 **State:** S2.2	**List:** 1B **Code:** 222
ZIGADENUS MICRANTHUS VAR FONTANUS SEEP DEATH CAMAS PMLIL28050 **Records in NDDB:** *No*	**Federal:** None **State:** None	**Global:** G4T3? **State:** S3?	**List:** **Code:**