Final
Environmental Impact Report
State Clearinghouse Number: 2003041190

Volume I

LA JOLLA RECHARGE BASIN

Prepared for:

Orange County Water District
10500 Ellis Avenue
Fountain Valley, California 92708

Submitted by:

Chambers Group, Inc.
17671 Cowan Avenue, Suite 100
Irvine, California 92614

May 2006

FINAL EIR
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CHAPTER I: INTRODUCTION TO THE FINAL EIR

On February 10, 2006, the Orange County Water District (OCWD, or District) distributed to public agencies and the general public the Draft Environmental Impact Report (EIR) for the proposed La Jolla Recharge Basin project. The Draft EIR contains the environmental analysis of potentially significant impacts of the proposed project. Together, the Draft EIR and this document, which includes responses to comments, constitute the Final EIR.

In accordance with Section 21091 of the California Environmental Quality Act (CEQA) Statutes (Public Resources Code Section 21000 *et. seq.*) and Section 15087 of the State CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 *et. seq.*), a 45-day public review period for the Draft EIR was provided from February 10 to March 27, 2006. During the public review period, six comments on environmental issues evaluated in the Draft EIR were received from public agencies. No comments were received from organizations or individuals.

Chapter II presents complete copies of written comments received on the Draft EIR. Following each letter are the responses to significant environmental issues raised in the comments, as required by State CEQA Guidelines §15132. The focus of the responses to comments is on the disposition of significant environmental issues that are raised in the comments, as specified by State CEQA Guidelines §15088(b).

Based on the Draft EIR comments and responses, the District has determined that no revisions or clarifications to the Draft EIR are necessary. Therefore, the Draft EIR has been reprinted in its entirety, without modification, and follows Chapter II.

CHAPTER II: RESPONSES TO COMMENTS ON THE DRAFT EIR

INTRODUCTION

This chapter provides responses to comments submitted to the Orange County Water District (OCWD or District) by agencies, organizations, and individuals regarding the La Jolla Recharge Basin Draft Environmental Impact Report (EIR), which was issued for public review and comment from February 10 to March 27, 2006. All comments received are reproduced in the chapter. Responses were developed to either answer questions about the Draft EIR analysis or refer the commenter to the appropriate location in the Draft EIR where detailed information about the issue can be found.

All comment letters submitted by agencies, organizations, and individuals are assigned a reference number (e.g., Letter No. 1, 2, 3, etc.), as shown below. The reference numbers are marked on the first page of each comment letter. Individual comments are assigned sequential alphanumeric identifiers. For example, Comment Letter No. 1 contains individual comments labeled 1A, 1B, 1C, etc. Following each comment letter are the District's responses, which are also assigned identifiers to correspond with each individual comment.

PUBLIC AGENCIES

No.	Agency	Name	Date
1	State of California, Department of Toxic Substances Control (DTSC)	Greg Holmes, Unit Chief *So. Cal. Cleanup Operations Branch – Cypress Office*	March 1, 2006
2	State Water Resources Control Board (SWRCB)	Ross Swenerton, Chief *Watershed Unit 1*	March 6, 2006
3	State of California, Department of Transportation (Caltrans), District 12	Unsigned Caltrans Log #1250 A	March 7, 2006
4	Southern California Association of Governments (SCAG)	Brian Wallace, Associate Regional Planner *Intergovernmental Review*	March 9, 2006
5	County of Orange, Resources and Development Management Department (RDMD)	Ronald L. Tippets, Chief *Environmental Planning Division*	March 31, 2006
6	California Regional Water Quality Control Board, Santa Ana Region (SARWQCB)	Mark G. Adelson, Chief *Regional Planning Programs Section*	April 13, 2006

PRIVATE ORGANIZATIONS AND INDIVIDUALS

No comment letters were submitted to OCWD from private organizations or individuals.

Comment Letter No. 1

Department of Toxic Substances Control

Alan C. Lloyd, Ph.D.
Agency Secretary
Cal/EPA

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

March 1, 2006

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, California 92708

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT (EIR) FOR THE LA JOLLA RECHARGE BASIN (SCH#2003041190)

Dear Mr. Deshmukh:

The Department of Toxic Substances Control (DTSC) has received your submitted EIR document for the above-mentioned project. The following project description is stated in your document: "The primary project component is the construction and operation of a groundwater recharge basin that will increase recharge into the Orange County Groundwater Basin. The new La Jolla Recharge Basin would add as much as 9,000 acre-feet of recharge capacity per year." Based on the review of the submitted EIR document DTSC has comments as follow:

1A

1. The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. Since hazardous materials or wastes were stored at the site, further studies should be carried out to delineate the nature and extent of the contamination, and the potential threat to public health and/or the environment should be evaluated. It may be necessary to determine if an expedited response action is required to reduce existing or potential threats to public health or the environment. If no immediate threat exists, the final remedy should be implemented in compliance with state regulations and policies.

   The draft EIR states: "Potentially hazardous chemicals used, stored, or handled at the site in connection with former site uses include pesticides and other agricultural chemicals, motor vehicle fuels, oils and lubricants associated with automobile repair and equipment maintenance, and printing inks."

1B

2. All environmental investigations, sampling and/or remediation should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous waste cleanup. The findings and

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Mr. Shivaji Deshmukh, P.E.
March 1, 2006
Page 2

1B

sampling results from the subsequent report should be clearly summarized in the EIR.

Proper investigation, sampling and remedial actions, if necessary, should also be conducted at the site prior to the new development or any construction, and overseen by a regulatory agency.

1C

3. If any property adjacent to the project site is contaminated with hazardous chemicals, and if the proposed project is within 2,000 feet from a contaminated site, then the proposed development may fall within the "Border Zone of a Contaminated Property." Appropriate precautions should be taken prior to construction if the proposed project is within a "Border Zone Property."

1D

4. Since building structures, asphalt or concrete-paved surface areas or other structures are planned to be demolished, an investigation as proposed should to be conducted for the presence of lead-based paints or products, mercury and asbestos containing materials (ACMs). If lead-based paints or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations, policies, and laws.

The draft EIR states: "The possible presence of ACMs and lead-based paint in the structures at the site was not ruled out during Phase I ESA preparation. In accordance with the Phase I ESA recommendations, ACM and LBP surveys will be conducted prior to structural demolition."

1E

5. The project construction will require soil excavation and soil filling in certain areas. Appropriate sampling is required prior to disposal of the excavated soil. If the soil is contaminated, properly dispose of it rather than placing it in another location. Land Disposal Restrictions (LDRs) may be applicable to these soils. Also, if the project proposes to import soil to backfill the areas excavated, proper sampling should be conducted to make sure that the imported soil is free of contamination.

1F

6. If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5).

1G

7. If it is determined that hazardous wastes are or will be generated and the wastes are (a) stored in tanks or containers for more than ninety days, (b) treated onsite, or (c) disposed of onsite, then a permit from DTSC may be required. If so, the

Mr. Shivaji Deshmukh, P.E.
March 1, 2006
Page 3

facility should contact DTSC at (818) 551-2171 to initiate pre application discussions and determine the permitting process applicable to the facility.

1H 8. If it is determined that hazardous wastes will be generated, the facility should obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942.

1I 9. Certain hazardous waste treatment processes may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

1J 10. If the project plans include discharging wastewater to a storm drain, you may be required to obtain an NPDES permit from the overseeing Regional Water Quality Control Board (RWQCB).

1K 11. If during construction/demolition of the project, soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the EIR should identify how any required investigation and/or remediation will be conducted, and the appropriate government agency to provide regulatory oversight.

1L 12. As indicated in your report on the hazardous materials use, onsite soils and groundwater likely contain pesticide, herbicides and agricultural chemical residue. Proper investigation and remedial actions should be conducted at the site prior to construction of the project.

If you have any questions regarding this letter, please contact me at (714) 484-5461 or Mr. Joseph Kaslowski, Project Manager at (714) 484-5471 or by e-mail at jkaslowski@dtsc.ca.gov.

Sincerely,

Greg Holmes
Unit Chief
Southern California Cleanup Operations Branch - Cypress Office

cc: See next page

Mr. Shivaji Deshmukh, P.E.
March 1, 2006
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cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044

Mr. Guenther W. Moskat, Chief
Planning and Environmental Analysis Section
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

Response to Comment Letter No. 1

State of California, Department of Toxic Substances Control (DTSC)
March 1, 2006

Response No. 1A

The potential for release of hazardous wastes/substances as a result of current or historic uses is addressed in Draft EIR Section 4.3 (Hazards and Hazardous Materials), which summarizes several environmental assessments that were prepared for the project site. Onsite soils were investigated for pesticide residues, VOCs, and other potentially hazardous substances. The Phase I and Phase II ESAs summarized in Section 4.3 are sufficient to describe the environmental conditions at the project site. All information relating to the need for future site investigation and/or remediation has been provided in Draft EIR Sections 4.3 and 4.5 (Air Quality). Provisions for pre-demolition inspections, on-site monitoring and inspections during grading, and soil testing and remediation contingencies have been established, along with performance standards, as mitigation measures in the Draft EIR.

Response No. 1B

Please refer to Response No. 1A. All information related to future site investigation and/or remediation has been provided in the Draft EIR.

Response No. 1C

Onsite soils were investigated for potentially hazardous substances, and records searches have been conducted to determine the presence of contamination on adjacent properties and other nearby sites. The data resulting from the Phase I and Phase II Environmental Site Assessments, along with their accompanying records search results, are summarized in Section 4.3 (Hazards and Hazardous Materials) of the EIR. No Border Zone Properties were identified.

Response No. 1D

Precautions against lead-based paint and ACM disturbance and exposure are discussed in Section 4.3 (Hazards and Hazardous Materials) of the EIR. Specifically, mitigation measure 4.3-2a requires that a licensed Asbestos Inspector be retained to determine the presence of asbestos-containing material (ACM) within structures to be demolished and in irrigation piping to be removed from the project site. If ACMs are present on-site, OCWD shall comply with all applicable State and federal ACM abatement policies and procedures for removal of ACMs, including SCAQMD Rule 1403 – *Asbestos Emissions from Demolition and Renovation Activities*. Mitigation measure 4.3-2b further provides that if any irrigation piping encountered during site grading and excavation activities is found to contain asbestos fibers, removal shall be conducted in accordance with the remediation and mitigation procedures established by all federal, State, and local standards including federal and California Occupation Safety and Health Administration (OSHA), and Air Quality Management District (AQMD) regulations for the excavation, removal, and proper disposal of the transite pipe [CFR Title 29 OSHA, CFR Title 29 California Health & Safety Code, and SCAQMD Regulation X - National Emission Standards For Hazardous Air Pollutants, Subpart M - National Emission Standards For Asbestos]. The material shall be disposed of at a certified asbestos landfill.

Mitigation measure 4.3-3 ensures that, prior to demolition of residential and/or commercial structures constructed before 1978, OCWD shall retain a licensed Lead-Based Paint Inspector to conduct a survey of buildings for lead-based paint. Documentation of the lead survey will be consistent with existing State and federal regulations for the management and mitigation of lead-based paint. Where lead-based paint exists, abatement will be completed prior to any demolition activities that would create lead dust or fume hazard. Lead-based paint removal will be performed in accordance with California Code of Regulations Title 8, Section 1532.1, which provides for exposure limits, exposure monitoring, respiratory protection and mandates good worker practices by workers exposed to lead.

Based on the findings in the Phase I and II ESAs, those mitigation measures will reduce potential ACM and lead-based paint impacts to levels that are less than significant.

Response No. 1E

Draft EIR Sections 4.3 (Hazards and Hazardous Materials) and 4.5 (Air Quality) contain mitigation measures requiring that any contaminated soils encountered on the project site during tank removal, site clearance, or excavation shall be sampled to determine the nature and extent of the contamination and disposed of off-site in accordance with applicable hazardous waste regulations. The District would also notify the Orange County Health Care Agency and other regulatory agencies as necessary prior to undertaking remedial action. If encountered on-site, potentially contaminated soils would be disposed of properly and, if applicable, subject to Land Disposal Restrictions. No soil imports will be necessary during construction of the proposed recharge basin.

Response No. 1F

The comment requires hazardous waste management in accordance with applicable State health and safety regulations. As indicated in Draft EIR Section 4.3 (Hazards and Hazardous Materials), hazardous wastes will not be generated by the proposed recharge basin project.

Response No. 1G

The comment requires hazardous waste management and on-site storage in accordance with applicable State health and safety regulations. As indicated in Draft EIR Section 4.3 (Hazards and Hazardous Materials), hazardous wastes will not be generated by the proposed recharge basin project, nor will hazardous materials be stored on-site.

Response No. 1H

The comment requires that a U.S. EPA Identification Number be obtained if the project generates hazardous wastes. As indicated in Draft EIR Section 4.3 (Hazards and Hazardous Materials), hazardous wastes will not be generated by the proposed recharge basin project.

Response No. 1I

The comment requires that authorization be obtained from the local Certified Unified Program Agency for certain project-related hazardous waste treatment processes. If found applicable to the disposal of potentially contaminated soils during construction, OCWD will contact the local CUPA for authorization. However, as indicated in Draft EIR Section 4.3 (Hazards and Hazardous Materials), hazardous wastes will not be generated during the operational phase of the proposed recharge basin project.

Response No. 1J

The comment addresses the need for regulatory clearance if the project would involve the discharge of wastewater to a storm drain. As appropriate and necessary during project construction and operations, OCWD will obtain all necessary NPDES permits from the Santa Ana Regional Water Quality Control Board (Region 8).

Response No. 1K

The comment requires that appropriate health and safety procedures be implemented if contamination is suspected or identified during project construction and demolition activities. Although the Phase II sampling program summarized in Draft EIR Section 4.3 (Hazards and Hazardous Wastes) found that no additional investigations are necessary, the presence of low concentrations of pesticide residuals in soils excavated from the recharge basin will be considered when evaluating soil reuse or disposal options. Section 4.3.4.1 (Construction Impacts) addresses the possibility of encountering previously undetected soil contamination during demolition and grading activities, and provides mitigation measures for potentially significant impacts. Soil that is contaminated would be properly disposed of rather than placed in another location on- or off-site, subject to applicable regulatory oversight.

Response No. 1L

As indicated in Response No. 1K, the Phase II sampling program summarized in Draft EIR Section 4.3 (Hazards and Hazardous Wastes) found that although no additional investigations are necessary, the presence of low concentrations of pesticide residuals in soils excavated from the recharge basin will be considered when evaluating soil reuse or disposal options. Section 4.3.4.1 (Construction Impacts) addresses the possibility of encountering previously undetected soil contamination during demolition and grading activities, and provides mitigation measures for potentially significant impacts. Soil that is contaminated would be properly disposed of rather than placed in another location on- or off-site, subject to applicable regulatory oversight. Land Disposal Restrictions (LDRs) may be applicable to these soils, as regulated by the U.S. EPA and/or CalEPA. Both the federal LDR program (40 CFR Part 268) and the State program (Title 22 CCR, Chapter 18, section 66268.1 et. seq.) require waste handlers to treat hazardous waste or meet specified levels for hazardous constituents before disposing of the waste on the land.

Comment Letter No. 2

State Water Resources Control Board

Division of Water Rights
1001 I Street, 14th Floor ♦ Sacramento, California 95814 ♦ 916.341.5300
P.O. Box 2000 ♦ Sacramento, California 95812-2000
FAX: 916.341.5400 ♦ www.waterrights.ca.gov

Alan C. Lloyd, Ph.D.
Agency Secretary

Arnold Schwarzenegger
Governor

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In Reply Refer
to:332:RAS:266.0

Ms. Heather McPherson
Orange County Water District
P.O. Box 8300
Fountain Valley, CA 92726-8300

Dear Ms. McPherson:

ORANGE COUNTY WATER DISTRICT DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED LA JOLLA RECHARGE BASIN PROJECT (SCH # 2003041190)

The staff of the State Water Resources Control Board (State Water Board), Division of Water Rights (Division), has reviewed your February 2006 Draft Environmental Impact Report (DEIR) for the proposed La Jolla Recharge Basin Project (Project). Our comments follow:

Orange County Water District (OCWD) proposes in the DEIR to divert up to 9000 acre-feet of surface water annually from Carbon Creek and transport this water to a recharge basin where it would be used to recharge the Orange County Groundwater Basin. Water subsequently stored in the groundwater basin would be used later for various municipal and other consumptive purposes within the OCWD water service area.

Under sections 1200-1201 of the California Water Code (CWC), such proposed diversion of surface water to offstream storage for later consumptive use would be an appropriation of water and would, therefore, require a water right permit issued by the State Water Board. In view of this, OCWD must file an application to appropriate water with the Division and obtain a water right permit for the project before any construction of diversion facilities is commenced or diversion of water is made. In addition, OCWD must revise the DEIR to meet the needs of the State Water Board as CEQA Responsible Agency for this project. The revised DEIR must include, at a minimum, the following:

2A 1. Acknowledgement that a State water right permit will be required for the project, including appropriate amendments to Table 3-2 on page 3-16.

2B 2. Preparation of a water availability analysis demonstrating that unappropriated water is available for the proposed project in accordance with CWC sections 1275(a), 1375(d), 1243 and 1243.5.

2C 3. Discussion and analysis of potential impacts in accordance with applicable topics described in the enclosed State Water Board Outline for Environmental Impact Reports Involving Water Development Projects.

California Environmental Protection Agency

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Ms. Heather McPherson -2-

Thank you for the opportunity to comment on the DEIR. Please add me to your mailing list as the State Water Board's contact person to receive further correspondence concerning responses to our comments herein and a copy of the Final EIR. For information on how to obtain and file the necessary permit application forms, please consult the Division's website at www.waterrights.ca.gov .

If you have any questions, please contact me by telephone at (916) 341-5398 or by email at RSwenerton@waterboards.ca.gov.

Sincerely,

ORIGINAL SIGNED BY

Ross Swenerton, Chief
Watershed Unit 1

Enclosure

cc: (all w/enclosure)

Larry Eng, Regional Manager
Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92923

Gerard Thibeault, Executive Officer
Santa Ana RWQCB
3737 Main St., Suite 500
Riverside, CA 92501

Chambers Group, Inc.
17671 Cowan Ave., Suite 100
Irvine, CA 92614

(*w/o enclosure*)
State Clearinghouse
P.O. Box 3044,
Sacramento, CA 95812-3044

Response to Comment Letter No. 2

State Water Resources Control Board (SWRCB)
March 6, 2006

Response No. 2A

The proposed project is covered under OCWD's application to appropriate water from the Santa Ana River. Application No. A031174 was submitted in 1992 and is pending.

Response No. 2B

The availability of unappropriated Santa Ana River water for OCWD projects has been demonstrated in accordance with the processing requirements for the pending water right application No. A031174. Since the proposed La Jolla Recharge Basin project is within the purview of that application, which has been pending since 1992, no further analysis of water availability is necessary in the Draft EIR.

Response No. 2C

Since the proposed La Jolla Recharge Basin project is within the purview of the pending water right application No. A031174, the related CEQA documentation issues are addressed by the SWRCB and OCWD in the context of the water right permit process. As stated in Order WR 2000-12 (p. 14):

> *"The environmental issues associated with the project proposed by the petitioners will be addressed by the SWRCB in the context of processing the water right applications. Prior to any potential approval or decision to proceed with a proposed project, the applicant water districts and the SWRCB must fulfill their obligations under the California Environmental Quality Act ("CEQA," Public Resources Code section 21000 et seq.) In addition to meeting statutory responsibilities under CEQA, the SWRCB will comply with its obligations to consider environmental and public interest issues under the Water Code and the public trust doctrine in the context of processing the water right applications submitted by the petitioners."*

As also stated in Order WRO-2002-0006 (p. 6), individual projects subject to the permit are not subject to case-by-case environmental analysis of the effects of water appropriations[1]. Therefore, no additional discussion and analysis of related potential impacts will be conducted for the La Jolla Recharge Basin Draft EIR.

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[1] Order WRO-2002-0006 (p. 6, footnote #7): *Neither Order WR 89-25 nor subsequent revisions of the Declaration provide an extensive explanation of the basis for classifying the Santa Ana River as fully appropriated. However, there is no indication that the classification of the Santa Ana River as fully appropriated was based upon a need to reserve or retain water in the river or its tributaries for instream uses. Neither Order WR 89-25, nor Decision 1194 addresses the subject of retaining water in the river to meet instream needs. In an instance in which instream or environmental considerations were not relied upon as a basis for classifying a watercourse as fully appropriated, a decision to revise the fully appropriated designation to allow for processing new water right applications need not involve consideration and analysis of instream or other environmental uses of the water sought to be appropriated. Those issues can properly be addressed in the context of processing the applications once they are accepted for filing.*

Comment Letter No. 3

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 12
3337 MICHELSON DRIVE
SUITE C380
IRVINE, CA 92612-1699
PHONE (949) 724-2000

Flex your power! Be energy efficient!

March 7, 2006

Ms. Heather McPherson
Orange County Water District
P.O. Box 8300
Fountain Valley, CA

IGR/CEQA
SCH#2003041190
Log # 1250A
DEIR
SR57, 91

Dear Ms. McPherson:

Subject: La Jolla Recharge Basin Project

Thank you for the opportunity to review and comment on **Draft Environmental Impact Report (DEIR) for the La Jolla Recharge Basin Project.** The proposed project consists of the construction and operation of a 10-acre groundwater recharge basin. The proposed 10-acre site will include an approximately 5.7-acre recharge basin, a perimeter access road, 3:1 side slopes, a maximum depth of 20 feet, a basin access ramp, and an area where material removed from the basin during cleaning can be temporarily stored. The project site is located in close proximity to State Route 57 and State Route 91 within the City of Anaheim, Orange County.

Caltrans District 12 is a reviewing agency and has the following comments:

3A

1. Any project work (e.g. street widening, emergency access improvements, sewer connections, sound walls, stormdrain construction, street connections, lighting and signage, etc.) proposed in the vicinity of the Caltrans Right-of-Way, would require an encroachment permit and all environmental concerns must be adequately addressed. If the environmental documentation for the project does not meet Caltrans requirements, additional documentation would be required before approval of the encroachment permit. Please coordinate with Caltrans to meet requirements for any work within or near Caltrans Right-of-Way. **(See Attachment: Environmental Review Requirements for Encroachment Permit).**

3B

2. All work within State Right-of-Way must conform to Caltrans Standard Plans and Standard Program (WPCP) or Storm Water Pollution Prevention Plan (SWPPP) as required. Any runoff draining into Caltrans Right-of-Way from construction operations, or from the resulting project, must fully conform to the current discharge requirements of the Regional Water Quality Control Board to avoid impacting water quality. Measures must be incorporated to contain all vehicle loads and avoid any tracking of materials, which may fall or blow onto Caltrans roadways or facilities. Please note that all projects involving soil disturbance activities should pay extra attention to storm water pollution control during the "Rainy Season" (October 1st – April 30th) and follow the Water Pollution Control BMPs to minimize impact to the receiving waters.

"Caltrans improves mobility across California"

Ms. Heather McPherson
March 7, 2006
Page 2

Please continue to keep us informed of projects that may impact the State Transportation Facilities. If you have any questions or comments, please contact Lynne Gear at 949-724-2241.

Sincerely,

Robert F. Joseph, Chief
IGR/Community Planning

Attachment

cc: Terri Pencovic, Headquarters
Terry Roberts, OPR
Leslie Manderscheid, Environmental Planning

"Caltrans improves mobility across California"

ENVIRONMENTAL REVIEW REQUIREMENTS FOR ENCROACHMENT PERMITS

Any Party, outside of Caltrans, that does work on a State Highway or Interstate Highway in California needs to apply for an encroachment permit. To acquire any encroachment permit, environmental concerns must be addressed. Environmental review of encroachment permit applications may take 3 weeks if the application is complete or longer if the application is incomplete. For soil disturbing activities (e.g. geotechnical borings, grading, usage of unpaved roads from which dirt and other materials may be tracked onto the State/Interstate highways, etc.), compliance with Water Quality and Cultural Resources Provisions are emphasized. Surveys may/ may not be soil-disturbing activities, depending on the site and survey method.

A complete application for environmental review includes the following:

1. If an environmental document (CE, EIR/EIS, ND, etc.) has been completed for the project, copy of the final, approved document must be submitted with the application.

2. **Water Quality Provision:** All work within the State Right of Way must conform to Caltrans Standard Plans and Standard Specifications for Water Pollution Control including production of a Water Pollution Control Program or Storm Water Pollution Prevention Plan as required. The applicant must provide Encroachments with a copy of the Storm Water Pollution Prevention Plan (SWPPP) including Best Management Practices (BMPs) to be implemented for construction activities impacting Caltrans Right of Way, prepared for this as required by the NPDES Statewide Storm Water Permit for General Construction Activities. If no SWPPP has been prepared for this project, then the applicant must follow the requirements described in the attached Water Pollution Control Provisions (please see attachment).

3. **Cultural Resouces Provisions:** If not included in the environmental document, before permit approval and project construction, the encroachment permit applicant must complete a *Cultural Resource Assessment* pursuant to Caltrans Environmental Handbook, Volume 2, Appendix B-1, and Exhibit 1, as amended. The Cultural Resources Assessment ascertains the presence or absence of cultural resources within a one-mile radius of the project area and evaluates the impact to any historical/cultural resource. Cultural Resources include "those resources significant in American history, architecture, archaeology, and culture, including Native American Resources" (Caltrans Environmental Handbook, Volume 2, Chapter1, as amended)]. The Cultural Resource Assessment must include:
   a) a clear project description and map indicating project work, staging areas, site access, etc.;
   b) a Record Search conducted at the South Central Coastal Information Center (SCCIC) located at California State University, Fullerton. For information call (714) 278-5395;
   c) proof of Native American consultation. Consultation involves contacting the Native American Heritage Commission (NAHC), requesting a search of their Sacred Lands File, and following the recommendations provided by the NAHC. For information call (916) 653-4082;
   d) documentation of any historic properties (e.g. prehistoric and historic sites, buildings, structures, objects, or districts listed on, eligible for, or potentially eligible for listing on the National Register of Historic Places) within a one mile radius of the project area;
   e) and a survey by qualified archaeologist for all areas that have not been previously researched.

   The SCCIC and NAHC have an approximate turn around time of 2 weeks.

4. **Biological Resources Provisions:** Work conducted within Caltrans Right of Way should have the appropriate plant and wildlife surveys completed by a qualified biologist. If the information is not included in the environmental document, Environmental Planning requests that the applicant submit a copy of the biological study, survey, or technical report by a qualified biologist that provides details on the existing vegetation and wildlife at the project site and any vegetation that is to be removed during project activities. Official lists and databases should also be consulted for sensitive species such as the California Natural Diversity Database and lists provided by the U.S. Fish and Wildlife Service and the California Department of Fish and Game. Any impacts that affect waterways and drainages and/or open space during construction, or that occur indirectly as a result of the project must be coordinated with the appropriate resource agencies. As guidance, we ask that the applicant include:
   a) clear description of project activities and the project site
   b) completed environmental significance checklist (not just yes and no answers, but a description should be given as to the reason for the response),
   c) staging/storage areas noted on project plans,
   d) proposed time of year for work and duration of activities (with information available),
   e) any proposed mitigation (if applicable to the project),
   f) and a record of any prior resource agency correspondence (if applicable to the project).

Response to Comment Letter No. 3

State of California, Department of Transportation (Caltrans), District 12
March 7, 2006

Response No. 3A

The comment describes types of project-related work that would require a Caltrans encroachment permit for work in the vicinity of a Caltrans right-of-way. The La Jolla Recharge Basin site is approximately 0.4 mile east of State Route 57 (Orange Freeway) and one mile north of State Route 91 (Riverside Freeway). No aspect of the proposed project would affect, either directly or indirectly, a Caltrans right-of-way.

Response No. 3B

The comment generally describes storm runoff water quality provisions applicable to projects in Caltrans rights-of-way. As indicated in Response No. 3A, no aspect of the proposed project would affect a Caltrans right-of-way. The comment also describes soil disturbance activities that could adversely impact Caltrans facilities. Draft EIR Section 4.5 (Air Quality) indicates that OCWD will comply with SCAQMD Rule 403, which will ensure that dirt hauled off-site is in a semi-moist state and that loads will be covered prior to transport. OCWD will also comply with relevant NPDES water quality provisions during construction and operational activities. Please refer to Draft EIR Section 4.1 (Hydrology and Water Quality) for a comprehensive discussion of the water quality protection measures (i.e., Best Management Practices, or BMPs) that will be implemented as part of the proposed project, along with the nine Special Conditions that accompanied the U.S. Army Corps of Engineers nationwide permit issued to OCWD.

Comment Letter No. 4

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

March 9, 2006

Ms. Heather McPherson
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708

RE: SCAG Clearinghouse No. I 20060118 La Jolla Recharge Basin EIR

Dear Ms. McPherson:

Thank you for submitting the **La Jolla Recharge Basin EIR** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

4A

We have reviewed the **La Jolla Recharge Basin EIR**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **February 16-28, 2006** Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1851. Thank you.

Sincerely,

BRIAN WALLACE
Associate Regional Planner
Intergovernmental Review

Doc #119703

Response to Comment Letter No. 4

Southern California Association of Governments (SCAG)
March 9, 2006

Response No. 4A

The comment states that the project is not regionally significant and therefore does not warrant comment from SCAG. Comment noted.

Comment Letter No. 5

03/31/2006 16:55 714-667-8344 COMM. & ADU. PLNG. PAGE 01/02

COUNTY OF ORANGE
RESOURCES & DEVELOPMENT MANAGEMENT DEPARTMENT

Bryan Speegle, Director
300 N. Flower Street
Santa Ana, CA
P.O. Box 4048
Santa Ana, CA 92702-4048
Telephone: (714) 834-2300
Fax: (714) 834-5188

NCL 06-012

March 31, 2006

Heather McPherson
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708

SUBJECT: DEIR for the La Jolla Recharge Basin

Dear Ms. McPherson:

The above referenced item is a Draft Environmental Impact Report (DEIR) for the Orange County Water District (OCWD). The proposed project site is on West La Jolla Street, between South Melrose Street (City of Placentia) and Red Gum Street (City of Anaheim). The purpose of the project is to increase the recharge capacity of its Forebay recharge facilities.

The County of Orange has reviewed the DEIR and offers the following comments regarding flood issues

5A
1. A County Property Permit will be required for all work within the Orange County Flood Control District's (OCFCD) right-of-way.

5B
2. Prior to approval of improvements proposed within the OCFCD right-of-way, (1) a concept study with engineering calculations must be submitted for review and approval to ensure that any proposed improvements will be acceptable and will not adversely impact the flood control function of the channel, and (2) an agreement between OCWD and OCFCD must be executed to define OCWD's responsibilities (please refer to the 2003 Miller Basin Water Conservation Plan for a sample agreement). The study and agreement shall address:

   a. The design, review, construction, operation, maintenance, liability, etc. for the proposed use of OCFCD's right-of-way and facilities;

03/31/2006 16:55 714-667-8344 COMM. & ADV. PLNG. PAGE 02/02

5B

b. The long term operation of the rubber dam, including but not limited to details regarding how and when the dam will be deflated to ensure that the capacity of Carbon Creek Channel will not be impacted during storm flows;

c. Seasonal operation restrictions (appropriate measures must be in place or operation might not be allowed during the rainy season), required inspections, and if needed, procedures for repair of the channel;

d. The requirement that the proposed use will not result in increased levels of vegetation in the channel which could affect the hydraulic capacity of channel;

e. The requirement that the proposed use of Carbon Creek Channel, an earthen channel, will not result in scour to the channel invert.

Thank you for the opportunity to respond to the DEIR. If you have any questions, please contact Charlotte Harryman at (714) 834-2522.

Sincerely,

Jerry Mitchell for

Ronald L. Tippets, Chief
Environmental Planning Division

2

Response to Comment Letter No. 5

County of Orange, Resources and Development Management Department (RDMD)
March 31, 2006

The March 13, 2006 comment letter from the County of Orange, RDMD was transmitted to the District following the close of the comment period for the DEIR. While the District has no legal duty to respond to this comment letter, the District has determined to respond in order to address the issues raised in the letter, and further clarify the analyses and conclusions in the DEIR.

Response No. 5A

OCWD acknowledges that a County Property Permit will be required for all work within the Orange County Flood Control District's (OCFCD) right-of-way. OCWD will obtain the encroachment permit from the Public Property Permits Section as part of the construction of the diversion structure in Carbon Creek Channel.

Response No. 5B

OCWD acknowledges that a concept study with engineering calculations must be submitted to OCFCD for review and approval to ensure that project-related improvements will be acceptable and will not adversely impact the flood control function of the channel. OCWD further acknowledges that an agreement between OCWD and OCFCD must be executed to define OCWD's responsibilities and to ensure the proper maintenance and functioning of the Carbon Creek Channel, in accordance with the performance standards enumerated in the comment.

Comment Letter No. 6

04/13/2006 15:29 9517816288 RWQCB PAGE 01/04

California Regional Water Quality Control Board
Santa Ana Region

Alan C. Lloyd, Ph.D.
Agency Secretary

3737 Main Street, Suite 500, Riverside, California 92501-3348
(951) 782-4130 • Fax (951) 781-6288
http://www.waterboards.ca.gov/santaana

Arnold Schwarzenegger
Governor

FACSIMILE TRANSMITTAL

DATE: 4/13/06

TO: Heather McPherson

FAX NO.: 714-378-3371

FROM: Glenn Robertson

SENDER'S DIRECT TELEPHONE NUMBER: (951) 782-3259

NUMBER OF PAGES, INCLUDING TRANSMITTAL MEMO: 4

SUBJECT: To Heather, Roy Herndon, and company: We have labored for a while (past the deadline) to deliver a CEQA response that truly evaluates this long-standing situation ... I suggest an Idea, with our group's buyoff, in this letter that may resolve the concerns of our agency, your District, and AC Products.

PLEASE CONTACT THE SENDER AT THEIR DIRECT NUMBER WITH ANY QUESTIONS.

Alan C. Lloyd, Ph.D.
Agency Secretary

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 – FAX (951) 781-6288 – TTY (951) 782-3221
http://www.waterboards.ca.gov/santaana

Arnold Schwarzenegger
Governor

10500 Ellis Avenue
Fountain Valley, CA 92708

DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR) FOR LA JOLLA RECHARGE BASIN PROJECT, ORANGE COUNTY WATER DISTRICT (OCWD), SCH# 2003041190

Dear Ms. McPherson:

Staff of the Regional Water Quality Control Board, Santa Ana Region (RWQCB), have reviewed the Draft Environmental Impact Report, Volumes I and II (DEIR) for the Orange County Water District's proposed La Jolla Recharge Basin Project (project). The OCWD proposes to construct a 5.7-acre infiltration basin on a projected 9.3 net acres within the City of Anaheim (La Jolla Street near Red Gum Street).

OCWD proposes to divert water from the adjacent Carbon Creek Channel to the proposed basin for recharge into the Orange County Groundwater Management Zone (OCWD Forebay Subarea). A rubber dam, proposed to be installed in Carbon Creek, would be inflated intermittently to capture stormflow and flows from other sources[1] released to the Channel from the Miller and Kraemer Recharge Basins to the east. The OCWD anticipates as much as 9,000 acre-feet of annual recharge capacity at this location, where shallow and deep aquifer zones have vertical continuity just outside of the Pressure Zone and its confining aquicludes (Volume II, Fig. 6).

6A The DEIR recognizes the potential of this proposed recharge activity to exacerbate the migration rate of an existing chlorinated hydrocarbon (HC) plume, extending from the former AC Products site west below Placentia through both aquifer zones (p. 4.2-24). Tetrachloroethylene levels in the AC Products plume are generally elevated (as high as 93 ppb) and therefore pose a threat to public health. The DEIR proposes the installation of three new monitoring wells adjacent to the plume, including two screened in the shallow zone (Shallow Aquifer, 95-125 feet below ground surface (bgs)) and one screened in the deep zone (Principal Aquifer 270-300 feet bgs). The DEIR (p.4.2-40) contends that the project will not adversely affect the plume, based on hydrogeological models. However, our examination of the DEIR's several plume maps indicates that the proposed basin, along with other nearby recharge basins and local stormwater infiltration, could have a minor influence on the plume's velocity, direction, and chemistry. A school reconstruction project, including a ball field that would infiltrate

[1] The Santa Ana River and purchased imports (Metropolitan Water District).

California Environmental Protection Agency

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6A stormwater, is proposed immediately to the west of OCWD's proposed project. Seasonal groundwater flow directions could redistribute HCs adsorbed to soil particles throughout the so-far narrow area affected by the plume. Our staff is aware that the increased infiltration that is expected to occur as a result of the La Jolla Recharge Basin could interfere with the plume remediation activities that are in progress at AC Products. Therefore, please consider the following comments, and incorporate them into the EIR:

6B 1. Stated project alternatives (p. 1-5), aside from the "no project alternative," include finding an alternative recharge basin location, reducing recharge capacity by 50% using a smaller basin, changing water sources, or project postponement until the AC Products cleanup is nearly complete. According to p. 1-6, none of these alternatives were found to reduce potentially significant environmental impacts. We believe that the EIR should reflect that the alternative site option, by definition, could reduce potentially significant water quality impacts, and that strong consideration should be given to the concept of either waiting until the AC Products remediation is complete, or selecting another site.

6C 2. Additional alternatives should be considered that would restore to the Carbon Creek Channel some of the beneficial uses of Coyote Creek, to which Carbon Creek is tributary. According to the "tributary rule" discussed in the Water Quality Control Plan for the Santa Ana River Basin, 1995, (Basin Plan, p. 3-5), waters not specifically listed in the Basin Plan have the same beneficial uses as the waters to which they are tributary. Carbon Creek does not have beneficial uses listed at this time and it should not be confused with another water body to the east having defined beneficial uses, Carbon Canyon Creek.

The beneficial uses of Coyote Creek are municipal and domestic supply (MUN), water contact recreation (REC1), non-contact water recreation (REC2), warm freshwater habitat (WARM), and wildlife habitat (WILD). While groundwater recharge (GWR) is not listed as a beneficial use for Coyote Creek, recharge is obviously a possible beneficial use for Carbon Creek in the area of the project site.

Currently, Carbon Creek Channel is narrow and partly armored with one-foot rip-rap clasts. The proposed project would permanently modify the channel to accommodate the rubber dam. We request that an alternative be considered that widens the existing channel bottom and removes armor to maximize infiltration, introduces native vegetation to detain and filter stormwater, and confines the proposed recharge project to the Channel, without introducing diversion structures. Intermittent maintenance of the channel would ensure continued recharge rates. This alternative supports the beneficial uses that are attributed to the channel via the tributary rule, avoids permanent channel modifications that would preclude this channel from supporting the beneficial uses cited above, and enhances ground water recharge within the channel. A Clean Water Act Section 401 Water Quality Certification would still be necessary. Depending on satisfactory recharge volumes, which may meet the lower values already considered as one alternative, the need for a basin at this site could be re-examined at a later date.

California Environmental Protection Agency

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04/13/2006 15:29 9517816288 RWQCB PAGE 04/04

Heather McPherson -3- April 4, 2006

6D 3. Discharges from the proposed well development must be authorized under the terms and conditions of Regional Board Order No. R8-2003-0061, NPDES No. CAG998001, a regional general *de minimus* permit. This Order can be viewed or downloaded from http://www.swrcb.ca.gov/rwqcb8/pdf/03-61.pdf. You may contact the RWQCB's Permitting Section staff at (909) 782-4130.

If you have any questions, contact Glenn Robertson at (951) 782-3259, or call me at (951) 782-3234.

Sincerely,

Mark G. Adelson

Mark G. Adelson, Chief
Regional Planning Programs Section

cc: City of Placentia Department Services Department– Raynald Pascua
City of Anaheim Planning Department – Sheri Vander Dussen
Orange County Flood Control – Herb Nakasone
State Clearinghouse – Scott Morgan
MC Squared Environmental Engineering Services – Matthew L. McCullough

X: Groberts /Data/CEQA Responses/DEIR- Orange County Water District- La Jolla Recharge Basin Project – MGA-AES

California Environmental Protection Agency

Recycled Paper

Response to Comment Letter No. 6

California Regional Water Quality Control Board, Santa Ana Region
April 13, 2006

The April 13, 2006 comment letter from the Santa Ana Regional Water Quality Control Board was transmitted to the District following the close of the comment period for the DEIR. While the District has no legal duty to respond to this comment letter, the District has determined to respond in order to address the issues raised in the letter, and further clarify the analyses and conclusions in the DEIR.

Response No. 6A

The Regional Board's comment letter says, *"The DEIR recognizes the potential of this proposed recharge activity to exacerbate the migration rate of an existing chlorinated hydrocarbon (HC) plume, extending from the former AC Products site west below Placentia through both aquifer zones (p. 4.2-24)."* It should be noted that the detailed analysis in the draft EIR indicates there is no significant effect to groundwater quality from the proposed project. The draft EIR describes a thorough evaluation of the proposed project with respect to potential impacts on the migration of the AC Products' chlorinated hydrocarbon plume and demonstrates that there is no significant effect on the plume's migration.

Response No. 6B

The comment in the Regional Board's letter says, *"We believe that the EIR should reflect that the alternative site option, by definition, could reduce potentially significant water quality impacts, and that strong consideration should be given to the concept of either waiting until the AC Products remediation is complete, or selecting another site."* The detailed analysis in the draft EIR indicates that there is no significant effect on groundwater quality from the proposed project. Since there are no significant environmental impacts, there is no environmental basis for delaying implementation of the project or selecting another site. Delaying the project would delay realization of the positive environmental benefits of the project. Section 5 of the draft EIR discusses these topics in further detail.

Response No. 6C

The comment in the Regional Board's letter suggests an alternative to the project that is based on recharge of water in the Carbon Creek Channel. OCWD has evaluated this alternative and found it to be infeasible. Water currently flows through the Carbon Creek Channel on a routine basis. A potential project involving channel restoration and vegetation planting in order to conduct new recharge in the channel would need to accommodate the existing channel recharge plus the new recharge, as well as maintain its design flood conveyance capacity. To be equivalent to the La Jolla Recharge Basin, an additional 9,000 acre-feet per year (afy) of recharge would need to occur over and above the water already recharging in the channel.

For the majority of its length near the proposed project site, the Carbon Creek Channel is V-shaped with sides composed of rip-rap or is concrete lined. The channel does not have a flat earthen bottom. Extensive reconstruction of the existing channel bottom would be required to develop a channel bottom that could be maintained to achieve recharge. Without maintenance, the recharge capacity declines in one to three months in OCWD's existing recharge facilities due to the accumulation of sediment. For recharge to occur in Carbon Creek Channel on a similar scale as the La Jolla Recharge Basin, the Carbon Creek Channel bottom would need to be maintained by removing the clogging layer on the channel bottom, requiring the channel bottom to be approximately 10 feet wide at a minimum. With a minimum 10-feet wide channel, OCWD would not be able to maintain the channel bottom with its existing equipment, but would have to purchase special equipment to maintain such a narrow channel. The reconstruction needed to develop a channel that could be maintained to sustain recharge could negatively impact the beneficial uses mentioned in the Regional Board's letter, such as the warm freshwater habitat and wildlife habitat.

The area over which recharge would occur for the proposed alternative of recharge in Carbon Creek Channel would be very different from the La Jolla Recharge Basin. The La Jolla Recharge Basin would recharge water over a wetted area of approximately 5.7 acres. To achieve a similar amount of recharge in Carbon Creek Channel with a reconstructed width of 10 feet, the recharge would stretch over approximately 4.7 miles of the creek assuming the same percolation rate as in the La Jolla Recharge Basin. This would cause recharge to occur much farther to the west compared to the location of the La Jolla Recharge Basin. Based on existing geologic data, recharge rates are anticipated to decrease towards the west along Carbon Creek Channel. From east to west in the direction of flow in Carbon Creek Channel, the sediments generally become finer grained due to the geologic setting of the area. The geologic setting is described in additional detail in OCWD's Groundwater Management Plan (OCWD, 2004) and California Department of Water Resources (DWR) Bulletin No. 45 (DWR, 1934). It is likely that the recharge rates in Carbon Creek Channel would decrease towards the west, and in fact the recharge would extend farther than the 4.7 miles of channel length calculated assuming the recharge rate is the same as at La Jolla Recharge Basin. Additionally, data in the Geologist's Report for the North Basin Groundwater Protection Project (OCWD, 2005) indicate a clay layer occurs at a depth of approximately 200 feet below ground surface starting at approximately State College Boulevard. West of about State College Boulevard, the clay layer would limit the vertical flow of potential recharge water from the shallow sediments into the Principal Aquifer, causing the potential recharge from Carbon Creek Channel to be of limited value. Recharge that remains in the shallow sediments and does not flow down into the Principal Aquifer is of limited value to the groundwater basin, since it does not reach the Principal Aquifer where most of the groundwater production occurs.

Another factor that would affect percolation rates in Carbon Creek Channel is channel armoring, which occurs when there is insufficient sand replenishment due to upstream sand entrapment or other factors that affect sediment transport. If the channel was reconfigured with an earthen bottom, channel armoring is expected to occur and would decrease percolation rates, which will extend the channel recharge area farther to the west.

There is also an important institutional factor that affects the feasibility of the suggested alternative. OCWD does not own Carbon Creek Channel, and the owner, the Orange County Flood Control District, has no plans to modify the channel and has been resistant to constructing soft-bottomed channels because of the potential for scour damage. The Orange County Flood Control District prefers armored channels that do not erode, but also do not recharge water.

In summary, the alternative of recharging water in Carbon Creek Channel is not a feasible alternative to the La Jolla Recharge Basin for the following reasons:

- Water currently flows through Carbon Creek Channel on a regular basis and any additional recharge would have to be in addition to the water already flowing in the channel.

- To configure a channel bottom that could be maintained for recharge, extensive reconstruction would be required. This reconstruction could negatively impact the beneficial uses mentioned in the Regional Board's letter, such as the warm freshwater habitat and wildlife habitat.
- Assuming channel reconstruction was completed, the assumed narrow width of the channel would result in the recharge water flowing 4.7 miles to the west before all the water was recharged.
- Towards the west, percolation rate would decline, and the water would likely flow farther than 4.7 miles to the west. Channel armoring would also likely reduce the percolation rate, extending the area of channel recharge farther to the west.
- Towards the west, a clay layer that occurs would limit vertical flow of the assumed recharge from the shallow sediments into the Principal Aquifer.
- OCWD does not own the channel, and the Orange County Flood Control District has been resistant to reconfiguring armored channels into channels with earthen bottoms.

Since there are no significant environmental impacts from the La Jolla Recharge Basin project, there is no environmental basis for selecting another site, such as the suggested alternative to recharge water in the Carbon Creek Channel.

Response No. 6D

The comment from the Regional Board relates to discharges from the proposed well development being authorized under the terms and conditions of Regional Board Order No. R8-2003-0061, NPDES No. CAG998001. Discharges associated with well development will be authorized under the Regional Board Order mentioned or its successor.

Draft
Environmental Impact Report
State Clearinghouse Number: 2003041190

Volume I

LA JOLLA RECHARGE BASIN

Prepared for:

Orange County Water District
10500 Ellis Avenue
Fountain Valley, California 92708

Submitted by:

Chambers Group, Inc.
17671 Cowan Avenue, Suite 100
Irvine, California 92614

May 2006

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FINAL EIR ORGANIZATION

The Final EIR is organized into the following chapters:

Chapter 1.0 *Executive Summary* - provides an introduction to the proposed project, including a description of the project's location, characteristics, and background. As required by CEQA Guidelines §15123, Chapter 1.0 also a) provides a brief summary of the proposed actions and their consequences; b) identifies each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect; c) identifies areas of controversy known to the lead agency including issues raised by agencies and the public; d) identifies issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects; and e) includes a discussion of features incorporated into the proposed project that serve to avoid, reduce and/or minimize potential impacts.

Chapter 2.0 *Introduction* - provides an overview of the uses of the EIR, and a description and explanation of the DEIR's organization. It also includes an outline of the public review process.

Chapter 3.0 *Project Description* - provides a description of the proposed project, including its location and boundaries, its objectives, and a general description of the project characteristics.

Chapter 4.0 *Environmental Analysis* - provides the description of the affected environment, presenting the analysis for each of the environmental resource areas evaluated, a detailed analysis of the environmental impacts, and discussion of mitigation measures to reduce or eliminate any significant environmental impacts associated with the project. Included for each environmental topic (i.e., Land Use, Traffic, Air Quality, etc.) addressed in Chapter 4.0 is the identification and description of specific measures or requirements incorporated into the project that serve to avoid or lessen potential significant impacts. All such measures will be made requirements to be implemented as part of the project, and will be included in the Mitigation Monitoring and Reporting Program for the project.

Chapter 5.0 *Project Alternatives* – discusses alternatives to the proposed project and compares the environmental impacts of those alternatives to those of the project.

Chapter 6.0 *Impact Overview* – summarizes the impacts identified in the EIR.

Chapter 7.0 *Organizations and Persons Consulted & EIR Preparers* – provides a list of the names and qualifications of those responsible for the preparation of the DEIR.

Chapter 8.0 *List of References* - presents references for the preparation of the document.

Chapter 9.0 *Technical Appendices* – presents the technical studies prepared in connection with the DEIR. It also includes the Notice of Preparation (NOP) and NOP comment summary, as well as brief résumés of key EIR contributors and preparers.

Chapter 10.0 Response to Comments on the Draft EIR - provides responses to comments submitted to the Orange County Water District (OCWD or District) by agencies, organizations, and individuals regarding the La Jolla Recharge Basin Draft EIR.

Chapter 1.0
Executive Summary

1.1 INTRODUCTION

1.1.1 PURPOSE OF THE EIR

This Environmental Impact Report (EIR) assesses the potential environmental impacts of constructing and operating the Orange County Water District's (OCWD, or District) La Jolla Recharge Basin (proposed project). This document has been prepared in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et. seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 et. seq.). It provides decision-makers, public agencies, and the public in general with detailed information about the potential significant environmental effects of the proposed project. It also lists the ways in which any significant effects of a project might be minimized, including the implementation of mitigation measures or alternatives to the project.

As described more fully in Chapter 2.0 (Introduction), this document serves as a project EIR. This project EIR is intended to provide detailed, project-level impact and mitigation analysis for the proposed project; and to support discretionary approvals and implementation. In accordance with State CEQA Guidelines Section 15161, this EIR focuses primarily on the changes in the environment that would result from the La Jolla Recharge Basin project, including all phases of planning, construction and operation, including the transfer of OCWD-owned property to the Placentia-Yorba Linda Unified School District (refer to Section 3.3.1.2 for information about the future middle school site).

OCWD is the lead agency for this CEQA process. Inquiries about the project and the CEQA process should be directed to:

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708
(714) 378-3200
sdeshmukh@ocwd.com

1.2 PROJECT PURPOSE AND OBJECTIVES

OCWD's mission is to provide local water retailers with a reliable quantity of high-quality groundwater, supplied at the lowest reasonable cost, in an environmentally responsible manner. In keeping with their mission, OCWD has proposed the La Jolla Recharge Basin project as a means of increasing the recharge capacity of its Forebay recharge facilities. The recharge system capacity is approximately 250,000 acre-feet per year (AFY), which is adequate to recharge the current river base flow, some river storm flows, and limited imported replenishment water. However, because of the heavy demand put on the recharge system to maximize recharge at all times, minimum flexibility exists to meet critical or short-term needs for extra recharge.

The proposed project's additional recharge capacity is needed to meet the following District-wide objectives:

- Capture increasing Santa Ana River (SAR) flows;
- Increase the recharge capacity of the Forebay recharge facilities in order to meet projected groundwater demand increases;
- Take advantage of short-term, high volume storm flows by having sufficient water conveyance, storage, and recharge facilities;
- Take advantage of imported water availability on short notice by having adequate storage and recharge facilities;
- Accept stored storm flows when the U.S. Army Corps of Engineers (ACOE or Corps) empties the Prado Water Conservation pool quickly during storm season;
- Capture springtime Prado Water Conservation releases, at 500 cubic feet per second (cfs) flow rate, when other basins are clogged; and
- Maintain overall recharge capacity during maintenance and improvement projects at other locations.

Additionally, the following objectives were instrumental in the site selection process for the proposed La Jolla Recharge Basin project.

- Acquire land and construct the recharge basin in proximity to the SAR and existing water conveyance systems in the Forebay; and
- Acquire large parcels with minimal improvements to minimize land acquisition costs.

1.3 PROJECT DESCRIPTION

1.3.1 PROJECT LOCATION AND EXISTING LAND USES

The La Jolla Recharge Basin project is proposed on an approximately 9.3-acre site in the City of Anaheim, California. The project site is on West La Jolla Street, between South Melrose Street (City of Placentia) and Red Gum Street (City of Anaheim). Refer to Figures 1-1 and 1-2 for the Regional Location and Vicinity Map, respectively. The site is about 0.4 mile east of State Route 57 (Orange Freeway) and one mile north of State Route 91 (Riverside Freeway).

Surrounding properties are generally light industrial, with the nearest residential uses approximately 450 feet to the north and 600 feet to the west. McFadden Park and Melrose Elementary School are approximately 550 and 1,000 feet west of the project site, respectively, in the City of Placentia. Section 4.7 (Land Use and Related Planning) contains a complete description of surrounding land uses.

In addition to the recharge basin, OCWD is proposing three new monitoring wells to monitor a groundwater contaminant plume that was caused by a nearby property owner (see discussion in Section 1.3.2.2). Two of the well sites are located in the 2800 block of East Via Martens, just east of Melrose Street, in the City of Anaheim. The third well would be installed in the 1000 block of South Melrose Street, in the City of Placentia. The monitoring well locations are also shown on Figure 1-2.

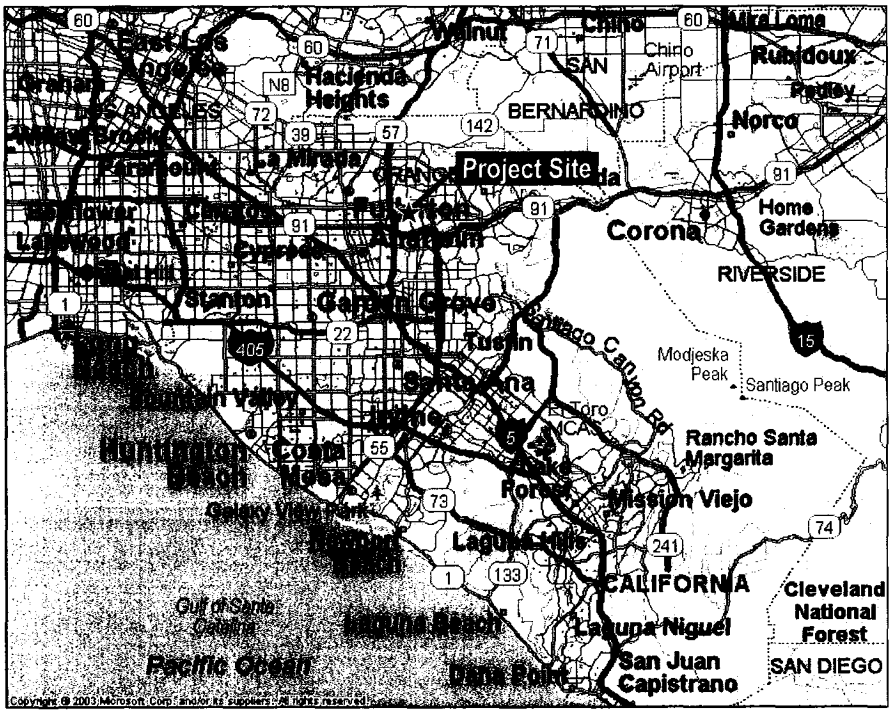
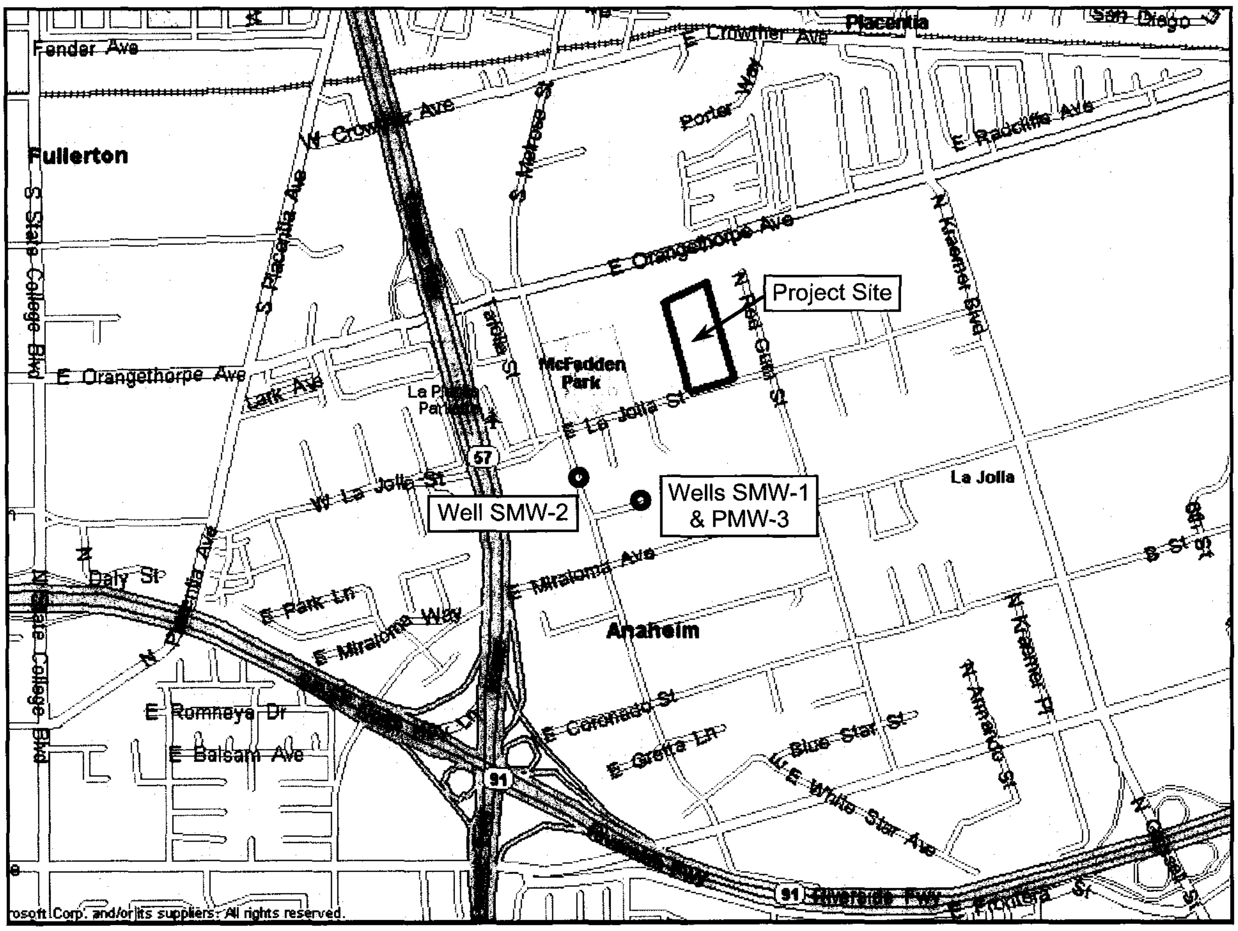


Figure 1-1
Regional Location

Figure 1-2
Vicinity Map



1.3.2 PROJECT DESCRIPTION SUMMARY

1.3.2.1 La Jolla Recharge Basin

The primary project component is the construction and operation of a groundwater recharge basin that will increase recharge into the Orange County Groundwater Basin. The new La Jolla Recharge Basin would add as much as 9,000 acre-feet of recharge capacity per year. The proposed 9.3-acre site will include an approximately 5.7-acre recharge basin, a perimeter access road, 3:1 side slopes, a maximum depth of about nine feet, a basin access ramp, and an area where material removed from the basin during cleaning can be temporarily stored. Water for the recharge basin will be provided from the Miller Recharge Basin, approximately 0.7 mile east, via Carbon Creek Channel. Water will be diverted into the proposed recharge basin via a diversion dam constructed in Carbon Creek Channel.

1.3.2.2 Groundwater Monitoring Program

Volatile organic compound (VOC) contamination, primarily tetrachloroethylene (PCE), from nearby AC Products, Inc. (AC Products) has impacted the underlying groundwater and migrated at least 1.8 miles to the west. The AC Products facility is located immediately south of the site, on the opposite side of La Jolla Street (see Figure 1-3). In September 1995, AC Products implemented a groundwater extraction program. However, recent data show residual PCE at concentrations as high as 93 micrograms per liter (µg/L) downgradient of the AC Products site (Rubicon 2005). The established maximum contaminant level (MCL) for PCE is 5 µg/L.

Source: Rubicon 2005

Figure 1-3 ***AC Products Facility Location***

As part of the groundwater recharge project, OCWD proposes to install and operate three new monitoring wells to monitor changes in the concentration and transport of AC Products' groundwater contaminant plume. OCWD will also use data reported to the Santa Ana Regional Water Quality Control Board (SARWQCB) by AC Products to track local groundwater quality. The locations of OCWD's proposed monitoring wells are shown on Figure 1-2. Two of the groundwater monitoring wells (SMW-1 and PMW-3) would be constructed immediately adjacent each other, though to different depths, in the 2800 block of East Via Martens, which is just east of Melrose Street in the City of Anaheim. A third well (SMW-2) would be installed in the 1000 block of South Melrose Street, approximately 350 feet south of La Jolla Street, in the City of Placentia.

1.4 PROJECT ALTERNATIVES

An EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1). Chapter 5.0 describes other alternatives that were evaluated during the course of EIR preparation and project planning. The discussion of alternatives focuses on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

The range of potential alternatives to the proposed project includes those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. Chapter 5.0 briefly describes the rationale for selecting the alternatives to be discussed, and also identifies alternatives that were considered by the District but were rejected as infeasible. The range of project alternatives evaluated, including those rejected as infeasible, includes the following:

- **No Project Alternative.** As required by State CEQA Guidelines §15126.6, this alternative discusses the existing conditions, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans (i.e., industrial development according to City of Anaheim General Plan and zoning) and consistent with available infrastructure and community services.
- **Alternative Recharge Basin Site.** A 9,000 AFY recharge basin would be constructed on a similarly sized site, subject to certain siting criteria discussed in Chapter 5.0.
- **Reduced Recharge Capacity Alternative.** Smaller recharge basin and up to 4,500 AFY of recharge capacity.
- **Alternative Recharge Water Source.** Use only pre-treated OCWD water sources instead of MWD and/or SAR source water.
- **Project Schedule Alternative.** Wait until AC Products' groundwater contamination plume remediation process is complete or near completion.

Consistent with the State CEQA Guidelines (Section 15126.6[a]), the comparison of alternatives and determination of the environmentally superior alternative is based on the ability of the alternative to meet the basic objectives of the project while feasibly avoiding or substantially lessening any significant impacts. Table 1-1 provides a comparative summary of the proposed project and each of the alternatives by environmental issue, except for the No Project Alternative. The table also indicates whether each of the alternatives analyzed would be subject to the same or different mitigation as the proposed project. The key summary points regarding the impacts associated with the alternatives are presented in Chapter 5.0.

1.5 AREAS OF CONTROVERSY

Pursuant to Section 15123 of the State CEQA Guidelines, the following are areas of concern known to the Lead Agency related to the proposed project:

- Concern has been expressed that the project could impact the direction and rate of flow of the nearby PCE contamination plume caused by AC Products, which in turn could affect OCWD's ability to implement the proposed groundwater recharge project.
- Concern has been expressed that SAR water would be used in the proposed recharge basin, and that it could contain contaminants that could be introduced to the Orange County Groundwater Basin since much of the dry water flow in SAR is tertiary-treated water from upstream wastewater treatment plants.

In addition to the topics cited above, this EIR addresses numerous physical environmental impacts, but does not address non-CEQA related issues such as general opposition to the project. Therefore, this EIR addresses the 2004 Notice of Preparation comments as they apply to CEQA-defined environmental issues (see Appendix 9.1).

1.6 ISSUES TO BE RESOLVED

Based on information in this EIR, and in light of the whole record, the OCWD Board of Directors will weigh the project alternatives, and whether any impacts result from the project, and whether and how to mitigate the potentially significant effects of the proposed project. The information in this EIR may constitute substantial evidence in the record to support OCWD's action on the project if its decision is later challenged in court.

1.7 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Table 1-1 at the end of this chapter summarizes the potentially significant adverse impacts of the proposed project and for each of the alternatives analyzed in Chapter 5.0. Each environmental resource area covered in the main text of Chapter 4.0 is summarized. Impacts found to be significant are listed along with the proposed mitigation measures. The residual impact after application of mitigation is also indicated for each significant impact. Where no potentially significant impacts are identified for an environmental issue, the reasons are briefly summarized.

No impacts were found to be significant and unavoidable after mitigation. Further, none of the project alternatives were found to avoid or substantially reduce any potentially significant impacts of the proposed project.

TABLE 1-1
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	COMPARATIVE EFFECTS OF PROJECT ALTERNATIVES			
		Alt. Site	***4,500 AFY Recharge Capacity***	***Alt. Recharge Water Source***	***Project Schedule Alt.***
4.1 HYDROLOGY AND WATER QUALITY					
Surface Water Quality – Construction Period ***Summary:*** *The Standard Conditions and the Corps' Special Conditions contain BMPs that are widely used in construction projects and are proven to minimize pollutant loading in stormwater runoff. With the combined oversight of the Corps and OCWD, no significant water quality impacts would occur during the construction period and no mitigation measures are necessary.*	Water quality impacts would be **less than significant** due to the Standard Conditions that will be implemented and subject to monitoring and reporting during construction. Additionally, the Corps requires nine (9) Special Conditions. Implementation of the Special Conditions will be monitored and reported directly to the Corps, rather than via OCWD's mitigation monitoring program.	LS	LS	LS	LS
SC 4.1-1 – SWPPP Contents: OCWD shall file a notice of intent (NOI) with the appropriate fees for coverage of the project under the General Construction Activity Storm Water Runoff Permit. The NOI shall be submitted to the Regional Water Quality Control Board prior to initiation of construction activity at the site. As required by the NPDES permit, a SWPPP shall be prepared and shall establish BMPs to prevent pollutant runoff, soil erosion, and sedimentation during construction. The SWPPP shall be prepared in compliance with the County of Orange 2004-05 Local Implementation Plan and the Orange County Stormwater Program's BMP fact sheets associated with the various program elements of the 2003 Drainage Area Management Plan. The District Engineer, or designee, shall ensure that the requirements of the SWPPP are defined on permit		✓	✓	✓	✓

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IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	COMPARATIVE EFFECTS OF PROJECT ALTERNATIVES			
		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
plan cover sheets as either general or special notes. During construction, the contractors shall follow the specifications of the SWPPP, a copy of which shall be kept on the job site at all times. The SWPPP shall establish BMPs for erosion and sediment control; non-storm water management; post-construction storm water management, waste management and disposal; maintenance, inspection, and repair of construction equipment and vehicles; employee training to perform inspections of the BMPs at the construction site; and proper storage, handling, use, and disposal of fuels and other toxic materials, as well as establishing fuel and maintenance areas away from Carbon Creek Channel.					
SC 4.1-2 – Sediment Control BMPs: The SWPPP shall include a description and illustration of BMPs that will be implemented to prevent the transport of sediment in stormwater runoff. Sediment control BMPs shall be in place at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during construction. The discharger shall consider site-specific and seasonal conditions when selecting and designing sediment control BMPs. At a minimum, the discharger/operator must be prepared to implement an effective combination of erosion and sediment control on all disturbed areas in anticipation of rainfall. Effective filtration devices and/or barriers shall be selected, installed and maintained properly. A proposed schedule for deployment of sediment control BMPs shall be included in the SWPPP. Sediment controls can include straw bale dikes, earth		✓	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
dikes, brush barriers, drainage swales, check dams, subsurface drain, sandbag dikes, fiber rolls, diversion velocity dissipaters, desilting basins, detention/retention ponds and/or other controls, as determined appropriate by the District's project engineer. Additionally, the SWPPP shall include a description of the BMPs to reduce the tracking of sediment onto public roads at all times. These public roads shall be inspected and cleaned at defined intervals approved by the District. Road cleaning BMPs shall be discussed in the SWPPP and shall not rely on the washing of accumulated sediment or silt into the storm drain system.					
SC 4.1-3 – Timing of Diversion Facility Construction: All project facilities proposed to be constructed within the Carbon Creek Channel, or that will be constructed across the flood control channel, shall be constructed during the dry season (normally May 1 through September 30 of each year). Flood control facilities disturbed by construction shall be fully restored to their original design condition prior to the onset of the rainy season (October 1) so that the flood control capacity of the affected County facilities are not compromised.		The type of facility proposed for recharge water conveyance would determine applicability.	✓	Not applicable	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
Surface Water Quality – Operations ***Summary:*** *To minimize the potentially adverse health and environmental resource effects of excessive irrigation runoff and improper application of fertilizers and pesticides, OCWD will prepare a Water Quality Management Plan. As a regulatory compliance action under the Countywide NPDES program, WQMP preparation is considered a Standard Condition*	The WQMP will contain BMPs that are commonly used and are proven to minimize pollutant loading in stormwater runoff. With implementation of the Standard Conditions, water quality impacts would be **less than significant** during project operations and no mitigation measures are necessary.	LS	LS	LS	LS
SC 4.1-4: OCWD shall consult the 2003 Orange County Drainage Area Management Plan to determine whether the proposed recharge basin project is subject to Site Design BMPs, Source Control BMPs, or project-based Treatment Control BMPs. Subject to the 2003 DAMP provisions, OCWD shall prepare a WQMP that references the DAMP's Model Integrated Pest Management, Pesticides and Fertilizer Guidelines for the selection of structural and non-structural BMPs for long-term, post-construction stormwater management. The applicable BMPs shall be incorporated into the project design and shown on the project plans prior to construction. The specific BMPs employed will be determined by OCWD during project design and in consultation with the DAMP and its appendices. The WQMP will address the following issue areas and performance criteria: • <u>Landscape Design</u> – Natural landscaping (i.e., a native plant palette) will be used to ensure drought tolerance, minimal irrigation runoff, and reduced pesticide and fertilizer usage. If pesticide and/or fertilizer usage is necessary, the landscape plan will consider the use of a buffer strip, which is an		✓	✓	Not applicable	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
area of grass or other vegetation between the treated landscaping and the site perimeter that receives no applications of fertilizers or pesticides. Landscape maintenance will include application of mulch to reduce weeds, keep the soil cool and moist, and prevent soil erosion and sedimentation in storm drain facilities. • Irrigation Design – Irrigation design will consider the use of irrigation techniques such as drip irrigation or soaker hoses to reduce runoff water and ensure water reaches the plant roots. If drip irrigation is found to be impractical, sprinkler systems will be well-maintained and will not water driveways, sidewalks, streets or other impervious surfaces. All irrigation plans will employ rain-triggered shutoff devices to prevent irrigation after precipitation, and will feature flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.					
4.2 HYDROGEOLOGY AND GROUNDWATER QUALITY					
Summary: *Potential impacts related to groundwater quantity and quality, recharge source water quality, and project-related contaminant transport would all be less than significant. In particular, the contaminant transport modeling demonstrates that the La Jolla Recharge Basin project will not adversely affect the rate or direction of movement of the AC Products PCE contamination plume.*	Impacts will be **less than significant** and no mitigation measures are necessary.	CBD	LS	LS	LS

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
4.3 HAZARDS AND HAZARDOUS MATERIALS					
Soil Contamination and Underground Storage Tanks					
Impact 4.3-1: *As indicated in the Phase II ESA, petroleum hydrocarbons were not detected in any of the soil samples from waste oil storage areas or from fuel storage and dispensing areas. However, OCWD will implement the following mitigation measures to address the possibility of encountering previously undetected storage tanks and/or soil contamination during demolition and grading activities.*	Based on the findings in the Phase I and II ESAs, the mitigation measures will reduce impacts to a level that is **less than significant**.	CBD	LS	LS	LS
MM 4.3-1a: If any Underground Storage Tanks are encountered during site grading and excavation activities, they shall be removed in accordance with the existing standards and regulations of, and oversight by, the Orange County Health Care Agency. The process for UST removal is detailed in the OCHCA's AST/UST Removal Report and Remediation Procedures Report. Soil samples from areas where storage tanks have been removed or where soil contamination is suspected shall be analyzed for hydrocarbons including gasoline and diesel in accordance with procedures set forth in the AST/UST Removal Report and Remediation Procedures Report and as directed by OCHCA. If hydrocarbons are identified in the soil, the appropriate response/remedial measures will be implemented as directed by OCHCA or other appropriate agency until all specified requirements of the oversight agencies are satisfied and a no-further-action status is attained. Any Aboveground Storage Tanks (ASTs) in existence at the commencement of		A Phase I ESA or other site-specific information would determine applicability.	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
site development shall be removed in accordance with all applicable regulations under the oversight of OCHCA. These procedures are detailed in the UST/AST Removal Report.					
MM 4.3-1b: The removal of onsite facilities and containers previously used for waste oil storage or fuel storage and dispensing shall be overseen by a qualified professional who is equipped to collect samples if stained, odorous, or hydrocarbon-saturated soil is encountered. This shall include the area around the existing aboveground storage tanks in the southeast corner of the site. As specified in Mitigation Measure 4.3-1a, if stained, odorous, or hydrocarbon-saturated soils are encountered, OCWD shall notify the Orange County Health Care Agency and other regulatory agencies as necessary prior to undertaking remedial action. If determined necessary, OCWD, or assigned contractor, shall also prepare a written contaminated soil mitigation plan in accordance with Mitigation Measure 4.5-2a (refer to Section 4.5 - Air Quality).		A Phase I ESA or other site-specific information would determine applicability.	✓	✓	✓
Asbestos-Containing Materials					
Impact 4.3-2: *Existing irrigation piping that must be removed during grading and demolition activities could contain asbestos-containing material, which poses a health hazard if it becomes airborne during demolition activities.*	Based on the findings in the Phase I and II ESAs, the mitigation measures will reduce impacts to a level that is **less than significant**.	CBD	LS	LS	LS
MM 4.3-2a: Prior to demolition and grading activities, a licensed Asbestos Inspector shall be retained to determine the presence of asbestos-containing		A Phase I ESA or other site-specific	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
material (ACM) within structures to be demolished and in irrigation piping to be removed from the project site. If ACMs are present on-site, OCWD shall comply with all applicable State and federal ACM abatement policies and procedures for removal of ACMs.		information would determine applicability.			
MM 4.3-2b: If any irrigation piping encountered during site grading and excavation activities is found to contain asbestos fibers, removal shall be conducted in accordance with the remediation and mitigation procedures established by all federal, State, and local standards including federal and California Occupation Safety and Health Administration (OSHA), and Air Quality Management District (AQMD) regulations for the excavation, removal, and proper disposal of the transite pipe [CFR Title 29 OSHA, CFR Title 29 California Health & Safety Code, and SCAQMD Regulation X - National Emission Standards For Hazardous Air Pollutants, Subpart M - National Emission Standards For Asbestos]. The material shall be disposed of at a certified asbestos landfill.		A Phase I ESA or other site-specific information would determine applicability.	✓	✓	✓
Lead-Based Paints					
Impact 4.3-3: *The existing residential and/or commercial structures constructed before 1978 might contain lead-based paint on internal and external surfaces. Lead-based paint poses a health hazard if it becomes airborne during demolition activities or leaches into on-site soils.*	Based on the findings in the Phase I and II ESAs, the mitigation measures will reduce impacts to a level that is **less than significant**.	CBD	LS	LS	LS
MM 4.3-3: Prior to demolition of residential and/or commercial structures constructed before 1978, OCWD shall retain a licensed Lead-Based Paint		A Phase I ESA or other site-specific	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
Inspector to conduct a survey of buildings for lead-based paint. Documentation of the lead survey shall be consistent with existing State and federal regulations for the management and mitigation of lead-based paint. Where lead-based paint exists, abatement shall be completed prior to any demolition activities that would create lead dust or fume hazard. Lead-based paint removal shall be performed in accordance with California Code of Regulations Title 8, Section 1532.1, which provides for exposure limits, exposure monitoring, respiratory protection and mandates good worker practices by workers exposed to lead. Contractors performing lead-based paint removal shall provide evidence to OCWD of certified training for lead-related construction work.		information would determine applicability.			
4.4 Transportation and Circulation					
Summary: *The project site is near an existing PYLUSD elementary school on La Jolla Street and adjacent to a proposed middle school site. Though not a significant impact, OCWD recognizes the importance of vehicle and pedestrian safeguards during construction of the proposed project and will implement the following measures:*	Impacts will remain **less than significant** after mitigation.	LS	LS	LS	LS
MM 4.4-1: Should construction occur within the right-of-way of any streets in the cities of Anaheim or Placentia, OCWD shall coordinate construction plans with the respective cities' Public Works Departments. OCWD shall also obtain the necessary encroachment permit(s) to temporarily relocate on street parking and/or construct project improvements within city		✓	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
streets before any project construction takes place.					
MM 4.4-2: The project contactor shall provide the Placentia-Yorba Linda Unified School District with a written schedule for completion of project site improvements, subject to prior review and concurrence by OCWD. Additionally, the project contractor shall ensure unimpeded pedestrian and vehicular access to Melrose Elementary School and the proposed Southwest Middle School site during project construction activities.		--	✓	✓	✓
MM 4.4-3: To ensure minimal circulation disruption, OCWD shall prepare a traffic management plan to be implemented by the construction contractor(s). Although not subject to local agency approval, the plan shall be coordinated through the City of Anaheim and shall be based upon a careful consideration of construction traffic routes to minimize impacts.		✓	✓	✓	✓
4.5 AIR QUALITY					
Equipment Emissions					
Impact 4.5-1: *Heavy equipment emissions would exceed the SCAQMD daily threshold for NOx during the grading and excavation phase of project construction.*	The mitigation measures will reduce potential impacts to a level that is **less than significant**.	LS	LS	LS	LS
MM 4.5-1a: During grading and construction activities, OCWD shall require that construction contractors use low-emission mobile construction equipment to reduce the release of undesirable emissions. OCWD shall require the use of construction equipment having lean-NOx catalysts. The use of such equipment will reduce NOx		✓	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
emissions below the threshold level. Additionally, OCWD shall require the use of aqueous diesel fuel and/or diesel particulate filters for use in all off-road diesel powered construction equipment to further reduce NOx emissions.					
MM 4.5-1b: OCWD shall stipulate in project plans and contractor specifications that equipment and supply staging areas shall be located as far as practicable from the nearest sensitive receptors during construction and periodic maintenance activities. Idling shall be limited to 10 minutes for trucks and heavy equipment, and equipment staging areas shall be located at least 300 feet away from the western property boundary (i.e., nearest McFadden Park and Melrose Elementary School).		✓	✓	✓	✓
Dust Control					
Although SCAQMD thresholds for most criteria pollutants (ROG, SOx, CO, PM10) will not be exceeded and mitigation is not required, OCWD will nonetheless implement the following standard measures, consistent with common construction practice, to further reduce construction emissions:	The impact will remain **less than significant** after mitigation.	LS	LS	LS	LS
MM 4.5-1c: On-going during grading and construction activities, normal wetting procedures and other dust palliative measures shall be followed to minimize fugitive dust emissions in compliance with SCAQMD Rule 403. At a minimum, those measures shall include the following: • The simultaneous daily disturbance area shall be limited to one acre, or enhanced dust control shall		✓	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
be used for such activities on up to 20 percent of the project property. • Construction contractors shall limit traffic speeds on all unpaved road surfaces to 15 miles per hour or less in order to reduce the release of fugitive dust. • Construction contractors shall suspend grading operations during first and second stage smog alerts and suspend all grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour or visible dust plumes emanate from the site. • Construction contractors shall develop a traffic plan to minimize traffic flow interference from construction activities. • All exposed earth surfaces shall be watered a minimum of twice daily. • Access points to paved surfaces shall be washed or swept daily. Public streets shall be swept for at least 50 feet on either side of site access points if silt accumulation is visible in the roadway. • Dirt hauled off-site shall be in a semi-moist state and loads shall be covered prior to transport.					
MM 4.5-1d: Construction plans and contractor specifications shall stipulate that the emissions of fugitive dust from any open silt storage piles will not remain visible in the atmosphere beyond the property line. Prior to off-site transport, silt storage piles shall be stabilized by watering, application of soil binders, and/or covered with tarps.		✓	✓	✓	✓

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Air Toxics – Potentially Contaminated Soils					
Impact 4.5-2: *Grading and excavation of soils in certain areas of the project site could trigger compliance with SCAQMD Rule 1166 concerning the emissions of volatile organic compounds.*	The mitigation measures will reduce potential impacts to a level that is **less than significant**.	CBD	LS	LS	LS
MM 4.5-2a: Any contaminated soils encountered on the project site during tank removal, site clearance, or excavation shall be sampled to determine the nature and extent of the contamination and disposed of off-site in accordance with applicable hazardous waste regulations, including SCAQMD Rule 1166 where soil samples reveal VOC levels in excess of 50 parts per million. The District shall notify the Orange County Health Care Agency and other regulatory agencies as necessary prior to undertaking remedial action.		A Phase I/II ESA or other site-specific information would determine applicability.	✓	✓	✓
MM 4.5-2b: During excavation, if additional soil testing indicates the probability of encountering VOC contaminated soils, the District, or assigned contractor, shall prepare a written VOC Contaminated Soil Mitigation Plan in accordance with the SCAQMD Rule 1166 – VOC Emissions from Decontamination of Soil – and submit the plan for SCAQMD approval. A VOC-Contaminated Soil Mitigation Plan shall be written to minimize VOC emissions to the atmosphere during excavation, grading, handling and treatment of VOC contaminated soil. SCAQMD approval of the mitigation plan shall be obtained before proceeding with the excavation and grading in the affected areas, as clearly delineated in the plan. Additionally, soil excavation in excess of 5,000 cubic yards shall be subject to a pre-approved AQMD Rule 403 Fugitive		A Phase I/II ESA or other site-specific information would determine applicability.	✓	✓	✓

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Dust Plan. The approved plan shall contain mitigation measures designed to reduce emissions and fugitive dusts and odors from handling and disposing of potentially contaminated soils.					
Impact 4.5-3: *Grading and excavation of soils in certain areas of the project site may expose construction personnel and nearby sensitive receptors to pesticide-contaminated dust emissions.*	The mitigation measures will reduce potential impacts to a level that is **less than significant.**	CBD	LS	LS	LS
MM 4.5-3: Prior to site grading and excavation, OCWD shall ensure that the construction contractor has an AQMD-approved plan for the removal and disposal of pesticide-contaminated soils. In formulating a comprehensive plan, the contractor shall comply with all relevant AQMD rules and reasonable conditions. The conditions shall include, but may not be limited to, conducting air monitoring and implementing dust control procedures to prevent airborne transport of site contaminants during site grading and excavation. After the pesticide-contaminated soil is removed, the removal contractor shall perform confirmation sampling to ensure that the desired clean-up levels are achieved. Additional plans elements shall include procedures for ensuring responsibility for the implementation of the plan; accessibility to the site for AQMD staff; notification of actions required by the plan; identification of emission receptors; monitoring and testing; suppression and covering of stockpiles; prevention of public nuisance from dust emissions; prevention of fugitive emissions of contaminated soil; loading of truck trailers; and disposal and treatment.		Applicability would depend on historical site uses, as determined by a Phase I/II ESA or other site-specific information.	✓	✓	✓

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IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	LEVEL OF SIGNIFICANCE AFTER MITIGATION	COMPARATIVE EFFECTS OF PROJECT ALTERNATIVES			
		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
Air Toxics – Asbestos-Containing Materials **Impact 4.5-4:** *Existing structures could contain asbestos-containing materials, which would pose a health hazard if asbestos becomes airborne during demolition activities.* **MM 4.5-4:** If asbestos-containing materials (ACMs) are found during the site survey required by Mitigation Measure 4.3-2a (see Section 4.3 – Hazards and Hazardous Materials), abatement of asbestos shall be completed prior to any demolition activities that would disturb ACMs or create airborne asbestos hazard. Actions to remove ACM shall be accomplished in accordance with SCAQMD Rule 1403 – Asbestos Emissions from Demolition and Renovation Activities, which requires that: • Asbestos removal shall be performed by a State-certified asbestos containment contractor; • A survey of the facility shall be conducted prior to issuance of a permit by SCAQMD; • SCAQMD shall be notified of intent to remove ACMs prior to demolition activity; • ACMs shall be removed in accordance with prescribed procedures; • Collected ACMs shall be placed in leak-tight containers or wrapping; and • ACMs shall be properly disposed.	The mitigation measures will reduce potential impacts to a level that is **less than significant**.	CBD An asbestos survey or other site-specific information would determine applicability.	LS ✓	LS ✓	LS ✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
4.6 NOISE					
Summary: *Although no significant project-related impacts have been identified, OCWD routinely includes standard noise provisions as part of construction specifications. The measures that OCWD will apply to this project include, but are not limited to, the following:*	Noise impacts would remain **less than significant** after mitigation.	CBD	LS	LS	LS
MM 4.6-1: Short-term construction noise intrusion shall, at a minimum, be limited by compliance with the Anaheim Municipal Code on hours of allowable disturbance, as stated in conditions on contractor specifications. Those same documents shall also specify construction access routing to minimize construction truck traffic past existing schools, residential neighborhoods, or other noise-sensitive uses in the project vicinity.		✓	✓	✓	✓
MM 4.6-2: Prior to commencement of demolition or construction, a note shall be placed on the plans requiring compliance with the following measures ongoing during demolition, grading, and construction operations: a. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers consistent with manufacturers' standards. All internal combustion equipment used for construction and drilling shall be properly tuned-up to minimize noise emissions, and shall use mufflers and noise shrouds no less effective than those originally installed on the equipment. No equipment shall have unmuffled exhaust. This measure shall be added to the construction		✓	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
contract and enforced by the District Engineer or designee; b. All stationary construction equipment shall be located in staging areas that will create the greatest distance between construction-related noise sources and McFadden Park (which is located west of the project site) and all equipment shall be oriented so that emitted noise is directed away from McFadden Park, as feasible; and, c. The construction contractor shall be required to adhere to all Noise Ordinance provisions of the City of Anaheim. Additionally, noisy construction within 500 feet of existing homes shall be limited to the hours of 7 a.m. and 7 p.m. on weekdays, 7 a.m. to 6 p.m. on Saturdays and not at any time on Sunday or Federal holidays.					
MM 4.6-3: If monitoring well drilling occurs within 300 feet of schools or residences, the drill sites shall be enclosed on all sides with an acoustical barrier that provides a minimum sound transmission class rating of 30. The height of the barriers is crucial in terms of effectiveness, as the higher the barrier the more the noise reduction. Types of shielding may include leaded blankets, an acoustic blanket, or several layers of plywood. This measure shall be added to the construction contract and enforced by the District Engineer or designee.		Applicability would depend on the need, if any, for groundwater monitoring wells.	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
MM 4.6-4: For project construction activities within 300 feet of an occupied school, the District shall confer with the City of Anaheim to determine whether project construction should continue on weekends and holidays while school is in session in an effort to avoid impacting noise-sensitive uses on weekdays. This approach is consistent with the City of Anaheim General Plan Noise Element, which generally discourages construction on weekends or holidays, except in the case of construction proximate to schools where the noise-generating operations could disturb the classroom environment.		Applicability would depend on proximity to sensitive noise receptors.	✓	✓	✓
4.7 LAND USE AND RELATED PLANNING					
Summary: *The proposed recharge basin project would not create land use conflicts with any existing or future uses, including the proposed Southwest Middle School project that is planned by PYLUSD. Post-construction activity levels on the site would be relatively minor compared to future adjacent uses. The nature of the proposed recharge basin project is such that its operations would be unaffected by intensified uses on neighboring properties. Although significant land use impacts will not result from project construction or operation, the following measure will be implemented:*	The mitigation measure will ensure that land use impacts remain **less than significant.**	LS	LS	LS	LS
MM 4.7-1: To ensure compatibility with future land uses and adjacent school site planning efforts, final construction documents and a copy of the project plans shall be made available by OCWD to interested and affected public agencies, including the Placentia-Yorba Linda Unified School District, the County of Orange, and the cities of Anaheim and Placentia.		✓	✓	✓	✓

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IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	**LEVEL OF SIGNIFICANCE AFTER MITIGATION**	**COMPARATIVE EFFECTS OF PROJECT ALTERNATIVES**			
		Alt. Site	***4,500 AFY Recharge Capacity***	***Alt. Recharge Water Source***	***Project Schedule Alt.***
4.8 Geology and Seismicity					
Summary: *Ninyo & Moore's (2003) evaluation of soils and geotechnical conditions concludes that recharge basin construction and operation is feasible from a geotechnical point of view. OCWD will incorporate the conclusions and recommendations presented in that report into design and construction of the recharge basin and site improvements. A geotechnical engineer will also conduct on-site review of potential structural and soils-related hazards during the construction process. Adherence to those procedures will ensure that potential geotechnical and seismic impacts remain below a level of significance.*	Impacts will be **less than significant** and no mitigation measures are necessary.	LS	LS	LS	LS
4.9 Biological Resources					
Impact 4.9-1: *Removal of the trees and large shrubs at the proposed project site could have an impact on nesting activity of native resident or migratory birds that could potentially nest on-site.*	The mitigation measure will reduce potential impacts to a level that is **less than significant**.	CBD	LS	LS	LS
MM 4.9-1: OCWD shall obtain the services of a wildlife biologist familiar with the project area resources to conduct a pre-construction survey no more than two (2) days prior to demolition or construction work in the area to verify the presence or absence of nesting birds on the project site. The area surveyed shall include all construction and staging areas, as well as areas within 100 feet outside the boundaries of the areas to be cleared, or as otherwise determined by the biologist. The results of the survey shall be documented in a letter report of		Applicability would depend on the presence of biological resources.	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
findings that shall describe the methods used to conduct the surveys, existing conditions of biological resources onsite, and results of the surveys. If the presence of nesting birds in the area of construction activity influence is confirmed, vegetation removal shall be delayed until outside the breeding season (February 1 through August 31) to avoid destruction of resident native bird nests and to ensure reproductive success for native bird species using the site for nesting purposes. If it is not feasible to avoid the nesting season, the biologist shall flag off the area(s) supporting bird nests, providing a minimum buffer of 100 feet between the nests and limits of construction. The construction crew shall be instructed to avoid any activities in this zone until the nest(s) is/are no longer active. Limits of construction to avoid the nest(s) shall be established within the field with flagging and stakes or construction fencing.					
4.10 AESTHETICS					
Summary: *No significant visual impacts have been identified; however, the project landscape plan and site plan will be submitted to several requesting agencies as a courtesy for their review and comment.*	The mitigation measure will ensure that land use impacts remain **less than significant.**	LS	LS	LS	LS
MM 4.10-1: A perimeter landscape plan shall be prepared showing vegetation types, locations, and presumed or actual heights of vegetation. The landscape plan shall also include measures for		✓	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
maintenance and replanting, if necessary. The District shall submit the proposed landscape plan and site plan to the County of Orange, the City of Anaheim, and OCTA for their review and comment prior to implementation of the project. Further, where feasible and practical, the final landscape plan shall include designs to comply with City of Anaheim recommendations.					
4.11 CULTURAL RESOURCES					
Impact 4.11-1: *Future development activities involving earthmoving have the potential to significantly impact potential archaeological resources.*	The mitigation measures will reduce potential impacts to a level that is **less than significant**.	LS	LS	LS	LS
MM 4.11-1a: Any excavation necessary for the proposed project shall be monitored by a qualified archaeological monitor under the supervision of a qualified Project Archaeologist who is on the Orange County List of Certified Archaeologists. If cultural material is encountered, the monitor shall have the power to halt or divert earthmoving equipment in the vicinity of the find until it can be evaluated.		✓	✓	✓	✓
MM 4.11-1b: If cultural material is encountered it will be evaluated using CRHR eligibility criteria. This may require an archaeological test program. If the Project Archaeologist recommends a test program, he or she shall prepare a test plan and implement it.					
MM 4.11-1c: If the cultural material is evaluated as eligible, mitigation shall consist of avoidance and preservation, if feasible. If avoidance is not feasible, the Project Archaeologist shall prepare a data					

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recovery plan that states how the data necessary to address scientifically consequential research topics will be recovered. The data recovery plan shall then be implemented.					
Impact 4.11-2: *Future development activities involving earthmoving have the potential to significantly impact Native American human remains.*	The mitigation measures will reduce potential impacts to a level that is **less than significant**.	LS	LS	LS	LS
MM 4.11-2: If Native American remains are discovered during construction, construction activities shall be halted or diverted until the provisions of Section 7050.5 of the Health and Safety Code and Section 5097.98 of the Public Resources Code have been implemented. These provisions include notifying the County Coroner, taking into account the recommendations of the Most Likely Descendant appointed by the Native American Heritage Commission, and reburying the remains where they will not be further disturbed.		✓	✓	✓	✓
4.12 Paleontological Resources					
Impact 4.12-1: *Project implementation could adversely affect a paleontological site that may be discovered during excavation of the recharge basin.*	The mitigation measures will reduce potential impacts to a level that is **less than significant**.	LS	LS	LS	LS
MM 4.12-1a: Prior to earthmoving, a project paleontologist shall be retained by the Orange County Water District (OCWD) and shall develop a mitigation plan and a discovery clause/treatment plan to be implemented during earthmoving on the project site. At a minimum, the treatment plan shall require		✓	✓	✓	✓

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		Alt. Site	*4,500 AFY Recharge Capacity*	*Alt. Recharge Water Source*	*Project Schedule Alt.*
the recovery and subsequent treatment of any fossil remains and associated data uncovered by earthmoving. As part of the plan, the project paleontologist shall develop a storage agreement with an Orange County institution with right-of-first-refusal (i.e., the Orange County Archaeo/Paleo Resource Management Facility [APRMF]) or, if necessary, the Natural History Museum of Los Angeles County Vertebrate Paleontology Section, San Bernardino County Museum, or another acceptable museum repository to allow for the permanent storage and maintenance of any fossil remains recovered as a result of the mitigation program, and for the archiving of associated specimen data and corresponding geologic and geographic site data at the museum repository.					
MM 4.12-1b: The paleontologist and a paleontologic construction monitor shall attend a pre-grade meeting to explain the mitigation program to grading contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earthmoving.		✓	✓	✓	✓
MM 4.12-1c: Paleontologic monitoring of earthmoving shall be conducted by the monitor when older Quaternary sediments will be disturbed.		✓	✓	✓	✓
MM 4.12-1d: If fossil remains are found by the monitor, earthmoving shall be diverted temporarily around the fossil site until the remains have been recovered and the monitor agrees to allow earthmoving to proceed.		✓	✓	✓	✓

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MM 4.12-1e: Any recovered fossil remains shall be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains then shall be curated and catalogued, at the expense of the OCWD, and associated specimen data and corresponding geologic and geographic site data shall be archived at the museum repository by a laboratory technician. The remains then shall be accessioned into the museum repository fossil collection, where they shall be permanently stored, maintained, and, along with associated specimen and site data, made available for future study by qualified investigators.		✓	✓	✓	✓
MM 4.12-1f: A final report of findings shall be prepared by the paleontologist for submission to OCWD and the museum repository following accessioning of the specimens into the museum repository fossil collection. The report shall describe geology/stratigraphy; summarize field and laboratory methods used; include a faunal list and an inventory of curated/catalogued fossil specimens; evaluate the scientific importance of the specimens; and discuss the relationship of any newly recorded fossil site in the parcel to relevant fossil sites previously recorded from other areas.		✓	✓	✓	✓

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Chapter 2.0
Introduction

2.1 ROLE OF THE ORANGE COUNTY WATER DISTRICT

The Orange County Water District (OCWD or District) is the Lead Agency for this project environmental impact report (EIR). OCWD was created as a special district by state law in 1933 for the protection and preservation of the Orange County Groundwater Basin (California Statutes, 1933, chapter 924, page 2400, as amended, "The Orange County Water District Act"). The Orange County Water District Act authorizes OCWD to *"transport, reclaim, purify, treat, inject, extract, or otherwise manage and control water"* for its beneficial use and to improve and protect the quality of groundwater supplies within the district. OCWD seeks to maximize yield from the basin, while also protecting the integrity of the basin's groundwater quality and quantity. To this end, OCWD conducts annual investigations of basin conditions, sets goals for recharge, and establishes limits on the pumping of groundwater to control overdraft of the basin. Replenishment activities, such as the diversion and percolation of Santa Ana River (SAR) water or the purchase of imported water for groundwater recharge, are consistent with the District Act for the *"protection of the water supplies for users within the district that are necessary for the public health, welfare and safety of the people of this state."*

2.2 PROJECT BACKGROUND

2.2.1 PREVIOUS CEQA ANALYSIS

In April 2003, the District analyzed the proposed La Jolla Recharge Basin project in a CEQA Initial Study (IS) and issued a Notice of Intent to Adopt a Mitigated Negative Declaration (MND) for public review and comment. The public review period for the IS/MND had a 30-day duration beginning on April 29, 2003 and ending on May 29, 2003. The District Board of Directors approved the MND in June of 2003, but received public comments that challenged the adequacy of the environmental review, particularly the need for the project and the potential impact of the project upon the quality of groundwater in the Orange County Groundwater Basin.

Specifically, a private business, AC Products, Inc. (AC Products), contended that groundwater recharge at the proposed La Jolla Recharge Basin site would create a detrimental plume migration effect that would hamper its ongoing groundwater remediation operation to contain and remove the volatile organic compounds (VOC) TCE and PCE from the aquifer. In early 1988, AC Products caused groundwater contamination through the discharge of VOCs, and has been attempting to mitigate the problem since 1995. To address the claim that the existing VOC plume could affect OCWD's ability to implement the La Jolla Recharge Basin project, OCWD directed that an EIR be prepared. To that end, OCWD prepared and distributed a Notice of Preparation (NOP) of a Draft EIR in May 2004.

2.2.2 NOTICE OF PREPARATION

As required by the State CEQA Guidelines (Sections 15082[a], 15103 and 15375), the NOP was circulated for comment for a period of 30 days. In accordance with Section 15082(b) of the State CEQA Guidelines, the District solicited comments from potential Responsible Agencies, including details about the scope and content of the environmental information related to the Responsible Agency's area of statutory responsibility, as well as the significant environmental issues and reasonable alternatives and mitigation measures that the Responsible Agency would have explored in the Draft EIR. Responsible Agencies include all public agencies, other than the Lead Agency, which have discretionary approval authority over the project. Specific concerns related to the project were sought in order to provide a document that best informs decision-makers and the general public. Lead Agency and Responsible Agency roles are defined in Section 3.7 (Intended Uses of the EIR and Project Approvals).

At the conclusion of the NOP comment period, comments were received from seven (7) affected and/or interested public agencies and private entities that expressed concern over several environmental issues and aspects of the proposed project. The comment letters received by the District during the NOP circulation period are summarized in Appendix 9.1 as part of a summary table indicating how and where environmental issues have been addressed in this Draft EIR.

2.3 PURPOSE OF THE DRAFT EIR

2.3.1 PUBLIC DISCLOSURE AND DECISION SUPPORT

The Orange County Water District is the public agency that has the principal responsibility for carrying out or approving the project and, as such, is the "Lead Agency" for this project under CEQA (CEQA Guidelines Section 15367). CEQA requires the Lead Agency to consider the information contained in the DEIR prior to taking any discretionary action. This DEIR is intended to provide information to the Lead Agency and other public agencies, the general public, and decision makers, regarding the potential environmental impacts from the construction and operation of the proposed La Jolla Recharge Basin project.

Under CEQA, *"The purpose of the Environmental Impact Report is to identify the significant effects of a project on the environment, to identify alternatives to the proposed project, and to indicate the manner in which significant environmental effects can be mitigated or avoided"* (Public Resources Code Section 21002.1[a]). An EIR is the most comprehensive form of environmental documentation identified in CEQA and the CEQA Guidelines and provides the information needed to assess the environmental consequences of a proposed project, to the extent feasible. EIRs are intended to provide an objective, factually supported, full disclosure analysis of the environmental consequences associated with a proposed project that has the potential to result in significant, adverse environmental impacts.

An EIR is also one of the various decision-making tools used by a Lead Agency to consider the merits and disadvantages of a project that is subject to its discretionary authority. Prior to approving the proposed project, the District must consider the information contained in the EIR, determine whether the EIR was properly prepared in accordance with CEQA and the CEQA Guidelines, determine that the EIR reflects the independent judgment of the District, adopt findings concerning the project's significant environmental impacts and alternatives, and adopt a Statement of Overriding Considerations if the proposed project would result in significant impacts that cannot be avoided.

2.3.2 SUMMARY OF TECHNICAL INFORMATION

The focus of this Draft EIR is to provide a succinct and coherent summary of the significant effect(s) that could result from project implementation. Due to the extensive treatment of topics related to water quality and hydrogeology, the relevant portions of the District's Engineering Report (OCWD 2003), groundwater modeling results, and other supporting documents have been referenced and summarized for the reader to understand the project's potential environmental effects. To the extent that technical terms and methodologies are employed in the analysis, they have also been summarized and/or defined. The technical analyses are integrated into this document as Appendices 9.3 through 9.7.

2.3.3 AVOIDANCE OR MINIMIZATION OF SIGNIFICANT IMPACTS

The Draft EIR focuses on the potentially significant environmental effects of the project. Significance criteria (indicating what constitutes a significant impact) have been developed for each environmental issue analyzed in this EIR, and are defined at the beginning of each impact analysis section. Impacts are categorized as follows:

1. significant, unavoidable
2. significant, but can be mitigated to a less-than-significant level
3. less than significant (mitigation is not required under CEQA, but may be recommended)
4. no impact

CEQA requires that a lead agency shall neither approve nor carry out a project as proposed unless the significant environmental effects have been reduced to an acceptable level (CEQA Guidelines Sections 15091 and 15092) or the project's benefits outweigh its unavoidable significant impacts, thereby requiring the Lead Agency to make a Statement of Overriding Considerations (CEQA Guidelines Section 15093). An acceptable level is defined as eliminating, avoiding, or substantially lessening the significant effects.

2.4 PROJECT APPROVAL AND PERMITTING PROCESS

As the Lead Agency, OCWD is the public agency that has the principal responsibility for carrying out or approving the proposed project (State CEQA Guidelines §15367). Project implementation will entail various actions that are collectively included in Chapter 3.0 (Project Description). Those actions include the sale of property to the Placentia-Yorba Linda Unified School District; demolition of existing on-site structures; removal and disposal of structural debris, equipment and potential contaminants; and construction and operation of the groundwater recharge basin and three off-site groundwater monitoring wells. Certification of this EIR and approval of the project is required before construction can commence. Following these actions, OCWD could proceed with final engineering design.

The discretionary actions to be taken by the District at (or as part of) the completion of the EIR may include, but are not limited to, the following:

- La Jolla Recharge Basin project approval, including approval of design and construction contracts;
- Actions related to real and personal property acquisition, disposal, leases, management and other approvals; and

- Regulatory or other actions implementing mitigation measures or actions identified in the Final EIR (i.e., State and federal resource agency permits).

Responsible Agencies (i.e., federal, State, and local agencies other than the District) may use the EIR in connection with any discretionary decisions that they are authorized to implement. Table 3-2 in the Project Description (Chapter 3.0) summarizes the major project approvals, permits, and approval responsibilities.

2.5 AVAILABILITY OF THE DRAFT EIR

This document is being circulated to local, state and federal agencies, and to interested organizations and individuals wishing to comment on the EIR. Publication of this Draft EIR marks the beginning of a 45-day public review period, during which written comments may be sent to OCWD. Comments should be focused on the adequacy and accuracy of the content of the EIR. The Draft EIR for the La Jolla Recharge Basin project may be reviewed at the following locations:

- Orange County Water District, 10500 Ellis Avenue, Fountain Valley, CA 92708 – Contact person: Mr. Shivaji Deshmukh, P.E. (sdeshmukh@ocwd.com)
- Orange County Water District Field Headquarters, 4060 East La Palma, Anaheim, CA 92807
- Anaheim Central Library, 500 W. Broadway, Anaheim, CA 92805 – Telephone (714) 765-1880
- http://www.ocwd.com/_html/projects.htm

2.6 INCORPORATION BY REFERENCE

Section 15150 of the State CEQA Guidelines permit an EIR to incorporate portions or all of any publicly available document by reference in order to avoid redundant analysis. Whenever this documentation is used in the preparation of this EIR, the information is summarized for the convenience of the reader and referenced accordingly. Incorporation by reference is encouraged by CEQA where previous environmental analysis or other publicly available documents convey useful information to the public and decision-makers. Most typically, EIRs incorporate by reference and summarize lengthy discussions of background impacts and existing environmental conditions from other documents. The primary documents consulted in the preparation of this EIR are as follows:

- **Orange County Water District. October 29, 2004. *Final Report – Santa Ana River Water Quality and Health Study.***

  The Santa Ana River Water Quality and Health (SARWQH) Study was initiated by OCWD in 1994 to address questions about the use of Santa Ana River water for recharging the Orange County Groundwater Basin because of the high percentage of treated wastewater in the river's base flow. The study was designed to provide scientific information to help address concerns expressed by the California Department of Health Services (DHS) regarding the use of reclaimed water to recharge groundwaters subsequently withdrawn for potable use. Researchers from several universities, research institutions, and government agencies participated in the study.

- **National Water Research Institute. August 2004. *Report of the Scientific Advisory Panel: Orange County Water District's Santa Ana River Water Quality and Health Study.***

  At the request of OCWD, the National Water Research Institute (NWRI) formed the Scientific Advisory Panel (Panel) in the spring of 1996 to provide independent review and guidance to the SARWQH Study. Panel membership includes nationally recognized experts in various fields related to public health, such as environmental chemistry, environmental engineering, environmental microbiology, environmental epidemiology, groundwater recharge, hydrology, toxicology, and water quality. Panel members generally met once per year as a full Panel to provide a comprehensive review of the research findings and to provide overall direction regarding various research elements. The findings, conclusions, and recommendations of the Panel are summarized in this report.

- **CGvL Engineers. January 2004. *La Jolla Recharge Basin Preliminary Design Report..***

  The Preliminary Design Report, prepared for OCWD, generally presents the project assumptions and the basis for design of the La Jolla Recharge Basin. The report also contains technical specifications, a summary of permitting requirements, preliminary design construction drawings, and a geotechnical report (Ninyo & Moore 2003).

- **Orange County Water District. June 2003. *Engineer's Report for La Jolla Recharge Basin.***

  The Engineer's Report evaluates the need, benefits and cost of purchasing and developing the project site into a groundwater recharge basin. The report describes the environmental site assessments performed to determine the acceptability of the site as a recharge basin. The report also describes the VOC contamination of the groundwater caused by AC Products, Inc. in 1988.

An additional reference cited due to the project proximity to the proposed project site includes:

- LSA, November 20, 2001, *Initial Study/Mitigated Negative Declaration, McFadden Park Elementary School*, prepared for Placentia-Yorba Linda Unified School District.

Chapter 8.0 (List of References) provides a complete listing of references used in the preparation of this EIR. These documents are all incorporated by reference into this EIR and are available for public review at the Orange County Water District, 10500 Ellis Avenue, Fountain Valley, California 92708.

2.7 ACRONYMS

ACM	asbestos-containing materials
(US)ACOE	U.S. Army Corps of Engineers
ADT	average daily traffic
APN	assessor's parcel number
AQMP	Air Quality Management Plan
AST	aboveground storage tank
bgs	below ground surface
BMP	best management practices
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
DAMP	Drainage Area Management Plan
dB or dBA	decibel(s)
DHS	California Department of Health Services
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ESA	environmental site assessment
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GWRS	Groundwater Replenishment System
IS	Initial Study
MND	mitigated negative declaration
MWD	Metropolitan Water District of Southern California
MSL	mean sea level
NFIP	National Flood Insurance Program
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWRI	National Water Research Institute
OCFCD	Orange County Flood Control District
OCHCA	Orange County Health Care Agency
OCWD	Orange County Water District
PCBs	polychlorinated biphenyls
PCE	tetrachloroethylene
PYLUSD	Placentia-Yorba Linda Unified School District
(OC)RDMD	(Orange County) Resources and Development Management Department
(SA)RWQCB	(Santa Ana) Regional Water Quality Control Board
SAR-DAMP	Santa Ana Regional Drainage Area Management Plan
SAR	Santa Ana River
SARWQH	Santa Ana River Water Quality and Health study
SCAQMD	South Coast Air Quality Management District
SWPPP	Storm Water Pollution Prevention Plan
TPH	total petroleum hydrocarbons
TCE	trichloroethylene
µg/kg	micrograms per kilogram
USGS	United States Geological Survey
UST	underground storage tanks
VOC	volatile organic compound

Chapter 3.0
Project Description

3.1 PROJECT BACKGROUND

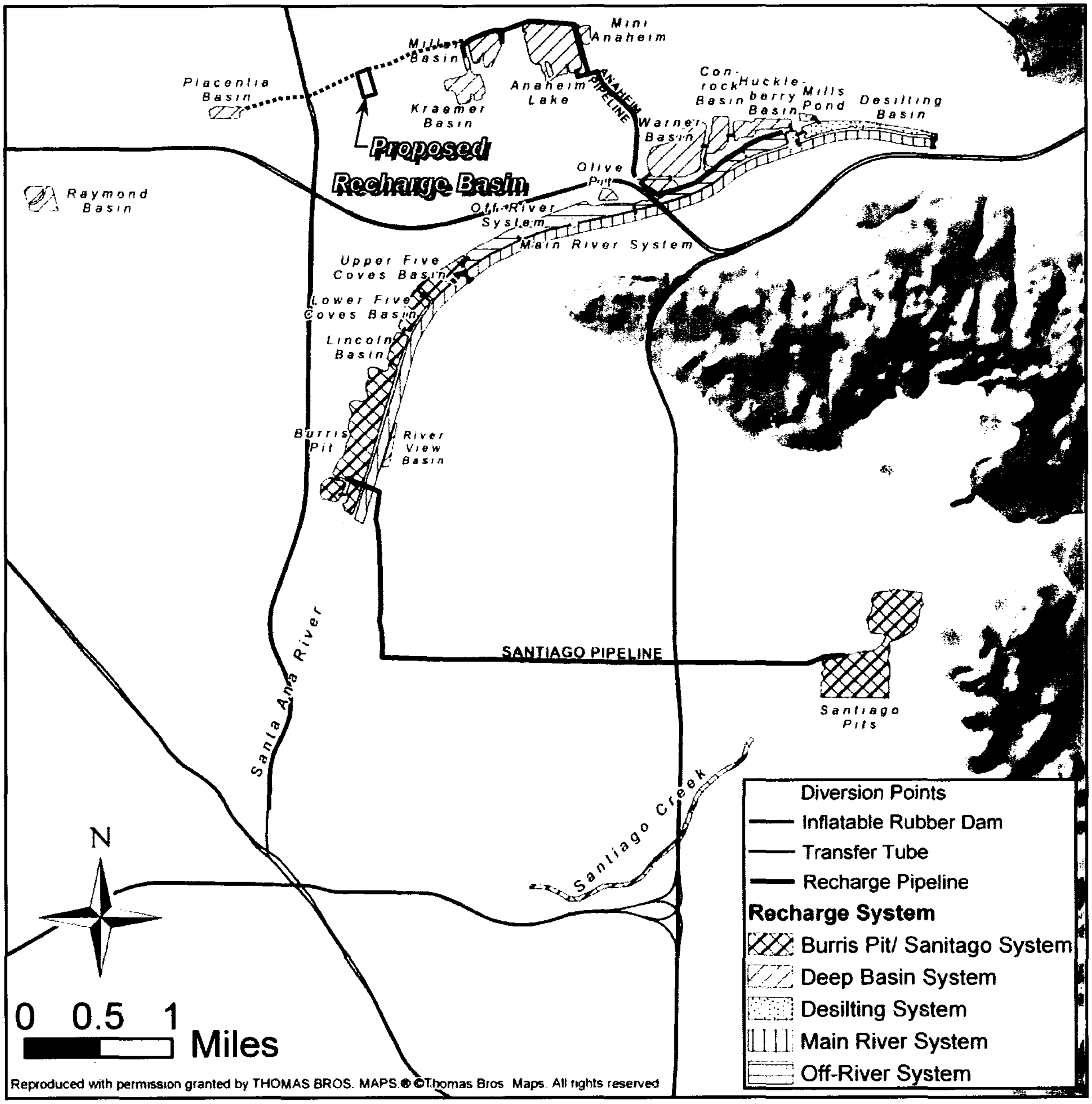
3.1.1 ROLE OF THE ORANGE COUNTY WATER DISTRICT

As previously indicated in Chapter 2.0 (Introduction), the Orange County Water District (OCWD or District) was created by State statute in 1933 to manage the Orange County Groundwater Basin (California Statutes, 1933, chapter 924, page 2400, as amended, "District Act"). The District has the specific statutory authority to acquire property and to construct and operate spreading grounds and other facilities to replenish the Orange County Groundwater Basin (District Act, Section 2). The Santa Ana River (SAR) is a primary source of water for replenishing the Orange County Groundwater Basin. In addition to capturing and recharging water from the SAR, OCWD also purchases and recharges imported water from the Colorado River and Northern California. Long-term planning of water resources management at OCWD includes new projects to maximize groundwater yield by increasing groundwater recharge to accommodate increasing demands. OCWD seeks to maximize yield from the basin, while also protecting the integrity of the basin's groundwater quality and quantity.

Groundwater production occurs from approximately 500 active wells within the District, with approximately 200 large-capacity wells operated by 20 water retail agencies. These large-capacity wells account for an estimated 96 percent of the total production from the Orange County Groundwater Basin and provide water for over 20 cities and agencies. Producers are responsible for operating and maintaining their respective, individually metered production wells. Monthly well production is documented by OCWD. Because OCWD does not sell or distribute water directly to consumers, once the water is extracted from the Orange County Groundwater Basin, the producers have full responsibility for ensuring that the water served to consumers complies with all drinking-water standards.

3.1.2 ORANGE COUNTY GROUNDWATER RESOURCES

OCWD has been managing groundwater recharge in Orange County for over 50 years. OCWD owns and operates approximately 1,100 acres of spreading facilities located in and adjacent to the SAR and Santiago Creek. The facilities consist of river channels and a series of shallow and deep basins, which allow percolation directly to the aquifers of the Orange County Groundwater Basin. OCWD's recharge facilities are divided into four systems---the Main River, Off-River, Deep Basin, and Burris Pit/Santiago Systems. Figure 3-1 depicts the overall layout of these systems, and shows the location of the proposed La Jolla Recharge Basin in the Deep Basin system. Section 4.2 (Hydrogeology and Water Quality) provides a brief description of those systems. Additional detail can be found in the OCWD *Engineer's Report for La Jolla Recharge Basin*, or on the District's web site (http://www.ocwd.com).



Source: SARWQH Study (OCWD 2004a)

Figure 3-1
OCWD Groundwater Recharge Facilities

3.1.3 PROJECT PURPOSE AND NEED

The District, in its *Engineer's Report for La Jolla Recharge Basin* (OCWD 2003), evaluated the need, benefits and cost of purchasing and developing the project site into a groundwater recharge basin. The recharge basin would help meet the increasing demand for groundwater by providing increased recharge capacity in the Forebay[1] of the Orange County Groundwater

[1] Forebay -- A portion of a groundwater basin where large quantities of surface water can recharge the basin through infiltration.

Basin. Concerning the need for the project, the following points are summarized from the *Engineer's Report:*

- The District's current recharge system capacity is approximately 250,000 acre-feet per year (AFY), which is adequate to recharge the current river base flow, some storm flow and limited imported replenishment water. However, the capacity is inadequate to meet long-term increases in groundwater demands.
- The District has recharge facilities that can recharge 500 cubic feet per second (cfs) for a short while, but average only 320 cfs due to clogging and other maintenance needs.
- Discharge from Prado Dam in the spring is normally 500 cfs due to environmental requirements, which is often more than can be recharged, resulting in loss of water to the ocean.
- The District is working with the U.S. Army Corps of Engineers (ACOE or Corps) to allow greater storage of water behind Prado dam; however, without greater recharge capacity this added storage is of limited value to the District.
- The estimated 2020 water supplies available for recharge total 338,000 AFY, which is 88,000 acre-feet more than the District's current annual recharge capacity.
- In addition to capacity needed to take advantage of increasing river flow, capacity is needed when replenishment water for purchase may become available on short notice, and to give the District more recharge system operational flexibility when maintenance and repair work is needed on other facilities.

As described, the District is in need of a significant increase in recharge capacity if it is to accommodate increased demand and take advantage of the increasing available volume of water. Development of the La Jolla Recharge Basin project will be an important step in this process. Based on the recharge capacity of the nearby Kraemer and Miller basins, OCWD estimates that the La Jolla Recharge Basin would have a recharge capacity of up to approximately 9,000 acre-feet per year.

3.2 PROJECT LOCATION

The La Jolla Recharge Basin project is proposed on an approximately 9.3-acre site in the City of Anaheim, California. The project site is located near the northwest corner of the intersection of West La Jolla Street and Red Gum Street (see Figures 3-2 and 3-3). State Route 57 (Orange Freeway) is located about 0.4 mile west of the project site and State Route 91 (Riverside Freeway) is about one mile to the south. The site is bordered by the Carbon Creek Flood Control Channel to the north, West La Jolla Street to the south, commercial/industrial properties in the City of Anaheim to the east, and McFadden Park and Melrose Elementary School in the City of Placentia to the west.

In addition to the recharge basin, OCWD is proposing three new monitoring wells to monitor a groundwater contaminant plume that was caused by a nearby property owner (see discussion in Section 3.4.7). Two of the well sites are located in the 2800 block of East Via Martens, just east of Melrose Street, in the City of Anaheim. The third well would be installed in the 1000 block of South Melrose Street, in the City of Placentia. The monitoring well locations are also shown on Figure 3-3.

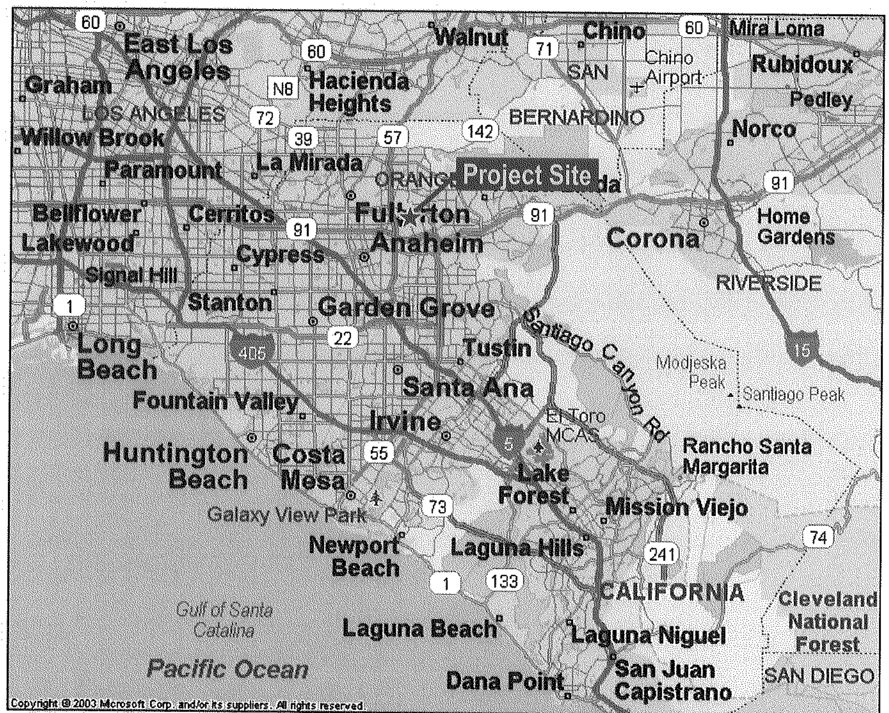
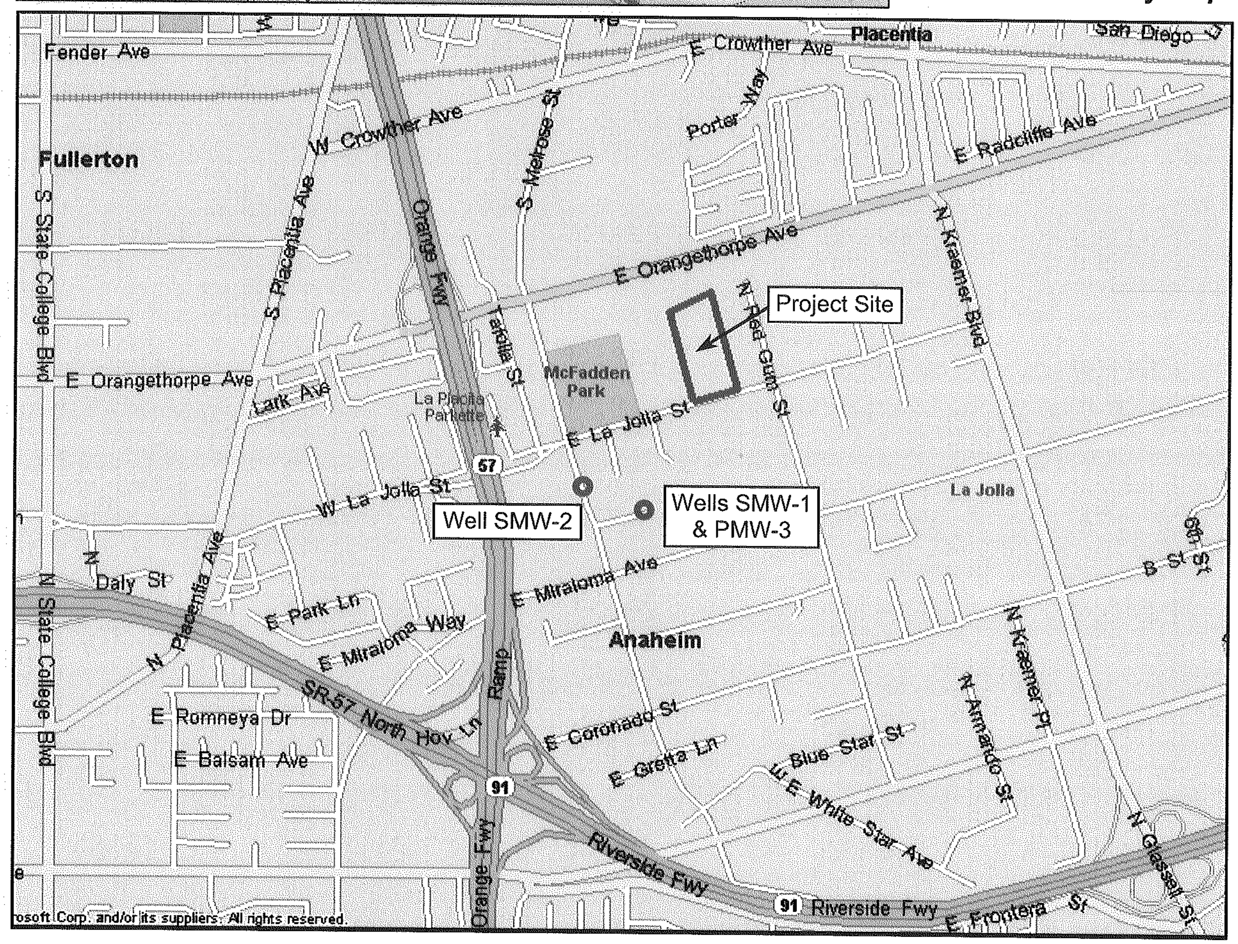


Figure 3-2
Regional Location

Figure 3-3
Vicinity Map



3.3 EXISTING ENVIRONMENTAL CONDITIONS

The following is a summary of the physical characteristics of the project site and adjacent land uses. Baseline environmental conditions of the site and vicinity are provided at the beginning of each section in Chapter 4.0 (Environmental Analysis). An understanding of existing environmental conditions is necessary to assess the effects that project construction and operations activities will have on the site and its surroundings (see Figure 3-4).

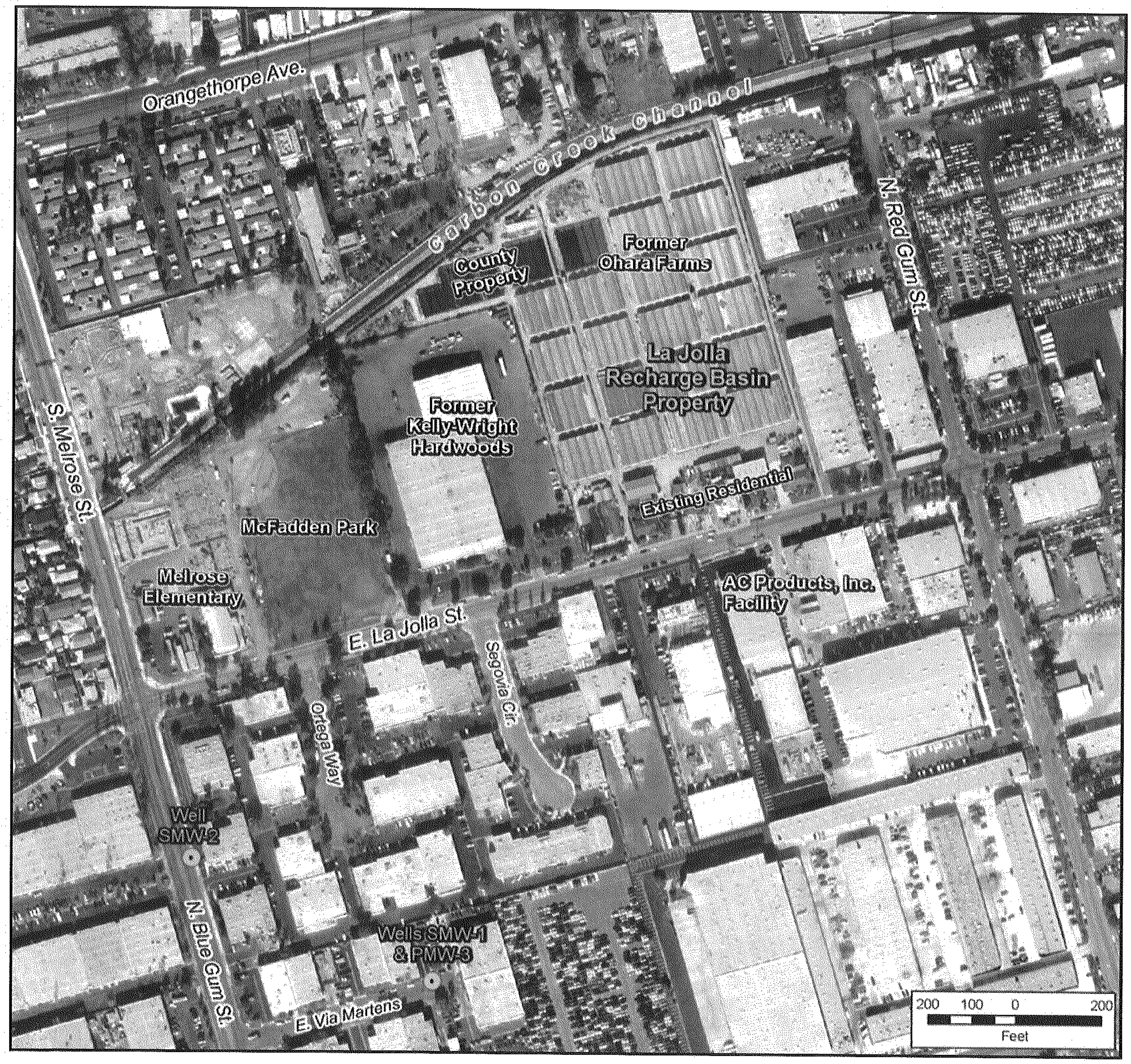


Figure 3-4
Existing Site Conditions and Surrounding Land Uses

3.3.1 LOCAL SETTING AND SURROUNDING LAND USES

3.3.1.1 Site Land Uses

The approximately 9.3-acre project site consists of several properties primarily under the ownership of the District, which purchased the project site from the T. Ohara Farms. The site generally consists of six parcels, two of which were used for a nursery with greenhouses and several seasonal growing areas. Most of the project site has been used for growing flowers for commercial use by the Ohara family. In addition to greenhouses and other smaller structures, five former residences along the project site street frontage were also acquired and will be demolished. Figure 3-4 depicts existing on-site structures, as well as surrounding land uses for the recharge basin site and the proposed monitoring well locations.

3.3.1.2 Adjacent Land Uses

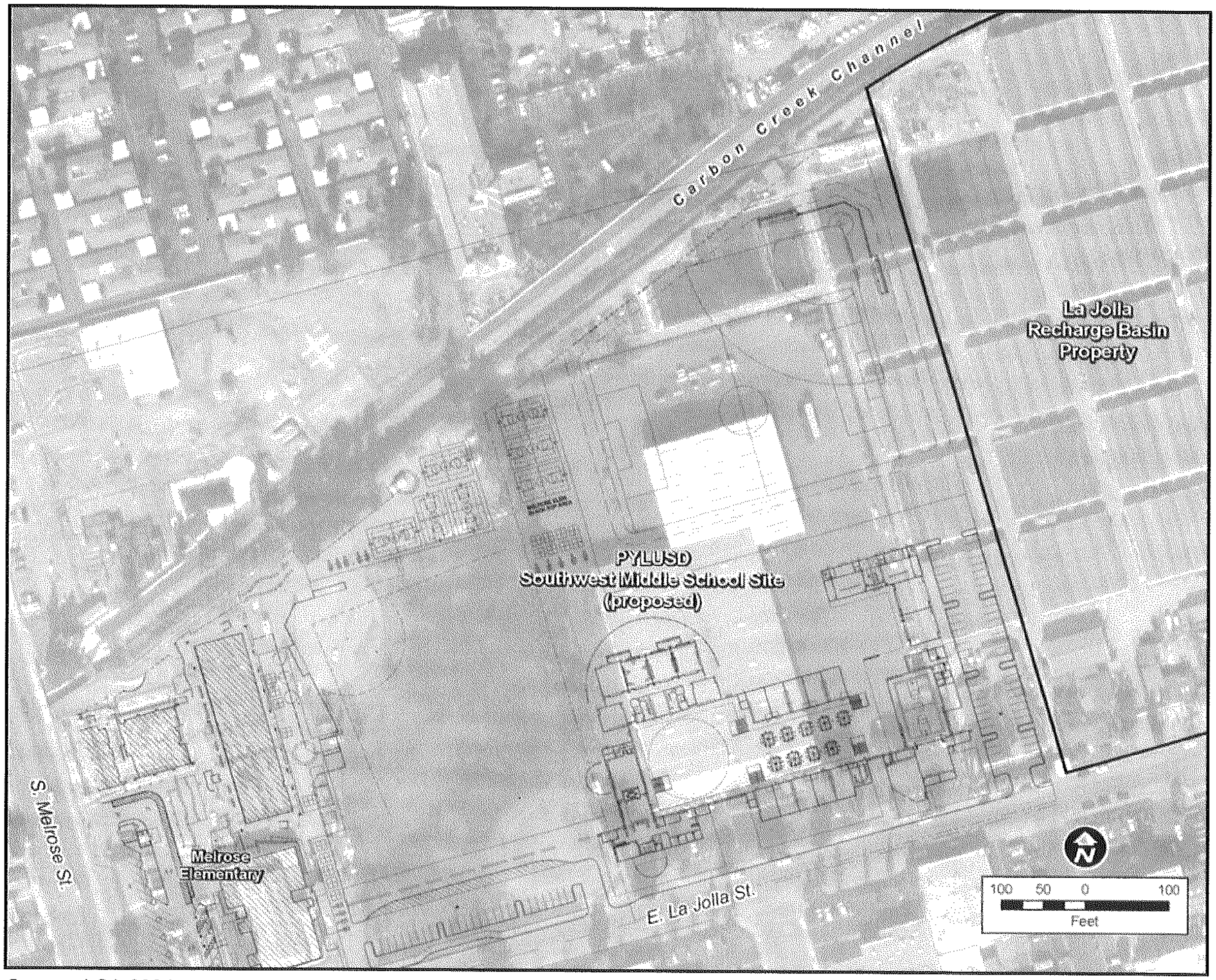
The site is bordered by light industrial and commercial uses in the City of Anaheim to the south and east, and by the recently closed Kelly-Wright Hardwoods wood processing factory and warehouse in the City of Placentia, immediately to the west. Melrose Elementary School and McFadden Park, also in Placentia, are situated about 550 feet west of the project site on approximately 7.6 acres. The Carbon Creek Flood Control Channel forms the site's northern boundary and separates the site from additional light industrial uses just to the north. The nearest residential land uses are approximately 450 feet to the north, in Placentia.

<u>Future Middle School Site</u>

The Placentia-Yorba Linda Unified School District (PYLUSD) has purchased the entire Kelly-Wright Hardwoods site for construction of its proposed Southwest Middle School (see discussion in Section 3.4.1 below). Under a tentative agreement with OCWD, the PYLUSD is also considering purchasing 1.76 acres of a 3.5-acre parcel from OCWD as part of its planned 10-acre school site. The subject acreage is part of the Ohara Farms property that was purchased by OCWD. The remainder of the 10-acre school site includes about 1.3 acres that would be purchased from the County of Orange, and an additional 0.8 acres of the existing McFadden Park playfield area along La Jolla Street. PYLUSD has informed OCWD that the middle school would provide educational facilities for grades 6 through 8 and would serve approximately 850 students. Figure 3-5 on the following page depicts the preliminary school site plan. It is important to note that the sale of OCWD property to PYLUSD has effectively no physical impacts on the environment. Furthermore, PYLUSD has assumed lead agency status in connection with the purchase and development of the entire proposed middle school property. As such, PYLUSD distributed a Notice of Preparation for the Southwest Middle School Draft EIR (SCH No. 2005051026) on May 5, 2005. As required by CEQA, all impacts created by the school development will be appropriately analyzed in that Draft EIR.

3.4 PROJECT ELEMENTS

The Orange County Water District is proposing to finalize acquisition of property in the City of Anaheim and convert the project site into a groundwater recharge basin. The proposed La Jolla Recharge Basin would be used to percolate water obtained from local storm flow, the SAR, or imported water purchased from the Metropolitan Water District of Southern California (MWD). The surface water routed into the basin would infiltrate into the vadose zone and recharge the underlying aquifer encountered at approximately 120 feet below ground surface (bgs). The proposed project would add as much as 9,000 AFY of recharge capacity to the Orange County Groundwater Basin, assuming the basin would operate year-round.



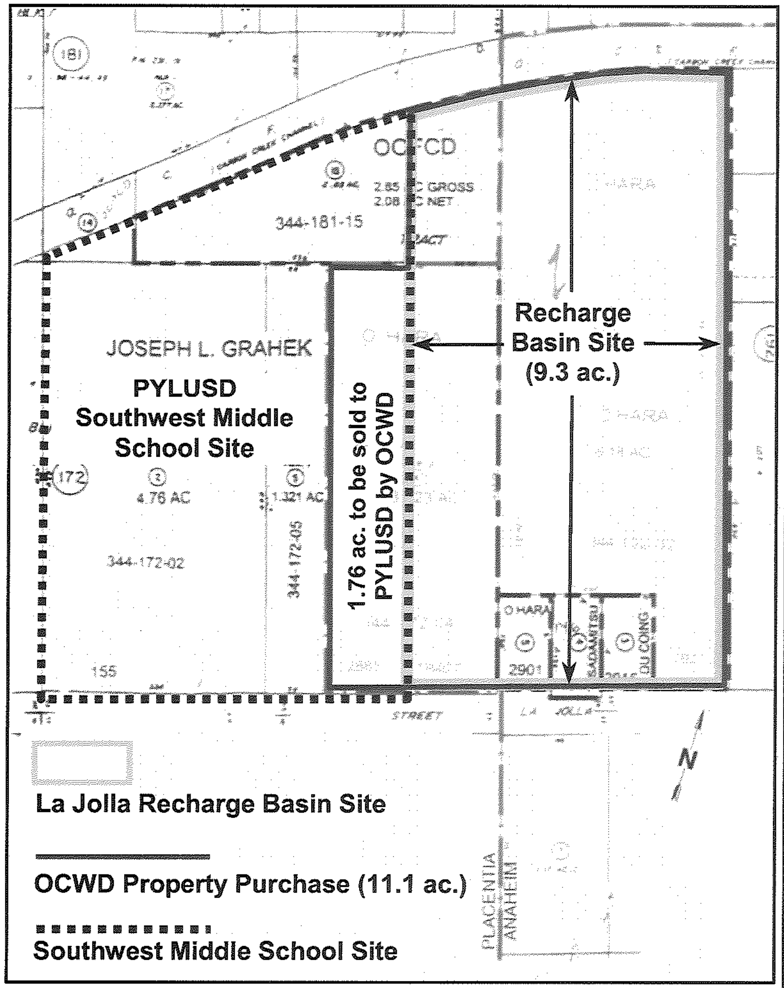
Source: LSA 2004

Figure 3-5
PYLUSD Middle School Project Conceptual Site Plan

The following describes each of the planned phases and activities associated with property acquisition, construction, and operation of the La Jolla Recharge Basin project.

3.4.1 PROPERTY ACQUISITION AND DISPOSITION

The District proposes to use all or portions of six contiguous parcels of land for the construction and operation of the La Jolla Recharge Basin. The six parcels of land straddle the corporate boundary between the cities of Anaheim and Placentia, California, with the majority of the property in Anaheim. In total, the project property will encompass about 9.3 acres. OCWD currently owns 10.2 acres on four parcels that were purchased from private landowners. OCWD also intends to purchase 0.64 acre from PYLUSD and 0.21 acre from a private party, for a total purchase of about 11.1 acres. OCWD is currently in negotiations to sell 1.76 acres of a 3.5-acre parcel to the PYLUSD, which has indicated it will use that land for a new middle school. If approved, the approximately 9.3 net acres remaining would be used by OCWD for the La Jolla Recharge Basin. Figure 3-6 shows the boundaries of the six parcels comprising the project site. Table 3-1 summarizes site acreages, land ownership, and existing uses.



Note: Figures do not depict the full extent of the Southwest Middle School site.

Figure 3-6 ***Proposed Property Acquisition and Disposition***

TABLE 3-1
PROPOSED SITE USE SUMMARY

APN	Street Address	Current (and Former) Uses	Current Owner	Parcel Acreage
344-181-15	No street address, Placentia	Vacant (former Ohara Farms)	County of Orange	0.64[1]
344-192-05	2901 W. La Jolla St., Anaheim	Vacant (former Midori Gardens and single-family residence)	OCWD	0.21
344-192-04	2911 W. La Jolla St., Anaheim	Vacant (former single-family residence)	OCWD	0.23[2]
344-192-03	2915 W. La Jolla St., Anaheim	interim residence, auto repair shop	B. Ducoing	0.21
344-192-02	2921 W. La Jolla St., Anaheim	Vacant (former Ohara Farms with single-family residence)	OCWD	6.26
344-172-04	2885 W. La Jolla St., Anaheim	Vacant (former Ohara Farms with single-family residence)	OCWD	1.76[3]
			Total	**9.3 acres**

[1] To be purchased from the County by PYLUSD and sold to OCWD. Remaining 1.33 acres of parcel to be used for PYLUSD's new middle school project.

[2] After La Jolla Street is widened along this parcel frontage, this parcel will be 0.21 acres.

[3] Remaining 1.76 acres of parcel to be sold to PYLUSD by OCWD.

3.4.2 BUILDING DEMOLITION

Five single-family residential units currently occupy about 1.2 acres of the site, while 16 greenhouses and various other structures, including outdoor equipment storage yards, occupy the remaining 8.1 acres of the project site. As concluded in Section 4.11 (Cultural Resources), no structure on the project site is historically significant by local, State, or federal standards. Each greenhouse is clad in corrugated fiberglass panels and consists of five, parallel half-cylindrical roofs covered in plastic. Numerous other small service buildings associated with the former commercial nursery operation are located on the property. Following property acquisition, all existing structures would be demolished and removed. The site also will be cleared and grubbed (i.e., vegetation removed) prior to basin excavation. This phase of construction is estimated to require 45 days to complete.

3.4.3 CONTAMINATED SOIL REMOVAL

The soil removed from the basin excavation would be transported off site for use elsewhere. As discussed in Section 4.3 (Hazards and Hazardous Materials), comprehensive environmental testing of the project site indicates the presence of low concentrations of organochlorine pesticides in surface soils, as well as low concentrations of certain heavy metals. Additionally, the removal of on-site storage facilities used in the past for pesticide, fuel, and waste oil storage could reveal isolated instances of soil contamination. As described in Section 4.3 (Hazards and Hazardous Materials), if contaminated soils are identified on the site OCWD will remove the contamination and dispose of the contaminated soils in accordance with applicable hazardous waste treatment, transportation, and disposal regulations prior to initiation of groundwater recharge. The removal and disposal of these hazardous materials will be conducted in accordance with regulations enforced by the Environmental Protection Agency and the Occupational Safety and Health Administration (OSHA). All contaminated soils will be disposed in the appropriate class landfill.

3.4.4 RECHARGE BASIN CONSTRUCTION

The 9.3-acre project site would be cleared and the approximately 5.7-acre recharge basin would be excavated to a depth of about nine feet below existing ground level. Excavation would require the removal and disposal of up to 92,000 cubic yards of soil. Completion of the basin site, including access roads, utility areas and staging areas, would require the additional grading of approximately 50,000 cubic yards of soil balanced on-site (i.e., not exported off-site). The sides of the open excavation would be sloped for stability, and the basin would have minimum freeboard of about 5.5 feet. The proposed basin will have a perimeter access road, 3:1 side slopes, a maximum depth of about nine feet, a basin access ramp, and an approximately 0.5-acre area where material removed from the basin during cleaning can be temporarily stored.

The basin would be filled with water supplied from local storm flow, the SAR, or imported from MWD. The recharge water would be conveyed via the Carbon Creek Channel, which is adjacent to the north side of the proposed basin (see Figure 3-7). The water would come from a turn-out on the existing pipeline that feeds Miller Basin. This pipeline originates at the pump station at Anaheim Lake. The turn-out on the pipeline would feed Carbon Creek Channel. An inflatable dam diversion structure would be placed within the Carbon Creek concrete channel to divert the water into an inlet structure at the northeast corner of the new recharge basin under gravity flow. Figure 3-8 shows the preliminary site plan for the proposed recharge basin.

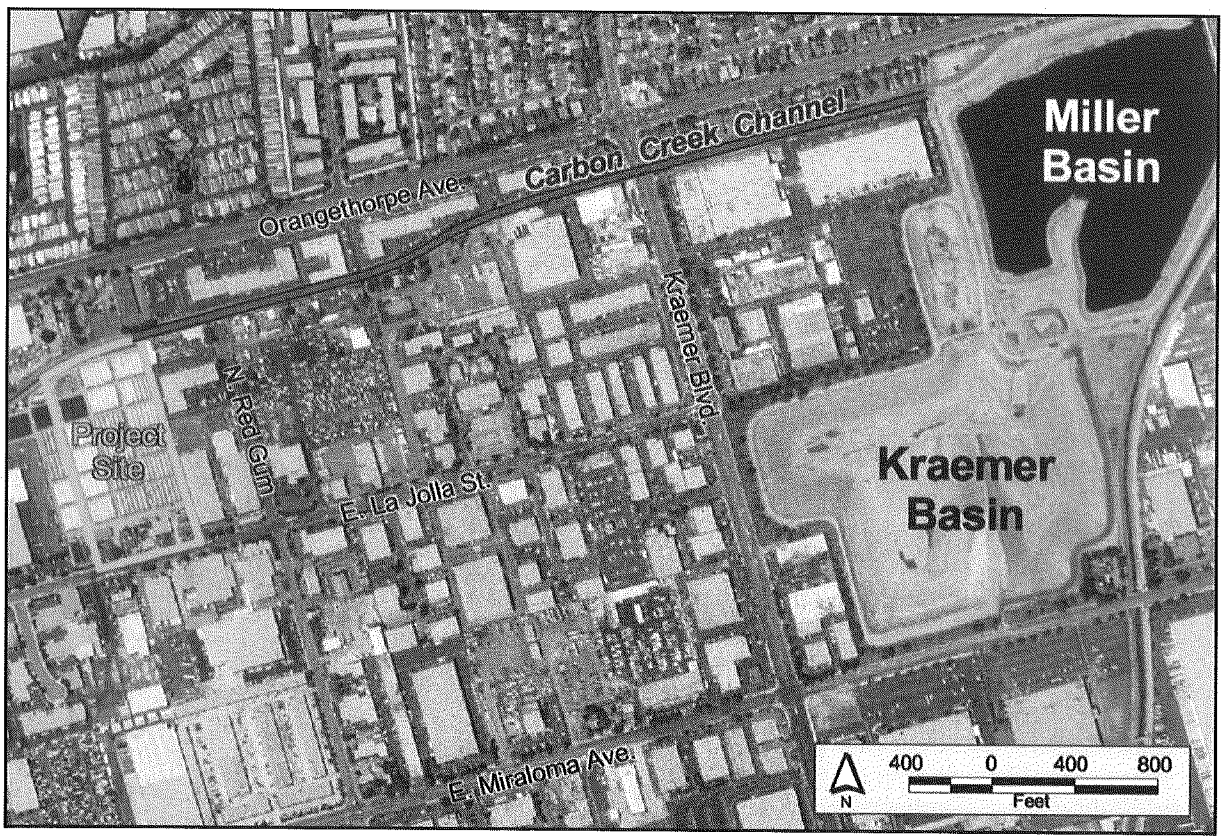
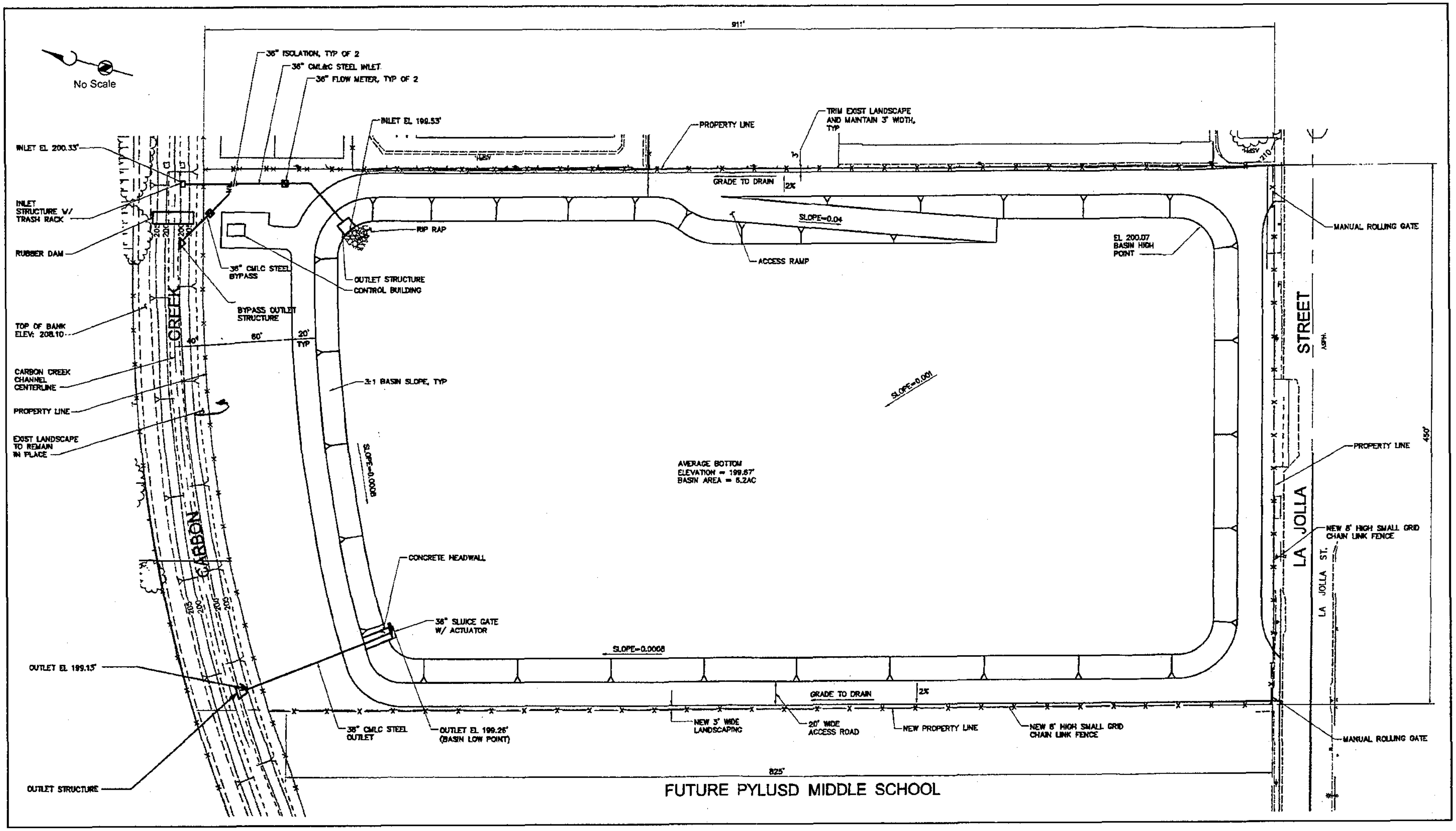


Figure 3-7 ***Source Water Conveyance Plan***



Source: CGvL 2003

Figure 3-8 *Preliminary Site Plan*

An inflatable rubber dam, approximately 35 feet wide and 4 feet high, would be constructed in the concrete channel of Carbon Creek to divert water into the new basin. Approximately 30 cubic yards of concrete would be poured in the creek to build the foundation for the rubber dam. Approximately 100 cubic yards of rip-rap would be installed on the creek banks for stabilization. During the rainy season, the rubber dam would be deflated so that Carbon Creek capacity is unimpeded for carrying storm flows. The basin will be filled and emptied using gravity flow via separate inlet/outlet structures. The inlet structures will consist of the following:

- 36-inch reinforced concrete pipe (RCP)
- inlet trash rack
- rubber dam and dam foundation
- 36-inch butterfly valve and actuator (one each for inlet and outlet)
- rip-rap reinforcement

The inlet facilities will supply sufficient volumes of water from Carbon Creek to maintain an average percolation rate of 20 cfs on a continuous basis. However, pipelines will be oversized to accommodate a greater possible capacity range and operational flexibility for OCWD staff.

As indicated, the wetted area of the basin will be approximately 5.7 acres. At an average water depth of three feet (maximum depth of 3.8 feet), the basin will retain approximately 25 acre-feet of water. One of the benefits of a shallow recharge basin is that it can be quickly drained, cleaned and brought back into service.

3.4.5 OTHER PROJECT FACILITIES AND DESIGN CONSIDERATIONS

The District is proposing the installation of irrigated perimeter landscaping, gated access, and about 3,000 linear feet of perimeter fencing. Electrical power will be required for a control building, service to the inflatable dam and inlet/outlet valves, and SCADA (supervisory control and data acquisition) facilities.

The District's design documents will govern the design of the proposed improvements, including the buildings, parking area, planting scheme, pavement and perimeter road, traffic/circulation, lighting, site furnishings, and screening. The final site plans will provide access control around the perimeter of the recharge basin, including installation of fencing between the recharge basin and the proposed Southwest Middle School site to the west. The District will coordinate with the City of Anaheim and the PYLUSD to ensure that an adequate barrier between the recharge basin and the proposed school is constructed, if and when a school is constructed.

3.4.6 RECHARGE BASIN OPERATIONS AND MAINTENANCE

The Engineer's Report assumes that the basin will be cleaned three times per year. In the examination of the benefits of the recharge basin project, it was conservatively assumed that the basin would be used, on average, only half the time, which equates to recharge of 4,500 acre-feet per year. However, those conservative estimates were intended primarily as input into the benefit-cost analysis of basin operations, recharge and maintenance, and not as parameters for environmental analysis. The basin would likely be full of water for much of the year and could achieve a recharge rate of up to 9,000 AFY if operational year-round. Accordingly, the EIR assumes full utilization and recharge of 9,000 AFY, and all potential environmental impacts are evaluated in Chapter 4.0 on a "most intense case" basis. No permanent office structures would be constructed as part of the project. District staff would monitor the site daily.

The basin would require periodic maintenance, which would involve the use of a loader and backhoe to remove accumulated silt that inhibits percolation. That silt and sediment removed from the basin, as well as debris removed from the trash rack during cleaning operations, will be temporarily deposited on the north side of the basin, south of the flood control channel, in a stockpile area approximately 60-feet wide and 320-feet long. A berm will be built along the channel to keep the silt out prior to its removal from the site. It is estimated that cleaning of the basin floor two to three times per year would remove an annual total of approximately 400 to 600 cubic yards of silt for offsite disposal each year by a private contractor.

In addition to basin cleaning, the District would also perform periodic channel cleaning, midge spraying, preventative maintenance, and landscape maintenance. Some heavy equipment might also be required to maintain the basin access road.

3.4.7 MONITORING OF EXISTING GROUNDWATER CONTAMINATION

AC Products, Inc. (AC Products) operates a maskant and adhesive facility at 172 E. La Jolla in Placentia, California. The AC Products property is located south of the project site, on the opposite side of La Jolla Street. The release of certain volatile organic compounds (VOCs) from the AC Products facility has impacted the underlying groundwater and the VOC contamination has moved approximately two miles downgradient (westward) in groundwater. The VOC contamination detected in groundwater beneath the AC Products facility includes tetrachloroethylene (PCE) as the principal compound, and lesser amounts of trichloroethene (TCE) and 1,1-dichloroethene (1,1-DCE). In September 1995, AC Products implemented a groundwater extraction program. However, recent data show residual PCE at concentrations as high as 93 micrograms per liter (μg/L) downgradient of the AC Products site (Rubicon 2005). The established maximum contaminant level (MCL) for PCE is 5 μg/L.

In 2005, OCWD retained Rubicon Engineering Corporation (Rubicon) to conduct groundwater flow and solute transport modeling to determine whether the proposed recharge basin would affect the long-term movement of AC Products' VOC contaminant plume. The Rubicon study found that the La Jolla Recharge Basin would have no adverse effect on either the VOC contaminant plume or AC Products' operations to remediate this pollution. The modeling further predicted that PCE concentrations in wells along the current axis of the plume between the AC Products facility and the Placentia Basin would decrease with time. Section 4.2 (Hydrogeology and Groundwater Quality) presents the results and conclusions of the Rubicon modeling study.

In addition to the Rubicon modeling, OCWD proposes the following two-part program that would confirm the model results relating to AC Products' VOC contamination plume concentration at several locations.

3.4.7.1 Supplemental Review of Monitoring Data

OCWD proposes to use the groundwater data reported to the Santa Ana Regional Water Quality Control Board (SARWQCB) by AC Products to track the flow and concentration of its VOC contaminant plume. Specifically, OCWD will acquire from the SARWQCB the reported data for 13 wells installed in the Shallow and Principal Aquifers along the current axis of the PCE plume (i.e., in the vicinity of AC Products and the Placentia Basin). The District will also monitor PCE concentrations in the area south of the axis of the plume through acquisition of reported data for another four of AC Products' existing monitoring wells. The monitoring program is summarized in Section 4.2 (Hydrogeology and Groundwater Quality). Details of the program, including the wells specified for inclusion in the program, are provided in the Contaminant Transport Modeling Report (Rubicon 2005) in Appendix 9.3 of this EIR.

3.4.7.2 Installation of New Monitoring Wells

OCWD proposes to install and operate three new groundwater monitoring wells to monitor changes in PCE concentration and transport in the groundwater contaminant plume caused by AC Products. The locations of the proposed wells were selected based on proximity to the projected contaminant plume under recharge conditions and assumed site accessibility. The wells will be installed prior to commencement of recharge at the project site in order to monitor changes in the model-predicted PCE plume concentrations.

Two of the wells (SMW-1 and PMW-3) would be constructed immediately adjacent to each other in the 2800 block of East Via Martens, just east of Melrose Street, in the City of Anaheim. The third well (SMW-2) would be installed in the 1000 block of South Melrose Street, approximately 350 feet south of La Jolla Street, in the City of Placentia. The locations of the proposed monitoring wells are shown in Figures 3-3 and 3-4. Site access restrictions and underground utility clearances will be evaluated prior to finalizing well locations.

Monitoring wells are designed and constructed with well screens placed at a specific depth and length to measure water quality at desired zones within an aquifer. Proposed Wells SMW-1 and SMW-2 would be Shallow Aquifer monitoring wells situated to complement the existing wells for monitoring any southerly component of contaminant plume transport downgradient of the AC Products property. The recommended perforated intervals are 95 to 125 feet below ground surface. Well PMW-3 would be screened in the Principal Aquifer adjacent to SMW-1, and would be perforated from 270 to 300 feet bgs. The recommended screened intervals may be changed by OCWD based on the observed stratigraphy encountered during well boring activities.

The monitoring wells will be drilled and installed prior to commencement of construction on the groundwater recharge basin. The wells will be installed sequentially via rotary or sonic drilling methods. Construction is expected to occur 8 to 10 hours per day, 5 days per week for approximately two weeks at each well site. Construction of the wells would temporarily require an area of up to 5,000 square feet.

3.5 PROJECT SCHEDULE

If approved, design plans for the proposed project are expected to be ready for District review about four months after project approval. Project construction would be complete within approximately eight months, based on the following phasing assumptions:

- Phase 1 – Demolition: approximately 1.5 months.
- Phase 2 – Recharge basin site grading and excavation: approximately 5 months.
- Phase 3 – Site construction, including the inflatable dam, inlet/outlet structures, electrical control facilities, asphalt paving, and fencing: approximately 1.5 months.

The three OCWD monitoring wells will be drilled and installed prior to commencement of construction on the groundwater recharge basin. The monitoring wells will be installed sequentially, with each well requiring approximately two weeks for construction.

3.6 STATEMENT OF PROJECT OBJECTIVES

A statement of objectives serves as a benchmark to measure the environmental impacts and other purposes of a proposed project and associated alternatives. These objectives will be used to evaluate the environmental impacts of the proposed La Jolla Recharge Basin project, as well as project alternatives that could minimize or avoid significant impacts while feasibly attaining those objectives.

The mission of OCWD is to provide local water retailers with a reliable quantity of high-quality groundwater, supplied at the lowest reasonable cost, in an environmentally responsible manner. The objective of the La Jolla Recharge Basin project is to increase the recharge capacity of OCWD's Forebay recharge facilities. The recharge system capacity is approximately 250,000 acre-feet per year, which is adequate to recharge the current river base flow, some river storm flows, and limited imported replenishment water. Because of the heavy demand put on the recharge system to maximize recharge at all times, minimum flexibility exists to meet critical or short-term needs for extra recharge.

The proposed project's additional recharge capacity is needed to meet the following District-wide objectives:

- Capture increasing SAR flows;
- Increase the recharge capacity of the Forebay recharge facilities in order to meet projected groundwater demand increases;
- Take advantage of short-term, high volume storm flows by having sufficient water conveyance, storage, and recharge facilities;
- Take advantage of imported water availability on short notice by having adequate storage and recharge facilities;
- Accept stored storm flows when the U.S. Army Corps of Engineers empties the Prado Water Conservation pool quickly during storm season;
- Capture springtime Prado Water Conservation releases, at 500 cfs flow rate, when other basins are clogged; and
- Maintain overall recharge capacity during maintenance and improvement projects at other locations.

Additionally, the following objectives were instrumental in the site selection process for the proposed La Jolla Recharge Basin project.

- Acquire land and construct the recharge basin in proximity to the SAR and existing water conveyance systems in the Forebay; and
- Acquire large parcels with minimal improvements to minimize land acquisition costs.

3.7 INTENDED USES OF THE EIR AND PROJECT APPROVALS

CEQA requires the preparation of an EIR when there is substantial evidence that a project may have a significant effect on the environment. The purpose of an EIR is to provide decision makers, public agencies, and the general public with an objective and informational document that fully discloses the potential environmental impacts of a proposed project or program. Table 3-2 summarizes the project approvals and permitting responsibilities.

TABLE 3-2
PROJECT PERMITS AND APPROVALS

Agency	Permit or Approval	Permitted Use or Activity
Orange County Water District	Project approval, including approval of design and construction contracts	▪ Design and construction of the La Jolla Recharge Basin ▪ Actions related to real and personal property acquisition, disposal, leases, management and other approvals
City of Anaheim Public Works Department	Encroachment Permit, Truck Haul Permit	▪ Work within the public right-of-way along La Jolla Street ▪ Construction truck routing on City streets
County of Orange Resources & Development Management Department, Public Works/Flood Control Div.	Encroachment Permit	▪ Construction of inflatable rubber dam and appurtenances to divert water from Carbon Creek ▪ Discharge water back to the creek from the recharge basin ▪ Use of the property on the northerly edge of the site.
US Army Corps of Engineers	Section 404 Permit	▪ Construction of inflatable rubber dam in Corps jurisdiction in Carbon Creek Channel
California Department of Fish and Game	Section 1602 Streambed Alteration Agreement	▪ Construction of inflatable rubber dam in CDFG jurisdiction in Carbon Creek Channel
Regional Water Quality Control Board	Section 401 Water Quality Certification	▪ Water quality certification for fill operations related to construction of inflatable rubber dam in Carbon Creek Channel

Pursuant to Section 53091 of the California Government Code, facilities for the production, generation, storage, treatment and transmission of water are exempt from local zoning and building ordinances. The District is not required to submit grading or landscape plans, or obtain building or demolition permits, since the District is exempt from building ordinances. However, as noted above, an encroachment permit from the City of Anaheim will be required for work in La Jolla Street, as will a Truck Haul Permit to comply with local regulations applicable to the District's project. Further, as a matter of inter-agency cooperation, the District intends to forward the design plans for the project to the City of Anaheim, the County of Orange, and the Orange County Transportation Authority for advisory review and comments by those agencies. The City of Placentia and PYLUSD will receive a copy of the Draft EIR for review and comment.

Chapter 4.0
Environmental Analysis

METHODOLOGY

The following sections describe the format used throughout the environmental analysis sections in Chapter 4.0 of this EIR.

EXISTING SETTING

This introductory section describes the existing environmental conditions related to each issue analyzed in the EIR. In accordance with Section 15125 of the State CEQA Guidelines, both the local and regional settings are discussed as they exist prior to implementation of the proposed project. The existing environmental setting is the basis for documenting the nature and extent of impacts anticipated to result from project implementation.

IMPACT SIGNIFICANCE CRITERIA

Section 15126 of the State CEQA Guidelines requires that an EIR *"identify and focus on the significant environmental effects"* of a proposed project. "Effects" and "impacts" have the same meaning under CEQA and are used interchangeably within this EIR. A "significant effect" or "significant impact" on the environment means *"a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project"* (Guidelines §15382).

Impact significance criteria, or thresholds of significance, are used to determine whether the proposed project may have a significant environmental effect. Thresholds are an analytical tool for judging significance, and may vary with different project characteristics and environmental settings. State CEQA Guidelines Section 15064.7 encourages each public agency to *"develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects."* However, in the absence of published and adopted thresholds by OCWD, this EIR relies on direction provided in *Thresholds of Significance* (OPR, 1994). That document states that thresholds are quantitative or qualitative, and *"may be based on standards such as the following:*

- *A health-based standard such as air pollutant emission standards, water pollutant discharge standards, or noise levels.*
- *Service capacity standards such as traffic level of service, water supply capacity, or waste treatment plant capacity.*
- *Ecological tolerance standards such as physical carrying capacity, impacts on declared threatened or endangered species, loss of prime farmland, or wetland encroachment.*
- *Cultural resource standards such as impacts on historic structures or archaeological resources.*
- *Other standards relating to environmental quality issues, such as those listed in the Guidelines' Initial Study Checklist or Appendix G of the Guidelines."*

In determining whether an impact is "significant" within CEQA's definition, this EIR relies on adopted General Plan policies, environmental quality standards of the CEQA Guidelines (Appendix G), and relevant standards of regulatory agencies (e.g., SCAQMD). An effort has been made to avoid overly subjective significance criteria that are not based on specific CEQA policies and/or generally accepted thresholds upon which significance can be determined.

IMPACTS FOUND NOT TO BE SIGNIFICANT

Section 15128 of the CEQA Guidelines requires that *"an EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR."* Given the history of the project site and the environmental issues known to exist, the District decided to prepare this EIR in order to provide full disclosure of the potential environmental effects of the project as defined to date.

The District issued a Notice of Preparation of a Draft EIR in May 2004 without conducting an Initial Environmental Study, as permitted by Section 15060(d) of the CEQA Guidelines. Therefore, the *Impacts Found Not to be Significant* discussions in Chapter 4.0 will reference the itemized Environmental Checklist Form in Appendix G of the Guidelines in order to indicate briefly the reasons for determining that other effects would not be significant or potentially significant.

This section also describes those elements of the proposed project that would enhance or otherwise beneficially modify the environmental resources or issues being discussed. In many instances, a project-initiated design component, or Project Design Feature (PDF), may avoid or reduce potentially adverse effects, yet without imposition of mitigation or other regulations. PDFs will be referenced throughout Chapter 4.0 and any mitigating effects on potentially significant environmental impacts will be noted.

In addition, the District implements regulatory compliance programs (e.g., NPDES permit, SCAQMD Rules and Regulations); regulatory and/or responsible agency permit conditions (e.g., 401/404 permits, 1602 Streambed Alteration Agreements); State and local building and structural codes (e.g., building and seismic codes); and other applicable federal, State and local programs that avoid or substantially reduce the potential environmental effects of District projects. This EIR collectively refers to those permit requirements and regulatory compliance measures as "Standard Conditions." For analytical purposes, compliance with Standard Conditions is not considered mitigation. Where an otherwise significant impact is avoided, in whole or in part, due to the application of Standard Conditions, the text will note that an issue of environmental concern exists; that the issue is addressed; and, if applicable, that the impact does not exceed environmental significance thresholds. This approach avoids creating mitigation measures that are mere repetitions of common District procedures or other regulatory requirements. Rather, it appropriately requires the use of project-specific mitigation measures to reduce potentially significant impacts to below a level of significance.

Where Standard Conditions and PDFs are described in detail in the environmental analysis, they will be listed and numbered according to the chapter in which they are cited. For instance, NPDES permit conditions for surface water quality would be cited in Section 4.1 of this EIR as SC 4.1-1, SC 4.1-2, etc. The Standard Conditions and PDFs that are listed for implementation will also be subject to monitoring and reporting during project construction and/or operation in OCWD's mitigation monitoring program (MMP) format. The MMP document is primarily used to enforce mitigation measures and addresses implementation responsibilities, timing, and monitoring and reporting activities.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Where the analysis in this section demonstrates that a potential effect does or might (without undue speculation) occur and is found to have a substantial or potentially substantial and adverse impact on physical conditions within the area affected by the project, that conclusion is noted and mitigation measures are provided that will reduce them to less than significant levels.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Since no unavoidable significant adverse impacts (i.e., those effects that either cannot be mitigated or they remain significant even after mitigation) will result from the proposed La Jolla Recharge Basin project, this section will simply affirm that finding for each analyzed topic.

CUMULATIVE IMPACTS

Section 15130(a) of the State CEQA Guidelines requires that an EIR discuss *"cumulative impacts of a project when the project's incremental effect is cumulatively considerable. Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.*

Section 15065(c) of the CEQA Guidelines defines "cumulatively considerable" as meaning that *"the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."* Guidance regarding the scope of the cumulative impacts discussion is provided in Section 15130(b)(1), which indicates that an adequate discussion of significant cumulative impacts must be predicated on either 1) a list of past, present, and reasonably anticipated probable future projects producing related or cumulative impacts, or 2) a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which is designed to evaluate regional or areawide conditions contributing to the cumulative impact.

However, the proposed recharge basin project is not expected to generate regional or areawide impacts on any environmental issue. For instance, the proposed project is not a trip-generating use and does not have the potential to create cumulative traffic, air quality, or noise impacts during either the construction or the operational phase, nor would the project incrementally add to a demand for public services or utilities that would result in environmental impacts. Given that the project impacts are primarily site-specific, OCWD identified the adjacent PYLUSD school project as having the potential to create impacts that may be individually insignificant, but cumulatively considerable. Similarly, OCWD views the ongoing VOC contamination plume remediation efforts by AC Products as a local project, but with the potential to produce cumulative environmental effects. Where applicable throughout Chapter 4.0, the analysis of the proposed recharge basin includes the potential incremental effects of those other nearby projects.

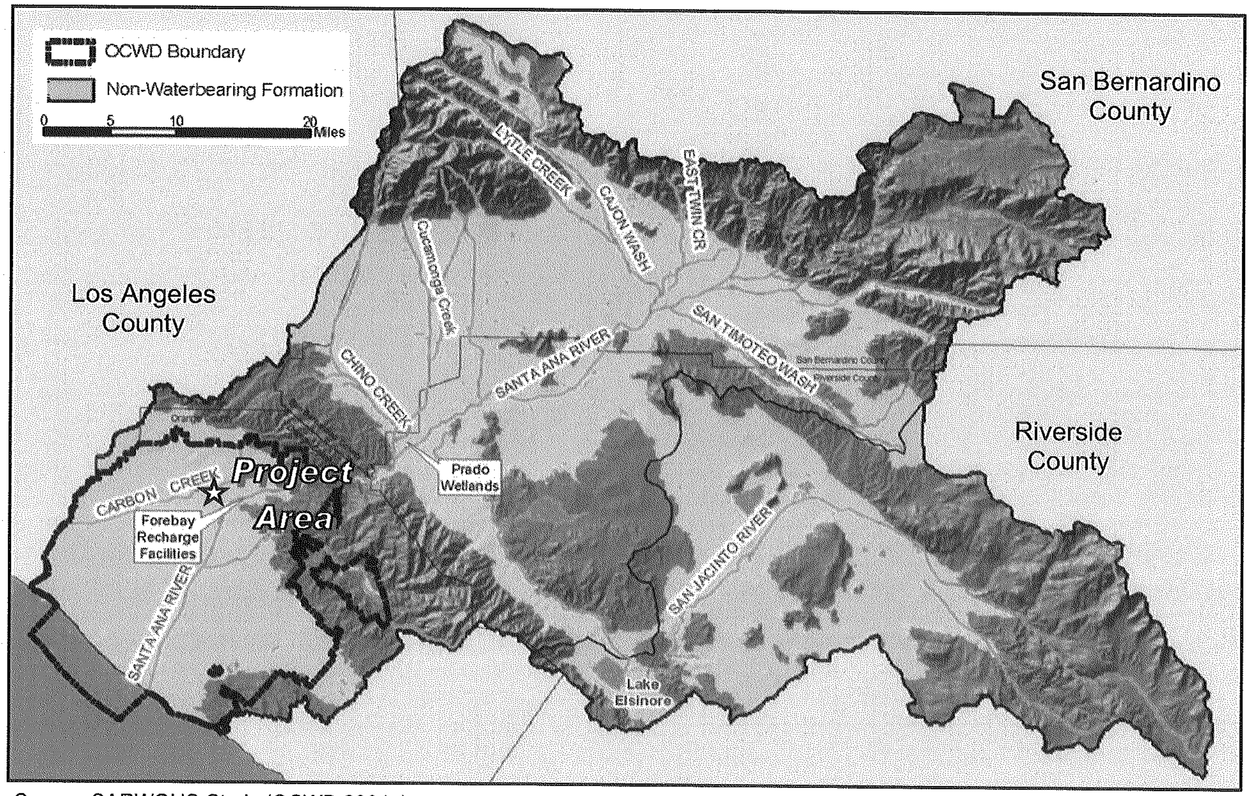
4.1 HYDROLOGY AND WATER QUALITY

4.1.1 EXISTING SETTING

4.1.1.1 Regional and Local Hydrology

Santa Ana River

The project site is in the Santa Ana River (SAR) watershed, which is the largest watershed in coastal Southern California, encompassing parts of Riverside, San Bernardino, and Orange Counties. The watershed, shown in Figure 4.1-1, has a drainage area of approximately 2,800 square miles and a population of more than 4.5 million. The SAR channel is the most prominent hydrologic feature on the eastern part of the Coastal Plain aquifer system of Los Angeles and Orange Counties. The river flows west out of the Santa Ana Canyon, which is located a few miles east of the site, rounds the base of the Peralta Hills, and then flows more or less southwest to the Pacific Ocean between the cities of Newport Beach and Huntington Beach.



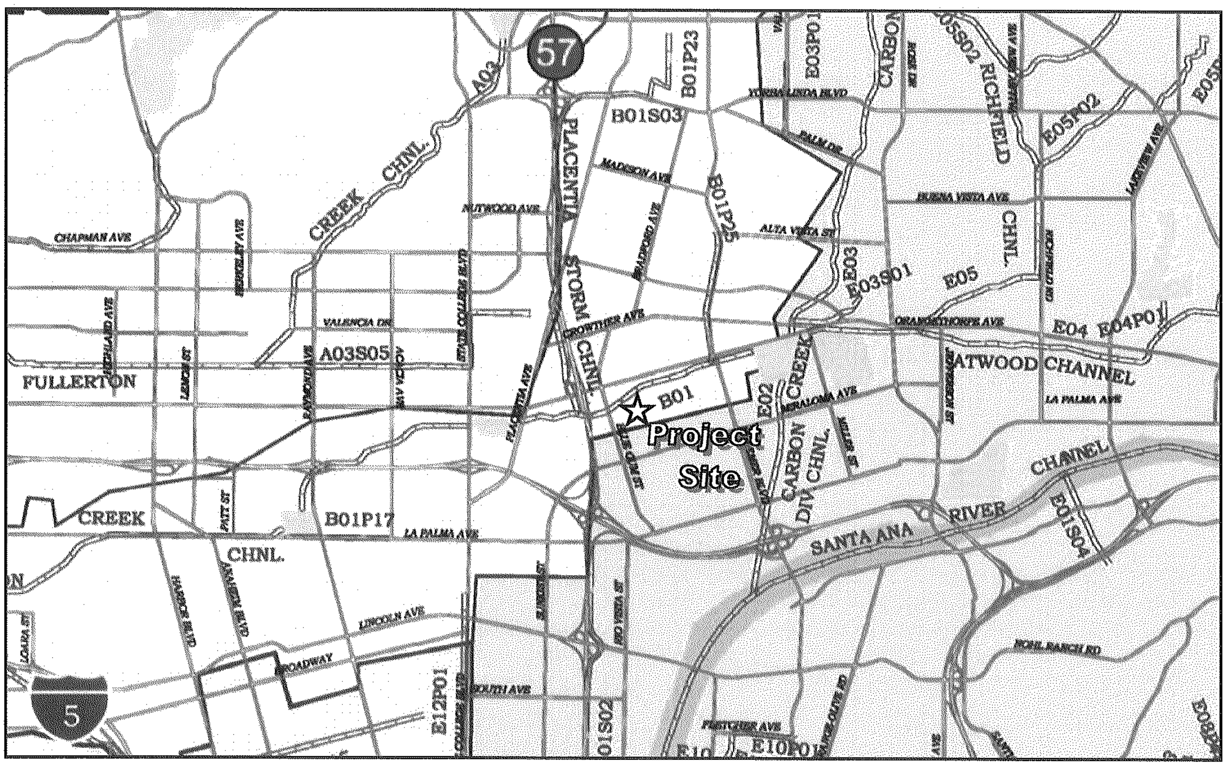
Source: SARWQHS Study (OCWD 2004a)

Figure 4.1-1 ***Santa Ana River Watershed***

The SAR is the principal source of water for replenishing the Orange County Groundwater Basin. Approximately 200,000 acre-feet per year (AFY) of SAR water are recharged on an average basis, representing more than half of the total recharge. During the summer months, much of the SAR base flow is tertiary treated wastewater from upstream treatment facilities in San Bernardino and Riverside Counties. The treated wastewater discharges, which currently total approximately 161 million gallons per day (mgd), or 180,000 AFY, comprise more than 90 percent of the base flow of the SAR. The upstream discharges will continue to increase as the population grows in the upper watershed.

Local Drainage Facilities

Carbon Creek Channel is designated as Facility B01 (see Figure 4.1-2) by the Orange County Resources & Development Management Department (RDMD), Public Works/Flood Control Division, formerly known as the Orange County Flood Control District (OCFCD). The channel forms the northern boundary of the proposed project site. Carbon Creek is a small channel, approximately 30 feet wide at the top and approximately 8 to 9 feet deep. The sides of the channel are concrete-lined, but sediments, including gravels and cobbles, are present at the bottom of the channel. Although the project site is in the Santa Ana River watershed, Carbon Creek Channel flows from east to west through Placentia and Anaheim, eventually discharging into a lower reach of Coyote Creek, which is tributary to the San Gabriel River in Los Angeles County.



Source: County of Orange

Figure 4.1-2 ***Carbon Creek Channel Drainage Facility***

The proposed recharge basin site is situated on level topography, with elevations ranging from 210 feet above mean sea level (MSL) at the southeast corner of the site, to about 206 feet above MSL at the northwest corner, at the Carbon Creek Channel. The channel bottom is approximately 5 to 8 feet below the site surface. Therefore, surface runoff is generally toward the northwest, unless redirected by on-site drainage swales or other features. The site does not have extensive asphalt coverage or other impervious surfaces. Compared to most surrounding development, the site is relatively pervious given the area of exposed soil. As a result of these factors, surface runoff generated from the site is considered low to moderate in both magnitude and intensity. Past site uses and surface flows did not necessitate substantial improvements to off-site drainage systems.

4.1.1.2 Water Quality Regulatory Framework

Federal Regulations and Programs

The Federal Clean Water Act's (CWA) purpose is to protect and improve water quality in waters of the United States (e.g., rivers, streams, ponds, lakes, and ditches). The CWA has established requirements for stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. The CWA prohibits the discharge of any pollutant to navigable waters from a point source unless an NPDES permit authorizes the discharge. An NPDES permit is required prior to municipal, construction-related, and industrial stormwater discharges.

State Regulations and Programs

NPDES Oversight

Division 7 of the California Water Code is known as the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) of 1969. It authorizes the State Water Resources Control Board (SWRCB) to adopt policies for water quality control, and it designates nine Regional Water Quality Control Boards (RWQCBs) to implement provisions of the Federal CWA, including compliance with NPDES permits. The Santa Ana Regional Water Quality Control Board (SARWQCB), Region 8, manages water quality on a day-to-day basis at the regional and local level, and is responsible for water quality permitting in the project area.

Clean Water Act Section 303(d) Listing

Section 303(d) of the federal CWA requires states to develop a list of "impaired" water bodies that may require additional protection (beyond traditional short-term and long-term controls) to ensure established water quality standards are achieved and maintained. This list also identifies the pollutants for which the water bodies/reaches are impaired. For these impaired water bodies, the state is required to develop appropriate total maximum daily loads (TMDLs). TMDLs are the sum of the individual pollutant load allocations for point sources, nonpoint sources, and natural background conditions (with an appropriate margin of safety) for a designated water body.

The project would receive some of its recharge water from Reach 2 of the SAR, which extends 20 miles from Prado Basin to the City of Santa Ana. The water would be conveyed via the Carbon Creek Channel. Neither Reach 2 of the SAR, nor the Carbon Creek Channel, are water quality limited or otherwise described as being "impaired" on the State's 303(d) list[1]. Specific data about the quality of the SAR water used by OCWD for its recharge operations are provided in Section 4.2 (Hydrogeology and Groundwater Quality).

Regional and Local Regulations and Programs

County of Orange NPDES Compliance

The County of Orange is a co-permittee under the National Pollutant Discharge Elimination System program. A co-permittee is a permittee to an NPDES permit (i.e., Areawide Municipal or General Construction Storm Water Permit) that is responsible for permit conditions relating to the discharge for which it is operator. Co-permittees are the County of Orange and its incorporated cities.

[1] Santa Ana Regional Water Quality Control Board, 2002 CWA Section 303(d) List of Water Quality Limited Segments. Approved by USEPA: July 2003

Construction Activities

Construction activities must be permitted under the statewide NPDES General Permit for Stormwater Discharges Associated with Construction Activity (General Construction Permit, Order No. 99-08-DWQ; Permit No. CAS000002). Under this permit, construction activities resulting in a disturbance of a minimum of one acre are required to file a Notice of Intent (NOI) to obtain a General Construction Permit. Construction activity is defined as clearing, grading, stockpiling and excavating, and generally does not include routine maintenance.

To reduce potential impacts to water quality and to comply with the requirements of the NPDES General Construction Permit, a Stormwater Pollution Prevention Plan (SWPPP) is required during construction activities. The SWPPP outlines Best Management Practices (BMPs) that control and manage stormwater runoff from the construction site. BMPs are defined as schedules of activity, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution of waters of the United States. BMPs must be implemented prior to initiation of construction activities and throughout the duration of construction. Structural BMP controls include first flush diversion, detention/retention basins, infiltration trenches/basins, porous pavement, oil/grease separators, grass swales, swirl concentrators, and engineering and design modification of existing structures. Non-structural BMPs include regulatory approaches, street sweeping and facility maintenance, and detection and elimination of illegal dumping.

Municipal Stormwater Discharge

NPDES Permit No. CAS618030 (Order No. R8-2002-0010) regulates municipal stormwater discharge for co-permittees in the Santa Ana Region of the County of Orange. It broadly regulates discharges of urban storm water from the lower Santa Ana watershed to waters of the U.S., which ultimately drain into the Pacific Ocean. This local NPDES Permit relies on the guidelines outlined in the statewide NPDES General Construction Permit for construction activities conducted in areas under the jurisdiction of the SARWQCB.

Orange County Drainage Area Management Plan

The *2003 Orange County Drainage Area Management Plan* (DAMP) is a document required under the municipal NPDES stormwater permit granted to the co-permittees by the SARWQCB. The DAMP contains required and recommended BMPs aimed at alleviating pollutant levels in stormwater runoff. Orange County's municipal NPDES permits require that all new developments and existing facilities with significant redevelopment must develop a Water Quality Management Plan (WQMP) incorporating structural and non-structural BMPs for long-term, post-construction stormwater management. The requirement for stormwater quality management applies equally to private and public projects. Depending upon the size and characteristics, projects are termed “Priority Projects” or “Non-Priority Projects” and generally are required to implement Site Design BMPs (integrate stormwater controls throughout the urban landscape), applicable Source Control BMPs (routine non-structural BMPs, routine structural BMPs and BMPs for individual categories/project features), and/or project-based Treatment Control BMPs (treating low-flow storm events or first-flush events).

Departments carrying out public agency projects that are not required to obtain permits are responsible for ensuring that Model WQMP (County of Orange 2003b) requirements are incorporated into the project design and shown on the project plans prior to bidding for construction contracts or similar contracts. Project WQMP requirements must be incorporated into the design of public agency projects and shown on the project plans before allowing the project to commence.

As further specified in the DAMP, all public works construction contracts administered by the Permittees are governed by "*Standard Specifications for Public Works Construction*" (subsequently referred to as the Green Book). The Green Book offers specific construction practices, which are included within DAMP Appendix H as Best Management Practices for public works construction. In general, the Green Book requires that contractors keep informed of, and at all times observe and comply with, state and federal laws and county and municipal ordinances and regulations.

Water Quality Control Plan for the Santa Ana Region

The SARWQCB has prepared a Water Quality Control Plan for the Santa Ana Region (i.e., Basin Plan). The most recent Basin Plan was adopted in 1995. As required by the CWA, the Basin Plan is currently undergoing review and, as appropriate, modification and adoption of applicable water quality standards as part of its triennial review process. Site-specific effluent and receiving water limits are specified in permits that comply with water quality standards identified in the Basin Plan.

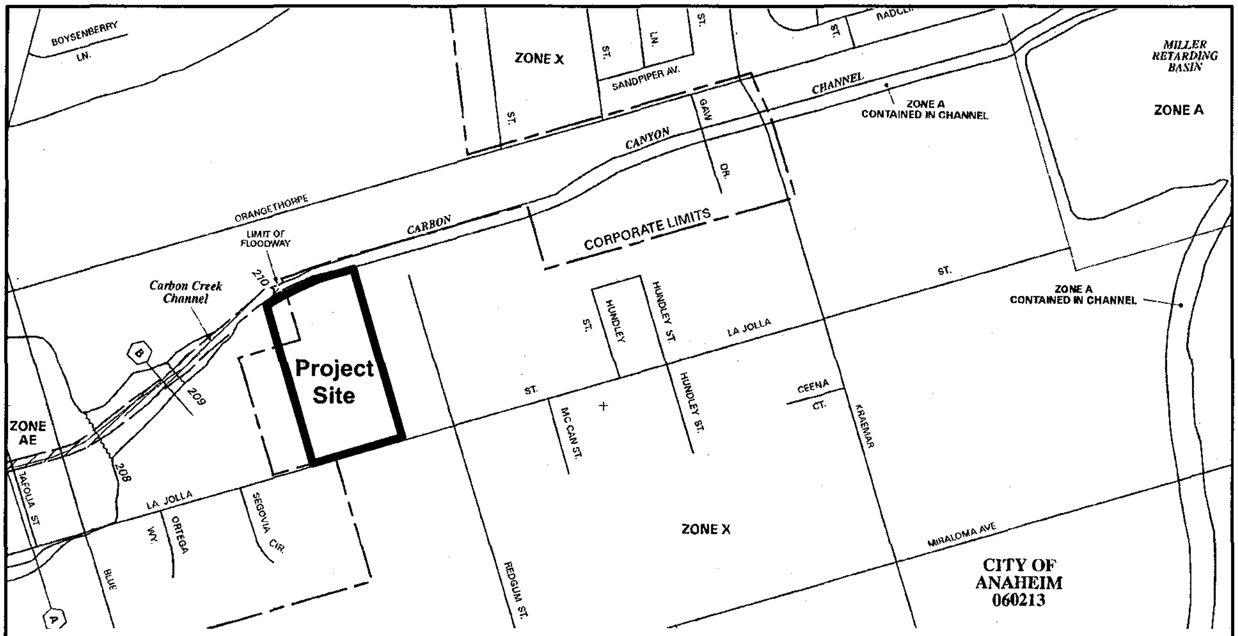
The SAR is proposed as recharge water source for the La Jolla Recharge Basin. Many reaches of the SAR serve as recharge areas for groundwater aquifers. The Basin Plan establishes water quality objectives for identified beneficial uses of surface water and groundwater. Groundwater beneficial uses in the Lower Santa Ana River Basin include municipal, domestic, agricultural, and industrial water supplies. In-stream beneficial uses along Reach 2 of the SAR include groundwater recharge, contact/non-contact water recreation[2], agricultural water supply, and provision of wildlife habitat. The RWQCB is charged with protecting these beneficial uses from pollution and nuisance.

The SAR and the Prado Flood Control Basin are the "receiving waters" of urban, industrial, and agricultural runoff. Prado Basin's uses include flood control and provision of habitat for endangered and threatened wildlife and plant species. Water quality indicators for the receiving waters of the SAR include those related to bacteria, biological oxygen demand and dissolved oxygen (BOD/DO), nitrogen, salinity, sediment, and turbidity. The focus for water pollution reduction efforts is aimed at sources such as dairy farms and animal manure, agriculture, channelization, and urban runoff. Other issues resulting from the discharge of treated sewage at treatment plants upstream of the Prado Basin are discussed separately in Section 4.1.1.5 (Recharge Basin Source Water Quality).

4.1.1.3 Flood Hazards

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) applicable to the site is Community Panel Number 06059C0151H (revised February 18, 2004). The FIRM panel indicates that the majority of the site is in Zone X, which is the designation given to areas of 100-year flood with average depths of less than one foot or with drainage areas less than one square mile (see Figure 4.1-3). Only the Carbon Creek Channel itself is designated Zone A, which is a special flood hazard area (SFHA) subject to inundation by the 100-year flood. Immediately upstream and downstream of the project site, the 100-year floodplain is contained completely within the Carbon Creek Channel and does not encroach upon the project site.

[2] The Basin Plan (p. 3-2) states that the REC1 (water contact recreation) and REC2 (non-contact water recreation) beneficial use designations assigned to surface waterbodies in this Region should not be construed as encouraging recreational activities. In the case of Reach 2 of the Santa Ana River, access to the waterbodies is prohibited because of potentially hazardous conditions and/or because of the need to protect other uses, such as municipal supply or sensitive wildlife habitat. Where REC1 or REC2 is indicated as a beneficial use in the Basin Plan, the designations are intended to indicate that the water quality of the waterbody could support recreational uses.



SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

Source: FEMA FIRM Panel 06059C0151H

Figure 4.1-3
FEMA Flood Zones

4.1.1.4 Existing Surface Water Quality

Onsite Pollutant Sources

Environmental site surveying and testing has been performed and limited soil contamination has been identified on-site (refer to Section 4.3 – Hazards and Hazardous Materials). Due to the project site's past uses, small quantities of pollutants commonly associated with automobile and heavy machinery traffic (i.e., hydrocarbons, heavy metals, etc.) and residual commercial pesticides and fertilizers are present on the site. Historic storage methods and spillage of small quantities of hazardous wastes likely contribute pollutants to surface waters during storm events. Silt and organic debris can also be conveyed in stormwater from exposed soils in the former nursery areas as well.

Offsite Pollutant Sources

No specific offsite pollutants have been identified in nearby surface waters. As indicated previously, neither Reach 2 of the SAR nor the Carbon Creek Channel adjacent to the project site are on the State's 303(d) list of water quality impaired water bodies. However, the VOC contamination plume that was caused by AC Products is present in the local aquifer. The current movement and contaminant levels of the AC Products VOC contamination plume are discussed in Section 4.2 (Hydrogeology and Groundwater Quality).

4.1.1.5 Recharge Basin Source Water Quality

A comment on the Notice of Preparation (NOP) for this EIR was submitted by AC Products, an adjacent property owner currently involved in remediating its prior discharge of pollutants to the Orange County Groundwater Basin. The comment questions the quality of the source water that will be used at the proposed La Jolla Recharge Basin. The comment specifically states that because recharge water will include water from the SAR and the Metropolitan Water District (MWD), "*the project will result in water consisting in part of discharges from sewage treatment plants (which contain numerous hazardous substances, such as pharmaceuticals, endocrine disrupters and other chemicals of concern, such as NDMA) and water from the Colorado River (which also contains hazardous substances, including perchlorate)*." The comment further asserts that "*imported water from both these water sources is likely to be contaminated,*" and that the EIR must "*...identify the significant effects that these various chemicals in the water from the Santa Ana River and MWD may have upon the quality and purity of the water imported to the recharge basin and allowed to enter drinking water supplies.*"

Since the proposed La Jolla Recharge Basin would replenish groundwater resources, the issue of groundwater quality is addressed in Section 4.2 (Hydrogeology and Groundwater Quality) rather than in this section. The groundwater quality discussions in that section address how OCWD extensively monitors the quality of the waters recharged into the Orange County Groundwater Basin, including source water from the SAR and imported water from MWD. The data and analyses show that the SAR and MWD recharge water sources meet all federal and state water quality standards, and that no significant adverse environmental or public health impacts would result from the use of those recharge sources.

4.1.2 IMPACT SIGNIFICANCE CRITERIA

The California Environmental Quality Act (CEQA) Appendix G (i.e., Environmental Checklist) outlines the significance criteria against which the project is measured for hydrology and water quality impacts. These criteria can be grouped into three categories: watershed and surface drainage, flooding hazards, and surface water quality. The proposed project would result in significant adverse environmental impacts if any of the following occur:

<u>Surface Drainage</u>

- *The project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site; or*
- *The project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.*

<u>Flood Hazards</u>

- *The project would place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map or place within a 100-year flood hazard area structures that would impede or redirect flood flows;*

- *The project would expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or*
- *The project would be subject to inundation by seiche, tsunami, or mudflow.*

Surface Water Quality

- *The project would create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or*
- *The project would violate any water quality standards or water discharge requirements, or otherwise substantially degrade water quality.*

4.1.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.1.3.1 Surface Drainage

- *The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.*
- *The project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems.*

Stormwater Runoff Quantities

The proposed project would involve clearing, grading, and excavation on most of the site during construction, which would alter the existing drainage pattern of the site. During construction, the removal of vegetation would only temporarily increase the potential for surface runoff generation. Although exposed soils would generate more runoff than vegetated areas, this temporary increase would not be large enough to require new or expanded drainage facilities to be constructed.

After completion, the proposed project would remove existing impervious surfaces and structures at the site and, therefore, would generate less runoff from the site. No additional runoff would be discharged into either the Carbon Creek Channel or the drainage facilities in La Jolla Street. Upon basin excavation, most onsite storm flows would be contained within the recharge basin itself and would dissipate through natural percolation. In addition to permanently decreased runoff volumes, the project would decrease pollutant loading over existing conditions, resulting in long-term beneficial changes in the quantity and quality of storm water runoff.

Drainage Channel Modifications

OCWD proposes to supply the La Jolla Recharge Basin with water from the SAR, which includes storm flow, and MWD. The water will come from a turnout at the Miller Retarding Basin (Facility E02B01) and will be conveyed to the project site via the Carbon Creek Channel. At the project site's northern boundary, OCWD would place a diversion structure in the channelized segment of Carbon Creek Channel. An inflatable rubber dam, approximately four-feet high (inflated) and 35-feet wide, will be constructed in the channel to divert water into the new recharge basin through a culvert-type inlet structure at the northeast corner of the site. The basin will be filled and emptied using gravity flow via separate inlet/outlet structures, with the outlet structure located at the northwest corner of the site. Figure 4.1-4 illustrates the channel and proposed basin cross-sections. The inlet structures will consist of the following:

- 36-inch reinforced concrete pipe (RCP)
- trash rack
- rubber dam and dam foundation
- 36-inch butterfly valve and actuator (one each for inlet and outlet)
- rip-rap reinforcement

Throughout much of each year, water flow in the channel is generally low volume, low velocity urban runoff. During the rainy season when stormwater management is a primary function of the channel, the diversion dam would be deflated to allow storm flow conveyance through the channel. Therefore, the diversion structure would not impede storm flow or alter the drainage course of the channel. No natural streams or rivers would be altered for the proposed project, and no significant drainage impacts would result.

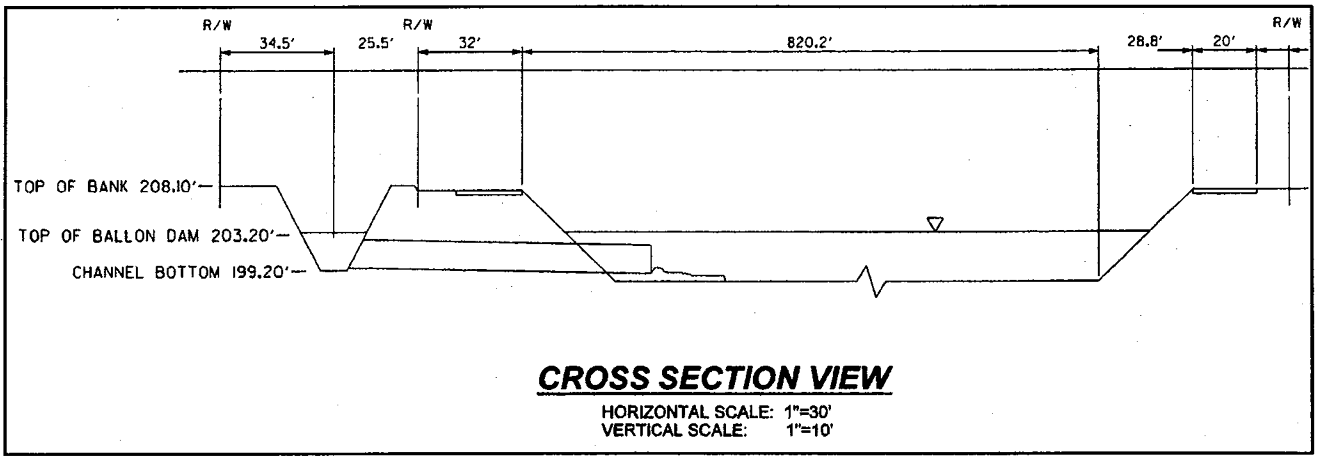


Figure 4.1-4 ***Cross Section of Carbon Creek Channel and Proposed Basin***

The State and federal permits that are required for construction and operation of the diversion dam in the Carbon Creek Channel include a Section 404 Permit from the U.S. Army Corps of Engineers (ACOE or Corps); a Streambed Alteration Agreement from the CDFG; and a Section 401 Water Quality Certification from the RWQCB. The proposed work within Orange County RDMD Public Works/Flood Control Division rights-of-way will also require an encroachment permit from the County's Public Property Permits Section. Table 3-2 shows the permit authorizations required from each of those agencies. Section 4.1.3.3 describes the water quality control measures required by the ACOE as terms and conditions of nationwide permits NW33 and NW43.

4.1.3.2 Flood Hazards

- *The project would not place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, or place within a 100-year flood hazard area structures which would impede or redirect flood flows.*

The proposed project is not located within a 100-year flood zone, nor does it include housing or structures that would impede or redirect flows in the adjacent Carbon Canyon Creek channel. No flooding or related impacts would occur.

- *The project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.*
- *The project would not be subject to inundation by seiche, tsunami, or mudflow.*

A seiche is a standing wave in an enclosed or partly enclosed body of water. Seiches are normally caused by earthquake activity, and can affect various bodies of water, including ponds, lakes, and rivers. A major seismic event has the potential result in dam failure or seiche conditions at these facilities. A seiche can occur as a result of ground vibrations initiating water wave motion. If wave amplitude is high enough, the water may slosh over the shore or barrier containing the water body and flow onto surrounding properties. In this instance, surrounding properties include businesses and a proposed school site.

However, given the proposed recharge basin design parameters, there is no potential for seiche occurrence. The basin would be excavated to a depth of approximately 9 feet below ground surface with 3:1 side slopes. The basin would have an average water depth of three feet (maximum depth of 3.8 feet) and a minimum of 5.5 feet of freeboard. The basin would thus have ample capacity to contain any seismic oscillation effects, and standing water would not be of sufficient quantity to pose a risk to nearby development, particularly the proposed school site immediately adjacent to the project site.

Given the inland location of the project area, no aspect of the project would expose persons or property to tsunami. Similarly, the site characteristics preclude any possibility of mudflow.

4.1.3.3 Surface Water Quality

- *The project would not violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.*
- *The project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.*
- *The project would not create or contribute runoff water that would provide substantial additional sources of polluted runoff.*

Project Construction

Recharge basin excavation and long-term sediment removal would involve construction-related activities (e.g., stockpiling) and disturbance of over one acre of land. Grading and excavation activities would temporarily expose bare soils, which could be subject to both wind and water-related erosion if not properly treated. However, the District will comply with the statewide General Construction Activity Storm Water Permit, which requires that a SWPPP be prepared to prevent water pollution from on-site construction activities. The SWPPP will include a description of Best Management Practices that will be implemented during basin construction and ongoing sediment removal activities in order to prevent off-site transport of pollutants into the Carbon Creek Channel or other drainage facilities. Similarly, groundwater encountered during monitoring well construction must be discharged in accordance with NPDES water quality standards to ensure that pollutants will not be introduced into the municipal storm drain system.

Prior to construction, OCWD will develop a SWPPP that addresses the following requirements, and incorporates similar BMPs, for controlling erosion and runoff:

- *temporary soil stabilization:* sandbag barriers, straw bale barriers, sediment traps, and fiber rolls;
- *temporary sediment control:* hydraulic mulch, hydroseeding, and geotextiles;
- *wind erosion control:* portable water and straw mulch;
- *tracking control:* street sweeping and entrance/outlet tire washing;
- *non-stormwater management:* clear water diversion and dewatering; and
- *waste management and materials pollution control:* vehicle and equipment cleaning, concrete waste management, and contaminated soil management.

The SWPPP will also identify other construction activities, such as asphalt paving, that are not to be performed during storm events in order to minimize any possible contamination of stormwater runoff from petroleum-based roadway materials. By preparing a SWPPP and implementing BMPs, OCWD will be in compliance with NPDES standards and regulations. Although there is flexibility in the selection of appropriate BMPs, the regulatory compliance actions under the NPDES program are considered Standard Conditions, which are non-discretionary and serve to reduce or avoid potential environmental impacts. Since the Standard Conditions prevent project impacts from exceeding significance thresholds, then the project need not include additional mitigation measures. OCWD will implement the following Standard Conditions and will track their completion and effectiveness as part of an adopted mitigation monitoring program (MMP):

SC 4.1-1 – SWPPP Contents: OCWD shall file a notice of intent (NOI) with the appropriate fees for coverage of the project under the General Construction Activity Storm Water Runoff Permit. The NOI shall be submitted to the Regional Water Quality Control Board prior to initiation of construction activity at the site. As required by the NPDES permit, a SWPPP shall be prepared and shall establish BMPs to prevent pollutant runoff, soil erosion, and sedimentation during construction. The SWPPP shall be prepared in compliance with the *County of Orange/Orange County Flood Control District 2004-05 Local Implementation Plan* and the Orange County Stormwater Program's BMP fact sheets associated with the various program elements of the *2003 Drainage Area Management Plan.* The District Engineer, or designee, shall ensure that the requirements of the SWPPP are defined on permit plan cover sheets as either general or special notes. During construction, the contractors shall follow the specifications of the SWPPP, a copy of which shall be kept on the job site at all times. The SWPPP shall establish BMPs for erosion and sediment control; non-storm water management; post-construction storm water management, waste management and disposal; maintenance, inspection, and repair of construction equipment and vehicles; employee training to perform inspections of the BMPs at the construction site; and proper storage, handling, use, and disposal of fuels and other toxic materials, as well as establishing fuel and maintenance areas away from Carbon Creek Channel.

SC 4.1-2 – Sediment Control BMPs: The SWPPP shall include a description and illustration of BMPs that will be implemented to prevent the transport of sediment in stormwater runoff. Sediment control BMPs shall be in place at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during construction. The discharger shall consider site-specific and seasonal conditions when selecting and designing sediment control BMPs. At a minimum, the discharger/operator must be prepared to implement an effective combination of erosion and sediment control on all disturbed areas in anticipation of rainfall. Effective filtration devices and/or barriers shall be selected, installed and maintained properly. A proposed schedule for deployment of sediment control BMPs shall be included in the SWPPP. Sediment controls can include straw bale dikes, earth dikes, brush barriers, drainage swales, check dams, subsurface drain, sandbag dikes, fiber rolls, diversion velocity dissipaters, desilting basins, detention/retention ponds and/or other controls, as determined appropriate by the District's project engineer. Additionally, the SWPPP shall include a description of the BMPs to reduce the tracking of sediment onto public roads at all times. These public roads shall be inspected and cleaned at defined intervals approved by the District. Road cleaning BMPs shall be discussed in the SWPPP and shall not rely on the washing of accumulated sediment or silt into the storm drain system.

SC 4.1-3 – Timing of Diversion Facility Construction: All project facilities proposed to be constructed within the Carbon Creek Channel, or that will be constructed across the flood control channel, shall be constructed during the dry season (normally May 1 through September 30 of each year). Flood control facilities disturbed by construction shall be fully restored to their original design condition prior to the onset of the rainy season (October 1) so that the flood control capacity of the affected County facilities are not compromised.

Since the project will require construction of an inflatable dam in the Carbon Creek Channel, OCWD has applied for and received permit coverage from the ACOE under nationwide permits NW33 and NW43, subject to compliance with the following non-discretionary Special Conditions:

1. Siltation and turbidity control measures (e.g., silt fences, hay bales) shall be implemented in all areas where disturbed soils may potentially wash into the drainages via rainfall or runoff. Such measures shall remain in place until the project is complete and exposed soils are stabilized. Any diversion dams (e.g., sand bags, straw bales, filter fabric, etc.) and/or pipe necessary for stream diversion shall be installed prior to initiation of construction. Upon completion of the project, the diversion dams and/or pipe shall be completely removed and the affected area returned to pre-project conditions as appropriate.

2. Equipment shall not operate in the flowing waters of the watercourse. The watercourse shall be diverted from the work area, or the permittee shall perform work during low water conditions when the area is naturally dewatered. The permittee shall suspend all operations when there is water within the project area, and remove all equipment from within the ordinary high watermark.

3. No debris, soil, silt, sand, rubbish, cement or concrete washings thereof, oil or petroleum products or washings thereof, shall be allowed to enter into or placed where it may be washed by rainfall or runoff into waterways. When project operations are completed, any and all excess construction materials, debris, and or other associated excess project materials shall be removed to an appropriate off-site location outside of any jurisdictional areas.

4. Materials and staging, storage, fueling, and maintenance of equipment shall be located outside of the Corps' jurisdiction in areas where potential spilled materials will not be able to enter any waterway or other body of water.

5. Diversion of river flows around all proposed work areas shall be completed prior to initiation of construction. Upon completion of the project, diversion shall be completely removed and the affected area restored to pre-project conditions.

6. Runoff and seepage from disturbed soils, improvements, roadways, embankments, and other alterations of the natural environment shall not cause a violation of water quality standards.

7. The permittee shall provide notification, either written or verbal, to the Corps of Engineers at least one week prior to the start of work as to the anticipated beginning and ending dates of construction.

8. A copy of the Corps permit shall be on the job site at all times during construction. The permittee shall provide a copy of this permit to all onsite contractor(s), subcontractor(s) and foreperson(s). The permittee shall require that all such contractor(s), subcontractor(s) and foreperson(s) read this authorization in its entirety prior to initiation of the project and ensure that all appropriate permit conditions are implemented as intended.

9. The permittee shall allow representatives from the Corps to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished within the terms and conditions of the permit.

The Special Conditions will be overseen by the Corps and are not considered Standard Conditions to be included in OCWD's mitigation monitoring program. Upon completion of construction, OCWD will certify that the work authorized by permit number 200400079-JPL was completed in accordance with the terms and conditions of the permit, and that the required mitigation was completed in accordance with the permit conditions. The Standard Conditions and the Corps' Special Conditions contain BMPs that are widely used in construction projects and are proven to minimize pollutant loading in stormwater runoff. With the combined oversight of the Corps and OCWD, no significant water quality impacts would occur during the construction period and no mitigation measures are necessary.

Project Operations

After project completion, most rainfall would be captured in the 5.7-acre recharge basin, and overall site runoff would decrease compared to existing conditions. By its nature, the proposed project maximizes water storage and infiltration opportunities. On the remainder of the site, the perimeter access road and other impervious areas would continue to produce stormwater runoff. Stormwater would generally run via sheet flow to catch basins, storm drains or open channels, and then to off-site municipal storm drain facilities.

Along with runoff quantity reductions, on-site sources of water pollution would be reduced or eliminated. Fertilizers and pesticides that were used in the former nursery operations have been discontinued, and any residual chemicals will be removed from the project site. The removal of contaminants and remediation of contaminated soils would reduce waterborne pollutant transport from the project site to receiving waters. The related water quality benefits are considered a positive impact of the proposed recharge basin project. Given the proposed use of the site and the overall reduction in impervious surfaces, the proposed recharge basin would not adversely impact runoff water quality or the capacity of off-site storm drain systems.

Few pollutant-generating activities have the potential to occur on the site. While vehicular motor oil, transmission fluid, and coolant contaminants from leaking cars and trucks can be transported off-site by runoff, OCWD estimates that only about 10 maintenance vehicles would access the site on a daily basis. Vehicular traffic would thus be minimal during the project life, and related runoff constituents are expected to be negligible and below significance thresholds. OCWD plans to install irrigated landscaping at the project site perimeter. Landscape maintenance could include the use of herbicides to eradicate weeds and other invasive plant species, as well as the use of fertilizers to encourage growth among the ornamental plantings. If used improperly, fertilizers and pesticides could potentially impair surface and groundwater supplies. Careless management activities such as over-irrigation, incorrect mixing and application, and improper storage and disposal can allow these chemicals to enter surface and groundwater through runoff and infiltration.

To minimize the potentially adverse health and environmental resource effects of excessive irrigation runoff and improper application of fertilizers and pesticides, OCWD will prepare a Water Quality Management Plan. As a regulatory compliance action under the Countywide NPDES program, WQMP preparation is considered a Standard Condition that will be implemented as follows:

> **SC 4.1-4:** OCWD shall consult the *2003 Orange County Drainage Area Management Plan* to determine whether the proposed recharge basin project is subject to Site Design BMPs, Source Control BMPs, or project-based Treatment Control BMPs. Subject to the *2003 DAMP* provisions, OCWD shall prepare a WQMP that references the DAMP's *Model Integrated Pest Management, Pesticides and Fertilizer Guidelines* for the selection of structural and non-structural BMPs for long-term, post-construction stormwater management. The applicable BMPs shall be incorporated into the project design and shown on the project plans prior to construction. The specific BMPs employed will be determined by OCWD during project design and in consultation with the DAMP and its appendices. The WQMP will address the following issue areas and performance criteria:
>
> - <u>Landscape Design</u> – Natural landscaping (i.e., a native plant palette) will be used to ensure drought tolerance, minimal irrigation runoff, and reduced pesticide and fertilizer usage. If pesticide and/or fertilizer usage is necessary, the landscape plan will consider the use of a buffer strip, which is an area of grass or other vegetation between the treated landscaping and the site perimeter that receives no applications of fertilizers or pesticides. Landscape maintenance will include application of mulch to reduce weeds, keep the soil cool and moist, and prevent soil erosion and sedimentation in storm drain facilities.
> - <u>Irrigation Design</u> – Irrigation design will consider the use of irrigation techniques such as drip irrigation or soaker hoses to reduce runoff water and ensure water reaches the plant roots. If drip irrigation is found to be impractical, sprinkler systems will be well-maintained and will not water driveways, sidewalks, streets or other impervious surfaces. All irrigation plans will employ rain-triggered shutoff devices to prevent irrigation after precipitation, and will feature flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.

The WQMP will contain BMPs that are commonly used and are proven to minimize pollutant loading in stormwater runoff. With implementation of the Standard Conditions, no significant water quality impacts would occur during project operations and no mitigation measures are necessary.

Effects of Recharging Santa Ana River Water

Recharge water sources and their effects on groundwater quality are addressed in Section 4.2 (Hydrogeology and Groundwater Quality). In general, the discussion indicates that there are no chemicals of significant public health concern in the SAR or MWD source waters, in water in the recharge basins, or in nearby groundwaters. Ongoing water quality testing shows that SAR and MWD waters comply with all federal and State standards governing their use as recharge sources. The information presented, along with the continual monitoring of surface and groundwater quality in the Orange County Groundwater Basin, substantiates the conclusion that the use of SAR and MWD water at the proposed recharge basin would not result in significant public health or environmental impacts.

4.1.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

The District routinely implements standard regulatory program measures to avoid or substantially reduce the potential hydrology and water quality impacts of its projects. The project-related hydrology and water quality impacts would be less than significant due to the Standard Conditions that will be implemented and subject to monitoring and reporting during construction.

4.1.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

All project-related hydrology and water quality impacts will be maintained at levels that are less than significant with the implementation of proposed infrastructure improvements and Standard Conditions. No significant erosion, flooding, or water quality impacts will result from project construction or operation.

4.1.6 CUMULATIVE IMPACTS

Cumulative drainage, flooding, and water quality impacts are generally confined to the drainages in the project area that are tributary to the Carbon Creek Channel and, ultimately, the San Gabriel River. Upstream land use changes resulting from cumulative development will create new impervious surfaces, increase stormwater runoff rates, and contribute to downstream sedimentation and urban pollutant runoff. However, water quality planning and regulation has been occurring on the basis of certain cumulative development assumptions for the project watershed. The impacts of cumulative upstream development will be substantially mitigated through design, avoidance and permitting requirements intended to protect water resources from adverse impacts. As projects are proposed within the watershed that do not conform to the growth and land use modification assumptions used in various watershed and drainage facility planning efforts, detailed hydrology studies are used to analyze additional flood control and water quality improvements that must be implemented to accommodate the incremental changes of a given project.

Though urban runoff from one particular area is often considered less than significant as a percentage of a major watershed, the cumulative effects of urbanization and water quality degradation in most watersheds can be adverse. However, the proposed project's incremental contribution would not be adverse or cumulatively considerable. Rather, the net effect of construction-related water quality control techniques, contaminated soil remediation, and the project-related reduction in long-term runoff quantities will be a benefit to downstream water quality.

4.2 HYDROGEOLOGY AND GROUNDWATER QUALITY

This section presents and analyzes the La Jolla Recharge Basin's effects on groundwater recharge and well production; its impact on nearby groundwater remediation activities; the use and quality of Santa Ana River (SAR) water for Orange County Groundwater Basin recharge; and long-term plans for monitoring the effects of project implementation. The baseline conditions, descriptions, and analyses in this section are derived, in large part, from the following reference documents:

- **Santa Ana River Water Quality and Health (SARWQH) Study (OCWD 2004a)**

  The SARWQH Study was initiated by OCWD in 1994 as a multi-year research program that was designed to characterize the quality of the SAR water and the quality of the basin it recharges, as well as to provide information on overall groundwater quality.

- **Report of the Scientific Advisory Panel: Orange County Water District's Santa Ana River Water Quality and Health Study (NWRI 2004)**

  This study provided independent assessment of the research components of the SARWQH Study. Prepared by the Scientific Advisory Panel, which was formed as an independent review panel under the auspices of the National Water Research Institute (NWRI). The panel provided input to OCWD during the SARWQH Study and the report summarizes its findings.

- **Contaminant Transport Modeling Report (Rubicon 2005)**

  Rubicon Engineering Corporation (Rubicon) developed a numerical model of groundwater flow and contaminant transport to evaluate the potential environmental effects of the proposed La Jolla Recharge Basin in the Forebay area. Specifically, numerical model simulations were conducted to quantitatively assess the effects of the proposed recharge on the tetrachloroethylene (PCE) component of the groundwater contaminant plume caused by the AC Products, Inc. facility, located in close proximity to the proposed project site. The report is included as Appendix 9.3 to this EIR.

- **Summary of Contaminant Transport Modeling Results (Geomatrix 2005)**

  Geomatrix Consultants, Inc. (Geomatrix) prepared a non-technical synopsis of Rubicon's Contaminant Transport Modeling Report. Geomatrix's summary report is not a quantitative assessment or critique of the contaminant transport modeling methodology or its results. Rather, the report is an abridged version of the often complex technical data, concepts, and terminology that the Rubicon report presents in depth. This section of the EIR incorporates Geomatrix's summaries of hydrogeologic conditions, as well as the findings of the conceptual and numerical transport models. The Geomatrix summary is included as Appendix 9.4 to this EIR.

All documents listed above have been incorporated by reference (see Section 2.6) or included as appendices to this EIR. This section provides only the summary information about the potential effects of the La Jolla Recharge Basin project.

4.2.1 EXISTING SETTING

4.2.1.1 State and Federal Regulatory Framework

Four water sources (imported water from the Metropolitan Water District of Southern California [MWD], surface water, groundwater, and recycled water) are currently managed, treated and distributed to customers throughout Orange County. The potable water quality within the Orange County distribution system is in compliance with all regulatory drinking water standards. Since the proposed recharge basin project would supplement potable groundwater supplies, the regulations applicable to the existing potable water supply in Orange County are described below.

Safe Drinking Water Act

The federal Safe Drinking Water Act (SDWA) and subsequent amendments authorize the Environmental Protection Agency (EPA) to set health-based standards (maximum contaminant levels, or MCLs) for drinking water to protect public health against both naturally-occurring and man-made contaminants. EPA administers the SDWA at the federal level and establishes MCLs for bacteriological, inorganic, organic, and radiological constituents (United States Code Title 42, and Code of Federal Regulations Title 40). California administers and enforces the drinking water program and has adopted its own SDWA, which incorporates the federal SDWA requirements including some requirements specific only to California (California Health and Safety Code, Section 116350 and related sections).

The 1986 and 1996 SDWA Amendments established wellhead protection and source water assessment (SWA) programs, respectively. Source water, used in this context, is untreated water from rivers, lakes, streams, and groundwater aquifers used for drinking water supply. These programs are the foundation of protecting drinking water resources from contamination and they avoid costly treatment to remove pollutants. In California, the Drinking Water Source Assessment and Protection (DWSAP) program fulfills these federal mandates. The California Department of Health Services (DHS) is the primary lead agency for developing and implementing the DWSAP program and responsible for performing the assessments of existing groundwater sources. OCWD was a contributing, working member of the technical advisory committee convened to assist DHS with development of the DWSAP, which was submitted and approved by EPA in 1999.

Drinking Water Standards

California's SDWA requires DHS to administer laws relating to drinking water regulation, including setting and enforcing both federal and State drinking water standards and administering water quality testing programs. Current drinking water regulations include both primary and secondary standards (Title 22 of the California Code of Regulations). Compliance with primary standards is mandatory, because these standards are based on potential health effects on water users. Secondary standards are those parameters that may adversely affect the aesthetic quality of drinking water, such as taste and odor. These standards are not federally enforceable, although DHS reserves the right to enforce secondary standards if warranted.

The primary standards define MCLs that cannot be exceeded by any public or private water system. State law requires DHS to set each MCL as close to the corresponding Public Health Goal (PHG) as is economically and technically feasible, placing primary emphasis on the protection of public health. The PHG is the concentration in drinking water that does not pose any significant risk to health, and which contributes to the MCL. DHS can set the MCL above the level of the PHG if it determines that the economic impact on water suppliers or consumers of reducing a contaminant to the PHG level would be excessive compared to the reduction in estimated health risk, or if current testing or treatment technologies are not adequate to ensure drinking water contamination levels would be at or below the PHG.

Notification Levels (formerly known as Action Levels) are advisory levels and not enforceable standards. If a chemical is detected above its Notification Level in a drinking water source, Health & Safety Code §116455 requires timely notification of the local governing bodies by drinking water systems. DHS recommends that the utility inform its customers and consumers about the presence of the chemical, and about health concerns associated with exposure to it. DHS also recommends that the drinking water system take the source out of service if a chemical is present at concentrations considerably higher than its Notification Level (the "response level" of Health and Safety Code §116455). The specific recommendation depends on the toxicological endpoint (i.e., cancer risk or non-cancer effects) that provides the basis for the Notification Level.

Water Quality Control Plan for the Santa Ana River Basin

The California Water Code requires adoption of water quality control plans that serve as the legal, technical and programmatic basis of water quality regulation for a region. The Santa Ana Regional Water Quality Control Board (SARWQCB) adopted the Water Quality Control Plan (the Basin Plan) for the Santa Ana River Basin in 1995 (SARWQCB 1995a). The Basin Plan identifies the Coastal Plain of Orange County as a significant groundwater basin. It establishes water quality objectives for identified beneficial uses of that groundwater, including municipal, domestic, agricultural, and industrial water supplies. The SARWQCB is charged with protecting these beneficial uses from pollution and nuisance. Basin Plan goals for groundwater protection and management include regulating activities that impact the beneficial uses of groundwater of the region; and planning, management, and education to avoid future impacts to groundwater resources. Section 4.1 (Hydrology and Water Quality) provides additional information about the Basin Plan goals and beneficial use designations for regional water resources.

4.2.1.2 Local Groundwater Management Authority

OCWD Groundwater Management Plan (GWMP)

As previously described in Chapter 2.0 (Introduction), the Orange County Water District was created by State statute in 1933 to manage the Orange County Groundwater Basin (California Statutes, 1933, chapter 924, page 2400, as amended, "The Orange County Water District Act"). The District Act authorizes OCWD to *"transport, reclaim, purify, treat, inject, extract, or otherwise manage and control water"* for its beneficial use and to improve and protect the quality of groundwater supplies within the district.

The District's *Groundwater Management Plan* (OCWD 2004b) is integral to the accomplishment of its mission. Previous versions of the GWMP were prepared in 1989, 1990, and 1994. The 2004 GWMP:

- Describes the hydrogeology of the Basin;
- Discusses the range of District activities and management programs, including groundwater monitoring, production management, recharge water supply, and groundwater quality management and improvement projects;
- Describes historical and future water demands and integrated demand/supply management strategies;
- Summarizes financial management programs; and

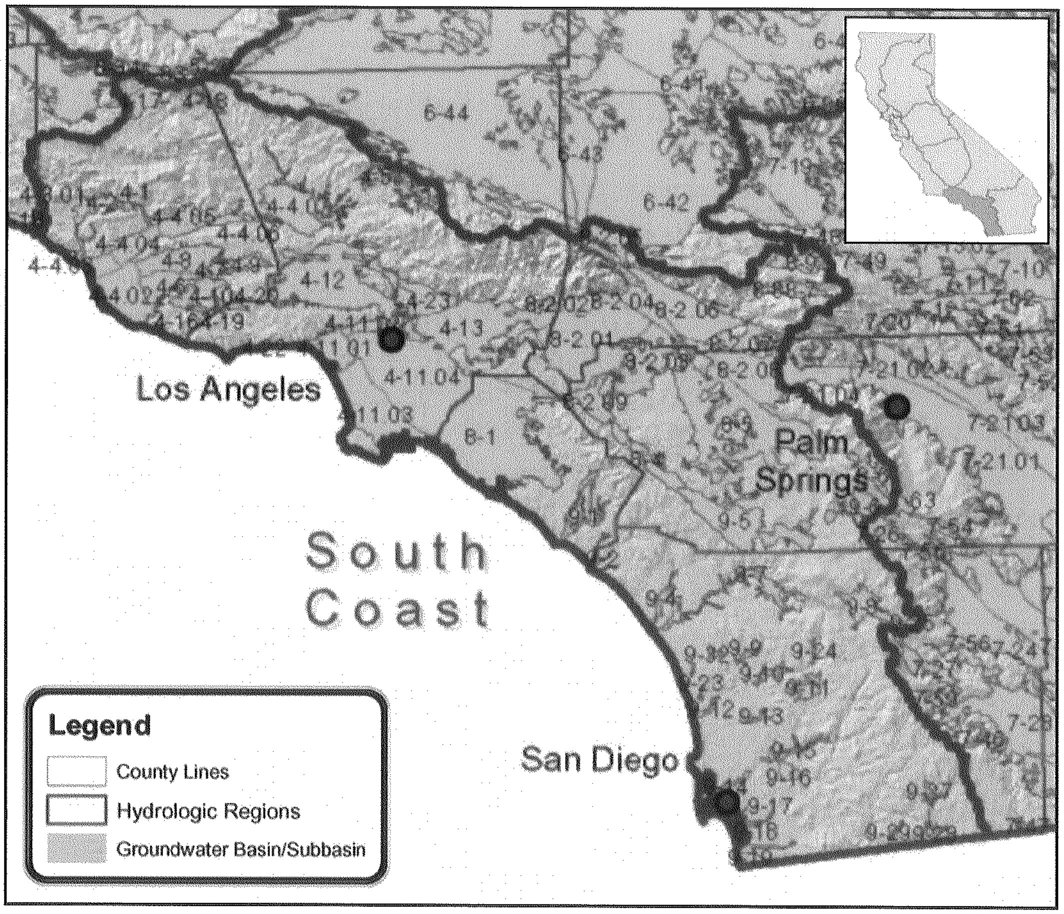
- Develops recommendations for continued proactive Basin management.

The GWMP and its applicability to the proposed project are discussed further in Section 4.2.1.6 (OCWD Groundwater Quality Programs) below.

4.2.1.3 Hydrogeologic Setting

South Coast Hydrologic Region

The South Coast Hydrologic Region (HR) covers approximately 6.78 million acres (10,600 square miles) of the southern California watershed that drains to the Pacific Ocean (see Figure 4.2-1). Significant geographic features include the Coastal Plain of Los Angeles and Orange Counties, the central Transverse Ranges, the Peninsular Ranges, and the San Fernando, San Gabriel, Santa Ana River, and Santa Clara River valleys.



Source: RWQCB

Figure 4.2-1 ***Regional Groundwater Basins***

The South Coast HR includes all of Orange County, most of San Diego and Los Angeles Counties, parts of Riverside, San Bernardino, and Ventura counties, and a small amount of Kern and Santa Barbara Counties. This HR is divided into Los Angeles, Santa Ana and San Diego subregions – RWQCB Regions 4, 8 and 9, respectively. Groundwater basins are numbered according to these subregions. The proposed project is in the Santa Ana Subregion, which encompasses the Santa Ana River drainage and other drainage systems.

The South Coast HR has 56 delineated groundwater basins, nine of which are in the Santa Ana subregion (8). The Santa Ana subregion's basins encompass most of Orange County and parts of Los Angeles, San Bernardino, and Riverside counties. Groundwater basins underlie 979,000 acres (1,530 square miles), or about 54 percent of the Santa Ana subregion. At about 224,000 acres, the Coastal Plain of Orange County is the largest basin in the Santa Ana Region.

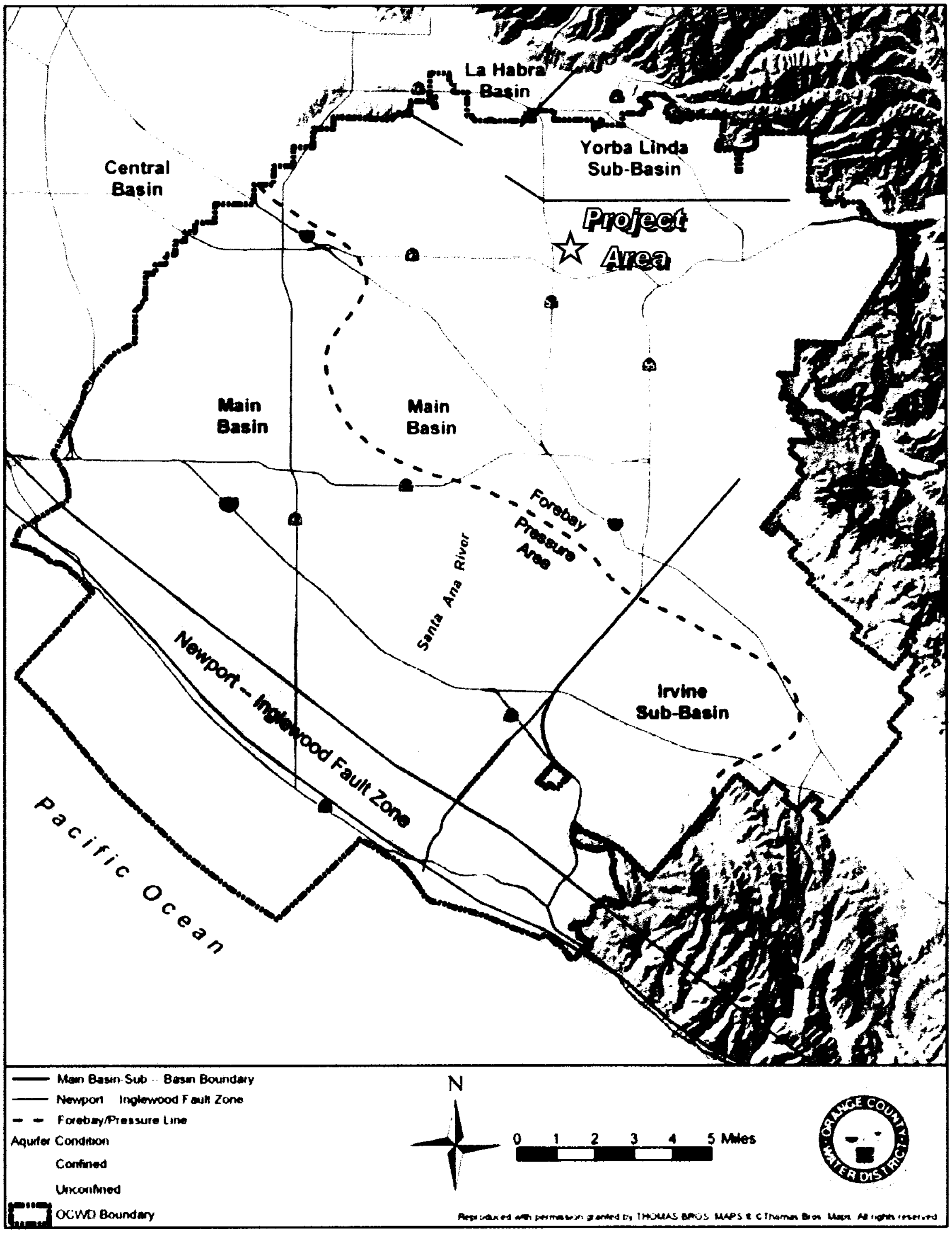
Conjunctive use of surface water and groundwater is a long-standing practice in the region. At present, much of the potable water used in Southern California is imported from the Colorado River and from sources in the eastern Sierra and Northern California. Several reservoirs are operated primarily for the purpose of storing surface water for domestic and irrigation use, but groundwater basins are also recharged from the outflow of some reservoirs. The concept is to maintain stream flow over a longer period of time than would occur without regulated flow and thus provide for increased recharge of groundwater basins. The Coastal Plain of Orange County and most of the larger basins in the South Coast HR are highly managed, with many conjunctive use projects being developed to optimize water supply.

Orange County Groundwater Basin

As indicated in Section 4.1 (Hydrology and Water Quality), the project site is located on the eastern portion of the groundwater basin known as the Coastal Plain of Orange County. Freshwater-bearing sediments in the Coastal Plain reach depths of greater than 4,000 feet in some locations. The fresh water-bearing alluvial and marine deposits beneath the Coastal Plain of Orange County range in thickness from 500 to 2,000 feet in the project vicinity. The Forebay is a portion of the Coastal Plain several miles inland of the mouth of the Santa Ana River and extending westward from the mouth of Santa Ana Canyon. The Orange County Groundwater Basin underlies the northern half of Orange County beneath broad lowlands known as the Tustin and Downey Plains. Figure 4.2-2 illustrates the Orange County Groundwater Basin's delineated units and management areas.

The Orange County Groundwater Basin covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, Santa Ana Mountains to the northeast, Pacific Ocean to the southwest, and county line to the northwest, where its aquifer systems continue into the Central Basin of Los Angeles County (Figure 4.2-2). Groundwater flow is unrestricted across the county line. The Newport-Inglewood fault zone forms the southwestern boundary of all but the shallow aquifers in the basin. In the central and coastal areas of the basin, individual fresh water-bearing units are separated by extensive clay and silt layers. These units can be identified and correlated between borings/wells and have been given specific aquifer designations.

In describing the complex sequence of fresh water-bearing sediments in the Orange County Groundwater Basin, the California Department of Water Resources (DWR) divided them into the Upper, Middle, and Lower aquifer systems. Most of the aquifers beneath the Coastal Plain dip gently southwesterly, and certain aquifers occur at or near the ground surface in the eastern parts of the basin in the Forebay area. These conditions make it generally favorable for OCWD's operation of groundwater recharge basins in the Forebay area. OCWD takes advantage of this condition by operating a number of groundwater recharge facilities in the Forebay area, mostly to the east of the proposed La Jolla Street recharge basin. In the Forebay area, surface water and shallow groundwater can move vertically downward in significant quantities to the aquifers used for groundwater production.



Source: SARWQHS Study (OCWD 2004a)

Figure 4.2-2
Orange County Groundwater Basin

The Upper aquifer system is composed of all aquifers overlying the Main aquifer. The Main aquifer comprises the upper portion of the Middle aquifer system throughout most of the basin. The lower portion of the Middle aquifer system is known as the "Lower Main" aquifer and contains "colored" water in some areas, which is groundwater that is unsuitable for domestic use without treatment due to high color and odor exceeding drinking water standards. The Main and Lower Main aquifers are sometimes referred to collectively as the "principal" aquifer and have been logged at depths of up to 2,000 feet bgs in many areas of the basin. The Lower aquifer system is indicated by the presence of a potentially high permeability, fresh water-bearing zone separated from the overlying Middle aquifer system by an extensive lower permeability deposit. No production wells currently draw water from the Lower aquifer system.

Local Hydrogeology

According to previous studies, the Upper aquifer system in the vicinity of the site is commonly reported as medium- to coarse-grained sands and gravels. However, thin layers of finer-grained and, hence, lower permeability soils occur within the coarser-grained sediments. These lower permeability layers may not be laterally continuous but are believed to inhibit vertical groundwater flow on a local scale. The thickness of the shallow zone of the Upper aquifer system varies, but the depth to the top of the Upper aquifer system in the site vicinity has been reported to vary from 80 to 120 feet bgs from 1992 through 1997.

The hydraulic gradient in the Upper aquifer system is generally toward the Pacific Ocean, and in the site vicinity the horizontal hydraulic gradient is about 0.003 to 0.007 due west. Aquifer tests performed by Harding Lawson Associates (HLA) have shown aquifer hydraulic conductivities ranging from 200 to 300 feet per day (ft/day) beneath the AC Products facility and approximately 870 ft/day in the vicinity of the Placentia Flood Control Basin.

SARWQH Hydrogeology Studies

The hydrogeologic studies conducted as part of the SARWQH Study were important in defining how, where, and when water leaving a recharge basin reaches a given well, and what changes occur to its quality during passage underground. Multi-depth monitoring wells constructed by OCWD enabled analyses that included age dating, introduction and subsequent monitoring of groundwater tracers, and the study of porous media flow near the outer surface of a recharge basin. The following summary of study findings provides a background to the groundwater movement and contaminant transport analysis presented in Section 4.2.3.4.

Groundwater flow, in contrast to surface water flow, generally follows pathways that tend to disperse horizontally and vertically with distance depending on the geologic structure of the aquifer. Subsurface investigation is the means to quantify flow directions, flow velocities, and any modifications in water quality over time and distance. Investigations may include groundwater tracing, which involves introduction of a tracer into the water at an upstream point (i.e., a recharge facility, followed by collection of water samples from a series of downstream monitoring wells). During the SARWQH Study, groundwater tracer studies were carried out successfully in the vicinity of Anaheim Lake, Kraemer Basin, and the SAR. Based on these studies, it was found that:

- Recharge water migration was complex; flow away from the recharge facilities was rapid; and multiple tracer arrivals over time were observed at some sampling wells;
- Flow rates varied with each recharge location;
- Groundwater originating from the three recharge areas studied maintained individual flow paths and velocities, and significant mixing of groundwater from the three recharge areas was not observed; and

- The horizontal distance from a well to a recharge basin was not a good predictor of the travel time of recharge water to the well. For example, horizontal groundwater flow velocities ranged from approximately 4 to 25 feet per day, but so little vertical movement was observed near some recharge areas that deep wells adjacent to the recharge basins might not be receiving water recharged in the basin.

4.2.1.4 Groundwater Replenishment

Santa Ana River Source Flow

The SAR is the principal source of water for replenishing the Orange County Groundwater Basin. Approximately 200,000 acre-feet per year (AFY) of SAR water are recharged on an average basis, representing more than half of the total recharge. As discussed in Section 4.1 (Hydrology and Water Quality), during the summer months, much of the SAR base flow is tertiary treated wastewater from upstream treatment facilities in San Bernardino and Riverside Counties. The treated wastewater discharges, which currently total approximately 161 million gallons per day (mgd), or 180,000 AFY, make up more than 90 percent of the base flow of the SAR. The upstream discharges will continue to increase as the population grows in the upper watershed.

4.2.1.5 OCWD Groundwater Facilities

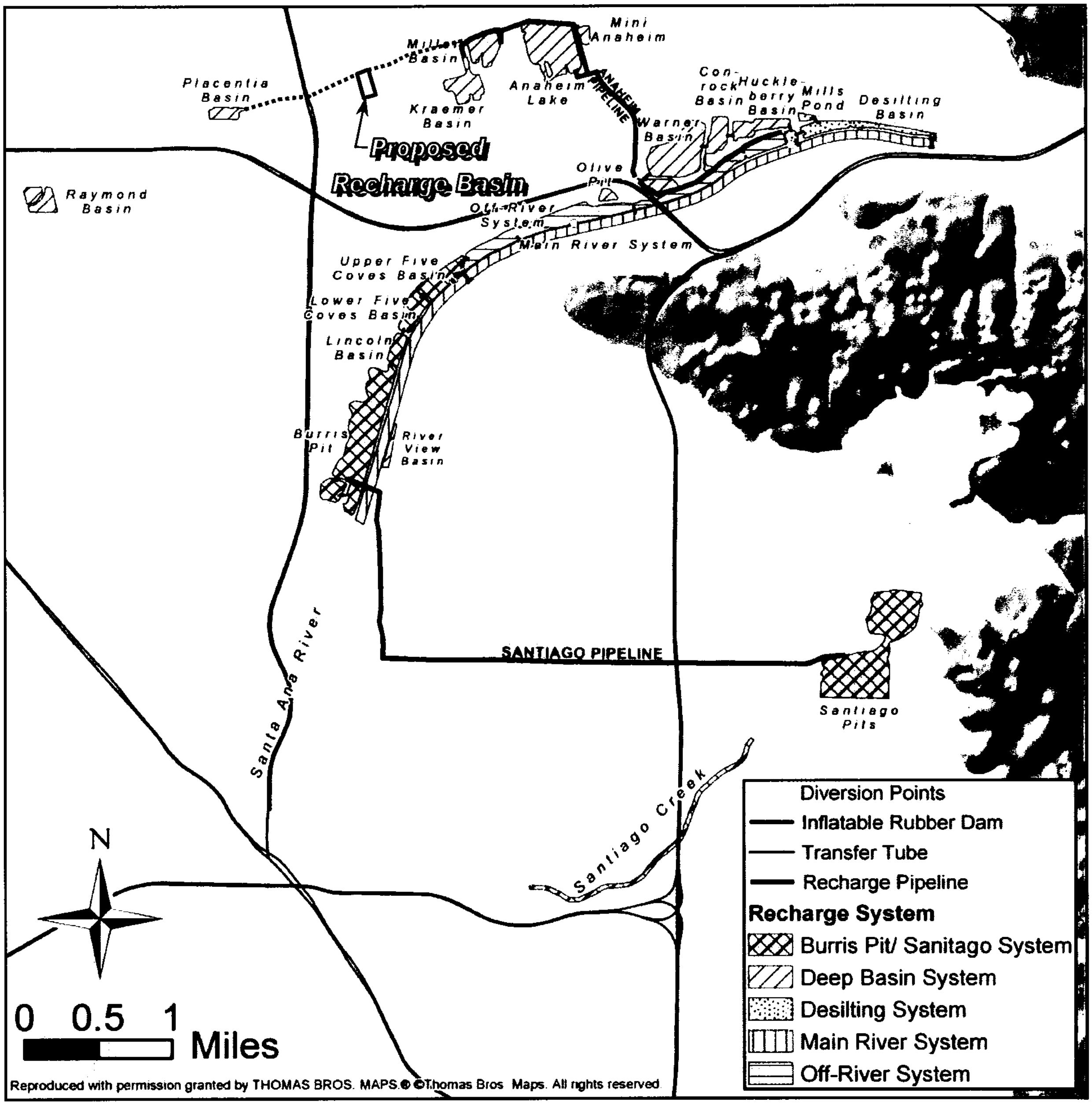
The Orange County Water District owns and operates approximately 1,100 acres of recharge spreading facilities located in and adjacent to the SAR and Santiago Creek. The facilities consist of river channels and a series of shallow and deep basins, which allow percolation directly to the aquifers of the Orange County Groundwater Basin. OCWD's recharge facilities are divided into four systems---the Main River, Off-River, Deep Basin, and Burris Pit/Santiago Systems, which are briefly described below. Figure 4.2-3 depicts the overall layout of these systems and shows the proposed recharge basin location in the Deep Basin system.

Main River System

The Main River System consists of the SAR channel from Ball Road northeast to Imperial Highway. The unlined riverbed is underlain by very sandy, highly permeable material and is divided into a series of basins separated by sand levees. Percolation rates in the Main River System range from 75 to 150 cubic feet per second (cfs). The levees create a maze for the water to flow at a velocity significant enough to prevent creation of the clogging layer of fine sediment and biological growth. The sand levees only remain intact for flows up to 350 cfs. After major storm events, and when the sediment and biological growth accumulate, the system is cleaned with heavy equipment and the levees are rebuilt to restore the system to its previous percolation rate.

Off-River System

The Off-River System is parallel to the SAR and consists of a shallow sheet flow channel similar to the Main River System. The Off-River System begins at the Imperial Highway Inflatable Dam and ends at the Carbon Creek Diversion Channel. The unlined sandy channel bottom permits water to percolate to the underlying aquifer. However, the Off-River System has a relatively poor percolation rate compared to the other nearby facilities due to the presence of a relatively fine-grained layer of sediment that occurs approximately three feet below the surface of most of the Off-River System. Percolation rates vary from approximately 5 cfs to 20 cfs depending on sediment accumulation and biological growth. In addition, the recharge capacity of portions of the Off-River System is limited due to mounding interference by the adjacent SAR and Warner Basin.



Source: SARWQH Study (OCWD 2004a)

Figure 4.2-3
OCWD Groundwater Recharge Facilities

Deep Basin System

The Warner Basin System (Foster-Huckleberry Pond, Conrock Basin, Warner Basin and Little Warner Basin), Anaheim Lake, Miller Basin and Kraemer Basin make up the Deep Basin System. The proposed La Jolla Recharge Basin would be located west of Kraemer and Miller Basins and would be considered part of the Deep Basin System. The recharge basins in the Deep Basin System range in depth from 10 to 60 feet deep and are underlain by pervious sandy material that allows for percolation into the underlying aquifer.

Percolation rates in the Deep Basin System decline with use due to clogging, requiring regular draining and cleaning to maintain an efficient recharge system with high percolation rates. Percolation rates for the entire Deep Basin System vary from approximately 150 cfs to 350 cfs. The combined maximum percolation rate of the downstream basins, Anaheim Lake, Miller Basin and Kraemer Basin, is approximately 260 cfs.

Burris Pit/Santiago System

The Burris Pit/Santiago System begins at the confluence of the Carbon Creek Diversion Channel and the SAR and ends at the Santiago Basin in Orange. This system consists of a series of deep and shallow recharge basins along the SAR and Santiago Creek. Five Coves Basins, Lincoln Basin, Burris Pit and Ball Road Basin comprise the SAR component. The Santiago component of the system includes the Santiago Pits (Blue Diamond, Bond and Smith Pits). The maximum percolation rate for this system is approximately 150 cfs.

Groundwater Production Wells

Groundwater production occurs from approximately 500 active wells within the District, with approximately 200 large-capacity wells operated by 20 retail water agencies. These large-capacity wells account for an estimated 96 percent of the total production from the Orange County Groundwater Basin and provide water for over 20 cities and agencies. Producers are responsible for pumping and maintaining their respective, individually metered production wells. Well production is documented by OCWD, but because OCWD does not sell or distribute water directly to consumers, once the water is extracted from the Orange County Groundwater Basin, the producers have full responsibility for ensuring that the water served to consumers complies with all drinking-water standards.

4.2.1.6 OCWD Groundwater Quality Programs

Section 4.1 (Hydrology and Water Quality) provided an overview of the proposed recharge basin's source water quality and the reasons for providing a comprehensive discussion of the issue in this EIR. Specifically, Section 4.1.1.5 (Recharge Basin Source Water Quality) noted that a comment by AC Products on the Notice of Preparation (NOP) for this EIR questions the quality of the source water that will be used at the proposed La Jolla Recharge Basin. The comment states that because recharge water will include water from the SAR and the Metropolitan Water District (MWD), "*the project will result in water consisting in part of discharges from sewage treatment plants (which contain numerous hazardous substances, such as pharmaceuticals, endocrine disrupters and other chemicals of concern, such as NDMA) and water from the Colorado River (which also contains hazardous substances, including perchlorate).*" The AC Products comment further asserts that "*imported water from both these water sources is likely to be contaminated,*" and that the EIR must "*...identify the significant effects that these various chemicals in the water from the Santa Ana River and MWD may have upon the quality and purity of the water imported to the recharge basin and allowed to enter drinking water supplies.*"

Since the proposed La Jolla Recharge Basin would replenish groundwater resources for potable uses, the issue of groundwater quality is addressed in this section rather than in Section 4.1 (Hydrology and Water Quality). The following sections address how OCWD extensively monitors the quality of the waters recharged into the Orange County Groundwater Basin, including the SAR and imported water from MWD. The data and analyses presented show that the proposed SAR and MWD recharge water sources meet all federal, state, and local public health standards for potable water consumption. As shown, OCWD does not recharge water at contaminant concentrations above the Notification Levels or the MCLs and thereby avoids contaminating groundwater with poor quality source water.

OCWD Groundwater Management Plan

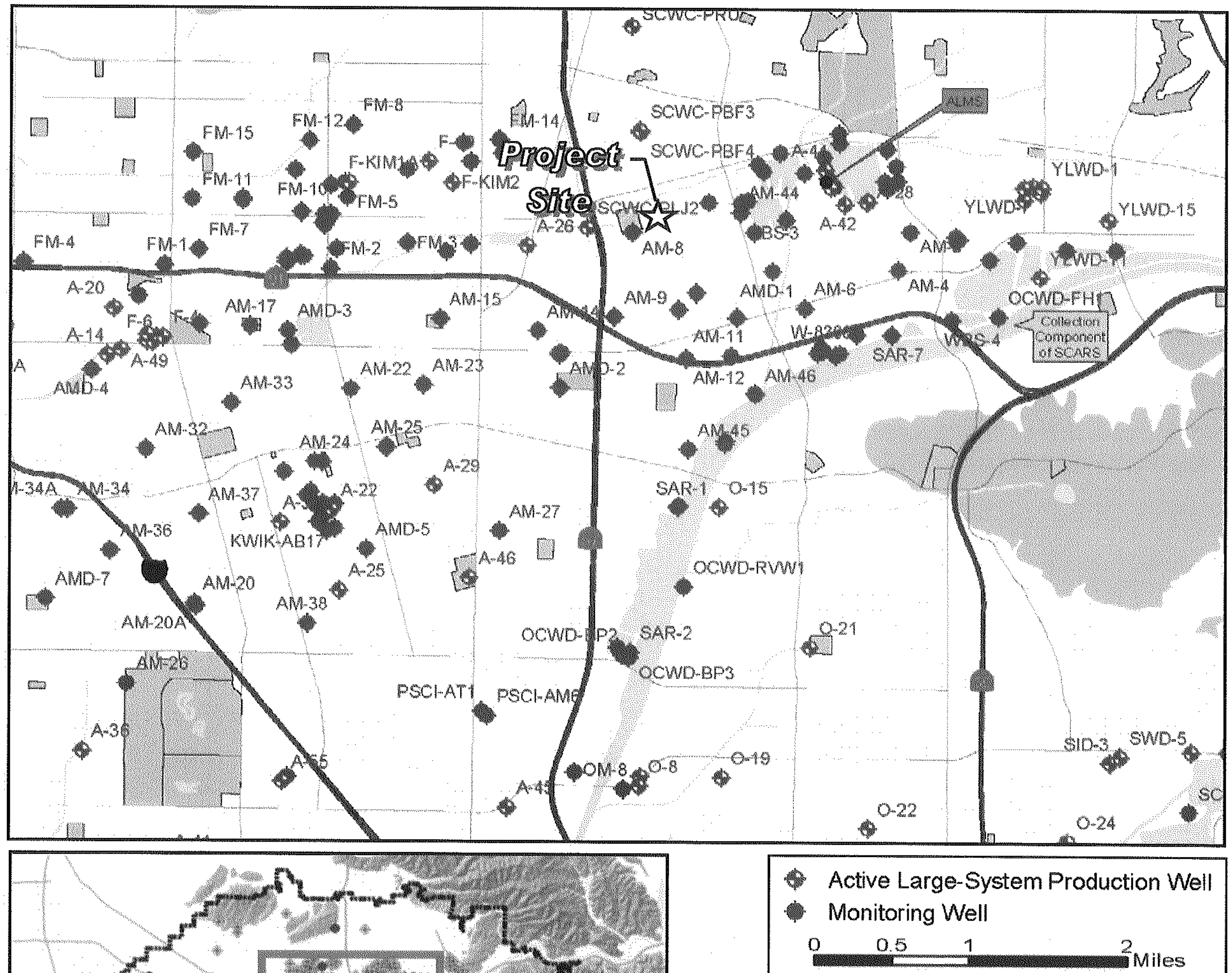
The OCWD *Groundwater Management Plan's* two major objectives are protecting and enhancing groundwater quality, and cost-effectively protecting and increasing the Basin's sustainable yield. In fulfilling its mandate to ensure adequate water supplies for producers, while also protecting the integrity of the basin's groundwater quality and quantity, OCWD administers a comprehensive water quality monitoring program to protect and evaluate groundwater resources for potable supply. The water quality monitoring programs are broadly classified into three categories: (1) regulatory or compliance with permits, environmental, and groundwater drinking water regulations, (2) committed OCWD and research projects, and (3) Basin management (i.e., evaluating and protecting Basin water quality). Table 4.2-1 summarizes the types of water quality protection programs and activities conducted by OCWD.

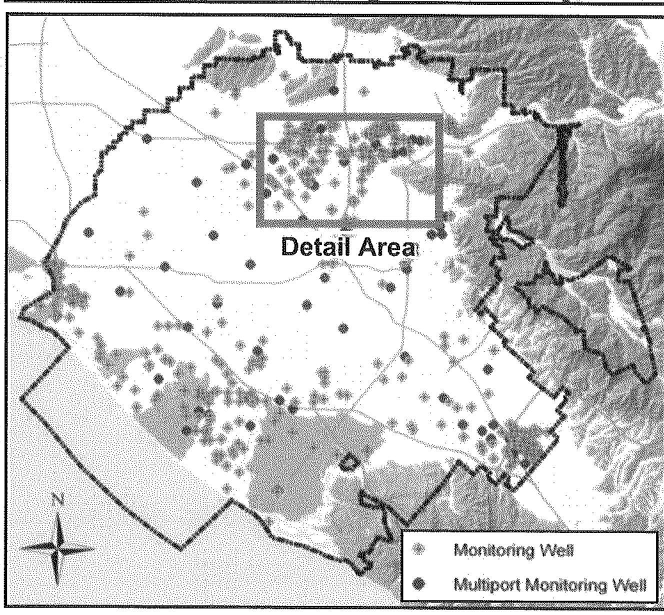
TABLE 4.2-1
OCWD WATER QUALITY MONITORING PROGRAMS

MANDATED	COMMITTED	BASIN MANAGEMENT
• State Regulations • Federal Regulations	• Board Authorized Interagency Agreements • Protect & Enhance Water Quality • Increase Basin Supplies	• Increase Basin Water Supplies • Identify & Monitor Pollution Sources
Compliance/Permits	**Studies/Projects**	**Basinwide Monitoring**
- Title 22/Groundwater Production - NPDES Dewatering - NPDES Storm Water	- VOC Investigations - SARWQ Investigations - Alternative Water Sources	- Recharge Investigations - Basinwide VOCs - MTBE, Perchlorate, As, Cr(VI), 1,4 -dioxane, NDMA, etc.
Source: Groundwater Management Plan (OCWD 2004b)		

In support of the programs shown in Table 4.2-1, OCWD operates a comprehensive, proactive monitoring program to track dynamic conditions including groundwater production, storage, elevations, and quality. A vast network of production and monitoring wells is used to collect data at frequencies necessary for short- and long-term trend analyses. The spatial distribution of the wells has been tailored toward basinwide analysis and, where appropriate, focused on local or sub-regional investigations. Because of the Basin's multiple-aquifer configuration, emphasis has been placed on installing multi-depth monitoring wells that provide depth-specific water level and quality data. In the proposed project area, detailed investigation of the Forebay was a priority in the SARWQH Study because of the proximity of potable supply wells to recharge basins. Figure 4.2-4 provides a basinwide overview of OCWD's monitoring well network and shows the monitoring wells and large system production wells in the project vicinity.

By means of the groundwater monitoring-well network developed by OCWD, data are available on the aquifers to depths of 2,000 feet in many areas of the basin. The monitoring wells are used to obtain depth-specific water level and water-quality data from individual aquifer zones. Data from these wells were used to delineate the depth of the "principal" aquifer system, within which most of the groundwater production occurs. Deeper aquifers exist below the principal aquifer system, but these zones contain colored water or are too deep to economically construct production wells. With the exception of OCWD monitoring wells and four colored water production wells constructed by Mesa Consolidated Water District and Irvine Ranch Water District, few wells penetrate the deep aquifer system.





Source: SARWQH Study (OCWD 2004a)

Figure 4.2-4
OCWD Monitoring Well Network – Basin Overview and Forebay Detail

OCWD's monitoring program for potable supply wells includes routine assessments of ambient water quality and provides real-time data of ambient conditions. Additionally, OCWD's laboratory is state-certified to perform bacteriological, inorganic, and organic analyses. A state-certified contactor laboratory analyzes radiological samples. DHS- or EPA-approved analytical methods are used for analyzing water quality samples for the drinking water compliance program. As new chemicals are regulated, the laboratory develops the analytical capability and becomes certified in the approved method to process compliance samples (OCWD 2004b).

Water Quality Monitoring – MWD Source Water

Replenishment water from MWD is often delivered to OCWD through outlet OC-28 at Anaheim Lake, which is monitored by MWD in its routine monthly monitoring program. General minerals, nutrients, and other selected constituents are monitored monthly by MWD. Radioactivity constituents, metals, volatile organics, and semi-volatile organics (e.g., pesticides and herbicides) are monitored quarterly.

The following information addresses a specific NOP comment by AC Products claiming that MWD recharge water from the Colorado River contains hazardous substances, most notably perchlorate, which could have significant effects *"upon the quality and purity of the water imported to the recharge basin and allowed to enter drinking water supplies."*

Perchlorate Background

Perchlorate and its salts (e.g., ammonium perchlorate) are used in solid propellant for rockets, missiles, and fireworks. Perchlorate has a number of industrial uses, and it is used in matches, flares, pyrotechnics, ordnance, and explosives. Perchlorate can interfere with iodide uptake by the thyroid gland. This can result in decreased production of thyroid hormones, which are needed for prenatal and postnatal growth and development, as well as for normal metabolism and mental function in the adult.

Regulatory Status in Drinking Water

Perchlorate is on both the federal and State unregulated monitoring lists. Thus, no drinking water standard (i.e., MCL) currently exists for perchlorate. Until the perchlorate MCL is in place, DHS will continue to use a 6-µg/L Notification Level to advise water systems and others. Findings above the Notification Level prompt certain requirements, as well as recommendations for consumer notification. DHS has also established a Response Level, or the level at which DHS recommends removal of a source from service. The Response Level for perchlorate is currently 10 times the Notification Level, or 60 µg/L.

Regulatory Status of Risk Assessment

In 2004, the California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) established a 6-µg/L public health goal (PHG) for perchlorate. As indicated previously, the PHG is the concentration in drinking water that does not pose any significant risk to health, and which contributes to the MCL. OEHHA reviewed the 2005 National Academy of Sciences' report on perchlorate and determined that no revision to the PHG was required.

Presence of Perchlorate in Groundwater

California's 1997 findings showed perchlorate to be a widespread inorganic contaminant of drinking water (DHS 2005). Public water system monitoring shows perchlorate detected in over 350 drinking water sources, primarily wells and mostly in the counties of Los Angeles, San Bernardino and Riverside. The SARWQCB has identified 31 public drinking water wells in Orange County in which perchlorate has been detected at levels ranging from 4.7 to 10.7 µg/L (SARWQCB 2004). Although some localized perchlorate contamination is the result of Defense Department activities at the former MCAS El Toro, the SARWQCB suspects that Chilean nitrate fertilizer, alone or combined with Colorado River water, may be the source of widespread low-level perchlorate contamination.

Much of the water imported into the County has historically come from the Colorado River, which was found to be contaminated with perchlorate from a Defense Department related plant in Henderson, Nevada (AGWA 2004). Between 1950 and 1998, OCWD imported approximately three million acre-feet of Colorado River water for groundwater recharge. In addition, Colorado River water was used in parts of the Basin for many years to irrigate agricultural land. The Santa Ana River Watershed Project Authority (SAWPA) concluded that Colorado River water historically contained perchlorate concentrations above the state's Notification Level of 6 µg/L when it entered California (SAWPA 2004). Though it is unclear how much the Colorado River water may have contributed to present levels in Orange County, perchlorate levels in Colorado River water are now below the Notification Level. Additionally, wells in Orange County with levels above the Notification Level are either being remediated by existing treatment or were taken out of service.

Presence of Perchlorate in Recharge Water

Table 4.2-2 presents MWD perchlorate data for Colorado River water, which could be a component of the source water used at the proposed recharge basin. The MWD data show that the Colorado River water perchlorate concentrations have been declining in recent years. The most recent data show that the perchlorate level is less than the Public Health Goal and the Notification Level, and is non-detectable at MWD's reporting level of 4 µg/L.

TABLE 4.2-2
MWD-REPORTED PERCHLORATE CONCENTRATIONS IN COLORADO RIVER WATER

Date	Perchlorate in micrograms per liter (µg/L)					
	Lake Havasu		San Jacinto Tunnel W. Portal		Lake Mathews	
	Month	6-Mo Range	Month	6-Mo Range	Month	6-Mo Range
May-2002	7	ND-7	7	4-7	6	ND-6
Jun-2002	6	ND-7	7	4-7	6	ND-6
Jul-2002	6	5-7	5	5-7	5	ND-6
Aug-2002	6	5-7	5	5-7	4	ND-6
Sep-2002	6	5-7	6	5-7	6	ND-6
Oct-2002	5	5-7	ND	ND-7	5	4-6
Nov-2002	4	4-6	ND	ND-7	4.2	4-6
Dec-2002	4.3	4-6	4.5	ND-6	4.1	4-6
Jan-2003	ND	ND-6	ND	ND-6	ND	ND-6
Feb-2003	4.5	ND-6	ND	ND-6	ND	ND-6
Mar-2003	5.5	ND-5.5	4.4	ND-4.5	ND	ND-5
Apr-2003	5.7	ND-5.7	4.5	ND-4.5	ND	ND-4.1
May-2003	5.3	ND - 5.7	5.4	ND - 5.4	4.3	ND - 4.3
Jun-2003	5.6	ND - 5.7	5.1	ND - 5.4	5.1	ND - 5.1
Jul-2003	5.4	4.5 - 5.7	5.3	ND - 5.4	ND	ND - 5.1
Aug-2003	5.1	5.1 -5.7	5.4	4.4 -5.4	4.5	ND - 5.1
Sep-2003	4.4	4.4 - 5.7	4.2	4.2 - 5.4	4.1	ND - 5.1

Date	Perchlorate in micrograms per liter (µg/L)					
	Lake Havasu		San Jacinto Tunnel W. Portal		Lake Mathews	
	Month	6-Mo Range	Month	6-Mo Range	Month	6-Mo Range
Oct-2003	4.2	4.2 - 5.6	ND	ND - 5.4	ND	ND - 5.1
Nov-2003	ND	ND - 5.6	ND	ND - 5.4	ND	ND - 5.1
Dec-2003	ND	5.4	ND	ND - 5.4	ND	ND - 4.5
Jan-2004	ND	ND - 5.1	ND	ND - 5.4	ND	ND - 4.5
Feb-2004	ND	ND - 4.4	ND	ND - 4.2	ND	ND - 4.1
Mar-2004	5.0	ND - 5.0	4.5	ND - 4.5	ND	ND
Apr-2004	5.6	ND - 5.6	5.8	ND - 5.8	ND	ND
May-2004	4.6	ND - 5.6	4.7	ND - 5.8	ND	ND
Jun-2004	ND	ND -5.6	ND	ND - 5.8	ND	ND
Jul-2004	ND	ND -5.6	ND	ND - 5.8	ND	ND
Aug-2004	ND	ND - 5.6	ND	ND - 5.8	ND	ND
Sep-2004	ND	ND - 5-6	ND	ND - 5.8	ND	ND
Oct-2004	ND	ND - 4.6	ND	ND - 4.7	ND	ND
Nov-2004	ND	ND	ND	ND	ND	ND
Dec-2004	ND	ND	ND	ND	ND	ND
Jan-2005	ND	ND	ND	ND	ND	ND
Feb-2005	ND	ND	ND	ND	ND	ND
Mar-2005	ND	ND	ND	ND	ND	ND
Apr-2005	ND	ND	ND	ND	ND	ND
May-2005	ND	ND	ND	ND	ND	ND

ND = Not detected at MWD perchlorate detection limit of 4 µg/L.

Source: OCWD 2005; MWD Data (Revised 10/25/2005)

The data in Table 4.2-2, together with ongoing efforts to control discharge of perchlorate to Lake Mead, indicate that perchlorate in Colorado River water does not exceed the either the PHG or the Notification Level. As noted previously, the PHG is set at a *de minimis* health level (i.e., the concentration in drinking water that does not pose any significant risk to health).

Water Quality Monitoring – Santa Ana River Source Water

The following information addresses a specific NOP comment by AC Products claiming that the use of SAR recharge water would result in hazardous substances such as pharmaceuticals, endocrine disrupters and other chemicals of concern, namely NDMA, infiltrating the drinking water aquifers. The comment further states, *"The remediation system installed by AC Products was not designed to treat these chemicals. Thus, the presence of these chemicals significantly impacts both the existing* [AC Products VOC contamination] *plume and the diverted* [AC Products] *plume."*

OCWD Monitoring Activities

Since the SAR is OCWD's primary source of recharge water, the District maintains a comprehensive monitoring program for the river. The program is important because base flow in the river is primarily from wastewater treatment plants upstream of Prado Dam, and storm flow in the river is impacted by urban and occasionally agricultural runoff. To assess water quality in the SAR, OCWD monitors the river at Imperial Highway (near the diversion of the river to the off-river recharge basins), below Prado Dam, and at several points on the river and key tributaries to the river above Prado Dam.

OCWD monitors the SAR at Imperial Highway on a regular basis for more than 100 regulated and unregulated compounds. In addition to the regulated chemicals, both EPA and DHS require monitoring for unregulated chemicals in sources of drinking water. Unregulated chemicals do not have an established drinking water standard, but are new priority chemicals of concern. OCWD samples and tests monitoring wells routinely for selected chemicals on the unregulated lists, chemicals with Notification Levels, or new chemicals of concern. Analyses for synthetic organic chemicals (SOCs) include testing for herbicides, pesticides, plasticizers, and other semi-volatile organics. General minerals, nutrients, and selected other constituents are monitored monthly, and radioactivity constituents, metals, volatile organics, and semi-volatile organics (e.g., pesticides and herbicides) are monitored quarterly.

Nitrosodimethylamine (NDMA) Background

DHS studies have found that NDMA is a wastewater disinfection byproduct that appears to be formed by several different reactions, depending on the water matrix and chemicals used (DHS 2002). This was confirmed by several water recycling agencies that have found NDMA in their plant effluents. In other studies cited by DHS, chloramination, cationic polymers, and detention times appear to be factors that may increase the levels of NDMA. Chloramination provides nitrogen species that may trigger the formation of NDMA. Some cationic polymers may be releasing precursors of NDMA into the water. In some instances in California, NDMA was found in groundwater wells that have been recharged with recycled water.

Regulatory Status in Drinking Water

According to the DHS[1], the Notification Level established by DHS for NDMA is 0.01 µg/L. NDMA is a carcinogenic chemical and DHS has also established a Response Level, or the level at which DHS recommends removal of a source from service. The Response Level for NDMA is currently 20 times the Notification Level. It is important to note that no MCL has been established for NDMA.

Presence of NDMA in Surface Water and Groundwater

OCWD conducts monitoring for NDMA in surface water at various locations, including the SAR at Imperial Highway, Anaheim Lake, and Kraemer Basin. OCWD also tests for NDMA at various groundwater monitoring wells. Concentrations of NDMA in SAR water are generally non-detect (OCWD 2004a) and are below the Notification Level in the majority of sampling instances.

Other Chemicals of Concern

The "past" emerging chemicals of concern, such as chromium-6 (CrVI), perchlorate and NDMA, are being replaced by a new wave of emerging environmental contaminants. This broad class of thousands of chemicals is composed of consumer and health-related products used daily and includes drugs (prescription and over-the-counter), food supplements, fragrances, sun-screen agents, deodorants, flavoring agents, insect repellants, and inert ingredients. This diverse group of chemicals is commonly referred to as pharmaceuticals and personal care products (PPCPs). Important classes of high use prescription drugs include antibiotics, hormones, beta-blockers (blood pressure medicine), analgesics (pain-killers), steroids, antiepileptic, sedatives, and lipid

[1] http://www.dhs.ca.gov/ps/ddwem/chemicals/AL/notificationoverview.pdf

regulators. Another class of emerging chemicals of concern includes compounds that may affect the endocrine system. These compounds, commonly referred to as Endocrine Disrupting Compounds (EDCs), may originate from the wide range of over-the-counter pharmaceuticals (cold remedies, diet supplements, etc.), pesticides, or other industrial compounds (OCWD 2004b).

Water quality concerns arise from the widespread use of PPCPs and EDCs. In most cases, the human health significance of the occurrence of these compounds at low concentrations is not known. European studies in the 1990s confirmed the presence of these chemicals in the less than one microgram per liter (µg/L) range, or one part per billion (ppb), in surface waters and groundwaters and at low concentrations in wastewater treatment plant effluents. Research investigations have documented that EDCs, when present in sufficiently high levels, interfere with the normal function of hormones that affect growth and reproduction in animals and humans. Findings of secondary sex changes, poor hatching, decreased fertility, and altered behavior are observed in fish following exposure to EDCs. A recent report by the USGS also found detectable concentrations of hormones and PPCPs in many vulnerable waterways throughout the United States (OCWD 2004b). Due to the potential impact of EDCs on future water reclamation projects, the District prioritizes tracking and awareness of these chemicals with regulatory agencies. Monitoring activities are tailored, with input from DHS, to meet the informational needs required for future reclamation projects.

In addition to routine and widespread monitoring, OCWD conducted the Santa Ana River Water Quality and Health (SARWQH) Study from 1994 to 2003 to comprehensively characterize the quality of river flows and the groundwater in the area near the recharge facilities. The multidisciplinary SARWQH Study was independently reviewed and confirms that current recharge practices using SAR water are protective of public health. The SARWQH Study and NWRI Report findings are presented below.

Santa Ana River Water Quality and Health Study

Due to the high percentage of wastewater in the SAR during non-storm periods, the SARWQH Study (OCWD 2004a) was initiated by OCWD in 1994 to further evaluate the use of the SAR to recharge the Orange County Groundwater Basin. The goals of the nearly 10-year SARWQH Study were to characterize the quality of the SAR water and the quality of the Basin it recharges, as well as to provide information on overall groundwater quality. The multi-disciplinary study design included an examination of hydrogeology, microbiology, water chemistry, organics, toxicology and public health. The SARWQH Study was subject to third-party review and guidance provided by the Scientific Advisory Panel, which was formed as an independent review panel under the auspices of the National Water Research Institute (NWRI) to provide critical assessment of the research components of the SARWQH Study. An independent Scientific Advisory Panel Report evaluating and commenting on research findings of the SARWQH Study was published by NWRI in August 2004.

The SARWQH Study and Scientific Advisory Panel Report both affirmed the overall compliance of the SAR water with the state and federal chemical drinking water standards, which indicates that the SAR recharge system provides a safe source of replenishment water for the Basin. Findings from the SARWQH Study provided information necessary for the planning and permitting of other projects, such as the Groundwater Replenishment (GWR) System currently under construction at OCWD. The results of the SARWQH Study and the NWRI Report confirm that current recharge practices using SAR water are protective of public health. Both the SARWQH Study and the NWRI Report are incorporated by reference into this EIR, and the findings that are relevant to the proposed La Jolla Recharge Basin project are summarized below.

SARWQH & NWRI Microbiology Findings

The SARWQH Study included a significant and intensive microbiology component that evaluated the sanitary quality of SAR water and the monitoring wells within the study area. A major focus was on assessing the potential vulnerability of the groundwater system to viruses, because they are more resistant to treatment than bacteria (which are usually removed by subsequent disinfection) and protozoa (which typically are removed by the natural filtering capacity of the aquifer and other mitigating factors).

Testing was conducted for coliphage and *Salmonella* phage, both of which are bacterial viruses. These organisms are considered indicators of fecal contamination and are not human pathogens. Phage were detected in 13 percent of the samples collected from the wells in the study area. There was a spatial randomness to the positive samples, and most of them occurred during or shortly after periods of heavy rainfall. Furthermore, based on the age of the groundwater, phage detection did not appear to be associated with the SAR or recharge activities of OCWD. Bacterial indicators were detected in 3 percent of the groundwater samples; however, no human enteric viruses were detected in 200 groundwater samples. Only one (a river water sample below Prado Dam) out of 100 SAR samples was positive for enteric virus.

Although 40 groundwater samples from monitoring wells were analyzed for protozoa, only one was positive for *Giardia* and two were positive for *Cryptosporidium*. The protozoan cysts detected in groundwater contained no internal structures and were considered nonviable. Protozoan pathogens were detected in eight out of 105 samples of SAR water, none of which were considered viable.

The NWRI Panel concluded, based on the microbial studies, that:

- The SAR does not represent a significant source of human pathogens in the recharge aquifer and, concomitantly, the health risk associated with groundwater recharge using SAR water is small;
- The groundwater in the SARWQH Study area is vulnerable to microbial contamination, as indicated by the occasional presence of coliphage; and
- The source of the coliphage in groundwater samples is unknown, though likely of fecal bacterial origin and could be from sources such as leaking sewers rather than from the SAR or associated recharge activities.

SARWQH & NWRI Organics and Water Chemistry Findings

In the SARWQH Study, OCWD employed analytical and monitoring approaches to identify unknown dissolved organic carbon (DOC), as well as previously identified synthetic organic chemicals known to be in wastewater. OCWD obtained research expertise from scientists at Stanford University, the United States Geological Survey, and Lawrence Livermore National Laboratory. Their efforts resulted in the classification of a substantial majority (perhaps greater than 90 percent) of organic matter in the SAR and recharge system. In addition, the isolation and classification schemes provided information on the relationship of compound classes to their probable origins. The NWRI Panel concluded that this research would be widely assimilated in future recharge studies and in the broader field of aquatic geochemistry.

The Panel concluded that most of the organic carbon in the SAR, recharge basins, and groundwater near the recharge basins is of natural origin. Radiocarbon and chemical classification studies determined that an approximate upper limit of 20 to 25 percent of the DOC entering the Anaheim Lake recharge basin, after significant pretreatment, is of anthropogenic origin and consists mostly of metabolites of linear alkylbenzene sulfonate (LAS) detergents and surfactants. Metabolites of LAS and other specific wastewater indicators (also of detergent origin) were found in lower concentrations in the SAR than in treatment plant effluents, with further decreases occurring after passage through the recharge basin sediments and subsequent groundwater flow.

Based on the organic water quality research, it was concluded that some waste-related organic materials do reach the Forebay groundwaters and, therefore, serve as markers of the incursion of wastewater. However, no chemicals of wastewater origin were identified at concentrations that are of public health concern in the SAR, in water in the infiltration basins, or in nearby groundwaters. The SARWQH Study also showed that the water quality improvements that occur during recharge and groundwater flow produces a quality and composition of DOC in groundwater that is comparable to other sources of drinking water, such as the Colorado River. The facilities and mechanisms currently employed for recharge by OCWD have proven effective for removing a significant percentage of organic material in recharge water. For example, the organic carbon in SAR water is reduced by approximately 50 percent during infiltration and one month of subsurface flow time.

SARWQH & NWRI Toxicology and Health Findings

The toxicology efforts largely focused on the extent to which the chemical and biomonitoring data derived from the SARWQH Study provided evidence that water from SAR recharge activity could impact human health when consumed upon withdrawal for potable purposes. The NWRI Panel recognized that considerable assurance is provided that the water is safe when analyzing water for contaminants identified in:

- Standards;
- Lists of priority pollutants;
- Measures of unregulated chemicals identified in municipal wastewater (e.g., pharmaceutically active compounds); and
- General measurements of water quality.

However, while highly unlikely, there remains the theoretical possibility of chemicals that may not have been detected, even with the most modern analytical methods. Therefore, the NWRI Report states that continuing emphasis needs to be placed on using appropriate treatment technology and on implementing an ongoing monitoring effort that focuses on the potential for new or emerging contaminants introduced into the water and carried to the consumer at levels of potential public health concern.

At the beginning of the SARWQH Study, considerable uncertainty existed about the identity of most of the organic chemicals in drinking water. The NWRI Panel encouraged OCWD to continue an ongoing monitoring program and to consider bio-monitoring approaches (e.g., fish bioassays) to provide additional assurance that chemicals of potential health importance that were not included in the analytical scheme would not go undetected.

Overall Conclusions and Findings

Constituents including non-regulated chemicals (e.g., pharmaceutically active chemicals) and contaminants of concern (e.g., NDMA) were considered during the course of the SARWQH Study. The classification of the major components of DOC and the transformations that occur within these chemical classes as water moves downstream and into the aquifer provided significant new evidence to support the conclusion that the product water is suitable for potable consumption and is also becoming comparable to other sources of drinking water, such as the Colorado River, in its organic profile.

The NWRI Report found that the level of treatment provided for wastewater discharged to the SAR is based on the beneficial uses of the river, in particular, body contact recreation (see previous discussion of Water Quality Control Plan for the Santa Ana River Basin). The level of treatment is sufficient to provide water that is adequately oxidized, coagulated, clarified, filtered, and disinfected (tertiary treated wastewater). The degree of treatment is capable of reducing concentrations of viruses in the water by approximately 5 orders of magnitude (100,000 times less), resulting in "essentially virus-free water" in accord with California Water Recycling Criteria (Title 22, Division 4, Chapter 3, California Administrative Code).

Based on the scientific data collected during the SARWQH Study, the Panel found that:

- The SAR met all water-quality standards and guidelines that have been published for inorganic and organic contaminants in drinking water.
- No chemicals of wastewater origin were identified at concentrations that are of public health concern in the SAR, in water in the infiltration basins, or in nearby groundwaters.
- Water quality in the SAR will continue to change, and these changes may influence OCWD recharge operations.
- Emerging chemical and microbiological constituents of concern (non-regulated and previously unidentified) will require continued surveillance.
- OCWD should continue to monitor the quality of SAR water and groundwater for chemical and biological constituents of public health concern.

North Basin Groundwater Protection Project

OCWD has an aggressive VOC monitoring program in the Forebay in areas where VOC contamination of the groundwater was known or suspected at concentrations above drinking water standards. Since 1989, over 40 monitoring wells have been installed to determine the lateral and vertical extent of VOC-impacted groundwater. Based on monitoring data, the VOC contamination plume included the primarily industrial area north of the 91 Freeway and west of the 57 Freeway, within a mile or so of the proposed La Jolla Recharge Basin site. Within this area are facilities that have a history of using chlorinated solvents (i.e., trichloroethylene [TCE] and PCE) and/or have documented release of VOCs that have impacted groundwater. The VOC contamination plume is primarily confined to the shallowest aquifer, which is generally less than 200 feet deep; however, hydrogeologic data indicate a potential for VOC-impacted groundwater to move down into deeper aquifers tapped by existing production wells. To minimize the spread of VOC contamination and risk to production wells, OCWD is implementing the North Basin Groundwater Protection Project. The project will extract groundwater and reduce VOC concentrations to below drinking water standards by one or more proven VOC treatment methods, such as Advanced Oxidation Treatment or air stripping. The North Basin Groundwater Protection Project is an example of OCWD's commitment to the capture and treatment of groundwater contamination in the Basin as a whole, and the importance of groundwater resources in the project vicinity.

4.2.2 IMPACT SIGNIFICANCE CRITERIA

The California Environmental Quality Act (CEQA) Appendix G (i.e., Environmental Checklist) outlines the significance criteria against which the project is measured for hydrogeology and groundwater quality impacts. The proposed project would result in significant adverse environmental impacts if any of the following occur:

Groundwater Supply

- *The project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).*

Groundwater Quality

- *The project would violate any groundwater quality standards, or otherwise substantially degrade groundwater quality.*

4.2.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.2.3.1 Groundwater Supply and Basin Recharge Capacity

- *The project would not deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.*

OCWD chose the La Jolla Recharge Basin site because of its recharge capacity and potential to increase groundwater supplies. The Engineer's Report discussed the on-site soils and geologic conditions that are conducive to groundwater recharge (refer to Section 4.8, Geology and Seismicity, for discussion). Subsurface investigations (England 2002/2003) on the project site and nearby properties also confirm that the soil types encountered support the use of the site as a recharge basin.

Nearby Kraemer Basin was also used for comparative purposes to determine the potential recharge capacity of the proposed recharge basin. The District constructed Kraemer Basin as a recharge basin in the late 1980s. Water for recharge is provided from the Anaheim Lake Pipeline, which can provide SAR or imported water. River water that reaches Kraemer Basin has typically passed through several other basins, which allows much of the silt and other particulates to settle out before reaching Kraemer. This results in cleaner water for recharge and longer operations before cleaning is required. This is the same process that would be used for proposed La Jolla Recharge Basin.

Kraemer Basin's recharge capacity was evaluated based on data available from July 2000 through June 2001, a period during which Kraemer Basin had water most of the year. Data for that period show that the percolation rate is over 100 cfs when the basin is clean and full, and drops off to 20 cfs when dirty and the basin is being emptied. The annual average rate of recharge is in the range of 60 cfs, which equates to a value of 120 acre-feet per day of recharge. If that recharge is uniform over the entire area of Kraemer Basin's 31 acres, then the amount of water that is "sunk" into the ground is 120 acre-feet divided by 31 acres, which is 3.9 feet of water each day, on average, through each acre of basin. Assuming the same average recharge rate of 3.9 feet per day at the nearly 6-acre La Jolla Recharge Basin, the recharge at La Jolla would be approximately 23.4 acre-feet per day, on average. Over one year's time, this would equate to approximately 8,500 acre-feet of recharge. In addition to the estimated recharge rate, it is assumed that the La Jolla site could actually recharge more because the shallow basin is planned to be cleaned up to three times per year, compared to two cleanings at Kraemer, which is much deeper and more difficult to empty and clean. More frequent cleaning will allow La Jolla Basin to maintain a higher average percolation rate. Therefore, based on geology and the capability of nearby Kraemer Basin, it is assumed that the proposed La Jolla Recharge Basin could recharge up to 9,000 acre-feet per year of water.

4.2.3.2 Construction-Related Water Quality Impacts

Remediation of Contaminated Soils

- *The project would not violate any groundwater quality standards, or otherwise substantially degrade groundwater quality.*

The purpose of the project is to increase groundwater supplies through groundwater recharge of surface water. The proposed project would involve recharging diverted SAR water and imported MWD water into the groundwater aquifer, consistent with and similar to on-going District activities in the Orange County Groundwater Basin. If contaminated surface soils were present on-site and left unmitigated, the proposed recharge operations could potentially transport the contamination into the groundwater aquifer. However, the Phase II ESA (England 2003) found only low residual concentrations of pesticides and degradation products in on-site soils, and petroleum hydrocarbons were not detected in any of the soil samples. Despite the lack of evidence suggesting soil contamination, the District will implement the mitigation measures identified in Section 4.3 (Hazards and Hazardous Materials) and 4.5 (Air Quality), which would ensure monitoring during construction and, if necessary remediation of previously undetected contamination in soils prior to beginning recharge operations. As a result, no impacts to groundwater quality are expected to result from the project, and no adverse impacts to water quality standards or discharge requirements would occur. By removing a potential source of contamination, the proposed project would have a beneficial effect on local groundwater quality.

4.2.3.3 Potential Impacts from Recharge Water Sources

- *The project would not violate any groundwater quality standards, or otherwise substantially degrade groundwater quality.*

Area of Controversy

Section 4.2.1.6 (OCWD Groundwater Quality Programs) previously described several issues raised by AC Products during the comment period for the Notice of Preparation for this EIR. The NOP comments specifically challenged the use of SAR recharge water on grounds that it would result in hazardous substances such as pharmaceuticals, endocrine disrupters and other chemicals of concern, namely NDMA, infiltrating the drinking water aquifers. The comments also focused on MWD recharge water from the Colorado River, claiming that it contains perchlorate and that its use could have significant effects on drinking water supplies. Ultimately, the comments about recharge water quality claimed, *"The remediation system installed by AC Products was not designed to treat these chemicals. Thus, the presence of these chemicals significantly impacts both the existing* [AC Products VOC contamination] *plume and the diverted* [AC Products] *plume."*

Section 4.2.1.6 described how OCWD extensively monitors the quality of the waters recharged into the Orange County Groundwater Basin, including source water from the SAR and imported water from MWD. The data and analyses demonstrate that the SAR and MWD recharge water sources meet all federal and state water quality standards, and that no significant adverse environmental or public health impacts would result from the use of those recharge sources. Likewise, the following discussions summarize the previous data and studies and relate them to the issues raised during the NOP comment period.

Issue Analysis

Overview of Basin Monitoring

The proposed recharge basin project would not contribute to groundwater contamination resulting from poor source water quality since OCWD will not knowingly recharge water with concentrations of contaminants above the Notification Levels or the future MCLs. The source water will be primarily SAR water occasionally blended with water supplied from MWD. As indicated previously, much of the SAR base flow during summer months is tertiary treated wastewater from treatment facilities in San Bernardino and Riverside counties. OCWD has been recharging the Orange County Groundwater Basin with SAR water since 1933. This longstanding practice is consistent with the OCWD's primary mission, which is to ensure that water quality is maintained in the Basin. That mission is reflected in the District's *Groundwater Management Plan* (Section 6), which states the goal that all water recharged into the Basin through OCWD facilities meet or be better than the DHS's MCLs and Notification Levels. Presently, more than 100 regulated and unregulated chemicals are monitored at a specified monitoring frequency established by regulation and listed in Table 3-2 of the GWMP. The Basin is continuously monitored for the regulated chemical classes. Typically, about one-third of the drinking water wells are sampled every year for general minerals, trace metals, and secondary MCL constituents (color, odor, TDS, sodium, chloride, alkalinity, etc.). VOCs and nitrates are sampled annually at every well.

The source water to be used in the La Jolla Recharge Basin is the same water as is used in the neighboring OCWD recharge basins in Anaheim. As demonstrated below, the recharge water sources used by OCWD, whether from the SAR or MWD (via the State Water Project or the Colorado River), currently meet all regulatory standards and would not introduce new chemicals into, or otherwise degrade water quality in, the local groundwater aquifer.

Perchlorate Effects

The data in Table 4.2-2 previously indicated that perchlorate concentrations in MWD water supplied to OCWD do not exceed either the PHG or the Notification Level. As noted previously, the PHG is set at a *de minimis* health level (i.e., the concentration in drinking water that does not pose any significant risk to health).

Despite the presence of low levels of perchlorate in some Orange County drinking water wells, the proposed La Jolla Recharge Basin project would not exacerbate any existing conditions. Although Colorado River water could be a component of the water supplied by MWD, OCWD continues to monitor perchlorate concentrations in MWD water and would not recharge any MWD water with concentrations above the Notification Levels or the future MCLs. Current monitoring data emphasizes the safety of imported water from MWD, particularly as it pertains to perchlorate. Therefore, no significant health or environmental effects will result from the use of MWD recharge water in the proposed recharge basin.

NDMA Effects

As with MWD water, OCWD would not knowingly recharge SAR water with contaminant concentrations above the Notification Levels or the MCLs. OCWD diligently monitors SAR source water quality to ensure that it meets all State and federal groundwater recharge standards. Additionally, OCWD's SARWQH Study and NWRI's peer review findings confirm that chemicals of wastewater origin have not been identified at concentrations that are of public health concern in the SAR, in water in the recharge basins, or in nearby groundwaters.

Given OCWD's limited sources for groundwater replenishment, the same recharge water to be used for the proposed project is already present throughout the Orange County Groundwater Basin. The site is located in the Forebay, where existing recharge facilities both up- and down-gradient of the proposed La Jolla facility have been recharging the Basin for years. The proposed project will supplement current recharge rates with water that has been used by OCWD for decades. The project itself would neither introduce new chemicals of concern to any portion of the Basin, nor would it create groundwater quality impairment where none currently exists. OCWD's recharge facilities and groundwater and surface water monitoring programs are state-of-the-art and are the most feasible way of ensuring present and future groundwater quality and quantity.

In light of the preceding information, no significant health or environmental effects are reasonably anticipated to result from OCWD's continued use of SAR and MWD source waters in groundwater replenishment operations. With specific regard to the NOP comments, and considering the groundwater modeling results presented in the following section, the La Jolla Recharge Basin would not adversely affect AC Products' existing contaminant plume. Neither the quantity nor the quality of project-related groundwater recharge would interfere with, or limit the effectiveness of, AC Products' ongoing remediation activities. Accordingly, project impacts are found to be less than significant.

4.2.3.4 Potential Contaminant Transport Effects

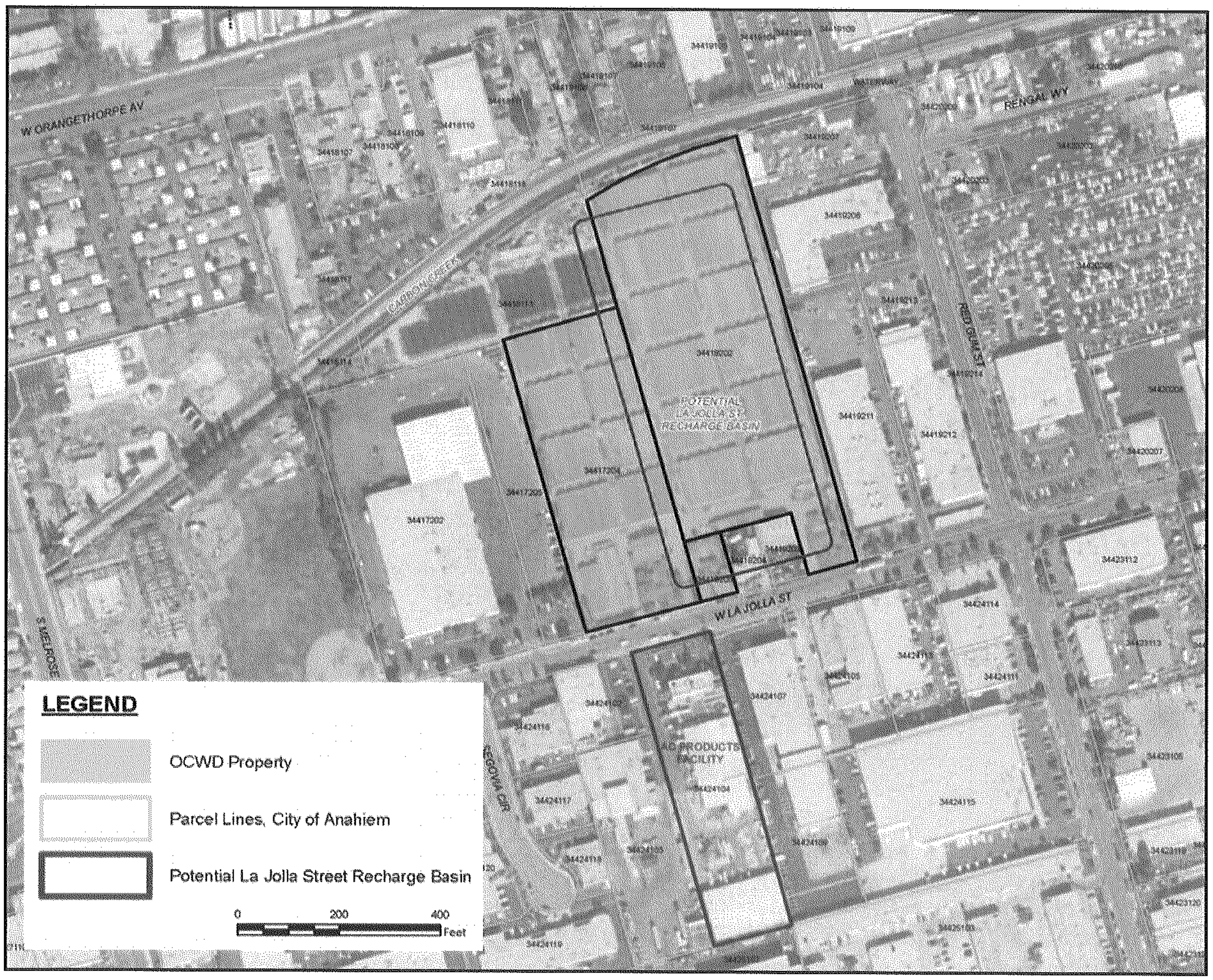
<u>Area of Controversy</u>

AC Products operates a maskant and adhesive facility at 172 E. La Jolla in Placentia, California (see Figure 4.2-5). This facility is located on the opposite side of La Jolla Street from the site. The release of certain volatile organic compounds (VOCs) from the AC Products facility is estimated to have occurred in 1988 and has contaminated the underlying groundwater. The dissolved VOC contaminants have moved approximately two miles downgradient (westward) in groundwater. The VOC pollution detected in groundwater beneath the AC Products facility includes PCE as the principal compound, and lesser amounts of TCE and 1,1-DCE. In September 1995, AC Products implemented a groundwater extraction program. However, recent data show residual PCE at concentrations as high as 93 micrograms per liter (µg/L) downgradient of the AC Products site (Rubicon 2005). The current MCL for PCE is 5 µg/L.

Groundwater movement affects contaminant transport, and previous groundwater flow modeling in 2003 indicated the potential for altering the path of the AC Products VOC contamination plume and for increasing downward migration of VOC contamination into the Shallow Aquifer (Rubicon 2005). However, the District's 2003 flow path analysis was based on advective[2] transport only and did not consider the effects of other transport mechanisms. Based on those previous findings, AC Products' comments on the NOP for this EIR include concerns about the

[2] Advective: As used, the horizontal and vertical movement of a mass of fluid (e.g., groundwater), as well as transport (as of pollutants) by such movement.

proposed recharge basin's effects on the VOC contamination plume caused by AC Products. Several of AC Products' comments asserted that the recharge basin project could cause VOC-contaminated groundwater, some of which presently is being captured, remediated and restored to the aquifer by AC Products, to be diverted into unaffected portions of the shallow and deeper aquifers. The comments further claimed that once it has been diverted, it might not be possible to adequately monitor, extract or treat the contaminated groundwater, nor could it be done at a cost that is feasible.



Source: Rubicon 2005

Figure 4.2-5 ***AC Products Facility Location***

District Response to NOP Comments

The proposed groundwater recharge project will facilitate the natural percolation of SAR and MWD water and does not, in and of itself, create any groundwater contamination impacts. The existing groundwater contamination impact was caused by the improper discharge of contaminants to the Orange County Groundwater Basin by AC Products over a period of time. AC Products' installation of monitoring and extraction wells, and a treatment system, is an acknowledgement that AC Products caused the groundwater contamination plume in the vicinity of the proposed project. Under federal and State law, AC Products has the responsibility to remediate this groundwater contamination. Neither the location nor the development and operation of an otherwise lawful, non-contaminating groundwater recharge basin affects responsibility for the cleanup.

In 2003, OCWD evaluated the proposed recharge basin and its potential effects on the AC Products contaminant plume, relying on the previously described advective transport model which indicated the potential for altering the path of the plume and for increasing downward migration of VOCs. However, the pollutant flow path model that was used to estimate impacts did not consider the effects of other transport mechanisms. Due to the limitations inherent in the 2003 transport model, and in order to address a known public concern, a more comprehensive and refined groundwater and contaminant transport modeling effort was conducted in 2005. As detailed below, the updated modeling study quantifies and predicts the project-related effects on VOC concentrations and plume movement. The modeling data show an insignificant project-induced directional change in the existing AC Products VOC contamination plume. The modeling summary in the following sections concludes that the recharge basin would not adversely affect the existing contaminant plume, nor would it interfere with AC Products' ongoing remediation activities. Accordingly, project impacts are found to be less than significant.

La Jolla Recharge Basin Groundwater Flow and Solute Transport Model

In order to more thoroughly document the proposed project's effects on groundwater flow and solute transport, OCWD contracted with Rubicon Engineering Corporation to develop a numerical model of groundwater flow and contaminant transport. Specifically, numerical model simulations were conducted to quantitatively assess the effects of the proposed recharge on the PCE groundwater contaminant plume originating from the AC Products facility. The Rubicon modeling study and Geomatrix's summary of that report serve as the basis for the following analysis. Conclusions are also based on the existing record of data for the local basin as managed by the District since 1933. Findings and recommendations are founded on the District's specific expertise with regard to the local groundwater, including groundwater model development, water level data collection, and flow direction analysis.

Groundwater Flow Modeling Background

In general, a groundwater flow model contains two major components: the conceptual model and the mathematical model. The conceptual model is the hydrogeologic framework of the area being modeled, obtained by gathering, analyzing, interpreting, and finally integrating all the geologic and hydrologic data for a given area into a conceptual understanding of how the flow system looks and behaves. The mathematical model is based in the conceptual model and includes the complex system of equations that govern the flow of groundwater and contaminants, as well as the computer program used to solve the equations. Before a groundwater model can be reliably used as a predictive tool for simulating future conditions, the model must be calibrated to reach an acceptable match between simulated and actual observed conditions. A detailed description of the District's groundwater model for the Basin can be found in Section 2.4 of the *Groundwater Management Plan* (OCWD 2004b).

Model Input Parameters

Rubicon developed a local groundwater flow model and a solute transport model to simulate the potential impact of future groundwater recharge activities on the AC Products VOC contamination plume. The Rubicon local groundwater flow model was developed based on OCWD's basin-wide regional groundwater flow model constructed by OCWD and which utilizes the U.S. Geological Survey's Three-Dimensional Finite-Difference Modular Ground-Water Flow code (MODFLOW). Rubicon performed contaminant transport modeling using the numerical code MT3DMS, which uses the same finite difference model numerical grid of the MODFLOW code. Both MODFLOW and MT3DMS models are widely accepted and used by groundwater professionals for numerical simulation of groundwater flow and transport of chemicals in groundwater.

The Rubicon local groundwater flow model is a refined and updated version of a previous local flow model developed by England Geosystem, Inc. As such, the subsurface hydrogeologic units, the aquifer systems, and the input and output parameters of the OCWD regional and the previous local groundwater flow models have been used in developing the Rubicon local groundwater flow model. However, the previous local groundwater flow model was a "steady-state flow" simulation (i.e., it had one set of flow conditions, including regional flow gradients and directions, extraction and recharge rates). The refined model (Rubicon flow model) has been changed to a "transient flow" model to accommodate varying pumping conditions and movement of the AC Products contamination plume over time. Transient flow is the unsteady flow during a change from a steady-flow state to another steady-flow state. The District's use of transient modeling has substantially improved the overall understanding of processes and conditions that determine how the Basin reacts to pumping and recharge. This improved understanding, coupled with the model's ability to simulate existing and possible future facilities and alternative operations, significantly improves the District's potential ability to enhance and actively manage Basin water resources (OCWD 2004b).

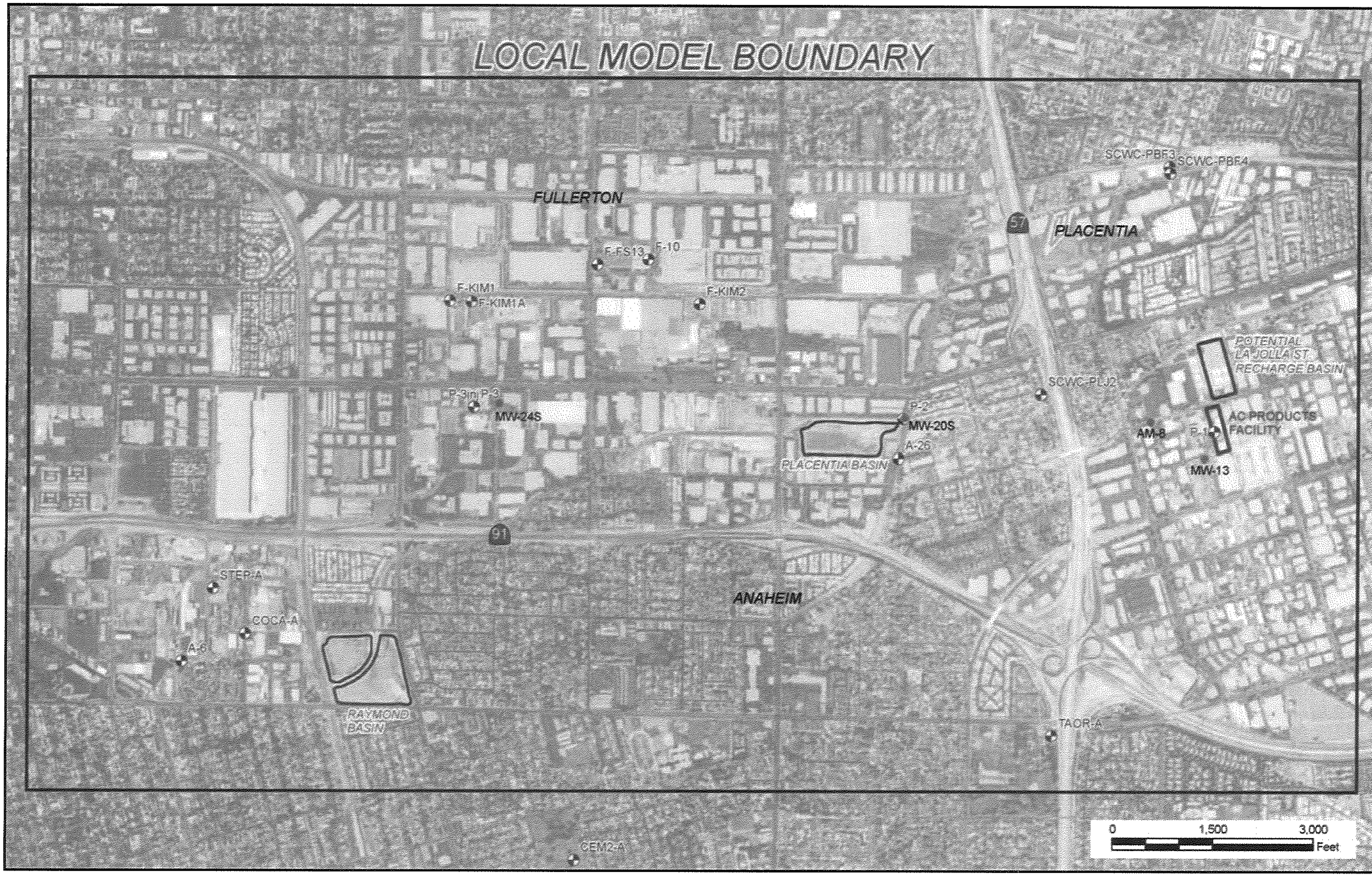
Model Area Characteristics

Figure 4.2-6 shows the Rubicon model area, or "domain". The model area is 3.5 miles east-west by 1.9 miles north-south and includes the proposed La Jolla Recharge Basin, the AC Products VOC contamination plume, two existing flood control basins (the Placentia and Raymond Basins), and active groundwater production and extraction wells.

Based on current knowledge of the underlying aquifer, the vertical layering of the previous local model has been modified from five layers in the initial local flow model to 17 layers in the Rubicon model (see Figure 4.2-7) to allow refined simulation of the potential downward movement of VOCs. Layers 1 through 5 of the Rubicon model are assigned to the Shallow Aquifer; layers 7 through 15 to the Principal Aquifer; and layer 17 to the Deep Aquifer system. The layers representing these aquifers are separated by layers of lower permeability aquitards (represented by layers 6 and 16). The thicknesses of the aquitards vary from place to place within the modeled area. Specifically, the aquitard separating the Shallow and the Principal Aquifers thins in the vicinity of the proposed La Jolla Recharge Basin.

Model Calibration

Model calibration involved analysis of hydraulic parameters, sources and sinks, and initial and boundary conditions. The local model simulation reproduced Principal Aquifer head values generated from the regional model. The modeled water levels produced for the Shallow Aquifer for the May 31, 1998 simulation date were compared to those generated during AC Products' site investigation and monitoring of June 9, 1998. The hydraulic conductivities and boundary conditions of the local model Layer 1 were adjusted to match the water levels in the Shallow Aquifer. The boundary conditions of the Rubicon model were set as constant value, specified head and adjusted to produce flow directions that conform to the observed regional flow direction of the Shallow Aquifer. Other dynamic factors such as the simulated production well extraction rates, and the water recharge at the Placentia Basin were varied to reflect historical data. The hydraulic conductivities of Layer 1 of the local model were adjusted until the measured hydraulic gradient determined from AC Products' June 9, 1998 water level measurement was matched. The initial runs showed extremely close matching with the head values generated during the May 1998 stress period of the regional model.

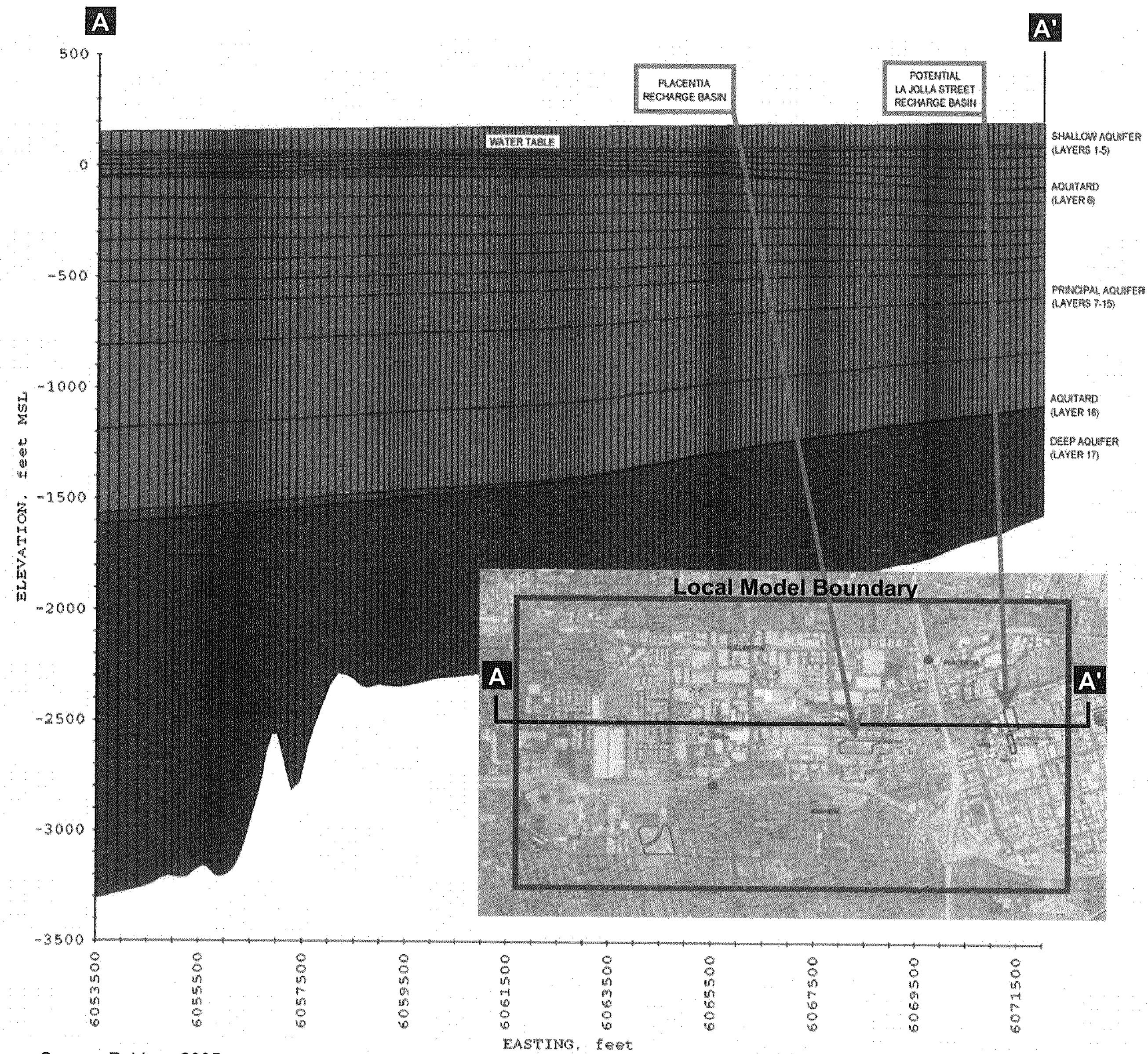


Source: Rubicon 2005

Selected Monitoring Well Location

Potential La Jolla Street Recharge Basin

Figure 4.2-6 ***Local Groundwater Model Domain***



Source: Rubicon 2005

Figure 4.2-7 ***Local Model Aquifer Layers***

The simulation time period extends from January 1988 (the assumed time when the Shallow Aquifer first became impacted by VOCs at AC Products) to January 2016, for a total simulation period of 28 years. Groundwater recharge to the proposed La Jolla Recharge Basin is assumed to begin in January 2006. Thirteen production wells within the model domain were active from 1988 through 2003. In addition, three extraction wells (P-1, P-2, and P-3) were installed by AC Products in the Shallow Aquifer as part of its groundwater remediation program. Consequently, potential effects of groundwater extraction and mass removal of VOCs have been accounted for in the Rubicon model. Basin recharge rates were varied over time to reflect recorded historical values.

Model Simulation Scenarios

The Rubicon report presents three transient model simulation scenarios. Rubicon simulated the effects of future recharge activities at the proposed La Jolla Recharge Basin on the AC Products PCE contamination plume under the scenarios of zero recharge, 4,500 acre-ft/year recharge, and 9,000 acre-ft/year recharge, all starting in January 2006. All boundary conditions were kept unchanged, and the three scenarios differ only in the modeled recharge to the proposed La Jolla Recharge Basin, as follows:

- Scenario 1: The first scenario is a baseline simulation that involves no recharge in the La Jolla Recharge Basin. This scenario is intended to predict groundwater flow and PCE transport under conditions of no groundwater recharge at the La Jolla Basin.
- Scenario 2: The second scenario is based on OCWD's best estimate of the recharge rate, which involves a constant recharge of 4,500 acre-ft/year (corresponding to 2.05 feet per day recharge over 6 acres), starting in January 2006.
- Scenario 3: The third scenario is based OCWD's estimate of maximum recharge conditions of 9,000 acre-ft/year (4.1 ft/day), which will require continuous operation and cleaning.

Although the simulated hydraulic head values vary throughout the modeled period in response to varying extraction and recharge rates, the regional flow direction in the Shallow Aquifer remains westward. Also, the potentiometric surface of the Principal Aquifer slopes toward the southwest during all simulations, indicating a southwesterly flow direction (see Figures 8 through 16 in Appendix 9.3). A local groundwater mound appears corresponding to the recharge activities in the Placentia basin.

As indicated previously, Rubicon used the numerical code MT3DMS to simulate movement of the PCE plume originating at the AC Products site. This transport model is capable of utilizing the finite difference model grid and other elements of the MODFLOW groundwater flow model. The simulated extents of the above-MCL PCE plume in the Shallow and Principal Aquifers are shown on Figure 4.2-8 for an assumed January 2006 start date of recharge.

Calibration of the transport model was performed by varying different fate and transport parameters (i.e., advection, dispersion, adsorption, decay) to match the historical concentrations of PCE detected in selected AC Products groundwater monitoring wells. To be conservative, Rubicon assumed that no PCE degradation occurs during the simulation period. One of the monitoring wells (MW-20S) selected for the model calibration is located in an area that is expected to be highly influenced by the future recharge activities at the La Jolla Recharge Basin. As part of the calibration process, a PCE source concentration of 35,458 μg/L has been assigned for January 1988, the beginning of the simulation period. This source concentration was logarithmically reduced with time to 100 μg/L in 2005 and 10 μg/L in 2011 to match the observed historical concentrations in downgradient wells.

<u>Groundwater Flow and Solute Transport Modeling Results</u>

Scenario 1 -- No Recharge from La Jolla Recharge Basin

Observation of the simulated head values for the first scenario (i.e., no recharge from La Jolla Basin) indicates that beneath the proposed recharge basin, where the aquitard separating the Shallow and Principal Aquifers is thin or absent, no significant vertical gradient exists between those two aquifers. However, a vertical downward gradient or an aquitard is evident farther west and away from the La Jolla Basin, where the aquitard underlying the Shallow Aquifer thickens.

This indicates that the hydraulic head in the Shallow Aquifer and the Principal Aquifer beneath the proposed project site are approximately equal under conditions of no recharge from the La Jolla Recharge Basin.

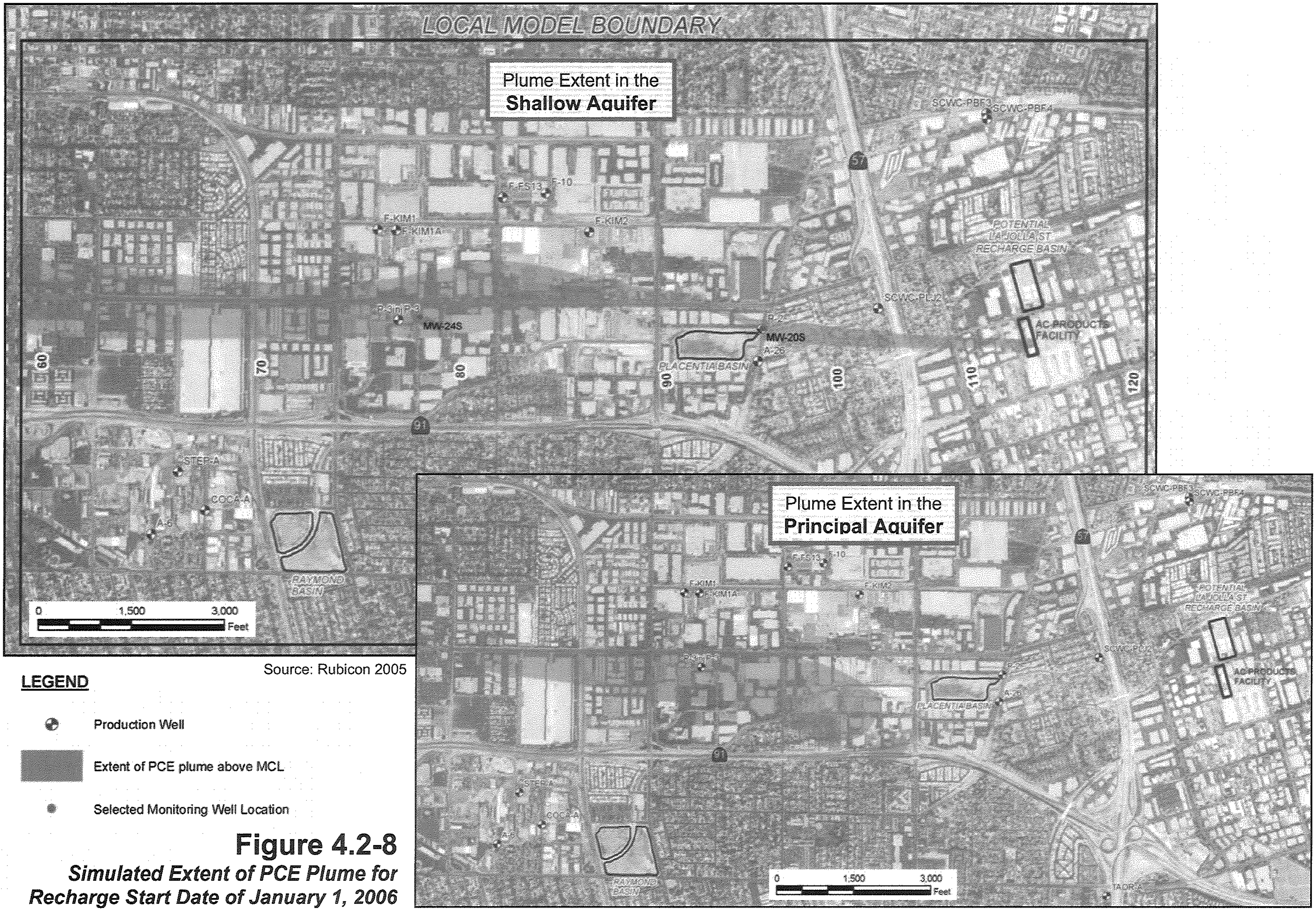
Under the zero recharge scenario, simulated PCE concentrations in the Shallow Aquifer near Well MW-20S decrease gradually. However, PCE continues to be present through the end of the simulation (year 2016), as depicted on Figure 4.2-9. For the 4,500 and 9,000 acre-ft/year scenarios, simulated PCE concentrations near well MW-20S decrease more rapidly due to dilution and plume redirection, as described below.

Scenario 2 -- 4,500 acre-ft/year Recharge from the La Jolla Recharge Basin

The influence of recharging 4,500 acre-ft/year at the La Jolla Recharge Basin is evident as a hydraulic mound is developed beneath the basin in the Shallow Aquifer. For this scenario, simulated PCE concentrations near well MW-20S decrease more rapidly due to dilution and plume redirection. Under this recharge scenario, the simulated area of the Shallow Aquifer containing PCE concentrations greater than its MCL of 5 µg/L is translated southward by approximately 225 feet as a recharge rate of 4,500 acre-ft/year is applied in the proposed La Jolla basin beginning in January 2006 (see Figure 4.2-10). However, the modeling indicates that the anticipated future recharge activities would have no effect on the PCE concentrations or movement in the Principal Aquifer. The modeling results indicate that no new, above-MCL PCE plume appears in the Principal Aquifer near the AC Products facility as a result of the proposed recharge at the future La Jolla Recharge Basin.

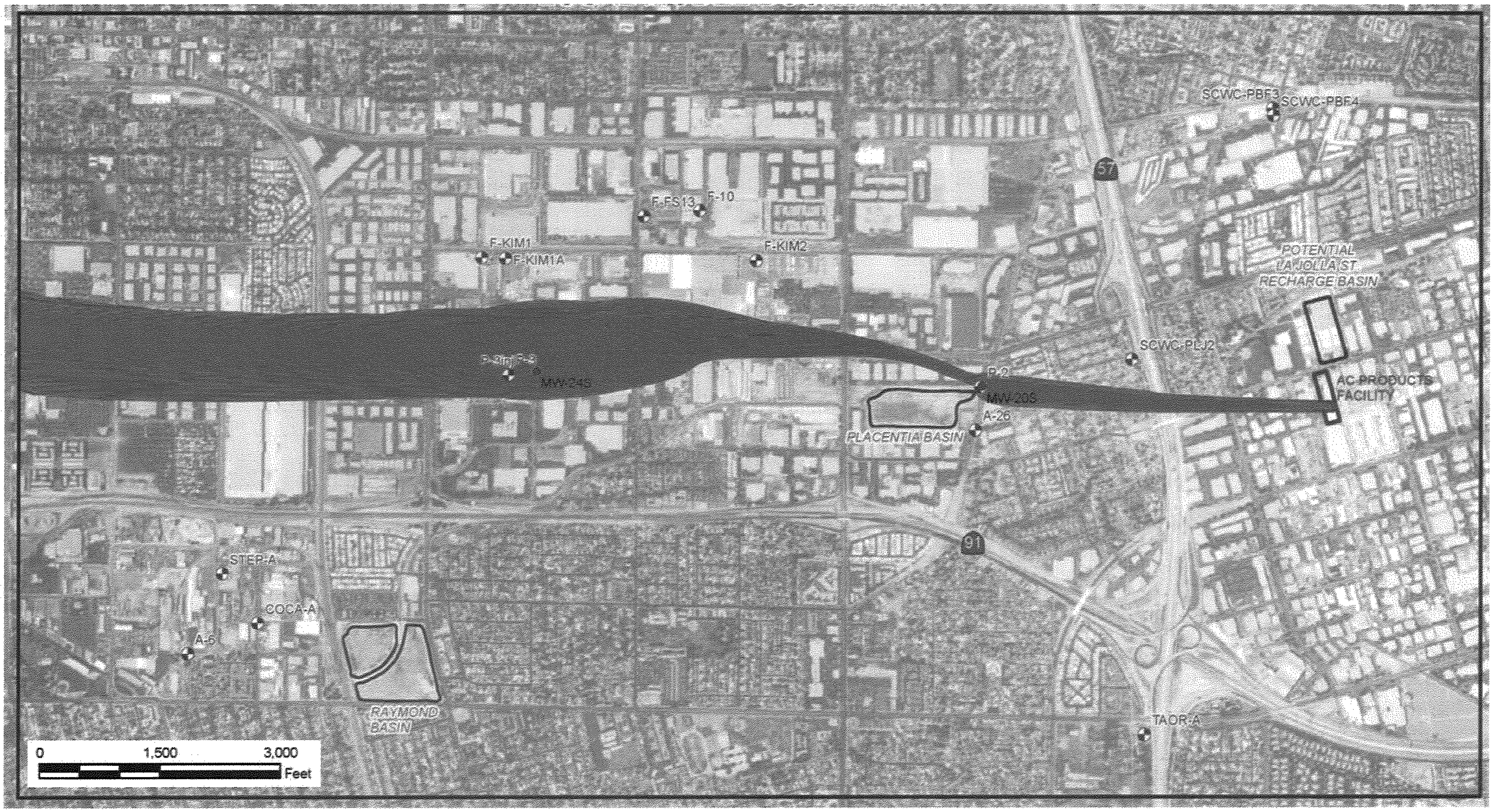
Scenario 3 -- 9,000 acre-ft/year Recharge from La Jolla Recharge Basin

Although more pronounced than Scenario 2, the influence of recharging up to 9,000 acre-ft/year at the La Recharge Jolla Basin is also evident as a hydraulic mound in the Shallow Aquifer is developed beneath the basin. For this scenario, simulated PCE concentrations near well MW-20S decrease more rapidly due to dilution and plume redirection, also similar to Scenario 2. Under this recharge scenario, the simulated area of the Shallow Aquifer containing PCE concentrations greater than its MCL of 5 µg/L is translated southward by approximately 380 feet as a recharge rate of 9,000 acre-ft/year is applied in the proposed La Jolla basin beginning in January 2006 (see Figure 4.2-11). Again, the modeling indicates that the anticipated future recharge activities would have no effect on the PCE concentrations or movement in the Principal Aquifer. The modeling results indicate that no new, above-MCL PCE plume appears in the Principal Aquifer near the AC Products facility as a result of the proposed recharge at the future La Jolla Recharge Basin.



Source: Rubicon 2005

Figure 4.2-8
Simulated Extent of PCE Plume for Recharge Start Date of January 1, 2006



Source: Rubicon 2005

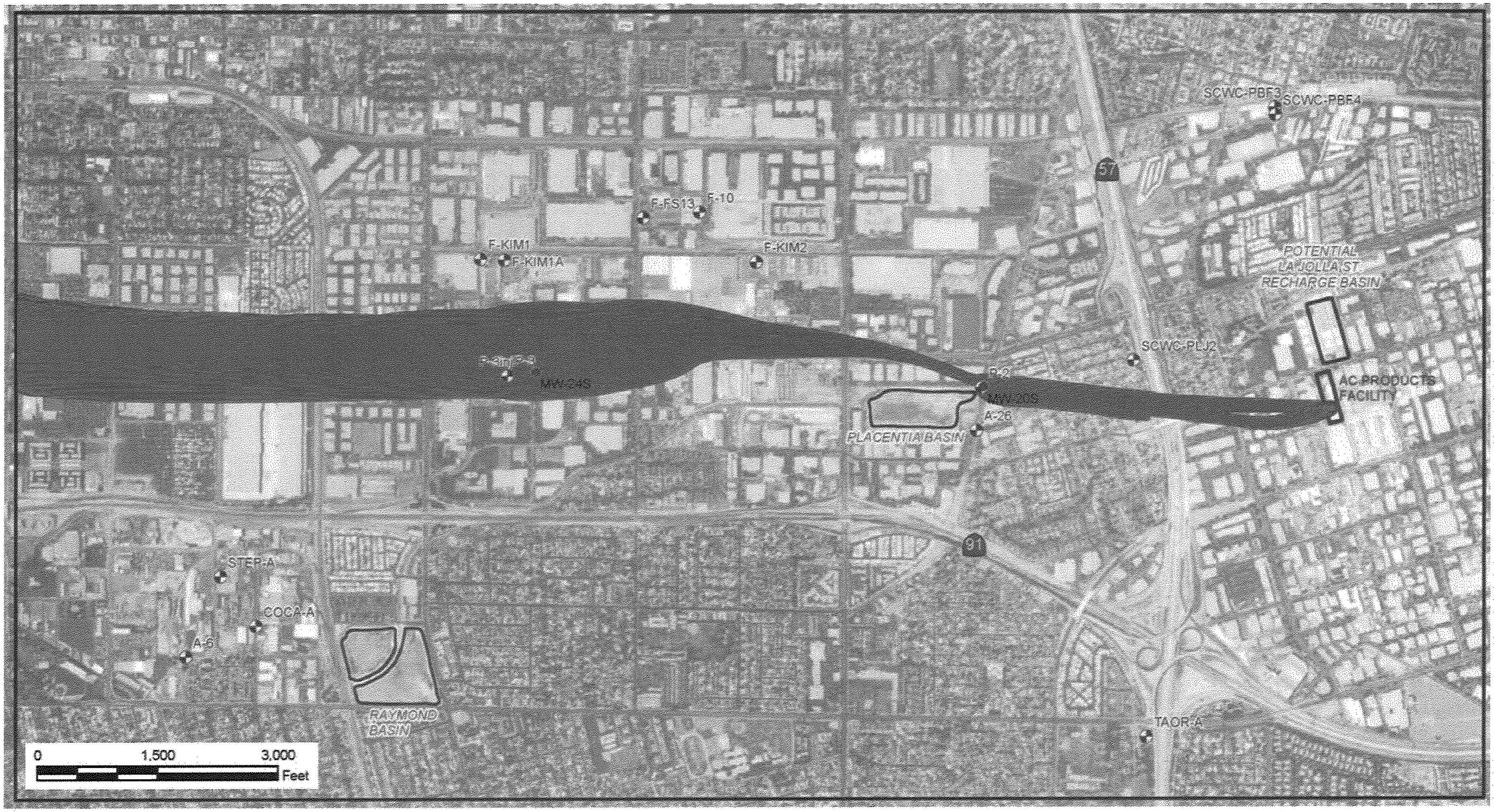
LEGEND

- Selected Monitoring Well Location
- Production Well

The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1, 2006 to January 1, 2016. The entire area of MCL exceedance is a composite of 11 overlays, each representing the area above MCL at the end of each year.

Figure 4.2-9

Scenario 1: Composite Simulated Extent of PCE Plume in the Shallow Aquifer 2006 to 2016 – No Recharge Basin



Source: Rubicon 2005

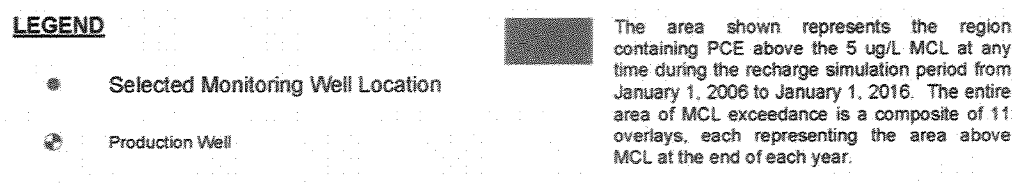
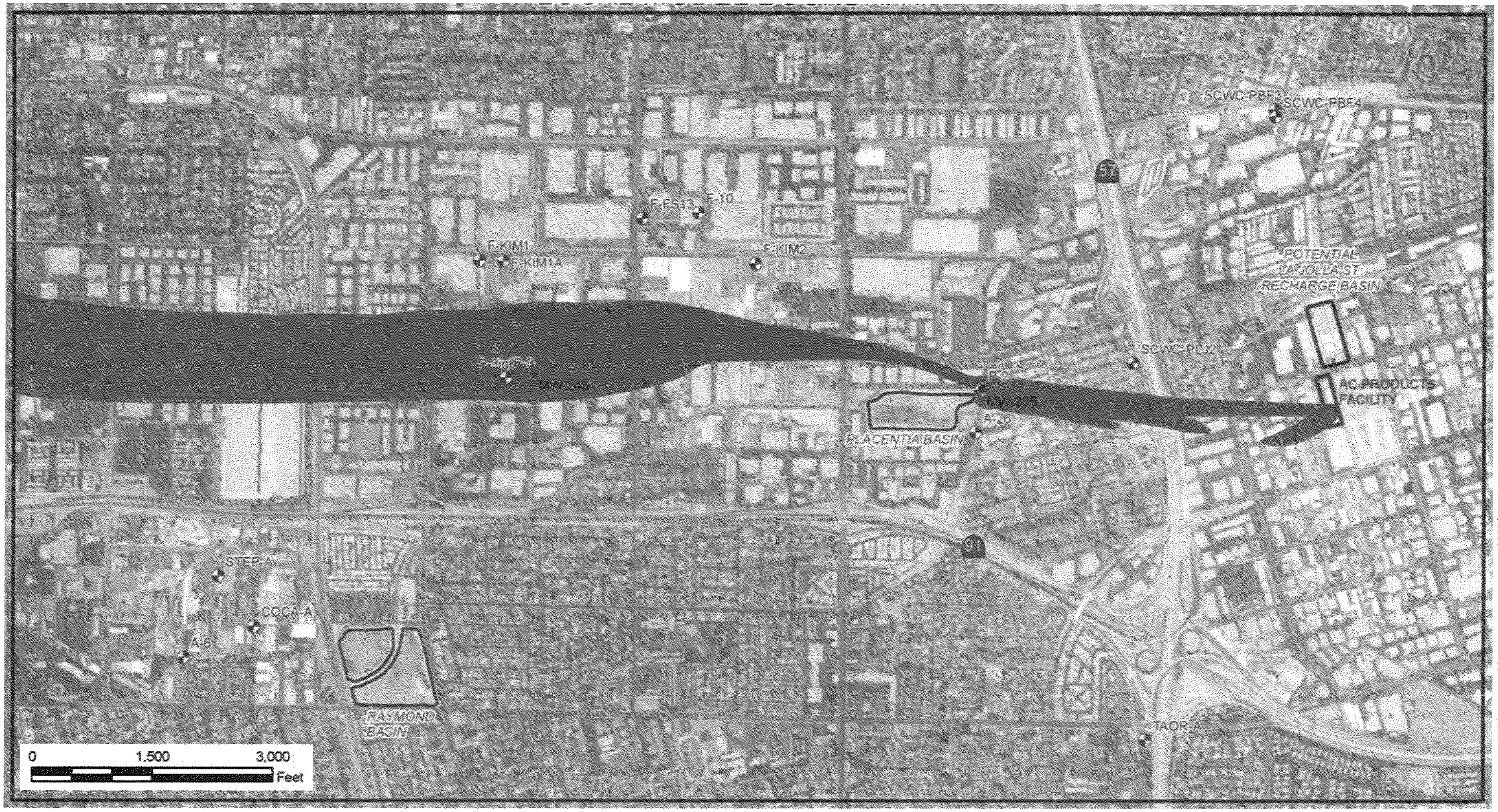


Figure 4.2-10

Scenario 2: Composite Simulated Extent of PCE Plume in the Shallow Aquifer 2006 to 2016 – 4,500 acre-ft/year of Recharge



Source: Rubicon 2005

LEGEND

- Selected Monitoring Well Location
- Production Well

The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1, 2006 to January 1, 2016. The entire area of MCL exceedance is a composite of 11 overlays, each representing the area above MCL at the end of each year.

Figure 4.2-11

Scenario 3: Composite Simulated Extent of PCE Plume in the Shallow Aquifer 2006 to 2016 – 9,000 acre-ft/year of Recharge

Findings and Conclusions

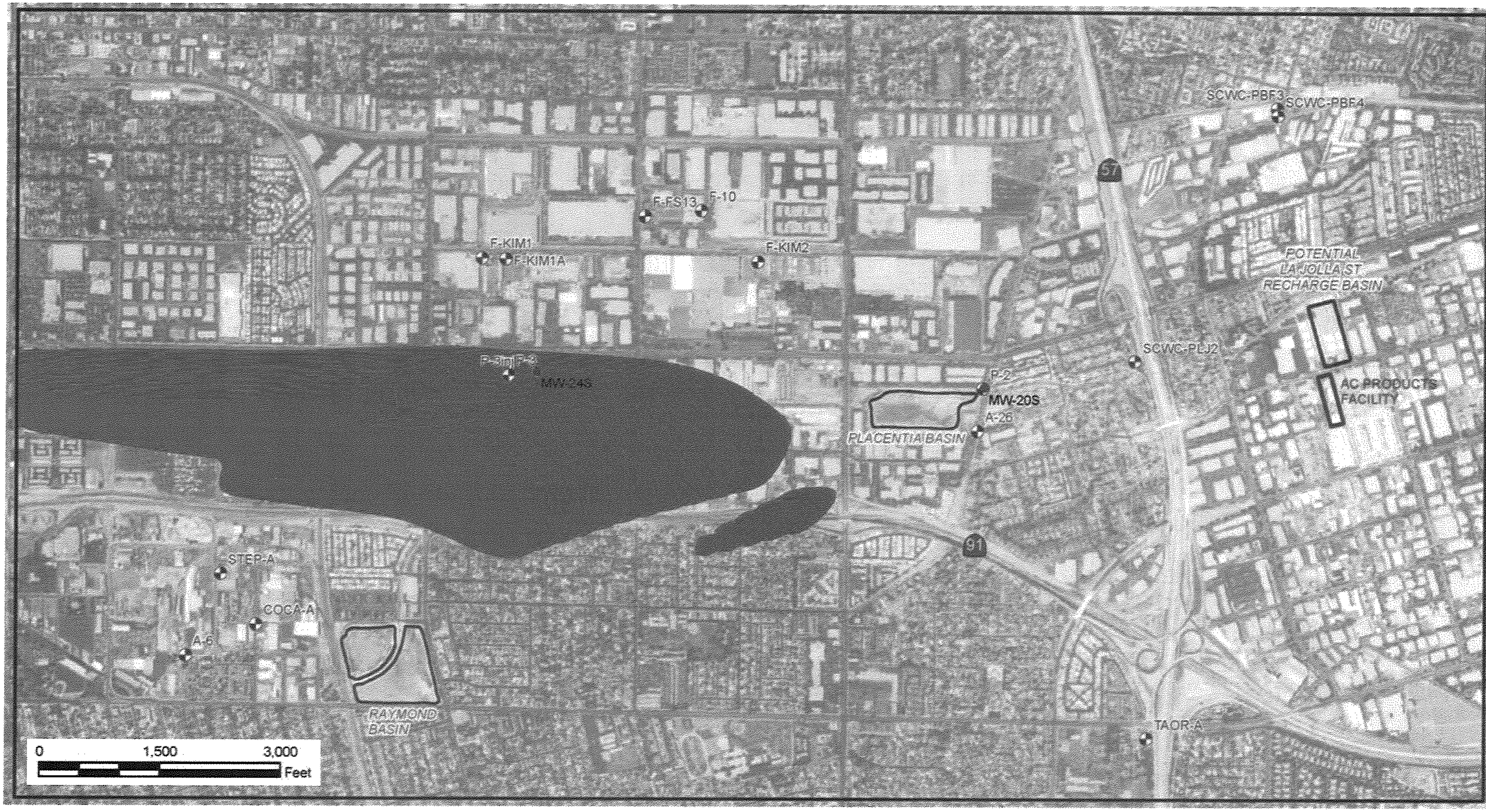
As described above, the groundwater flow model presented by Rubicon is based on the regional flow model and the widely accepted MODFLOW code, while the chemical transport model is based on a widely accepted and utilized MT3DMS fate and transport code. The calibration of the flow model to the actual groundwater heads supports its validity and allows its use as the foundation for the transport model and a basis for the assessment of the fate and transport of PCE in groundwater. The transport model has incorporated the main mechanisms (i.e., advection, dispersion, and retardation) of fate and transport of PCE in groundwater. The model also accounts for PCE source concentration reduction at the AC Products facility. However, the model does not account for degradation of PCE, and therefore may provide a conservative representation of future PCE concentrations (i.e., actual PCE concentrations should be lower than predicted concentrations).

Despite the conservative assumptions, the results of Rubicon's modeling indicate that the anticipated future recharge activities at the La Jolla Recharge Basin will have no effect on the PCE concentrations or movement in the Principal Aquifer. Figure 4.2-12 on the following page illustrates the simulated extent of the AC Products PCE contamination plume for all three modeled scenarios for the years 2006 to 2016, including no recharge, 4,500 acre-ft/year recharge, and 9,000 acre-ft/year recharge. As the center of the PCE plume already has moved away from the AC Products site, there is little potential for movement of additional PCE to the Principal Aquifer as a result of project-related recharge. PCE concentrations in the Principal Aquifer decrease over time under all three scenarios, and decrease more rapidly under the 4,500 and 9,000 AFY recharge scenarios than under the no recharge scenario.

Confirmation of Modeling Results

As stated above, the Rubicon model predicts that as recharge into the La Jolla Recharge Basin begins, PCE concentrations will decrease with time in wells located along the axis of AC Products' dissolved PCE contamination plume in the Shallow Aquifer. To confirm the predictions, and out of an abundance of caution, OCWD will implement measures to monitor the potential effects that future recharge might have on PCE concentrations. The following Project Design Features (PDFs) will be implemented:

> **PDF 4.2-1:** OCWD will use the data reported to the RWQCB by AC Products to track local groundwater quality. Specifically, OCWD will acquire reported data for the following wells located along the axis of the AC Products VOC contamination plume:
>
> - MW-8S, MW-8D
> - MW-9S, MW-9D
> - MW-12
> - MW-14S, MW-14D-A, MW-14D-B, and MW-14D-C
> - MW-20S, MW-20D-A, MW-20D-B, and MW-20D-C
>
> These monitoring wells are perforated in the Shallow Aquifer. The frequency of monitoring will depend on recent and future changes in PCE concentrations, as well as AC Products' monitoring requirements.



Source: Rubicon 2005

LEGEND

- Selected Monitoring Well Location
- Production Well

The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1, 2006 to January 1, 2016. The entire area of MCL exceedance is a composite of 11 overlays, each representing the area above MCL at the end of each year.

Figure 4.2-12
Composite Simulated Extent of PCE Plume in the Principal Aquifer 2006 to 2016 – All Modeled Scenarios

PDF 4.2-2: OCWD will use reported data for the following specific wells located to the south of the axis of the PCE plume between the AC Products facility and the Placentia Basin to confirm the modeling results and predictions for that area of the project:

- MW-13
- MW-15
- MW-16
- MW-17

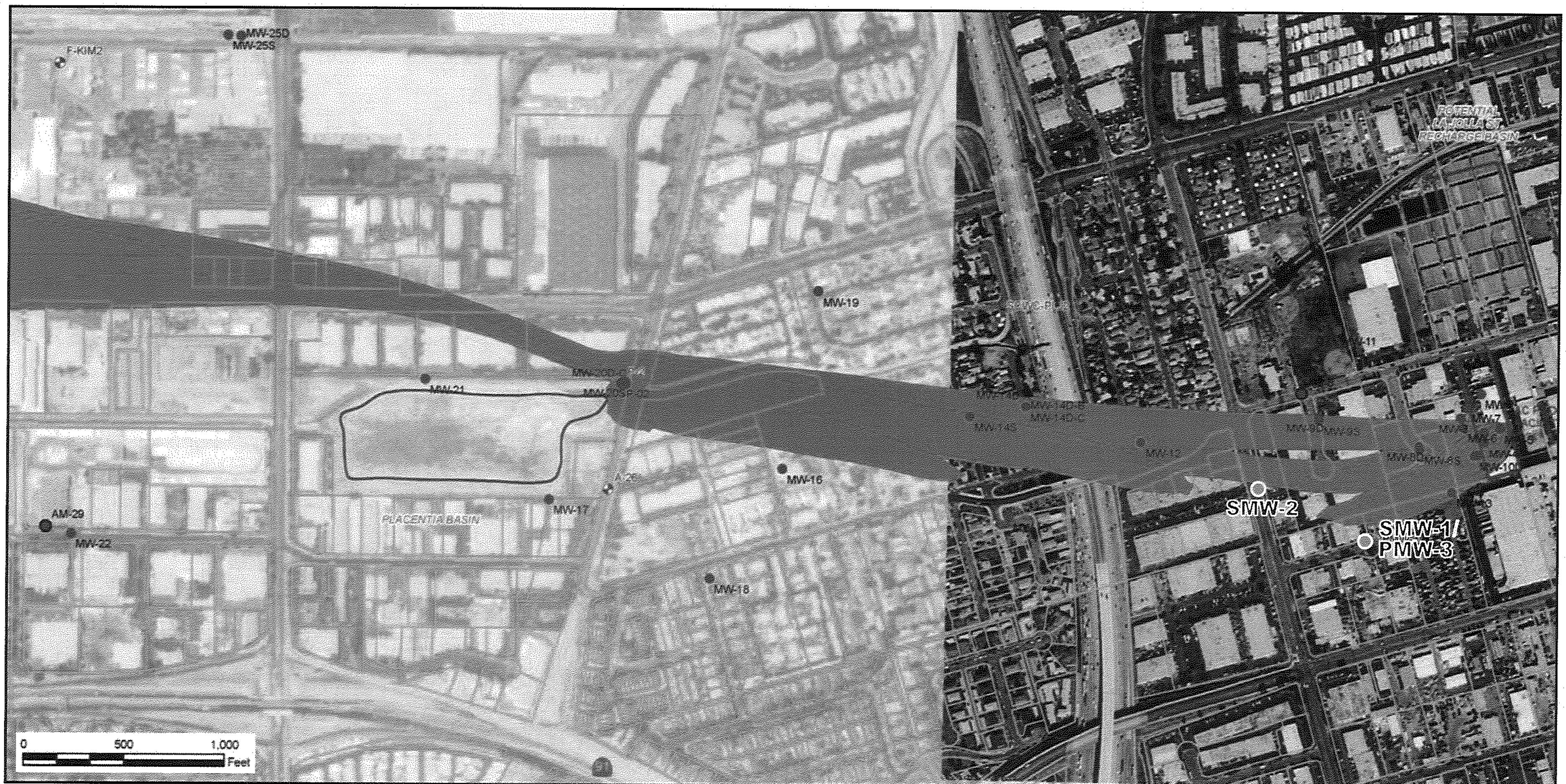
These monitoring wells are perforated in the Shallow Aquifer. The frequency of monitoring will depend on recent and future changes in PCE concentrations, as well as AC Products' monitoring requirements.

PDF 4.2-3: OCWD will install two additional monitoring wells (SMW-1 and SMW-2) in the Shallow Aquifer and one additional monitoring well (PMW-3) in the Principal Aquifer adjacent to SMW-1 to supplement the data reported by AC Products. These additional wells will be installed in the southern portion of the project area to monitor any potential southerly component of PCE transport downgradient of AC Products. The new wells will be installed prior to recharge because the Rubicon model predicts that PCE concentrations would change within a relatively short time after recharge occurs. To confirm the Rubicon model findings, the monitoring results will be evaluated in conjunction with the data reported by AC Products.

Monitoring wells SMW-1 and SMW-2 will have perforated intervals at 95 to 125 feet below ground surface. Well PMW-3 will be perforated from 270 to 300 feet bgs. The recommended screened intervals may be changed by OCWD based on the observed stratigraphy encountered during well boring activities. During monitoring of the proposed wells, OCWD will measure the depth to groundwater and collect water samples for chemical analysis using EPA Method 8260B for VOCs.

The existing and proposed monitoring well locations are shown on Figure 4.2-13. The monitoring program recommended by Rubicon would provide data to confirm the modeling results and monitor the actual effect of the proposed recharge operations on the PCE plume in the Shallow and Principal Aquifers in the vicinity of the AC Products facility.

The existing PCE contamination impact is a result of historical contamination of the Orange County Groundwater Basin by AC Products, not the proposed recharge basin project. Although the existing remediation program appears to slightly reduce the contamination caused by AC Products, it is unlikely that the site will be fully remediated by the time the La Jolla Recharge Basin project is implemented. OCWD's proposed groundwater-monitoring program will confirm that existing contamination is prevented from adversely affecting groundwater. OCWD is committed to ensuring that any potential shift in the existing groundwater contamination plume is detected. The extensive data review and groundwater analysis efforts by OCWD, Rubicon, and Geomatrix demonstrate that the proposed project would not exacerbate the existing PCE contamination caused by AC Products, and would not significantly impact groundwater quality in the Orange County Groundwater Basin.



Source: Rubicon 2005

LEGEND

- Proposed Monitoring Well Locations
- Existing AC Products Monitoring Well Location
- Other Existing Monitoring Well Locations
- Production Well

The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1, 2006 to January 1, 2016 in both the 4,500 and 9,000 AF/YR recharge scenarios. The entire area of MCL exceedance is a composite of overlays, each representing the area above MCL at the end of each year for both recharge scenarios.

Figure 4.2-13

Monitoring Well Locations

4.2.3.5 Impacts to Municipal Groundwater Production Wells

The City of Anaheim has expressed concern that implementation and long-term operation of the proposed recharge basin could impact existing City of Anaheim Water Well No. 26, which is located downgradient from the project site. As described in previous sections, groundwater transport modeling shows that the proposed recharge basin would not cause a substantial shift in, or otherwise exacerbate, the existing PCE contamination plume caused by AC Products. OCWD will install new monitoring wells and review data from the existing AC Products monitoring system to confirm that the project is not affecting the existing VOC contamination plume.

The District will not knowingly use recharge water that could cause an exceedance of a MCL or a Notification Level in a drinking water well, including the City of Anaheim Well No. 26. The recharge water quality will be identical to the water being recharged at the neighboring recharge basins. The District monitors the quality of the recharge water to ensure that the groundwater is not adversely affected. As a courtesy to the City, the District will periodically submit monitoring results to the City of Anaheim Public Utilities Department, Environmental Services Division to document conditions at Anaheim Well No. 26. With the proposed long-term monitoring program in place, no significant impacts to nearby groundwater production wells will result.

4.2.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

The contaminant transport modeling indicates that the proposed project will not adversely affect the rate or direction of movement of the AC Products PCE contaminant plume. While OCWD has committed to implement a groundwater-monitoring program to confirm the modeling results, potentially significant project-related impacts have not been identified and mitigation measures are not necessary.

4.2.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

All project-related hydrogeology and groundwater quality impacts will remain at levels that are less than significant.

4.2.6 CUMULATIVE IMPACTS

Based on the data presented throughout this section, it has been shown that no significant public health threats are currently posed by MWD and SAR source water, by water in the recharge basins, or by nearby groundwaters. The evidence presented in the comprehensive SARWQH study, along with the continual monitoring of surface and groundwater quality in the Orange County Groundwater Basin, substantiates the conclusion that the use of SAR and MWD source water at the proposed recharge basin will not result in cumulatively significant environmental or health effects. Further, the contaminant transport modeling takes into account future recharge conditions in concluding that the proposed recharge basin will not have a significant adverse effect on the existing groundwater PCE plume. Therefore, no cumulatively significant public health or environmental effects will result from project implementation.

4.3 HAZARDS AND HAZARDOUS MATERIALS

The findings and recommendations in this section generally are based on Phase I and Phase II Environmental Site Assessments (ESAs) prepared by England Geosystem, Inc. for OCWD in early 2002 and 2003, respectively. The Phase I and Phase II technical assessments are incorporated by reference and available for review at the District offices.

As indicated in Chapter 3.0 (Project Description), the Placentia-Yorba Linda Unified School District (PYLUSD) is in negotiations with OCWD to purchase a 1.76-acre portion of the parcel along the western side of the proposed recharge basin site (i.e., the former Ohara Farms properties). PYLUSD is planning to include the property as part of its proposed Southwest Middle School project site. On behalf of PYLUSD, Mission Geoscience, Inc. conducted a Phase I ESA for the school project in January 2002. The Phase I ESA and subsequent soils sampling in April 2002 were conducted on approximately 19.3 acres west of the project site, and included the western portion of the proposed recharge basin site. Due to the study area overlap, the England Geosystem Phase I and II ESAs reference the Mission Geoscience investigations as appropriate.

4.3.1 EXISTING SETTING

4.3.1.1 Phase I Environmental Site Assessment

Scope of Investigation

England Geosystem, Inc. conducted a Phase I ESA in March 2002 to evaluate the possible presence of hazardous substances at the site, including in the underlying subsurface environment, which could adversely affect the value of the site and/or construction of the proposed recharge basin. The Phase I ESA included a review of the site's history and previous land use; historical records searches of relevant federal, State, and local regulatory agencies; a walkover survey and visual inspection of the site and surrounding properties; a review of potential off-site sources of contamination that could have impacted the site; and a preliminary evaluation of the possible presence of hazardous materials in the existing structures at the site.

Phase I ESA Findings

The Phase I ESA found that the project parcels have been used for citrus fruit growing, intensive flower cultivation, light industrial, and residential purposes over the past 50 years. Among other things, the Phase I ESA evaluated the history of the Ohara properties in the context of past chemical use, storage, handling, and/or disposal within or near its boundaries. Potentially hazardous chemicals used, stored, or handled at the site in connection with former site uses include pesticides and other agricultural chemicals, motor vehicle fuels, oils and lubricants associated with automobile repair and equipment maintenance, and printing inks. With the exception of the agricultural chemicals, the potentially hazardous chemicals appear to have been used on a localized basis only and the quantities appear to have been relatively small. Seven features and areas of possible environmental concern at the Ohara properties were identified in the Phase I ESA. The locations of these features and areas are shown in Figure 4.3-1 and they are described below:

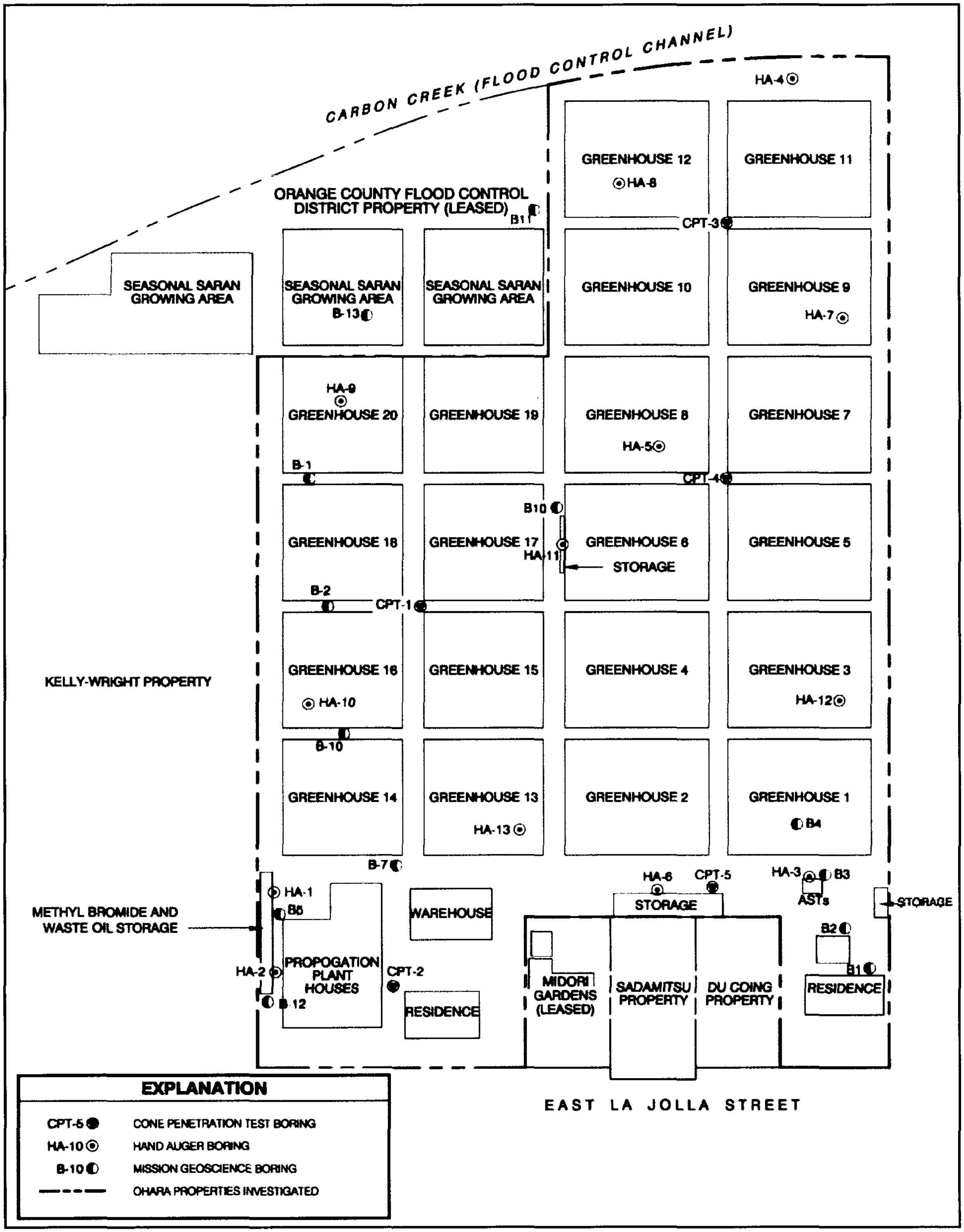
- Two 500-gallon aboveground storage tanks (ASTs) located behind (to the north of) the residence at 2921 West La Jolla Street, in the southeast corner of the Ohara properties. One tank contains gasoline and the other diesel fuel. Both tanks are located within a concrete secondary containment structure and appear to be good condition.

- A fenced compound at the east end of the property used to store various canisters and gas cylinders, including methyl bromide (a soil fumigant) and nitrogen. The ground surface within the storage compound is unpaved.
- A wood frame storage shed along the western property boundary in which waste oil is stored in 55-gallon drums.
- A metal storage box, located adjacent to the above-mentioned storage shed, used to store cylinders of methyl bromide gas.
- A wooden storage shed near the center of the site, adjacent to Greenhouse No. 6, used to store containers of Vapam (another soil fumigant).
- Pesticides and soil fumigants routinely applied in the 20 greenhouses during the flower growing process.
- Two electrical transformers, both of which belong to the City of Anaheim. One is pole-mounted and located along the eastern property boundary. The other transformer is in a subsurface vault near the center of the property. According to City of Anaheim personnel, transformers manufactured after 1977 do not contain polychlorinated biphenyls (PCBs); however, City of Anaheim personnel were not able to tell England Geosystem personnel when the subject transformers were installed. England Geosystem understands, however, that the City of Anaheim would be responsible for managing and, if necessary, removing PCB-containing transformers.

The Phase I ESA also evaluated potential “off-site” sources of contamination in the vicinity of the Ohara properties. Two off-site sources were identified as being of possible concern:

- The Kelly-Wright facility is a former lumber warehousing and distribution facility located adjacent to and west of the Ohara property. The facility maintained a hazardous waste storage area for 55-gallon drums containing waste-oil and used antifreeze, a four-stage clarifier (not presently used), and a forklift mechanic shop where waste-oil was stored in 55-gallon drums.
- The AC Products facility to the south of the Ohara properties. Volatile organic compounds (VOCs), notably tetrachloroethylene (PCE) and trichloroethylene (TCE), released at the AC Products facility have impacted the underlying soil and ground water. Ongoing investigations had shown that VOC contamination migrated about two miles to the west in the uppermost water-bearing zone and had possibly impacted groundwater beneath the southern portion of the Ohara properties.

Based on the results of the Phase I ESA, England Geosystem recommended the collection and analysis of shallow soil samples from beneath the chemical storage areas and at representative locations throughout the remainder of the Ohara properties to evaluate whether residual pesticides and/or herbicides may be present in near-surface soils. Similarly, the possible presence of asbestos-containing materials (ACMs) and lead-based paint (LBP) in the structures at the site was not ruled out during Phase I preparation. Therefore, the presence of potentially hazardous chemicals in near-surface soils was a concern in the context of disposing or reusing material excavated during construction of the proposed recharge basin and/or leaching once the basin is operational.



Source: England Geosystem 2003

Figure 4.3-1
Areas of Environmental Concern and Soil Sampling Locations

4.3.1.2 Phase II Environmental Site Assessment

Scope of Investigation

England Geosystem, Inc. conducted a Phase II ESA in May 2003. The Phase II ESA evaluated subsurface conditions that could make the site unsuitable for use as a recharge basin. Specific objectives of the assessment were to:

- Assess whether chemical compounds, including pesticides and motor vehicle fuels, used in current and past commercial flower growing operations, had impacted near-surface soil beneath the site.
- Assess whether vadose-zone[1] soil beneath the southern portion of the site had been impacted by chemical compounds that may have migrated, in the subsurface, from the AC Products facility on the opposite (south) side of La Jolla Street.
- Assess whether there may be laterally continuous, low-permeability strata of substantial thickness beneath the site that could impede the infiltration of water from the proposed recharge basin.

The Phase II investigation included 13 hand auger borings to depths up to 10 feet below ground surface (bgs), and 5 Cone Penetrometer Test borings drilled up to 76 feet bgs at the locations shown in Figure 4.3-1. The soil samples were analyzed using standard U.S. Environmental Protection Agency (EPA) methods for the following chemical constituents of potential concern:

- total petroleum hydrocarbons
- volatile organic compounds
- heavy metals
- pesticides
- glyphosate

The Phase II ESA sampling protocol and laboratory findings of the total petroleum hydrocarbon (TPH), metals, VOCs, and pesticide/herbicide analyses are presented in the England Geosystem report dated July 8, 2003.

Phase II ESA Findings

The summary findings of the Phase II ESA are as follows:

Soil Chemical Analyses

- Petroleum hydrocarbons were not detected in any of the soil samples. The storage and dispensing of gasoline and diesel fuel appear to have had no impact on near-surface soils around the existing ASTs in the southeast corner of the site. Likewise, the storage of waste oil along the western boundary of the Ohara properties appears to have had no impact on near surface soil. Additionally, there is no indication that petroleum hydrocarbons used and stored at the adjacent Kelly-Wright property to the west have adversely impacted subsurface conditions beneath the Ohara properties. No additional investigations are recommended, although OCWD will have the removal of these features overseen by a qualified professional, equipped to collected samples if stained, odorous, or hydrocarbon-saturated soil is encountered.

[1] VADOSE ZONE—The subsurface zone between the water table (zone of saturation) and the land surface where some of the spaces between the soil particles are filled with air. Also referred to as the unsaturated zone or, less frequently, the zone of aeration.

- Nine of the 17 heavy metals were reported at detectable concentrations, as shown in Table 4.3-1 below. However, the reported metals concentrations are within the range of background soil concentrations in California and are below MCLs. With the exception of arsenic, the reported metals concentrations were all well below "average" background concentrations. The reported arsenic concentrations ranged from 5.46 milligrams per kilogram (mg/kg) to 8.64 mg/kg, which are marginally "above average" but still within the range of background concentrations and below MCL. Average California background levels in soil are 3.5 mg/kg. The reported arsenic concentrations are also considerably lower than the background concentrations established, after an exhaustive investigation, at a nearby site in a similar depositional environment.

TABLE 4.3-1
SUMMARY OF METALS IN SOILS

EPA Method 6010B/7471A -- Results in mg/kg					
Sample ID (see Fig. 4.3-1) **Collection Date** **Depth (feet bgs)**	**HA-1-1** **03/31/03** **1**	**HA-1-5** **03/31/03** **5**	**HA-2-1** **04/02/03** **1**	**HA-2-5** **04/02/03** **5**	**Average CA Background Levels in Soil***
Antimony	<0.750	<0.750	<0.750	<0.750	0.6
Arsenic	**8.64**	**6.80**	**5.46**	**1.55**	3.5
Barium	33.3	29.6	32.7	14.5	509
Beryllium	<0.250	<0.250	<0.250	<0.250	1.28
Cadmium	<0.500	<0.500	<0.500	<0.500	0.36
Chromium (Total)	6.18	3.98	6.83	2.34	122
Cobalt	4.09	2.34	4.09	1.45	14.9
Copper	3.55	3.68	4.17	2.08	28.7
Lead	0.832	1.01	2.10	0.853	23.9
Mercury	<0.0835	<0.0835	<0.0835	<0.0835	0.26
Molybdenum	<0.250	<0.250	<0.250	<0.250	1.3
Nickel	4.45	2.73	4.79	1.75	57
Selenium	<0.750	<0.750	<0.750	<0.750	0.058
Silver	<0.250	<0.250	<0.250	<0.250	0.8
Thallium	<0.750	<0.750	<0.750	<0.750	0.56
Vanadium	14.1	9.51	14.8	5.02	112
Zinc	22.6	14.1	24.3	9.48	149

(<) Indicates result not detected at or above the method reporting limit shown.
(*) Source: Bradford, et al., 1996 (cited in England 2003)

- Tests for soil fumigants and herbicides in locations where they most likely would occur in near-surface soils showed no detectable residuals concentrations of concern. A total of 20 soil samples collected from various locations at the site were analyzed for VOCs. None of the soil samples analyzed contained detectable concentrations of VOCs, including methyl bromide, which was widely used as a soil fumigant at the Ohara properties.
- Independent investigations by England Geosystem and Mission Geoscience found low residual concentrations of pesticides and degradation products. Despite the assumed long history of pesticide use at the site, the pesticide residuals do not appear to have migrated downward to an appreciable extent. Glyphosate and PCBs were not detected in any of the

soil samples from areas where pesticides have been used or stored at the site. However, 4,4'-DDE was reported at 7.1, 21, and 58 μg/kg in the 1-foot soil samples collected from Borings HA-5, HA-12, and HA-13, respectively. Endrin aldehyde and 4,4'-DDT were detected only in the 1 foot soil sample from Boring HA-13 at concentrations of 6.6 and 41 μg/kg, respectively. Endrin aldehyde is one of a variety of degradation byproducts of the pesticide Endrin. If released into soil, Endrin aldehyde is not expected to leach in most soil types. The constituent 4,4-DDE is a biodegradation product of 4,4-DDT, an insecticide banned by the EPA in 1972. Both 4,4-DDT and 4,4-DDE adsorb strongly to soil and should not leach appreciably. A complete list of the pesticides and PCBs tested and a summary of the analytical results are presented in Table 4.3-2. The presence of low concentrations of organochlorine pesticides in surface soils is consistent with the findings of Mission Geoscience's soil sampling for PYLUSD.

TABLE 4.3-2
SUMMARY OF PESTICIDES AND PCBS IN SOILS

EPA Method 8081A/8082 Results in μg/kg				
Sample ID (see Fig. 4.3-1) **Collection Date** **Depth (feet bgs)**	**HA-5-1** **03/31/03** **1**	**HA-11-1** **04/02/03** **1**	**HA-12-1** **04/02/03** **1**	**HA-13-1** **04/02/03** **1**
Alpha-BHC	<5.0	<5.0	<5.0	<5.0
Gamma-BHC	<5.0	<5.0	<5.0	<5.0
Beta-BHC	<5.0	<5.0	<5.0	<5.0
Heptachlor	<5.0	<5.0	<5.0	<5.0
Delta-BHC	<5.0	<5.0	<5.0	<5.0
Aldrin	<5.0	<5.0	<5.0	<5.0
Heptachlor Epoxide	<5.0	<5.0	<5.0	<5.0
Endosulfan I	<5.0	<5.0	<5.0	<5.0
Dieldrin	<5.0	<5.0	<5.0	<5.0
4,4'-DDE	**7.1**	<5.0	**21**	**58**
Endrin	<5.0	<5.0	<5.0	<5.0
Endrin Aldehyde	<5.0	<5.0	<5.0	**6.6**
4,4'-DDD	<5.0	<5.0	<5.0	<5.0
Endosulfan II	<5.0	<5.0	<5.0	<5.0
4,4'-DDT	<5.0	<5.0	<5.0	**41**
Endosulfan Sulfate	<5.0	<5.0	<5.0	<5.0
Methoxychlor	<5.0	<5.0	<5.0	<5.0
Chlordane	<50	<50	<50	<50
Toxaphene	<100	<100	<100	<100
Araclor-1016	<50	<50	<50	<50
Araclor-1221	<50	<50	<50	<50
Araclor-1232	<50	<50	<50	<50
Araclor-1242	<50	<50	<50	<50
Araclor-1248	<50	<50	<50	<50
Araclor-1254	<50	<50	<50	<50
Araclor-1260	<50	<5O	<50	<50
Araclor-1262	<50	<50	<50	<50

EPA Method 8081A/8082 Results in µg/kg				
Sample ID (see Fig. 4.3-1) **Collection Date** **Depth (feet bgs)**	**HA-5-1** **03/31/03** **1**	**HA-11-1** **04/02/03** **1**	**HA-12-1** **04/02/03** **1**	**HA-13-1** **04/02/03** **1**
Endrin Ketone	<5.0	<5.0	<5.0	<5.0
EPA Method 547M Results in µg/kg				
Glyphosate	-	<2,000	--	<2,000
(<) Indicates result not detected at or above the method reporting limit shown.				
Source: England, 2003				

- No additional investigations were recommended; however, the presence of low concentrations of pesticide residuals in soils excavated from the recharge basin will be considered when evaluating soil reuse or disposal options. Section 4.3.4.1 (Construction Impacts) addresses the possibility of encountering previously undetected soil contamination during demolition and grading activities, and provides mitigation measures for potentially significant impacts. Soil that is contaminated must be properly disposed of rather than placed in another location on- or off-site. Land Disposal Restrictions (LDRs) may be applicable to these soils, as regulated by the U.S. EPA and/or CalEPA. Both the federal LDR program (40 CFR Part 268) and the State program (Title 22 CCR, Chapter 18, section 66268.1 et. seq.) require waste handlers to treat hazardous waste or meet specified levels for hazardous constituents before disposing of the waste on the land.
- The absence of detectable VOC concentrations in soil samples collected from borings near the southern boundary of the site indicates that the VOCs released at the nearby AC Products facility have had negligible or no impact on the upper 35 feet of the vadose zone. The possibility that VOCs may be present in groundwater beneath the southern portion of the site has been taken into consideration in the design and operation of the proposed recharge basin (refer to Section 3.4.7, Monitoring of Existing Groundwater Contamination).

Infiltration Suitability

Visual observations and CPT data show that vadose zone soils beneath the site are predominantly sands to a depth of 76 feet, the greatest depth investigated under the Phase II ESA. Information reported by the testing consultant retained by the PYLUSD for the same area of the site indicate predominantly sandy soils continuing to at least 115 feet. The available data do not indicate the presence of a laterally continuous fine-grained layer of significant thickness beneath the site. Therefore, the site is suitable for groundwater infiltration.

4.3.1.3 Other Site Considerations

Underground Storage Tanks (USTs)

The project site has historically been used for residential uses and agricultural production, and it is possible that buried septic tanks exist on the site, along with the attendant risk of nitrate contamination in soils and groundwater. The District acknowledges that septic systems may have been used in the past on the site, but the presence of underground tanks has not been confirmed. Section 4.3.4.1 (Construction Impacts) addresses the possibility of encountering previously undetected storage tanks during demolition and grading activities, and provides mitigation measures for potentially significant impacts.

PCB-Containing Materials

Two electrical transformers belonging to the City of Anaheim may have been manufactured and installed after 1977 and may not contain PCBs. However, City of Anaheim personnel were not able to tell England Geosystem personnel when the subject transformers were installed. Anaheim Public Utilities is responsible for managing City-owned transformers and, if necessary to replace or remove from the site during construction, the City would test and properly dispose of any PCB-containing transformers. Table 4.3-2 indicates that PCBs were not detected in any of the soil samples and no impacts are expected.

Asbestos-Containing Materials and Lead-Based Paints

The possible presence of ACMs and lead-based paint in the structures at the site was not ruled out during Phase I ESA preparation. In accordance with the Phase I ESA recommendations, ACM and LBP surveys will be conducted prior to structural demolition. Mitigation measures in this section and in Section 4.5 (Air Quality) address the potential for ACM and LBP presence.

4.3.1.4 School Site Assessment

Mission Geoscience's Phase I ESA reached generally the same conclusions as England Geosystem's Phase I ESA. In January 2002, Mission Geoscience collected various soil samples near the ASTs, inside Greenhouse No. 1, adjacent to the waste oil drum storage area, and near the pesticide/fumigant storage areas. The soil samples were analyzed for TPH, VOCs, semi-volatile organic compounds (SVOCs), organochlorine herbicides, and organophosphate pesticides. The locations of Mission Geoscience's soil borings are shown in Figure 4.3-1.

Soil Chemical Analyses

TPH, SVOCs, VOCs, organochlorine herbicides, and organophosphate pesticides were not detected in any of the soil samples analyzed. However, certain organochlorine pesticides, specifically 4,4-DDE, 4,4-DDT, and Toxaphene were reported in certain of the near-surface soil samples (i.e., 0 to 0.5 feet bgs). Toxaphene, 4,4-DDE, and 4,4-DDE were not reported at detectable concentrations in any of the deeper (i.e., 2 feet bgs and deeper) soil samples analyzed. Because of the low concentrations and limited vertical distribution of the organochlorine pesticides in near-surface soils, Mission Geoscience concluded that they were unlikely to constitute a "chemical of concern" for the site, although more detailed sampling and analysis for organochlorine pesticides were recommended in light of the property's proposed use as a school site.

Infiltration Suitability

In January 2003, Mission Geoscience drilled 13 additional borings at the proposed school site, six of which were located on the Ohara properties. The locations of the six borings on the Ohara properties, (Borings B-1, B-2, B-7, B-10, B-12, and B-13) are shown in Figure 4.3-1. The borings were advanced to depths of up to 115 feet bgs. The boring logs show that the vadose zone soils beneath the Ohara properties are almost exclusively sands with only the occasional, very thin layer of fine-grained, lower permeability silt or clay. Ground water was not encountered in any of the borings to the maximum depth investigated of 115 feet bgs.

4.3.1.5 Off-Site Environmental Conditions

Records Search Results

Environmental Data Resources, Inc. (EDR) conducted an environmental records search as part of the Phase I ESA (England 2002). Table 4.3-3 summarizes the results of the database searches. The proposed site is not on a list of known hazardous materials sites.

TABLE 4.3-3
SUMMARY OF HAZARDOUS WASTE AND CONTAMINATED SITES DATABASE SEARCH RESULTS

Database	Distance in Miles from Proposed La Jolla Recharge Basin Site			
	<1/8	*1/8 - 1/4*	*1/4 - 1/2*	*1/2 -1*
NPL	0	0	0	0
CERCLIS	0	0	0	NR
CHMIRS	2	2	2	8
Cortese	I	2	4	21
LUST	1	2	9	NR
UST	2	6	NR	NR
Hist UST	2	7	NR	NR
CLEANERS	0	1	NR	NR

NR = Not requested in database query
Source: Environmental Data Resources, Inc., 2003

The National Priority List (NPL) and the CERCLIS database include Superfund contamination sites that are undergoing remediation activities. No NPL sites were located within one mile of the site. The California Hazardous Material Incident Report System (CHMIRS) database compiles hazardous material incidents such as spills that have been reported in the area. This database found two reported spills within 1/8 of a mile of the proposed site. One occurred in January 1988 involving small quantities of acephate gas; the other occurred in 1988 involving small quantities of sodium sulfonate. No residual impacts to the proposed project site have resulted from these past neighboring spills.

The CORTESE database, maintained by CalEPA, also compiles sites that have reported contamination. The one site on the CORTESE database within 1/8 mile of the proposed site involves a leaking underground storage tank identified in 1990 at Monarch Pools, Inc., across Red Gum Street east of the site. This site is also listed in the Leaking Underground Storage Tank (LUST) database, which reports 12 known LUSTs within 1/2 mile of the site. The closest LUST site is the nearby Monarch Pools site. No other information on the extent of the leak or status of the remediation is known.

The UST and Hist UST databases found two sites within 1/8 mile of the property. One of these sites was the Monarch Pools site described above. The other site was located across La Jolla Street from the project site, at the AC Products facility. The database reported an underground piping leak that created a contamination plume consisting of halogenated solvents extending westward into Fullerton. AC Products has initiated a remediation program in coordination with the RWQCB consisting of an array of monitoring wells and two extraction wells located near Orangethorpe Avenue in Fullerton.

The CLEANERS list shows the location of dry cleaners that store perchloroethylene. One dry cleaner is located within 1/4 mile of the site. No report of accidental release has been recorded for this site.

4.3.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) outlines the significance criteria against which a project is measured for public health and safety. Potentially significant public health and safety impacts would result if the project would:

- *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.*
- *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.*
- *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.*
- *Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.*
- *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.*
- *Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.*

4.3.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.3.3.1 Construction Impacts

- *The project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.*

<u>Accidental Spills</u>

Toxic chemicals associated with construction and construction vehicles have the potential to be inadvertently dumped, spilled, washed, or leached from containers and vehicles on-site during construction. These chemicals include, but are not limited to, fossil fuels and corrosive acids and bases. Once in the ground, these toxics may persist and eventually enter the water table where they can be detrimental to floral and faunal species upon contact or ingestion.

The risk of a spill of minor amounts of hazardous substances used during onsite construction activities could be reduced to insignificant by proper storage and handling of hazardous substances and by conducting all fueling, vehicle maintenance, or other activities that involve handling hazardous substances away from slopes and drainages (natural or structural). To minimize these potential effects, the District must obtain a State General Construction Activity Stormwater Permit from the Regional Water Quality Control Board (RWQCB) before grading begins. As part of this permit, the District will prepare a Storm Water Pollution Prevention Plan (SWPPP) which establishes Best Management Practices (BMPs) for proper storage, handling, use, and disposal of fuels and other toxic materials, as well as establishing fuel and maintenance areas away from drainage ways (see Section 4.1, Hydrology and Water Quality). Because these permitting requirements automatically apply to the project, they are considered standard conditions of project approval that will reduce this potential effect to a less than significant level.

Underground Storage Tanks

As indicated previously, it is possible that buried septic tanks exist on the site, along with the attendant risk of nitrate contamination in soils and groundwater. If septic systems are encountered during site grading and excavation activities, they would be removed in accordance with the existing standards and regulations of, and oversight by, the Orange County Health Care Agency (OCHCA). The process for UST removal is detailed in the OCHCA's *AST/UST Removal Report and Remediation Procedures Report*. If present, septic system USTs would be removed and disposed of as construction waste. Any residual nitrates in the excavated soils would not be considered as hazardous contamination and would not be subject to disposal at a hazardous waste landfill. Nitrates remaining in the ground would be flushed out and quickly diluted and would not result in significant soil or water quality impacts.

The issue of hazardous contamination encountered during excavation, as well as mitigation for potential impacts, is addressed in Section 4.3.4.1.

4.3.3.2 Operational Impacts

- *The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.*

The proposed recharge basin project does not involve the routine use, manufacture, or transport of hazardous substances for its operations. Although pesticides and other potentially hazardous materials may have been used on the site in the past, residual concentrations of these materials are not expected to pose a potential health hazard to the public. The current interpretation of State law is that if these compounds were legally applied they would not be considered hazardous waste. Contaminated soil, if found and moved off-site, would be considered hazardous and would be handled in accordance with prevailing laws and regulations, including the federal (40 CFR Part 268) and/or State (Title 22 CCR, Chapter 18, section 66268.1 et. seq.) LDR programs, which require waste handlers to treat hazardous waste or meet specified levels for hazardous constituents before disposing of the waste on the land.

- *The project would not result in hazardous emissions or handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.*

Melrose Elementary School is within one-quarter mile of the proposed site, and a middle school is contemplated by the Placentia Yorba Linda Unified School District for the adjacent property to the west. However, the proposed recharge basin project would not involve the ongoing treatment, storage or disposal of hazardous materials, and no impacts would result from project operations.

- *The project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, it would not create a significant hazard to the public or the environment.*

The environmental records search conducted as part of the project Phase I ESA (England 2002) revealed that several hazardous materials incidents, including spills and underground storage tank leaks, have occurred at other sites in the project vicinity over the past two decades.

However, the Phase II ESA (England 2003) and other investigative sampling at adjacent properties have found that no residual impacts to the proposed project site have resulted from these past neighboring spills.

- *The project is not located within an airport land use plan or within two miles of a public airport, public use airport, or private airstrip such that the project would result in a safety hazard for people residing or working in the project area.*

The project site is not within two miles of a public airport, public use airport, or private airstrip. Therefore, no impact will result.

- *The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.*

The project site plan includes considerations of emergency access. Dual access points to the basin perimeter road are provided. Implementation of the proposed project will not interfere with any emergency response plans, nor would project construction or operations block area roadways under emergency or non-emergency circumstances.

- *The project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.*

The project area is heavily urbanized and there are no vegetated wildlands in the vicinity of the project site. Therefore, the proposed project will not expose people or structures to a risk of loss, injury or death involving wildland fires. As with most surface water storage features, it is possible that the recharge basin could serve as a backup source of water for firefighting purposes in the event that fire flows are inadequate during a fire response. However, that determination would be made by the responding fire agency and is not proposed for consideration at this time.

- *The project will be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs, and the project will comply with federal, state, and local statutes and regulations related to solid waste.*

When structures such as buildings, surface parking, and sidewalks are demolished as part of the initial site preparation phase for the project, demolition wastes will be generated. Figure 4.3-2 shows the on-site structures that will be dismantled or demolished. Demolition-generated wastes could consist of heavy, inert materials such as concrete, asphalt, rock and soils, wood, drywall, plaster, metals and brick. When disposed of in landfills, demolition wastes do not decompose but instead take up valuable landfill capacity. Additionally, since demolition wastes are heavy when compared with paper and plastic, it is more difficult for jurisdictions to reduce the tonnage of disposed waste. For this reason, demolition waste debris has been specifically targeted by the State of California for diversion from the waste stream. Projects that will generate demolition waste should emphasize deconstruction and diversion planning, rather than demolition. Deconstruction is the planned, organized dismantling of existing buildings and structures on a project site, which allows maximum use of the deconstructed materials for recycling and limits disposal at solid waste landfills. The County of Orange recommends that the proposed project address a waste reduction plan for the demolition wastes generated from the project. However, the demolition contractor is given the responsibility of removing all demolished materials, and will have the option of recycling. OCWD will also comply with all local, State, and federal requirements for integrated waste management (e.g., recycling) and solid waste disposal, as applicable.

Source: Keyhole 2004

Figure 4.3-2
Structures to be Removed from the Project Property

Demolition-generated waste from the proposed project may contain contaminated soils, asbestos, lead-based paints, fluorescent lamps and ballasts, or other hazardous materials. Orange County solid waste landfills are not permitted to accept these waste materials. In addition, Orange County solid waste landfills are not permitted to accept waste contaminated with toxic or hazardous materials, or waste having a moisture content greater than 50 percent. During the demolition phase of the proposed project, if contaminated soils, asbestos, lead-based paints, fluorescent lamps and ballasts, hazardous materials or liquids are discovered, then these materials must be transported to facilities that are permitted to accept them. OCWD will comply with all related State and federal regulations to ensure the proper identification and disposal of hazardous materials, including disposal of all contaminated soils in the appropriate class landfill.

4.3.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

4.3.4.1 Construction Impacts

- *The project could result in hazardous emissions within one-quarter mile of an existing or proposed school.*

The existing and proposed PYLUSD schools are within one-quarter mile of the proposed site. Based on the Phase I and II ESAs (England 2002/2003), the subsurface conditions observed and documented at the former Ohara Farms properties are unlikely to pose a threat to workers involved in demolition activities and/or construction of the proposed recharge basin. Although petroleum hydrocarbons were not detected in any of the on-site soil samples, excavated soils could subject construction personnel and nearby receptors to previously undetected VOCs or low levels of pesticides by breathing or swallowing dust stirred up during grading and excavation. Similarly, the existing structures to be demolished could contain asbestos-containing materials and lead-based paint, which could pose a health hazard if they become airborne during demolition activities. Although unlikely to occur, the potential off-site transport of airborne VOC, pesticide, and ACM particulates is addressed in Section 4.5 (Air Quality). With application of the mitigation measures below and in Air Quality, potentially hazardous emissions impacts would be reduced to a level that is less than significant.

<u>Soil Contamination and Underground Storage Tanks</u>

Impact 4.3-1: *As indicated in the Phase II ESA, petroleum hydrocarbons were not detected in any of the soil samples from waste oil storage areas or from fuel storage and dispensing areas. However, OCWD will implement the following mitigation measures to address the possibility of encountering previously undetected storage tanks and/or soil contamination during demolition and grading activities.*

> **MM 4.3-1a:** If any Underground Storage Tanks are encountered during site grading and excavation activities, they shall be removed in accordance with the existing standards and regulations of, and oversight by, the Orange County Health Care Agency. The process for UST removal is detailed in the OCHCA's *AST/UST Removal Report and Remediation Procedures Report*. Soil samples from areas where storage tanks have been removed or where soil contamination is suspected shall be analyzed for hydrocarbons including gasoline and diesel in accordance with procedures set forth in the *AST/UST Removal Report and Remediation Procedures Report* and as directed by OCHCA. If hydrocarbons are identified in the soil, the appropriate response/remedial measures will be implemented as directed by OCHCA or other appropriate agency until all specified requirements of the oversight agencies are satisfied and a no-further-action status is attained. Any Aboveground Storage Tanks (ASTs) in existence at the commencement of site development shall be removed in accordance with all applicable regulations under the oversight of OCHCA. These procedures are detailed in the UST/AST Removal Report.

> **MM 4.3-1b:** The removal of onsite facilities and containers previously used for waste oil storage or fuel storage and dispensing shall be overseen by a qualified professional who is equipped to collect samples if stained, odorous, or hydrocarbon-saturated soil is encountered. This shall include the area around the existing aboveground storage tanks in the southeast corner of the site. As specified in Mitigation Measure 4.3-1a, if stained, odorous, or hydrocarbon-saturated soils are encountered, OCWD shall notify the Orange County Health Care Agency and other regulatory agencies as necessary prior to undertaking remedial action. If determined necessary, OCWD, or assigned contractor,

shall also prepare a written contaminated soil mitigation plan in accordance with Mitigation Measure 4.5-2a (refer to Section 4.5 - Air Quality).

Asbestos-Containing Materials

Impact 4.3-2: *Existing irrigation piping that must be removed during grading and demolition activities could contain asbestos-containing material, which poses a health hazard if it becomes airborne during demolition activities.*

Mitigation Measure 4.5-4 in Section 4.5 (Air Quality) addresses OCWD's obligations under SCAQMD *Rule 1403 – Asbestos Emissions from Demolition and Renovation Activities*, and relates to mitigation of airborne asbestos hazards if ACM is found to be present in any on-site structures. The following measures address ACM survey requirements and the possible presence of ACM in aboveground or subsurface piping. These measures will be implemented along with MM 4.5-4.

> **MM 4.3-2a:** Prior to demolition and grading activities, a licensed Asbestos Inspector shall be retained to determine the presence of asbestos-containing material (ACM) within structures to be demolished and in irrigation piping to be removed from the project site. If ACMs are present on-site, OCWD shall comply with all applicable State and federal ACM abatement policies and procedures for removal of ACMs.

> **MM 4.3-2b:** If any irrigation piping encountered during site grading and excavation activities is found to contain asbestos fibers, removal shall be conducted in accordance with the remediation and mitigation procedures established by all federal, State, and local standards including federal and California Occupation Safety and Health Administration (OSHA), and Air Quality Management District (AQMD) regulations for the excavation, removal, and proper disposal of the transite pipe [CFR Title 29 OSHA, CFR Title 29 California Health & Safety Code, and SCAQMD Regulation X - National Emission Standards For Hazardous Air Pollutants, Subpart M - National Emission Standards For Asbestos]. The material shall be disposed of at a certified asbestos landfill.

Lead-Based Paints

Impact 4.3-3: *The existing residential and/or commercial structures constructed before 1978 might contain lead-based paint on internal and external surfaces. Lead-based paint poses a health hazard if it becomes airborne during demolition activities or leaches into on-site soils.*

> **MM 4.3-3:** Prior to demolition of residential and/or commercial structures constructed before 1978, OCWD shall retain a licensed Lead-Based Paint Inspector to conduct a survey of buildings for lead-based paint. Documentation of the lead survey shall be consistent with existing State and federal regulations for the management and mitigation of lead-based paint. Where lead-based paint exists, abatement shall be completed prior to any demolition activities that would create lead dust or fume hazard. Lead-based paint removal shall be performed in accordance with California Code of Regulations Title 8, Section 1532.1, which provides for exposure limits, exposure monitoring, respiratory protection and mandates good worker practices by workers exposed to lead. Contractors performing lead-based paint removal shall provide evidence to OCWD of certified training for lead-related construction work.

4.3.4.2 Operational Impacts

Potential Impacts to Existing VOCs in Groundwater

The District recently conducted contaminant transport modeling (Rubicon 2005) to evaluate the potential dispersion and dilution effects that future recharge operations would have on existing dissolved VOCs, as well as the possible impact on the effectiveness of AC Products' extraction system. The comprehensive modeling analysis of AC Products' VOC contamination plume concluded that the proposed recharge basin project could be implemented without significantly impacting existing or future groundwater resources. The modeling results and the District's currently proposed groundwater monitoring system are presented in Section 4.2 (Hydrogeology and Groundwater Quality).

4.3.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Based on the findings in the Phase I and II ESAs, the potential for environmental impairment to the site from hazardous substances/wastes on-site or on properties in the vicinity is considered low to moderate, and requires no further action beyond the mitigation measures cited in Section 4.3.4.1 for construction impacts. With adherence to local, State, and federal regulations governing human health hazards, risk of upset, and emergency preparedness, public health and safety impacts will remain at less than significant levels.

4.3.6 CUMULATIVE IMPACTS

The project-related public health and safety issues are localized and deemed individually less than significant. When combined with the potential middle school development on the adjacent site, the cumulative effects of demolishing existing site uses and reusing the sites as proposed would be positive. Since project implementation would result in the removal of all potentially hazardous materials, the project-related impacts are considered beneficial, both individually and cumulatively.

4.4 TRANSPORTATION AND CIRCULATION

The following section references information from a draft traffic impact analysis prepared by LSA Associates, Inc. in May 2005 for the Placentia-Yorba Linda Unified School District's (PYLUSD) Southwest Middle School project. The school project is proposed immediately adjacent to and west of the La Jolla Recharge Basin site (see Figure 4.4-1). The relevant traffic analysis data cited include a description of the existing roadway network, existing traffic volumes and levels of service, and 2007 projected traffic volumes and levels of service with the completed middle school and future, cumulative development. The LSA traffic analysis was prepared using the City of Placentia General Plan Circulation Element, 2001 Orange County Congestion Management Program, Orange County Master Plan of Arterial Highways, 2002 Orange County Traffic Flow Map, and Traffic Counts collected in October 2004.

4.4.1 EXISTING SETTING

4.4.1.1 Regional Roadway Network

As illustrated on Figure 4.4-1, State Route 57 (Orange Freeway) is located about 0.4 mile west of the project site and State Route 91 (Riverside Freeway) is about one mile to the south. Both State highways and Interstate 5, approximately four miles southwest, provide regional access to the site. In the project vicinity, SR-57 provides access to the project site via its interchange at Orangethorpe Avenue.

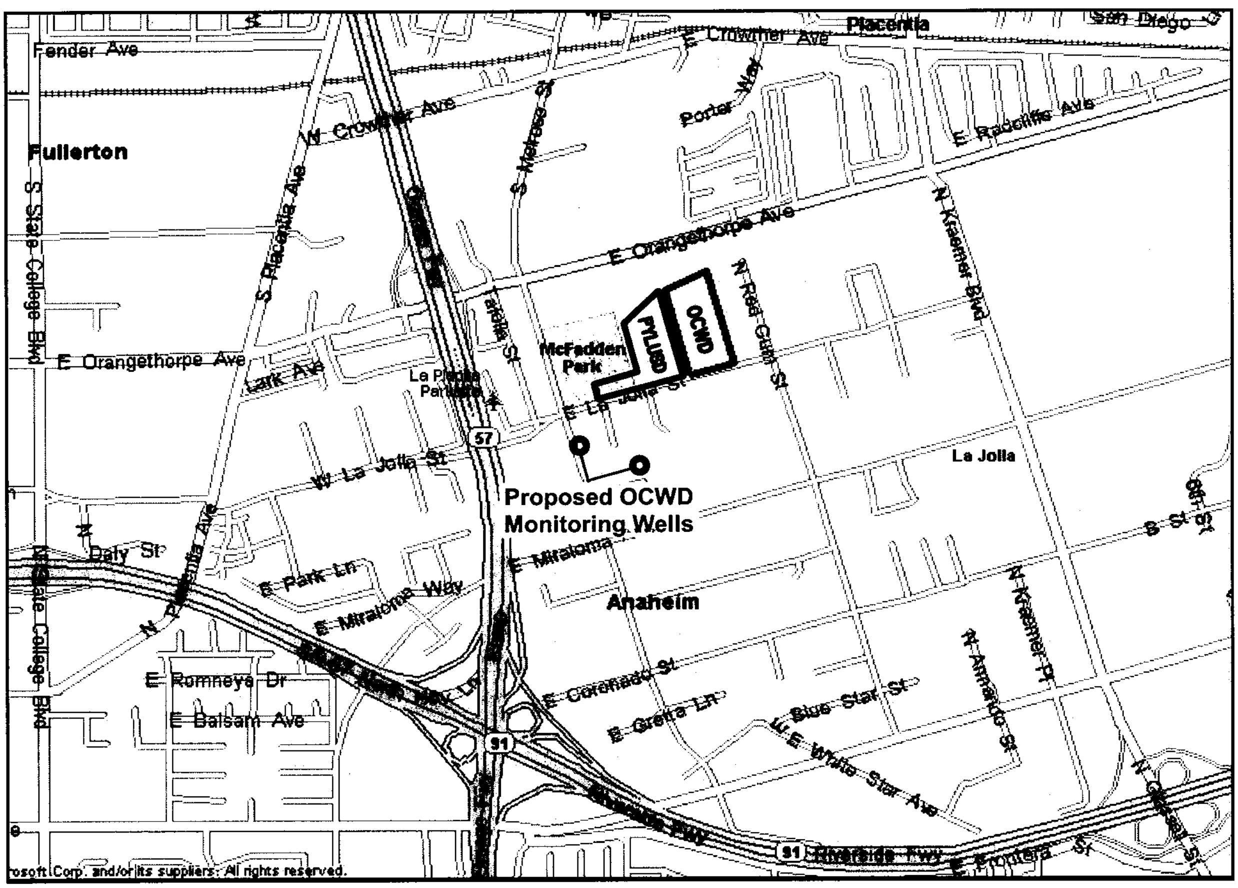
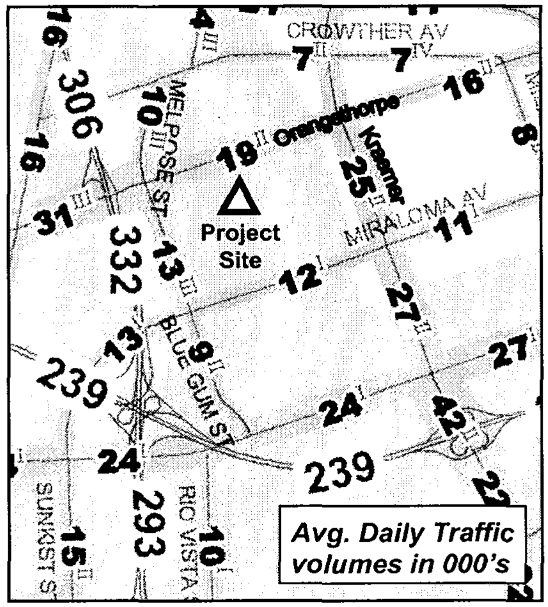


Figure 4.4-1 ***Project Area Circulation System***

4.4.1.2 Local Roadway Network

Local access routes and average daily traffic volumes are depicted in the graphic inset, and their operational characteristics are described below.



- **La Jolla Street** – La Jolla Street is a two-lane local roadway providing access to the residential and industrial land uses in the vicinity of the project site. This roadway is the southern boundary of the project site. It is the only direct access to the project parcels.

- **Melrose Street** – Melrose Street is a four-lane secondary arterial highway on the Orange County Master Plan of Arterial Highways (MPAH). It is on the western side of the proposed project site. According to traffic volumes obtained from the Orange County Traffic Flow Map, South Melrose Street carries up to 17,000 vehicles per day in the project vicinity.

- **Orangethorpe Avenue** – The project is located approximately one-quarter mile south of Orangethorpe Avenue, a six-lane major arterial on the MPAH. The roadway provides 3 lanes of traffic in each direction. It has dual westbound left turn lanes at Melrose. Orangethorpe Avenue carries approximately 19,000 vehicles per day in the vicinity of the project, increasing to over 30,000 at the SR-57 on-/off-ramps.

- **Kraemer Boulevard** – Kraemer Boulevard is a north-south, 4-lane major arterial roadway. Kraemer Boulevard is located east of the proposed project site and provides local vehicular access, as well as regional access via the SR-91 on-/off-ramps. Kraemer Boulevard carries about 25,000 vehicles per day north of Miraloma Avenue.

4.4.1.3 Intersection Levels of Service

Level of Service Definitions

For the three study area intersections, intersection performance is calculated using the Intersection Capacity Utilization (ICU) method and by estimating the volume-to-capacity (V/C) ratio. To calculate an ICU the volume of traffic using the intersection is compared with the capacity of the intersection. ICU is usually expressed as a percent. The percent represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. The ICU value translates to a Level of Service estimate, which is a relative measure of the intersection performance.

The six qualitative LOS categories have been defined along with the corresponding ICU value range, as shown in Table 4.4-1. An ICU value of .90 (LOS D) is considered the maximum desirable ICU value for the cities of Anaheim and Placentia, and an ICU value of 1.00 (LOS F) exceeds the theoretical capacity of an intersection.

TABLE 4.4-1
LEVEL OF SERVICE DEFINITIONS FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	0.00 - 0.60	Free Flow; Very low delay, less than 5.0 seconds per vehicle.
B	0.61 - 0.70	Rural Design; Delay in the range of 5.1 to 15 seconds per vehicle.
C	0.71 - 0.80	Urban Design; Delay in the range of 15.1 to 25 seconds per vehicle.
D	0.81 - 0.90	Maximum Urban Design; Delay ranges from 25.1 to 40 seconds per vehicle.
E	0.91 - 1.00	Capacity; Delay ranges from 40.1 to 60 seconds per vehicle.
F	≥ 1.01	Forced Flow; Delay in excess of 60 seconds per vehicle.

The intersections analyzed in the LSA traffic study included 1) La Jolla Street/Melrose Street, 2) Melrose Street/Orangethorpe Avenue, and 3) La Jolla Street/Kraemer Boulevard. Existing daily AM and PM peak hour1 turning movement counts at the study intersections were conducted in October 2004. LSA evaluated levels of service for AM and PM peak hours at those three intersections using the intersection capacity utilization (ICU) methodology. The ICU methodology compares the volume to capacity (V/C) ratios of conflicting turn movements at an intersection, sums these critical conflicting V/C ratios for each intersection approach, and determines the overall ICU.

Existing (2004) Peak Hour Conditions

Table 4.4-2 from the LSA traffic analysis shows the existing level of service for the intersections analyzed. The level of service standard outlined in the Orange County Congestion Management Program (CMP) is LOS E. The level of service standard in the cities of Placentia and Anaheim is LOS D. Therefore, the acceptable levels of service for Melrose Street/La Jolla Street and La Jolla Street/Kraemer Boulevard intersections in this analysis is considered to be LOS D or better, or LOS E for the intersection of Orangethorpe Avenue/Melrose Street. As shown in Table 4.4-2, all the study area intersections currently operate at acceptable levels of service in accordance with the county and city standards.

TABLE 4.4-2
EXISTING (2004) INTERSECTION LEVELS OF SERVICE

		Existing			
		AM Peak		PM Peak	
	Intersections	ICU	LOS	ICU	LOS
1	Orangethorpe Avenue/ Melrose Street	0.56	B	0.60	B
2	Melrose Street/ La Jolla Street	0.57	B	0.60	B
3	La Jolla Street/ Kramer Boulevard	0.42	A	0.47	A
Source: LSA Associates, Inc. 2005					

[1] In traffic modeling, the "peak hour" is the highest one-hour period in both the AM (7:00 to 9:00 AM) and PM (4:00 to 6:00 PM) peak periods, as determined by four consecutive 15-minute count periods.

4.4.2 IMPACT SIGNIFICANCE CRITERIA

The following analysis qualitatively compares estimated project traffic volumes with the intersection levels of service calculated in 2004 (Table 4.4-2). CEQA Appendix G (Environmental Checklist) outlines the significance criteria against which a project is measured for circulation performance. The proposed project would result in significant adverse environmental impacts if any of the following occur:

- *The project would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections.*
- *The project would exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.*
- *The project would result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.*
- *The project would substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).*
- *The project would result in inadequate emergency access.*
- *The project would result in inadequate parking capacity.*
- *The project would conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).*

4.4.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.4.3.1 Construction Traffic

Construction at the site would include demolition, debris removal, and soil movement activities. During the estimated six-month construction period, there would be an increase in truck traffic and worker traffic to the site. It is estimated that construction would generate up to 60 round-trip dirt-haul trucks per day and 20 employee round trips per day for six months. This impact would be short-term and would not cause a substantial increase in traffic or affect the existing levels of service at area intersections. Deliveries of paving and construction materials could result in days where truck trips to and from the site are increased. However, this would be of limited duration and would not deteriorate levels of service to below acceptable levels. Given the project site location and size, there is adequate room for on-site staging and queuing of deliveries.

The project site is near an existing elementary school and adjacent to a proposed middle school. Although no significant safety impacts are anticipated, OCWD will implement vehicle and pedestrian safeguards during construction. Along with providing construction notification to PYLUSD, OCWD will prepare a traffic management plan to be implemented by the construction contractor(s) during construction. The plan is not subject to local agency approval, but it will be coordinated through the City of Anaheim and will be based upon a careful consideration of construction traffic routes to minimize cumulative construction impacts. With implementation of those measures, project construction traffic will not create individually or cumulatively significant traffic impacts.

Truck Haul Permit

The City of Anaheim requires a permit to haul excavated soil from the site. A Truck Haul Permit must be obtained from the City of Anaheim Public Works Department, Development Services Division, for all routes within Anaheim City limits. As is standard practice, the District will obtain a Truck Haul Permit from the City of Anaheim. The permitting requirement is not considered mitigation for a potentially significant impact.

Right-of-Way Improvements

Although not an issue of circulation system performance, portions of the La Jolla Street right-of-way adjacent to the project site are currently missing curb, gutter, and sidewalk improvements. The project does not require construction within City of Anaheim streets and would not necessitate repairing La Jolla Street to its pre-construction condition. Since the District is not required to obtain a building permit for development subject to the City's approval, the District is not required to upgrade the City's streets to comply with specific building standards. However, as a courtesy to the City, the District will upgrade the curb, gutter and sidewalk on La Jolla Avenue at the project location consistent with City standards as part of the project design specifications. Street improvements are considered beneficial elements of the project, not mitigation for a potentially significant impact.

4.4.3.2 Long-Term Traffic Impacts

- *The project would not cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections.)*

Future (2007) Levels Of Service

The LSA (2005) traffic study for the proposed Southwest Middle School analyzed future intersection levels of service with the school project and traffic growth resulting from other areawide development. Based on the projected 850-student enrollment, the LSA study estimated that the school project has the potential to generate 391 AM peak hour and 136 PM peak hour vehicle trips. Those trips were distributed and added to the 2007 traffic base and levels of service for that future year. The levels of service for the future year with the school project are shown in Table 4.4-3. As shown below, all study area intersections would continue to operate at acceptable levels of service. As a result, the proposed school project would not cause a significant increase in traffic or cause a significant impact to the surrounding circulation system.

TABLE 4.4-3
2007 INTERSECTION LEVELS OF SERVICE

		2007 Existing Plus Growth Plus Middle School Project			
		AM Peak		PM Peak	
	Intersections	ICU	LOS	ICU	LOS
1	Orangethorpe Avenue/ Melrose Street	0.61	B	0.64	C
2	Melrose Street/ La Jolla Street	0.69	C	0.67	C
3	La Jolla Street/ Kramer Boulevard	0.45	A	0.49	A

Source: LSA Associates, Inc. 2005

The La Jolla Recharge Basin project operations would result in a negligible increase in traffic due to maintenance personnel visiting the site on a daily basis. The District estimates that up to ten trips per day could be required for long-term maintenance of the recharge basin. Since that level of trip generation is inconsequential in relation to the existing traffic load and capacity of the street system, no significant impacts would result and no mitigation measures are required.

- *The project will not exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.*

The level of service standard outlined in the Orange County Congestion Management Program is LOS E. The intersection of Orangethorpe Avenue/Melrose Street is a CMP intersection. The project trip contribution of about 10 trips per day is inconsequential. As shown in Table 4.4-3, that CMP intersection will operate at acceptable levels of service in accordance with the County Level of Service standards.

- *The project will not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.*

The proposed project involves only non-aviation plans for the project area. There will be no change in air traffic patterns.

- *The project will not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).*

Increased project traffic would not pose traffic hazards to motor vehicles, bicyclists or pedestrians during the construction phase or after occupancy of the development. No aspect of the project circulation design is particularly conducive to traffic hazards. Any increased traffic hazards would be an outcome of driver behavior and not of project traffic volumes or circulation features. The Project Site is located in a developed light industrial area already characterized by moderate traffic levels and similar safety hazards. Based on the traffic evaluation, there is no need for signalization for either vehicular traffic control or pedestrian safety.

- *The project will not result in inadequate emergency access.*

La Jolla Street will provide two points of direct access to site. Emergency access to the site interior will be provided via a 20-foot roadway around the recharge basin. The proposed project would not significantly alter emergency access to the site and no significant impacts would result.

- *The project will not result in inadequate parking capacity.*

Off-street and on-street parking areas will accommodate all anticipated parking needs during the construction and operational periods of the project. No parking capacity impacts will result.

- *The project will not conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).*

The Orange County Transportation Authority (OCTA) is the public transit agency that serves the project area. Long-term site operations and maintenance personnel require specialized equipment and vehicles that could not be served by transit services. Therefore, the proposed project does not have the potential to generate transit ridership. While transit service may be extended to the immediate site area as a service to the existing and proposed PYLUSD schools, any such plans would be unrelated to the proposed project.

The proposed site plan and design standards are compatible with the use of all alternative modes of transportation. The project would include sidewalk and gutter improvements in the La Jolla Street right-of-way adjacent to the site for the benefit of pedestrians. The project would not conflict with opportunities for pedestrian access to the services, recreation, and arterial streets where public transit may be provided in the future.

City and County Bikeways

The Orange County Transportation Authority's (OCTA) Commuter Bikeways Strategic Plan (CBSP) proposes the Carbon Creek Bikeway, a Second Priority regional Class I bikeway, along Carbon Creek from La Palma Avenue to east of Kraemer Boulevard. Various Class I (paved off-road) bikeway segments exist along Carbon Creek in the City of Anaheim, west of the project site. However, neither La Jolla Street nor the Carbon Creek Channel adjacent to the project site is designated on the OCTA master plan map or the City of Anaheim Bicycle Master Plan (2004) map as an existing or proposed bikeway.

If planned for future use as a Class I bikeway, the flood control easement along the project site boundary would require 10 feet for the bikeway with two feet of clearance on each side to provide adequate space. Since the project would construct an underground pipeline from the Carbon Creek Channel to the proposed recharge basin, the project would not limit a proposed bike path easement on OCFCD property. The property to be acquired as part of the project is far enough from the creek to maintain ample room for the proposed bike path on County property. The project would not affect bikeway and landscaping setbacks within the Carbon Creek easement and no impacts would result.

4.4.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

4.4.4.1 Construction Traffic and Pedestrian Safety

The project site is near an existing PYLUSD elementary school on La Jolla Street and adjacent to a proposed middle school site. Though not a significant impact, OCWD recognizes the importance of vehicle and pedestrian safeguards during construction of the proposed project and will implement the following measures:

MM 4.4-1: Should construction occur within the right-of-way of any streets in the cities of Anaheim or Placentia, OCWD shall coordinate construction plans with the respective cities' Public Works Departments. OCWD shall also obtain the necessary encroachment permit(s) to temporarily relocate on street parking and/or construct project improvements within city streets before any project construction takes place.

MM 4.4-2: The project contactor shall provide the Placentia-Yorba Linda Unified School District with a written schedule for completion of project site improvements, subject to prior review and concurrence by OCWD. Additionally, the project contractor shall ensure unimpeded pedestrian and vehicular access to Melrose Elementary School and the proposed Southwest Middle School site during project construction activities.

MM 4.4-3: To ensure minimal circulation disruption, OCWD shall prepare a traffic management plan to be implemented by the construction contractor(s). Although not subject to local agency approval, the plan shall be coordinated through the City of Anaheim and shall be based upon a careful consideration of construction traffic routes to minimize impacts.

4.4.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Transportation and circulation impacts will remain less than significant after mitigation.

4.4.6 CUMULATIVE IMPACTS

Cumulative traffic impacts were addressed in the short- and long-range impact analyses for the Southwest Middle School project. The proposed recharge basin's trip contribution of about 10 maintenance trips per day is inconsequential and cumulatively less than significant.

4.5 AIR QUALITY

4.5.1 EXISTING SETTING

4.5.1.1 Meteorology/Climate

California is divided into 15 air basins based on meteorological and geographical similarity. The project site is located in the South Coast Air Basin (Air Basin), a 6,800-square mile area that is a subregion of the South Coast Air Quality Management District's (SCAQMD) jurisdiction. The Air Basin is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. It includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties.

Warm summers, mild winters, infrequent rainfall, moderate afternoon breezes, and generally fair weather characterize the climate of the Anaheim area, termed a Mediterranean-type climate. The Pacific Ocean is the primary moderating influence on the climate pattern, but the coastal mountain ranges lying along the north and east sides of the Air Basin act to buffer extreme summer heat and winter cold temperatures occurring in the interior desert and plateau areas. Temperatures in Anaheim average a very comfortable 73°F year-round, with warm summer afternoons (90+ degrees) and often cool on winter mornings (around 50 degrees). The temporal and spatial distribution of rainfall in the project area varies considerably. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers often completely dry. Rainfall measurements at the nearest climatic observation station at Fullerton Municipal Airport average 14 inches per year, but vary markedly from one year to the next.

Although the Air Basin has a semi-arid climate, the air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants (e.g., smog) horizontally. The dominant daily wind pattern is an onshore 8 to 12 miles per hour (mph) daytime breeze and an offshore 3 to 5 mph nighttime breeze. The typical wind flow pattern fluctuates only with occasional winter storms, or strong northeasterly Santa Ana Winds from the mountains and deserts northeast of the Air Basin.

On virtually all spring and early summer days, most of the pollution produced during an individual day is moved out of the Air Basin through mountain passes, or is lifted by warm vertical currents produced by the heating of adjacent mountain slopes. In those seasons, the Air Basin can be "flushed" of pollutants by a transport of ocean air in the afternoon. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen (NOX) to form smog. Carbon monoxide (CO) is not as significant a problem because inversions are not as low and intense in the surface boundary layer (within 100 feet of the ground) as in winter because horizontal ventilation is better in summer.

<u>Inversion Layer</u>

Vertical dispersion of air pollutants in the Air Basin is hampered by the presence of a temperature inversion in the layers of the atmosphere near the surface of the Earth. In a normal situation, temperatures decrease with altitude and air continues to rise because it remains warmer than the surrounding air. With an inversion layer, air cannot expand upwards because the warmer air above traps it. However, as day progresses and the sun warms the ground, the surface layer of the air approaches a temperature equal to the temperature of the inversion layer. When these temperatures become equal, the inversion layer begins to erode at the lower edge. If enough warming takes place, the inversion layer becomes weaker and weaker and finally "breaks". The surface air layers will then mix upward without limit. This phenomenon is frequently observed in the middle or late afternoon on hot summer days when the smog appears to clear up suddenly. Winter inversions frequently break by mid-morning preventing contaminant build-up.

In the winter, the greatest pollution problems are CO and NOX because of extremely low-level inversions and air stagnation during the night and early morning hours. During winter evenings, cold air from the mountains sinks to the valley floor while air over the valley remains warm. This phenomenon forms radiation inversions. Radiation inversions, in conjunction with calm winds, trap pollutants. These inversions lead to air pollution "hot spots" along major roadways and heavily developed areas within the Air Basin.

The average occurrence of inversion at the ground surface in the Air Basin is 11 days per month. The averages vary from two days in June to 22 days in December and January. The potential for high concentration of pollutants varies seasonally for many contaminants. During late spring, summer, and early fall, light winds, low mixing heights and sunshine combine to produce conditions that maximize production of photochemical oxidants (e.g., ozone). During the spring and summer, when fairly deep marine layers are frequently found in the Air Basin, sulfate concentrations are the highest.

4.5.1.2 Regulatory Setting

The project site is located within the Air Basin under the jurisdiction of the South Coast Air Quality Management District (SCAQMD) and, to a lesser extent, the California Air Resources Board (CARB). Other important agencies involved in air quality management in the Air Basin include the United States Environmental Protection Agency (EPA) and the Southern California Association of Governments (SCAG). In response to the severity of air pollution in the United States, Federal, State, and local agencies have adopted regulations that require an evaluation of impacts to air quality for proposed projects and intended mitigation measures for projected air pollutant emissions.

The AQMD and SCAG, in coordination with local governments and the private sector, have developed the Air Quality Management Plan (AQMP) for the Basin. The AQMP is the South Coast Air Basin portion of the State Implementation Plan (SIP) of the California Clean Air Act and the Federal Clean Air Act. The AQMP provides the blueprint for meeting State and Federal ambient air quality standards. The plan is updated triennially, and each iteration of the plan has a 20-year planning horizon. The AQMD Governing Board adopted the Final 2003 AQMP on August 1, 2003. The 2003 AQMP updates the demonstration of attainment with the federal standards for ozone and PM_{10}; replaces the 1997 attainment demonstration for the federal carbon monoxide (CO) standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal nitrogen dioxide (NO2) standard that the South Coast Air Basin (Basin) has met since 1992.

<u>Ambient Air Quality Standards</u>

To assess air quality impacts of the proposed recharge basin, project impact and baseline air quality levels must be compared to Ambient Air Quality Standards (AAQS). The Federal government and the State of California have adopted health-based air quality standards to protect the public from the harmful effects of air pollution. AAQS are the levels of air quality considered safe, with an adequate margin of safety, designed to protect the segment of the public most susceptible to respiratory distress (e.g., asthmatics, elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise). Such persons are called "sensitive receptors." Sensitive receptors in the vicinity of the project include students at Melrose Elementary School, almost 1,000 feet west of the project site at Melrose and La Jolla Streets. Single-family homes are located about 450 feet north, yet are separated from the site by light industrial uses and Orangewood Avenue.

The Federal Clean Air Act (CCA) of 1970 established National Ambient Air Quality Standards (NAAQS) for six pollution species:

- Ozone (O_3)
- Nitrogen Dioxide (NO_2)
- Sulfur Dioxide (SO_2)
- Particulate Matter less than 10 microns in diameter (PM_{10})
- Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$)
- Carbon Monoxide (CO)
- Lead (Pb)

These pollution species are referred to as "criteria pollutants." New standards for 8-hour ozone and $PM_{2.5}$ have recently been established. Federal and State standards are shown in Table 4.5-1.

SCAQMD Rules and Regulations

Through the air quality attainment planning process, the SCAQMD also develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the Air Basin. The SCAQMD rules that are applicable to the proposed project are as follows:

- *Rule 403 - Fugitive Dust.* This rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area that remains visible beyond the emission source property line. A person conducting active operations shall utilize one or more of the applicable best available control measures to minimize fugitive dust emissions from each fugitive dust source type. During construction, best available control measures identified in the rule would be required to minimize fugitive dust emissions from proposed earth-moving and grading activities.
- *Rule 1166 - Volatile Organic Compound Emissions from Decontamination of Soil.* Rule 1166 applies to soils that are contaminated with VOCs measured as greater than 50 parts per million (ppm) within three inches of the soil surface. To reduce health and safety impacts from encounters with soil contamination during excavation and soil movement, the SCAQMD would require the submittal of an excavation plan application to obtain approval to proceed with the excavation and grading. The approved plan must contain mitigation measures designed to reduce emissions and fugitive dusts and odors from handling and disposing of the contaminated soils.
- *Rule 1403 - Asbestos Emissions from Demolition and Renovation Activities.* The purpose of this rule is to limit emissions of asbestos, a toxic air contaminant, from structural demolition/renovation activities. The rule requires people to notify the SCAQMD of proposed demolition/renovation activities and to survey these structures for the presence of asbestos-containing materials (ACMs). The rule also includes (1) requirements to notify any intent to disturb ACM; (2) control measures; and (3) ACM removal, handling, and disposal techniques. Structural demolition activities associated with construction are required to comply with the requirements of Rule 1403.

TABLE 4.5-1
FEDERAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 $\mu g/m^3$)	Ultraviolet Photometry	0.12 ppm (235 $\mu g/m^3$)[8]	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 $\mu g/m^3$)*		0.08 ppm (157 $\mu g/m^3$)[8]		
Respirable Particulate Matter (PM10)	24 Hour	50 $\mu g/m^3$	Gravimetric or Beta Attenuation	150 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 $\mu g/m^3$		50 $\mu g/m^3$		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		65 $\mu g/m^3$	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 $\mu g/m^3$	Gravimetric or Beta Attenuation	15 $\mu g/m^3$		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	Gas Phase Chemiluminescence	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 $\mu g/m^3$)		—		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 $\mu g/m^3$)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 $\mu g/m^3$)		0.14 ppm (365 $\mu g/m^3$)	—	
	3 Hour	—		—	0.5 ppm (1300 $\mu g/m^3$)	
	1 Hour	0.25 ppm (655 $\mu g/m^3$)		—	—	—
Lead[9]	30 Day Average	1.5 $\mu g/m^3$	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 $\mu g/m^3$	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 $\mu g/m^3$	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 $\mu g/m^3$)	Ultraviolet Fluorescence			
Vinyl Chloride[9]	24 Hour	0.01 ppm (26 $\mu g/m^3$)	Gas Chromatography			

*This concentration was approved by the Air Resources Board on April 28, 2005 and is expected to become effective in early 2006.

See footnotes on next page ...

California Air Resources Board (5/6/05)

TABLE 4.5-1
FOOTNOTES

1	*California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.*
2	*National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.*
3	*Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.*
4	*Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.*
5	*National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.*
6	*National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.*
7	*Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.*
8	*New federal 8-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18,1997. Contact U.S. EPA for further clarification and current federal policies.*
9	*The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.*

4.5.1.3 Existing Air Quality

An air quality monitoring station is located in the City of Anaheim and the readings at this station (refer to Table 4.5-2) are used to characterize air quality in the vicinity of the project site. Air quality within the region has exhibited a gradual improvement largely due to more stringent vehicle emission controls and the use of reformulated "clean" fuels. Nevertheless, the Air Basin is considered a "non-attainment area" since Federal Clean Air Standards for precursors of ozone formation and PM_{10} are being exceeded.

Ozone and particulates are seen to be the two most significant air quality concerns. The five-year trend in these data in Table 4.5-2 shows that the frequency of violations of the ozone and particulate standards have dropped since 1998. More localized pollutants such as carbon monoxide, nitrogen oxides, lead, etc. should be very low near the project site because background levels, and there are almost no sources of such emissions near the project site. Although air quality is still moderately degraded in the project vicinity, there are definite signs of improvement as seen in the air pollution monitoring data.

On-site emissions sources are currently limited to those from product deliveries, customer trips, worker commutes, and on-site vehicular emissions at the existing automotive repair business on the property. Given the size of the existing work facility (less than 3,000 square feet), the emission-producing vehicular trips and stationary sources are negligible.

TABLE 4.5-2
AMBIENT AIR QUALITY MONITORING SUMMARY

Pollutant/Standard	1998	1999	2000	2001	2002
	Number of days standards were exceeded and maximum levels during such violations				
Ozone					
State 1-Hour ≥ 0.09 ppm	10	1	9	2	3
Federal 1-Hour > 0.12 ppm	2	0	1	0	0
Federal 8-Hour > 0.08 ppm	4	0	1	0	0
Max. 1-Hour Conc. (ppm)	0.14	0.10	0.13	0.11	0.10
Carbon Monoxide					
State 8-Hour > 9.0 ppm	0	0	0	0	0
Max. 8-Hour Conc. (ppm)	5.3	5.3	6.8	4.7	5.4
Nitrogen Dioxide					
State 1-Hour ≥ 0.25 ppm	0	0	0	0	0
Max. 1-Hour Conc. (ppm)	0.13	0.12	0.13	0.12	0.10
Suspended Particulates (PM_{10})					
State 24-Hour > 50 $\mu g/m^3$	12	15	8	9	5
Federal 24-Hour > 150 $\mu g/m^3$	0	0	0	0	0
Max. 24-Hour Conc. ($\mu g/m^3$)	81	122	126	93	69
Suspended Particulates ($PM_{2.5}$)					
Federal 24-Hour > 65 $\mu g/m^3$	--	2	6	1	1
Max. 24-Hour Conc. ($\mu g/m^3$)	--	68.7	113.9	70.8	68.6
Source: SCAQMD Air Quality Data, 1998-2002					

4.5.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) outlines criteria against which a project may be measured for air quality impacts. Those criteria are evaluated in light of the SCAQMD numeric thresholds discussed below. In general, potentially significant air quality impacts would result if the project would:

- *Conflict with or obstruct implementation of the applicable air quality plan.*
- *Violate any air quality standard or contribute substantially to an existing or projected air quality violation.*
- *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).*
- *Expose sensitive receptors to substantial pollutant concentrations.*
- *Create objectionable odors affecting a substantial number of people.*

The State CEQA Guidelines define a significant effect on the environment as *"a substantial adverse change in the physical condition which exists in the area affected by the proposed project."* In order to determine whether or not the proposed project would cause a significant effect on the environment, the impact of the project must be determined by examining the types and levels of emissions generated and their impacts on factors that affect air quality. The SCAQMD has established specific air pollution thresholds against which a proposed project can be evaluated and assist lead agencies in determining whether or not the proposed project is potentially significant. If a proposed project exceeds the thresholds, then it should be considered significant. Each of these threshold factors is discussed below.

4.5.2.1 Thresholds for Construction Emissions

The following significance thresholds for construction emissions have been established by the SCAQMD. Projects in the Air Basin with construction-related emissions that exceed any of these emission thresholds should be considered to be significant:

- *75 pounds per day of Reactive Organic Gases (ROG)*[1]
- *100 pounds per day of NO_X*
- *550 pounds per day of CO*
- *150 pounds per day of PM_{10}*
- *150 pounds per day of SO_X*

4.5.2.2 Thresholds for Operational Emissions

<u>Direct or Primary Effects</u>

Specific criteria for determining whether the potential air quality impacts of a project are significant are set forth in SCAQMD's 1993 *CEQA Air Quality Handbook*. The criteria include emissions thresholds, compliance with State and national air quality standards and conformity with existing SIP or consistency with the current AQMP. The daily operational emissions "significance" thresholds are:

- *55 pounds per day of ROG*
- *55 pounds per day of NO_X*
- *550 pounds per day of CO*
- *150 pounds per day of PM_{10}*
- *150 pounds per day of SO_X*

In addition to the thresholds above, consideration must also be given to the following local 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, then project emissions are considered significant if they increase ambient concentrations by a measurable amount. The SCAQMD defines a measurable amount as 1.0 ppm or more for the 1-hour CO concentration by or 0.45 ppm or more for the 8-hour CO concentrations.

[1] Reactive Organic Gases: Instead of using the term volatile organic compounds, CARB Emissions Inventory Board uses the term ROG. ROG is defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and excluding other compounds listed in the definition.

The SCAQMD indicates in Chapter 6 of its *CEQA Air Quality Handbook* that they consider a project to be mitigated to a level of insignificance if its emissions are mitigated below the thresholds provided above.

Indirect or Secondary Effects

The SCAQMD recommends that "additional indicators" should be used as screening criteria with respect to secondary air quality effects. Relevant additional factors identified in the Handbook include the following significance criteria:

- *Interference with the attainment of the federal or State Ambient Air Quality Standards by either violating or contributing to an existing or projected air quality violation.*
- *Generation of vehicle trips that cause a CO "hot spot".*

The SCAQMD indicates in Chapter 6 of the Handbook that they consider a project to be mitigated to a level of insignificance if its secondary effects are mitigated below the thresholds provided above.

4.5.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.5.3.1 Short-Term Construction Emissions

- *The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.*

Construction activities will be concentrated at the construction site during grading, but they also spill over into the adjacent community. Vehicles track dirt off-site; construction worker vehicles and supply trucks compete with the general public for sometimes inadequate roadway capacity; and trucks are often left idling near off-site sensitive receptors while waiting to load or unload.

To evaluate emissions during the construction and operational phase of the project, the URBEMIS 2002 model was used. This model, and its predecessors, was developed by CARB in conjunction with SCAQMD and other districts to facilitate CEQA analyses for common projects. The model contains emission factors from EMFAC2002, which is the accepted emission factor model for motor vehicles in California. It also contains emission factors and default assumptions for typical emission sources for the construction and operation phases of many development projects.

Implementation of the recharge basin project involves a variety of construction activities over approximately 150 days and three general phases, as described below. For modeling purposes, equipment requirements and durations were quantified for each of the construction phases, as described below.

Demolition

Demolition and clearing of on-site structures, including greenhouses and buildings, will be accomplished in the first phase. The sizes of the buildings are factored into the emissions quantities generated during demolition. However, since the greenhouses are essentially 'empty' structures (as compared to the residences with interior walls, flooring, ceilings, foundations, etc.) and can be dismantled and removed, rather than demolished in situ, they are assigned a lower weight (i.e., ten percent of concrete or wood-frame demolition debris volume) in terms of cubic feet of material demolished and removed, in turn reducing dust generation. Demolition is estimated to require approximately 45 calendar days to complete.

Grading and Excavation

In the second and most activity-intensive phase, it is assumed that the 6-acre basin would be excavated to a depth of nine feet. Approximately 92,000 cubic yards (cy) of soil would be hauled off-site over an approximately 110-day grading period, averaging about 42[2] haul trucks per day. Another 50,000 cubic yards of soil would be moved and balanced on-site. At any given time, the maximum acreage disturbed per day will be about one acre. It is estimated that one scraper, one trencher, two loaders, and two dozers would operate daily at the site during the construction period. It is further assumed that 20 employees would each travel 60 round-trip miles daily, and a water truck would travel 10 miles per day at the job site.

Construction has generally been considered a temporary source of potential nuisance from dust or odors. Dust is normally the primary concern during grading activities. Because such emissions are not amendable to collection and discharge through a controlled source, they are called "fugitive emissions". However, fugitive dust emissions from earthmoving and building demolition would be controlled via water trucks and street sweepers in accordance with SCAQMD Rule 403.

The construction equipment (consisting of graders, bulldozers, trucks, etc.) is generally diesel-powered, resulting in high levels of nitrogen oxide (NOx) and particulate emissions. Delivery vehicles and workers commuting to the construction site will generate mobile emissions.

Other On-site Construction

The third phase includes construction of the inflatable dam, inlet/outlet structures, electrical control facilities, asphalt paving, and fencing. The construction phase includes about one acre of asphalt paving emissions and related equipment emissions. This phase of construction is estimated to require 45 calendar days to complete. Emission estimates for the asphalt-paving sub-phase were based on the following assumptions:

- *Paving will occur over a one-month period after completion of site grading and excavation.*
- *A total of one acre will be paved.*
- *The construction equipment will include one loader, one paver, one forklift, paving equipment, one roller, one water truck, and construction materials delivery trucks.*

Estimated emissions for the three construction phases of the project are summarized in Table 4.5-3. The URBEMIS 2002 model output is included in Appendix 9.5. As shown in Table 4.5-3, most short-term emissions associated with construction of the project would not exceed daily significance thresholds established by the SCAQMD. Standard controls will be implemented to reduce equipment emissions and fugitive dust generated during grading (i.e., Rule 403 measures), as discussed below. However, NOx emissions would exceed the daily threshold and will require mitigation.

[2] Based on URBEMIS 2002 default haul truck capacity of 20 cubic yards per truck.

TABLE 4.5-3
PROJECT CONSTRUCTION EMISSIONS (UNMITIGATED)

Pollutant	Unmitigated Construction Emissions (lbs./day)	SCAQMD Significance Thresholds (lbs./day)	Significant Impact?
Reactive Organic Gases (ROG)	14.04	75	No
Nitrogen Oxides (NOx)	127.09	100	**Yes**
Sulfur Oxides (SOx)	0.69	150	No
Particular Matter (PM_{10})	25.09	150	No
Carbon Monoxide (CO)	101.61	550	No
Source: URBEMIS 2002 Computer Model; Output in Appendix 9.5			

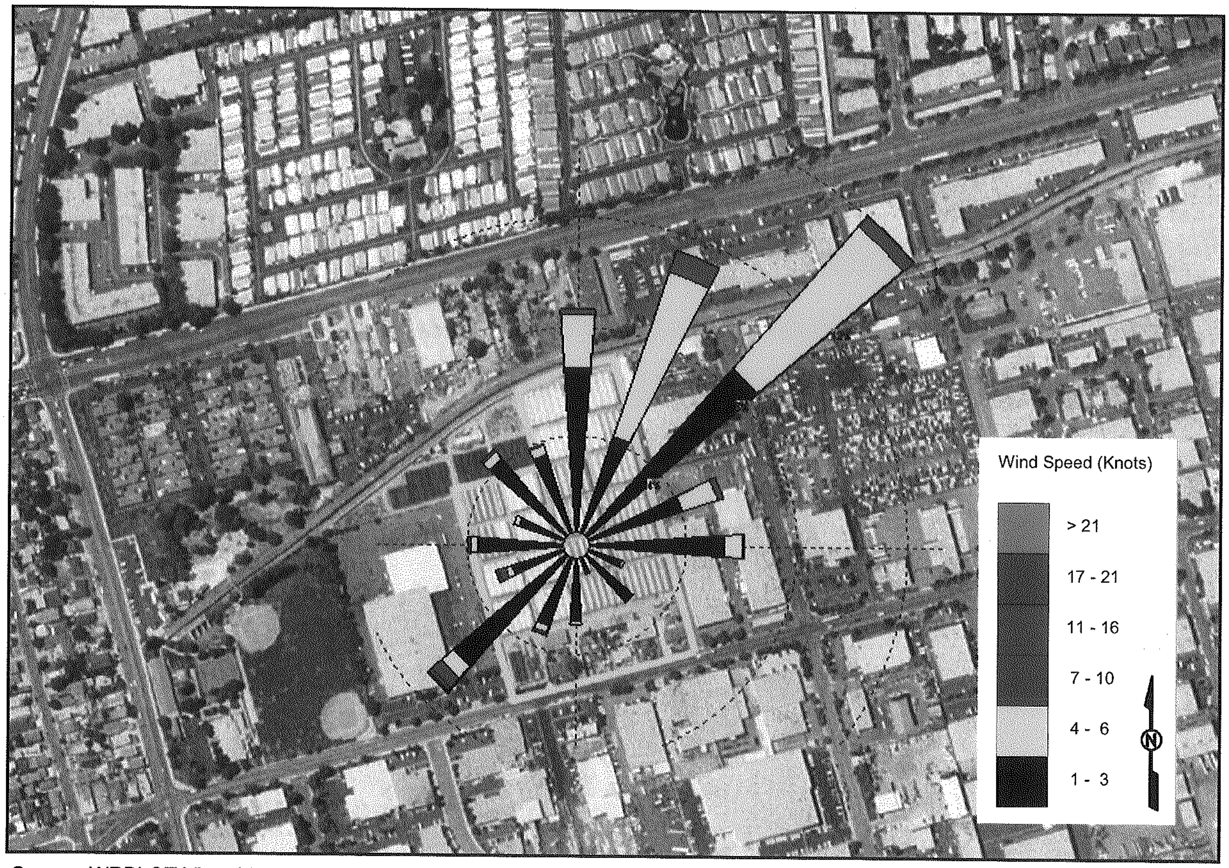
Fugitive Dust Emissions

- *The project would not expose adjacent sensitive receptors to substantial pollutant concentrations during grading activities.*

In addition to gaseous emissions, land clearance, grading and excavation activities will result in fugitive dust emissions. The URBEMIS 2002 model estimates that each acre graded produces an average of 10 pounds of PM_{10} per day from soil disturbance. Sensitive receptors located in the vicinity of the project include Melrose Elementary School and the McFadden Park ballfields located between 550 and 1,000 feet west of the project site. Single-family homes are located about 450 feet north, yet are separated from the site by light industrial uses and Orangewood Avenue.

The greatest potential for short-term air quality impacts on local receptors is related to fugitive dust emissions potentially impacting nearby school sensitive receptors. The SCAQMD publishes hourly wind flow pattern data within the Air Basin. In general, wind flow patterns reflect the dispersion of cooler marine air during the afternoon periods and the cooler inland air during the late night and early morning periods. Typical summer daytime (noon to 7:00 p.m.) ocean winds are from the southwest with average wind speeds ranging from 10 to 15 miles per hour (mph). Typical winter daytime winds have average wind speeds of 6 to 9 mph from the southwest. During most periods when grading is underway, the wind direction will be generally towards the northeast (see wind rose illustration in Figure 4.5-1), though directional changes will occur, and dust particulates can be transported off-site in many directions.

The wind flow patterns would have their greatest impact during the summer months when the average wind velocity is the greatest. During the daytime periods, the ocean air blows inland at average velocities of between 10 to 15 mph. This would mean that any fugitive dust associated with grading, or disturbed by the wind itself, would likely be transported in a northeasterly direction toward residential areas within ¼ mile, and occasionally southwesterly toward the existing school. Although PM_{10} quantities will not exceed the SCAQMD significance threshold, the District will implement means to control fugitive dust to ensure that effects in sensitive receptor areas are minimized.



Source: WRPLOT View 2005

Figure 4.5-1 ***Average Wind Speeds and Directions***

Monitoring Well Construction

The monitoring wells will be drilled and installed prior to commencement of construction on the groundwater recharge basin. The wells will be installed sequentially via rotary or sonic drilling methods. Construction is expected to occur 8 to 10 hours per day, 5 days per week for approximately 2 weeks at each site. Construction of the wells would temporarily require an area of up to 5,000 square feet. The well construction schedules will not overlap with construction of the recharge basin; therefore, the emissions from well construction would not be combined with those from the basin construction.

Well construction is estimated to include three pieces of heavy equipment: a backhoe to dig the vault, a drill rig to drill the hole, and a crane to set the casing and pump in place. A welder is also included to weld casing, vault covers, and any necessary metal work. Only one or two pieces of the equipment would be in use at any given time. Emissions for the heavy equipment were obtained from Table A9-8-B of the SCAQMD's *CEQA Air Quality Handbook*. Of the four types of equipment discussed above, Table A9-8-B shows the drill rig as creating the greatest levels of pollution. For purposes of this analysis, drilling operations are based on a 10-hour per day schedule. Drilling would cease, at least temporarily, for other activities such as the welding of casing and the emissions would be no greater than if drilling were to proceed for the duration of well construction.

One truck haul per day with a projected round-trip distance of 22.6 miles is included. A commuting component for construction employee travel and haul trucks has also been included. Well construction emissions, including heavy equipment and mobile-source emissions are shown in Table 4.5-4. All emissions are below the daily criteria. Also, because well construction would only take about two weeks per well site, the project would not exceed the SCAQMD quarterly criteria and any potential impact is less than significant.

TABLE 4.5-4
DAILY WELL CONSTRUCTION EMISSIONS (LBS./DAY, UNMITIGATED)

Source	CO	NO_x	ROG	PM_{10}
Drill Rig	75.2	90.3	11.3	5.6
Worker Trips	3.8	0.6	0.4	0.0
Haul Trucks	0.4	0.4	0.0	0.0
Dust	None	None	None	2.3
Total	**79.4**	**91.3**	**11.7**	**7.9**
SCAQMD Threshold	550	100	75	150
Exceeds Threshold?	**No**	**No**	**No**	**No**
Source: SCAQMD CEQA Air Quality Handbook, Table A9-8-B				

Well construction is limited to a relatively small area; does not involve grading; and, in the performance of the contract, to avoid extensive clean-up, contractors would typically attempt to disturb as little area as possible. The area to be disturbed is estimated at no more than about 5,000 square feet. Based on a conservative value of 20 pounds per acre per day, PM_{10} dust emissions are estimated at no more than 2.3 pounds per day.

4.5.3.2 Operational Activity Impacts

Mobile Source Emissions

- *The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation, nor would the generation of vehicle trips cause a CO "hot spot."*

Project operations will result in up to 10 trips per day by maintenance/operations personnel traveling to the recharge basin. Additionally, two to three times per year, the District would remove approximately 200 cubic yards of silt from the basin, requiring off-site disposal by a contractor. As shown in Table 4.5-5, emissions of CO, ROG, NOx and PM_{10} are all forecast to be less than SCAQMD thresholds by a large margin of safety. The construction and operation of a groundwater recharge basin would not conflict with the air quality control policies outlined in the SCAQMD's Air Quality Management Plan. None of the operational activities would be subject to permitting by the SCAQMD. As such, the proposed project would not violate air quality standards.

The project would result in an overall reduction of emissions for operational activities since the existing emissions associated with product delivery and worker commute at the existing automotive repair business on the property would be eliminated. Though already minimal, the existing emissions sources would be replaced with even fewer daily worker trips and negligible emissions from the recharge basin operation (landscaping equipment, basin maintenance equipment, etc.). As such, the project contribution to the cumulative baseline would not be considered significant.

TABLE 4.5-5
PROJECT OPERATIONAL EMISSIONS (LBS./DAY, UNMITIGATED)

Source	ROG	NOx	CO	PM10
Basin cleaning and silt hauling	1.60	11.58	13.06	12.94
Area Source Emissions	0.07	0.01	0.48	0.00
Mobile Source Emissions	0.25	0.16	1.75	12.68
Total	**1.92**	**11.75**	**15.29**	**25.62**
SCAQMD Significance Threshold	*55*	*55*	*550*	*150*
Exceeds Threshold (?)	**No**	**No**	**No**	**No**
Source: URBEMIS 2002 Computer Model; Output in Appendix 9.5				

Microscale Impacts

- *The project would not expose sensitive receptors to substantial mobile-source pollutant concentrations.*

The ambient air quality monitoring data in Table 4.5-2 show that carbon monoxide levels in Anaheim were well below the State 8-hour standard. Locally, changes in the location of any collection of automotive sources, or changes in the number of vehicles or travel speeds, may impact the microscale air quality, including ambient CO concentrations, around any given development. Traffic increases not only contribute air pollutants in direct proportion to their cumulative percentage of traffic volume growth, but they slow all existing traffic to slower, more inefficient travel speeds. As indicated previously, however, minimal operational emissions would be associated with the La Jolla Recharge Basin project. The project traffic (average of two trips per day) would not measurably impact any local intersection, regardless of its operational level of service. Therefore, the proposed project is not subject to a CO hotspot analysis, and it would not expose sensitive receptors to substantial pollutant concentrations, most notably CO from vehicle exhaust sources.

- *The project would not create objectionable odors affecting a substantial number of people.*

In addition to exhaust, dust, and ROG, project construction could release odors. Odors are one of the most obvious forms of air pollution to the general public and can present problems for both the source and the surrounding community. The only potential odors associated with the project are from the application of asphalt and paint, and from diesel-fueled equipment during the construction period. Odors generated during construction would be short-term and would not result in long-term impacts to the surrounding area. Therefore, any odor impacts would not be considered as significant.

4.5.3.3 Air Quality Plan Consistency

- *The project would not conflict with or obstruct implementation of the applicable air quality plan.*

Projects relate to the AQMP/SIP through air quality planning consistency with the Southern California Association of Government's (SCAG) growth forecasts. Residential projects relate to the AQMP through the land use and growth assumptions used to forecast automotive air pollution emissions. Insofar as the proposed project is non-residential, will not induce growth, and will produce minimal emissions during its operational lifetime, the project is deemed consistent with the AQMP.

4.5.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

4.5.4.1 Construction Activities

As shown previously in Table 4.5-3, most of the fugitive dust, construction equipment, and worker commute emissions will not exceed the SCAQMD thresholds. All pollutants but NOx have an adequate margin of safety between daily emissions and the significance standard. However, with the construction equipment emissions mitigation specified below, NOx emissions will be reduced below the threshold on a maximum activity day, as shown in Table 4.5-6.

TABLE 4.5-6
PROJECT CONSTRUCTION EMISSIONS (MITIGATED)

Pollutant	Unmitigated Construction Emissions (lbs./day)	Mitigated Construction Emissions (lbs./day)	SCAQMD Significance Thresholds (lbs./day)	Significant Impact?
Reactive Organic Gases (ROG)	14.04	14.04	75	No
Nitrogen Oxides (NOx)	127.09	87.45	100	No
Sulfur Oxides (SOx)	0.69	0.69	150	No
Particular Matter (PM_{10})	25.09	15.87	150	No
Carbon Monoxide (CO)	101.61	101.61	550	No
Source: URBEMIS 2002 Computer Model; Output in Appendix 9.5				

Equipment Emissions

Impact 4.5-1: *Heavy equipment emissions would exceed the SCAQMD daily threshold for NOx during the grading and excavation phase of project construction.*

> **MM 4.5-1a:** During grading and construction activities, OCWD shall require that construction contractors use low-emission mobile construction equipment to reduce the release of undesirable emissions. OCWD shall require the use of construction equipment having lean-NOx catalysts. The use of such equipment will reduce NOx emissions below the threshold level. Additionally, OCWD shall require the use of aqueous diesel fuel and/or diesel particulate filters for use in all off-road diesel powered construction equipment to further reduce NOx emissions.
>
> **MM 4.5-1b:** OCWD shall stipulate in project plans and contractor specifications that equipment and supply staging areas shall be located as far as practicable from the nearest sensitive receptors during construction and periodic maintenance activities. Idling shall be limited to 10 minutes for trucks and heavy equipment, and equipment staging areas shall be located at least 300 feet away from the western property boundary (i.e., nearest McFadden Park and Melrose Elementary School).

Although SCAQMD thresholds for most criteria pollutants (ROG, SOx, CO, PM_{10}) will not be exceeded and mitigation is not required, OCWD will nonetheless implement the following standard measures, consistent with common construction practice, to further reduce construction emissions:

Compliance with SCAQMD Rule 403 Dust Control

During construction of the proposed project, OCWD shall be required to comply with regional rules, which will assist in reducing short-term air pollutant emissions. SCAQMD Rule 403 requires that fugitive dust be controlled with the best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Two options are presented in Rule 403: monitoring of particulate concentrations or active control. Monitoring involves a sampling network around the project with no additional control measures unless specified concentrations are exceeded. The active control option does not require any monitoring, but requires that a list of measures be implemented starting with the first day of construction. Relevant control measures from Rule 403 are identified below:

MM 4.5-1c: On-going during grading and construction activities, normal wetting procedures and other dust palliative measures shall be followed to minimize fugitive dust emissions in compliance with SCAQMD Rule 403. At a minimum, those measures shall include the following:

- The simultaneous daily disturbance area shall be limited to one acre, or enhanced dust control shall be used for such activities on up to 20 percent of the project property.
- Construction contractors shall limit traffic speeds on all unpaved road surfaces to 15 miles per hour or less in order to reduce the release of fugitive dust.
- Construction contractors shall suspend grading operations during first and second stage smog alerts and suspend all grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour or visible dust plumes emanate from the site.
- Construction contractors shall develop a traffic plan to minimize traffic flow interference from construction activities.
- All exposed earth surfaces shall be watered a minimum of twice daily.
- Access points to paved surfaces shall be washed or swept daily. Public streets shall be swept for at least 50 feet on either side of site access points if silt accumulation is visible in the roadway.
- Dirt hauled off-site shall be in a semi-moist state and loads shall be covered prior to transport.

MM 4.5-1d: Construction plans and contractor specifications shall stipulate that the emissions of fugitive dust from any open silt storage piles will not remain visible in the atmosphere beyond the property line. Prior to off-site transport, silt storage piles shall be stabilized by watering, application of soil binders, and/or covered with tarps.

Air Toxics

Potentially Contaminated Soils

Although petroleum hydrocarbons were not detected in any of the on-site soil samples (refer to Section 4.3 – Hazards and Hazardous Materials), excavated soils will be monitored for stained, odorous, or hydrocarbon-saturated in areas of the site previously used for the dispensing or storage of gasoline, diesel fuel, or waste oil storage. To reduce health and safety impacts from encounters with soil contamination during excavation and soil movement, soils will be disposed of off-site in accordance with applicable hazardous waste regulations. Consistent with this obligation, if the contamination exceeds the VOC levels of SCAQMD Rule 1166[3], the District would comply with its provisions. As with VOCs, construction personnel and nearby receptors could be exposed to pesticides by breathing or swallowing dust stirred up during grading and excavation.

Impact 4.5-2: *Grading and excavation of soils in certain areas of the project site could trigger compliance with SCAQMD Rule 1166 concerning the emissions of volatile organic compounds.*

> **MM 4.5-2a**: Any contaminated soils encountered on the project site during tank removal, site clearance, or excavation shall be sampled to determine the nature and extent of the contamination and disposed of off-site in accordance with applicable hazardous waste regulations, including SCAQMD Rule 1166 where soil samples reveal VOC levels in excess of 50 parts per million. The District shall notify the Orange County Health Care Agency and other regulatory agencies as necessary prior to undertaking remedial action.

> **MM 4.5-2b**: During excavation, if additional soil testing indicates the probability of encountering VOC contaminated soils, the District, or assigned contractor, shall prepare a written VOC Contaminated Soil Mitigation Plan in accordance with the SCAQMD Rule 1166 – *VOC Emissions from Decontamination of Soil* – and submit the plan for SCAQMD approval. A VOC-Contaminated Soil Mitigation Plan shall be written to minimize VOC emissions to the atmosphere during excavation, grading, handling and treatment of VOC contaminated soil. SCAQMD approval of the mitigation plan shall be obtained before proceeding with the excavation and grading in the affected areas, as clearly delineated in the plan. Additionally, soil excavation in excess of 5,000 cubic yards shall be subject to a pre-approved AQMD Rule 403 Fugitive Dust Plan. The approved plan shall contain mitigation measures designed to reduce emissions and fugitive dusts and odors from handling and disposing of potentially contaminated soils.

Impact 4.5-3: *Grading and excavation of soils in certain areas of the project site may expose construction personnel and nearby sensitive receptors to pesticide-contaminated dust emissions.*

> **MM 4.5-3:** Prior to site grading and excavation, OCWD shall ensure that the construction contractor has an AQMD-approved plan for the removal and disposal of pesticide-contaminated soils. In formulating a comprehensive plan, the contractor shall comply with all relevant AQMD rules and reasonable conditions. The conditions shall include, but may not be limited to, conducting air monitoring and implementing dust control procedures to prevent airborne transport of site contaminants during site grading and excavation. After the pesticide-contaminated soil is removed, the removal contractor shall perform confirmation sampling to ensure that the desired clean-up levels are achieved. Additional plans elements shall include procedures for ensuring responsibility for the implementation of the plan; accessibility to the site for AQMD staff; notification of actions required by the plan; identification of emission receptors; monitoring and testing; suppression and covering of stockpiles; prevention of public nuisance from dust emissions; prevention of fugitive emissions of contaminated soil; loading of truck trailers; and disposal and treatment.

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[3] Rule 1166 applies to soils that are contaminated with VOCs measured as greater than 50 parts per million (ppm) within three inches of the soil surface.

Asbestos-Containing Materials

Impact 4.5-4: *Existing structures could contain asbestos-containing materials, which would pose a health hazard if asbestos becomes airborne during demolition activities.*

MM 4.5-4: If asbestos-containing materials (ACMs) are found during the site survey required by Mitigation Measure 4.3-2a (see Section 4.3 – Hazards and Hazardous Materials), abatement of asbestos shall be completed prior to any demolition activities that would disturb ACMs or create airborne asbestos hazard. Actions to remove ACM shall be accomplished in accordance with SCAQMD Rule 1403 – *Asbestos Emissions from Demolition and Renovation Activities*, which requires that:

- Asbestos removal shall be performed by a State-certified asbestos containment contractor;
- A survey of the facility shall be conducted prior to issuance of a permit by SCAQMD;
- SCAQMD shall be notified of intent to remove ACMs prior to demolition activity;
- ACMs shall be removed in accordance with prescribed procedures;
- Collected ACMs shall be placed in leak-tight containers or wrapping; and
- ACMs shall be properly disposed.

4.5.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Project-related air quality impacts were shown to be less than significant during project construction. Dust (PM_{10}) emissions during grading will not exceed adopted significance thresholds and will be further reduced by the use of enhanced dust control measures. Short-term NOx emissions from diesel-powered equipment will approach the SCAQMD threshold, but emissions reductions achievable by combustion modifications (aqueous diesel fuel, particulate filters, etc.) will ensure that NOx emissions remain below the threshold level of significance.

4.5.6 CUMULATIVE IMPACTS

- *The project would not result in a cumulatively considerable net increase of criteria pollutants for which the project region is in non-attainment under applicable federal and/or state ambient air quality standards.*

The cumulative impact of many individual projects leads to the overall air quality problems of the region. The SCAQMD has recommended that the threshold level of regionally significant ozone (smog) precursor emissions for stationary (smokestack) sources be applied to mobile source emissions from general development projects. In an "extreme" non-attainment area such as the Air Basin, the "de minimis" emissions level is 10 tons/year (55 lb./day) of ROG and/or NOx. Project-related mobile source impact emissions were evaluated relative to these stationary source thresholds and found to be below those criteria levels in the long-term, particular since major maintenance activities will only occur two to three times per year.

During the short-term, construction activities on other nearby sites could run concurrently with the proposed project and might involve heavy grading activities. The NOx emissions for equipment exhaust from the recharge basin project alone are near the SCAQMD threshold after mitigation. The sum total of heavy equipment emissions at other construction sites, particularly at the adjacent proposed middle school site, could exceed the individual project threshold for NOx and other pollutants. However, in accordance with SCAQMD methodology, the proposed recharge basin project can be mitigated to below the daily threshold values and would not create impacts that are cumulatively considerable.

4.6 NOISE

4.6.1 EXISTING SETTING

4.6.1.1 Noise Characteristics and Measurement Systems

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Zero on the decibel scale is the faintest sound detectable by a person with good auditory acuity. The decibel scale is a logarithmic progression designed to allow for comparisons of widely varying sound pressure within an easily manageable range.

Humans perceive each increase of ten decibels to be approximately a doubling of apparent loudness. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions by weighting sounds within the range of human sensitivity more heavily (middle A and its higher harmonics) in a process called "A-weighting" written as dB(A). Any further reference to "dB" in this report should be understood to be A-weighted.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called LEQ), or alternately, as a statistical description of the sound level that is exceeded over some stated fraction of a given observation period. For example, L_{50} is the A-weighted sound level that is exceeded 30 minutes in a 60-minute period (i.e., 50% of the sample time). These values are typically used to demonstrate compliance with noise restrictions included in the City noise ordinance. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise metric called the Community Noise Equivalent Level (CNEL).

4.6.1.2 Applicable Noise Regulations

<u>State of California Noise Standards</u>

The State of California has developed a noise/land use compatibility matrix for recommended incorporation into local general plan noise elements. The State model guidelines were used as a basis for the noise/land use compatibility standards incorporated into the City of Anaheim General Plan Noise Element.

An interior CNEL of 45 dB is mandated by the State of California Noise Insulation Standards (CCR, Title 24, Part 6, Section T25-28) for multiple family dwellings and hotel and motel rooms. Since normal noise attenuation within residential structures with closed windows is about 20 dB, an exterior noise exposure of 65 dB CNEL allows the interior standard to be met without any specialized structural attenuation (dual paned windows, etc.). A noise level of 65 dB is also the level at which ambient noise begins to interfere with one's ability to carry on a normal conversation at reasonable separation without raising one's voice. A noise exposure of 65 dB CNEL is thus typically the exterior noise land use compatibility guideline for new residential dwellings in California.

City of Anaheim Noise Standards

The proposed project is in the City of Anaheim and is subject to the General Plan and noise ordinances incorporated therein. In accordance with the City's General Plan Noise Element, the City has adopted the State of California standards discussed above. Furthermore, the Noise Element indicates that exterior noise levels at residential locations should not exceed a CNEL of 65 dB, while interior levels shall not exceed a CNEL of 45 dB in any habitable room.

The Noise Element also includes stationary source noise standards. These standards are shown below. Note that these levels are not to be exceeded for a period of more than 30 minutes in any hour, the standard plus 5 dBA for a period of 15 minutes in any hour, the standard plus 10 dBA for a period of 5 minutes in any hour, the standard plus 15 dBA for a period of 1 minute in any hour, or the standard plus 20 dBA for any period of time.

Receiving Land Use Category	Noise Level	Time Period
One and Two Family Residential	45	10:00 PM – 7:00 AM
	55	7:00 AM – 10:00 PM
Multi-Family Residential, Public Space	50	10:00 PM – 7:00 AM
	55	7:00 AM – 10:00 PM
Commercial	55	10:00 PM – 7:00 AM
	60	7:00 AM – 10:00 PM
Industrial	70	Anytime

Stationary sources of noise are also included in the local Municipal Code, Chapter 6.70, Sound Pressure Levels. Section 6.70.010 simply states that "*No person shall, within the City, create any sound, radiated for extended periods from any premises which produces a sound pressure level at any point on the property in excess of sixty decibels (Re 0.0002 Microbar) read on the A-scale of a sound level meter.*" The section goes on to state, "*Traffic sounds, sound created by emergency activities and sound created by governmental units shall be exempt from the applications of this chapter. Sound created by construction or building repair of any premises within the City shall be exempt from the applications of this chapter during the hours of 7:00 a.m. and 7:00 p.m.*"

It is also of note that the City of Anaheim General Plan Noise Element (p. N-24) contains a policy to *"Discourage construction on weekends or holidays except in the case of construction proximate to schools where these operations could disturb the classroom environment."*

City of Placentia Noise Standards

According to Chapter 23.76, Noise Control, of the City of Placentia's Municipal Code, there are three designated noise zones:

(1) Noise Zone 1: All residential property
(2) Noise Zone 2: All commercial property
(3) Noise Zone 3: All industrial property.

As defined in Section 23.76.050 of the City's Municipal Code, the following exterior noise standards, unless otherwise specifically indicated, apply to all real property within a designated noise zone:

Noise Zone	Noise Level	Time Period
1. Residential Property	55 dB(A)	7:00 a.m.-10:00 p.m.
	50 dB(A)	10:00 p.m.-7:00 a.m.
2. Commercial Property	65 dB(A)	Anytime
3. Industrial Property	70 dB(A)	Anytime

According to Section 23.76.060 of the Municipal Code, the following interior noise standards, unless otherwise specifically indicated, apply to all residential property within a designated noise zone:

Noise Zone	Noise Level	Time Period
1	55 dB(A)	7:00 a.m.-10:00 p.m.
	45 dB(A)	10:00 p.m.-7:00 a.m.

According to Section 23.81.170 of the Municipal Code, noise sources associated with grading, construction and the maintenance of real property are not subject to the provisions described above. However, there are time periods during which such activities are permitted, as follows:

- Grading and construction are permitted only between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between the hours of 9:00 a.m. and 6:00 p.m. on Saturday, and are prohibited at any time on Sunday and on all federal holidays.
- Maintenance of real property including, but not limited to: the mowing of lawns, trimming of trees and shrubs, and general landscape maintenance (Ord. 94-0-143 §1, 1994) is permitted only between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between the hours of 9:00 a.m. and 6:00 p.m. on Saturday, and between the hours of 10:00 a.m. and 5:00 p.m. on Sunday and federal holidays.

4.6.1.3 Noise-Sensitive Receptors

La Jolla Recharge Basin Site

The proposed project is to be sited in a primarily commercial and industrial mixed-use area. While no ambient noise measurements were obtained, as is typical of an urban environment, vehicles traveling along the local roadways and intermittent equipment and activity noise from nearby industrial uses dominate the local noise environment.

McFadden Park is situated about 550 feet west of the project site. The Carbon Creek Flood Control Channel form the site's northern boundary and separates the site from additional light industrial uses south of Orangethorpe Avenue. The nearest residential land uses are approximately 450 feet to the north and 600 feet to the west.

Monitoring Wells SMW-1 and PMW-3

These wells would be constructed immediately adjacent each other in the 2800 block of East Via Martens, just east of Melrose Street, in the City of Anaheim. All adjacent land uses are light industrial or office uses. The nearest sensitive receptors are Melrose Elementary School and residential development, approximately 800 and 1,000 feet north, respectively. None of the properties within 500 feet of the well sites are considered noise sensitive.

Monitoring Well SMW-2

The third well (SMW-2) would be installed in the 1000 block of South Melrose Street, approximately 350 feet south of La Jolla Street, in the City of Placentia. Residential uses are located approximately 450 feet northwest of the well site, and Melrose Elementary School is approximately 500 feet to the north. All adjacent land uses are light industrial or office parks. None of the immediately surrounding properties are considered noise sensitive.

4.6.2 IMPACT SIGNIFICANCE CRITERIA

Noise impacts can be described in three categories. The first are audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 decibels (dB) or more since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1 dB that are inaudible to the human ear. A change of 5 dBA is readily discernable to most people in an exterior environment whereas a change of 10 dBA is perceived as a doubling (or halving) of the noise. Only audible changes in existing ambient or background noise levels are considered potentially significant.

CEQA Appendix G (Environmental Checklist) outlines the significance criteria against which a project may be measured for noise. Since CEQA does not provide quantitative thresholds in this regard, additional objective criteria are included in the thresholds listed below. Potentially significant noise impacts would result if the project would result in:

- *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Noise impacts are considered significant if they expose noise-sensitive uses to noise levels exceeding standards where they are currently met;*
- *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or*
- *Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.*

CEQA Appendix G also identifies potential noise impacts associated with aircraft noise. However, there are no airports in close proximity and the proposed use is such that aircraft noise would not be an issue.

4.6.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.6.3.1 Construction Impacts

The project includes the construction and operation of a groundwater recharge basin and appurtenant on-site facilities, as well as three off-site groundwater monitoring wells. Construction activities, especially heavy equipment, will create short-term noise increases at various locations throughout the site and at the well locations. Construction would include the excavation of the recharge basin, dirt hauling, and the drilling of monitoring wells.

- *The project would not result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.*

Blasting or the use of pile drivers typically causes excessive groundborne noise and vibration during construction. The proposed project would not require any blasting activities or pile driving for demolition or earthwork. Project construction will entail the use of grading and construction equipment. The use of earthmoving equipment such as tractors, trucks, and backhoes, as well as impact equipment such as jackhammers could create a certain level of nuisance vibration and noise commonly associated with such activities. Except in areas of solid underlying rock, vibration from such sources dissipates to imperceptible levels within less than 100 feet from the source. Ground-borne vibration from general construction activities will not be a concern since equipment operating along the project boundary will not be adjacent to vibration-sensitive land use. In this instance, existing residences will be located well beyond the 100-foot zone of perceptible impact. No significant vibration impacts would result.

- *The project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.*

Excavation activities are expected to last approximately six months. Project-related construction activities could intermittently generate high noise levels on and adjacent to the site from the use of heavy construction equipment for ground clearing and soil movement operations. All construction activities would occur between 7:00 a.m. and 7:00 p.m. in accordance with the City of Anaheim Municipal Code, Section 6.70.010, which states, *"Sound created by construction or building repair of any premises within the City shall be exempt...during the hours of 7:00 a.m. to 7:00 p.m."*

Construction activity noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment. Ground clearing activities typically result in an average noise level of 84 dBA 200 feet from the construction activities. This noise level would be attenuated to approximately 78 dBA at 400 feet. The closest residential receptors are located approximately 450 feet to the north, across Orangethorpe Avenue. McFadden Park is located approximately 550 feet to the west, and Melrose Elementary School is nearly 1,000 feet west of the site. Although project construction would temporarily increase ambient noise levels during the working hours described above, potentially sensitive receptors are located far enough from the site and screened by noise-attenuating structures so that no significant noise impacts will result.

The District routinely includes standard provisions for muffling of mobile equipment and placement of stationary noise sources away from sensitive land uses as part of standard construction specifications. The District's equipment tuning and construction staging measures are detailed in Section 4.6.4 below. Also, as noted previously, the City of Anaheim General Plan Noise Element contains a policy that discourages construction on weekends or holidays, except in the case of construction proximate to schools where the noise-generating operations could disturb the classroom environment. Therefore, the District will confer with the City to determine whether project construction should continue on weekends and holidays while school is in session in an effort to avoid impacting the existing and/or proposed PYLUSD schools immediately west of the project site.

4.6.3.2 Operational Impacts

- *The project will not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, nor would the project result in exposure of persons to or generation of noise levels in excess of standards established in the Anaheim General Plan or noise ordinance, or applicable standards of other agencies.*

Once completed, the proposed project would not increase ambient noise levels in the vicinity of the project. Daily recharge basin operations would generate only about 10 vehicular trips per day, which is unnoticeable in the ambient noise environment. The basin would require maintenance several times a year, which would involve use of a Basin Cleaning Vehicle that is submerged and operates on the bottom of the basin while filled. Some heavy equipment could be required to maintain the basin and access road. In the context of surrounding industrial land uses and the ambient noise conditions, noise generated by maintenance activities would be less than significant and would not affect Anaheim area residents' noise exposure beyond the noise levels currently experienced.

- *The project is not located within two miles of a public airport, public use airport, or private airstrip, nor would the project expose people residing or working in the project area to excessive noise levels.*

The project site is not within two miles of a public airport, public use airport, or private airstrip. Therefore, no impact will result.

4.6.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

4.6.4.1 Construction Noise

Although no significant project-related impacts have been identified, OCWD routinely includes standard noise provisions as part of construction specifications. The measures that OCWD will apply to this project include, but are not limited to, the following:

> **MM 4.6-1:** Short-term construction noise intrusion shall, at a minimum, be limited by compliance with the Anaheim Municipal Code on hours of allowable disturbance, as stated in conditions on contractor specifications. Those same documents shall also specify construction access routing to minimize construction truck traffic past existing schools, residential neighborhoods, or other noise-sensitive uses in the project vicinity.
>
> **MM 4.6-2:** Prior to commencement of demolition or construction, a note shall be placed on the plans requiring compliance with the following measures ongoing during demolition, grading, and construction operations:
>
> a. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers consistent with manufacturers' standards. All internal combustion equipment used for construction and drilling shall be properly tuned-up to minimize noise emissions, and shall use mufflers and noise shrouds no less effective than those originally installed on the equipment. No equipment shall have unmuffled exhaust. This measure shall be added to the construction contract and enforced by the District Engineer or designee;

b. All stationary construction equipment shall be located in staging areas that will create the greatest distance between construction-related noise sources and McFadden Park (which is located west of the project site) and all equipment shall be oriented so that emitted noise is directed away from McFadden Park, as feasible; and,

c. The construction contractor shall be required to adhere to all Noise Ordinance provisions of the City of Anaheim. Additionally, noisy construction within 500 feet of existing homes shall be limited to the hours of 7 a.m. and 7 p.m. on weekdays, 7 a.m. to 6 p.m. on Saturdays and not at any time on Sunday or Federal holidays.

MM 4.6-3: If monitoring well drilling occurs within 300 feet of schools or residences, the drill sites shall be enclosed on all sides with an acoustical barrier that provides a minimum sound transmission class rating of 30. The height of the barriers is crucial in terms of effectiveness, as the higher the barrier the more the noise reduction. Types of shielding may include leaded blankets, an acoustic blanket, or several layers of plywood. This measure shall be added to the construction contract and enforced by the District Engineer or designee.

MM 4.6-4: For project construction activities within 300 feet of an occupied school, the District shall confer with the City of Anaheim to determine whether project construction should continue on weekends and holidays while school is in session in an effort to avoid impacting noise-sensitive uses on weekdays. This approach is consistent with the City of Anaheim General Plan Noise Element, which generally discourages construction on weekends or holidays, except in the case of construction proximate to schools where the noise-generating operations could disturb the classroom environment.

4.6.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The District's standard noise mitigation measures require that individual projects proceed in accordance with local noise ordinances to ensure that community noise impacts remain less than significant. With the use of the District's standard noise measures, construction and operations noise can be mitigated to a less than significant level.

4.6.6 CUMULATIVE IMPACTS

Insofar as construction noise would be temporary and addressed by the District's standard noise reduction practices, project-related effects would not be cumulatively considerable. Similarly, operational impacts are not cumulatively considerable given their infrequent occurrence (2 to 3 times per year for major maintenance). In the context of the project's ambient noise environment, cumulative noise effects would not be significant.

4.7 LAND USE AND RELATED PLANNING

4.7.1 EXISTING SETTING

4.7.1.1 Site Land Uses

The approximately 9.3-acre project site consists of several properties primarily under the ownership of the Orange County Water District, which purchased the project site from the T. Ohara Farm. The site consists of six parcels, two of which were used for a nursery with greenhouses and several seasonal growing areas. Most of the project site has been used for growing flowers for commercial use by the Ohara family. However, five former residences along the project site street frontage have been purchased as part of the project and will be demolished.

As part of the project, OCWD is also purchasing about 0.64 acre of an adjacent 2-acre parcel (APN 344-181-15) from the Placentia-Yorba Linda Unified School District (PYLUSD). That particular parcel was previously leased by the County of Orange to the Ohara family for their flower-growing business, and contains the remnants of three greenhouses. PYLUSD plans to use the majority of that parcel, in addition to other contiguous parcels, for its proposed Southwest Middle School. Figure 4.7-1 on the following page shows an aerial view of existing on-site structures and uses.

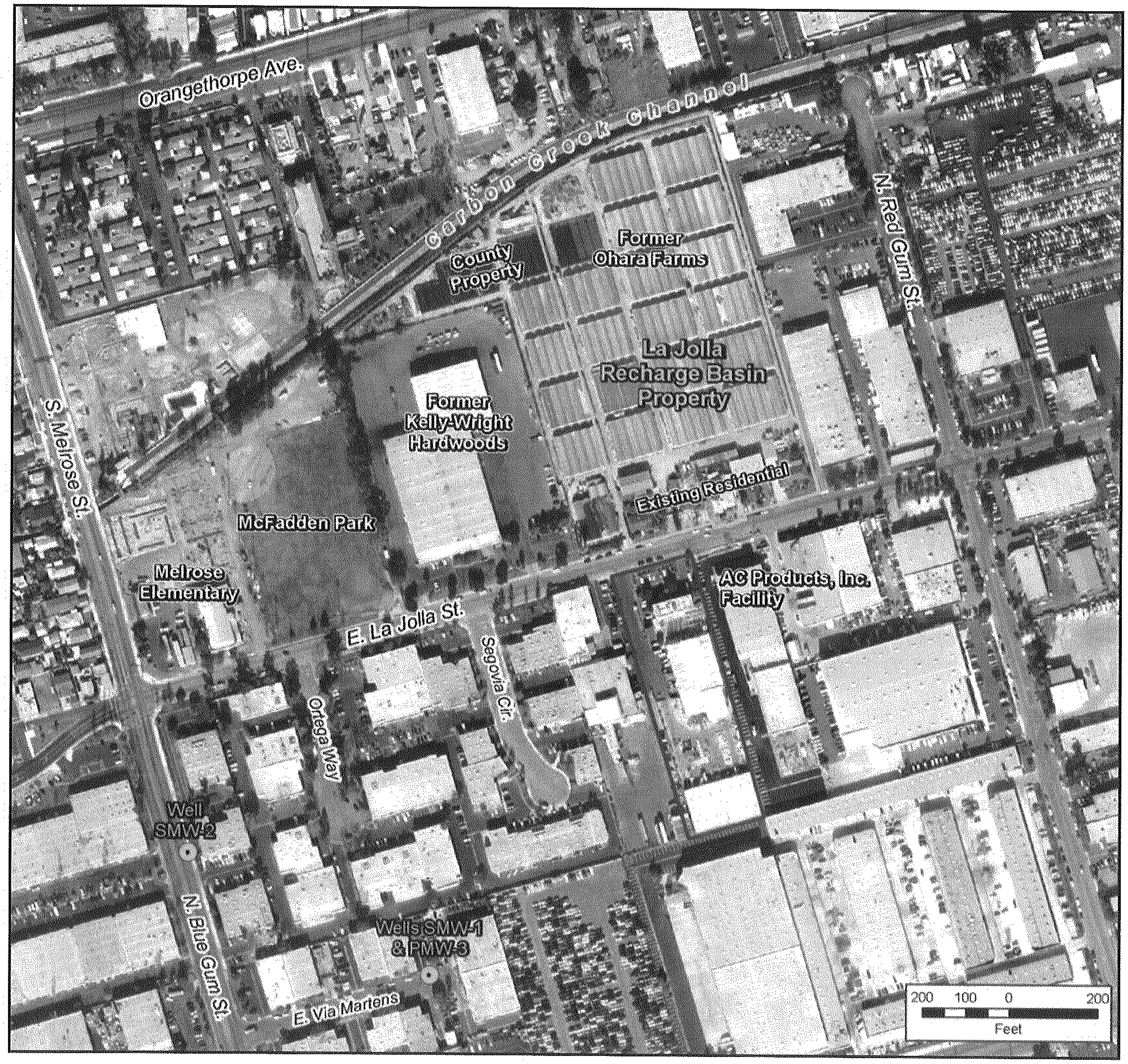
4.7.1.2 Adjacent Land Uses

The site is bordered by light industrial and commercial uses in the City of Anaheim to the south and east, and by the recently closed Kelly-Wright Hardwoods wood processing factory and warehouse in the City of Placentia, immediately to the west (see Figure 4.7-1). The PYLUSD has purchased that site for construction of its proposed Southwest Middle School. The approximately 7.6-acre Melrose Elementary School and McFadden Park and ballfield complex, also in Placentia, is situated about 550 feet west of the project site. The Carbon Creek Channel forms the site's northern boundary and separates the site from additional light industrial uses south of Orangethorpe Avenue. The nearest residential land uses are approximately 450 feet to the north and 600 feet to the west.

4.7.1.3 Monitoring Well Sites

Monitoring Wells SMW-1 and PMW-3 would be constructed immediately adjacent each other in the 2800 block of East Via Martens, just east of Melrose Street, in the City of Anaheim. All adjacent land uses are light industrial or office uses. The nearest air quality and noise sensitive receptors are Melrose Elementary School and residential development, approximately 800 and 1,000 feet north, respectively. None of the properties within 500 feet of the well sites are considered noise sensitive.

The third well (SMW-2) would be installed in the 1000 block of South Melrose Street, approximately 350 feet south of La Jolla Street, in the City of Placentia. Residential uses are located approximately 450 feet northwest of the well site, and Melrose Elementary School is approximately 500 feet to the north. All adjacent land uses are light industrial or office parks. None of the immediately surrounding properties are considered noise sensitive.



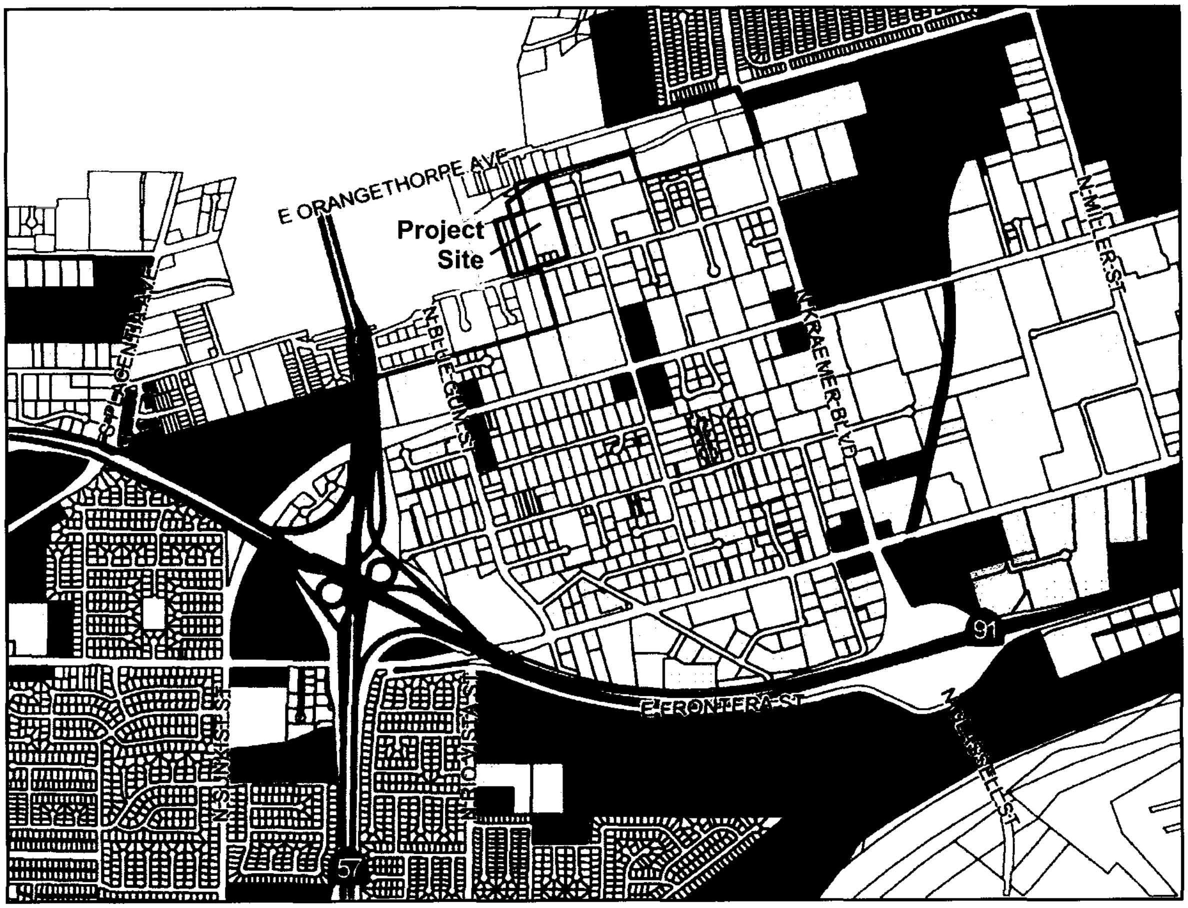
Source: Keyhole.com 2004

Figure 4.7-1
Existing Site Conditions and Surrounding Land Uses

4.7.1.4 Existing Regulatory Land Use Documents

<u>City of Anaheim General Plan</u>

The proposed project site is designated as 'Industrial' in the City of Anaheim Land Use Element. The 'Industrial' designation permits such uses as research and development, technology centers, office uses, business parks, assembly and light manufacturing, repair and service facilities, warehousing and distribution, and limited employee-serving retail uses (see Figure 4.7-2 on the following page).



Industrial

	Designation	Description	Maximum Density (FAR)	Typical Implementation Zone(s)
☐	Industrial	Industrial-related uses, including research and development uses, technology centers, corporate and support office uses; business parks, assembly and light manufacturing, repair and other service facilities; warehousing and distribution centers; and, limited, employee-serving retail uses.	0.50	I

Source: City of Anaheim 2004

Figure 4.7-2
City of Anaheim General Plan Land Use

The City's Green Element (2004) designates a large area east of State College Boulevard and north of the Santa Ana River as a "Groundwater Protection Zone". As one of it's stated goals (Goal 5.2), the Green Element endeavors to promote water conservation and to "maximize opportunities to install local or regional groundwater recharge facilities."

City of Anaheim Municipal Code

The proposed recharge basin site is located in the Northeast Area Specific Plan No. 94-1 (Development Area I) Zone, which provides for the development of industrial uses and related facilities to achieve the following Specific Plan goals:

- Improving the marketability of existing land uses;

- Redeveloping and improving underutilized parcels;
- Optimizing municipal revenues from sales and property taxes;
- Establishing appropriate mechanisms to fund improvements;
- Improving the overall appearance of the area; and,
- Protecting and enhancing the integrity and desirability of industrial sites within the planned industrial areas of the community.

The property is also located in a Redevelopment Area (Alpha Project, Northeast Area), which has the basic objective of eradicating "blighting influences within the Project area and the prevention of their reoccurrence through the redevelopment of land uses consistent with the environment, economic, and social goals of the community."

Although the proposed recharge basin is not consistent with nor in conformance with the above-noted plans that provide for industrial and related uses, pursuant to Section 53091 of the California Government Code facilities for the production, generation, storage, treatment and transmission of water are exempt from local zoning and building ordinances. The District is not required to submit grading or landscape plans, or obtain building or demolition permits, since the District is exempt from building ordinances. However, the District acknowledges that an encroachment permit from the City of Anaheim will be required for work in La Jolla Street, as will a Truck Haul Permit to comply with local regulations applicable to the District's project.

In terms of land use and planning compatibility, therefore, this EIR evaluates the project's physical compatibility with surrounding land uses in areas such as noise, traffic generation, emissions, visual impact, and public health and safety.

Other Related Plans

The Orange County Transportation Authority's (OCTA) Commuter Bikeways Strategic Plan (CBSP) proposes the Carbon Creek Bikeway, a Second Priority regional Class I bikeway, along Carbon Creek from La Palma Avenue to east of Kraemer Boulevard. Various Class I (paved off-road) bikeway segments exist along Carbon Creek in the City of Anaheim, west of the project site. However, neither La Jolla Street nor the Carbon Creek Channel adjacent to the project site is designated on the OCTA master plan map or the City of Anaheim Bicycle Master Plan (2004) map as an existing or proposed bikeway. Nevertheless, a bike path could be accommodated in the Carbon Creek Channel flood control easement if warranted in the future.

4.7.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) outlines the significance criteria that this project is measured against for land use and planning. The project would have a potentially significant land use and planning impact if it would:

- *Physically divide an established community;*
- *Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or*
- *Conflict with any applicable habitat conservation plan or natural community conservation plan.*

4.7.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.7.3.1 Community Impacts

- *The proposed project would not physically divide an established community.*

The project site is in a highly developed light industrial/commercial area, adjacent to a flood control channel and school and park facilities. The project requires the acquisition of land but does not require any off-site improvements that could potentially disrupt the physical arrangement of an established community. The La Jolla recharge basin project would not divide a community or isolate previously contiguous neighborhoods. No aspect of the project has the potential to divide or alter the physical arrangement of surrounding residential communities.

4.7.3.2 Planning and Land Use Compatibility

- *The proposed project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.*

City of Anaheim General Plan and Zoning Consistency

The proposed project site is zoned 'SP 94-1, Development Area I' in the City of Anaheim Zoning Ordinance. Although the proposed water use alone is not consistent with local plans that provide for industrial and related uses, the District has no authority to acquire land for uses other than water supply, storage, transmission and related infrastructure. The proposed project does not include the acquisition of land in excess of what is needed for the water supply project. Similarly, the District has no authority to develop and expend funds for mixed-use projects not associated with water supply infrastructure.

Moreover, as noted previously, Section 53091 of the California Government Code exempts water supply projects from local City and County zoning and building ordinances. As such, the District will not be submitting an application to the City for a grading, demolition or building permit. This notwithstanding, the District's project is not inconsistent with the designated industrial land uses and therefore does not conflict with the City's General Plan or the uses allowed under the Northeast Area Specific Plan. In addition, the project would not prevent neighboring properties from conforming with the Plans or with the Redevelopment Area aesthetic and economic objectives. As such, the project does not create any significant land use impacts that require mitigation.

Land Use Compatibility

Implementation of the groundwater recharge basin project would not result in land uses deemed incompatible with the surrounding industrial, school, park, and other land uses in accordance with the existing land use planning and regulatory documents. The health and safety of students at the existing and proposed nearby schools are of primary importance to the District, and are among the primary land use compatibility issues considered throughout this EIR. Site safety is a concern because the project site will be bordered by a middle school and will contain extensive electrical and control equipment, as well as present an open waterbody hazard. Therefore, fencing will be installed along all property boundaries except along Carbon Creek Channel (CGvL 2003).

As demonstrated throughout Chapter 4.0 of this EIR, the physical indicators of land use compatibility (i.e., noise, air quality, traffic, public health and safety, aesthetics, etc.) have been avoided or minimized through project design and/or mitigation. No significant land use compatibility impacts will result from the proposed project.

Regional Recreation Plans

As indicated in Section 4.4 (Transportation and Circulation), neither the OCTA's Commuter Bikeways Strategic Plan nor the City of Anaheim Bicycle Master Plan maps show an existing or proposed bikeway along the project segment of Carbon Canyon Creek. If planned for future use as a Class I bikeway, the flood control easement along the project site boundary would require 10 feet for the bikeway with two feet of clearance on each side to provide adequate space. Since the project would construct an underground pipeline from the Carbon Creek Channel to the proposed recharge basin, the project would not limit a proposed bike path easement on OCFCD property. The property to be acquired as part of the project is far enough from the creek to maintain ample room for the proposed bike path on County property. The project would not affect bikeway and landscaping setbacks within the Carbon Creek easement and no impacts would result.

4.7.3.3 Conservation Plans

- *The proposed project would not conflict with any applicable habitat conservation plan or natural community conservation plan.*

The proposed project is not located within the Natural Communities Conservation Plan (NCCP) program for Orange County. The site is developed and does not contain any native habitat. No habitat conservation plan or natural community conservation plan governs development at the project site; therefore, the District's use of the site will not conflict with any such plans.

4.7.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

Although significant impacts related to land use and planning will not result from project construction or operation, the following measure will be implemented:

> **MM 4.7-1:** To ensure compatibility with future land uses and adjacent school site planning efforts, final construction documents and a copy of the project plans shall be made available by OCWD to interested and affected public agencies, including the Placentia-Yorba Linda Unified School District, the County of Orange, and the cities of Anaheim and Placentia.

4.7.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Land use and related planning impacts are found to be less than significant after mitigation.

4.7.6 CUMULATIVE IMPACTS

The proposed recharge basin project would not create land use conflicts with any existing or future uses, including the proposed Southwest Middle School project that is planned by PYLUSD. Post-construction activity levels on the site would be relatively minor compared to future adjacent uses. The nature of the proposed recharge basin project is such that its operations would be unaffected by intensified uses on neighboring properties. No adverse land use or policy impacts will result, either individually or cumulatively.

4.8 GEOLOGY AND SEISMICITY

This section summarizes data and analyses from several geotechnical studies and subsurface investigations. The *Preliminary Design Report for the La Jolla Recharge Basin,* prepared by CGvL Engineers in 2004, included a Geotechnical Evaluation by Ninyo & Moore (2003). Based on the results of soils testing and exploratory borings, Ninyo & Moore's geotechnical evaluation provides recommendations for the design and construction of the proposed recharge basin and other site improvements. The section also references pertinent information from the Mission Geoscience (2000) Geologic Hazards Assessment for the adjacent McFadden Park site, as well as the England Geosystem (2003) Phase II Assessment Report for the former Ohara Properties.

4.8.1 EXISTING SETTING

4.8.1.1 Regional Geology

The California coastal region has been subjected to intense tectonic forces for millions of years. Folding, faulting of marine sediments, and associated volcanism resulted in the formation of the Coast Ranges that extend along most of the California coast. Terrestrial, marine, and volcanic rocks deposited in valleys between mountain ranges compose the aquifers called the Coastal Basins aquifers. The California Department of Water Resources considers more than 100 coastal basins to be "significant" because of the amount of groundwater potentially obtainable, or due to the scarcity of surface-water sources in a basin. Nearly all of the large population centers in California, including Orange County, are located in the coastal basins.

The Los Angeles Basin physiographic region is divided into four structural blocks delineated by zones of faulting and flexure. The central block, in which the site is located, extends south from the Santa Monica Mountains to the San Joaquin Hills (see Figure 4.8-1). A northwest-trending synclinal trough dominates the central block.

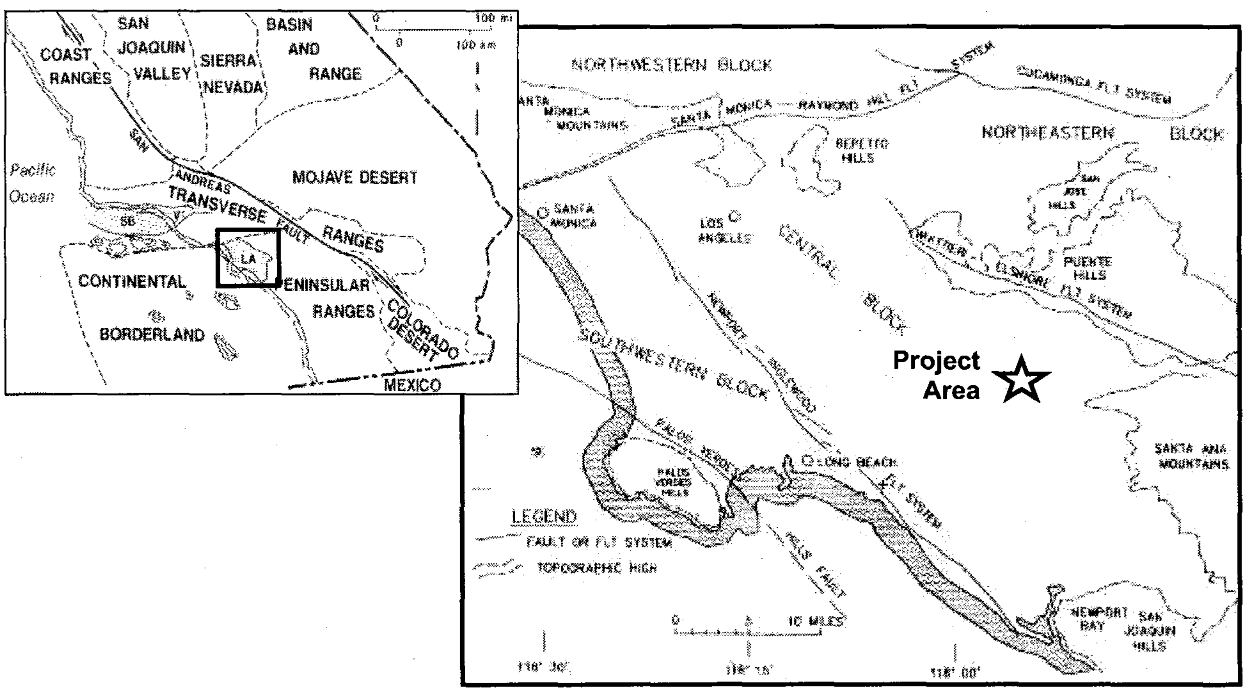


Figure 4.8-1 ***Regional Physiographic Features***

The basement complex is of pre-Cretaceous metasedimentary and metavolcanic rocks with some plutonic intrusions. Marine and nonmarine clastic sedimentary rocks of late Cretaceous through Pleistocene age overlie the basement rocks. This sedimentary sequence reaches a cumulative thickness of up to 32,000 feet in some areas (Yerkes, et al. 1965). Overlying these sedimentary rocks is a series of unconsolidated alluvial and marine deposits. Only the uppermost portion of this sequence of unconsolidated alluvial and marine deposits contains fresh water.

4.8.1.2 Local Subsurface Conditions

The La Jolla site is approximately 4,000 feet west of Kraemer and Miller basins. The La Jolla site is downgradient and adjacent to Carbon Creek Channel, in the same river fluvial deposits as the other two basins. As part of the Phase II Environmental Site Assessment at the La Jolla site (England 2003), Cone Penetrometer Testing was performed to assess whether there was any continuous, low-permeability soil strata of substantial thickness beneath the site that could impede infiltration. Based on visual observations while hand-augering, soils in the upper 10 feet of the vadose zone are primarily sand and silty sand. The surface soils contained higher percentages of silt and, in the flower growing areas, the surface soils were generally loose and uncompacted, as independently confirmed by Ninyo & Moore (2003).

Tests performed by England Geosystem found predominantly sand to as deep as 76 feet below ground surface. This was the limit of the testing equipment. Silty soils were interpreted to be present at various depths but the thickness of these lower permeability soils was usually less than one foot. The depths at which the finer grained soils occurred varied with location, making correlations between borings difficult. However, the CPT data do not indicate the presence of a laterally continuous and substantial layer of fine-grained soil beneath the project properties. Moreover, no perched water zones, which may be indicative of an impediment to vertical groundwater movement, were indicated. Tests performed by the Placentia-Yorba Linda Unified School District's consultant, Mission Geoscience, found the same, but to a depth of 115 feet. Neither consultant found evidence of a laterally continuous fine-grained layer of any significant thickness. The resulting conclusion is that the site is underlain by sand, and none of the soil types encountered preclude the site as a recharge basin. The predominance of sand is consistent with that for Kraemer Basin, located less than a mile away, which is also underlain by sand. Given this similar geology and close proximity, it is reasonably assumed that the percolation capability of the proposed La Jolla Basin will be very similar to that of Kraemer Basin. Recharge capability is discussed further in Section 4.2 (Hydrogeology and Groundwater Quality).

4.8.1.3 Regional Geohydrology

In all the coastal basins, most of the freshwater is contained in aquifers that consist of continental deposits of sand and gravel that might be interbedded with confining units of fine-grained material, such as silt and clay. The aquifers and confining units compose an aquifer system. The project site is located on the eastern portion of the Coastal Plain aquifer system of Orange County. The Coastal Plain is bounded by the Chino and Puente Hills to the north, the Santa Ana Mountains to the east, and the San Joaquin Hills to the south. The ground surface across the Coastal Plain typically slopes gently westward, away from these relief features, toward the Pacific Ocean. The boundary of the plain is the Pacific Ocean to the west and the line of contact between the alluvial deposits and the consolidated sediments of the hills and mountains to the north, east, and south.

In the vicinity of the site, freshwater-bearing strata have been divided into three aquifer systems, designated as the Upper, Middle and Lower aquifer systems of the Orange County Groundwater Basin. These aquifer systems are typically confined, although they are locally interconnected within the Coastal Plain (Herndon 1992). Most of the aquifers beneath the Coastal Plain dip gently southwesterly, and certain aquifers occur at or near the ground surface in the eastern parts of the basin in the Forebay area. These conditions are generally favorable for OCWD's operation of groundwater recharge basins in the Forebay area. Regional and local hydrogeologic settings are described in greater detail in Section 4.2 (Hydrogeology and Groundwater Quality).

4.8.1.4 Seismic Hazards

The Seismic Hazards Mapping Act of 1990 (Public Resources Code, Chapter 7.8, Division 2) directs the California Department of Conservation (DOC), Division of Mines and Geology (DMG) to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by DMG in their land-use planning and permitting processes.

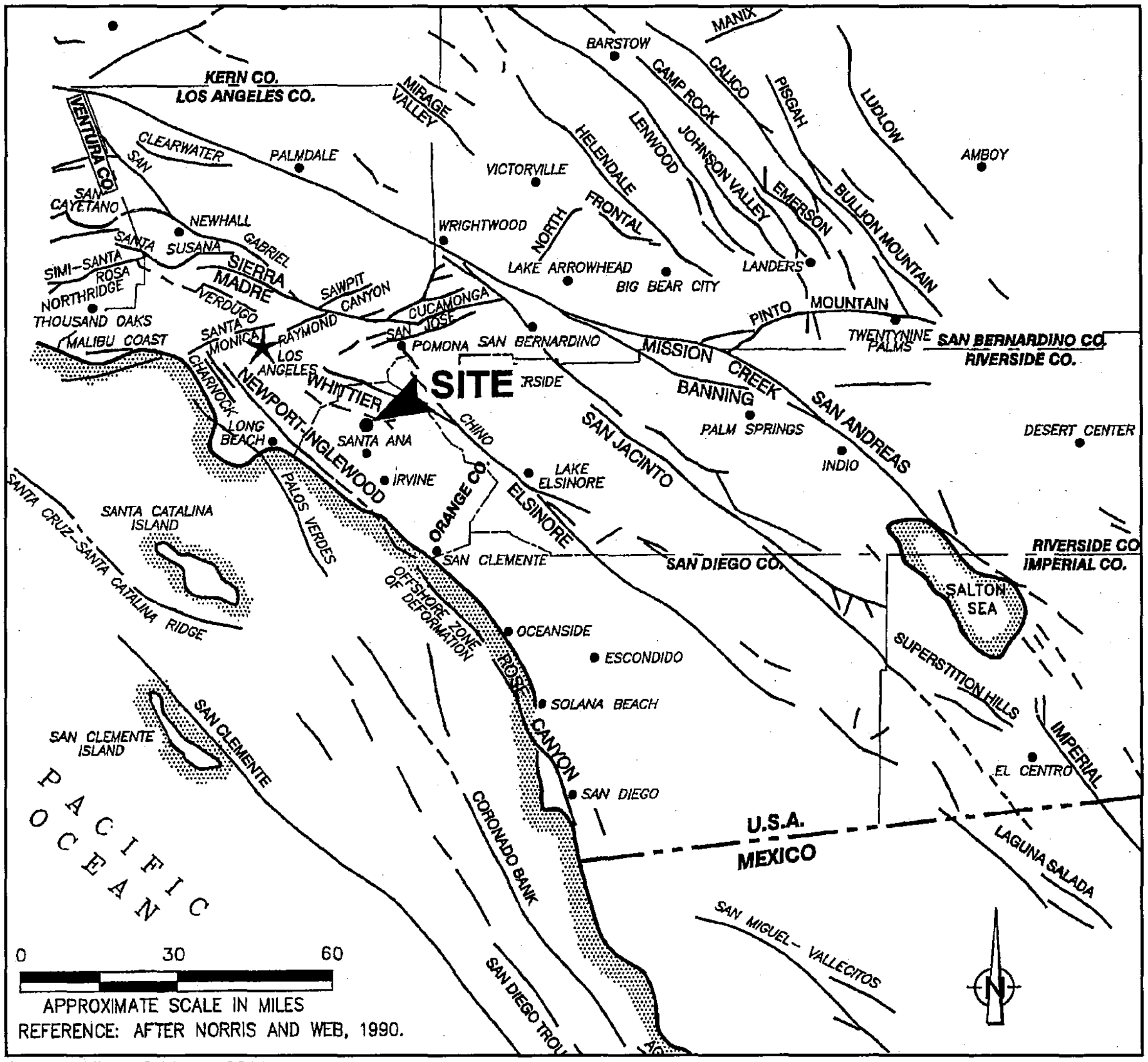
Faulting and Surface Rupture

The proposed project site is not in an existing Alquist-Priolo Earthquake Fault Zone. Faults in the site vicinity include a concealed trace of the potentially active Norwalk fault located approximately 2.7 miles west of the site and a concealed trace of the active El Modeno fault located approximately 1.4 miles southwest of the site (Ninyo & Moore 2003). The two nearest zones of "well-defined and sufficiently active" surface faulting presently recognized by the State of California are along the surface traces of the Whittier-Elsinore Fault Zone, located approximately three miles to the northeast, and the "on-shore" segment of the Newport-Inglewood Fault Zone, located approximately 17 miles to the southwest, at their respective nearest positions relative to the proposed site. Figure 4.8-2 shows the locations of regional faults.

The Whittier-Elsinore Fault Zone, a right-lateral oblique strike slip fault, is reportedly capable of an Upper Bound Earthquake (UBE) of moment magnitude M7.4 during a multiple-segment rupture involving both the Whittier Fault and the Glen Ivy North segment of the Elsinore Fault, or a characteristic earthquake of moment magnitude M6.8 during a "single-segment" rupture of either segment individually. The Whittier Fault segment has not ruptured historically; however, the Glen Ivy North segment of the Elsinore Fault ruptured during the M_L 5.5 1938 Elsinore earthquake (Mission 2000).

The on-shore segment of the Newport-Inglewood Fault Zone is reportedly capable of a UBE of M_{max} of M6.9. This fault segment was responsible for the 1933 M_w 6.4 Long Beach earthquake, and apparently also a minor (M_w 3.8) earthquake in 1990. Most recent published data from the onshore segments of the Newport-Inglewood Fault Zone suggest a possible average recurrence interval of 2,200 years between large, surface-rupturing events (Mission 2000).

Based on other data presented in the Mission Geoscience (2000) geologic hazards assessment for the adjacent McFadden Park site, the potential for surface fault rupture on the proposed recharge basin site by known active or potentially active faults is considered nonexistent, owing to the relative respective distances of the potential seismic sources as summarized above. Furthermore, there are no topographic or geomorphic features in the immediate site vicinity otherwise indicative of any historic surface rupture or related co-seismic deformation.



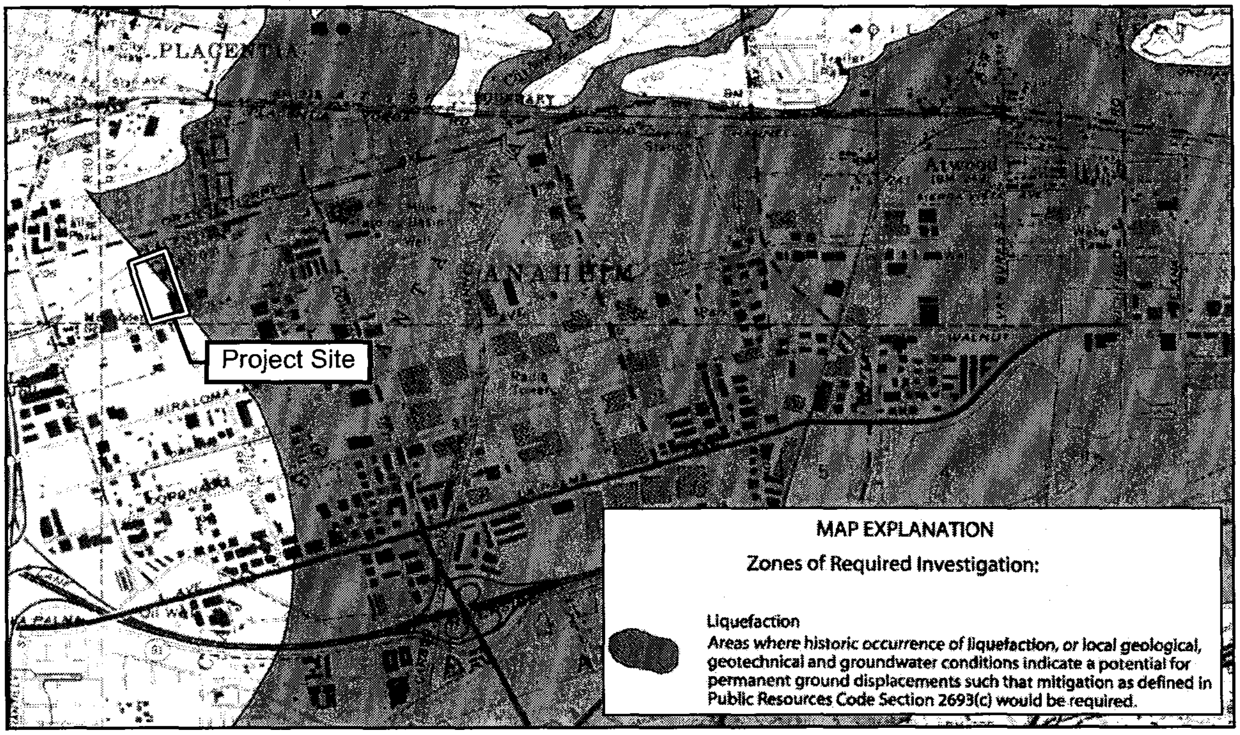
Source: Ninyo & Moore 2003

Figure 4.8-2 ***Fault Location Map***

For preliminary design purposes, the strong ground-shaking due to earthquake expected onsite during the design life of the proposed recharge basin, associated with an upper-bound earthquake (10 percent probability of exceedance in 100 years), may be considered to be 0.49g (Mission 2000). Ninyo & Moore reviewed a California probabilistic seismic hazard assessment and estimated the peak ground acceleration, with a 10 percent probability of exceedance in 50 years, at approximately 0.42g at the site. The site seismic design acceleration will be determined by the OCWD project engineer and will meet professional engineering design criteria.

Liquefaction

Soil liquefaction is the loss of soil strength during a significant seismic event. It occurs primarily in loose, fine to medium grain, granular material that is water-saturated and generally occurring within 40 feet of the ground surface. Liquefaction consists of a rearrangement of the soil particles into a denser condition resulting, in this case, in localized areas of settlement. The Seismic Hazards Zones Map (Official Map of Orange Quadrangle, 1998) shown on Figure 4.8-3 indicates that the site is at the extreme western limit of an area of historically occurring liquefaction, or local geological, geotechnical and groundwater conditions that would indicate a potential for permanent ground displacements. Based upon this information alone, the site liquefaction hazard potential initially appears moderate to high. However, Ninyo & Moore did not encounter groundwater in their exploratory borings to depths of 51.5 feet. The lack of shallow groundwater and relatively dense consistency of the alluvial soils at depth thus indicates that the potential for liquefaction at the site is low (Ninyo & Moore 2003).



Source: CDMG 1998, Orange and Anaheim quadrangles

Figure 4.8-3
Local Liquefaction Potential

4.8.1.5 Mineral Resources

The project site is not zoned for mineral resource extraction. There are currently no mineral extraction activities within the proposed project site; there are no known commercially valuable minerals located on the project site; and there are no historical indications of such use. No mineral resources could be directly or indirectly affected by new residential development on the project site; therefore, CEQA does not require further evaluation of the issue.

4.8.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) outlines the significance criteria against which the project is measured for geologic, seismic, soil stability, and mineral resource impacts. Significant adverse environmental impacts could occur if the proposed project would result in any of the following:

- *Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

- *i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.*
- *ii) Strong seismic ground shaking.*
- *iii) Seismic-related ground failure, including liquefaction.*
- *iv) Landslides.*

- *Result in substantial soil erosion or the loss of topsoil.*
- *Locate development on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.*
- *Locate development on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.*

4.8.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

- *The proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.*

The proposed recharge basin project does not include structures for human occupancy or facilities that would be considered essential to sustain life or property during a seismic event. The project site is not in an existing Alquist-Priolo Earthquake Fault Zone, nor within two miles of the surface traces of any identified or known active or potentially active faults. Similarly, the site is not located on or near either primary or secondary co-seismic surface geomorphology exhibiting deformation (i.e., pressure ridges, escarpments, fissures). Thus, the project site is not expected to experience primary surface fault rupture or related ground deformation during the life of the proposed recharge basin. No significant impacts would result.

- *The proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.*

The proposed project site is not located within a landslide hazard zone, and the surrounding topography is flat. Therefore, no impacts will result.

- *The proposed project would not result in substantial soil erosion or the loss of topsoil.*

During construction, the proposed project would involve grading and excavation of approximately ten acres of land. The majority of the earthwork will consist of excavations for the proposed recharge basin, while other minor earthwork will include trench excavations for the proposed inlet and outlet structures extending from Carbon Creek Channel; foundation construction for the equipment building; and the construction of the perimeter access road. Given the amount of ground disturbance, unprotected soils could be exposed to wind and water erosion. However, excavation and grading will be completed in accordance with codes and regulations intended to minimize soil erosion. The District will develop a Storm Water Pollution Prevention Plan (SWPPP) to gain coverage under the statewide National Pollutant Discharge Elimination System (NPDES) general permit. The plan would include Best Management Practices (BMPs) to control sediment in runoff from the site, thereby minimizing potential erosion from storm runoff. After completion of the basin and other site improvements, the exposed soils would be protected from erosion by gravel or landscaping.

The area just north of the recharge basin would be used to temporarily store silt that is removed from the basin two to three times per year. Although the basin cleaning would be scheduled to avoid forecast storms, and the silt would remain on-site only temporarily before it is hauled away, the potential remains for unexpected rainfall to cause erosion. Therefore, OCWD will construct a berm to separate the silt storage area from Carbon Creek Channel. The berm would impound the stormwater from that relatively small area of the site and would avoid silt deposition in the channel. No significant impacts would result.

- *The proposed project is not subject to high risk for seismic-related ground failure, including liquefaction, and would not result in exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death.*

The site is located near an historic liquefaction hazard zone, as identified by the California Geological Survey (CGS) Seismic Hazard Map. Structures in these areas are generally subject to ground-shaking and liquefaction. However, since the proposed recharge basin does not involve structures for human occupancy, a detailed liquefaction study is not required (Pub. Res. Code Section 2621.6). More importantly, Ninyo & Moore did not encounter groundwater in exploratory borings to depths of 51.5 feet. The lack of shallow groundwater and relatively dense consistency of the alluvial soils at depth thus indicates that the potential for liquefaction at the site is low (Ninyo & Moore 2003).

Although the basin sidewalls could be affected by the continual saturation of recharge operations and localized surficial sloughing could occur during a seismic event, the final basin design will comply with all applicable codes and seismic engineering guidelines for slope stabilization within seismically active areas. The project will comply with design for structures located in Seismic Zone 4 in accordance with the Uniform Building Code (UBC, 1997). Additional UBC seismic design parameters are provided in the Ninyo & Moore geotechnical evaluation. The sidewalls of the recharge basin will be constructed at a 3:1 slope that minimizes the risk of failure, as recommended by the geotechnical engineer (Ninyo & Moore 2003).

A qualified geotechnical engineer will review all project plans prior to the start of construction. During excavation and construction of the recharge basin, a qualified geotechnical engineer will be on-site to provide geotechnical observation and testing services and to observe materials exposed during excavation. If conditions are found to vary from those described in the Ninyo & Moore report, then additional recommendations will be made regarding fill placement and compaction. The proposed design and construction measures will ensure that potential seismic-related impacts are maintained at levels that are less than significant.

- *The proposed project would not locate development on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.*

As previously stated, the site is not located within a designated Alquist-Priolo Earthquake Fault Zone and potential hazards associated with landslides are considered very low. Based on the published literature and subsurface data obtained from exploratory borings, the liquefaction potential at the site is also considered to be low. The geotechnical assessment of the recharge basin has concluded that while ground-shaking and liquefaction potential are present at the site, the risk of sidewall sloughing and/or failure can be minimized by following specific engineering techniques during grading and construction (Ninyo & Moore 2003). No significant impacts would result.

- *The project is not located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, and will not create substantial risks to life or property.*

Operation of the basin would saturate underlying soils when the basin is filled with water, which could cause expansive soils to swell, if present. However, the proposed site is located over soils known to allow for effective percolation of water into the groundwater aquifer. Since expansive soils generally have substantial clay content (i.e., low percolation potential), they are unlikely to be found in the area. No habitable structures would be constructed as part of the project that could be affected by expansive soils. As such, if small areas of expansive soils do exist at the site, no damage from shrink-swell effects would occur and no significant impacts would result.

4.8.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

The evaluations of soils and subsurface conditions by England (2003) and Ninyo & Moore (2003); the school site assessment by Mission Geoscience (2000); and the Engineer's Report (OCWD 2003) all conclude that recharge basin construction and operation is feasible from a geotechnical point of view. OCWD will incorporate the conclusions and recommendations presented in those reports into design and construction of the recharge basin and site improvements. A geotechnical engineer will also conduct on-site review of potential structural and soils-related hazards during the construction process. Adherence to those procedures will ensure that potential geotechnical and seismic impacts remain below a level of significance.

4.8.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Impacts will be less than significant and no mitigation measures are necessary.

4.8.6 CUMULATIVE IMPACTS

Geotechnical constraints are site-specific and do not generally extend to other properties planned for or currently under development. Each development project is required to conform to strict engineering requirements on an individual basis. Implementation of the proposed project will not cumulatively contribute to soil, slope, or other localized geotechnical issues.

Development in a seismically active region will naturally add to the cumulative exposure of structures and property to seismic hazards. Earthquake damage is generally greater as development encroaches upon active fault zones, depending on building construction, soil types, and geology. Though State and local building codes are intended to address development-specific impacts of seismic ground-shaking, each significant seismic event inevitably reveals vulnerabilities in building design, slope stabilization methods, infrastructure, and other development features. Some of the potential damages are not readily foreseen; hence, fully mitigating potential loss of property may simply not be possible in this instance, particularly in an area that will be subject to some level of seismic activity in the future. Insofar as the proposed recharge basin project does not pose a foreseeable risk to life or property, the project's cumulative effects are deemed less than significant.

4.9 BIOLOGICAL RESOURCES

4.9.1 EXISTING SETTING

4.9.1.1 Regulatory Environment

Federal Endangered Species Act Jurisdiction

The U.S. Fish and Wildlife Service (USFWS), under the federal Endangered Species Act (ESA) of 1973, as amended, protects species listed as endangered or threatened. Endangered species are defined as a species *"in danger of extinction throughout all or a significant portion of its range,"* while a threatened species is *"likely to become endangered in the foreseeable future."*

Clean Water Act Jurisdiction

The U.S. Army Corps of Engineers (Corps) has jurisdiction over, and regulates the discharge of fill material into, 'waters of the United States' under Section 404 of the federal Clean Water Act (CWA) (1972, 33 U.S.C. 1344). By definition, these include all waterways, streams, and intermittent streams that could be used for interstate commerce, and their tributaries. In non-tidal waters, the Corps' jurisdictional limits extend to the ordinary high water mark (OHWM) which is defined as that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear natural line impression on the bank, shelving, changes in the character of soil, and destruction of the surrounding area. The upstream limit of Corps jurisdiction is that point on the stream where the OHWM is no longer perceptible. The Corps also maintains that it has the authority to regulate isolated vernal pools and wetlands that contain endangered species as "waters of the United States." Permits must be obtained for activities that would result in a discharge of dredge or fill material into waters of the United States or adjacent wetlands and associated habitat.

California Department of Fish and Game (CDFG) Jurisdictions

California Endangered Species Act

The California Endangered Species Act (CESA) definitions of "endangered" and "threatened" parallel those of the federal Act. Endangered species are in serious danger of becoming extinct and threatened species are likely to become an endangered species in the foreseeable future according to Sections 2062 and 2067, respectively, of the California Fish and Game Code. Candidate species are species that are under formal review by CDFG for addition to the endangered or threatened species list (Section 2067). Prior to being considered for protected status, the CDFG designates a species as being of special concern. "Species of special concern" are those species for which CDFG has information indicating that the species is declining.

Streambeds

The California Department of Fish and Game, through provisions of the CDFG Code (Section 1602), is empowered to issue agreements ("Streambed Alteration Agreements") for projects that would adversely affect wildlife habitat associated with the natural flow of any river, stream, or lake edges. Streams (and rivers) are defined by the presence of a channel bed and banks, and intermittent flow. Riparian habitat includes willows, mulefat, and other vegetation typically associated with the banks of a stream or lake shoreline.

Nesting Birds

Nesting bird species, their eggs, and their nests are protected by the California Fish and Game Code (Sections 3503 and 3513), which prohibits the destruction of native resident and migratory bird eggs and nests.

Preliminary site visits revealed a relatively low level of bird activity on the project site, due in large part to the semi-industrial setting and a general lack of mature vegetation over most of the site. However, several large trees north of the Carbon Creek Channel are within 100 feet of the site boundary and proposed construction areas. Several shrubs along the fence line at the northern site boundary could also support nesting birds. Though there appears to be an overall lack of suitable nesting habitat on-site, a qualified wildlife biologist will survey the site and surroundings to make that determination (see Section 4.9.4.1).

4.9.1.2 Vegetation Communities

The project site is located in an urbanized area of the City of Anaheim. Several houses, greenhouses, and commercial structures currently occupy the project site. Much of the project site is either developed with existing structures, paved, or otherwise devoid of vegetation. Vegetation on the perimeter of the project site consists of non-native grasses, shrubs and trees, including blue gum eucalyptus (*Eucalyptus globulus*).

4.9.1.3 Jurisdictional Waters and Riparian Vegetation

Section 404 of the Federal Clean Water Act requires permitting of activities that would result in discharge of dredge or fill material into "waters of the United States" or adjacent wetlands. Federal policy directs "no net loss" of wetland habitats. Section 1602 of the California Fish and Game code requires a "Streambed Alteration Agreement" for projects that would alter a stream channel.

4.9.1.4 Wildlife Species

Horticultural plant varieties make up a majority of the vegetative cover present on-site. Due to the historical disturbance of the site and the absence of native habitat, there is no habitat for candidate, sensitive, or special status species on the project site.

4.9.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) outlines the significance criteria against which a project is measured for biological resource impacts. The project would have a potentially significant adverse environmental impact on biological resources if it results in any of the following:

- *Have a substantial adverse effect, either directly or indirectly or through habitat modification, on any species listed as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the CDFG or USFWS.*
- *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the CDFG or the USFWS.*
- *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

- *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native or resident migratory wildlife corridors, or impede the use of native wildlife nursery sites.*
- *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*
- *Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan.*

4.9.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.9.3.1 Riparian Habitat

- *The project will not have a substantial adverse effect on any riparian habitat identified in local or regional plans, policies, regulations or by the CDFG or the USFWS.*

The proposed project site is not located within or adjacent to riparian habitat or another sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS. Carbon Creek Channel at the site's northern boundary does not support riparian habitat at this location. Although the project will include construction of a diversion structure within the rip-rap-lined channel, no biological resources would be affected by the construction activities.

Carbon Creek Channel is characterized as a "waters of the United States" and is therefore subject to regulation by the Corps. Any project resulting in the placement of dredging or fill material into waters of the United States requires the procurement of a CWA Section 404 permit from the Corps. Activities that are not likely to impact sensitive species, like the proposed project, can be authorized under a Section 404 Nationwide Permit. As described previously in Section 4.1 (Hydrology and Water Quality), OCWD has applied for and received permit coverage from the Corps under nationwide permits NW33 and NW43, subject to compliance with certain non-discretionary Special Conditions. Section 4.1.3.3 details the water quality control measures required by the Corps as terms and conditions of nationwide permits NW33 and NW43.

State permits that are required for construction and operation of the diversion dam in the Carbon Creek Channel include a Streambed Alteration Agreement from the CDFG, and a Section 401 Water Quality Certification from the RWQCB. Table 3-2 in the Project Description shows the permit authorizations required from each of those agencies. CDFG sent a letter dated November 29, 2004 stating that OCWD is not required to obtain a Section 1602 Streambed Alteration Agreement due to the expiration of time limits specified in the Permit Streamlining Act [Gov't Code §65920 et. seq]. If the project is built and the first maintenance occurs within 5 years of that date, then OCWD is covered under the Fish and Game Code.

OCWD will request a Section 401 Water Quality Certification from the SARWQCB for proposed work in, and discharge to, Carbon Creek Channel during construction of the diversion structure and related improvements. The application will be reviewed at a later date since 401 Certification by the SARWQCB is predicated on certification of the EIR.

4.9.3.2 Wildlife Movement Corridors

- *The proposed project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native or resident migratory wildlife corridors, or impede the use of native wildlife nursery sites.*

The proposed recharge basin site is neither the site of any native, resident or migratory fish or wildlife corridors, nor the site of a native wildlife nursery. The former nurseries on-site did not specialize in protected species. Nursery operations have been relocated.

4.9.3.3 Conservation Planning

- *The proposed project would not have a substantial adverse effect, either directly or indirectly or through habitat modification, on any species listed as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the CDFG or USFWS.*

Horticultural plant varieties make up a majority of the vegetative cover present on-site. Due to the historical disturbance of the site and the absence of native habitat, there is no habitat for candidate, sensitive, or special status species on the project site.

- *The proposed project will not conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan.*

The project site and vicinity do not contain habitat that is protected by local policies or ordinances protecting biological resources. The project site is not located in the jurisdiction of the Orange County Natural Communities Conservation Plan (NCCP). The proposed project will not conflict with any adopted Habitat Conservation Plans, Natural Conservation Community Plans, or other approved habitat conservation plans.

- *The proposed project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

The proposed project would not conflict with any local policies or ordinances protecting biological resources because no such resources exist on-site. Although community design goals might encourage the protection, preservation and enhancement of the area's natural resources, including trees, site observation did not identify any mature trees requiring preservation by nature of their size, species, or other designated value.

4.9.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

4.9.4.1 Nesting Birds

Although no nesting birds were identified on-site during field visits in early 2005, several large trees across Carbon Creek Channel from the site are within 100 feet of the project site boundary and the proposed diversion dam location. Those and other off-site trees, as well as large shrubs along the northeasterly fence line, could support nesting birds.

As stated previously, nesting bird species, their eggs, and their nests are protected by the California Fish and Game Code (Sections 3503 and 3513), which prohibits the destruction of native resident and migratory bird eggs and nests. Therefore, OCWD must implement mitigation to minimize or avoid any such disturbance or harm during the construction period.

Impact 4.9-1: *Removal of the trees and large shrubs at the proposed project site could have an impact on nesting activity of native resident or migratory birds that could potentially nest on-site.*

> **MM 4.9-1:** OCWD shall obtain the services of a wildlife biologist familiar with the project area resources to conduct a pre-construction survey no more than two (2) days prior to demolition or construction work in the area to verify the presence or absence of nesting birds on the project site. The area surveyed shall include all construction and staging areas, as well as areas within 100 feet outside the boundaries of the areas to be cleared, or as otherwise determined by the biologist. The results of the survey shall be documented in a letter report of findings that shall describe the methods used to conduct the surveys, existing conditions of biological resources onsite, and results of the surveys.
>
> If the presence of nesting birds in the area of construction activity influence is confirmed, vegetation removal shall be delayed until outside the breeding season (February 1 through August 31) to avoid destruction of resident native bird nests and to ensure reproductive success for native bird species using the site for nesting purposes.
>
> If it is not feasible to avoid the nesting season, the biologist shall flag off the area(s) supporting bird nests, providing a minimum buffer of 100 feet between the nests and limits of construction. The construction crew shall be instructed to avoid any activities in this zone until the nest(s) is/are no longer active. Limits of construction to avoid the nest(s) shall be established within the field with flagging and stakes or construction fencing.

4.9.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of the mitigation measure will reduce the potential project impact to nesting birds to below a level of significance. No other biological resource impacts would result from the project.

4.9.6 CUMULATIVE IMPACTS

According to Section 15138 of the State CEQA Guidelines, cumulative impacts mean the incremental effects of an individual project when viewed in connection with the effects of past, current, and probable future projects. The proposed project will not contribute even incrementally to the loss of habitat as a result of ongoing development in the region. The project will not result in cumulatively significant impacts.

4.10 AESTHETICS

Observation of the proposed La Jolla Recharge Basin site and surrounding land uses serves as the primary basis for visual impact assessment of the proposed project. The preliminary site plan and other publicly available data provide information about site topography, local building architecture, natural features, and grading and landscape plans. Those site descriptions will be briefly summarized in order to provide a qualitative assessment of the proposed project's compatibility with the adjacent natural and built landscapes. Though no visual simulations of the proposed recharge basin have been prepared, Chapter 3.0 (Project Description) contains a plan view of the site, along with aerial photography, which illustrate the dominant visual features. Those illustrations are incorporated as necessary in the following discussion in order to provide visual context for the written impact.

The primary tool for this visual analysis is the Scenic Quality Evaluation methodology, which is based on four criteria. These criteria and their accompanying terminology are used to discuss existing landscape quality and to assess the effects of landscape additions and modifications.

- Variety - includes the number of objects in a landscape, their distribution and relationship in terms of scale between them. Landscapes with considerable variety have the potential to possess high levels of scenic quality; however, variety can amount to "noise" in the absence of unity, which is discussed below. Variety is in opposition to monotony, when the repetition of a limited number of visual elements can be uninteresting.
- Unity - the balanced, orderly, harmonious quality of combined landscape elements. A unified landscape is not simply the sum of its elements, but rather a balanced compatibility between elements in terms of color, form, texture, and linearity of features.
- Vividness - the quality in the visual landscape that has the power to create a lasting impression. The most obvious source of vividness is contrast, provided the contrast avoids confusion and remains harmonious with the overall setting. Vividness can be thought of as synonymous with "memorability".
- Uniqueness - the scarcity of an object or landscape in a physiographic region. Unique objects can be of visual, physical, biological, or human interest.

With respect to viewshed analysis, the visual character of a site is also defined by a combination of foreground, middleground, and background views. The following distance zones were assigned to the features within those three views:

<u>Foreground:</u> Elements seen at a close proximity which dominate the view and which are within approximately a quarter of a mile from the viewer.

<u>Middleground:</u> Elements which partially dominate the view, seen at a moderate distance, and which are within a quarter to one mile from the viewer.

<u>Background:</u> Elements which are seen at a distance and typically do not dominate the viewshed, but become part of the overall visual composition and which are greater than one mile from the viewer.

The stronger the influence exerted by the features in these visual zones, the greater the potential for landscape variety, though not necessarily aesthetic quality.

4.10.1 EXISTING SETTING

4.10.1.1 Local Visual Elements

Located in a highly urbanized, predominately industrial area of the City of Anaheim, the project site is not visually influenced by any notable natural or architectural features. The site and surrounding areas are essentially flat and there are no substantial opportunities for scenic views due to intervening structural development. The site contains numerous abandoned greenhouses, various storage structures, and several residential structures in various forms of dilapidation. All viewsheds from and within the site are dominated by foreground urban development. None of the four criteria defining landscape quality are positively represented on the project site or in the immediate vicinity.

The proposed recharge basin site lacks perimeter, interior, or structural lighting of note. The existing playfields for Melrose Elementary School have lighting for evening use by the community.

4.10.1.2 Existing Policies and Regulations

Pursuant to Section 53091 of the California Government Code, the District is not required to submit a grading or landscape plan, or obtain a building permit, from the City of Anaheim or the County of Orange for this water storage and transmission project. Although exempt from municipal landscape and site design criteria, the District will, as a courtesy, submit the proposed landscape plan and site plan to the County of Orange, the City of Anaheim, and Orange County Transportation Authority (OCTA) prior to implementation of the project.

4.10.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) outlines the significance criteria against which a project is measured for visual impacts. Potentially significant visual impacts would result if the project would:

- *Have a substantial adverse effect on a scenic vista.*
- *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.*
- *Substantially degrade the existing visual character or quality of the site and its surroundings.*
- *Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.*

4.10.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

- *The project would not have a substantial adverse effect on a scenic vista.*

The project would involve demolishing all on-site structures and excavation of the proposed recharge basin to a depth of approximately 9 feet over approximately 5.7 acres. Portions of the proposed recharge basin would be visible in various foreground viewsheds near the site. However, the basin will be generally subject to the same visual access limitations currently affecting the property. That is, the project will have no structural or topographic relief, and with so much intervening development, most views of the project property are obstructed to some degree. The proposed recharge basin would affect no scenic vistas or resources. The new facilities would be lower profile than the existing structures located both on the site and off-site. No impacts are anticipated.

- *The project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.*

The proposed project site is not a scenic resource within any State scenic highway corridors. The proposed site could be partially visible from, but would not otherwise affect the existing highway corridor along SR-57 located approximately 0.4 mile west of the site. The proposed recharge basin would not impede distant views of scenic resources. There are no rock outcroppings or historic buildings located within view of a state scenic highway in the vicinity of the project site.

- *The recharge basin would not substantially degrade the existing visual character or quality of the site and its surroundings.*

Construction activities would have temporary visual impacts at the site, yet the proposed recharge basin would be constructed within a light industrial/commercial area that is characterized by warehouses and light industrial buildings, arterial boulevards, and smaller feeder streets. Single-family homes, a nursery, and greenhouses currently occupy the site.

The project would involve the removal of existing structures and vegetation. Construction of the recharge basin would involve excavation, trenching, grading, and the construction of some new structures. Demolition and construction activities may be seen from residential neighborhoods, commercial and industrial centers, roadways, and recreation and open space land uses. The potential short-term visual impacts include exposed soil, dirt storage, and construction staging areas. Due to the short-term nature, this is considered a less than significant impact. After completion, the proposed project would change the visual character of the site from houses and greenhouses to an expansive view of open water. The modified land use would not significantly impact the character of the site or local visual resources.

The County of Orange had previously requested that drought-tolerant landscaping be installed along the site's northern boundary, adjacent to Carbon Creek Channel, in order to soften views of the recharge basin from the (future) regional bike path. The City of Anaheim requested similar landscaping treatment in order to mitigate the visual impact of the project from the neighborhood north of the site. Although exempt from municipal landscape design criteria, the District will, as a courtesy, submit the proposed landscape plan and site plan to the County, the City of Anaheim, and OCTA prior to implementation of the project.

As noted previously, pursuant to Section 53091 of the California Government Code, the District is not required to submit a grading or landscape plan, or obtain a building permit, from the City or County for this water storage and transmission project. This notwithstanding, an implementation measure will be required to ensure that the project does not result in impacts to local aesthetics. The District will prepare a landscape plan for the perimeter of the La Jolla Recharge Basin site to minimize public views and glare from the open water. Where feasible and practical, the landscape plan will include designs to comply with City and County recommendations. The District will consider comments provided by those agencies during preparation of the final landscape plan. This will ensure that potential aesthetics impacts remain at a level that is less than significant.

- *The project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.*

There would be no substantial new sources of light associated with the proposed project. Other than lighting for emergency and safety purposes, the proposed project would not require substantial site lighting.

The water surface could create minor glare for neighboring properties during sunset. However, the surrounding land uses are primarily industrial. Since sunlight reflecting off of water would not typically affect daytime views, and since most nearby buildings are not oriented with views of the site, the impact would be less than significant. Planned landscape treatments at the site perimeter would further minimize the potential for surrounding uses to be exposed to evening glare.

Recreational facilities at the proposed Southwest Middle School would consist of baseball fields, a soccer field, basketball courts, and volleyball courts. The athletic fields would be illuminated for evening use until 10:00 p.m., similar to the existing playfields for Melrose Elementary School. Those uses would predominate nighttime views in the immediate project vicinity in the future

4.10.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

No significant impacts have been identified; however, the project landscape plan and site plan will be submitted to several requesting agencies as a courtesy for their review and comment.

> **MM 4.10-1:** A perimeter landscape plan shall be prepared showing vegetation types, locations, and presumed or actual heights of vegetation. The landscape plan shall also include measures for maintenance and replanting, if necessary. The District shall submit the proposed landscape plan and site plan to the County of Orange, the City of Anaheim, and OCTA for their review and comment prior to implementation of the project. Further, where feasible and practical, the final landscape plan shall include designs to comply with City of Anaheim recommendations.

4.10.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of the measure calling for inter-agency review of various aspects of the site design will ensure that potential aesthetics impacts remain at a level that is less than significant.

4.10.6 CUMULATIVE IMPACTS

The proposed project would not contribute to the degradation of views or other aesthetic amenities. View effects would not extend much beyond the site boundaries and is not a neighborhood or citywide issue of concern. The intensification of land uses adjacent to the project site would dominate foreground and middleground views, but would have no effect on the proposed recharge basin operations. No cumulative impacts would result.

4.11 CULTURAL RESOURCES

4.11.1 EXISTING SETTING

4.11.1.1 Survey and Research Methods

Chambers Group, Inc. conducted a cultural resources records search and survey for the project site (Appendix 9.6). The purpose of the records search, literature review, and field reconnaissance was to identify all potentially significant archaeological resources within the properties proposed for the La Jolla Recharge Basin. In addition, the buildings on the properties were evaluated for eligibility for the California Register of Historical Resources by San Buenaventura Research Associates (Appendix 9.7).

A records search was performed by the South Central Coastal Information Center (SCCIC) of the California Historic Resources Information System, located at California State University, Fullerton. The records search identified all previously recorded cultural resources on or within a one-mile radius of the project area. Additional inventories of historic resources were reviewed, including the California Office of Historic Preservation's Historic Property Data File, the National Register of Historic Places, California State Historic Landmarks, and the California Points of Historic Interest. The state Native American Heritage Commission (NAHC) was asked to conduct a search of its Sacred Lands File to determine if places of concern to Native Americans have been recorded in the project area.

An archaeological field survey of the former Ohara Nursery property was performed by Roger D. Mason, Ph.D., an Orange County certified archaeologist, on May 26, 2004. The survey was conducted on foot and all open ground surfaces were inspected. Only the areas between the greenhouses could be surveyed.

Houses on the properties facing East La Jolla Street were described and photographed by Mitch Stone of San Buenaventura Research Associates. He also carried out a reconnaissance of the greenhouses and other structures on the former Ohara nursery property behind the houses. Mr. Stone performed historical research to identify previous owners and provide historical context for the evaluation of the buildings.

4.11.1.2 Prehistoric Setting

The Milling Stone Period (about 9,000 B.P. [before present] to 3,000 B.P.) represents a long period of time characterized by smaller more mobile groups compared to later time periods. These groups probably had a seasonal round of settlement, which included both inland and coastal residential bases (Mason, Koerper, and Langenwalter 1997). They relied on grass and sage seeds to provide calories and carbohydrates. Although fewer projectile points occur, compared to later periods, faunal data indicate the same animals were hunted. Inland Milling Stone Period sites are characterized by numerous manos, metates, and hammerstones while shell middens are common along the coast. Quartzite, rhyolite, and other coarse grained materials are more common than chert as the preferred materials for making flaked stone tools (Mason and Peterson 1994).

The period from 1000 B.C. to A.D. 750 is known archaeologically as the Intermediate Period. During this period mortars and pestles appear, indicating the beginning of acorn exploitation (Koerper and Drover 1983). Use of the acorn, a storable high calorie food source, probably allowed greater sedentism, especially in inland areas. Large projectile points indicate that the bow and arrow, characteristic of the Late Prehistoric Period, had not yet been introduced.

Hunting was probably conducted using a dart thrower. Settlement patterns during this period are not well known. The semi-sedentary settlement pattern characteristic of the Late Prehistoric Period may have begun during the Intermediate Period, although lower population densities may have meant less territoriality.

The project area was part of territory occupied by the Tongva Native American group (renamed Gabrielinos by Spanish missionaries who took them to San Gabriel Mission) when the Spanish arrived in A.D. 1769. The Orange County area is also claimed by the Acjachemem Native American group (renamed Juaneños by Spanish missionaries who took them to San Juan Capistrano Mission). Tongva and Acjachemem settlement and subsistence systems may extend back in time to the beginning of the Late Prehistoric Period about A.D. 750. The Tongva and Acjachemem were semi-sedentary hunters and gatherers. One of the most important food resources for inland groups were acorns gathered from oak groves in canyons, drainages, and foothills. Acorns were ground with a mortar and pestle. Seeds from sage and grasses, goosefoot, and California buckwheat were collected and ground using manos and metates. Protein was supplied by hunting deer, rabbits, and other animals using a bow and arrow, as well as various traps and snares. Coastal dwellers collected shellfish and engaged in fishing for bay/estuary, nearshore, and kelp bed species. Dried shellfish and fish were probably exchanged for inland products such as acorns (Koerper, Mason, and Peterson 2002).

The Tongva and Acjachemem lived in villages of up to 150 people located near permanent water sources and a variety of food resources (Earle and O'Neil 1994). The village was the center of a territory from which resources were gathered. Work parties left the village for short periods of time to hunt, fish, and gather plant foods. While away from the village they established temporary camps and resource processing locations. Archaeologically, such locations are indicated by manos and metates for seed processing, bedrock mortars for acorn processing, and lithic scatters indicating manufacturing or maintenance of stone tools (usually made of chert) used in hunting or butchering. Overnight stays in field camps are indicated by fire-affected rock used in hearths (Mason and Peterson 1994).

The Tongva village of Hutukna was probably located in east Anaheim on the bank of the Santa Ana River. Over 240 people from this village were baptized at San Gabriel Mission (Earle and O'Neil 1994:21).

4.11.1.3 Historic Setting

Spanish missionaries began their exploration of California and development of the missions in 1769, starting in San Diego and ending with the missions in San Rafael and Sonoma established in 1823. Mission San Gabriel Arcangel was founded in 1771, east of what is now Los Angeles in Gabrielino territory (Castillo 1978:100). Mission San Juan Capistrano was founded in 1776 in south Orange County.

After Mexico became independent from Spain in the early 1830s, the Mexican government closed the missions. Former mission lands were granted to soldiers and other Mexican citizens for use as cattle ranches. The project area was included in the San Juan Cajon de Santa Ana land grant granted to Juan Patricio Ontiveros in 1837 (Aviña 1976).

California became part of the United States in 1848 when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States. California became a state in 1850. The principal economic activity continued to be cattle ranching in southern California until the arrival of the transcontinental railroads in the 1870s and 1880s. In some areas, however, grape growing and wine making were important. Anaheim was founded in 1857 on land purchased from Ontiveros by the Los Angeles Vineyard Society, a group of German Americans from San Francisco. Anaheim became a successful center of grape and wine production until the early 1880s when pests destroyed the vines. Most of the vines were then replaced by citrus groves. Anaheim was not successful in becoming the county seat when Orange County was formed in 1889, but developed rapidly as a citrus production area after the arrival of the Santa Fe Railroad in 1887. The project area was outside the city during the 1920s, but there was a Mexican American community or *colonia* known as La Jolla along Carbon Creek. People who lived in La Jolla worked in the citrus orchards. La Jolla was damaged by flooding in 1938. Anaheim grew rapidly in the early 1950s, annexing 7,500 acres of former citrus orchards for residential subdivisions. The La Jolla area was later absorbed by Anaheim and Placentia as they expanded (see Appendix 9.6).

4.11.1.4 Records Search and Survey Findings

According to current records at the SCCIC, the Ohara property was included in a previous cultural resources reconnaissance of a large area of northeast Anaheim. Eight other cultural resources investigations have been documented within 1 mile of the project area (see Appendix 9.6).

No cultural resources have previously been identified within the Ohara property. One prehistoric archaeological site has been recorded within 1 mile of the project area. This site, P30-000428, was located near Carbon Creek and contained manos and metates. Two other prehistoric archaeological sites were also recorded along Carbon Creek just beyond the one-mile records search radius.

A records search of the Native American Heritage Commission's sacred lands files failed to indicate the presence of Native American cultural resources in the immediate project vicinity (see Appendix 9.6).

No archaeological material was identified within the Ohara property as a result of the cultural resources field survey conducted by Chambers Group.

Five houses on parcels facing La Jolla Street were described and evaluated by Mitch Stone of San Buenaventura Research Associates (Appendix 9.7), as shown in Table 4.11-1.

TABLE 4.11-1
STRUCTURES IDENTIFIED AS A RESULT OF THE FIELD SURVEY

Address	Age	Description
2885 E. La Jolla Street	1963	Ranch-style single family residence with wood siding
2901 E. La Jolla Street	1947	Stucco-clad single family residence
2911 E. La Jolla Street	1948	Ranch-style single family residence
2915 E. La Jolla Street	Late 1940s	Stucco-clad single family residence
	1983	Concrete block industrial building
2921 E. La Jolla Street	ca. 1960	Stucco-clad single family ranch-style residence

In addition, there are 20 greenhouse buildings, as well as equipment sheds, on the large parcel behind the houses. The greenhouses are of wood frame construction covered by fiberglass panels. They probably date to the 1970s (Appendix 9.7).

4.11.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) outlines the significance criteria that a project may be measured against for cultural resources. The project would have a potentially significant impact on cultural and historic resources if it would:

- *Cause a substantial adverse change in the significance of an historical resource, as defined in Section 15064.5 of the State CEQA Guidelines.*
- *Cause a substantial adverse change in the significance of an archaeological resource, as defined in Section 15064.5 of the State CEQA Guidelines.*
- *Disturb any human remains, including those interred outside of formal cemeteries.*

CEQA guidelines state that only impacts to cultural resources that qualify as "Historical Resources" are potentially significant. Historical Resources are those buildings, structures, objects, and archaeological sites that are at least 50 years old and that meet the eligibility criteria for the California Register of Historical Resources (CRHR) or that are listed in a local (city or county) historical resources inventory (Title 14, California Code of Regulations, Section 15064.5[a]). The CRHR eligibility criteria are as follows:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with the lives of persons important in our past;

C. 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; or

D. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, the resources must have integrity (Title 14, California Code of Regulations, Section 4852). Historical, buildings, structures, and objects are usually evaluated under Criteria A, B, and C, while archaeological sites are evaluated under Criterion D.

4.11.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

4.11.3.1 Historic Resources

The residences at 2901, 2911, and 2915 E. La Jolla Street are more than 50 years old. In order to determine whether historical resources, as defined by CEQA, are present, these buildings, along with the younger residences, the concrete block industrial building, and the nursery greenhouses and sheds were evaluated using the CRHR criteria. None of these buildings appear to be potentially eligible for the CRHR. None of them can be shown to be associated with important events in the Anaheim/ Placentia areas (Criterion 1). None of them are associated with significant persons in history (Criterion 2) and they are not architecturally distinctive (Criterion 3). All are minimal examples of common architectural styles or do not represent a known style. The City of Anaheim does not maintain an inventory of historical buildings. Therefore, none of the buildings on the property are listed on a local inventory (Appendix 9.7).

Because there are no eligible historical buildings or structures on the project property, project implementation would not cause a substantial adverse change in the significance of an historical resource, as defined in Section 15064.5 of the State CEQA Guidelines.

4.11.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

In order to determine whether there are potential impacts to cultural resources, it must be determined whether there are Historical Resources as defined by CEQA (eligible historic structures, buildings, objects, or archaeological sites or buildings or structures listed in a local inventory) and, if so, whether they will be impacted by proposed project activities.

4.11.4.1 Archaeological Resources

The records search and survey did not identify any archaeological resources within the project boundaries. The distribution of prehistoric archaeological sites along Carbon Creek, which runs along the northern boundary of the project property, indicates the potential for previously unknown buried archaeological sites on the project property. If present, these could be impacted by earthmoving activities for new campus buildings. Such impacts could be significant without mitigation. However, implementation of the following mitigation measures will reduce impacts to less than significant.

Impact 4.11-1: *Future development activities involving earthmoving have the potential to significantly impact potential archaeological resources.*

> **MM 4.11-1a:** Any excavation necessary for the proposed project shall be monitored by a qualified archaeological monitor under the supervision of a qualified Project Archaeologist who is on the Orange County List of Certified Archaeologists. If cultural material is encountered, the monitor shall have the power to halt or divert earthmoving equipment in the vicinity of the find until it can be evaluated.
>
> **MM 4.11-1b**: If cultural material is encountered it will be evaluated using CRHR eligibility criteria. This may require an archaeological test program. If the Project Archaeologist recommends a test program, he or she shall prepare a test plan and implement it.
>
> **MM 4.11-1c:** If the cultural material is evaluated as eligible, mitigation shall consist of avoidance and preservation, if feasible. If avoidance is not feasible, the Project Archaeologist shall prepare a data recovery plan that states how the data necessary to address scientifically consequential research topics will be recovered. The data recovery plan shall then be implemented.

4.11.4.2 Native American Remains

Native American human remains are not likely outside of archaeological sites. However, as previously noted, there is the potential for encountering buried prehistoric archaeological sites. Such a site could contain Native American human remains. The following mitigation measure will ensure that the project complies with state law and will reduce impacts to less than significant.

Impact 4.11-2: *Future development activities involving earthmoving have the potential to significantly impact Native American human remains.*

MM 4.11-2: If Native American remains are discovered during construction, construction activities shall be halted or diverted until the provisions of Section 7050.5 of the Health and Safety Code and Section 5097.98 of the Public Resources Code have been implemented. These provisions include notifying the County Coroner, taking into account the recommendations of the Most Likely Descendant appointed by the Native American Heritage Commission, and reburying the remains where they will not be further disturbed.

4.11.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The mitigation measures for archaeological resources and Native American human remains will reduce impacts to less than significant. Because there are no eligible historical buildings, there will be no significant impacts to historical resources.

4.11.6 CUMULATIVE IMPACTS

4.11.6.1 Archaeological Resources

Excavation proposed as part of the project, together with other projects in the project vicinity, could contribute to loss of archaeological resources. It is difficult to assess the amount of loss because the existence and significance of archaeological resources on the project property that could be potentially impacted cannot be predicted. However, implementation of mitigation measures that are consistent with State law for this and other projects in the project vicinity will reduce the cumulative impact to a less than significant level.

4.11.6.2 Historic Buildings and Structures

The project will not impact any eligible historical buildings or structures. Therefore, the project will not contribute to cumulative impacts to historical buildings or structures in the project vicinity.

4.12 PALEONTOLOGICAL RESOURCES

4.12.1 EXISTING SETTING

4.12.1.1 Survey and Research Methods

The Natural History Museum of Los Angeles County Vertebrate Paleontology Section (LACMVP) conducted an archival search for previously recorded fossil localities near the property proposed for the La Jolla Recharge Basin.

4.12.1.2 Paleontologic Sensitivity

The results of the archival search indicate that alluvial sediments underlie the study area. Older terrestrial Quaternary deposits are present in the project area and are found below the recent Quaternary Alluvium and soil found at the surface. A fossil locality in the Santa Ana River floodplain in the project vicinity has produced fossil horse specimens at a depth of 8 to 10 feet below surface.

4.12.2 IMPACT SIGNIFICANCE CRITERIA

CEQA Appendix G (Environmental Checklist) indicates that potentially significant paleontological resource impacts would occur if the project would:

- *Directly or indirectly destroy a unique paleontological resource or site.*

Identifiable remains recovered from the project site would be scientifically highly important if they represented new or rare species, geologic (temporal) and/or geographic range extensions, age-diagnostic or environmentally sensitive species, and/or more complete specimens than are now available for their respective species. The remains also would contribute to a more comprehensive documentation of the diversity of extinct plant and animal life that existed in and near the study area during the Pleistocene Epochs.

4.12.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

All potential impacts on paleontological resources are determined to be significant and will require mitigation.

4.12.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

Project-related impacts on paleontological resources could occur as relatively deep excavations for basin construction are necessary. Construction phase development impacts are potentially significant and require mitigation.

- *Excavation proposed for the project has the potential to directly or indirectly destroy a unique paleontological resource or site.*

Earthmoving and excavation for the recharge basin extending more than approximately 5 feet below surface could result in the loss of scientifically highly important paleontologic resources. The loss of paleontologic resources from the project site would be a significant adverse impact. This impact can be mitigated to less than significant by implementing a paleontologic monitoring program during construction.

Impact 4.12-1: *Project implementation could adversely affect a paleontological site that may be discovered during excavation of the recharge basin.*

MM 4.12-1a: Prior to earthmoving, a project paleontologist shall be retained by the Orange County Water District (OCWD) and shall develop a mitigation plan and a discovery clause/treatment plan to be implemented during earthmoving on the project site. At a minimum, the treatment plan shall require the recovery and subsequent treatment of any fossil remains and associated data uncovered by earthmoving. As part of the plan, the project paleontologist shall develop a storage agreement with an Orange County institution with right-of-first-refusal (i.e., the Orange County Archaeo/Paleo Resource Management Facility [APRMF]) or, if necessary, the Natural History Museum of Los Angeles County Vertebrate Paleontology Section, San Bernardino County Museum, or another acceptable museum repository to allow for the permanent storage and maintenance of any fossil remains recovered as a result of the mitigation program, and for the archiving of associated specimen data and corresponding geologic and geographic site data at the museum repository.

MM 4.12-1b: The paleontologist and a paleontologic construction monitor shall attend a pre-grade meeting to explain the mitigation program to grading contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earthmoving.

MM 4.12-1c: Paleontologic monitoring of earthmoving shall be conducted by the monitor when older Quaternary sediments will be disturbed.

MM 4.12-1d: If fossil remains are found by the monitor, earthmoving shall be diverted temporarily around the fossil site until the remains have been recovered and the monitor agrees to allow earthmoving to proceed.

MM 4.12-1e: Any recovered fossil remains shall be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains then shall be curated and catalogued, at the expense of the OCWD, and associated specimen data and corresponding geologic and geographic site data shall be archived at the museum repository by a laboratory technician. The remains then shall be accessioned into the museum repository fossil collection, where they shall be permanently stored, maintained, and, along with associated specimen and site data, made available for future study by qualified investigators.

MM 4.12-1f: A final report of findings shall be prepared by the paleontologist for submission to OCWD and the museum repository following accessioning of the specimens into the museum repository fossil collection. The report shall describe geology/stratigraphy; summarize field and laboratory methods used; include a faunal list and an inventory of curated/catalogued fossil specimens; evaluate the scientific importance of the specimens; and discuss the relationship of any newly recorded fossil site in the parcel to relevant fossil sites previously recorded from other areas.

4.12.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

The recommended mitigation measures comprise a paleontologic resource impact mitigation program that is in compliance with Society of Vertebrate Paleontology standard measures for reducing the potential adverse environmental impacts of construction on paleontologic resources to an insignificant level, and for the acceptance by a museum repository of a mitigation program fossil collection. With appropriate mitigation, earthmoving associated with the development phase of the project could result in beneficial effects, including the recovery of scientifically highly important fossil remains that would not have been exposed without earthmoving.

4.12.6 CUMULATIVE IMPACTS

The Santa Ana River alluvial plain contains a variety of paleontological resources that have scientific importance. In general, paleontological resources are site-specific in nature and dealt with on an individual basis, and individual projects usually will not contribute to cumulative impacts to these resources. Each of the cumulative project sites in the project vicinity must undergo an evaluation for the potential occurrence of such resources and include site monitoring during site grading operations, if necessary. The mitigation measures will protect existing paleontological resources, the intent of which is to reduce the cumulative impacts to a less than significant level. Mitigation of potential impacts at the project site will render areawide effects less than significant.

Chapter 5.0
Project Alternatives

5.1 INTRODUCTION

In accordance with the requirements of CEQA, this section analyzes the environmental impacts of alternatives to the proposed project. CEQA Guidelines Section 15126.6(a) states:

> *"An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives."*

An EIR need not consider every conceivable alternative to a project, and there is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason. (Citizens of Goleta Valley v. Board of Supervisors (1990) 52 Cal.3d 553 and Laurel Heights Improvement Association v. Regents of the University of California (1988) 47 Cal.3d 376). As such, the EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. Thus, OCWD has developed this chapter to select a range of project alternatives for examination and for publicly disclosing its reasoning for selecting those alternatives.

5.2 ALTERNATIVES DEVELOPMENT AND SCREENING

5.2.1 SCREENING CRITERIA

An EIR must briefly describe the rationale for selection and rejection of alternatives. OCWD, as the lead agency, may make an initial determination as to which alternatives are feasible, and therefore merit in-depth consideration, and which are infeasible. Alternatives that are remote or speculative, or the effects of which cannot be reasonably predicted, need not be considered (State CEQA Guidelines, Section 15126.6(f)(3)). The State CEQA Guidelines (Section 15126.6[c]) state that any EIR should *"identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts."*

5.2.2 ALTERNATIVES CONSIDERED BUT REJECTED

This section identifies alternatives considered by the lead agency but rejected as infeasible and provides a brief explanation of the reasons for their exclusion.

5.2.2.1 No Project/No Build Alternative

This chapter will not analyze in detail a No Project/No Build Alternative, where physical environmental conditions are assumed to remain as they existed when the EIR environmental analysis commenced in April 2004. Such a scenario presumes that no other plans would be implemented on the project site and that it would remain vacant, yet with existing greenhouses and other structures remaining, for the foreseeable future. Although a No Build scenario may avoid some of the identified project impacts such as construction period traffic, noise, air emissions, and biological and cultural resources impacts, it would create environmental impacts in other areas. The vacant structures would deteriorate over time and would negatively impact the community aesthetic and land use compatibility, particularly as the property immediately west is developed as a middle school. Also, any as yet unknown soil contamination or structural hazards (i.e., asbestos or lead-based paint) would not be remediated. Aside from environmental considerations, the alternative does not meet any project objectives, nor does it feasibly address the owner's legal right to pursue development or other legal use of the site. It is also economically infeasible for any owner of the project property, whether OCWD or another entity, to let the site remain unused while still incurring costs for basic maintenance and nuisance abatement. Given the artificial assumptions required to preserve the project site as it exists, no further discussion of a No Build Alternative is necessary, as per CEQA Guidelines Section 15126.6(e).

5.2.2.2 Alternative Groundwater Recharge Method

It is assumed that this alternative would be implemented on the proposed project site at La Jolla Street, but would use a groundwater recharge method for Santa Ana River (SAR) and imported source waters other than percolation into the groundwater aquifer. Based on a technology review by OCWD engineers, the only potential alternative methods would be the construction and use of vertical recharge wells or infiltration galleries to deliver the water into the aquifer. As summarized in the following discussion, however, an Alternative Groundwater Recharge Method on the project site has limited comparative merit when considering its feasibility, its ability to meet the project objectives, and its role in environmental impact reduction and/or avoidance.

Recharge wells or infiltration galleries would require pre-treatment of SAR water or unfiltered imported water, which would otherwise clog these facilities due to turbidity. Thus, construction of a water treatment facility to reduce turbidity, as well as construction of recharge wells or infiltration galleries, would be required under this alternative. Compared with the proposed project, this alternative would add a costly treatment step in the process of using SAR water or imported water for groundwater recharge. The SAR water, once treated, must be used for recharge because the California Department of Health Services (DHS) would not permit treatment and direct potable use of SAR water. Only the imported water can be treated and put directly into potable supply. However, an alternative involving pre-treatment to potable drinking water standards may as well be delivered directly to the potable water distribution system rather than being used as a groundwater recharge source. Treating imported water for direct potable supply is not proposed under this alternative since that scenario precludes groundwater recharge and is basically the same as a No Project alternative. Since the proposed La Jolla Recharge Basin project relies on technologically proven methods for recharging SAR water and imported water sources, both of which currently meet all State and federal criteria for groundwater recharge, this alternative with its treatment requirements serves no advantageous technological or public health purpose. Furthermore, this alternative would involve higher costs for construction and operation of treatment facilities, recharge wells and/or infiltration galleries, whereas the proposed La Jolla Recharge Basin project would provide a positive cost-benefit outcome (OCWD 2003) for OCWD. Treatment of imported water and SAR water prior to recharge or infiltration is not a cost-effective means of increasing groundwater supplies. This alternative not only lacks a beneficial economic purpose, but its pre-treatment requirements could cause SAR water and imported water to become economically infeasible for use at the project site.

Aside from feasibility issues, an Alternative Groundwater Recharge Method that eliminates on-site storage capacity would not meet the project objectives of having recharge capacity available for accepting releases of SAR water from the Prado Water Conservation Pool, or taking advantage of surplus imported water availability for recharge. More specifically, a lack of surface storage capacity would incrementally hinder OCWD's ability to: 1) take advantage of increasing future SAR flows and high-volume storm flows; 2) take advantage of surplus imported water availability on short notice by having adequate storage and recharge facilities; 3) capture and reallocate flows when other basins are clogged; and 4) maintain overall recharge capacity during maintenance and improvement projects at other locations.

Feasibility and the ability to meet project objectives notwithstanding, a water treatment and recharge system alternative would not substantially reduce any of the project-related impacts that were identified as potentially significant before mitigation (see Chapter 4.0). When compared with the proposed recharge basin project, the alternative's construction-related traffic, air quality, and noise impacts might be reduced proportionally to the decreased excavation and soil hauling requirements. However, those reductions would likely be offset by the extended construction period and increased equipment requirements for the treatment plant component. Furthermore, the operation of a water treatment plant on the project site could introduce land use incompatibility impacts through the storage and use of hazardous substances in proximity to the existing and proposed schools. Since the impacts of the proposed recharge basin can all be reduced to levels that are less than significant with mitigation, the Alternative Groundwater Recharge Method serves no real impact reduction or avoidance purpose. For this and the other reasons cited previously, the Alternative Groundwater Recharge Method is rejected and no further discussion is necessary, as per CEQA Guidelines Section 15126.6(e).

5.3 IDENTIFICATION OF ALTERNATIVES

For each of the project alternatives, the following analysis describes the alternative and the rationale for its selection. The comparative merits of each alternative are evaluated relative to the proposed project, specifically addressing project objectives, feasibility, and the elimination or reduction of impacts. Table 1-1 in the Executive Summary (Chapter 1.0) summarizes the impacts of each alternative and evaluates the significance of those impacts.

5.3.1 REDUCED RECHARGE CAPACITY ALTERNATIVE

This alternative would result in up to 4,500 acre-feet per year of recharge capacity on the same La Jolla Street project site. That recharge capacity could be achieved either by construction and operation of a smaller recharge basin, or by diversion and percolation of lesser quantities of recharge water in the basin.

5.3.2 ALTERNATIVE RECHARGE WATER SOURCE

This alternative could involve the use of Groundwater Replenishment System[1] (GWRS) water as a recharge water source instead of the water that OCWD currently obtains from MWD and the SAR. The GWRS project is a joint project between OCWD and the Orange County Sanitation District (OCSD). The GWRS essentially includes the purification of wastewater using a three-step process of microfiltration, reverse osmosis and ultraviolet light and hydrogen peroxide treatment techniques. Roughly half of the purified water will be injected into Orange County's expanded seawater intrusion barrier. The remaining water will be piped to percolation basins in Anaheim, where it will blend with the existing groundwater before it is used as a source of drinking water for north and central Orange County residents.

The transfer of GWRS water to the project site would require construction of new pipelines from Kraemer Basin and would require permitting from DHS and SARWQCB, which could potentially require shut-down of wells, such as Anaheim Well No. 26, in order to meet recycled water recharge travel time requirements. While it would be possible to pump water from Kraemer Basin to the proposed La Jolla Basin via Carbon Creek, any use of GWRS water at the project site would be subject to restrictive permitting and travel time requirements, regardless of the conveyance method.

5.3.3 ALTERNATIVE RECHARGE BASIN SITE

The EIR scoping phase provides an opportunity for agencies and interested members of the public to influence the content of the document. Public meetings and/or comments on the Notice of Preparation (NOP) are both means by which the lead agency can receive public input about a variety of expressed interests and issues. Based on that input, the lead agency can devise an analysis approach that is responsive to valid environmental concerns and promotes informed decision-making. The scope of analysis in this EIR is an example of public input helping to define issues of environmental importance. As such, the NOP comments were used as a basis for the evaluation of numerous issues, including project alternatives. Specifically, AC Products, the nearby property owner responsible for the existing VOC contamination plume in the local groundwater aquifer, has requested that OCWD evaluate alternative site locations (see NOP comment summaries in Appendix 9.1). This section does evaluate a site alternative consistent with the CEQA requirement to focus on alternatives to the project location that are capable of avoiding or substantially lessening any significant effects of the project.

Under this alternative, a 9,000 AFY recharge basin would be constructed on a similarly sized site as the proposed La Jolla Recharge Basin project. This alternative is subject to the same siting criteria that were used in the site selection process for the proposed La Jolla Recharge Basin. As such, the property would need to be in proximity to the SAR and existing water conveyance systems in the Forebay; and it would need to be a large parcel with minimal improvements to minimize land acquisition costs.

5.3.4 PROJECT SCHEDULE ALTERNATIVE

Under this alternative, OCWD would wait until AC Products' groundwater contamination plume remediation process is complete or near completion in order to avoid potential plume migration effects. In comments on the NOP, AC Products stated that water quality data obtained from 1997 to 2003 from the network of monitoring wells installed by AC Products indicate that, while there have been modest decreases in PCE concentrations in the area of the plume that will be

[1] See www.gwrsystem.com for more information.

diverted away from extraction well P-02 by the La Jolla Recharge Basin, the decreases have not been substantial enough for it to be likely that the plume will have reduced sufficiently by 2004 to be insignificant. Therefore, the implementation schedule is as yet unknown and would be based on AC Products' groundwater monitoring data, which would be submitted to the SARWQCB and obtained for review by OCWD.

5.3.5 NO PROJECT ALTERNATIVE

One of the alternatives required for analysis is the "No Project" alternative. The State CEQA Guidelines (§15126.6[e]) state that *"the 'no project' analysis shall discuss the existing conditions at the time the notice of preparation is published . . . as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services."* Under this alternative, the proposed La Jolla Recharge Basin project would not be approved. The No Project scenario is, therefore, the sum of existing conditions plus industrial development according to the City of Anaheim General Plan and zoning. 'Existing conditions' presumes the removal of the existing greenhouses and other structures remaining from the former Ohara Farms operations, as well as PYLUSD's continued planning and design of the proposed Southwest Middle School project on an adjacent site. Any industrial site development must be a private undertaking for which OCWD is not statutorily authorized by "The Orange County Water District Act" (California Statutes, 1933, chapter 924, page 2400, as amended). Therefore, this alternative necessarily assumes that OCWD would sell the project property at fair market value to a private developer and that OCWD would have no role in pursuing development entitlements on the site.

As described in Section 4.7 (Land Use and Related Planning), the proposed project site is designated as 'Industrial' in the General Plan Land Use Element. The 'Industrial' designation permits such uses as research and development, technology centers, office uses, business parks, assembly and light manufacturing, repair and service facilities, warehousing and distribution, and limited employee-serving retail uses. The maximum allowable density, or floor-area-ratio (FAR), is 0.5. This means that the 9.3-acre site could support up to approximately 200,000 square feet ([9.3 acres x 43,560 sq. ft.] x 0.5 FAR) of industrial development, if a private developer was to receive project approval by the City of Anaheim.

5.4 ALTERNATIVES ANALYSIS

5.4.1 CRITERIA FOR ANALYSIS OF ALTERNATIVES

The feasibility of each alternative is discussed below, along with the degree to which each alternative meets the stated project objectives and reduces or avoids significant environmental impacts. With regard to impact avoidance or reduction, it is important to note that Chapter 4.0 has identified various project-related impacts as potentially significant. In each instance, however, feasible mitigation measures have been agreed to by OCWD that will effectively reduce all potentially significant construction and operational impacts of the La Jolla Recharge Basin to less than significant levels.

The performance of the alternatives relative to the proposed project is evaluated to determine the "comparative merits of the alternatives" (§15126.6[a]). All project alternatives are analyzed according to the following criteria (references are to sections of the CEQA Guidelines):

5.4.2 ABILITY TO MEET PROJECT OBJECTIVES

The alternative should feasibly be able to attain *"most of the basic objectives of the project"* (§15126.6[a]), even though it might, to some degree, impede the attainment of those objectives or be more costly (§15126.6[b]). For purposes of this analysis, the proposed project's additional recharge capacity is needed to meet the following District-wide objectives:

- Capture increasing SAR flows;
- Increase the recharge capacity of the Forebay recharge facilities in order to meet projected groundwater demand increases;
- Take advantage of short-term, high volume storm flows by having sufficient water conveyance, storage, and recharge facilities;
- Take advantage of imported water availability on short notice by having adequate storage and recharge facilities;
- Accept stored storm flows when the U.S. Army Corps of Engineers (ACOE or Corps) empties the Prado Water Conservation pool quickly during storm season;
- Capture springtime Prado Water Conservation releases, at 500 cubic feet per second (cfs) flow rate, when other basins are clogged; and
- Maintain overall recharge capacity during maintenance and improvement projects at other locations.

Additionally, the following objectives were instrumental in the site selection process for the proposed La Jolla Recharge Basin project.

- Acquire land and construct the recharge basin in proximity to the SAR and existing water conveyance systems in the Forebay; and
- Acquire large parcels with minimal improvements to minimize land acquisition costs.

<u>Reduced Recharge Capacity Alternative</u>

A recharge basin with up to 4,500 acre-feet per year of recharge capacity would partially meet the project objectives. However, the project objectives imply a quantitative preference that cannot be met by decreasing recharge capacity. In most instances, the project objectives call for maximum storm flow capture and recharge capacity. Given the recharge capacity potential associated with the project property, this alternative would not fully utilize that potential in a manner that is consistent with the project objectives.

<u>Alternative Recharge Water Source</u>

The use of GWRS water at the project site is theoretically possible, but the recharge of GWRS water at the La Jolla site or another site does not meet the project objectives of having recharge capacity available for accepting releases of SAR water from the Prado Water Conservation Pool, or taking advantage of surplus imported water availability for recharge. More specifically, excluding SAR and MWD water as recharge sources at the project site would incrementally hinder OCWD's ability to take advantage of increasing future SAR flows and high-volume storm flows, as well as impede OCWD's ability to take advantage of imported water availability on short notice.

Alternative Recharge Basin Site

An alternative project site could meet the basic project objectives if it is responsive to the siting criteria that include proximity to the SAR and existing water conveyance systems in the Forebay, and sufficient parcel size with minimal improvements to minimize land acquisition costs. The site should also be capable of providing 9,000 AFY recharge capacity, similar to the proposed project, in order to meet the objectives that call for the availability of recharge capacity for SAR and MWD water. The ability of an alternative site to meet the recharge objectives is also determined by the soils and underlying geologic strata that define its infiltration capacity. Any site not possessing most, if not all, of the same physical characteristics as the proposed La Jolla Recharge Basin site would not likely meet the recharge capacity criterion. In summary, OCWD does not have knowledge of any alternative sites in the Forebay area that are of comparable size, cost, and proximity to recharge sources and conveyance facilities as the proposed La Jolla Street site.

Project Schedule Alternative

As indicated previously, the timing for this alternative is presently unknown. It is assumed that delaying project implementation until AC Products' groundwater contamination plume remediation process is complete or near completion would not hinder the long-term objectives of capturing SAR storm flows, accepting MWD water, and recharging the Orange County Groundwater Basin. Given the timing uncertainty, however, those same objectives could be unmet in the short-term if groundwater remediation requires several years or more.

No Project Alternative

Assuming that OCWD abandons its plans for the proposed La Jolla Recharge Basin project and sells the site to a private developer, an industrial development project would be consistent with the City of Anaheim's currently adopted land use plans for the project site. However, the No Project Alternative would not achieve any of the project objectives, which generally include the cost-effective capture and use of surface water to increase groundwater supplies.

5.4.3 FEASIBILITY OF PROJECT ALTERNATIVES

The alternatives are evaluated to see if they can *"feasibly attain the basic objectives of the project" (§15126[d]). CEQA defines "feasible" to mean "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors"* (Guidelines, §15364). In addition to the environmental consequences of a particular alternative, therefore, decision-makers must consider if an alternative can be implemented in a "reasonable period of time" and, equally as important, what economic, legal, social, and technological factors affect its implementation. Among the factors for eliminating an alternative from detailed consideration in an EIR are site suitability, economic viability, availability of infrastructure, general plan consistency, or other related concerns. No single one of these factors establishes a fixed limit on the scope of reasonable alternatives.

Reduced Recharge Capacity Alternative

The Engineer's Report (OCWD 2003) evaluated a 4,500 AFY facility as the conservative basis for its cost-benefit calculations, which were generally favorable. However, maximizing the recharge capacity of the basin would not only increase the cost-benefit ratio, but would also take advantage of excess stormwater resources that would otherwise be lost. Although generally feasible at 4,500 AFY, this alternative would not provide the same economic and resource management benefits as the proposed 9,000 AFY recharge basin project.

Alternative Recharge Water Source

As indicated previously, supplying the project site with GWRS water would require construction of new pipelines from Kraemer Basin. While this alternative is technologically feasible, the pipeline engineering and construction costs would substantially increase the overall cost of project implementation. While economic feasibility could only be determined through preliminary engineering and cost-benefit analyses, higher construction and operational costs are a certainty if pipelines are necessary. A less costly conveyance alternative might involve pumping the water from Kraemer Basin to the project site via the Carbon Creek Channel.

Regardless of conveyance options, any GWRS water usage at the proposed La Jolla recharge facility would require that the District obtain additional permits from DHS and SARWQCB. The GWRS recycled water has been planned and permitted for specific recharge facilities, and the proposed La Jolla Recharge Basin is not among those facilities due to various feasibility constraints. Most notable among the constraints are the recycled water recharge travel time requirements that have been established by DHS and SARWQCB for GWRS recycled water. Due to the proposed project location, along with the District's specific knowledge of groundwater conductivity in the subject aquifers, it is probable that the limited travel times would require shut-down of nearby production wells, such as Anaheim Well No. 26, in order to meet those travel time requirements. Any such disruption of water supply wells, particularly those serving the City of Anaheim, could adversely affect municipal groundwater availability and supply. Given those potential constraints, this alternative is considered legally and economically infeasible since it would likely create adverse effects without providing any comparative project benefits.

Alternative Recharge Basin Site

One of the economic and legal feasibility criteria is whether OCWD can reasonably acquire, control or otherwise have access to an alternative site that serves the project purpose. As indicated previously, OCWD does not currently have knowledge of alternative sites in the Forebay area that are of comparable size, cost, and proximity to recharge sources and conveyance facilities as the proposed La Jolla Street site. Insofar as OCWD has already acquired most of the project property, it would be costly and time-consuming to abandon the site in search of another that meets the criteria for a 9,000 AFY recharge basin, particularly since an alternative site would serve no impact reduction or avoidance purpose.

Project Schedule Alternative

Waiting until AC Products' groundwater contamination plume remediation process is complete or near completion is infeasible since an alternative should be *"capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors"* (Guidelines, §15364). As with all of the project alternatives, the Project Schedule Alternative would not serve any impact reduction or avoidance purpose, and its implementation would therefore be considered unnecessary and unreasonable use of time and resources.

No Project Alternative

Industrial development of the project site based on currently adopted City of Anaheim land use plans may be feasible taking into account economic, environmental, social and technological factors. However, the alternative is not legally feasible as an OCWD-sponsored project since land development is inconsistent with OCWD's legislated purpose, which is to manage and protect the Orange County Groundwater Basin. As indicated previously, the No Project Alternative fails to feasibly attain any of the basic objectives of the project.

5.4.4 ABILITY TO REDUCE OR AVOID SIGNIFICANT ENVIRONMENTAL EFFECTS

Section 15126.6 of the State CEQA Guidelines requires that an EIR describe a range of reasonable alternatives to the proposed project or its location that is capable of avoiding or substantially lessening one or more of the significant effects and that could feasibly attain most of the basic objectives of the project. The focus of the alternatives analysis is on the reduction of impacts and that focus must be maintained even if the alternatives would impede to some degree the attainment of the project objectives, or would be more costly. That is to say, the decision to approve or deny a project (or an alternative) should not be constrained by the idea that the project purpose necessarily represents the highest good, or that monetary costs overrule the obligation to protect public health and the environment. Given those parameters, the "rule of reason" outlined in State CEQA Guidelines Section 15126.6(f) requires that the EIR foster informed decision-making and public participation in order to permit a reasoned choice among alternatives. Inherent in the CEQA-defined reasoning is that the choice of alternatives must include impact reduction as a primary consideration.

As stated previously, no significant unmitigable impacts were identified for the proposed La Jolla Recharge Basin project. Potentially significant but mitigable impacts were identified for the proposed project for the following resource areas: hazards and hazardous materials, air quality, biological resources, cultural resources, and paleontological resources. OCWD will also implement mitigation measures and Standard Conditions for other environmental issue areas. In those instances, however, impacts did not exceed significance thresholds. Rather, OCWD's standard construction and operations practices dictate that such measures be implemented and subject to mitigation monitoring. This includes measures in the areas of hydrology and water quality, transportation and circulation, noise, land use and related planning, and aesthetics.

Table 1-1 in Chapter 1.0 (Executive Summary) provides a comparative summary of the proposed project and each of the alternatives by environmental issue. The table also indicates whether each of the alternatives analyzed would be subject to the same or different mitigation as the proposed project. As shown in Table 1-1, the project alternatives are neither necessary for, nor capable of, avoiding or substantially lessening the environmental effects of the proposed La Jolla Recharge Basin project.

The No Project Alternative is not included in Table 1-1 since it would involve industrial development of the project site based on currently adopted City of Anaheim land use plans and would be completely unlike and out of place with the other project alternatives. As indicated previously, OCWD could not legally sponsor such a project, and the alternative would fail to feasibly attain any of the basic project objectives. In addition, the potentially significant impacts of the proposed recharge basin project can all be reduced to levels that are less than significant with mitigation measures, so the No Project Alternative serves no impact reduction or avoidance purpose. An industrial project would require the same demolition and soil remediation activities as any site reuse alternative. During construction, the alternative may not have the same excavation and soil hauling requirements as the proposed recharge basin; however, site preparation and building construction would require more construction personnel and equipment than the proposed project. Therefore, the alternative's construction-related traffic, air quality, and noise impacts would be greater than those resulting from the proposed project. During the operational phase of an industrial project, vehicular trips would increase substantially in comparison with the proposed project. Finally, an industrial use could introduce land use incompatibility impacts with the existing and proposed schools. Since the No Project Alternative fails to meet the basic screening criteria discussed previously (i.e., ability to meet the basic project objectives, feasibility, and ability to avoid significant environmental impacts), this alternative is rejected as infeasible for OCWD's purposes and no further discussion is necessary, as per CEQA Guidelines Section 15126.6(e).

5.4.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Due to the unknown circumstances of an alternative project site, the environmentally superior alternative among those considered is the Reduced Recharge Capacity Alternative, which would result in up to 4,500 acre-feet per year of recharge capacity on the same La Jolla Street project site. However, the level of environmental superiority is negligible (i.e., only slightly reduces some construction-related noise, traffic, and air emissions). As discussed throughout this chapter, any environmental advantage over the proposed project is further diminished when weighed against the fact that a reduction in recharge capacity fails to meet several of the project objectives and is economically less feasible for OCWD to construct and operate.

Chapter 6.0
Impact Overview

In considering the environmental impacts of project planning, development, and operation, this EIR has provided discussions of numerous subjects. Following is a listing of required EIR subjects (as per Section 15126 of the State CEQA Guidelines) and the location of the relevant discussion:

- **Significant Environmental Effects of the Proposed Project** – The significant environmental effects of the proposed La Jolla Recharge Basin project are summarized in Chapter 1.0 (Executive Summary) and detailed throughout the various topical analyses in Chapter 4.0.
- **Significant Environmental Effects Which Cannot be Avoided if the Proposed Project is Implemented** – Unavoidable significant environmental effects, if applicable, are addressed in each section of the environmental analysis, under either the "Level of Significance After Mitigation" or the "Cumulative Impacts" headings.
- **Significant Irreversible Environmental Changes Which Would be Involved in the Proposed Project Should it be Implemented** – Significant irreversible environmental changes are addressed in Section 6.1 below.
- **Growth-Inducing Impacts of the Proposed Project** – Growth inducement is analyzed in Section 6.2 below.
- **Mitigation Measures Proposed to Minimize the Significant Effects** – The project mitigation measures are listed in Chapter 1.0 (Executive Summary) and throughout the various topical analyses in Chapter 4.0.
- **Alternatives to the Proposed Project** – Project alternatives are discussed in Chapter 5.0.
- **Impacts Found Not to be Significant** – Project impacts found not to be significant are addressed in Section 6.3 below.

6.1 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126 of the State CEQA Guidelines states, in part, that the EIR should address *"Significant Irreversible Environmental Changes Which Would Be Caused By The Project Should It Be Implemented. Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."*

Implementation of the proposed recharge basin project will result in several impacts that, once they occur, would be difficult or impossible to reverse. These environmental changes include:

- Commitment of vacant former agricultural facilities to public project development. A former productive use of the project site was for ornamental flower growing and commercial sales. However, the greenhouses and seasonal growing areas on the project site have long since been vacated and several issues relating to potentially hazardous substances in on-site soils and structures have come to light. In the midst of a large mixed-use community that includes light industrial, residential, and immediately adjacent recreational and educational uses, the project site has lost its potential for commercial growing activities that are protective of public health and the environment.
- One-time use of non-renewable energy and other non-renewable and slowly renewable resources such as lumber and forest products, sand and gravel, petroleum products, and metals for project construction, and ongoing consumption of minor quantities of energy once the project is constructed and operating.

Each of the EIR sections evaluates project-related impacts over the short- and long-term periods. It is therefore, not necessary to repeat the discussion of project impacts in this section. Over the long term, implementation of the project will not result in an irreversible commitment of non-renewable and renewable resources, including land, construction materials, aggregate materials, water, and energy resources. Land, as the major consumable resource affected by the recharge basin project, will not be irretrievably lost to development and could be used to achieve alternative economic goals in the future.

The proposed La Jolla recharge basin will not result in significant impacts to the quality of the natural environment. The project site is located in a highly urbanized area and, therefore, is not anticipated to disturb any sensitive natural resources. The project site will be monitored during excavation for the presence of historic, prehistoric, or paleontological resources of significance. No significant impacts are anticipated to occur.

The project would assist in increasing local potable water supplies. The project will not contribute significantly to any adverse cumulative effects, nor would the project cause substantial adverse effects on human beings. The residences and commercial buildings that occupy the site are vacant and the residents and tenants have been relocated. In the post-construction period, the proposed recharge basin will continue to serve OCWD's customers without adverse environmental effects.

6.2 GROWTH-INDUCING IMPACTS

The CEQA Guidelines section 15126.2 (d) require that an EIR:

> *"Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth."*

The analysis of growth inducement must also discuss ways in which the proposed project may encourage or facilitate other activities that may significantly affect the environment individually, or cumulatively.

Growth-inducing impacts may be either direct or indirect. Direct growth-inducing impacts occur when a project directly fosters growth. This may come about in a variety of ways, including but not limited to, the extension of urban services such as utilities and improved roads to previously underdeveloped areas. Provision of urban services to previously underdeveloped areas can induce growth by allowing new development to occur more easily. Growth inducement can lead to economic growth directly and through multiplier effects that can cause related growth in the areas near a new project. Indirect growth inducement results from the related multiplier effects whereby additional growth is induced by the demand for housing, goods, and services associated with a project. The following sections discuss the direct and indirect growth inducing impacts of the proposed project.

6.2.1 DIRECT GROWTH-INDUCING IMPACTS

The nature of the project is to increase groundwater recharge capacity and stormflow capture in a highly developed area in order to provide additional groundwater supplies and to reduce reliance on higher-cost imported water. The proposed project does not involve the extension of water utility services to underdeveloped areas, and no new infrastructure facilities are required for the proposed project. The extension of existing utilities and service systems from within the project area would provide the necessary systems to accommodate the proposed project. No direct growth-inducement would result from the extension of utilities or service systems to the project, as sufficient systems already exist.

The proposed project would not remove development restrictions that would directly increase business activity or residential development. Additionally, although the project would create a temporary and relatively minor demand for construction workers, the demand would not result in substantial economic growth through the creation of new jobs. Employees for the construction and operation of the facility would come from the existing local labor pool and would not create either a short-term or long-term demand for new housing. Therefore, direct growth-inducing impacts are less than significant.

6.2.2 INDIRECT GROWTH-INDUCING IMPACTS

The proposed project would supplement recharge of the Orange County Groundwater Basin as a means to increase and maximize the Basin's sustainable yield. This would increase local water supply reliability and reduce the area's reliance on imported water supply to meet its future needs. However, the increase in local water supply reliability would not cause growth within the area since local communities and water agencies within the service area would pursue other water supply options to meet the needs of planned growth in the absence of increased Basin yield that would be provided by the project. This planned growth increase will occur regardless of increased Basin yield associated with the project.

As indicated above, growth in the OCWD service area is not constrained by water availability. Imported water is among the existing water supply options that could be pursued to meet the needs of planned growth if Basin yield is not increased. Metropolitan Water District of Southern California's *Regional Urban Water Management Plan*, adopted in November 2005, states that Metropolitan's reliability analysis shows that Metropolitan can maintain reliable supplies under the conditions that have existed in past dry periods, through 2030. This includes a repeat of the multiple dry year (1990-92) hydrology and the single dry year (1977) hydrology. Since Metropolitan's supplies are projected to exceed its demands over the next 20 years, growth is not water supply-limited, including growth in the OCWD service area. Thus, the project contribution to increased Basin yield would not result in indirect growth inducement in the region.

This type of project is not considered an economic driver because it does not help create additional jobs and economic growth through multiplier effects. As discussed in the direct growth-inducement section above, construction labor would primarily come form the local labor pool and would not result in the demand for new housing. Similarly, the recharge basin would be operated and maintained by OCWD employees. Thus, the project would not result in indirect growth inducement in the region.

6.3 EFFECTS FOUND NOT TO BE SIGNIFICANT

Section 15128 of the CEQA Guidelines states, in part, that the EIR *"shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR."* During the scoping process for this EIR, it was determined that several potential environmental effects would not occur as a result of this project, or would occur but would not have a significant impact on the environment. This determination was based on the 2003 Initial Study prepared in support of the rescinded MND, the findings of which were reviewed and confirmed during preparation of this project EIR. Table 6-1 identifies those topics that were found to be insignificant and that were not included in the evaluation of impacts in the preceding sections of this EIR. Further, the responses to the Notice of Preparation (Appendix 9.1) did not identify any additional topics for examination in the EIR beyond those already designated for detailed analysis. Many of the responses to the Notice of Preparation repeated comments that were received during the MND comment period in 2003.

TABLE 6-1
SUMMARY OF EFFECTS FOUND NOT TO BE SIGNIFICANT

Potential Environmental Effect	Previous IS/MND Finding	Draft EIR Determination
Agriculture Resources		
▪ Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance ▪ Conflict with existing zoning for agricultural use or a Williamson Act contract ▪ Conversion of farmland to non-agricultural use	**No Impact (applies to all potential effects)**: Farmland not present on or adjacent to site. Site zoned for light industrial uses; no agricultural preservation contracts exist for the project site.	The IS/MND analysis is sufficient to exclude agricultural resource issues from further study.
Mineral Resources		
▪ Loss of availability of a known mineral resource that would be of value to the region and the residents of the state ▪ Loss of availability of a locally-important mineral resource recovery site delineated on a	**No Impact (applies to all potential effects):** The proposed project site is not located in an area of known mineral resources delineated in the County of Orange General Plan and would not impact the present or future availability of a known mineral	According to the California Geological Survey, parts of East Anaheim are identified as being within a Mineral Resource Zone, Class 2 (MRZ-2). Lands within this zone are determined to have a high potential for significant mineral deposits. However, the

Potential Environmental Effect	Previous IS/MND Finding	Draft EIR Determination
local general plan, specific plan, or other land use plan	resource.	City of Anaheim has only three sectors identified as containing mineral resources of regional significance. The project site is not within one of those sectors. The three sectors are developed with industrial uses and have limited value as mineral resources, similar to the project site (City of Anaheim General Plan, p. G-23). The General Plan information and IS/MND analysis are sufficient to exclude mineral resource issues from further study.
Population & Housing		
▪ Inducement of substantial population growth in an area, either directly or indirectly	**No Impact:** The proposed project would not directly or indirectly induce population growth. The project does not include any housing or new businesses, create new employment beyond that needed for construction, and would not construct new roads or infrastructure.	The IS/MND analysis is sufficient to exclude population growth issues from further study.
▪ Displacement of substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere	**Less Than Significant Impact:** The proposed project would displace four single-family residences located on the site, which is not considered a substantial number of people that would necessitate the construction of replacement housing elsewhere.	The IS/MND analysis is sufficient to exclude housing displacement issues from further study. Further, at the time the NOP was circulated (i.e., the environmental baseline per CEQA Guidelines Sec. 15125), all four single-family homes were vacant.
Public Services		
▪ Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, or other public facilities	**No Impact:** The proposed project would not require any new or physically altered government facilities, schools, parks, or other public facilities. The project would not require or interfere with service ratios or response times for fire protection or police protection.	The IS/MND analysis is sufficient to exclude public services issues from further study.

Potential Environmental Effect	Previous IS/MND Finding	Draft EIR Determination
Recreation		
▪ Increased use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated ▪ Project includes recreational facilities or requires the construction or expansion of recreational facilities that might have an adverse physical effect on the environment	**No Impact (applies to all potential effects):** McFadden Park is located just west of the proposed project. Construction and operation of the recharge basin would not interfere with use of the park. The park would remain open to the public during basin construction. There are no existing recreational uses on the proposed project site that would be displaced. The project does not include residential uses and would not increase the demand for or use of existing neighborhood or regional parks. The proposed project would construct a recharge basin that would only be used for groundwater recharge. There would be no recreational activities allowed at the site. The project would not require the expansion of existing recreational facilities.	The IS/MND analysis is sufficient to exclude recreation issues from further study.
Utilities & Service_Systems		
▪ Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. ▪ Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. ▪ Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	**Less Than Significant Impact (applies to all potential effects):** The proposed project would not consume water or generate wastewater, or require construction or expansion of existing water/wastewater treatment facilities. Groundwater water would continue to be extracted from existing wells and treated at existing treatment facilities. Though the project is the construction and operation of a groundwater recharge basin and appurtenant facilities, the construction of those facilities will not cause significant environmental effects. Site construction will involve grading and excavation throughout the project site, with the potential for traversing areas of biological, paleontological, and archeological sensitivity.	The IS/MND analysis is sufficient to exclude utilities and service systems issues from further study.

Potential Environmental Effect	Previous IS/MND Finding	Draft EIR Determination
	However, each of those issues is dealt with and mitigated separately throughout this EIR.	
▪ Require or result in the construction of new energy facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	Electrical service from the City of Anaheim will be needed for power to operate the inflatable rubber dam and motor-operated valves. However, no utility improvements are proposed necessitating joint phasing with roadway or and other infrastructure improvements. Prior to the commencement of the on-site improvements, however, the District will work with the City of Anaheim to devise vehicular routing plans to minimize potential traffic conflicts. All site-related work activities are subject to the mitigation in Chapter 4.0, the intent of which is to minimize traffic disturbance and construction period dust and equipment emissions.	
▪ Have insufficient water supplies available to serve the project from existing entitlements and resources, or would require new or expanded entitlements. ▪ Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	**No Impact (applies to all potential effects):** No new water supplies would be needed for long-term operation of the project. The project does not include facilities that would require potable water. There will be some landscaping on the site that will require irrigation; however, water consumption will be negligible and will be far less than was used on the site for the nursery. Likewise, wastewater generation would be negligible.	

Chapter 7.0
Organizations and Persons Consulted & EIR Preparers

7.1 PUBLIC AGENCIES

ORANGE COUNTY WATER DISTRICT

***Shivaji Deshmukh, P.E., Assistant Director of Engineering/Project Manager**
M.S., Civil Engineering
California Registered Civil Engineer

***Roy L. Herndon, Chief Hydrogeologist**
M.S., Hydrology & Water Resources
California Professional Geologist, California Certified Hydrogeologist

***Adam S. Hutchinson, Director of Recharge Operations**
M.S., Hydrology
California Registered Geologist, California Certified Hydrogeologist

***Heather McPherson, Engineer**
B.S., Chemical Engineering

***Greg D. Woodside, Director of Planning and Watershed Management**
M.S., Hydrology
California Registered Geologist, California Certified Hydrogeologist

7.2 PROJECT CONSULTANTS

RUBICON ENGINEERING CORPORATION

***David Hogshead, P.E., Principal Engineer**
B.S., Mechanical Engineering
California Registered Civil Engineer

***Mohsen Mehran, Ph.D., CEO/Hydrogeologist**
Ph.D., Civil Engineering
Certified Ground Water Professional, Qualified Environmental Professional

* Denotes key EIR contributors whose résumés are included in Appendix 9.2 of this document.

7.3 EIR PREPARERS & CONTRIBUTORS

CHAMBERS GROUP, INC. (EIR PREPARATION)

Lisa Allen, Wildlife Biologist
M.S., Environmental Science

***Mike DeVore, Project Manager**
M.S., Environmental Studies

Susan D. Lamoureux, Director of Environmental Services
M.A., Social Ecology/Planning and Public Policy

Roger Mason, Ph.D., Principal Investigator/Archaeologist
Ph.D., Anthropology
Registered Professional Archaeologist

***Jennifer Wilcox, Environmental Analyst**
M.S., Chemistry

GEOMATRIX CONSULTANTS, INC. (HYDROGEOLOGY REVIEW)

***Hassan Amini, Ph.D., Vice President and Principal Hydrogeologist**
Ph.D., Geological Sciences
California Certified Hydrogeologist, California Registered Geologist, California Registered Environmental Assessor

SAN BUENAVENTURA RESEARCH ASSOCIATES (HISTORIC ARCHITECTURE)

Mitchel R. Stone, Architectural Historian
B.S., Urban Planning

Chapter 8.0
List of References

The public may request assistance in obtaining and/or reviewing any of the documents referenced in this List of References. The documents listed below may be reviewed or obtained by contacting the Orange County Water District, 10500 Ellis Avenue, Fountain Valley, CA 92708, contact person: Mr. Shivaji Deshmukh, P.E. (sdeshmukh@ocwd.com), or by contacting Chambers Group, Inc., 17671 Cowan Avenue, Suite 100, Irvine, CA 92641, Project Reference No. 8378.

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APPENDIX 9.1
NOTICE OF PREPARATION (NOP), NOP COMMENTS, AND SUMMARY TABLE

NOTICE OF PREPARATION

DRAFT ENVIRONMENTAL IMPACT REPORT
for the
LA JOLLA RECHARGE BASIN PROJECT
Anaheim, California

May 17, 2004

I. INTRODUCTION

This Notice of Preparation (NOP) is a request for responsible and trustee agencies, other interested agencies and parties, and members of the general public to provide input to the Draft Environmental Impact Report (EIR) for the La Jolla Recharge Basin project in Anaheim, California.

Compliance with the California Environmental Quality Act (CEQA[1]) is required before the implementation of the recharge basin project. Pursuant to Section 21165 of CEQA, the Orange County Water District ("District" or "OCWD") is the Lead Agency responsible for preparing the Draft EIR to address the potential impacts associated with construction, operation, and maintenance of the groundwater recharge basin.

OCWD prepared and approved a Mitigated Negative Declaration (MND) in June of 2003, but received public comments that challenged the adequacy of the environmental review, particularly the need for the project and the mitigation measures related to protection of the groundwater basin. Specifically, a private business contended that groundwater recharge at the proposed La Jolla Recharge Basin site would create a detrimental plume migration effect that would hamper the business' ongoing groundwater remediation operation to contain and remove the volatile organic compounds (VOC) TCE and PCE from the aquifer. Since the MND challenges presented a "fair argument" that the La Jolla Recharge Basin could contribute to significant environmental effects, OCWD has determined that an EIR must be prepared to meet the requirements of CEQA. As such, the Draft EIR will contain an analysis of plume migration and contaminant transport effects of groundwater recharge in the Anaheim Forebay area of the OCWD, specifically the Deep Basin System. Additionally, the Draft EIR will address comments on the previous MND as they apply to CEQA environmental issues.

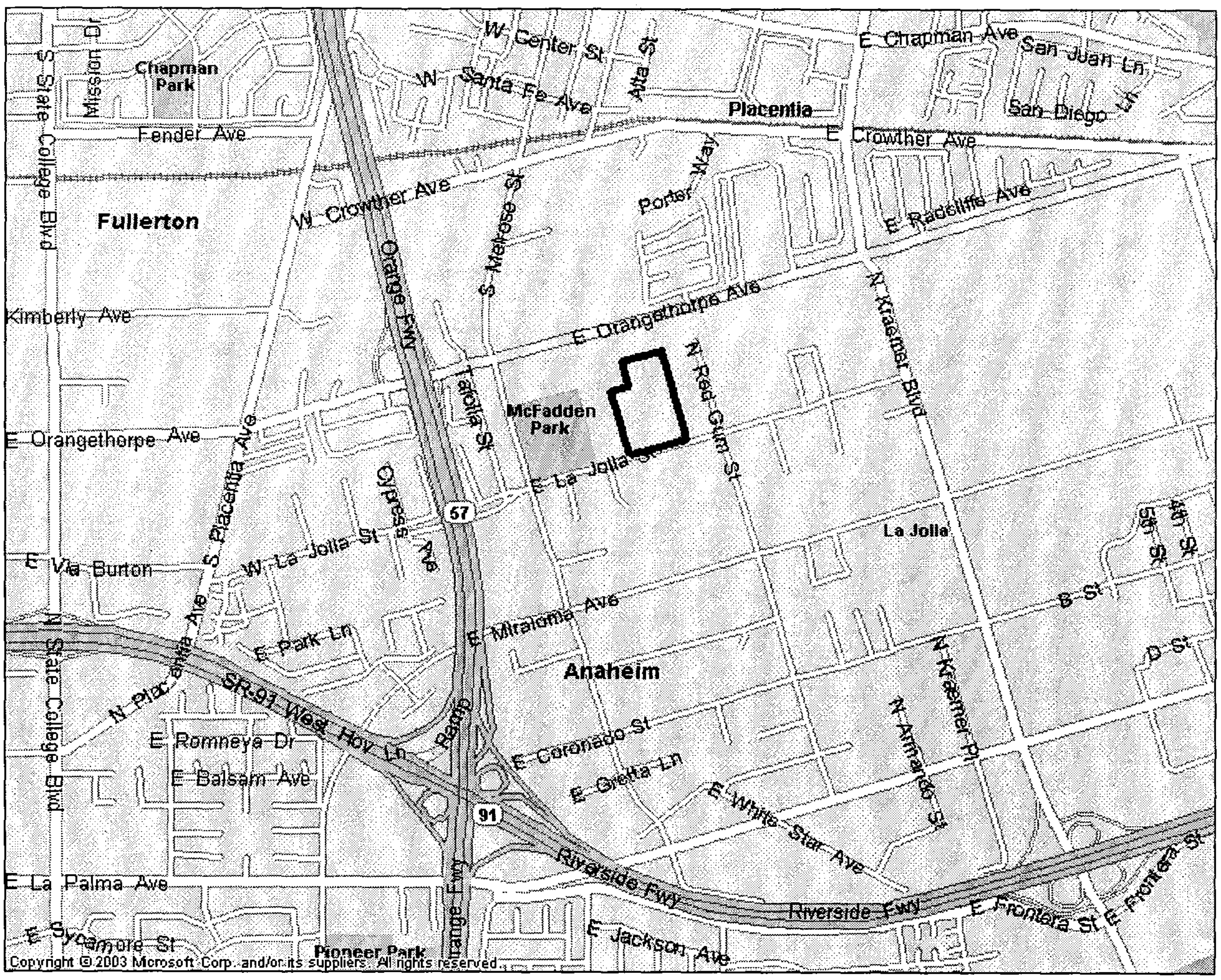
II. PROJECT LOCATION

The La Jolla Recharge Basin site is located in the City of Anaheim on an approximately 10-acre parcel near the northwest corner of the intersection of West La Jolla Street and Red Gum Street (refer to Figures 1 and 2 for the Regional Location and Vicinity Map).

[1] California Public Resources Code Division 13, Sections 21000 through 21177, are commonly known as the California Environmental Quality Act ("CEQA"). Implementing procedures for CEQA are found in California Code of Regulations Title 14 Chapter 3 Sections 15000 through 15387, commonly known as the "CEQA Guidelines."

Figure 1.
Regional Location

Figure 2.
Vicinity Map



III. PROJECT DESCRIPTION

The proposed project is the construction a groundwater recharge basin that will increase recharge into the Orange County Groundwater Basin. The new recharge basin would add approximately 9,000 acre-feet of recharge capacity per year. The proposed 10-acre site will include an approximately 5.7-acre recharge basin, a perimeter access road, 3:1 side slopes, a maximum depth of 20 feet, a basin access ramp, and an area where material removed from the basin during cleaning can be temporarily stored (see Figure 3). Water for the recharge basin will be provided from the Miller Recharge Basin via Carbon Creek Channel (see Figure 4) by means of a diversion dam.

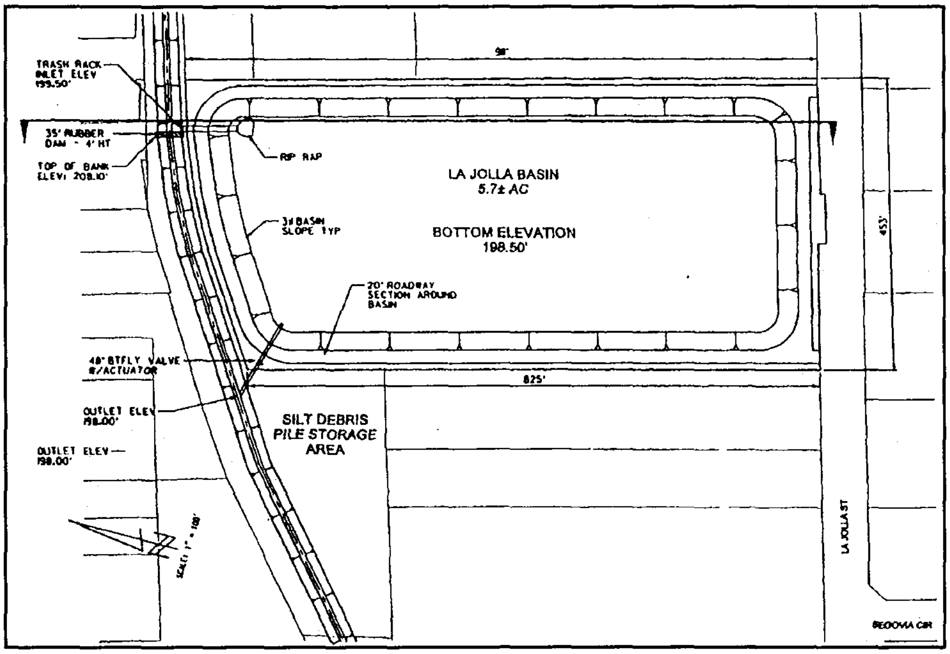


Figure 3. *Preliminary Site Plan*

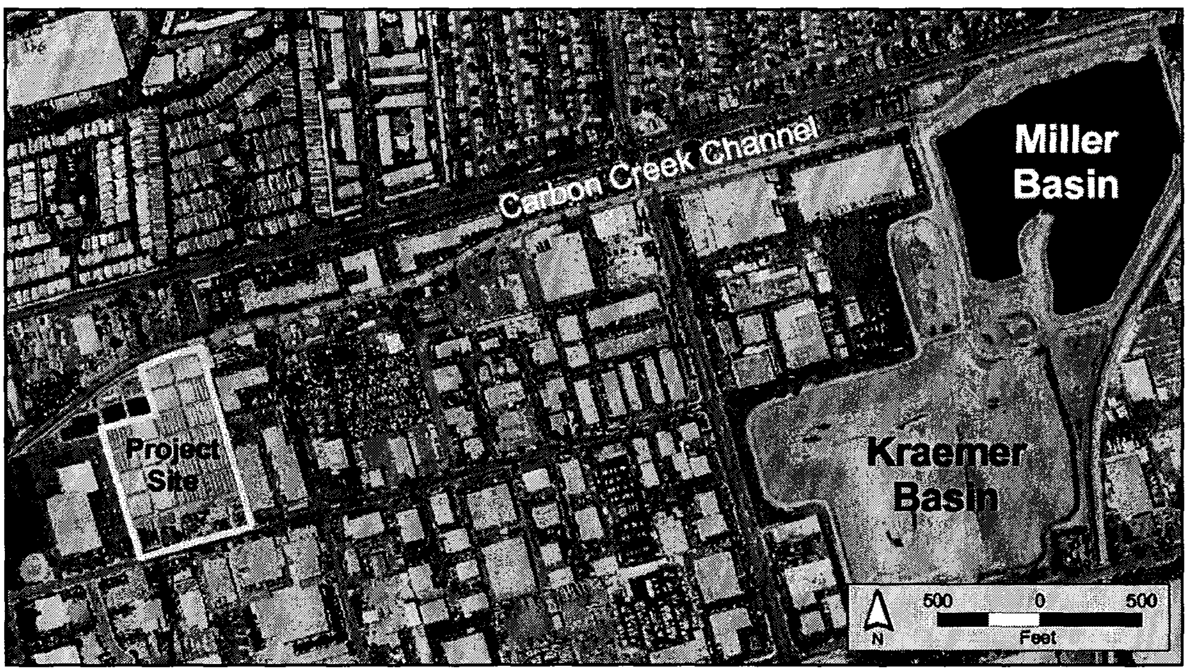


Figure 4. *Water Conveyance Plan*

IV. PROBABLE ENVIRONMENTAL EFFECTS

A primary issue to be analyzed in the Draft EIR will be the nature, extent, and project impacts to the VOC contaminant plume under remediation in the project vicinity. The Draft EIR will also focus on the following areas of key environmental concern:

- Hydrogeology, Hydrology, and Water Quality
- Hazards & Hazardous Materials
- Geology/Soils
- Air Quality
- Biological Resources
- Cultural Resources
- Transportation/Traffic
- Land Use/Planning
- Noise
- Aesthetics
- Public Services
- Utilities/Services Systems

Due to the highly urbanized location of the site and vicinity, the Draft EIR will not address the topics of mineral resources or agricultural resources. Similarly, recreation and population and housing issues will not be analyzed due to the non-residential nature of the project.

V. PUBLIC COMMENT

Your comment to this NOP should be sent at the earliest possible date, but not later than 30 days after the receipt of this notice.[2] It is anticipated that this deadline will be June 17, 2004. The District will rely on your written response to this NOP to further refine the scope of the Draft EIR. Please identify your name, address, and agency in your comments and send your comments to:

Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708
Contact person: Mr. Shivaji Deshmukh, P.E.
e-mail: sdeshmukh@ocwd.com

Each Responsible Agency shall provide the District with specific detail about the scope and content of the environmental information related to the Responsible Agency's area of statutory responsibility that must be included in the draft EIR. The response at a minimum shall identify the significant environmental issues and reasonable alternatives and mitigation measures which the Responsible Agency will need to have explored in the Draft EIR.

Copies of the rescinded La Jolla Recharge Basin Initial Study/Mitigated Negative Declaration prepared in 2003 and other project documentation are available for review at the above address.

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[2] Sections 15082 and 15103 of the State CEQA Guidelines.

Arnold
Schwarzenegger
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Jan Boel
Acting Director

Notice of Preparation

May 19, 2004

To: Reviewing Agencies

Re: La Jolla Recharge Basin
SCH# 2003041190

Attached for your review and comment is the Notice of Preparation (NOP) for the La Jolla Recharge Basin draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
P.O Box 8300
Fountain Valley, CA 92728-8300

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Senior Planner, State Clearinghouse

Attachments
cc: Lead Agency

State Clearinghouse Data Base

SCH#	**2003041190**
Project Title	La Jolla Recharge Basin
Lead Agency	Orange County Water District

Type	NOP Notice of Preparation
Description	Construction and operation of a groundwater recharge basin that will increase recharge into the Orange County Groundwater Basin. The new recharge basin would add approximately 9,000 acre-feet of recharge capacity per year. The proposed 10-acre site will include an approximately 5.7-acre recharge basin, a perimeter access road, 3:1 side slopes, a maximum depth of 20 feet, a basin access ramp, and an area where material removed from the basin during cleaning can be temporarily stored. Water for the recharge basin will be provided from the Miller Recharge Basin via Carbon Creek Channel by means of a diversion dam.

Lead Agency Contact

Name	Mr. Shivaji Deshmukh, P.E.				
Agency	Orange County Water District				
Phone	714-378-3216	***Fax***			
email					
Address	10500 Ellis Avenue P.O Box 8300				
City	Fountain Valley	***State***	CA	***Zip***	92728-8300

Project Location

County	Orange						
City	Anaheim						
Region							
Cross Streets	La Jolla Street and Red Gum Street						
Parcel No.	344-172-04, 344-192-02 to 344-192-05						
Township	3S	***Range***	9W	***Section***	Unsect	***Base***	SB

Proximity to:

Highways	SR-57 & SR-91
Airports	John Wayne
Railways	
Waterways	Santa Ana River, Carbon Creek
Schools	
Land Use	Vacant nursery and outdoor storage; four single-family residential structures/zoning: SP 94-1, Development Area 1/ GP: General Industrial

Project Issues	Aesthetic/Visual; Air Quality; Archaeologic-Historic; Drainage/Absorption; Geologic/Seismic; Noise; Public Services; Toxic/Hazardous; Traffic/Circulation; Water Quality; Water Supply; Wetland/Riparian; Cumulative Effects; Soil Erosion/Compaction/Grading; Landuse
Reviewing Agencies	Resources Agency; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 5; Native American Heritage Commission; California Highway Patrol; Caltrans, District 12; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Board, Region 8

Date Received	05/19/2004	***Start of Review***	05/19/2004	***End of Review***	06/17/2004

Note: Blanks in data fields result from insufficient information provided by lead agency.

OP Distribution List County: Orange SCH# [illegible]

esources Agency

- Resources Agency, Nadell Gayou
- Dept. of Boating & Waterways, Suzi Betzler
- California Coastal Commission, Elizabeth A. Fuchs
- Colorado River Board, Gerald R. Zimmerman
- Dept. of Conservation, Roseanne Taylor
- California Energy Commission, Environmental Office
- Dept. of Forestry & Fire Protection, Allen Robertson
- Office of Historic Preservation, Hans Kreutzberg
- Dept of Parks & Recreation, B. Noah Tilghman, Environmental Stewardship Section
- Reclamation Board, Lori Buford
- Santa Monica Mountains Conservancy, Paul Edelman
- S.F. Bay Conservation & Dev't. Comm., Steve McAdam
- Dept. of Water Resources, Resources Agency, Nadell Gayou

Fish and Game

- Dept. of Fish & Game, Scott Flint, Environmental Services Division
- Dept. of Fish & Game 1, Donald Koch, Region 1
- Dept. of Fish & Game 2
- Dept. of Fish & Game 3, Robert Floerke, Region 3
- Dept. of Fish & Game 4, William Laudermilk, Region 4
- Dept. of Fish & Game 5, Don Chadwick, Region 5, Habitat Conservation Program
- Dept. of Fish & Game 6, Gabrina Gatchel, Region 6, Habitat Conservation Program
- Dept. of Fish & Game 6 I/M, Tammy Allen, Region 6, Inyo/Mono, Habitat Conservation Program
- Dept. of Fish & Game M, George Isaac, Marine Region

Other Departments

- Food & Agriculture, Steve Shaffer, Dept. of Food and Agriculture
- Dept. of General Services, Robert Sleppy, Environmental Services Section
- Dept. of Health Services, Wayne Hubbard, Dept. of Health/Drinking Water

Independent Commissions,Boards

- Delta Protection Commission, Debby Eddy
- Office of Emergency Services, John Rowden, Manager
- Governor's Office of Planning & Research, State Clearinghouse
- __________
- Native American Heritage Comm., Debbie Treadway
- Public Utilities Commission, Ken Lewis
- State Lands Commission, Jean Sarino
- Tahoe Regional Planning Agency (TRPA), Cherry Jacques

Business, Trans & Housing

- Caltrans - Division of Aeronautics, Sandy Hesnard
- Caltrans - Planning, Terri Pencovic
- California Highway Patrol, John Olejnik, Office of Special Projects
- Housing & Community Development, Cathy Creswell, Housing Policy Division

Dept. of Transportation

- Dept. of Transportation 1, Mike Eagan, District 1
- Dept. of Transportation 2, Don Anderson, District 2
- Dept. of Transportation 3, Jeff Pulverman, District 3
- Dept. of Transportation 4, Tim Sable, District 4
- Dept. of Transportation 5, David Murray, District 5
- Dept. of Transportation 6, Marc Birnbaum, District 6
- Dept. of Transportation 7, Cheryl J. Powell, District 7
- Dept. of Transportation 8, John Pagano, District 8
- Dept. of Transportation 9, Gayle Rosander, District 9
- Dept. of Transportation 10, Tom Dumas, District 10
- Dept. of Transportation 11, Mario Orso, District 11
- Dept. of Transportation 12, Bob Joseph, District 12

Cal EPA

Air Resources Board

- Airport Projects, Jim Lerner
- Transportation Projects, Kurt Karperos
- Industrial Projects, Mike Tollstrup

- California Integrated Waste Management Board, Sue O'Leary
- State Water Resources Control Board, Jim Hockenberry, Division of Financial Assistance
- State Water Resources Control Board, Student Intern, 401 Water Quality Certification Unit, Division of Water Quality
- State Water Resouces Control Board, Steven Herrera, Division of Water Rights
- Dept. of Toxic Substances Control, CEQA Tracking Center

Regional Water Quality Control Board (RWQCB)

- RWQCB 1, Cathleen Hudson, North Coast Region (1)
- RWQCB 2, Environmental Document Coordinator, San Francisco Bay Region (2)
- RWQCB 3, Central Coast Region (3)
- RWQCB 4, Jonathan Bishop, Los Angeles Region (4)
- RWQCB 5S, Central Valley Region (5)
  - RWQCB 5F, Central Valley Region (5), Fresno Branch Office
  - RWQCB 5R, Central Valley Region (5), Redding Branch Office
- RWQCB 6, Lahontan Region (6)
  - RWQCB 6V, Lahontan Region (6), Victorville Branch Office
- RWQCB 7, Colorado River Basin Region (7)
- RWQCB 8, Santa Ana Region (8)
- RWQCB 9, San Diego Region (9)

- Other __________

Last Updated on 05/06/04

City of Anaheim
PLANNING DEPARTMENT

June 17, 2004

Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708

RE: Notice of Preparation of the Draft Environmental Impact for La Jolla Recharge Basin Project

Dear Mr. Deshmukh:

Thank you for the opportunity to review the above-referenced document. City staff has reviewed the document and has no comments at this time.

Please forward any subsequent public notices and/or environmental documents regarding this project to my attention at the address listed below.

If you have any questions regarding this response, please do not hesitate to contact me at (714) 765-5139, Extension 5739.

Sincerely,

Marie Newland

Marie Newland, AICP
Assistant Planner

mnewland/respagencies/OCWD.doc

State of California—Health and Human Services Agency
Department of Health Services

California Department of Health Services

SANDRA SHEWRY
Director

ARNOLD SCHWARZENEGGER
Governor

June 17, 2004

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708

Response to Notice of Preparation for Draft EIR - La Jolla Recharge Basin

Our office has reviewed the draft notice of preparation for the La Jolla Recharge Basin. The proposed recharge facilities are connected to the Kramer Basin and receive water from the District's Groundwater Replenishment System (GWRS). The GWRS project is currently regulated under an Order issued by the Regional Water Quality Control Board (RWQCB, Order No. R8-2004-0002). This order was prepared in consultation with our Department, the public, and member agencies of Orange County Water District (OCWD) to ensure that the District's recharge activities do not adversely impact local drinking water sources.

The expansion of the recharge facilities associated with the GWRS project will require an amendment to Order No. R8-2004-0002. Prior to processing this amendment request, OCWD will need to demonstrate that adjacent drinking water sources are not adversely impacted by the District's recharge activities and current Department guidelines for the beneficial recharge of recycled water into the Orange County Aquifer System are adhered to. Follow-up tracer studies may be required by the Department to verify the travel time from the point of recharge to adjacent domestic water sources.

RECEIVED
JUN 30 2004
BY: [signature]

Southern California Drinking Water Field Operations Branch, Santa Ana District
28 Civic Center Plaza, Room 325, Santa Ana, CA, 92701
Telephone: (714) 558-4410 Fax: (714) 567-7262
Internet Address: www.dhs.ca.gov/ps/ddwem/

The Draft EIR for this project will need to present the District's proposal to evaluate how the proposed recharge facilities will impact local drinking water sources and comply with Department guidelines for the beneficial recharge of recycled water. If you have any questions regarding this letter, please contact me at (714) 558-4708.

Sincerely,

Cor Shaffer, P.E.
District Engineer
State of California, DWFOB

Enclosure: Project Description

cc: County of Orange, Department of Environmental Health (w/ enclosures)
Region 8 – Regional Water Quality Control Board
File – Orange County Water District

OCWD LaJollaBasin Recharge Draft EIR LTR.doc

Department of Toxic Substances Control

Edwin F. Lowry, Director
5796 Corporate Avenue
Cypress, California 90630

Terry Tamminen
Agency Secretary
Cal/EPA

Arnold Schwarzenegg
Governor

June 1, 2004

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, California 92708

NOTICE OF PREPARATION OF A SUBSEQUENT DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE LA JOLLA RECHARGE BASIN PROJECT, ANAHEIM, CALIFORNIA.

Dear Mr. Deshmukh:

The Department of Toxic Substances Control (DTSC) has received your Notice of Preparation (NOP) of a draft Environmental Impact Report (EIR) for the above-mentioned Project. .

Based on the review of the document, DTSC's comments are as follows:

1) A copy of the NOP should be filed with the State Clearinghouse, 1400 Tenth Street, P.O. Box 3044, Sacramento, California 95812-3044, Telephone Number: (916) 445-0613.

2) The draft EIR needs to identify and determine whether current or historic uses at the Project site have resulted in any release of hazardous wastes/substances.

3) The draft EIR needs to identify any known or potentially contaminated sites within the proposed Project area. For all identified sites, the draft EIR should evaluate whether conditions at the site pose a threat to human health or the environment. A Phase I Assessment may be sufficient to identify these sites. Following are the databases of some of the regulatory agencies:

   - National Priorities List (NPL): A list is maintained by the United States Environmental Protection Agency (U.S.EPA).

- CalSites: A Database primarily used by the California Department of Toxic Substances Control.

- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.

- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that maintained by U.S.EPA.

- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.

- Leaking Underground Storage Tanks (LUST) / Spills, Leaks, Investigations and Cleanups (SLIC): A list that is maintained by Regional Water Quality Control Boards.

- Local County and City maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.

4) The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If hazardous materials/wastes were stored at the site, an environmental assessment should be conducted to determine if a release has occurred. If so, further studies should be carried out to delineate the nature and extent of the contamination, and the potential threat to public health and/or the environment should be evaluated. It may be necessary to determine if an expedited response action is required to reduce existing or potential threats to public health or the environment. If no immediate threat exists, the final remedy should be implemented in compliance with state regulations and policies.

5) All environmental investigation and/or remediation should be conducted under a Workplan which is approved by a regulatory agency that has jurisdiction to oversee hazardous waste cleanup.

6) If the subject property was previously used for agriculture, onsite soils could

contain pesticide residues. Proper investigation and remedial action may be necessary to ensure the site does not pose a risk to the future residents.

7) If any property adjacent to the project site is contaminated with hazardous chemicals, and if the proposed project is within 2,000 feet from a contaminated site, then the proposed development may fall within the "Border Zone of a Contaminated Property." Appropriate precautions should be taken prior to construction if the proposed project is within a "Border Zone Property."

8) If building structures are planned to be demolished, an investigation should be conducted for the presence of lead-based paints and asbestos containing materials (ACMs). If lead-based paints or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies.

9) The project construction may require soil excavation and soil filling in certain areas. Appropriate sampling is required prior to disposal of the excavated soil. If the soil is contaminated, properly dispose of it rather than placing it in another location. Land Disposal Restrictions (LDRs) may be applicable to these soils. Also, if the project proposes to import soil to backfill the areas excavated, proper sampling should be conducted to make sure that the imported soil is free of contamination.

10) The draft EIR should indicate the distance from the project site to any sensitive receptors such as schools, daycares, hospitals, or residences within a quarter mile radius. Human health and the environment of sensitive receptors should be protected during the construction or demolition activities. A study of the site should be conducted to provide basic information for determining if there are, have been, or will be, any threatening releases of hazardous materials that may pose a risk to human health or the environment.

11) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5).

12) If it is determined that hazardous wastes are or will be generated and the wastes are (a) stored in tanks or containers for more than ninety days, (b) treated onsite, or (c) disposed of onsite, then a permit from DTSC may be required. The facility

should contact DTSC at (818) 551-2171 to initiate pre application discussions and determine the permitting process applicable to the facility.

13) If it is determined that hazardous wastes will be generated, the facility should obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942.

14) Certain hazardous waste treatment processes may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

15) If the project plans include discharging waste water to the municipal sewer system, you may be required to obtain waste water discharge requirements from the Santa Ana Regional Water Quality Control Board.

16) If during construction/demolition of the project, soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the draft EIR should identify how any required investigation and/or remediation will be conducted, and the government agency to provide appropriate regulatory oversight.

17) If applicable there should be a reference to related documents, correspondences, communications, and assessment reports.

DTSC provides guidance for preparation of a Preliminary Endangerment Assessment (PEA), and cleanup oversight, through the Voluntary Cleanup Program (VCP). For additional information on the VCP, please visit DTSC's web site at www.dtsc.ca.gov. If you have any questions regarding this letter, please contact Ms.Teresa Hom, Project Manager, at (714) 484-5477.

Sincerely,

Greg Holmes
Unit Chief
Southern California Cleanup Operations Branch
Cypress Office

cc: See next page

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044

Mr. Guenther W. Moskat, Chief
Planning and Environmental Analysis Section
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

IRELL & MANELLA LLP
A REGISTERED LIMITED LIABILITY LAW PARTNERSHIP
INCLUDING PROFESSIONAL CORPORATIONS

1800 AVENUE OF THE STARS, SUITE 900
LOS ANGELES, CA 90067-4276
TELEPHONE (310) 277-1010
FACSIMILE (310) 203-7199

840 NEWPORT CENTER DRIVE, SUITE 400
NEWPORT BEACH, CALIFORNIA 92660-6324

TELEPHONE (949) 760-0991
FACSIMILE (949) 760-5200
WEBSITE: www.irell.com

WRITER'S DIRECT
TELEPHONE (949) 760-5228
rmcnell@irell.com

June 15, 2004

VIA MESSENGER

Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708-6921

Dear Mr. Deshmukh:

We represent AC Products, Inc. ("AC Products"). On its behalf, we are responding to the Orange County Water District's ("OCWD") Notice of Preparation of a Draft Environmental Impact Report (the "DEIR") for the La Jolla Recharge Basin Project (the "Project"), dated May 17, 2004.

First, the Project will cause groundwater contaminated with volatile organic compounds, which presently is being captured, remediated and restored to the aquifer by AC Products, to be diverted into unaffected portions of the shallow and deeper drinking water aquifers. Once it has been diverted, it will not be possible to adequately monitor, extract or treat the contaminated groundwater. Nor can this be done at a cost that is feasible.

Second, the recharge water will comprise water from the Santa Ana River and the Metropolitan Water District. Thus, the Project will result in water consisting in part of discharges from sewage treatment plants (which contain numerous hazardous substances, such as pharmaceuticals, endocrine disrupters and other chemicals of concern, such as NDMA) and water from the Colorado River (which also contains hazardous substances, including perchlorate). Perchlorate also is present in groundwater as a consequence of Chilean fertilizer having been imported into Orange County for historical agricultural purposes. Perchlorate is present in the groundwater above applicable public health goals and may be present above maximum contaminant levels that will be adopted in the near future. For the foregoing reasons, among others, it is anticipated that it will be infeasible for the OCWD to obtain either an NPDES or a WDR for the compounds that will be discharged by the Project.

Third, the OCWD has asserted that AC Products must pay for mitigation of the exacerbation of the contaminated groundwater that will be caused by the Project's diversion of groundwater outside of the present capture zone. However, AC Products is not legally responsible for the exacerbation of existing contamination by the OCWD.

Fourth, the OCWD identified at least two viable alternative sites for the proposed recharge basin. The OCWD apparently did not pursue these sites or reveal their existence to the public during the Mitigated Negative Declaration process. The OCWD is required to meaningfully evaluate alternatives to the Project during its preparation of the DEIR to avoid significant effects on the environment. Moreover, the OCWD must meaningfully evaluate alternatives, even though it already has spent several million dollars to acquire the land for the Project.

Fifth, as part of the Project, the OCWD intends to sell part of the site to the Placentia/Yorba Linda Unified School District (the "School District"), and the School District apparently intends to build a middle school on that land. This should be identified as part of the Project and fully evaluated in compliance with CEQA as part of the EIR.

AC Products reasserts its comments made in connection with the OCWD's adoption of the MND for the Project. Attached for your reference are AC Products' June 4, 2003 comment letter in response to the OCWD's Notice of Availability and Notice of Intent to Adopt a Mitigated Negative Declaration for La Jolla Recharge Basin (attached hereto as Exhibit A). AC Products also incorporates by reference the matters contained in its letters sent to the OCWD's counsel, Rutan & Tucker, dated February 11, 2004 (attached hereto as Exhibit B) and February 12, 2004 (attached hereto as Exhibit C).

Very truly yours,

Richard J. McNeil

RJM:jml

Enclosures

EXHIBIT A

IRELL & MANELLA LLP
A REGISTERED LIMITED LIABILITY LAW PARTNERSHIP
INCLUDING PROFESSIONAL CORPORATIONS

840 NEWPORT CENTER DRIVE, SUITE 400
NEWPORT BEACH, CALIFORNIA 92660-6324

[AVE]NUE OF THE STARS, SUITE 900
[LOS] ANGELES, CA 90067-4276
TELEPHONE (310) 277-1010
FACSIMILE (310) 203-7199

TELEPHONE (949) 760-0991
FACSIMILE (949) 760-5200
WEBSITE: www.irell.com

WRITER'S DIRECT
TELEPHONE (949) 760-5228
rmcneill@irell.com

June 4, 2003

Mr. John Kennedy
Assistant General Manager
Orange County Water District
P.O. Box 8300
Fountain Valley, CA 92728-8300

Re: Mitigated Negative Declaration for La Jolla Recharge Basin

Dear Mr. Kennedy:

We represent AC Products. On its behalf, we are responding to the Orange County Water District's ("OCWD's") "Notice of Availability and Notice of Intent to Adopt a Mitigated Negative Declaration for the La Jolla Recharge Basin."

Respectfully, the Mitigated Negative Declaration ("MND") does not meet the requirements of the California Environmental Quality Act ("CEQA"). In particular, and as conceded by the OCWD's own consultant, England Geosystem, Inc., the La Jolla Recharge Basin Project ("Project") will directly cause a very significant amount of groundwater that is contaminated with volatile organic compounds – and which presently is being adequately captured, remediated and restored to the aquifer by AC Products – to be diverted into unaffected portions of the shallow and deeper drinking water aquifers. After it is diverted, it will not be capable of being monitored, extracted or treated by the remediation system operated by AC Products. This is a significant adverse effect on the environment that requires the preparation of an Environmental Impact Report ("EIR") pursuant to California Public Resources Code § 21083 and California Code of Regulations § 15065.

During the preparation of the EIR, the OCWD should be mindful that the mitigation measures proposed in the MND do not provide adequate mitigation measures to address the effects of diverting the plume into presently unaffected areas. The OCWD's proposed mitigation in the MND consists of two actions: (1) installing two to four monitoring wells and (2) coordinating with AC Products and the Santa Ana Regional Water Quality Control Board ("RWQCB") "to modify the remediation program as necessary."[1] However, the installation of two to four monitoring wells will not result in the contaminated groundwater

[1] Orange County Water District La Jolla Recharge Basin Initial Study/Mitigated Negative Declaration ("OCWD MND") at 20.

being adequately monitored and, of course, will not result in the diverted contaminated groundwater being remediated. During the preparation of the EIR, the OCWD must commit to installing a sufficient number of wells, at sufficient depths, to evaluate the shift in the plume. Likewise, the OCWD must commit to undertake remediation of the portion of the plume outside of the capture zone of the AC Products remediation system. Our more detailed comments concerning the commitment OCWD must make based on the current project description are discussed in Section II, infra.

Furthermore, proposing to "coordinate with AC Products and the RWQCB to modify the remediation program" is impermissible "deferred mitigation," which does not meet CEQA's requirements that the mitigation measures be formulated prior to approval of the MND. The proposal to "coordinate" is not a mitigation measure because it does not commit the OCWD itself to do anything to modify the remediation program in response to the impact of the Recharge Basin.

In addition, the MND fails to identify or discuss the significant effects of the introduction of other chemicals, such as perchlorate, pharmaceutical compounds, including potential endocrine disrupters, and other compounds that are present in the water sources that will be imported to the Recharge Basin to infiltrate into the drinking water aquifers. The remediation system installed by AC Products was not designed to treat these chemicals. Thus, the presence of these chemicals significantly impacts both the existing plume and the diverted plume. As the MND did not identify these significant impacts, no mitigation was proposed.

The OCWD must both conduct an Environmental Impact Report ("EIR") to comply with CEQA and, in connection therewith, propose mitigation measures that will be adequate to avoid or mitigate the spreading of the plume that the Project will cause and the introduction of additional contaminants of concern into drinking water supplies.

A more detailed discussion of these matters is presented below.

I. Background

The OCWD Project would create a groundwater recharge basin over an approximately ten acre site and would add an additional 9,000 acre-feet per year of recharge capacity to the Orange County Groundwater Basin. The OCWD completed an Initial Study (IS) that "found all environmental issues to be less than significant after incorporation of mitigation measures into the project description."[2]

2 OCWD Public Notice of Availability.

AC Products is located at 172 E. La Jolla in Placenta, California. AC Products is located across the street from the proposed La Jolla Recharge Basin. For several years, AC Products has been conducting a remediation program under the supervision of the RWQCB. The remediation system comprises an array of 34 monitoring wells and three extraction wells that are or were connected to two separate remediation systems installed to address an accidental release of tetrachloroethylene ("PCE") at the AC Products facility. The system was designed to adequately capture and treat the groundwater plume and the two original extraction wells have successfully treated the contaminated water from the plume. The system cost approximately in excess of $2,500,000 to design and construct and it is anticipated that the system will cost another approximately $1,000,000 to operate through project completion.

The OCWD is (and for many years has been) aware of the nature and configuration of the AC Products remediation system. Approximately two months ago, AC Products and the OCWD reached an agreement pursuant to which AC Products agreed to install and operate an additional extraction well downgradient of the AC Products, Well P-3, and an associated additional groundwater remediation system. That well and the associated remediation system were installed by AC Products at a cost in excess of $500,000. However, neither the extraction well nor the remediation system were sited to capture or treat the diverted contaminated groundwater that will result from operation of the Recharge Basin. The reason for this is that the OCWD did not reveal to AC Products that the Recharge Basin project was under consideration. As proposed, the Project will in large part reduce the effectiveness of P-3 and the remediation system.

II. The OCWD's Proposed Mitigated Negative Declaration Fails To Comply With CEQA

A. A Mitigated Negative Declaration Is Improper Where A Project May Have A Significant Effect

Under Public Resources Code Section 21151, a local agency ordinarily must prepare an EIR for any project which *may* have a significant effect on the environment. More specifically, Public Resources Code Section 21151 provides:

> "All local agencies shall prepare, or cause to be prepared by contract, and certify the completion of, an environmental impact report on any project that they intend to carry out or approve which may have a significant effect on the environment."

As stated in Sundstrom v. County of Mendocino, 202 Cal. App. 3d 296, 304 (1988) "[t]he 'heart' of CEQA is the provisions requiring preparation of an environmental impact report."

CEQA only excuses preparation of an EIR in very limited circumstances. More specifically, California Code of Regulations § 15064(f) provides:

> "If the lead agency determines there is substantial evidence in the record that the project may have a significant effect on the environment but the lead agency determines that revisions in the project plans or proposals made by, or agreed to by, the applicant would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur and there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment then a mitigated negative declaration shall be prepared... If the lead agency determines there is no substantial evidence that the project may have a significant effect on the environment, the lead agency shall prepare a negative declaration."[3]

Courts review the appropriateness of an agency's approval of a MND using the "fair argument" test. As stated in San Bernardino Valley Audubon Society v. Metropolitan Water District of Southern California, 71 Cal. App. 4th 382, 389 (1999) (holding EIR required for a lake project when the evidence supported a fair argument of significant environmental impact):

> "Under [the fair argument] test, the agency must prepare an EIR whenever substantial evidence in the record supports a fair argument that a proposed project may have a significant effect on the environment. If such evidence is found, it cannot be overcome by substantial evidence to the contrary. The lead agency's determination . . . does not resolve conflicts in the evidence but determines only whether substantial evidence exists in the record to support the prescribed fair argument" (internal citations omitted).[4]

When applying the fair argument test, the California Supreme Court has adopted a "low threshold" requirement for preparation of an EIR in order to respect the Legislature's intent under CEQA to "afford the fullest possible protection to the environment within the reasonable scope of the statutory language." See No Oil, Inc. v. City of Los Angeles, 13 Cal. 3d 68, 76 (1974) (holding that defendant city abused its discretion by allowing defendant corporation to establish oil drilling districts before making a written negative

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[3] See also Cal. Pub. Res. Code § 21080(c).

[4] See also Cal. Code Reg. ("CCR") § 15064(f)(1) ("[I]f a lead agency is presented with a fair argument that a project may have a significant effect on the environment, the lead agency shall prepare an EIR even though it may also be presented with other substantial evidence that the project will not have a significant effect.")

declaration or an environmental impact report). As stated by the court in San Bernardino Valley Audubon Society, supra at 390:

> "As the state Office of Planning and Research discussion following [CEQA] Guidelines section 15070 explains: 'A Mitigated Negative Declaration is not intended to be a new kind of document....[It] provides efficiencies in the process where the applicant can modify his project to avoid all potential significant effects."

Moreover, where a project "has the potential to substantially degrade the quality of the environment," the lead agency "shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project...." CCR § 15065(a).

In this case, the OCWD's Project fails to satisfy the fair argument test because substantial evidence exists that the Project may have a significant adverse effect on the environment, as reflected in the OCWD's own analysis of the Project. As noted above, this constitutes a mandatory finding of significance that requires the preparation of an EIR.

B. The Project Will Have A Significant Effect On The Environment By Diverting The Plume To Unaffected Drinking Water Source Areas

"A project will normally have a significant effect on the environment if it will substantially degrade water quality; contaminate a public water supply; or substantially degrade or deplete ground water resources." See Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster, 52 Cal. App. 4th 1165, 1189 (1997) (the disposal of municipal solid waste in a quarry atop a basin was a "significant effect" because it could contaminate or degrade water quality in the basin). See also Oro Fino Gold Mining Corp v. County of El Dorado, 225 Cal.App.3d 872, 883 (1990) (finding that the potential for groundwater contamination from a mineral exploration project that involved drilling exploratory holes constitutes a significant effect). In the case at hand, the Project will cause a significant portion of the existing plume to be diverted into unaffected portions of the shallow and deeper aquifers. In the absence of the Project's impact, the plume would be captured, treated and replaced into the aquifer.

The MND acknowledges that recharge water from the proposed Project "could affect the shape and flow direction of the [AC Products] contamination plume."[5] The Technical Memorandum prepared by England Geosystem, Inc., the OCWD's consultant, concluded even more emphatically that "[t]he groundwater flow direction near the upgradient portion of the [AC Products] PCE plume would be altered from the current due west course to a

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[5] OCWD MND at 19.

southwesterly course." More specifically, England Geosystem concluded that the recharge basin will cause approximately half of the PCE plume currently being captured by AC Products' extraction wells to be diverted away from the wells and pushed into currently unimpacted areas.[6] Moreover, England Geosystems Inc. concluded that "[d]ownward vertical hydraulic gradients may be induced [by the Project] near the plume, causing potential migration of PCE into the principal aquifer."[7]

Thus, based on the OCWD's own consultant's analysis, and as is further reflected in the MND, substantial evidence exists of significant adverse environmental effects. First, the Project will cause the PCE plume to migrate laterally in the shallow aquifer, thus diverting contaminated groundwater which presently would be captured and treated by the extraction wells and remediation systems installed by AC Products. Second, the PCE plume may be forced downward into the principal drinking water aquifer.

C. **The Project Will Have A Significant Effect On The Environment By Causing The Introduction Of Perchlorate And Other Chemicals Into Drinking Water Source Areas**

The MND indicates that the source of recharge water for the Project will be the Santa Ana River and the Metropolitan Water District (MWD).[8] Imported water from both these water sources is likely to be contaminated. Much of the water in the Santa Ana River comprises discharges from sewage treatment plants that contain pharmaceuticals, other endocrine disrupters and other chemicals of concern. Studies in recent years have shown that pharmaceutical compounds, other endocrine disrupters and other compounds pass through sewage and other wastewater treatment plants without being destroyed or removed. NDMA precursors also are present in sewage and NDMA can be created during treatment. In addition, much of the water provided by the MWD to the OCWD for recharge originates in the Colorado River, which consistently contains perchlorate at concentrations greater than USEPA's January 2002 draft toxicological report on perchlorate, which recommended a drinking water limit of 1 microgram per liter.

The MND fails to identify the significant effects that these various chemicals in the water from the Santa Ana River and MWD may have upon the quality and purity of the water imported to the recharge basin and allowed to enter drinking water supplies. These effects should be evaluated, and appropriate mitigation measures proposed, in the EIR.

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6 England Geosystem Technical Memorandum at 16.

7 England Geosystem Technical Memorandum at 17.

8 OCWD MND at 3.

D. The Project's Proposed Mitigation Measures Fail To Avoid Or Mitigate The Project's Potentially Significant Effects

The OCWD has proposed the following mitigation measures to address the significant effect it identified of diverting the plume into unaffected drinking water supplies. First, the OCWD states: "The District will install two to four monitoring wells at the perimeter of the existing plume and collect groundwater samples to determine whether the existing contamination plume is altered by the implementation of the new La Jolla Recharge Basin." Second, the OCWD states: "If monitoring results indicate that the additional recharge location has affected the course of the plume, the OCWD will coordinate with AC and the RWQCB to modify the remediation program as necessary."[9]

These measures are inadequate to avoid or adequately mitigate the potential groundwater contamination that will occur as a result of the Project.

1. Two To Four Monitoring Wells Is Not Sufficient To Monitor The Perimeter Of The Plume

AC Products currently has 34 monitoring wells in place to obtain water level and water quality data. These wells allow AC Products (and the RWQCB) to evaluate the extent of the impacted area and the progress of the remediation. Given the significant migration of the plume that is forecasted by the OCWD as a result of the construction and operation of the La Jolla Recharge Basin, the effectiveness of the existing monitoring well network will be significantly reduced. Given the modeling conducted by England Geosystems, a significant number of additional monitoring wells (certainly, more than two to four) will need to be installed to monitor the shifted plume. In addition, it may be necessary that some of these wells need to be installed at significantly greater depth to assess the impact on the deeper aquifer. Clearly, the installation of an additional two to four wells, as the OCWD currently proposes in its MND, is insufficient to mitigate the impact to drinking water from the Recharge Basin.

2. The OCWD Fails To Provide Any Specific Mitigation Measure In The Likely Event That The Plume Changes Course

Should the plume shift into other areas of the shallow and deeper aquifers, thus significantly reducing the effectiveness of the current groundwater remediation program to treat this water, the OCWD proposes to "coordinate with AC Products and the RWQCB to modify the remediation program as necessary."[10] This is not adequate mitigation. The

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[9] OCWD MND at 20.

[10] Id.

OCWD makes no commitment either to relocate the recharge project or to identify and implement a solution to mitigate the impacts of its proposed Project on shallow and deeper drinking water aquifers.

The OCWD's proposal to "coordinate" with AC Products and the RWQCB constitutes impermissible "deferred mitigation." The OCWD may not defer the determination of appropriate mitigation into the future: "A negative declaration requiring formulation of mitigation measures at a future time violates the rule that members of the public and other agencies must be given an opportunity to review mitigation measures before a negative declaration is approved." Gentry v. City of Murrieta, 36 Cal. App. 4th 1359, 1393 (1995) (holding that postponing mitigation until receipt of recommendations of future biological study improperly deferred mitigation). See also Oro Fino Gold Mining Corp., supra at 884-885 (negative declaration improperly adopted in reliance on mitigation measures calling for future reclamation, erosion, dust, and fire plans); Sundstrom v. County of Mendocino, supra at 306 (1988) ("CEQA requires environmental review at the earliest feasible stage in the planning process . . . environmental impact should be assessed as early as possible in government planning [and] should be considered at a point in the planning process where genuine flexibility remains").

During the preparation of the EIR, the OCWD must commit to mitigate the impact on groundwater by identifying and committing to implement specific actions that will result in the contaminated ground water being captured and treated. At a minimum, the OCWD's commitment to preventing potential groundwater contamination should be to install as many extraction wells as necessary in order to capture the portion of the PCE plume that will elude AC Products' extraction wells after the implementation of the recharge. In addition, the OCWD must commit to building pipelines to convey groundwater that the new extraction wells will capture to the existing treatment facilities being operated by AC Products and commit to increasing the capacity of those treatment facilities in the event that the combined pumping rate of the existing and new extraction wells exceeds the capacity of the existing treatment systems. Also, the OCWD must commit to build additional injection wells or otherwise facilitate the recharge of the treated water in the event the flow rate from the expanded extraction well field exceeds the capacity of AC Products' newly installed injection well. Moreover, the OCWD must commit to augmenting the existing treatment systems to treat perchlorate and other compounds that will not be treated by the existing systems, if such treatment is required prior to discharge by AC Products. The OCWD also must commit to acquire land to house any additional treatment systems and associated wells necessitated by the impact of the Project.

3. **AC Products' Remediation Effort Will Not Reduce The Contamination Within The Plume To Insignificant Levels By The Time The Project Becomes Operational**

The MND states that "[t]he remediation effort may reduce the contamination by the time the new recharge basin becomes operational in late 2004." The basis for this statement is not provided, and it is not offered as a mitigation measure in any event. However, water quality data obtained from 1997 to 2003 from the network of monitoring wells installed by AC Products indicate that, while there have been modest decreases in PCE concentrations in the area of the plume that will be diverted away from extraction well P-02 by the La Jolla Recharge Basin, the decreases have not been substantial enough for it to be likely that the plume will have reduced sufficiently by 2004 to be insignificant.

III. Conclusion

The OCWD's MND fails to meet CEQA requirements. Substantial evidence exists that the OCWD's La Jolla Basin Project raises significant environmental concerns. The OCWD must conduct an EIR. During the preparation of the EIR, the OCWD must propose mitigation measures that adequately address these concerns.

In the meantime, we respectfully request that our office be provided with all technical reports, updates, and notices regarding the Project.

Very truly yours,

Richard J. McNeil

Richard J. McNeil

RJM:ldp

cc: Joe Matrange, AC Products, Inc.

EXHIBIT B

IRELL & MANELLA LLP
A REGISTERED LIMITED LIABILITY LAW PARTNERSHIP
INCLUDING PROFESSIONAL CORPORATIONS

1800 AVENUE OF THE STARS, SUITE 900
LOS ANGELES, CA 90067-4276
TELEPHONE (310) 277-1010
FACSIMILE (310) 203-7199

840 NEWPORT CENTER DRIVE, SUITE 400
NEWPORT BEACH, CALIFORNIA 92660-6324

TELEPHONE (949) 760-0991
FACSIMILE (949) 760-5200
WEBSITE: www.irell.com

WRITER'S DIRECT
TELEPHONE (949) 760-5228
rmcnell@irell.com

February 11, 2004

VIA FACSIMILE

Jeffrey T. Melching, Esq.
Rutan & Tucker LLP
611 Anton Boulevard, 14th Floor
Costa Mesa, California 92626-1931

Re: *AC Products, Inc. v. Orange County Water District*
OCSC Case No. 03CC09197

Dear Jeff:

Following up on our discussions last week, AC Products remains concerned that the issues in the first amended petition for writ of mandate and complaint do not properly frame the issues the Court will be asked to consider, in view of the OCWD's recent unilateral repeal of its mitigated negative declaration ("MND") approving the La Jolla Recharge Basin. Thus, AC Products intends to file a second amended complaint.

Among our concerns, as I mentioned to you, is that even though the OCWD formally repealed its environmental approval of the La Jolla Recharge Basin, it is nevertheless apparently continuing to negotiate for the purchase of additional land for the recharge basin, according to an agenda item on its website. This is clearly impermissible under CEQA, as environmental review must precede a project. Otherwise, the project gains irreversible momentum and the EIR serves simply as a post hoc rationalization of the decision previously made by the agency. This is one of the principal issues we wish to ask the Court to consider. We will also ask the Court to order the OCWD to stay any further development of the recharge basin pending preparation and certification of an EIR. We also are concerned that valuable judicial resources not be wasted on the Court determining whether the MND be decertified, since the OCWD has repealed now the MND.

The amended complaint will add three new causes of action: one for failure to comply with CEQA by proceeding with the project in the absence of environmental review, a second for failure to adequately define the project to include the development of the middle school on land owned by the OCWD, and a third for failure to adequately consider alternative sites for the recharge basin. The remaining causes of action will remain basically as previously pled.

The second amended complaint will focus the Court on what we believe the pressing issues of significance are that require its consideration, in view of the OCWD's recent change in posture. AC Products requests that the OCWD stipulate that AC Products may file the second amended complaint. Please let me know if the OCWD is willing to do so by the close of business today. If you are not willing to so stipulate, please consider this letter formal notice that AC Products will appear *ex parte* tomorrow Friday, February 13, 2004, in Department CX105 at 1:30 p.m. to apply for an order permitting it to file the second amended complaint.

Thank you for your consideration of our request. Of course, if there are any matters that you would like to discuss in the interim, please do not hesitate to call me.

Very truly yours,

Rich

Richard J. McNeil

RJM:jml

EXHIBIT C

IRELL & MANELLA LLP
A REGISTERED LIMITED LIABILITY LAW PARTNERSHIP
INCLUDING PROFESSIONAL CORPORATIONS

1800 AVENUE OF THE STARS, SUITE 900
LOS ANGELES, CA 90067-4276
TELEPHONE (310) 277-1010
FACSIMILE (310) 203-7199

840 NEWPORT CENTER DRIVE, SUITE 400
NEWPORT BEACH, CALIFORNIA 92660-6324

TELEPHONE (949) 760-0991
FACSIMILE (949) 760-5200
WEBSITE: www.irell.com

WRITER'S DIRECT
TELEPHONE (949) 760-5228
rmcneill@irell.com

February 12, 2004

VIA FACSIMILE (714) 546-9035

Jeffrey T. Melching, Esq.
Rutan & Tucker LLP
611 Anton Boulevard, 14th Floor
Costa Mesa, California 92626-1931

Re: *AC Products, Inc. v. Orange County Water District*
OCSC Case No. 03CC09197

Dear Jeff:

I am in receipt of your letter of earlier today and a copy of OCWD Resolution No. 04-01-9.

The OCWD resolution repeals the Mitigated Negative Declaration ("MND") that AC Products sought to have decertified, directs staff to solicit a proposal for an EIR and states that "the District shall not undertake any construction activities with respect to the La Jolla Basin Project until the District certifies an environmental impact report for that Project."

Unfortunately, rather than assuage us that the District has not already made up its mind to build the La Jolla Recharge Basin, the resolution only heightens our concern that the OCWD will undertake any number of pre-construction activities that will result in an ultimate Board approval to build the La Jolla Recharge Basin. The more such activities occur, the more the La Jolla project gains irreversible momentum and the more the EIR process becomes nothing more than a post hoc rationalization of a fait accompli. For example, and without limitation, we note that it appears that the OCWD already acquired approximately ten acres of land for the recharge basin at a cost of $7.9 million, obviously a very substantial commitment to the project.

As to the procedural issue you raise, and although I agree with you that amendments to pleadings ordinarily should be made by noticed motion, this is not always the case. *Loser v. E. R. Bacon Co.*, 201 Cal. App. 2d 387 (1962). In this case, an *ex parte* application is appropriate given that Judge Sundvold should not be spending time considering whether to decertify the MND and given the briefing schedule that was the subject of the stipulation you and I submitted last week.

At the same time, in the spirit of cooperation, I have no conceptual objection to providing you with a copy of the proposed amended complaint and providing you with time to prepare such response as you deem appropriate in lieu of proceeding *ex parte*. In that regard, I would suggest we prepare a supplemental stipulation advising the Court that it need not consume its resources considering the first amended petition for writ of mandate, that AC Products intends to file a noticed motion to amend its complaint, that the District will respond to that motion accordingly as it deems appropriate, and that the briefing and hearing dates proposed in our stipulation dated February 4 be taken off calendar and rescheduled to later dates.

I also renew my request that the District agree to a stipulated judgment that it will not take additional pre-construction activities (such as acquiring additional land, negotiating for land, conducting design and engineering studies and the like) that would eviscerate its objectivity in evaluating alternative locations for the recharge basin and in preparing the EIR. You previously refused to agree to such a stipulation. I also will request that you stipulate to the filing of the amended complaint once I have sent it to you, and I hope you will respond to me favorably on that issue at that time.

Feel free to contact me to discuss any of the foregoing at your convenience.

Very truly yours,

Rick

Richard J. McNeil

RJM:jml

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
P.O. Box 8300
Fountain Valley, CA 92728-8300

June 7, 2004

Re: La Jolla Recharge Basin DEIR
SCH# 2003041190

Dear Mr. Deshmukh:

Thank you for the opportunity to comment on the above-referenced Negative Declaration. The Commission was able to conduct a Sacred Lands File search of the proposed project area, which identified no recorded Native American sites within the project area. However, the lack of recorded sites does not preclude the possibility that cultural resources may be present. To adequately assess the specific related project impacts on cultural resources, the Commission recommends the following actions be taken:

- ☐ Contact the appropriate California Historic Resources Information Center for a record search. The record search will determine:
  - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded on or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ☐ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.
- ☐ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
  - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5 (e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

I am enclosing a list of Native American individuals/groups that may have additional knowledge of cultural resources in the project area. Early consultation with tribes is the best way to avoid unanticipated discoveries once a project is underway. The Commission makes no recommendation or preference of a single individual or group over another; we suggest you contact all of those listed, allowing a minimum of two weeks for a response. If they cannot supply information, they might recommend others with specific knowledge. If you receive notification of change of address or phone number from any these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information.

Sincerely,

Carol Gaubatz

Carol Gaubatz
Program Analyst
(916) 653-6251

CC: State Clearinghouse

NATIVE AMERICAN CONTACTS
Orange County
June 7, 2004

Samuel H. Dunlap
P.O. Box 1391
Temecula , C A 92593
Gabrielino
Cahuilla
Luiseno
(909) 262-9351 (Cell)
(909) 693-9196 FAX

Craig Torres
713 E. Bishop
Santa Ana , C A 92701
(714) 542-6678
Gabrielino Tongva

Ti'At Society
Cindi Alvitre
6602 Zelzah Avenue
Reseda , C A 91335
(714) 504-2468 Cell
Gabrielino

Coastal Gabrieleno Diegueno
Jim Velasques
5776 42nd Street
Riverside , C A 92509
(909) 784-6660
Gabrielino
Kumeyaay

Gabrielino Tongva Indians of California Tribal Council
John Tomy Rosas, Vice Chair/Environmental
4712 Admiralty Way, Suite 172
Marina Del Rey, C A 90202
hhcc@mcn.org
310-570-0440
Gabrielino Tongva

Gabrielino/Tongva Counci / Gabrielino Tongva Nation
501 Santa Monica Blvd., Suite 500
Santa Monica , C A 90401-2415
(310) 587-2203
(310) 587-2281 Fax
Gabrielino Tongva

Gabrieleno/Tongva Tribal Council
Anthony Morales, Chairperson
PO Box 693
San Gabriel , C A 91778
(626) 286-1632
(626) 286-1262 Fax
(626) 286-1758 (Home)
Gabrielino Tongva

Gabrielino Band of Mission Indians of CA
Ms. Susan Frank
PO Box 3021
Beaumont , C A 92223
(702) 647-0094: Phone/FAX
Gabrielino

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contocting local Native Americans with regard to cultural resources assessment for the proposed Draft EIR, La Jolla Recharge Basin, SCH# 2003041190, Orange County.

NATIVE AMERICAN CONTACTS
Orange County
June 7, 2004

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Tribal Chair/Cultural Resources
5450 Slauson, Ave, Suite 151 PMB Gabrielino Tongva
Culver City , CA 90230-6
gtongva@earthlink.net
562-761-6417 - voice
562-920-9449 - fax

Gabrielino Tongva Indians of California Tribal Council
Mercedes Dorame, Tribal Administrator
20990 Las Flores Mesa Drive Gabrielino Tongva
Malibu , CA 90202
Pluto05@hotmail.com

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contocting local Native Americans with regard to cultural resources assessment for the proposed Draft EIR, La Jolla Recharge Basin, SCH# 2003041190, Orange County.

California Regional Water Quality Control Board
Santa Ana Region

Terry Tamminen
Secretary for Environmental Protection

3737 Main Street, Suite 500, Riverside, California 92501-3348
(909) 782-4130 • Fax (909) 781-6288
http://www.swrcb.ca.gov/rwqcb8

Arnold Schwarzenegger
Governor

June 1, 2004

Shivaji Deshmukh
Orange County Water District
10500 Ellis Avenue
PO Box 8300
Fountain Valley, CA 92708

WITHDRAWAL OF CLEAN WATER ACT SECTION 401 WATER QUALITY STANDARDS CERTIFICATION FOR THE PROPOSED LA JOLLA RECHARGE BASIN, CITY OF ANAHEIM, (ACOE REFERENCE NUMBER 200400079-JPL)

Dear Mr. Deshmukh:

On October 7, 2003, we received your application for water quality standards certification pursuant to the Clean Water Act, Section 401 (application) for the above referenced project. On November 18, 2003, the Santa Ana Regional Water Quality Control Board (Regional Board) issued a Certification based in part upon a mitigated negative declaration (MND) that had been approved in June of 2003. On May 24, 2004, Regional Board staff received a Notice of Preparation indicating that the MND for the La Jolla Recharge Basin had been rescinded and an environmental impact report (EIR, State Clearinghouse No. 2003041190) was being prepared.

In consideration of the rescinded MND, the Certification for the La Jolla Recharge Basin, dated November 18, 2003, is hereby withdrawn. You may submit a new application for Certification, with the issuance of the new Certification predicated on final action on the anticipated EIR.

Should there be any questions, please contact Adam Fischer at (909) 320-6363, or Mark Adelson at (909) 782-3234.

Sincerely,

GERARD J. THIBEAULT
Executive Officer

cc: U. S. Environmental Protection Agency, Director of Water Division – Alexis Strauss (WTR-10)
U. S. Environmental Protection Agency, Supervisor of the Wetlands Regulatory Office – Tim Vendlinski (WTR-8)
U. S. Army Corps of Engineers, Los Angeles Office
U. S. Fish and Wildlife Service – Loren Hays
State Water Resources Control Board, OCC – Jorge Leon
State Water Resources Control Board, DWQ-Water Quality Certification Unit – Oscar Balaguer, Chief
California Department of Fish and Game, Chino Hills Office – Robin Maloney Ramos

South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 · http://www.aqmd.gov

June 4, 2004

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708

Dear Mr. Deshmukh:

Notice of Preparation of a Draft Environmental Impact Report for
La Jolla Recharge Basin Project

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Draft Environmental Impact Report (EIR).

Air Quality Analysis
The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2002 Model. This model is available on the CARB Website at: www.arb.ca.gov.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures
In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources
SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Charles Blankson, Ph.D., Air Quality Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:CB:li

ORC040520-04LI
Control Number

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

June 8, 2004

Mr. Shivaji Deshmukh, P.E.
Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708

RE: SCAG Clearinghouse No. I 20040314 La Jolla Recharge Basin Project

Dear Mr. Deshmukh:

Thank you for submitting the **La Jolla Recharge Basin Project** for review and comment. As areawide clearinghouse for regionally significant projects, SCAG reviews the consistency of local plans, projects and programs with regional plans. This activity is based on SCAG's responsibilities as a regional planning organization pursuant to state and federal laws and regulations. Guidance provided by these reviews is intended to assist local agencies and project sponsors to take actions that contribute to the attainment of regional goals and policies.

We have reviewed the **La Jolla Recharge Basin Project**, and have determined that the proposed Project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and California Environmental Quality Act (CEQA) Guidelines (Section 15206). Therefore, the proposed Project does not warrant comments at this time. Should there be a change in the scope of the proposed Project, we would appreciate the opportunity to review and comment at that time.

A description of the proposed Project was published in SCAG's **May 16-31, 2004** Intergovernmental Review Clearinghouse Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this Project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1867. Thank you.

Sincerely,

Jeffrey M. Smith

JEFFREY M. SMITH, AICP
Senior Regional Planner
Intergovernmental Review

LA JOLLA RECHARGE BASIN
NOTICE OF PREPARATION (NOP) COMMENT SUMMARY

Commenting Agency, Group, or Individual	NOP Comment Summary	EIR Response to NOP Comment
1. City of Anaheim Planning Department, June 17, 2004 *Marie Newland, AICP Assistant Planner*	City staff has reviewed the document and has no NOP comments at this time. Requests that any subsequent public notices and/or environmental documents regarding the project be forwarded to the City.	The City will receive a copy of the Draft EIR for review and comment.
2. State of California Health and Human Services Agency, Department of Health Services (DHS), June 17, 2004 *Cor Shaffer, P.E., District Engineer*	**2a.** The expansion of the recharge facilities associated with the GWRS project will require an amendment to Order No. R8-2004-0002. Prior to processing this amendment request, OCWD will need to demonstrate that adjacent drinking water sources are not adversely impacted by the District's recharge activities and current Department guidelines for the beneficial recharge of recycled water into the Orange County Aquifer System are adhered to. Follow-up tracer studies may be required by the Department to verify the travel time from the point of recharge to adjacent domestic water sources. **2b.** The Draft EIR will need to present the District's proposal to evaluate how the proposed recharge facilities will impact local drinking water sources and comply with Department guidelines for the beneficial recharge of recycled water.	**2a.** The La Jolla Recharge Basin project will not receive GWRS water for recharge operations. **2b.** Section 4.2 (Hydrogeology and Groundwater Quality) describes the project's recharge water sources. They are limited to Santa Ana River water and imported water from MWD. GWRS water is not proposed as recharge water source.
3. State of California Environmental Protection Agency (CalEPA), Department of Toxic Substances Control (DTSC), June 1, 2004 *Greg Holmes, Unit Chief Southern California Cleanup Operations Branch*	**3a.** The draft EIR needs to identify and determine whether current or historic uses at the Project site have resulted in any release of hazardous wastes/substances. **3b.** The draft EIR needs to identify any known or potentially contaminated sites within the proposed Project area. For all identified sites, the draft EIR should evaluate whether conditions at the site pose a threat to human	**3a.** The potential for release of hazardous wastes/substances as a result of current or historic uses is addressed in Section 4.3 (Hazards and Hazardous Materials), which summarizes several environmental assessments that were prepared for the project site. **3b.** The Phase I and Phase II ESAs summarized in Section 4.3 (Hazards and Hazardous Materials) are sufficient to describe

Commenting Agency, Group, or Individual	NOP Comment Summary	EIR Response to NOP Comment
	health or the environment. A Phase I Assessment may be sufficient to identify these sites.	the environmental conditions at the project site.
	3c. The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight.	**3c.** All information related to future site investigation and/or remediation has been provided throughout Chapter 4.0 of the EIR.
	3d. If the subject property was previously used for agriculture, onsite soils could contain pesticide residues. Proper investigation and remedial action may be necessary to ensure the site does not pose a risk to the future residents.	**3d.** Onsite soils were investigated for pesticide residues. The resulting data are summarized in Section 4.3 (Hazards and Hazardous Materials) of the EIR.
	3e. Appropriate precautions should be taken prior to construction if the proposed project is within a "Border Zone Property."	**3e.** Onsite soils were investigated for pesticide residues. The resulting data are summarized in Section 4.3 (Hazards and Hazardous Materials) of the EIR.
	3f. An investigation should be conducted for the presence of lead-based paints and asbestos containing materials (ACMs). Contaminants should be remediated in compliance with California environmental regulations and policies.	**3f.** Precautions against lead-based paint and ACM disturbance and exposure are discussed in Section 4.3 (Hazards and Hazardous Materials) of the EIR.
	3g. The project construction may require soil excavation and soil filling in certain areas. Appropriate sampling is required prior to disposal of the excavated soil. If the soil is contaminated, properly dispose of it rather than placing it in another location. Land Disposal Restrictions (LDRs) may be applicable to these soils.	**3g.** Precautions against lead-based paint and ACM disturbance and exposure are discussed in Section 4.3 (Hazards and Hazardous Materials) of the EIR.
	3h. The draft EIR should indicate the distance from the project site to any sensitive receptors such as schools, daycares, hospitals, or residences within a quarter mile radius. Human health and the environment of sensitive receptors should be protected during the construction or demolition activities.	**3h.** The draft EIR indicates the distance from the project site to sensitive receptors such as schools and residences in Sections 4.3 (Hazards and Hazardous Materials), 4.5 (Air Quality), and 4.6 (Noise). Sensitive receptors have been considered extensively in the EIR analysis, particularly during construction and demolition activities.

Commenting Agency, Group, or Individual	NOP Comment Summary	EIR Response to NOP Comment
	3i. If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5).	**3i.** Hazardous wastes will not be generated by the proposed project. Please see Section 4.3 (Hazards and Hazardous Materials).
	3j. If the project plans include discharging wastewater to the municipal sewer system, you may be required to obtain wastewater discharge requirements from the Santa Ana Regional Water Quality Control Board.	**3j.** Any necessary discharges to the municipal sewer system would be subject to the requirements of the Santa Ana Regional Water Quality Control Board.
	3k. If during construction/demolition of the project, soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the draft EIR should identify how any required investigation and/or remediation will be conducted, and the government agency to provide appropriate regulatory oversight.	**3k.** Sections 4.3 (Hazards and Hazardous Materials) and 4.5 (Air Quality) include measures to ensure that appropriate health and safety procedures are implemented if any form of contamination is suspected during construction or demolition on the project site.
4. Irell & Manella LLP (representing AC Products, Inc.), June 15, 2004 *Richard J. McNeil*	AC Products reasserted its comments submitted to OCWD in 2003. AC Products also incorporated by reference the matters contained in its letters sent to OCWD's legal counsel, Rutan & Tucker, dated February 11, 2004 and February 12, 2004. **4a. Introduction of Contaminants into Groundwater Aquifer(s):** The recharge water will include water from the Santa Ana River and the Metropolitan Water District and will result in water consisting in part of discharges from sewage treatment plants (which contain numerous hazardous substances, such as pharmaceuticals, endocrine disrupters and other chemicals of concern, such as NDMA) and water from the Colorado River (which also contains hazardous substances, including perchlorate). Perchlorate is present in the groundwater above applicable public health goals and may be present above maximum contaminant levels that will be adopted in the near future. For the foregoing reasons, among others, it is anticipated that it will be infeasible for the OCWD to obtain either an NPDES or a WDR for the compounds that will be discharged by the Project. The remediation system installed by AC Products was not designed to treat these chemicals. Thus, the presence of these chemicals	**4a.** The Project Description (Chapter 3.0) describes the proposed La Jolla Recharge Basin, its recharge source waters, and OCWD's proposal for supplementing the monitoring system for AC Products' VOC contamination plume. Additionally, Sections 4.1 (Hydrology and Water Quality), 4.2 (Hydrogeology and Groundwater Quality), and 4.3 (Hazards and Hazardous Materials) provide detailed analyses of the issues of recharge water sources, existing groundwater quality, and the project's potential for diverting AC Products' VOC contamination plume. OCWD's groundwater research and modeling results provide

Commenting Agency, Group, or Individual	NOP Comment Summary	EIR Response to NOP Comment
	significantly impacts both the existing plume and the diverted plume. Further monitoring, extraction, or treatment will not be possible or feasible.	substantial scientific data supporting the conclusion that the project will not adversely affect groundwater quality by introducing contaminants or causing the diversion of AC Products' VOC contamination plume.
	4b. Project Effects on Plume Remediation: AC Products is currently remediating a release of tetrachloroethylene ("PCE") via a system that was designed to capture and treat the groundwater plume. The Project will cause a significant portion of the existing plume to be diverted into unaffected portions of the shallow and deeper aquifers. In the absence of the Project's impact, the plume would be captured, treated and replaced into the aquifer.	**4b.** The Project Description (Chapter 3.0) describes the proposed La Jolla Recharge Basin, its recharge source waters, and OCWD's proposal for supplementing the monitoring system for AC Products' VOC contamination plume. Sections 4.1 (Hydrology and Water Quality), 4.2 (Hydrogeology and Groundwater Quality), and 4.3 (Hazards and Hazardous Materials) also address the impact that the existing AC Products VOC contamination plume could have on OCWD's ability to construct and operate the proposed recharge basin.
	4c. Plume Migration Mitigation: OCWD has asserted that AC Products must pay for mitigation of the exacerbation of the contaminated groundwater that will be caused by the Project's diversion of groundwater outside of the present capture zone. However, AC Products is not legally responsible for the exacerbation of existing contamination by the OCWD. During the preparation of the EIR, the OCWD must commit to installing a sufficient number of wells, at sufficient depths, to evaluate the shift in the plume. Likewise, the OCWD must commit to undertake remediation of the portion of the plume outside of the capture zone of the AC Products remediation system. During the preparation of the EIR, the OCWD must commit to mitigate the impact on groundwater by identifying and committing to implement specific actions that will result in the contaminated groundwater being captured and treated. At a minimum, the OCWD's commitment to preventing potential groundwater contamination should be to install as many extraction wells as necessary in order to capture the portion of the PCE plume that will elude AC Products' extraction wells after the implementation of the recharge. In	**4c.** See Response 4b above. Due to the limitations inherent in OCWD's 2003 transport model, and in order to address a known public concern, a more comprehensive and refined groundwater and contaminant transport modeling effort was conducted in 2005. The updated modeling study quantifies and predicts the project-related effects on AC Products' VOC contaminant concentrations and plume movement. The modeling data show only a minor (i.e., less than significant) project-induced directional change in the existing AC Products VOC contamination plume. The modeling summaries in the cited sections conclude that the recharge basin would not adversely affect the existing contaminant plume, nor would it interfere with AC Products' ongoing remediation activities.

Commenting Agency, Group, or Individual	NOP Comment Summary	EIR Response to NOP Comment
	addition, the OCWD must commit to building pipelines to convey groundwater that the new extraction wells will capture to the existing treatment facilities being operated by AC Products and commit to increasing the capacity of those treatment facilities in the event that the combined pumping rate of the existing and new extraction wells exceeds the capacity of the existing treatment systems. Also, the OCWD must commit to build additional, injection wells or otherwise facilitate the recharge of the treated water in the event the flow rate from the expanded extraction well field exceeds the capacity of AC Products' newly installed injection well. Moreover, the OCWD must commit to augmenting the existing treatment systems to treat perchlorate and other compounds that will not be treated by the existing systems, if such treatment is required prior to discharge by AC Products. The OCWD also must commit to acquire land to house any additional treatment systems and associated wells necessitated by the impact of the Project.	The existing groundwater contamination impact was caused by the improper discharge of contaminants to the groundwater basin by AC Products over a period of time. AC Products' installation of monitoring and extraction wells, and a treatment system, is an acknowledgement that AC Products caused the groundwater contamination plume and that it bears the responsibility to remediate this groundwater contamination.
	4d. Project Site Alternatives: OCWD identified at least two viable alternative sites for the proposed recharge basin. The OCWD is required to meaningfully evaluate alternatives to the Project during its preparation of the DEIR to avoid significant effects on the environment. Moreover, the OCWD must meaningfully evaluate alternatives, even though it already has spent several million dollars to acquire the land for the Project.	**4d.** Chapter 5.0 (Project Alternatives) of this EIR evaluates an alternative project site. However, no significant effects on the environment were found to result from the La Jolla Recharge Basin project as currently proposed. Therefore, an alternate location was deemed unable to meet the basic CEQA requirement that alternatives serve an impact reduction or avoidance purpose. Other considerations cited in the analysis also render the site alterative infeasible. Furthermore, the relocation of an otherwise lawful, non-contaminating groundwater recharge basin does not affect AC Products' responsibility for the VOC-contaminated groundwater cleanup.
	4e. School Property Sale and Project Segmentation: As part of the Project, the OCWD intends to sell part of the site to the Placentia/Yorba Linda Unified School District (the "School District"), and the School District apparently intends to build a middle school on that land. This should be identified as part of the Project and fully evaluated in compliance with CEQA as part of the EIR.	**4e.** The sale of OCWD property to PYLUSD would occur independently of the proposed La Jolla Recharge Basin's approval status. The planned physical characteristics of the projects and their environmental changes are of interest for CEQA compliance purposes. Consequently,

Commenting Agency, Group, or Individual	NOP Comment Summary	EIR Response to NOP Comment
		the La Jolla Recharge Basin and the proposed PYLUSD middle school project are undergoing project-specific EIR processing and public review to ensure full CEQA compliance. Where applicable in the two EIRs, the analyses have referenced issues and data that are relevant to both projects, thereby providing full disclosure of project-specific and cumulative effects.
5. **Native American Heritage Commission (NAHC), June 7, 2004** *Carol Gaubatz* *Program Analyst*	The Commission was able to conduct a Sacred Lands File search of the proposed project area, which identified no recorded Native American sites within the project area. However, presence of cultural resources cannot be precluded and the Commission recommended various actions be taken to ensure that the project impacts on cultural resources be adequately assessed.	Sections 4.11 (Cultural Resources) and 4.12 (Paleontological Resources) provide mitigation measures to ensure that unforeseen impacts during construction are reduced to levels that are less than significant according to CEQA.
6. **California Regional Water Quality Control Board—Santa Ana Region, June 1, 2004** *Gerard J. Thibeault* *Executive Officer*	On October 7, 2003, the Regional Board received OCWD's application for water quality standards certification pursuant to the Clean Water Act, Section 401 (application) for the proposed project. On November 18, 2003, the Regional Board issued a Certification based in part upon the mitigated negative declaration that had been approved in June of 2003. On May 24, 2004, Regional Board staff received a Notice of Preparation indicating that the MND for the La Jolla Recharge Basin had been rescinded and an environmental impact report was being prepared. In consideration of the rescinded MND, the Certification for the La Jolla Recharge Basin, dated November 18, 2003, was withdrawn and the District was informed that a new application and Certification would be necessary and would be predicated on final action on the EIR.	OCWD anticipates submitting a new Section 401 application for the proposed project upon completion of the CEQA process.
7. **South Coast Air Quality Management District, June 4, 2004** *Steve Smith, Ph.D.* *Program Supervisor,* *CEQA Section*	The SCAQMD recommends that the Lead Agency use the 19993 California Environmental Quality Act (CEQA) Air Quality Handbook as guidance when preparing its air quality analysis. Alternatively, lead agency may use the California Air Resources Board (CARB) approved URBEMIS 2002 Model. The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Construction-related air quality analysis should include emissions from the use of heavy-duty equipment from grading,	Please refer to Section 4.5 (Air Quality) for the analysis of construction-related and operation-related air quality impacts. Mitigation measures are specified consistent with SCAQMD's CEQA guidance and applicable Rules.

Commenting Agency, Group, or Individual	NOP Comment Summary	EIR Response to NOP Comment
	earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). As related to the proposed project, operation-related air quality impacts may include, but are not limited to, emissions from stationary sources, area sources, and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Additionally, SCAQMD's Rule 403 - Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required.	
8. **Southern California Association of Governments, June 8, 2004** *Jeffrey M. Smith, AICP Senior Regional Planner, Intergovernmental Review*	SCAG has determined that the proposed project is not regionally significant per SCAG Intergovernmental Review (IGR) Criteria and CEQA Guidelines. Therefore, the project does not warrant comments at this time.	Comment noted.

APPENDIX 9.2
RÉSUMÉS OF KEY EIR CONTRIBUTORS AND PREPARERS

Shivaji Deshmukh, P.E.
Assistant Director of Engineering

Education

M.S. Civil Engineering	University of California, Los Angeles	1998
B.S. Civil Engineering	University of California, Los Angeles	1997

Registration

Licensed Professional Civil Engineer	California #62168	2001

Experience

Assistant Director of Engineering
Orange County Water District (OCWD), Fountain Valley, CA 5/2004- present

RESPONSIBILITIES:
Responsibilities entail managing the staff and activities involved in implementing the District's Capital Improvement Program and the Groundwater Replenishment (GWR) System.
HIGHLIGHTS:

- Oversee Engineering department of 7 responsible for over $400 million in design and construction.
- Developed a Project Development Policy to implement programs and projects at the District.
- Serve as chief engineering contact for the public on District engineering projects.
- Oversight and development of Public Works contracts, scopes of work, requests for proposals, and environmental documentation (CEQA/NEPA) for the GWR System and OCWD Capital Improvement Program.

Senior Engineer
Orange County Water District, Fountain Valley, CA 8/2001 – 4/2004

RESPONSIBILITIES:
Focus was on the design, construction, and implementation of the GWR System.

- Served as technical advisory team captain and member for various components in the design and construction of the GWR System. This involved managing a team of consultants to produce conceptual and final design plans and specifications for the Advanced Water Purification, Barrier Expansion, and Pipeline facilities.
- Assisted in District-wide planning effort, including development of Strategic/Business Plan.
- Wrote grant and loan funding applications for various projects at OCWD including GWR System, wetlands, and conjunctive use programs. This entailed all aspects from initial research on grant eligibility, grant application writing, grant procurement, and invoicing.
- Worked with local and state regulators on approval of emerging technologies and compliance in water reuse applications

Engineer
Orange County Water District, Fountain Valley, CA 1/1999 - 7/2001

RESPONSIBILITIES:
Engineer in the Project Development Department. Concentration on the development of treatment approaches for the GWR System.

HIGHLIGHTS:
- Piloted various membrane systems for qualification and consideration in final design.
- Directed and coordinated research projects between public agencies, consultant engineers, and universities.

TECHNICAL ADVISORY COMMITTEES

WateReuse Legislative/Regulatory Committee (California Section)	March 2003 - present
AWWA Membrane Processes Committee	June 2003- June 2006
AWWA Water Reuse Committee	June 2003- June 2006
AWWA Water Allocations & Regulations Committee	June 2003- June 2006

Steering Committee to Develop a Water and Wastewater Energy Efficiency Roadmap (American Water Works Association Research Foundation and California Energy Commission)

PROFESSIONAL AFFILIATIONS

WateReuse Association	Member	2003 - present
American Water Works Association (AWWA)	Member	1999 - present
Water Environment Federation (WEF)	Member	1999 - 2004
American Chemical Society (ACS)	Member	1999 - 2002

Roy L. Herndon
Chief Hydrogeologist

Education: **B.A. Geology, The Colorado College, Colorado Springs**
M.S. Hydrology & Water Resources, Univ. of Arizona, Tucson

Registration: **California Professional Geologist No. 4817**
California Certified Hydrogeologist No. 113

Experience:

Mr. Herndon has over 20 years experience as a hydrogeologist. He directs the activities of OCWD's Hydrogeology Department, including numerical groundwater flow modeling, performance evaluation and improvement of two seawater intrusion barriers, several basin-wide and local water level and water quality investigations, and the operation of a comprehensive water resources data management system. He also serves on the Alamitos Seawater Barrier Management Committee and the MCAS El Toro Restoration Advisory Board. Key current activities include conceptual project evaluation and groundwater modeling for OCWD's Long-Term Facilities Plan, VOC plume remedial investigation and feasibility study, as well as evaluating basin overdraft, coastal salinity, and enhanced recharge feasibility.

ADAM S. HUTCHINSON
Director of Recharge Operations

Education:

Master of Public Administration. California State University at Long Beach (in progress) GPA 4.0
Master of Science - Hydrology. University of Arizona. GPA 3.8
Bachelor of Science - Geology. California State University at Los Angeles

Certifications:

California Registered Geologist, No. 6638, Obtained in 1996
California Certified Hydrogeologist, No. 529, Obtained in 1997

Experience:

Director of Recharge Operations. **Orange County Water District**, Fountain Valley, CA. March 2005 - Present.

Senior Hydrogeologist. **Orange County Water District**, Fountain Valley, CA. February 2000 – March 2005.

Project Hydrogeologist. **CH2M HILL**, Santa Ana, CA. December 1993 - February 2000.

Research Assistant and Teachers Aide. **Hydrology Department**, **University of Arizona**, Tucson, AZ. January 1993-December 1993.

Staff Hydrogeologist. **Law/Crandall, Inc.**, Los Angeles, CA. August 1990- August 1992.

Water Resources Conservation Intern. **National Wildlife Federation**, Washington, DC. January 1990-June 1990.

Hydrogeologist and Consultant. **World Vision International**, Africa. January 1989-September 1989.

Researcher, Hydrogeologist/Geologist. **Oak Ridge National Laboratory** (ORNL), Grand Junction, CO Projects Office. June 1988-December 1988.

Distinguishing Qualifications:

- Highly experienced in hydrologic field work and data analysis, well drilling and logging, evaluations of subsurface geology, geophysical well log interpretation, aquifer test design and analysis, and design of groundwater monitoring systems.
- Extensive experience in all aspects of artificial recharge, including surface percolation testing and evaluation, optimization of surface percolation, injection well design and testing, well clogging analyses, soil testing and evaluation, and geochemical modeling.
- Experienced in all aspects of Aquifer Storage and Recovery (ASR) systems, from initial feasibility studies to design and full scale implementation.

- Experienced in development and application of numerical groundwater flow and transport models and geochemical models for contaminant fate and transport, optimization of ASR operations, evaluation of contaminant capture systems, multiple-well aquifer tests, wellfield evaluation, subsurface drainage, aquifer/groundwater interactions and surface water/groundwater interactions.
- Very experienced in well drilling, design, construction, development, rehabilitation, testing, and sampling.

Representative Projects:

- Los Angeles Department of Public Works Seawater Intrusion Barrier Well Redevelopment Study
- Rapid Infiltration/Extraction (RIX) Facility Enhancement Study
- ASR Demonstration Projects - Foothill Municipal Water District, Eastern MWD, Calleguas MWD
- Victor Valley Wastewater Reclamation Authority Rapid Infiltration Basin Study
- Chino Basin Conjunctive Use Demonstration Project
- Update of San Gabriel Basin Flow and Transport Model (CFEST)
- Large Scale Aquifer Test of Long Beach Wellfield
- Design and Construction of Two High Capacity Wells in Long Beach, CA
- Rehabilitation of Water Wells in Long Beach, CA and Kazakstan

For descriptions of the above listed projects and other projects, see attached list.

Publications:

The Los Angeles Basin Seawater Intrusion Barrier Injection Well Redevelopment Study. Proceedings of 9th Biennial Symposium on the Artificial Recharge of Groundwater, Tempe, Arizona, June 1999.

The San Gabriel Valley Recycled Water Demonstration Project. Proceedings of ASCE's Third International Symposium on Artificial Recharge of Groundwater. Amsterdam, Netherlands. September 21-25, 1998. Co-author, Greg Woodside.

A Graphical Method of Estimating Injection Well Clogging Using the Modified Fouling Index. Proceedings of the AWRA Symposium on Conjunctive Use of Water Resources: Aquifer Storage and Recovery, Long Beach, CA, October 1997.

Shallow Vadose Zone Injection Well Testing in Chino Basin, California. Proceedings of 7th Biennial Symposium on the Artificial Recharge of Groundwater, Tempe, Arizona, May 1995.

Estimation of Injection Well Clogging with the Modified Fouling Index (MFI). Proceedings of ASCE's Second International Symposium on Artificial Recharge of Groundwater. Orlando, Florida. July 17-22, 1994.

Estimation of Injection Well Clogging with a Membrane Filter (Preliminary Results). Proceedings of the Symposium on Effluent Use Management, AWRA 29th Annual Conference. Tucson, Arizona. August 29-September 2, 1993.

Porcelain Reef. *The Leader*. October 1990. *The Leader* is a monthly publication of the National Wildlife Federation, Washington, DC.

Hydrogeology of the Sunyani and Tano Districts, Brong-Ahafo Region, Ghana. World Vision International Ghana Rural Water Project. 1989.

Honors:

Awarded "Best Student Paper Presentation" at AWRA 29th Annual Convention (1993). Awarded Student Energy Research Semester by DOE. Awarded CSLA Geology Department's "Aaron Waters Scholarship Award" that is presented to the "Outstanding Senior in Geology." Geology Club President (2 years). Member of Student Government as Representative of the School of Natural and Social Sciences (1 year). Swim Team (4 years), MVP 1985.

Descriptions of Representative Projects

Artificial Recharge

Project manager for site investigation for locating rapid infiltration basins for the Victor Valley Waste Water Reclamation Authority's treatment plant expansion. Site investigation included cone penetrometer testing, deep soil borings, backhoe trench pit logging, soil sampling, and ring infiltrometer testing. Results of investigation were used to identify the most suitable location for rapid infiltration basins and to the area required to meet the discharge requirements of the facility.

Assistant project manager for Eastern Municipal Water District's Follico Well Aquifer Storage Recovery (ASR) Demonstration Project. The project involved assisting EMWD in modifying wellhead piping for ASR operations, conducting three injection/extraction test cycles, evaluating well performance, aquifer properties, clogging, and water quality issues. Geochemical modeling was used to assess the potential for adverse geochemical reactions that may affect well performance.

Lead field hydrogeologist for the Rapid/Infiltration Extraction (RIX) facility Infiltration Rate Enhancement Study. Fine-grained sediments that were impeding infiltration were identified using piezometer testing and backhoe test pits. Specifications were prepared for a suitable replacement material for the fine-grained sediments. Oversaw removal of over 50,000 cubic feet of sediments from three infiltration basins. This effort resulted in an average 20 percent improvement in infiltration capacity of the three basins.

Lead field hydrogeologist for the Chino Basin Conjunctive-Use Demonstration Project in San Bernardino County, California for the Metropolitan Water District of Southern California. Field work involved conducting infiltration tests in existing spreading basins and other locations, logging boreholes to evaluate soil conditions, conducting borehole infiltration tests, and overseeing drilling, construction, and testing of shallow vadose zone injection wells. The evaluation of field results involved interpreting infiltration data, laboratory analyses of soil, groundwater, and recharge water chemistry, results of borehole infiltration tests and shallow vadose zone injection well tests. Developed a CFEST groundwater flow model, calibrated to aquifer tests results, to assess the fate of injected raw surface water and optimize recovery of injected water.

Lead hydrogeologist for the Southern California Comprehensive Reclamation and Reuse Study (SCCWRRS), Phase 1B. The project is a cooperative effort funded by the U.S. Bureau of Reclamation, California Department of Water Resources, and 7 Southern California municipal agencies. Phase 1B represents a reconnaissance level study aimed at evaluating regional reclamation systems and developing potential capital projects. As hydrogeologist, Mr. Hutchinson was responsible for evaluating all the artificial recharge facilities in Southern California, including spreading grounds and injection wells. Each facility was evaluated in terms of existing capacity, available capacity, water quality constraints, and location. Mr. Hutchinson completed his $110,000 task 20 percent under budget.

Mr. Hutchinson has evaluated the performance of Aquifer Storage and Recovery (ASR) operations for the Foothill Municipal Water District, City of Roseville, Santa Rosa Water District, and the Metropolitan Water District of Southern California (Callegaus MWD). Evaluations typically involved numerical groundwater flow and transport modeling, and geochemical modeling, examining well performance, well clogging, groundwater, recharge water and native groundwater chemistry compatibility, and potential impacts on groundwater quality.

Mr. Hutchinson conducted extensive research on well clogging by suspended solids in ten injection/production wells in Tucson, Arizona. Extensive test results on 10 injection/production wells in Tucson and other tests done on wells all over the world, show that the clogging rate in an injection well is related to the modified fouling index (MFI) of the recharge water and aquifer transmissivity. Therefore, the MFI, which is a measure of the plugging potential of the suspended solids in a recharge water, can be used to assess and predict clogging rates in injection wells. Further research showed that the MFI is not related to suspended particle size or number, but rather to particle composition.

Water Resources

Project manager for study to assess the impacts to groundwater of using reclaimed water for irrigation at the Westwinds Golf Course on Former George Air Force Basin in Victorville,CA. This study involved assessing native groundwater quality, salt content of reclaimed water reaching groundwater, groundwater flow volume beneath the golf course, and estimated impacts to the groundwater quality caused by using reclaimed water for irrigation. The results of the study were submitted to the Regional Water Quality Control Board-Lahontan Region, which approved the project.

Mr. Hutchinson oversaw a hydrogeologic monitoring program for a large private university in Los Angeles County. Data collected were used to develop a comprehensive water budget for the campus, including irrigation, rainfall, evaporation, runoff, soil types, evapotranspiration, groundwater levels, subdrain outflows, and salt loading. A computer program written specifically for this project was used to calculate the water budget and verify the results with a salt balance. Soil moisture profiles were also monitored using neutron logging.

Task Manager for the Cachuma Project Contract Renewal Environmental Impact Statement/Environmental Impact Report (EIS/EIR) prepared for the US Bureau of Reclamation, Cachuma Project Authority, and Santa Barbara County Water Agency. Mr. Hutchinson conducted research on historical groundwater conditions and developed simple computer models that were used to assess the impacts of various proposed alternatives associated with the Contract Renewal on groundwater storage, levels, and quality in the Santa Ynez River Riparian Basins, Lompoc Basin, Goleta Basin, Santa Barbara Basin, Montecito Basin, and Carpenteria Basin.

Project manager for a water resources evaluation of Ward Valley in the eastern Mojave desert. This evaluation was done to assess the volume of groundwater that could be pumped from the valley without adverse impacts to the environment. The water pumped was to be used by a nearby city for municipal supply. The results of the evaluation included an estimate of the volume of water the city could pump on an annual basis without adverse impacts to the environment, the most suitable location for wells, and an estimate of the number of wells that would be necessary to meet the City's target production rate.

Mr. Hutchinson designed, oversaw data collection, and interpreted the results of a two-month aquifer test involving most of the wells operated by the Long Beach Water Department. Data was also collected from Los Angeles and Orange Counties. The purpose of the test was to assess the hydrogeologic properties of the aquifers utilized by the City of Long Beach, the effectiveness of the Alamitos Fault has on groundwater flow, the impact that increased pumping by the City may have on other nearby pumpers and the effectiveness of the Alamitos Injection Barrier. A Micro-Fem groundwater flow model was used to assist in interpreting the results of the test.

Well Construction and Rehabilitation

Project manager for the 1998 Well Construction Program for the Long Beach Water Department (LBWD). This project included preparation of master well specifications in Construction Standards Institute (CSI) format to be used for all future LBWD well construction projects. These specifications were used in designing and constructing two wells in eastern Long Beach. Mr. Hutchinson provided engineering support services during drilling and construction including: logging of drill cuttings, interpreting geophysical logs, developing final well design, overseeing well development and well testing (step and constant rate pumping tests), overseeing and interpreting spinner logging and plumbness and alignment testing, and developing recommendations for final pump design. The target extraction rate for each well was 2,000 gpm.

Project manager for the 1998 Well Rehabilitation Program for the Long Beach Water Department (LBWD). This project included preparation of master well rehabilitation specifications in Construction Standards Institute (CSI) format to be used for all future LBWD well rehabilitation projects. Specifications were developed for Sonar Jet cleaning, acid treatment, shock chlorination, swab and airlift development, pump development, well testing and other related tasks. In addition to specifications, detailed plans were prepared for demolition of all existing above ground piping and installation of new pumps, motors, flowmeters, underground vaults, electrical wiring, and fencing for five wells. Mr. Hutchinson provided engineering support services during rehabilitation including: overseeing mechanical and chemical well development, well testing (step and constant rate pumping tests), spinner logging, and developing recommendations for final pump design. The average improvement in well yield was greater than 30 percent. A total of five wells were rehabilitated in 1998 at a total cost of $600,000.

Mr. Hutchinson evaluated infiltration rates and prepared a detailed groundwater and surface-water monitoring program for the San Gabriel River Recycled Water Demonstration Project. The San Gabriel River Recycled Water Demonstration Project will result in recharge of up to 33,000 cubic meters per day of tertiary-treated recycled water in a 3 km stretch of the San Gabriel River just downstream of the Santa Fe Dam. Mr. Hutchinson implemented a large scale infiltration testing program designed to evaluate the infiltration rates of various stretches of the river bed. Assessing the infiltration rate is critical to getting regulatory approval to recharge recycled water. Mr. Hutchinson also prepared a comprehensive groundwater and surface water monitoring program that would lead to regulatory approval of the project and keep monitoring costs to a minimum.

Mr. Hutchinson worked in Kazakstan, a new independent state of the former Soviet Union, on a USAID project to assess the condition of a large water supply wellfield and implement a large-scale well rehabilitation program. The assessment included an evaluation of the long term yield of the wellfield, the effectiveness of well redevelopment techniques, including mechanical and chemical methods, and an evaluation of pump design. He spent one month in the field redeveloping wells using physical and chemical methods during a pilot study. The results of the pilot study were used to develop a full-scale well rehabilitation program. The full-scale redevelopment project entailed redeveloping numerous wells using chemicals and mechanical methods and installing 29 submersible pumping systems. Mr. Hutchinson spent 15 weeks in Kazakstan managing the full-scale program.

Mr. Hutchinson has been involved in overseeing drilling, geological and geophysical logging, design, construction, development, and testing of high capacity municipal water supply wells in Kansas City, MO, Big Bear, Watsonville, Barstow, Azusa, Colton, Los Angeles, and Long Beach, CA.

Mr. Hutchinson oversaw the sitting, drilling, construction, and development of over 50 wells for rural water supply in north, central and western Ghana. He also spent several months in Ethiopia, Kenya, Malawi, and Tanzania evaluating existing rural water supply projects.

Modeling-Groundwater Flow, Transport and Geochemistry

Mr. Hutchinson reconditioned and updated the San Gabriel Basin Flow and Transport Model (CFEST) used by EPA to evaluate potential remedies to capture contaminated groundwater in the Whittier Narrows before it migrates to the Central Basin. Reconditioning involved restructuring data files and numerical representations of the conceptual model so they could be directly read by the CFEST code using commercially available software tools. Tools used include Arcview for GIS data, Argus ONE for mesh generation, and Excel, text files and Access for creating input data files. The conceptual model was updated based on recent investigations conducted by the USGS, EPA and others. After recalibration, the updated model was used to simulate various pumping scenarios to capture the contaminant plume in both the shallow and intermediate zones.

Mr. Hutchinson has developed numerous groundwater flow and transport models to simulate ASR operations and assess recovery efficiency. Computer codes used include Modflow, Micro-Fem, and CFEST.

Mr. Hutchinson has conducted geochemical modeling to assess the compatibility of native groundwater with a proposed recharge water in many ASR projects. The computer codes used include WATEQ and EQ3NR. He used EQ6 to simulate the dissolution of mine tailings in seawater to assess the impact that disposal of mine tailings in the ocean would have on water quality, particularly metals concentrations.

Contaminated Site Characterization

Mr. Hutchinson oversaw the collection of soil samples and installation of monitoring wells at the Aliso Towne Gas Site-Sector E, Los Angeles, California for the Southern California Gas Company. The objective of this investigation is to determine whether residual constituents in the soil and groundwater are associated with manufactured gas plant activities.

Mr. Hutchinson oversaw the collection of soil samples and installation of soil vapor extraction (SVE) wells at Hill Air Force Base, Ogden, Utah. Soil sample analyses were used to characterize the extent of jet fuel in the subsurface and establish baseline conditions. The SVE wells were used to remediate the site.

Mr. Hutchinson oversaw the collection of soil samples, installation of monitoring wells and soil vapor extraction (SVE) wells, and groundwater sampling at the ARCO Hynes Facility. Soil sample analyses were used to characterize the extent of petroleum hydrocarbons in the subsurface and establish baseline conditions. The SVE wells and monitoring wells were used to remediate the site.

Mr. Hutchinson has conducted field oversight of soil sampling, monitoring well construction, multi-port well installation, surface water sampling, and groundwater sampling for the Environmental Protection Agency in numerous locations in the San Gabriel Basin and Del Amo Superfund sites.

Mr. Hutchinson oversaw the installation and sampling of groundwater monitoring wells around the perimeter of a water disposal pond used by the Southern California Gas Company at a compressor station in Newberry Springs, California. The wells were installed at the request of the Regional Water Quality Control Board-Lahontan Region to assess the potential impact seepage from the waste pond may have on local groundwater quality.

Landfills

Mr. Hutchinson was the lead field hydrogeologist for an audit of Kern County Waste Management Department's (KCWMD) landfill monitoring program. The audit included a review of the landfill monitoring program, including observation of field sampling practices, sample analysis, statistical analysis, database management, reporting, analytical laboratory assessment, and the work of other consultants. Detailed findings, recommendations, and a cost/benefit analysis were prepared. In addition, an Article 5 evaluation of 7 KCWMD landfills was completed.

Mr. Hutchinson was a project manager for quarterly sampling of more than 30 wells in and adjacent to the following landfills:

1. Scholl Canyon Inactive Landfill, Glendale, California
2. Penrose Landfill, Los Angeles, California
3. Plant Dump, Livingston-Graham, Irwindale, California

4. Dike Disposal Site, Livingston-Graham, Irwindale, California
5. Brand Park Landfill, Glendale, California
6. Nu-Way Landfill, Irwindale, California
7. Owl Rock Quarry Landfill, Irwindale, California
8. Chandler's Landfill, Palos Verdes, California
9. Azusa Landfill, Irwindale, California

For each of the landfills listed, Mr. Hutchinson was responsible for preparing quarterly and annual groundwater monitoring reports to satisfy the requirements of the Regional Water Quality Control Board.

Mr. Hutchinson prepared a second SWAT (Solid Wastes Assessment Test) monitoring report for the Tuxford Landfill in Los Angeles, California meet the requirements of the Regional Water Quality Control Board. Groundwater elevations were monitored at 11 wells and groundwater chemistry at 3 wells on a quarterly basis.

Mr. Hutchinson conducted a study of the groundwater conditions at the Santa Clara and Coastal Landfills near Oxnard, California. This study was conducted for the Ventura Regional Sanitation District to assess reasons for elevated concentrations of vinyl chloride in groundwater.

Heather McPherson
Engineer

Education: **B.S. Chemical Engineering, Washington State University**

Background:

Ms. McPherson has over six years of experience in engineering and project management in the water resource engineering field. Her experience includes hydraulic modeling, planning, design, ArcView GIS systems, master planning, cost estimating, feasibility studies, environmental permitting, and hydraulic and capacity analysis.

Ms. McPherson has been involved in several recharge projects with the OCWD. The responsibilities of these projects included engineering design and project management activities. She is also responsible for the reconstruction activities of the Prado Wetlands facilities.

Greg D. Woodside
Director of Planning and Watershed Management

Education

M.S., Hydrology, New Mexico Institute of Mining and Technology, 1988
B.S., Geological Sciences, California State University, Fullerton, 1986

Registrations

Registered Geologist (California), Certificate No. 6445
Certified Hydrogeologist (California), Certificate No. HG 465

Work History

2003 – present: Planning and Watershed Management Director, Orange County Water District
1999 – 2003: Health and Regulatory Director, Orange County Water District
1997 - 1999: Senior Hydrogeologist, Orange County Water District
1988 - 1997: Hydrogeologist and Project Manager, CH2M HILL, Santa Ana, CA
1986-1988: Research Assistant, New Mexico Tech Hydrology Program, Socorro, NM
1986: Hydrologist: The Earth Technology Company, Long Beach, CA

Relevant Experience

Member of the University of California Center for Water Resources Advisory Council (2000-present)

Director, Costa Mesa Sanitary District (1998-present)

Mr. Woodside is a California registered geologist and certified hydrogeologist whose background encompasses water resources planning and quantitative hydrogeology. He is responsible for long- term planning and watershed management at the Orange County Water District (OCWD). Mr. Woodside managed the Santa Ana River Water Quality and Health Study, a comprehensive evaluation of water quality in the Santa Ana River. He interacts with the regulatory agencies, water districts, and water quality experts on a wide range of water quality and policy issues regarding water recycling. He is the project manager for OCWD's Strategic Plan and Groundwater Management Plan.

Mr. Woodside represented OCWD at the Nitrogen/Total Dissolved Solids Task Force, which recommended a comprehensive revision to the water quality objectives in the Water Quality Control Plan for the Santa Ana River Basin. This effort involved reaching a consensus among approximately 20 water and wastewater agencies and the California Regional Water Quality Control Board, Santa Ana Region, concerning water quality objectives and guidance for implementing water recycling projects.

Mr. Woodside has evaluated conjunctive use projects in the Orange County Groundwater Basin, Central Basin and San Gabriel Basins, including projects that would recharge up to 50,000 acre-feet per year of recycled and imported water. Methods used by Mr. Woodside to evaluate conjunctive use projects include integrated surface and groundwater budgets, flow path analysis, simple analytical models of groundwater flow, and complex 3-dimensional numerical models.

Mr. Woodside has developed groundwater flow and contaminant transport models using the finite-element CFEST code and the finite-difference MODFLOW code. Mr. Woodside has extensive experience in drilling monitoring wells and small-diameter extraction wells. He also has experience with the water quality databases in the Central and West Coast Groundwater Basins, the San Gabriel Basin, and the ARC/INFO Geographic Information System (GIS) software package.

Mr. Woodside developed a three-dimensional numerical model for ground-water flow in the northeast portion of the Central Basin in Los Angeles County as part of the U.S. Environmental Protection Agency (EPA) San Gabriel Basin project. As part of this project, Mr. Woodside also evaluated the extent of volatile organic compound contamination in the Montebello Forebay portion of the Central Basin. In addition to this model, he assisted in development of the groundwater model for the entire San Gabriel Basin. This model, which covers an area of over 170 square miles, simulates groundwater flow and contaminant transport for a 13-year period from 1977 to 1990.

Representative Projects

- Project manager for the Santa Ana River Water Quality and Health Study, a comprehensive, multi-million dollar research project to evaluate the water quality and health impacts of recharge of Santa Ana River water on the Orange County Groundwater Basin.
- Project manager for development of OCWD's Strategic Plan and Groundwater Management Plan.
- Project manager for Alamitos Barrier Improvement Project, which is constructing 15 new wells to enhance performance of the Alamitos Seawater Intrusion Barrier.
- Project manager of the Biomonitoring Demonstration project, which evaluated the feasibility of monitoring water quality with fish.
- Project manager for the Santa Ana River sulfur hexafluoride recharge tracer test, where sulfur hexafluoride was injected into the Santa Ana River for 15 days. About 3,000 acre-feet of water tagged with the tracer was recharged, and movement of the recharge water is being monitored at downgradient wells to evaluate the flow paths and travel times of recharge water.
- Project manager for the Anaheim Lake/Kraemer Basin recharge tracer test, where xenon and neon were added to recharge basin water. About 2,500 acre-feet of water tagged with the tracer was recharged, and movement of the recharge water is being monitored at downgradient wells to evaluate the flow paths and travel times of recharge water. Oxygen isotopes are also being used to monitor the movement of the recharge water.
- Staff hydrologist for the Central Basin Conjunctive Use Project, supporting the evaluation in the following areas: development of conjunctive use alternatives, evaluation of impacts on basin groundwater levels and injection barriers using groundwater modeling, and evaluation of recharge options. Groundwater modeling to assess impacts on basin groundwater levels was conducted with the CFEST finite-element code. Mr. Woodside evaluated aquifer transmissivity and storage coefficients, and developed the groundwater model used in this project
- Project manager for the Groundwater Impact Assessment, San Gabriel Valley Water Reclamation Project, California. Developed scope of work and budget and managed the project. Developed a groundwater model of reclaimed water flow and transport. Evaluated

impacts of reclaimed water recharge on groundwater flow conditions, water quality, and compared to Title 22 criteria. Mr. Woodside is also the project manager and lead hydrogeologist for preparation of the Title 22 Engineering Report for this project, which will recharge tertiary treated reclaimed water in the San Gabriel River.

- Project Manager on the ARCSWest Program for the US Environmental Protection Agency Region IX. Mr. Woodside is the lead hydrogeologist and Project Manager on the South El Monte and El Monte Operable Unit oversight assignments in the San Gabriel Basin. Mr. Woodside has reviewed Field Sampling Plans, Remedial Investigation approaches, and application of numerical models to simulate groundwater flow and contaminant transport. Mr. Woodside also provided and continues to provide technical support to US EPA for oversight of field work such as installation of wells, testing of large-diameter production wells, and groundwater modeling.

- Lead hydrogeologist for designing and constructing a dewatering system at a closed landfill in Los Angeles County. Mr. Woodside oversaw development of cross sections through the site, and estimated aquifer parameters. Mr. Woodside oversaw field investigations to characterize the water-bearing units beneath the landfill, and developed a three-dimensional groundwater model to assist with designing the dewatering system. Mr. Woodside designed aquifer tests and analyzed aquifer test data from the site to assess hydraulic properties and boundary conditions. He is currently overseeing the construction of the dewatering wells. Mr. Woodside developed the plans and specifications for installation of the dewatering wells, and oversaw their construction.

- Project manager and lead hydrogeologist, Whittier Narrows Operable Unit Feasibility Study, California. He evaluated hydrogeologic properties and extent of groundwater contamination. He developed a computer model of groundwater flow and transport of organic contaminants, and used the model to evaluate containment alternatives with extraction wells. Supervised installation of over 5,000 linear feet of monitoring wells, including 2 wells to 1,000 feet deep.

- Lead groundwater modeling expert providing technical support to the USEPA for 5 different projects in Southern California.

- Evaluated alternatives for expanding an existing pump-and-treat facility at a VOC-contaminated site in Southern California. Mr. Woodside used modeling results presented by other parties to evaluate the potential benefit of increasing pumping by addition of extraction at new production wells. The modeling results were used to show that the expansion originally proposed by others would provide limited benefit, and that other options should be explored more carefully.

- Lead hydrogeologist for developing MODFLOW model of operating extraction wells in an ongoing remediation project. The MODFLOW model was used with a particle-tracking program to estimate the source area for each extraction well. Information from the source area assessment was used to develop technical cases regarding potential sources of contamination.

- Lead technical specialist for developing the database for groundwater quality in the Central and West Coast Basins. This database was developed using ARC/INFO, a GIS software package. Information in the database includes concentrations of organic compounds, well locations, and well construction details. Graphical displays were developed showing the extent of organic and inorganic contamination (such as nitrate, chloride, and total dissolved solids). Additionally, analytical tools were developed to determine the distribution of contaminants on a well-by-well basis and efficiently calculate the number of exceedances of regulatory limits.

- Supervised installation of more than 40 monitoring wells, 30 18-inch and 22-inch extraction wells, and eight 8-inch extraction wells at a rapid infiltration and extraction (RIX) facility in Colton, California. Designed a three-dimensional groundwater flow model of the proposed site that was used to evaluate changes in groundwater levels at the site and to design the extraction system used to remove the infiltrated wastewater.

- Project hydrogeologist, where he installed two monitoring wells to depths of approximately 550 and 280 feet and performed the geologic logging during drilling and supervised well construction in Duarte, California.

- Assisted in developing a sampling plan for contaminated groundwater and soil at a former refinery at an EPA Superfund site in Ventura County. He also collected groundwater and soil samples, and monitored health and safety conditions.

- Staff hydrologist for a nation-wide environmental/geotechnical consulting firm, was involved in a flood studies project for two military bases in the Southwest. Mr. Woodside analyzed soils maps and geomorphic maps and was involved in the field work connected with this project.

Publications List of Greg D. Woodside

With Jordan Clark, Lee Davisson, Bryant Hudson, and Roy Herndon. Geochemical Imaging of Flow Near an Artificial Recharge Facility, Orange County, California. Ground Water. Vol 42, 2, 167-174. 2004.

With Mahin Talebi. Source Control Enhancements to Foster Indirect Potable Reuse, *WEFTEC 2003 Conference Proceedings*; October 2003

With Scott Goldman, Rich Atwater, Mike Hogan, and Jag Salgaonkar. Beyond Hollywood. WEFTEC03 Preview Paper, September 2003.

With Roy Herndon, Lee Davisson, and Bryant Hudson – Use of Isotopes to Estimate Groundwater Age and Flow Path. Southwest Hydrology. January-February 2003.

With Mike Wehner. Lessons Learned from the Occurrence of 1,4-Dioxane at Water Factory 21 in Orange County, California. WateReuse 2002 Reuse Symposium. 2002.

With Margaret Toussaint. OCWD's Biomonitoring Demonstration Project – Fish as an Indicator of Source Water Quality. WateReuse Association Symposium XVI. September 2001.

With Adam Hutchinson. Use of Shallow Probes to Understand Water Level, Temperature and Water Quality Changes Directly Beneath a Large Recharge Facility. Paper presented at the 10th Biennial Symposium on the Artificial Recharge of Groundwater, Tucson, AZ. June 2001.

With Jeff Gamlin, Jordan Clark, and Roy Herndon. Large-Scale Tracing of Ground Water With Sulfur Hexafluoride. Journal of Environmental Engineering, Vol 127, No. 2, pp. 171-174. February 2001

With Adam Hutchinson. The San Gabriel Valley Recycled Water Demonstration Project, in "Artificial Recharge of Groundwater", Peters et al. (eds), Balkema, Rotterdam. 1998.

With Sumant Gupta. GIS in Groundwater Hydrology, in "Geographical Information Systems in Hydrology." Kluwer Academic publishers. 1996.

Evaluation of Reclaimed Water Recharge with a CFEST Finite Element Model, San Gabriel Basin, California. American Geophysical Union Fall 1992 Meeting. San Francisco. December 1992.

Evaluation of Reclaimed Water Recharge with a CFEST Finite Element Model, San Gabriel Basin, California. American Water Resources Association, 29th Annual Conference and Effluent Use Management Symposium. Tucson, Arizona. August 1993.

Use of a GIS Database in the Whittier Narrows Operable Unit Feasibility Study. Hazardous Materials Control '91 Conference. Washington, D. C. December 1991.

With Jonathan Harris. Integrated Use of a GIS and a Three-Dimensional Finite-Element Model: San Gabriel Basin Groundwater Flow Analyses. First International Conference on Integrating Geographic Information Systems and Environmental Modeling. Boulder, Colorado. September 15-19, 1991.

Evaluation of a Rapid Infiltration and Extraction Facility Using a Three-Dimensional Numerical Model. American Geophysical Union Fall 1990 Meeting. San Francisco, California. 1990.

With C. S. Chen. Analytical Solution for Aquifer Decontamination by Pumping. *Water Resources Research*. August 1988.

Aquifer Decontamination by Pumping in Radial and One Dimensional Uniform Flow Fields. Independent Study for Master's Degree. New Mexico Institute of Mining and Technology. May 1988.

With C. S. Chen. Aquifer Decontamination by Pumping: Theories for Concentration Variation at the Withdrawal Well. American Geophysical Union Fall 1987 Meeting. San Francisco, California. 1987.

San Juan Groundwater Basin in Orange County, California. *Los Angeles Basin Hydrogeology Field Trip Guidebook.* Geologic Society of America. March 1986. (co-author)

Hydrogeology of Las Pulgas Watershed. Camp Pendleton, California. Senior Thesis for Bachelor's Degree. California State University, Fullerton. December 1985.

Presentations at Conferences (partial list)

Santa Ana River Water Quality and Health Effect Study Results. Groundwater Resources Association of California Artificial Recharge Conference, March 17, 2005, Sacramento, CA

Source Control Enhancements to Foster Indirect Potable Reuse, WEFTEC 2003 Conference. October 2003, Los Angeles, CA

Lessons Learned from the Occurrence of 1,4-Dioxane at Water Factory 21 in Orange County, California. WateReuse 2002 Reuse Symposium. Orlando, Florida September, 2002.

OCWD's Biomonitoring Demonstration Project – Fish as an Indicator of Source Water Quality. WateReuse Association Symposium XVI. September 2001. San Diego, CA September 2001.

DAVID HOGSHEAD, P.E.
Principal Engineer

FIELDS OF EXPERTISE

Mr. Hogshead has over 18 years of experience in environmental and hazardous waste-related projects with particular emphasis on ground water hydrology, modeling, and remedial design. Mr. Hogshead has a comprehensive background in site characterization, and the design and construction of soil and ground water remediation programs. He has been responsible for site assessment and remedial operations at sites contaminated with chlorinated solvents, petroleum hydrocarbons, and heavy metals. Mr. Hogshead has extensive experience in database development, geographical information systems (GIS), and in the application of computer models to the analysis of ground water flow and contaminant transport and dispersion of airborne contaminants.

EDUCATION

B.S., 1983, Mechanical Engineering, University of California, San Diego

OSHA 29 CFR 1910.120 initial and refresher site worker training

PROFESSIONAL REGISTRATIONS

Registered Civil Engineer in the State of California (RCE No. C 049188)

EMPLOYMENT HISTORY

2004 to present	Principal Engineer, Rubicon Engineering, Irvine, California
2000 to 2004	Senior Project Manager, England Geosystem, Inc., Irvine, California
1988 to 2000	Project Manager/Senior Engineer, Geosystem Consultants, Inc., Irvine, California.
1986 to 1988	Staff Engineer, Geosystem Consultants, Inc., Irvine, California.
1984 to 1986	Engineer, IT Corporation

SELECT PROJECT EXPERIENCE

– Involved in environmental assessment and remediation projects where responsible for planning and performance of field investigations, development/design of site-specific remedial programs, evaluation of effectiveness of remediation systems, and ground water/contaminant transport modeling.

– Senior engineer in application of numerical models (MODFLOW and CFEST) to three-dimensional simulation of ground water flow and contaminant transport in multi-aquifer system in San Gabriel Valley. Objective of modeling effort was to evaluate various remedial alternatives and assess consequences of each alternative in terms of downgradient migration and achieving cleanup levels.

- Applied analytic and semi-analytic ground water flow/contaminant transport models to field-scale problems in numerous projects.

- Soil and ground water remediation at public utility facility in Riverside County with multiple plumes of gasoline and diesel contamination. Designed pump and treat system for gasoline-impacted ground water using air stripping, dual-phase pumping system for recovery of free-floating diesel product, and in-situ vapor extraction system for remediation of gasoline-containing soils. Responsible for air dispersion modeling and health risk assessment related to permitting air stripping and in-situ vapor extraction systems. As result of the modeling and risk assessment, South Coast Air Quality Management District waived requirement for vapor abatement, thereby saving client substantial sums of money.

- As project hydrologist, performed aquifer characterization and designed ground water extraction/treatment/reinjection system for federal Superfund site in San Joaquin Valley where the hexavalent chromium contaminated soil and ground water.

- Responsible for diesel product recovery project at large ranch in Arizona. To date, over 70,000 gallons of diesel fuel have been recovered from four extraction wells using aboveground water/diesel separation techniques.

- Project engineer on project involving shoring, dewatering, excavation, and aboveground treatment of about 10,000 cubic yards of petroleum- contaminated soil. Soil treated by aeration and disposed of cost-effectively at nearby Class II municipal landfill.

- Developed data management systems to compile, maintain, retrieve, and present hydrologic and soil/water quality data.

- Evaluated effectiveness of ground water remediation programs by analyzing hydraulic data, ground water/contaminant transport modeling, and computing efficiency of treatment systems.

- Performed in-situ vapor extraction tests to evaluate feasibility and effectiveness of ISVE/enhanced bioremediation in remediating soils contaminated with volatile organic compounds.

- Prepared air emission inventory plans in response to Assembly Bill 2588.

- Performed feasibility study to select the most appropriate remedial technologies for 100,000 barrels of acid sludge generated at a refinery. Designed and implemented treatability study to test efficiency of on-site treatment/separation.

- Responsible for design, implementation, and testing of ground water extraction/treatment systems, application of ground water/contaminant transport models, design and implementation of extraction/injection systems.

- Conducted numerical modeling of ground water and solute transport for field-scale problems; performed underground tank integrity testing; installed monitoring wells; constructed project tracking system; responsible for data base management.

MOHSEN MEHRAN, Ph. D.
Chief Executive Officer/Hydrogeologist

FIELDS OF EXPERTISE

Dr. Mehran's hydrogeologic background includes both experimental and theoretical expertise in the areas of transport phenomena in fractured porous media. He has developed and applied numerous computer models to solve ground water flow problems and investigate the migration of various chemical compounds in fractured/porous media - e.g., petroleum compounds, hexavalent chromium and other metals, chlorinated solvents, herbicides, volatile organic compounds, and numerous other chemicals. He has applied this technical specialty to evaluation of mitigation alternatives, development of cleanup criteria, ground water restoration, site assessment and investigation, and soil remediation projects for clients in the aerospace, petroleum, electronics, chemical, wood preserving, communications, and other industries.

Dr. Mehran is active professionally by publishing and acting as a reviewer for the *Journal of Ground Water* and *Journal of Ground Water Monitoring and Remediation*. Dr. Mehran provides legal support and expert witness testimony for cases related to causes of contamination, identification of multiple sources of contamination, and cost recovery/allocation. He has published more than 50 technical papers.

EDUCATION

Ph.D., 1971, Civil Engineering University of California, Davis

M.S., 1966, Soil Physics University of California, Davis

B.S., 1962, Agricultural Engineering Tehran University

PROFESSIONAL REGISTRATIONS

Certified Ground Water Professional No. 189

Qualified Environmental Professional - Institute of Professional Environmental Practice

EMPLOYMENT HISTORY

2004 to present	Chief Executive Officer/Hydrogeologist, Rubicon Engineering
2000 to 2004	Chief Executive Officer, England Geosystem, Inc.
1986 to 2000	Principal Hydrogeologist, Principal-in-Charge, Project Manager, and technical contributor in ground water investigation and remediation projects, Geosystem Consultants, Inc., Irvine, California
1981 to 1985	Project Manager/Technical Specialist – Hydrogeology, IT Corporation Irvine, California
1979 to 1981	Staff Scientist, Lawrence Berkeley Laboratory, Berkeley, California
1977 to 1979	Visiting Associate Professor, University of California, Davis, California
1974 to 1977	Associate Professor, Civil Engineering Department, Tehran Polytechnique, Iran

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1971 to 1974 Post-Graduate Scientist, University of California, Davis, California

SELECT PROJECT EXPERIENCE

- Principal investigator and expert witness in more than 15 environmental cases representing the private sector and government agencies on behalf of plaintiffs and defendants.

- Principal investigator and project manager in evaluation and remediation of sites contaminated with tetrachloroethene (PCE) originated from dry cleaning operations.

- Project Director for soil quality assessment at 18 areas of Boeing's Long Beach facility. The contaminants include jet fuel, lubricating oils, trichloroethylene (TCE), other industrial solvents, and hexavalent chromium. Preparation of the operation plans and conducting of soil sampling and soil gas analysis.

- Project Director for deep soil and ground water remediation of primarily TCE and methylene chloride in Long Beach at Boeing's C-1 Facility, Building 10.

- Project Director for Focused Feasibility Study for remediation of chlorinated hydrocarbons, [primarily TCE and 1,1-dichloroethylene (DCE), chloroform, hexavalent chromium, and other chemicals] in soil and ground water at Boeing's C-6 manufacturing facility in Los Angeles. The scope of work includes using GIS for data organization, evaluation, analysis, visualization, and communication.

- Responsible for overall technical and financial performance on major projects involving ground water and soil contamination.

- Conducted hydrologic investigations and prepared site-specific numeric models of transport of contaminants in soils and ground water.

- Responsible for conducting evaluations of cleanup alternatives, negotiating with state and federal agencies, preparing Remedial Action Plans, and conducting remedial actions at sites throughout California.

- Designed and evaluated extraction/treatment system to remediate dissolved TCE migration in a fractured sandstone formation; assessed remedial action effectiveness.

- Investigated hexavalent chromium contamination in soil and ground water at Superfund sites, performed geochemical studies to assess sources of hexavalent chromium and its migration behavior, conducted Feasibility Studies to select the most appropriate remedial technology, and performed pilot tests to evaluate the feasibility of in situ remediation technologies.

- Evaluated migration pathways of TCE, 1,2-dichloroethene, and carbon tetrachloride in fractured limestone formation and developed containment and remedial technologies.

- Demonstrated natural attenuation of chlorinated hydrocarbons in drinking water aquifer to support site closure.

- Evaluated effectiveness of ground water remediation program to reduce the concentrations of methylene chloride, TCE, and tetrachloroethene in a multilayered aquifer.

- Modeled ground water flow and ethylene dibromide (EDB) transport to evaluate the effectiveness of an extraction/injection program at a chemical manufacturing facility and prepared technical reports in accordance with the requirements of the California Regional Water Quality Control Board.

- Expert witness services for the allocation of responsibility and costs of remediation related to volatile organic compounds and hexavalent chromium in ground water – Burbank versus Glendale Operating Units (OUs) and the Potentially Responsible Parties (PRPs) within the Glendale North and Glendale South. This included assessment of the contribution by Burbank to contamination in Glendale and by various PRPs within the Glendale OUs.

- Ground water and contaminant transport modeling for remediation and cost allocation among potentially responsible parties at EPA operable units in the San Fernando and San Gabriel Valley ground water basins.

- Conducted a soil and ground water investigation to delineate the extent of hexavalent chromium contamination in Ukiah, California – including site characterization, geochemical evaluation of leaching of chromium, hydrogeologic studies, Remedial Action Plan preparation, and in-situ remediation assessment.

- Performance of a comprehensive RI/FS at a site in Central Valley, California. Hexavalent chromium, trivalent chromium, and arsenic were the principal chemicals of concern. Activities involved over 50 ground water monitoring wells; drilling and sampling of more than 120 borings; evaluation of in-situ remediation technologies, and feasibility study.

- Taught courses in advanced ground water hydrology, contaminant transport modeling, and soil mechanics. Continued research in transport phenomena in fractured/porous media. Dr. Mehran has supervised numerous graduate students on various research topics.

- Responsible for fundamental formulation and computer model development of the simultaneous transport of water, contaminant, and heat in fractured/porous media and evaluation of the hydrogeologic consequences of dewatering deep formations. Utilizing numerical models, developed the capability of simulating the long-term effects of dewatering and reinvasion of water by considering saturated-unsaturated flow in fractured shale formations. A practical application of this research relates to the migration of dissolved organic constituents and radionuclides in fractured formations.

- Conducted research on transport and transformation of various nitrogen species in soils under saturated and unsaturated flow conditions, applied to nitrate pollution of ground water. This work was supported by the National Science Foundation. The computer models developed by Dr. Mehran have been successfully applied to the behavior of nitrogen and other chemical compounds in actual field problems.

PROFESSIONAL AFFILIATIONS

American Chemical Society
American Geophysical Union
Association of Ground Water Scientists and Engineers
National Ground Water Association
Member of the Research Advisory Board of the National Water Research Institute

PUBLICATIONS

Mehran, M., "Influence of Soil Moisture Suction on Soil Tensile and Compressive Strength," M.S. Thesis, University of California, Davis, 1966.

Mehran, M., "Development of Air Force Erosion Control Manual," report to Water Resources Engineers, Inc., Walnut Creek, California, 1969.

Mehran, M., "Electrical Dispersion and Electrokinetic Phenomena in Clays," Ph.D. Dissertation, University of California, 1971.

Mehran, M., and K.K. Tanji, "Chemical Transport in Flooded Rice Fields," paper presented before the Environmental Division of American Society of Agronomy Meeting, November 1, 1972, Miami, Florida.

Mehran, M., K.K. Tanji, J.W. Biggar, and D.W. Henderson, "Chemical Transport Under Different Water Management Systems," Proceedings of 14th Rice Tech., Working Group, p. 72, 1972.

Mehran, M., and K.K. Tanji, "Computer Modeling of Nitrogen Transformations in Soils," Journal of Environmental Quality 3(4):391-396, 1974.

Tanji, K.K., M. Mehran, J.W. Biggar, and D.W. Henderson, "Flood and Seepage Water Sampling Techniques in Rice Fields Under Different Water Management Systems," Soil Science Society of America, Proceedings 37:483-485, 1973.

Tanji, K.K., M. Mehran, J.W. Biggar, and D.W. Henderson, "Dye Tracer Movement in Rice Strip Plots," California Agriculture 27(7):10-13, 1973.

Tanji, K.K., and M. Mehran, "Computer Modeling of Nitrogen Transformation and Transport in Soils," Proceeding of the First Annual National Science Foundation Trace Contaminants Conference, Oakridge National Laboratory, p. 252-265, 1973.

Tanji, K.K., M. Mehran, J.W. Biggar, and D.R. Nielsen, "Computer Modeling of Nitrogen Transformation and Transport in Cropped Irrigated Lands," Annual Report to the National Science Foundation for Grant No. GI34733X, July 1973.

Tanji, K.K., J.W. Biggar, M. Mehran, and D.W. Henderson, "Herbicide Persistence and Movement Studies with Molinate in Rice Irrigation Management," California Agriculture 28(5):10-12, 1974.

Tanji, K.K., T.K. Kam, M. Mehran, J.W. Biggar, and D.R. Nielsen, "Computer Modeling of Nitrogen Transformation and Transport in Cropped Irrigated Lands," Annual Report to the National Science Foundation for Grant No. GI34733X, July 1974.

Tanji, K.K., T.K. Kam, and M. Mehran, "Nitrogen Studies in Secondary Sewage Percolation Ponds," Symposium on Nitrogen Transport and Transformation, Chicago, Illinois, 1974.

Mehran, M., "Contamination of Surface and Ground Waters by Nitrogenous Compounds," Proceedings of 24th Iranian Medical Congress, Ramsar, Iran, September 1975.

Mehran, M., and K. Arulanandan, "Low Frequency Conductivity Dispersion in Clay-Water-Electrolyte Systems," Clays and Clay Minerals 25:38-48, 1977.

Tanji, K.K., F.E. Broadbent, M. Mehran, and M. Fried, "An Extended Version of a Conceptual Model for Evaluating Annual Nitrogen Leaching Losses from Croplands," Journal of Environmental Quality 8(1):114-120, 1979.

Tanji, K.K., and M. Mehran, "Nitrogen Modeling in Croplands," final report, Nitrate in Effluents from Irrigated Agriculture for National Science Foundation, Grant No. ENV 76-10283 A01, 1979.

Mehran, M., T.N. Narasimhan, and J.P. Fox, "An Investigation of Dewatering for the Modified In-situ Retorting Process, Peance Basin, Colorado," Lawrence Berkeley Laboratory Report No. LBL-11819, 1980.

Mehran, M., K.K. Tanji, and I.K. Iskandar, "Compartmental Modeling for Prediction of Nitrate Leaching Losses," Chapter 16 in: Modeling Wastewater Renovation by Land Treatment. I.K. Iskandar (ed.), John Wiley and Sons, 1981.

Gupta, S.K., K.K. Tanji, and M. Mehran, "Field Simulation of Water and Nitrogen Transport in Soil-Water-Plant Systems. Part I: Water Flow."

Mehran, M., K.K. Tanji, and S.K. Gupta, "Field Simulation of Water and Nitrogen Transport in Soil-Water-Plant Systems. Part II: Nitrogen Transport and Transformations."

Tanji, K.K., M. Mehran, and S.K. Gupta, "Water and Nitrogen Fluxes in the Root Zone of Irrigated Maize. Chapter 4.1: Description of Models," in: Simulation of Nitrogen Behavior in Soil Plant Systems. M.J. Frissel and J.A. Van Veen (ed.), Center for Agricultural Publishing and Documentation, Wageningen, The Netherlands, 1981.

Mehran, M., T.N. Narasimhan, and J.P. Fox, "Hydrogeologic Consequences of Modified In-situ Retorting Process, Piceance Creek Basin, Colorado," 14th Oil Shale Symposium, Golden Colorado, April 1981.

Noorishad, J., M. Mehran, and T.N. Narasimhan, "On the Formulation of Saturated-Unsaturated Fluid Flow in Deformable Porous Media," Advances in Water Resources, Vol. 5, 61-62, 1982.

Noorishad, J., and M. Mehran, "An Upstream Finite Element Method for Solution of Transient Transport Equation in Fractured Porous Media," Water Resources Research, Vol. 18, No. 3, 588-596, 1982.

Mehran, M., J. Noorishad, and K.K. Tanji, "Numerical Simulation of the Effect of Soil Nitrogen Transport and Transformation on Ground Water Contamination, "Proceeding of the 16th Congress of The International Association of Hydrogeologists, Prague, Czechoslovakia, September 1982.

Selim, H.M., M. Mehran, K.K. Tanji, and I.K. Iskandar, "Mathematical Simulation of Nitrogen Interactions in Soils," Mathematics and Computers in Simulation, Vol. 25, No. 3, 241-248, 1983.

Mehran, M., M. J. Nimmons, and E.B. Sirota, "Delineation of Underground Hydrocarbon Leaks by Organic Carbon Detection," Proceedings of National Conference on Management of Uncontrolled Hazardous Waste Sites, Washington, D.C., 94-97, October 31, 1983.

Mehran, M., J. Noorishad, and K.K. Tanji, "A Numerical Technique for Simulating the Effects of Soil Nitrogen Transport and Transformations on Ground Water Contamination," Journal of Environmental Geology, Vol. 5, No. 4, 213-218, 1984.

Mehran, M., and R.L. Olsen, "Adsorption Characteristics of Trichloroethylene (TCE) in Soil-Water Systems," paper presented at the Spring Meeting of the American Geophysical Union, Cincinnati, Ohio, May 1984.

Mehran, M., and B.M. Rector, "Ground Water Treatment and Contaminant Migration Control," paper presented at a meeting of the Chemical Manufacturers Association, Atlanta, Georgia, September 1984.

Mehran, M., and R.L. Pellissier, "Geochemical Characteristics of Ethylene Dibromide," paper presented at the International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii, December 1984.

Mehran, M., "University-Industry Round-Table: Research Needs in Hazardous Waste Management," presented before the faculties of Civil Engineering and Environmental Engineering, University of Southern California, October 9, 1985.

Mehran, M., "Modeling of Volatile Organic Compounds in Ground Water Systems," paper presented at the University of Southern California, November 8, 1985.

Parmele, C.S., R.D. Allen, and M. Mehran, "Steam-Regenerated Activated Carbon -- An Emission-Free Cost-Effective Ground Water Treatment Process," presented at American Institute of Chemical Engineers Annual Meeting, Chicago, Illinois, November 13, 1985.

Parmele, C.S., T.L. Schomer, and M. Mehran, "Industrial Prospective on In-Situ Methodology," paper presented at Southeastern Symposium on In-Situ Treatment and Immobilization of Hazardous and Radioactive Waste, Knoxville, Tennessee, June 8-10, 1986.

Mehran, M., R.L. Olsen, and B.M. Rector, "Distribution Coefficient of Trichloroethylene in Soil Water Systems," Ground Water, Volume 25, No. 3,275-282, 1987.

Mehran, M., "Ground Water/Contaminant Transport Models -- Uses and Misuse," presented to the California Environmental Health Association, October 28, 1987.

Mehran, M., "Statistical Techniques for Waste Environmental Sampling," presented at a meeting of the American Statistical Association, New Orleans, Louisiana, August 1988.

Mehran, M., "Role of Geochemistry of Chromium on Soil and Ground Water Remediation at Wood Preserving Facilities," presented at a meeting of the American Wood Preservers Association, Seattle, Washington, September 1988.

Azari, A., M.H. Alemi, and M. Mehran, "Estimating Mean of Groundwater Trace Constituents and Toxic Compounds for Censored Data," presented at a meeting of the American Society of Agronomy, Anaheim, California, November 27 to December 2, 1988.

Mehran, M., "Environmental Considerations Related to Siting and Operation of Wood Preserving Facilities," presented at a meeting of the American Wood Preservers Association, Richmond, Virginia, September 12, 1989.

Mehran, M., R.L. Olsen, and R.W. Chappell, "Adsorption and Desorption Characteristics of Chlorinated Volatile Organic Compounds," presented at the Ground Water Geochemistry Conference of National Water Well Association, Kansas City, Missouri, February 21, 1990.

Mehran, M., "Evaluation of Hexavalent Chromium Migration for Ground Water Remediation," presented at the 84th Annual Meeting & Exhibition of Air & Waste Management Association, Vancouver, British Columbia, June 16 - 21, 1991.

Mehran, M., "Fate and Transport of Ethylene Dibromide in Soil and Ground Water Systems," presented at the 85th Annual Meeting & Exhibition of Air & Waste Management Association, Kansas City, Missouri, June 21 - 26, 1992.

Mehran, M., "Design of Extraction/Injection Systems Using Analytic Models," presented at the 85th Annual Meeting & Exhibition of Air & Waste Management Association, Kansas City, Missouri, June 21 - 26, 1992.

Mehran, M., "Soil and Ground Water Remediation by Vapor Extraction and Air Sparging," American Water Resources Association, Chicago, Illinois, November 1994.

Mehran, M., "Combined Effects of Water Table Drawdown, Vapor Extraction, and Air Sparging on Soil and Ground Water Remediation," Emerging Technologies in Hazardous Waste Management VII, American Chemical Society, Atlanta, Georgia, September 1995.

Mehran, M., "Soil and Ground Water Remediation by Vapor Extraction and Air Sparging," International Chemical Congress, Honolulu, Hawaii, December 1995.

Mehran, M., "Impacts of Pollutants on Ground Water Resources: Trends and Research Needs," International Conference on Industrial Pollution and Control Technologies, November 17 - 19, 1997, Hyderabad, India.

Mehran, M., "Natural Attenuation of Methylene Chloride in Ground Water," The 5th International Symposium on In-Situ and On-Site Bioremediation, April 1999, San Diego, California.

EDUCATION

M.S., Environmental Studies, California State University, Fullerton

B.A., Geography, California State University, Fullerton

REGISTRATIONS, AFFILIATIONS, AND CERTIFICATIONS

Certificate in Geographic Information Systems, University of California, Riverside

Member, Association of Environmental Professionals

DISTINGUISHED QUALIFICATIONS

Mr. DeVore has more than 15 years of experience managing and preparing California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) analyses for a variety of projects, including redevelopment plans, annexations, mixed-use Specific Plans, General Plan Amendments/zone changes, infrastructure expansions, and major public/institutional facilities. He manages and prepares CEQA documentation, including public notices, initial environmental studies, Environmental Assessments (EAs), Findings of No Significant Impact (FONSIs), Environmental Impact Reports (EIRs) (including focused, program, and supplemental/subsequent EIRs, and EIR addenda), Environmental Impact Statements (EISs), Mitigated Negative Declarations (MNDs), Mitigation Monitoring and Reporting Programs (MMRPs), Findings of Fact, responses to public comments, and Statements of Overriding Considerations (SOCs). He is experienced with Geographic Information System (GIS), database management, and visual analysis/simulations.

PROFESSIONAL EXPERIENCE (Representative Projects)

Water/Wastewater

EIR Addendum to EIR 560 for the Programmatic Permit for the East Garden Grove - Wintersburg Channel (CO5), Orange County -- RDMD. Performed as an Environmental Analyst for the EIR Addendum to EIR 560. The proposed project was a programmatic permit for flood control channel improvements. The EIR Addendum focused on the biological resources and wetlands delineation data to verify that the environmental conditions as outlined in EIR 560 had not changed significantly due to project phasing and improvement changes.

Colored Water Treatment Plant for Well No. 6 EIR, Orange County -- Mesa Consolidated Water District (MESA). Primary Environmental Analyst of the EIR for the Colored Water Treatment Plant for Well No. 6 in the City of Costa Mesa. The EIR analyzed the construction and operation of a proposed colored water treatment plant and ancillary facilities on a 2-acre project site in Costa Mesa. Currently operational, the plant treats colored water pumped from MESA's Well No. 6. The plant was constructed over several years in three phases, with each phase intended to produce approximately 3,500 gallons of treated water per minute. Each treatment stage has a treatment process consisting of ozonation followed by biological filtration. The treatment plant site also contains the following facilities: (1) a building containing the ozone-generating equipment, a small laboratory, an office, a conference room, and a restroom; (2) a 5-million-gallon treated-water storage tank; (3) booster pumps to pump the treated water into the distribution system; (4) liquid oxygen storage tanks; and (5) an 80,000-gallon backwash tank. The site's location in a residential neighborhood required health risk assessments of accidental chlorine and pressurized liquid oxygen releases, as well as a risk assessment of exposure to trihalomethane as a chemical by-product of the treatment process. Other EIR issues included local noise, air quality, and visual impacts to adjacent residents.

Landfill

Gregory Canyon Landfill Draft EIR, San Diego County -- San Diego County Department of Environmental Health. Performed as a Technical Environmental Lead for the preparation of the first Draft EIR for the Gregory Canyon Landfill. The 1,300-acre property was located in the environmentally sensitive foothill area of north San Diego County, adjacent to the San Luis Rey River. Significant issues analyzed in the Draft EIR included land use and relevant planning, hydrology and water quality, biological and cultural resources, and noise associated with landfill operations. This was a highly controversial project in the county.

Facilities

CEQA/NEPA Documentation for the Saticoy and Lancaster Veterans Home Projects, Ventura County -- California Department of General Services, Real Estate Services Division (RESD). Acted as the Project Manager for a new veterans home project in Ventura County. The veterans home was to be constructed in two phases and included a public outreach component. The project was required to comply with both CEQA and NEPA because it received federal funding.

Rancho Potrero Youth Leadership Academy, Orange County -- Orange County Probation Department/Orange County Department of Education. Performed as a Deputy Project Manager for the preparation of the EIR for a new 90-bed juvenile detention facility and high school in the rural Foothill Trabuco area. The environmental issues included land use compatibility with the Foothill Trabuco Specific Plan, traffic, biological resources, cultural resources, public safety, and public services. The time constraints imposed by the grant funding from the State Board of Corrections required the Draft EIR to be prepared concurrently with the project design. Extensive coordination with the responsible agencies was required because of the sensitive biological resources involved. Provided assistance with community involvement and educational programs to ensure community participation in the process.

Price Costco Bulk Retail Facility EIR, Los Angeles County -- City of Torrance. Served as an Senior Environmental Analyst for the preparation of the EIR for a proposed bulk retail facility in the City of Torrance. The 156,000-square-foot Price Costco was proposed to be located at the southeasterly city limits of Torrance, adjacent to the City of Lomita. The project required a General Plan Amendment and zone change to accommodate the commercial facility. The EIR analyzed traffic and circulation, noise, land use compatibility, and fiscal and market impacts.

Education

EIR Addendum for Ocean View Hills K-8 School, San Diego County -- San Ysidro Unified School District. **Acted as a Co-Project Manager for the EIR Addendum and California Department of Education (CDE)/Department of Toxic Substances Control (DTSC) compliance for a new interim and permanent K-8 school in southern San Diego County.**

Science Museum Space Saver School and Science Education Resource Center, Los Angeles County -- Los Angeles Unified School District. Acted as a Technical Environmental Lead for the Science Museum School/Science Education Resource Center, a joint venture between the Los Angeles Unified School District, the California Museum of Science and Industry (CMSI), the Jet Propulsion Laboratory, and the University of Southern California. This unique project proposed the adaptive reuse of the existing Armory Building, a recognized historical structure, located within Exposition Park in the City of Los Angeles. The Supplemental EIR analyzed several significant issues related to the proposed project, including CMSI/Exposition Park Master Plan consistency, historical resources, traffic and circulation, hazardous materials, aesthetics, noise, air quality, and land use compatibility. Technical studies were undertaken to evaluate the potential traffic impacts and offsite air contamination. In addition, an historic structures report was prepared that analyzed the effects of converting the historic Armory into a school and adding additional structures on the property. As a direct result of that effort, effective mitigation measures were identified and incorporated into the design of the project to ensure that the historical integrity of the structure was not compromised.

Transportation

CenterLine Light Rail Supplemental Draft EIS (SDEIS)/Revised Draft EIR (RDEIR) and Final EIS (FEIS)/EIR, Orange County -- Orange County Transportation Authority. This proposed system was planned to connect major activity centers in Santa Ana, Costa Mesa, and Irvine, including the Santa Ana Regional Transportation Center, the Santa Ana Civic Center, South Coast Plaza, the Orange County Performing Arts Center, John Wayne Airport, the Irvine Business Complex, and the University of California, Irvine. Served as an Environmental Analyst for GIS data, produced GIS-based graphics, and coordinated GIS distribution among the CenterLine project team members.

Development

General Plan Amendment 37594-GA, Zone Change 37595-ZC, and Annexation No. 17 for Marine Corps Air Station (MCAS) El Toro and James A. Musick Branch Jail EIR, Orange County -- City of Irvine. Served as a Deputy Project Manager for the first EIR and boundary/legal description for the proposed annexation of the MCAS El Toro by the City of Irvine and the adoption of the Millennium Plan (developed by the

El Toro Reuse Planning Authority) as the non-aviation land use alternative to Orange County's proposed international airport. The Draft EIR depicted significant adverse transportation impacts extending several miles beyond the site. As a result, the Final EIR evaluated a new reduced-density alternative (Millennium Plan Light) to reduce the projected traffic impacts. Due to the complexity of the issue, the Irvine City Council decided to withdraw the Millennium Plan project and downsize the density of the plan. A reduced-density alternative evolved into the Great Park Plan. This highly charged political assignment was completed within a condensed time frame, as directed by the Irvine City Council.

Recirculated Supplemental EIR for the Cabrillo Way Marina Development Project, Los Angeles County -- Port of Los Angeles. Project Manager and GIS Specialist for the EIR for the second phase of improvements within the West Channel/Cabrillo Beach Recreational Complex. The goal of the improvements was to provide a unified continuous waterfront and to reconstruct the waterside infrastructure within the West Channel Development Area. Cabrillo Way Marina covers a total of 49 acres of land and 37 acres of water.

Dos Lagos Specific Plan and Annexation EIR, Riverside County -- City of Corona. Performed as the Project Manager for the EIR for the Dos Lagos Specific Plan, Annexation No. 94, and for the actions and/or plans necessary to facilitate the project. The EIR included a request for annexation from Riverside County into the City of Corona, as well as pre-zoning and pre-annexation agreements; a General Plan Amendment; a Specific Plan for the Dos Lagos project; adoption of a redevelopment area by Corona; state and federal wildlife agency permitting; and a master tentative tract map. The project annexed a total of 921.29 acres into the City of Corona and adopted city zoning, General Plan, and Specific Plan designations for a mixed-use project of approximately 541 acres within the larger annexation area. The primary issues analyzed in the EIR included sensitive wildlife and habitat resources, geotechnical constraints, hydrology/geohydrology and water quality, agricultural land use compatibility, and archaeological and historic resources.

Recreation

Mitigated Negative Declaration (MND) for Richard T. Steed Memorial Park Master Plan, Orange County. Project Manager and GIS Manager for the MND for the revised Master Plan. The MND addressed the Master Plan alternatives including either a hockey rink or amphitheater adjacent to the existing skate park. Conducted vegetation mapping, terrain analysis, stormwater runoff analysis, and viewshed/line-of-sight analysis for the site, which was adjacent to the San Onofre State Beach Park.

EDUCATION

M.S., 1998, Chemistry, University of California, Irvine

B.S., 1997, Chemistry, University of California, Irvine

REGISTRATIONS, AFFILIATIONS, AND CERTIFICATIONS

American Chemical Society Certification,

Association of Environmental Professionals

DISTINGUISHED QUALIFICATIONS

Jennifer Wilcox has 6 years of experience managing and performing a wide range of air quality, water quality, hazardous material and waste, pollution prevention, and risk assessment projects for public and private sector clients. Ms. Wilcox's air quality experience includes permits-to-construct, annual emissions reporting, Emergency Planning and Community Right to Know Act (EPCRA) reporting, synthetic minor reporting, regulatory compliance evaluations, participation in compliance audits, and negotiations with South Coast Air Quality Management District (SCAQMD) and San Diego Air Pollution Control District (SDAPCD). Her water quality experience includes preparation of storm water pollution plans (SWPPP) for industrial and construction facilities, preparation of oil spill, prevention, control, and countermeasure (SPCC) plans, and preparation of a variety of domestic water management plans. Ms. Wilcox's pollution prevention (P2) experience includes developing process specific opportunity assessments (PSOAs) for waste management, preparation of a P2 management action plan (MAP), and developing P2 case studies and regulatory tools for implementation into daily work protocol. Her experience in hazardous materials and waste and risk assessment activities include site inspections, risk reduction evaluations and reporting, Resource Conservation and Recovery Act (RCRA) assessments and reporting, agency involvement, and regulatory compliance evaluations.

PROFESSIONAL EXPERIENCE

Environmental

Program Environmental Impact Report For Lower San Diego Creek, Orange County -- County of Orange, Public Facilities Resources Department. Assisted with the scoping, public participation, and preparation of the Program EIR for the Operations and Maintenance Manual for San Diego Creek In-Line Channel Basins, as well as sediment removal projects within the three In-Line Basins and the Basin 2 deepening project. Restoration of the channel sections and sediment basins are intended to return a portion of San Diego Creek to its baseline condition as a 100-year flood control facility and restore the basins ability to capture sediment. The long-term Operations and Maintenance Manual will outline maintenance activities to maintain this baseline condition. Operations and maintenance activities include inspections, repairs, and maintenance. The routine maintenance required to keep the basins operating efficiently includes sediment monitoring, sedimentation removal, maintenance of structures, and vegetation management. The basin deepening component is intended to reduce sediment Total Maximum Daily Load (TMDL). Issues analyzed at a programmatic level include riparian biological resources, hydrology and hydraulics, and in-stream water quality in order to support applications for programmatic resource agency permitting.

EIR for Operations and Maintenance Manual for San Diego Creek In-Line Channel Basins -- Orange County Resources and Development Management Department. Orange County Flood Control District is preparing an Operations and Maintenance Manual for three existing San Diego Creek In-Line Sedimentation Basins in the San Diego Creek Watershed. Environmental analyst for an EIR that will address the impacts of this operations and maintenance program on sensitive biological resources, hydrology/water quality, mineral resources, and public safety.

Program EIR for the Master Plans for Long Beach City College, Liberal Arts Campus and Pacific Coast Campus, Los Angeles County -- Long Beach Community College District (District). Environmental analyst for two separate Program EIRs for Master Plans for the Liberal Arts and Pacific Coast Campuses of Long Beach City College. The District is the recipient of bond funds for an extensive improvement and building program at these two campuses to meet its increased enrollment needs and the evolving demands upon post-secondary educational institutions. This construction/building program will provide new facilities, renovate existing buildings, and solve parking inadequacies.

Air Quality

Onsite Regulatory Air Specialist for Goodrich Aerospace, San Diego. Project role was Onsite Regulatory Air Specialist. Goodrich Aerospace requested onsite regulatory assistance to perform compliance review and approval of all materials brought into the Goodrich facility as well as general air quality support. Compliance review was conducted using active Goodrich Aerospace air permits and San Diego Air Pollution Control District (SDAPCD) regulations. General air quality support included the preparation of monthly synthetic minor reports, streamlining of facility reporting and record-keeping practices, and management of internal and regulatory audits.

Permit Modification for the Secondary Treatment Capabilities at Eastern Municipal Water Districts (EMWD) Perris Valley Regional Water Reclamation Facility (PVRWRF), Perris Valley. Task Manager for the air permit modification for the addition of two secondary clarifiers to an existing 8 million gallon per day (MGD) wastewater treatment process line. Due to the need for expanded wastewater treatment capabilities, PVRWRF added two new secondary treatment clarifiers to their 8-MGD treatment process line. As a result of this addition, modification of the existing wastewater treatment permit occurred. Permit modification included modeling wastewater treatment emissions using Bay Area Sewage Toxics Emission (BASTE) model, performing South Coast Air Quality Management District (SCAQMD) rule analysis, and preparation and submission of a permit application.

Permit-to-Construct for an Expansion Project for Laguna County Sanitation District, Santa Maria. Task Manager for the permit-to-construct for the installation of a new boiler and flare as part of an expansion project for the sanitation district. Permit-to-construct preparation included emissions evaluations based on Santa Barbara County Air Pollution Control District (SBAPCD) regulations and coordination with SBAPCD for permit approval.

Water Quality

Oil Spill Prevention, Control, and Countermeasure (SPCC) Plans for Lockheed Martin Aeronautics Company, Palmdale. Task Manager for the preparation of four Oil SPCC Plans for Lockheed Martin facilities in accordance with 40 CFR 112 regulations (including updated 2002 regulation). Responsibilities included coordinating and performing site inspections, identification of facility deficiencies, and suggestions for regulatory compliance.

Oil Spill Prevention, Control, and Countermeasure (SPCC) Plans for Northrop Grumman Corporation, Palmdale. Task Manager for the preparation of two Oil SPCC Plans for Northrop Grumman facilities in accordance with 40 CFR 112 regulations (including updated 2002 regulation). Responsibilities included coordinating and performing site inspections, identification of facility deficiencies, and suggestions for regulatory compliance.

Disinfection Byproducts Monitoring Plan for Lockheed Martin Aeronautics Company, Palmdale. Task Manager for the preparation of a Disinfection Byproducts Monitoring Plan for a domestic water system owned and operated by Lockheed Martin. Responsibilities included regulatory review of the new disinfection byproducts rule implemented by the Department of Health Services (DHS), Los Angeles Region and coordination with DHS to ensure plan approval.

Storm Water Pollution Prevention Plans (SWPPPs) for Multiple Construction Sites (e.g., Calpine Metcalf Energy Center, Pasadena Department of Water and Power, Lennar Communities). Task Manager for the preparation of SWPPPs. Responsibilities included evaluation of California Storm Water Permit for construction activities and evaluation of construction site operations. Two of the construction sites were high profile and received drop by visits from state and county auditors to evaluate implementation of the SWPPPs. Neither site received violations.

Hazardous Materials/Waste and Risk Assessment Activities

Remediation Oversight, Regulatory Compliance, and Investigative Support for the Decommissioning of Three Navy Owned Combustion Turbine Sites for Cabrillo Power II LLC, San Diego. Project role was Assistant Project Manager. The property use agreement at three Navy-owned, Cabrillo-operated combustion turbine sites came to a conclusion, and the Navy requested that Cabrillo document evidence of contamination in soil and groundwater at specific areas at each site during their period of land occupation.

Responsibilities included preparation work plans, documentation of evidence of contamination in soil and groundwater at specific areas at each site during Cabrillo's period of land occupation, and coordination with the Navy and San Diego, Department of Environmental Health representatives to meet agency regulatory requirements.

Remediation Oversight and Regulatory Support for a Diesel Spill at the Kearny Mesa Power Block, Sites 2 and 3, for Cabrillo Power II LLC, San Diego. Project role was task manager. Responsibilities included site investigation, preparation of a sampling and analysis plan, and coordination and submittal of a closure report to San Diego, Department of Environmental Health.

Resource Conservation and Recovery Act (RCRA) Facility Assessment and Visual Site Inspection for Air Force Plant 42, Palmdale. Task Manager for the preparation of a RCRA Facility Assessment Addendum Preliminary Review/Visual Site Inspection Report for two plant sites at Air Force Plant 42. Responsibilities included evaluation of present and former solid waste management units (SWMUs) to assess the release potential to the environment (e.g., soil, surface water, air). Evaluation of SWMUs included record reviews of past and current uses, as well as visual site inspections.

Risk Reduction Evaluation for Air Force Plant 42, Palmdale. Project role was task manager. Responsibilities included visual site inspections of over 100 facilities where hazardous materials/waste are used/stored to assess risk to the potential risk to the storm water system and the environment (e.g., soil, surface water). Evaluated each facility and provided recommendations to reduce the risk for potential releases to the environment.

Business Plans for Los Angeles World Airports -- Pasadena Department of Water and Power, and Atlantis Plastics. Task manager for the preparation of business plans. Responsibilities included visual site inspections, hazardous material/waste inventories, and development of emergency response procedures.

<u>Other Training</u>

- Air Quality Permitting and Compliance Course
- 40 Hour HAZWOPER

HASSAN AMINI, Ph.D.
Vice President and Principal Hydrogeologist

EDUCATION

University of Colorado, Boulder, Colorado, Ph.D., Geological Sciences, 1983
University of Colorado, Boulder, Colorado, M.S., Geological Sciences, 1978
University of Tabriz, Iran, B.S., Geology, 1974

REGISTRATION

Certified Hydrogeologist: California No. 691, 2000
Registered Geologist: California No. 4738, 1990
Registered Environmental Assessor: California No. 01219, 1989

PROFESSIONAL HISTORY

Geomatrix Consultants, Inc., Vice President and Principal Hydrogeologist, 2002 to present
McLaren-Hart/Jones, Vice President and Operations Manager, 1996 - 2002
McLaren-Hart, Principal Geoscientist and RI/FS Practice Area Leader, 1992 - 1996
IT Corporation, Project to Senior Project Manager, 1987 - 1992
Purdue School of Sciences at Indianapolis, Department of Geology, Assistant Professor, 1985 - 1987
University of Colorado, Denver, Department of Geological Sciences, Assistant Professor, 1983 - 1985
U.S. Geological Survey, Denver, Colorado, Field Assistant and Fellow, 1977 - 1981
Environmental Research Center, University of Tabriz, Iran, Geologist, 1974-1976

REPRESENTATIVE EXPERIENCE

Dr. Amini has more than 19 years of experience in geology, surface water and groundwater hydrology, geochemistry, assessing the extent of soil and groundwater contamination in complex geologic and hydrogeologic settings, investigating the fate and transport of contaminants in soil and groundwater, conducting remedial investigation and feasibility studies (RI/FS), developing remedial action plans (RAPs), developing cost estimates, and providing project management services.

Dr. Amini provides consultation in protection and management of surface water and groundwater resources. He has experience with fate and transport analysis and remediation of a wide range of chemical contaminants including perchlorate, MTBE, chlorinated solvents, fuel hydrocarbons, herbicides and pesticides, and toxic metals. The range of his experience spans numerous sites, regulatory drivers, scopes of work, and industry types. He has assisted clients involved as potentially responsible parties (PRPs) in CERCLA matters related to clean-up of regional aquifers in Superfund sites. He has provided strategic planning, technical direction, and consulting services for numerous sites under RCRA and CERCLA, and has managed a wide range of projects involving surface water and groundwater assessments and remediation in the southern and Central Valley areas of California. Dr. Amini has also developed comprehensive remedial action plans, negotiated clean-up levels, and provided expert opinion and testimony on topics related to his expertise.

His regulatory agency interface and liaison experience includes negotiations with U.S. EPA Region IX, U.S. Army Corp of Engineers, California Department of Toxic Substances Control, California State Water Resources Control Board, California Regional Water Quality Control Boards (Los Angeles, Santa Ana, San Diego, Central Valley, and Colorado River Regions), California Department of Fish and Game, California Division of Oil, gas, and Geothermal Resources, Los Angeles County Department of Public Works, Orange County Health Care Agency, and a number of local agencies. Negotiations have involved presentation and approval of site investigation work plans and reports, discussion of local and regional groundwater issues, remedial action plans, negotiation of clean-up levels, and potential responsible parties.

REPRESENTATIVE PROJECTS

- *Characterization and Remediation of Perchlorate Impact to Soil and Groundwater, Orange County, California:* Directed characterization of impact of perchlorate to soil and groundwater at an industrial facility. Prepared work plan for review and approval of the CRWQCB and performed characterization and fate and transport analysis of the impact of perchlorate to soil and groundwater beneath and off-site of the facility. Utilized hydraulic push probes and CPT rig to characterize the impact of perchlorate to multiple water-bearing zones beneath the site and selected strategic locations for groundwater monitoring wells. Conducted multiple-track investigation of potential risk to deeper drinking water aquifers and interacted with water quality authorities and water purveyors. Performed hydraulic control and mass removal of the dissolved perchlorate through aggressive pumping from strategic locations. Performed feasibility study to select long-term remedies for soil and groundwater.

- *Surface Water and Groundwater Interaction Studies, Carson, California:* Performed surface water quality assessment through streambed sediments sampling and surface water regime and quality studies to determine the sources of volatile organic compounds and heavy metals in a wetland environment. Investigated potential point source and non-point sources of contamination that historically impacted the stream bed and the wetland through storm water runoff. Evaluated the seasonal variations of the surface water stream and its flow regime and the interaction of the surface and groundwater systems. Provided expert testimony in connection with a law suit that involved several municipalities and industrial companies.

- *Groundwater Investigations, California:* Conducted groundwater investigations at numerous industrial facilities in the San Fernando and San Gabriel Superfund areas. Performed all work in accordance with NCP guidelines and RWQCB-specified Well Investigation Program (WIP). Work included soil vapor survey, and soil and groundwater investigations. He has performed regional studies involving surface and groundwater interaction and has identified potential sources of chemical impact to surface and groundwater quality in those areas.

- *Groundwater Pump-and-Treat, California:* Project manager for design and installation of three groundwater pump-and-treat operations in Malibu, Santa Monica, and Cerritos. Developed groundwater models to select optimum locations of extraction wells for free-phase and dissolved petroleum product recovery. Also used models to predict the configuration of the plumes in the future under various pumping scenarios. Selected appropriate pumping rates based on the modeling studies. Assisted the client in securing NPDES permits for wastewater discharge.

- *Soil and Groundwater Investigation, Culver City, California:* Conducted soil and groundwater investigation of a city block formerly used by an aircraft manufacturing company. Assessed chlorinated VOCs, petroleum hydrocarbons, and PCBs in soil and performed removal actions to mitigate impacted areas. Installed groundwater wells to different depths to monitor two separate water-bearing zones. Obtained closure status for groundwater and mitigated soil.

- *Groundwater Extraction and Treatment System:* Project manager for design and installation of a groundwater extraction and treatment system. The remedial system consisted of 22 groundwater extraction wells equipped with electric pumps and high pressure activated carbon vessels for primary and secondary adsorption units. The system extracted and treated approximately 750,000 gallons per day of extracted groundwater that contained dissolved chlorinated hydrocarbons compounds.

AFFILIATIONS

National Ground Water Association
Association of Hazardous Materials Professionals

SELECTED PUBLICATIONS

Amini, H., Bahde, J., Clarke, L., *Managing The Risk of UXO*, Pollution Engineering, March 2000, pp. 8-11.

Ghirelli, R.P., H. Amini, B.D. Kerger, D.G. Dodge, and R.O. Richter, 1997, "MTBE Water Contamination: Key Considerations for Remediation, Risk Assessment, and Risk Management." 1997 Pacific Conference on Chemistry and Spectroscopy, American Chemical Society for Applied Spectroscopy.

Kent, R.T., H. Amini, 1991, "Environmental Assessment for Real Property Transfers," *Modern Real Estate Transactions,* Ninth Edition, American Law Institute - American Bar Association Committee on Continuing Professional Education, Resource Materials, Vol. 1, pp. 1087-1098.

Amini, H., E. E. Larson, H. H. Mehnert, and J. D. Obradovich, "K-Ar Dating and Magnetic Polarity Stratigraphy of the Upper Cenozoic Bruneau Formation, Implications for Stratigraphy and Paleogeography of the Western Snake River Plain, Idaho," *Geological Society of America Bulletin* (in press).

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Amini, M. H., and N. Kermanschahchi, 1975, "Hydrological and Hydrogeological Controls of the Tabriz Flood," University of Azarabadegan, *Open-File Report No. 315,* 82 pp.

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Aiken, B. and H. Amini, "Impacts of Barometric Pumping in Deep Monitoring Wells and Adapted Methodologies for Vapor Sampling to Account for Atmospheric Air Exchange," 2004 North American Environmental Field Conference and Exposition, Tampa, Florida.

Amini, H., 2003, "Fate and Transport of Perchlorate and its Impact on Water Resources," The Center for Environmental Analysis – Center for Research Excellence in Science and Technology (CEA-CREST), 4th Annual Environmental Science Conference, Pasadena, California.

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Final
Environmental Impact Report

State Clearinghouse Number: 2003041190

Volume II

LA JOLLA RECHARGE BASIN

Prepared by:

Orange County Water District
10500 Ellis Avenue
Fountain Valley, California 92708

With assistance from:

Chambers Group, Inc.
17671 Cowan Avenue, Suite 100
Irvine, California 92614

May 2006

Draft
Environmental Impact Report
State Clearinghouse Number: 2003041190

Volume II
Technical Appendices

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February 2006

LA JOLLA RECHARGE BASIN
VOLUME II - DRAFT EIR TECHNICAL APPENDICES

CONTENTS

*Appendices 9.1 and 9.2 are included in Volume I of the Draft EIR

APPENDIX 9.3
CONTAMINANT TRANSPORT MODELING REPORT

Rubicon Engineering Corporation
March 2005

REPORT

CONTAMINANT TRANSPORT MODELING

Potential La Jolla Street Recharge Basin
Anaheim Forebay Area
Orange County, California

March 15, 2005

PREPARED FOR

Orange County Water District
10500 Ellis Avenue
Fountain Valley, California 92708

PREPARED BY

Rubicon Engineering Corporation
16 Technology Drive, Suite 138
Irvine, California 92618

Project No. 1005.01

RUBICON
ENGINEERING

RUBICON
ENGINEERING

March 15, 2005

Project No. 1005.01

Mr. Roy Herndon
ORANGE COUNTY WATER DISTRICT
10500 Ellis Avenue
Fountain Valley, California 92708

Report
Contaminant Transport Modeling
Potential La Jolla Street Recharge Basin
Anaheim Forebay Area
Orange County, California

Dear Mr. Herndon:

Enclosed are five copies of the Contaminant Transport Modeling Report for the subject site. Rubicon Engineering Corporation appreciates the opportunity to be of service to Orange County Water District. If you have any questions or require additional information, please do not hesitate to call.

Respectfully submitted,

RUBICON ENGINEERING CORPORATION

David C Hogshead

David C. Hogshead
Senior Engineer

DCH:dch
Enclosure

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5	Scenario3_Shallow.avi
6	Scenario3_Principal.avi

Note: See included CD for animation files.

LIST OF ABBREVIATIONS AND ACRONYMS

1,1-DCE	1,1-dichloroethene
acre-ft/year	acre-feet per year
AC Products	AC Products, Inc.
bgs	below ground surface
CDWR	California Department of Water Resources
EGI	England Geosystem, Inc.
ft/day	feet per day
GMS	Groundwater Modeling System
EIR	Environmental Impact Report
GIS	Geographic Information System
HLA	Harding Lawson Associates
MCL	Maximum Contaminant Level for drinking water
MSL	Mean Sea Level
MWD	Metropolitan Water District
OCWD	Orange County Water District
Rubicon	Rubicon Engineering Corporation
TCE	trichloroethene
PCE	tetrachloroethene
$\mu g/\ell$	micrograms per liter
VOCs	volatile organic compounds

1.0 INTRODUCTION

This report presents the results of contaminant transport modeling performed by Rubicon Engineering Corporation (Rubicon) on behalf of the Orange County Water District (OCWD). The modeling was performed to evaluate the potential environmental effects of the proposed La Jolla Street recharge basin (La Jolla Basin) in the Anaheim Forebay area of Orange County, California. The modeling results will be integrated into the Environmental Impact Report (EIR) for the proposed La Jolla Basin project. More specifically, numerical model simulations were conducted to quantitatively assess the effects of the proposed recharge on the ground water contaminant plume originating from the AC Products, Inc. (AC Products) facility, located in close proximity to the proposed La Jolla Basin project site.

The transport model is based on previous ground water flow simulations, which have been refined to allow a more detailed characterization for contaminant migration behavior. Although the previous ground water modeling activities have been reported (EGI, 2002), for completeness, the flow model structure and its findings are reiterated in this report.

Section 2.0 of this technical memorandum presents pertinent background information. Section 3.0 describes construction of the ground water flow model. Section 4.0 presents the development and results of the transport model. Findings of this modeling effort are presented in Section 5.0. The modeling was performed by Rubicon). The qualifications of Rubicon and the authors of this report are provided in Appendix A.

2.0 BACKGROUND INFORMATION

OCWD has acquired three contiguous parcels with a total area of about 12 acres located approximately one-half mile east of the Orange Freeway (State Highway 57). The site location is shown in Figure 1, and the site and vicinity is shown in Figure 2. OCWD intends to sell a portion of the property to the Placentia-Yorba Linda Unified School District and is considering use of the remaining property as a ground water recharge basin. The parcels that comprise the site straddle the boundaries of the cities of Placentia and Anaheim and are bounded by La Jolla Street to the south, the Carbon Creek Channel to the north, and commercial properties to the east and west. All or portions of adjacent residential and flood control parcels would be acquired to accommodate the proposed basin. The entire area covered by these parcels is referred to as the "site" (Figure 2). If the recharge basin were constructed, the existing improvements on the properties would be removed and a recharge basin excavated to a depth of approximately 9 feet below ground surface (bgs). According to OCWD, the area of the recharge basin would be six acres. The basin would be used to percolate water obtained from the Santa Ana River or imported water purchased from the Metropolitan Water District of Southern California (MWD). The surface water routed into the basin would infiltrate into the vadose zone and recharge the underlying aquifer encountered at approximately 120 feet bgs.

As shown in Figure 2, the AC Products facility is located immediately south of the site, on the opposite side of La Jolla Street. Certain volatile organic compounds (VOCs) released from the AC Products facility have impacted the underlying ground water and migrated at least 1.8 miles to the west. The VOCs detected in ground water beneath the AC Products facility include tetrachloroethene (PCE) as the principal compound, and lesser amounts of trichloroethene (TCE) and 1,1-dichloroethene (1,1-DCE). In September 1995, AC Products implemented a ground water extraction program with the intention of containing and mitigating the VOC-impacted zones of the aquifer. Recent data show residual PCE at concentrations as high as 93 micrograms per liter ($\mu g/\ell$) downgradient of the AC Products site (Mc^2 Environmental Engineering Services, 2004).

The proposed operation of the La Jolla Basin in the vicinity of AC Products has raised questions regarding the potential impact of recharge on the existing VOC plume. The results of previous ground water flow modeling indicate the potential for altering the path of the plume and for increasing downward migration of VOCs into the Shallow Aquifer (EGI, 2002). The flowpath analysis was based on advective transport only and did not consider the effects of other transport mechanisms. The modeling results presented in this report consider the effects of the major transport mechanisms and processes that contribute to migration of the PCE component of the AC Products' VOC plume.

2.1 OBJECTIVES AND APPROACH

The primary objective of the contaminant transport model is to quantitatively assess the potential impact of the proposed recharge on the AC Products PCE plume. The emphasis of the modeling is to assess the relative impacts of various recharge scenarios rather than predict absolute concentrations. The approach is to construct a numerical model that can simulate the effects of the following flow and contaminant transport factors and mechanisms:

- Recharge
- Advection
- Dispersion
- VOC source strength
- Adsorption (Retardation)
- Removal of VOCs from the aquifer via ground water extraction.

The transport model builds on the previous flow-modeling study of the proposed La Jolla Basin, which in turn was based on the regional flow model of the Orange County Basin developed by OCWD (OCWD, 2001). The previous flow model was further refined to allow proper characterization of contaminant transport behavior. The refined local flow model was used to define the flow field as a basis for transport modeling. The transport model was calibrated to simulate historical concentrations (through March 2004) in selected AC Products monitoring wells. Once the simulation of historical concentrations was completed, the future fate of the plume was projected both with and without the proposed recharge.

2.2 Physiographic Setting

Physiographically, the site is located on the eastern portion of the Coastal Plain of Los Angeles and Orange counties. The Coastal Plain is bounded by the Santa Monica Mountains to the north; the Puente Hills, Chino Hills, and the Santa Ana Mountains to the east; and the San Joaquin Hills to the south. The ground surface in the Coastal Plain typically slopes gently westward, away from these relief features, toward the Pacific Ocean. The boundary of the plain is the Pacific Ocean to the west and the line of contact between the alluvial deposits and the bedrock of the hills and mountains to the north, east, and south. The area near, and within a several mile radius of, the mouth of the Santa Ana Canyon is referred to as the Anaheim Forebay area (Herndon, 1992). Certain aquifers beneath the Coastal Plain occur at or near the ground surface in the Anaheim Forebay area. The OCWD takes advantage of this condition by operating a number of ground water recharge basins in the Anaheim Forebay area, mostly to the east of the proposed La Jolla Basin.

The Santa Ana River channel is the most prominent drainage feature in the site vicinity (Figure 1). The river flows west out of the Santa Ana Canyon, which is located a few miles east of the site, rounds the base of the Peralta Hills, and then flows generally southwest to its outfall into the Pacific Ocean between the cities of Newport Beach and Huntington Beach. Other, smaller drainage features include Carbon Creek, which originates in the Chino Hills and flows along the northern site boundary, from east to west, before discharging into a lower reach of Coyote Creek, immediately before its confluence with the San Gabriel River.

2.3 HYDROGEOLOGY

The site is located within the Los Angeles Basin physiographic region. The Los Angeles Basin is divided into four structural blocks delineated by zones of faulting and flexure. The central block, in which the site is located, extends from the Santa Monica Mountains in the north to the San Joaquin Hills in the south. The central block is dominated by a northwest-trending synclinal trough. The basement complex is of pre-Cretaceous metasedimentary and metavolcanic rocks with some plutonic intrusions. The basement rocks are overlain by marine and nonmarine clastic sedimentary rocks of late Cretaceous through Pleistocene age. This sedimentary sequence reaches a cumulative thickness of up to 32,000 feet in some areas (Yerkes, et al., 1965). Overlying these sedimentary rocks is a series of unconsolidated alluvial deposits. Only the uppermost portion of this sequence of unconsolidated alluvial deposits contains fresh water.

The fresh water-bearing alluvial deposits beneath the Coastal Plain of Orange County range in thickness from 500 to 2,000 feet, depending on location. According to the California Department of Water Resources (CDWR), they consist primarily of unconsolidated stream channel, marine terrace, and alluvial deposits of Pleistocene to Recent age (CDWR, 1967). In the central and coastal areas of the basin, individual fresh water-bearing units are separated by extensive clay and silt layers. These units can be identified and correlated between borings/wells and have been given specific aquifer designations. In the inland area of the basin (generally northeast of the Santa Ana Freeway), the clay and silt deposits are thinner and less continuous. The correlation of individual water-bearing units is, thus, more difficult and specific aquifer designations have not been made in most of the inland area (OCWD, 1997).

The complex sequence of fresh water-bearing sediments in the Orange County ground water basin has been divided by CDWR into the Upper, Middle, and Lower aquifer systems (CDWR, 1967). The Upper aquifer system is "comprised of all aquifers overlying the Main aquifer." The Main aquifer comprises the upper portion of the Middle aquifer system throughout most of the basin. The lower portion of the Middle aquifer system is known as the "Lower Main" aquifer and contains "colored" water in some areas, particularly near the coast. The Main and Lower Main aquifers are sometimes referred to collectively as the "principal" aquifer and have been logged to depths of up to 2,000 feet bgs in many areas of the basin (OCWD, 1997). The Lower aquifer system was identified by CDWR based on oil exploration-related electric logs, which indicate the presence of a potentially high permeability, fresh water-bearing zone separated from the overlying Middle aquifer system by an extensive lower permeability deposit. No production wells currently draw water from the Lower aquifer system.

The Upper aquifer system includes the Recent-age Semi perched, Talbert, and Bolsa aquifers and the aquifers of the lower Pleistocene-age Lakewood Formation. According to Harding Lawson Associates (HLA), the depth to the top of the Upper aquifer system in the site vicinity has varied between about 80 to 120 feet bgs from 1992 through 1997 (HLA, 1998). The aquifer material is commonly reported as medium- to coarse-grained sands and gravels. However, thin layers of finer-grained and, hence, lower permeability sediments occur within the coarser-grained sediments (HLA, 1998). These lower permeability layers may not be laterally continuous but are believed to locally inhibit vertical ground water flow. The ground water flow direction in the

Upper aquifer system is generally toward the Pacific Ocean. In the site vicinity, the hydraulic gradient is about 0.003 to 0.007 due west. Aquifer tests performed by HLA have shown aquifer hydraulic conductivities ranging from 200 and 300 feet per day (ft/day) beneath the AC Products facility and approximately 870 ft/day in the vicinity of the Placentia Flood Control Basin.

In the Anaheim Forebay area, surface water and shallow ground water can move vertically downward in "significant quantities" to the uppermost aquifer used for ground water production, typically the Talbert aquifer. The aquifers in the Anaheim Forebay area include occasional lenses of clay and silt but typically exhibit unconfined to semi-confined characteristics. However, the heterogeneity of the coarse- and fine-grained sediments makes aquifer and ground water flow path delineation extremely difficult in the Anaheim Forebay area. In the Pressure area, surface water and shallow ground water are prevented from percolating in large quantities into the uppermost "producible" aquifer by clay and silt layers at shallow depths. Potentiometric head differentials of 50 to 100 feet are common between shallow, often semi-perched aquifers and the underlying production aquifers in the Pressure area (OCWD, October 1997).

3.0 GROUND WATER FLOW MODELING

To simulate the potential impact of recharge on the AC Products plume, a three-dimensional numerical model was constructed. The model was developed as a two-step process: flow modeling first and then contaminant transport modeling. The flow model presented in this section is a refinement of the previous local ground water flow model of a sub-area within the Anaheim Forebay (EGI, 2002). The previous local flow model was itself based on the regional model developed by OCWD. Using input and output parameters from the regional model, Rubicon has constructed a refined local flow model in the area of the proposed La Jolla Basin. The numerical grid and generated flow field from the refined local flow model form the basis for the transport model described in Section 4.0. The regional and local flow models are described below.

3.1 REGIONAL FLOW MODEL

OCWD has developed a regional ground water flow model of the Coastal Plain of Orange County (OCWD, 2001). The model was constructed using the U.S. Geological Survey's Three-Dimensional Finite-Difference Modular Ground-Water Flow code commonly referred to as MODFLOW (McDonald and Harbaugh, 1988; Harbaugh and McDonald, 1996).

3.1.1 Regional Model Geometry and Aquifer Parameters

OCWD's regional flow model covers the entire Orange County ground water basin and extends approximately five miles into the Central Basin in Los Angeles County. The extent of the regional model boundaries is shown in Figure 3. The total area of the model domain is approximately 315 square miles. The model grid consists of 212 rows, 296 columns, and 3 layers. Horizontal grid spacing is uniformly 500 feet by 500 feet across the model. A total of 95,513 cells are active in the three model layers. The grid rotation is 39 degrees west of north.

The three model layers are conceptualizations of three aquifer systems. Specifically, the first or upper layer represents the Shallow Aquifer system. The second and third layers represent the Principal and Deep Aquifer systems, respectively. The three aquifer systems are separated by lower permeability strata throughout most of the basin. These aquitards are implicitly represented in the regional model by the spatially varying, vertical conductance terms assigned within the three model layers. As simulated in OCWD's regional model, the aquitard separating the Shallow and Principal Aquifer systems pinches out in the vicinity of the potential La Jolla Basin.

The regional model uses MODFLOW's "confined/unconfined" layer type option for all three model layers. For this option, the top and bottom elevations for each cell are input. During the model run, if the head value is above the top-of-cell elevation, a confined condition exists and the transmissivity is calculated as the horizontal hydraulic conductivity times the vertical cell thickness. If the head value is below the top-of-cell elevation, the cell is unconfined and transmissivity is calculated as the saturated thickness times the hydraulic conductivity.

The Orange County ground water basin is divided into the Forebay area to the north and Pressure area to the south. In the Forebay area, unconfined water table conditions exist in the Shallow Aquifer. In this area, ground surface elevations have been input for top elevation of the upper model layer. In the Pressure area, an aquitard separates the top of the Shallow Aquifer from semi-perched water zones. Here the elevation of the aquitard bottom has been used to represent the elevation of the top of the upper model layer.

For each of the three modeled aquifer systems, OCWD has created Geographic Information System (GIS)-type polygon coverages of aquifer parameters, including horizontal hydraulic conductivity, vertical to horizontal conductivity ratios, primary storage coefficient, and secondary storage coefficient. In addition, coverages have been created representing the vertical hydraulic conductivity for the two aquitards between the first, second, and third model layers. In constructing the regional model, OCWD has mapped these "grid-independent" polygon coverages to individual grid cells of the model.

3.1.2 Regional Model Stresses and Boundary Conditions

MODFLOW's Well Package is used to model the following stresses in the regional model:

- Outflow from production, dewatering, and seawater barrier extraction wells.
- Inflow from seawater barrier injection wells (Talbert and Alamitos barriers).
- Inflow from the La Habra Basin.
- Inflow from unlined channels.

Inflows to the regional model from the following sources are simulated using MODFLOW's Recharge Package.

- Areal recharge from rainfall in the Forebay area.
- Areal recharge from semi-perched water in the Pressure area.
- Recharge from surrounding mountain fronts including the Chino, Peralta, San Joaquin, and Tustin Hills, and from the Santa Ana Mountains.
- Inflow from recharge facilities, for example the Miller and Kraemer basins and the Santa Ana River.

Inflow and outflow from the Shallow Aquifer (Layer 1) at several locations along the model perimeter are controlled using constant-head boundary conditions. This includes assigned head values between 0 and 1 foot above mean sea level (MSL) where the Alamitos, Bolsa, and Talbert Gaps reach the ocean. Also, constant head values of approximately 260 feet MSL have been assigned where the Santa Ana River crosses the northeastern boundary of the model domain (Figure 3).

Variable head values have been assigned to cells where the regional-model domain borders the Central Basin. Variable head boundary conditions were also assigned along the west end of the La Habra Basin and the area of inflow from the Santiago Canyon. Variable head conditions were simulated using MODFLOW's CHD1 package (Leake and Prudic, 1991).

3.1.3 Simulated Time Period and Model Calibration

To develop a local flow model in the site vicinity, EGI (2002) used the regional model simulation input data for a transient calibration run covering a nine-year period between November 1, 1990 and October 31, 1999 (OCWD Calibration Run No. 50). The nine-year period is divided into 108 monthly stress periods. At the beginning of each stress period, model stresses, including pumping rates, recharge rates, and head values at variable head boundaries, are updated. Within each stress period, the numerical model uses time steps of one day.

3.2 Initial Local Flow Model

OCWD's regional model was developed primarily as a predictive tool to test future basin management strategies and was not intended for use in small-scale, site-specific studies such as the evaluation of recharge at the proposed La Jolla Basin. To evaluate the effects of potential recharge at the site, a local model was first constructed that covers a sub-domain of the regional model in the vicinity of the proposed La Jolla Basin site (EGI, 2002).

The local flow model was developed with the aid of the Department of Defense Groundwater Modeling System (GMS) software. GMS is a comprehensive graphical environment for performing ground water simulations using many widely accepted models, including MODFLOW and MT3DMS. GMS includes tools for grid generation, regional to local model conversion, and post-processing. The previous local flow model was a steady-state flow simulation, i.e. one set of flow conditions, including regional flow gradients and directions, extraction rates, and recharge were used to simulate average historical water levels.

3.2.1 Local Model Geometry

The horizontal extent of the initial local model domain is shown in Figure 4. The horizontal dimensions of the model domain are approximately 3.5 miles in the east-west direction and 1.9 miles in the north-south direction. The local model domain is completely within the Anaheim Forebay area. Figure 4 shows the locations of the potential La Jolla Basin and the AC Products facility immediately to the south.

GMS's automatic grid generation module was used to horizontally discretize the model domain. The grid was refined in areas where the hydraulic gradients would be greatest, including within the potential La Jolla Basin and at the location of active production wells. For the recharge basin, a minimum or base cell size of 50 feet by 50 feet was set up at the center of the potential recharge basin. Here a cell bias of 5 percent was assigned, i.e. the relative cell dimensions in the x and y directions in adjacent cells were increased by 5 percent. At production well locations, a base cell size of 75 feet by 75 feet with a bias of 10 percent was selected. The resulting horizontal grid, shown in Figure 5, has 104 rows in the north-south direction and 189 columns in the east-west direction. The maximum cell dimensions were 196 and 224 feet in the east-west and north-south directions, respectively.

The previous local model had five vertical layers (EGI, 2002). As with the regional model, a single layer was used to represent each of the aquifer systems: Layer 1 represented the Shallow

Aquifer, Layer 3 represented the Principal Aquifer, and Layer 5 represented the Deep Aquifer. Unlike the regional model, the aquitards separating these water-bearing zones were modeled explicitly in the local model. Layer 2 represented the aquitard separating the Shallow and Principal Aquifers and Layer 4 represented the aquitard between the Principal and Deep Aquifers. Layer elevations for the local model grid cells were determined using the top and bottom layer elevations from the regional model, i.e. the elevations at the centers of the local model grid cells were determined by interpolating from the values input into OCWD's regional model.

3.2.2 Aquifer Parameters

Aquifer parameters were initially assigned to each layer in the initial local model using the same GIS coverages applied to the regional model. These included the following coverages:

- Horizontal hydraulic conductivity in the Shallow, Principal, and Deep Aquifers
- Ratios of horizontal to vertical conductivities in the Shallow, Principal, and Deep Aquifers.
- Vertical hydraulic conductivities in the aquitard separating the Shallow and Principal Aquifers, and in the aquitard separating the Principal and Deep Aquifers.

Horizontal conductivities in the two aquitards were assigned the same value as the vertical hydraulic conductivity. For the aquitard separating the Shallow and Principal Aquifers, the ratio of vertical to horizontal conductivity ranged from 0.0005 to 1.0 ft/day. For the aquitard separating the Principal and Deep Aquifers the ratio of vertical to horizontal conductivity ranged from 0.002 to 0.005 ft/day.

During model calibration, no changes were made to the hydraulic conductivities for the Principal or Deep Aquifers, or for the two aquitards. However, hydraulic conductivities for the Shallow Aquifer (Layer 1) were updated, as discussed below.

3.2.3 Initial and Boundary Conditions

Simulations of the initial local flow model were performed under steady-state flow conditions for a given date. The date selected was May 31, 1998, which corresponds to the end of the 91st stress period in the transient regional model simulation. This particular date was selected because the hydraulic head values and hydraulic gradients represented approximate average conditions for the nine-year simulation.

The initial head values assigned to the local model grid cells were derived from the regional model values at the end of the May 1998 stress period. For the layer representing the Shallow Aquifer, head values from the regional model output were interpolated onto the refined local model grid. The same was performed for the layers representing the Principal and Deep Aquifers. For the starting head conditions in the previous local model representing the two aquitards, an average value from the overlying and underlying aquifers was assigned to each cell.

For the initial local flow simulation, "constant head" conditions were first assigned to each grid cell along the model boundary. As discussed below, the initial head values and boundary conditions in the top layer were updated during model calibration.

3.2.4 Sources and Sinks

Hydraulic sources and sinks for the initial local model were duplicated from the May 1998 stress period of the regional model. These stresses included extraction from wells, recharge into existing recharge basins, and areal recharge applied throughout the model domain.

Two existing flood control basins are located within the local model domain: the Placentia and Raymond Basins. These basins are occasionally used for ground water recharge. However, no recharge into these basins occurred during May 1998 and, therefore, no recharge specific to these sites was modeled during the initial local model simulations. As described below, subsequent simulations using a refined local model included recharge at the Placentia Basin.

A uniform areal recharge value of 0.001 ft/day was applied to the top of Layer 1. This represents precipitation- and applied water-derived recharge through the vadose zone down into the shallow aquifer.

Twelve production wells had recorded extraction rates during May 1998. The extraction rates are the same used for the May 1998 stress period in the regional model. One extraction well was included in the local model that was not in the regional model. That well was AC Products' Extraction Well P-2, located near the eastern edge of Placentia Basin. Based on AC Products operational data, an extraction rate of 500 gpm was assigned to this well.

3.2.5 Local Flow Model Calibration

The construction of the initial local model (EGI, 2002) included calibration runs for the flow domain. Calibration runs began with the geometry, hydraulic parameters, sources and sinks, and initial and boundary conditions described above. The initial runs showed an extremely close match of the head values generated during the May 1998 stress period of the regional model.

As mentioned earlier, the regional model was calibrated to measured head values in many observation wells located in the Shallow, Principal, and Deep Aquifer systems, including wells located in the immediate vicinity of the potential recharge. By extension, as the local model simulation effectively reproduced Principal-aquifer head values generated from the regional model, the local model calibration of the Shallow Aquifer was considered sufficient.

In the Shallow Aquifer, modeled water levels were compared to those generated during AC Products' site-specific investigations. In the course of defining and monitoring the extent of the PCE plume originating from the AC Products site, several Shallow Aquifer wells were installed. Water level elevation data for these wells have consistently shown a ground water flow direction that is due-west, which differs from the regional model's Shallow-Aquifer southwesterly flow direction. AC Products' water level data sets include a round of measurements recorded on June 9, 1998, close to the May 31, 1998 simulation date. This data set showed westerly flow with an average hydraulic gradient of 0.0046 between the AC Products site and State College Boulevard. Moreover, the shape of the PCE plume originating from the AC Products site indicates that the predominant flow direction is due-west. West of State College Boulevard, the measured gradient reduces to approximately 0.0032.

To match the water levels in the Shallow Aquifer, the hydraulic conductivities and boundary conditions of the local model Layer 1 were adjusted. To match the westerly flow direction, the boundary conditions on the north and south of the model were changed from "constant head" to "no flow." The boundary conditions on the western edge of the model domain were left as "constant-head," keeping the interpolated head values from the regional model. The eastern boundary cells were also left as constant head but the heads were updated to a uniform value of 120 feet MSL.

The hydraulic conductivities in Layer 1 were updated until the measured hydraulic gradient was matched. Cells to the east of Well P-2 were assigned a constant value of 300 ft/day. To the west of Well P-2, all Layer 1 cells were assigned a uniform horizontal hydraulic conductivity value of 800 ft/day. All cells in Layer 1 were assigned vertical hydraulic conductivity values equal to one-fifth the horizontal conductivity value.

The gradient and direction are in agreement with those determined from AC Products' June 9, 1998 water level measurements. The simulated and measured water levels are also in close agreement in absolute terms. For instance, the simulated water level immediately downgradient of the AC Products site was 110 feet MSL (100 feet bgs) and the recorded value at this location was 110.78 ft MSL (AC Products Well MW-13).

3.3 Refined Local Flow Model

For the current study, the local flow model was changed to a transient flow model to more accurately represent flow conditions over the time that the AC Products plume has been present. Although the regional flow directions and gradients were held constant as before, the simulated production well extraction rates, and the Placentia Basin recharge rates were varied over the modeled time period to reflect recorded historical values. The modeled simulation time was a 28-year period from January 1, 1988 through January 1, 2016. The beginning time was based on an estimation of when the Shallow Aquifer first became impacted by VOCs at the AC Products facility. It was also assumed that recharge into the La Jolla Basin would begin on January 1, 2006. Therefore, the model simulates the impact of the first 10 years of recharge on the AC Products plume.

3.3.1 Local Model Geometry

No refinements were made to the local flow model in the horizontal direction. The areal extent and horizontal cell discretization were unchanged (Figure 5).

As one of the objectives of the transport modeling was to quantitatively simulate the potential downward migration of VOCs into the Shallow Aquifer, the previous model grid was further refined in the vertical direction. As the model calculates parameters such as water levels and contaminant concentrations at each cell, the refinement in the vertical direction provides the desired resolution for calculating and tracking downward contaminant plume movement. Specifically, the five layer model was converted to a 17-layer model as follows:

Initial Local Flow Model Layer	Refined Local Flow Model Layer	Zone
1	1-5	Shallow Aquifer
2	6	Aquitard
3	7-15	Principal Aquifer
4	16	Aquitard
5	17	Deep Aquifer

The final grid featured a total of 189 columns (east-west direction), 104 rows (north-south direction), and 17 layers for a total number of 334,152 cells. A cross-section of the model grid passing through the site is shown in Figure 6. The location of the cross-section is shown in Figure 5

3.3.2 Aquifer Parameters

No updates were made to the aquifer properties during the local flow model refinement. For instance, for the Shallow Aquifer, the same hydraulic conductivity distribution for Layer 1 in the initial local flow model was used in Layers 1-5 of the refined model.

3.3.3 Initial and Boundary Conditions

For the refined flow model, a constant regional flow direction and gradient were simulated. The regional flow was simulated by setting up constant value, specified-head conditions at all boundary cells.

For the Shallow Aquifer, specified head values from the initial local flow model Layer 1 boundary cells were first assigned to Layer 1 in the refined model. Layer 1 in the refined model represents the topmost of five layers within the Shallow Aquifer. At this point, the boundary values were altered slightly from the initial model run to further adjust to regional flow direction in the Shallow Aquifer. The initial model simulated a due-west Shallow Aquifer regional flow direction. Boundary conditions in the refined model were updated to alter the regional flow direction slightly to the north. In this manner, the flow path from the contaminant source area at the AC Products facility was directed toward Extraction Well P-2, then toward Well P-3. The flow direction was altered by first assigning "specified head" conditions to all Layer 1 boundary cells in the refined model (the north and south boundaries had "no flow" conditions in the initial model). The specified head values in the refined model's Layer 1 boundary cells were then updated by trial and error to alter the flow direction as described above.

For the Principal Aquifer, the boundary cell specified-head values from Layer 3 in the initial model were assigned to Layer 13 within the refined model. The center of Layer 13 represents mid-depth of the Principal Aquifer. For the Deep Aquifer, the boundary cell specified-head values from Layer 5 of the initial flow model were assigned to Layer 17 of the refined model.

Specified-head boundary conditions for 3 of the 17 layers within the refined model were based on the previous flow model boundary conditions as described above. An intermediate, steady-state model run was then performed to generate the boundary conditions in the remaining 14 layers. All interior cells were set to "inactive." The boundary cells for Layers 1, 13, and 17 of the refined model were set as specified-head values with values derived from the initial model. The boundary cells from the remaining 14 layers were set to "active" with the head values then calculated in the intermediate model simulation. The calculated boundary-cell head values were then used as specified-head values in subsequent model runs (see below).

3.3.4 Sources and Sinks

As discussed above, the boundary-head conditions were modeled using constant values throughout the model simulation, representing steady state regional flow directions and gradients. Also, a uniform areal recharge value of 0.001 ft/day was applied to the top of Layer 1 throughout the simulation time period. This represents area-wide recharge into the Shallow Aquifer such as precipitation.

Whereas the regional flow and areal recharge were held constant for the flow simulations, transient values for ground water extraction and recharge were used to better simulate historical conditions. Specifically, actual recorded values for production well extraction rates and Placentia Basin recharge rates for the 1988 through 2003 time period were simulated. Values for these flow "stresses" were updated annually in the model simulation.

There are 13 production wells within the local model domain which had been active from 1988 through 2003. Also, there are three Shallow Aquifer remediation wells that have been operated by AC Products, Wells P-1, P-2, and P-3. Well P-1 is located at the AC Products facility. This well was in operation between October 1995 and November 1997 to remediate the VOC source area. VOC mass removal via P-1 extraction is implicitly incorporated into the transport model by the reduction in source concentrations (see Section 4.0) rather than explicitly incorporating the extraction rate into the flow model.

Historical extraction rates for AC Products Extraction Wells P-2 and P-3 are incorporated into the refined flow model. Well P-2 is located near the northeastern corner of the Placentia Basin, approximately 0.8 mile downgradient of the AC Products facility. AC Products Well P-3 is approximately 1.8 miles downgradient of the AC Products facility. The water extracted from Well P-3 is treated and reinjected into Well P-3inj, which is perforated in the Principal Aquifer. The locations of these wells are shown in Figure 4 and their completion details are summarized in Table 1.

The recorded annual flow volumes for these production/remediation wells from 1988 through 2003 are shown in Table 2. These are the flow volumes which were used in the MODFLOW simulation. Projected flow volumes for these wells from the beginning of 2004 through the end of 2015 were provided by OCWD (Table 2).

Two existing flood control basins are located within the local model domain: These are the Placentia and Raymond Basins. Both basins have been used periodically by OCWD for ground water recharge. The Placentia Basin is located along the axis of the AC Products plume and, therefore, has a potential for influencing the movement of VOCs in the underlying aquifers. The simulated recharge rates for the Placentia Basin are presented in Table 3 and Figure 7. The values for 1988 through 2003 are recharge volumes recorded by OCWD. OCWD expects to continue to use the Placentia Basin for recharge in the future. OCWD's estimate of 2,100 acre-feet per year (acre-ft/year) of future recharge has been used in the model simulation for the January 1, 2005 through January 1, 2016 time period.

A total of three transient flow scenarios were simulated using the refined model. During each of the three scenarios, the aforementioned flow boundary conditions and stresses were utilized. The model scenarios differed only in the modeled recharge into the La Jolla Basin, which is the final hydraulic stress considered. The modeled recharge rates for the three scenarios are summarized in Table 4. The first is a baseline simulation where no recharge occurs in the La Jolla Basin. In the second scenario, a constant recharge rate of 4,500 acre-ft/year is simulated beginning in January 2006. This recharge volume is based on an infiltration rate of 2.05 feet per day (ft/day) over 6 acres. This recharge rate is OCWD's best estimate at this time of the average annual recharge rate. The recharge rate is doubled to 9,000 acre-ft/year (4.1 ft/day) in the third scenario, representing what OCWD considers maximum recharge conditions, which would only occur if the basin were continuously operated and cleaned using a basin cleaning vehicle.

The simulated head values varied throughout the modeled time period because of the varying extraction and injection rates. The head values for the final time-step in Simulation 1 (No La Jolla recharge) are illustrated in Figures 8, 9, and 10. Figure 8 shows a plan view of the simulated water levels in the Shallow Aquifer. The regional flow direction is to the west and local "mounding" at the Placentia basin.

The simulated potentiometric surface, shown in Figure 9, illustrates the southwesterly flow direction in the Principal Aquifer. A steep hydraulic gradient is observed in the southeastern corner of the model domain. This is an area near the boundary of the Principal Aquifer in the regional model. The steep gradient is a result of the specified flux condition applied in the regional model simulation.

An east-to-west profile view of the simulated head values for the final timestep in Simulation 1 is shown in Figure 10. This view indicates that beneath the La Jolla Basin, where the first aquitard has pinched out, no significant vertical gradient exists between the Shallow and Principal Aquifers. Further west, as the aquitard thickness increases, the vertical gradient is more apparent.

Similar results for the simulated head values in Simulations 2 and 3 are shown in Figures 11 through 13, and 14 through 16, respectively. The profile for Simulation 2 shows the Shallow Aquifer mounding at the La Jolla Basin and the downward hydraulic gradient created by the recharge. The profile for Simulation 3 shows the increased effects as the recharge rate is increased from 4,500 to 9,000 acre-ft/year.

3.3.5 Summary of Refinements to Local Flow Model

The significant refinements to the initial flow model are summarized as follows:

- The number of layers in the model was increased from 5 to 17 to allow for a higher resolution of flow and contaminant transport in the vertical direction.
- The specified boundary head conditions for the Shallow Aquifer were altered slightly to more accurately represent the westerly flow direction in the Shallow Aquifer.
- The model was converted from a steady-state to transient flow simulation to honor varying pumping and recharge rates and to enable the introduction of La Jolla Basin recharge at a specified time. Three model simulations were performed with recharge in the La Jolla Basin at rates of zero, 4,500, and 9,000 acre-ft/year beginning on January 1, 2006.

4.0 CONTAMINANT TRANSPORT MODELING

Using the flow field from the local flow model runs, a transport model was constructed to simulate the historical movement of the PCE plume originating from the AC Products facility, and to predict the effects of any future recharge into the proposed La Jolla Basin on the plume. Transport modeling was performed using the numerical code MT3DMS (Zheng and Wang, 1996), which utilizes the same finite difference model grid generated by MODFLOW. The transport model also utilizes the flow field generated by MODFLOW to simulate the mass transport component of the plume. The MT3DMS code is capable of simulating the following transport parameters:

- Advection
- Dispersion
- Adsoption
- Decay
- Varying source concentration

The approach to calibrating the transport model was to vary these transport parameters to reasonably simulate historical concentrations of PCE in selected monitoring wells. Site-specific characteristics, literature data, and previous modeling experience were utilized as guidance for selecting the appropriate range of parameters. The selected wells included Shallow Aquifer AC Products Monitoring Wells MW-20S and MW-24S. Well MW-20S is located adjacent to Extraction Well P-2 near the northeastern corner of the Placentia Basin. Particular emphasis was placed on calibration to Well MW-20S, which is representative of the area of the plume expected to be most influenced by La Jolla Basin recharge. This area is between the AC Products facility and the Placentia Basin. Well MW-24S is located adjacent to Extraction Well P-3, approximately 1.8 miles downgradient of the AC Products facility.

4.1 SOURCE CONCENTRATION

The source of the plume was modeled by assigning a time-varying concentration of PCE to a single cell within the top layer of the model grid. The location of the source cell is shown in Figure 5. During transport model calibration runs, the "plume start time" and the "source strength versus time profile" were varied. The final plume start time selected was January 1, 1988. The final source strength is shown in Table 5 and Figure 17. The source concentration on January 1, 1988 for the final calibration run was 35,458 $\mu g/\ell$ of PCE. It is assumed that the source area concentrations decrease logarithmically to 100 $\mu g/\ell$ in 2005 and 10 $\mu g/\ell$ in 2011. It is noted that the effects of the onsite AC Products Extraction Well P-1 are inherently included in the modeled decrease in source concentration.

4.2 AQUIFER TRANSPORT PARAMETERS

Other transport parameters refined during model calibration runs included dispersivity and retardation. For the final calibration run, the longitudinal dispersivity was set to 5 feet. The transverse and vertical dispersivities were set to 30 percent of longitudinal value, or 1.5 feet. These dispersivities are considered relatively low and contribute less to the transport of the plume compared to the advective component. An advective-dominant plume is characteristically narrow in the direction transverse (or perpendicular) to the regional flow direction. The low dispersivities are supported by the observed AC Products monitoring well data, which indicate a long narrow plume downgradient of the AC Products facility (Mc^2, 2004).

The retardation factor, *R*, for the contaminant transport represents the movement of the advective front of the plume relative to the ground water flow velocity. The retardation of the plume movement is related to the adsorption of the PCE onto the soil matrix or soil organic matter as the plume travels in ground water through the aquifer. For the final calibration run, the *R* value for PCE was set to 2.0 for the entire model domain. The effect is that the advective front of the plume moves at one half the velocity of ground water flow. This value is within the range of literature values for PCE (Mehran et al., 1990; Hoffman, 1995).

The transport modeling runs did not consider molecular diffusion, which is expected to be relatively minor as compared to advection and dispersion. The model also assumes that PCE does not degrade in the aquifer. The observed data indicate that degradation compounds of PCE, including TCE and 1,1-DCE are present. However, the concentrations of the degradation compounds are low compared to the PCE concentrations. In addition, ground water in the Shallow Aquifer is generally aerobic, which is not conducive to in-situ degradation of PCE.

4.3 Transport Model Calibration

As discussed above, calibration of the transport model was performed by varying the source and transport parameters such that the modeled concentrations downgradient of the source reasonably matched the historical PCE concentrations in selected downgradient monitoring wells. The observed versus simulated concentrations in AC Products Wells MW-20S and MW-24S are shown in Figures 18 and 19, respectively. The observed data indicate that monitoring at these locations began after the leading edge of the plume had arrived. Therefore, it is not possible to calibrate to the initial increase in PCE concentrations. The observed data show steadily-decreasing concentrations since monitoring began. The simulated concentrations agree with the magnitude and trend of observed data in Well MW-20S (Figure 18). This indicates that the model is reasonably calibrated for the PCE plume between the AC Products facility and the Placentia Basin. As mentioned above, this is the area expected to be most influenced by the La Jolla Basin recharge.

Calibration data for Well MW-24S, located 1.8 miles downgradient of the source (Figure 19), indicates that the slope of the PCE concentrations versus time is similar for the observed and simulated data. However, the relative magnitude for the simulated concentrations is higher than the observed concentrations. It is noted that the higher simulated concentrations would provide a conservative estimate of the potential effects of recharge in prediction scenarios, i.e. the simulated PCE residuals are expected to be higher than the observed concentrations.

The calibrated transport model reasonably represents the PCE migration behavior, especially for the existing plume between the AC Products facility and the Placentia Basin. The ability to match the historical data using a calibrated set of transport parameters gives confidence in predicting the future transport of the plume using the same parameters.

Both the observed and modeled plumes indicate that the center of mass of the PCE plume has moved a considerable distance from the site. Recent data indicate that as of March 2004, the center of mass was near the Placentia Basin, approximately 0.8 mile downgradient of the AC Products facility (Mc^2, 2004). This is significant because the effects of the proposed recharge into the La Jolla Basin are most pronounced near the basin itself.

4.4 PREDICTIVE TRANSPORT SIMULATIONS

Once the transport model calibration was completed, predicted transport simulations were performed. Specifically, three transport scenarios were modeled based on the three flow model scenarios discussed in Section 3.2 and summarized in Table 4. The simulation period for each scenario was January 1, 1988 through January 1, 2016. The model simulation parameters were identical for the time period of January 1, 1988 through January 1, 2006, prior to any simulated La Jolla Basin recharge. Here, the final calibration run (1988-2004) is first extended to the end of 2005 using anticipated hydraulic stresses for 2005. The simulated extent of PCE concentrations above the 5 µg/ℓ maximum contaminant level (MCL) for PCE in the Shallow and Principal Aquifers are shown in Figures 20 and 21, respectively.

The three scenarios differed only in the assumed La Jolla Recharge for the final 10 years of the simulation (2006-2015). The first scenario is the baseline in which there is no recharge at the La Jolla Basin. The second and third scenarios simulate constant recharge rates of 4,500 and 9,000 acre-ft/year, respectively, beginning on January 1, 2006.

A total of six computer animation files have been included on a CD included with this report. These animations show the movement of PCE plume throughout the simulation period. The six animations show concentrations at the top of the water table within the Shallow Aquifer (Model Layer 1) and Principal Aquifer (Model Layer 7) for the three recharge scenarios. It is noted that the top of the water table and top of the Principal Aquifer are approximately 100 feet and 285 feet, respectively, beneath the La Jolla Basin. Comparison of the animations shows the La Jolla Basin recharge water transporting the residual PCE plume near the AC Products facility to the south.

The simulated future concentrations at AC Products Monitoring Well MW-20S are shown in Figure 18. The effects of the recharge are observed at this well after 2 years (2008) because of the dilution and redirection of the plume to the south. These effects are more pronounced in Scenario 3 (9,000 acre-ft/yr) than in Scenario 2 (4,500 acre-ft/yr).

The predicted concentrations at AC Products Monitoring Well MW-24S are shown in Figure 19. The graph shows that the La Jolla Basin recharge will have a negligible effect on the plume near this well.

A comparison of the extent of the PCE plume above the MCL in the Shallow Aquifer after five years of recharge (January 1, 2011) for the three simulations is shown in Figure 22. A similar comparison for PCE in the Shallow Aquifer after 10 years of recharge (January 1, 2016) is shown in Figure 23. The corresponding comparisons of PCE in the Principal Aquifer (Layer 7) after 5 and 10 years of recharge are shown in Figures 24 and 25, respectively.

Figures 26, 27, and 28, show the extent of areas exceeding the MCL in the Shallow Aquifer at any time during the La Jolla Recharge period (January 1, 2006 through January 1, 2016) for the three simulations. The corresponding extent of the areas exceeding the MCL in the Principal Aquifer is shown in Figures 29, 30, and 31. The figures indicate that the above-MCL plume in the Shallow Aquifer is translated a maximum of approximately 225 feet to the south for the 4,500 acre-ft/yr recharge scenario (Figure 27), and 380 feet to the south for the 9,000 acre-ft/year scenario. In both scenarios, the maximum translation occurs between the AC Products facility and the Placentia Basin. The residual PCE downgradient of the Placentia Basin is relatively unaffected under both recharge scenarios.

In the Principal Aquifer, the residual above-MCL plume downgradient of the Placentia Basin is sufficiently far enough from the La Jolla Basin that it is also unaffected by the proposed recharge (Figures 29, 30, and 31). Also, no new "above MCL plume" appears in the Principal Aquifer near the AC Products facility as a result of the proposed recharge. A visualization of the plume movement versus time for the three recharge scenarios in both the Shallow and Principal Aquifers are shown in the animation files attached to this report.

5.0 FINDINGS AND RECOMENDATIONS

5.1 FINDINGS

The findings for the contaminant transport modeling are summarized as follows:

- OCWD regional model, in development since 1988, has been used to establish the flow regime in the local model domain of interest. The calibration data provided by OCWD demonstrate that the regional flow model is a reasonable representation of the flow regime.
- The local flow model maintains the integrity of the regional model but provides a more refined flow field for transport computations.
- The transport model considers advection, dispersion, and retardation mechanisms to account for the transport of PCE in the Shallow and Principal Aquifers. In addition, the transport model considers the effects of source concentration reduction on the downgradient plume. This is achieved by utilizing the observed PCE concentrations in the source area for the duration of the record.
- Transport simulations have been performed to calibrate the PCE plume against the observed data. Wells MW-20S and MW-24S located approximately 0.8 and 1.8 miles, respectively, downgradient of the source have been used for this purpose.
- The calibration results show a reasonably good agreement between the observed and simulated concentrations, particularly for Well MW-20S. Also, the simulated decreasing concentration trend and slope agrees with the observed data collected at Well MW-24S. However, the relative magnitudes of simulated concentrations are higher than the observed data. These higher simulated concentrations provide a conservative analysis, i.e. the actual residual concentrations would be lower than the simulated concentrations.
- To predict the migration behavior of PCE, three recharge scenarios were considered: zero, 4,500, and 9,000 acre-ft/year beginning on January 1, 2006. The calibrated transport model was used to evaluate the relative impact of these recharge scenarios on the disposition of the PCE plume. As the three scenarios are identical with the exception of the La Jolla Basin recharge rate, the results are meaningful to assess the impact of recharge irrespective of model uncertainties.
- Animations of the transport simulations show migration of the PCE plume under the three recharge scenarios for the Shallow and Principal Aquifers. The effects of recharge on plume configuration are more pronounced for the 9,000 acre-ft/year scenario.
- Predictive simulations for the Shallow Aquifer demonstrate that under the no-recharge scenario, PCE concentrations in Well MW-20S reduce gradually but

continue to be present until 2016. For the other two recharge scenarios, after approximately two years of recharge, PCE concentrations reduce significantly because of the dilution effects of transport processes and plume redirection (Figure 18).

- Predictive simulations for the Shallow Aquifer show that extent of above-MCL PCE plume may be translated south by approximately 225 and 380 feet under the 4,500 and 9,000 acre-ft/year recharge scenarios, as compared to zero recharge scenario.
- Predictive simulations for the Principal Aquifer show that under all three recharge scenarios, PCE concentrations decrease with time irrespective of the magnitude of recharge. This transport behavior is expected because presently the PCE plume has migrated away from the AC Products facility and the induced gradients from recharge are most pronounced in the immediate vicinity of the La Jolla Basin. Therefore, the potential for additional vertical migration of PCE into the Principal Aquifer is minimal.

5.2 RECOMMENDATIONS FOR CONFIRMATION OF MODELING RESULTS

Upon recharge into the La Jolla Basin, the model predicts that PCE concentrations in wells along the current axis of the Shallow Aquifer plume between the AC Products facility and the Placentia Basin will decrease with time. Confirmation of the model results can be accomplished by monitoring the PCE concentrations to assess the potential impact of recharge and any remedial measures that may be in effect. The existing monitoring well locations in the vicinity of the AC Products facility and Placentia Basin are shown in Figure 32. The corresponding well construction details are shown in Table 6. The model-predicted lateral extent of PCE in the Shallow Aquifer, representing greater than MCL with recharge of 4,500 and 9,000 acre feet per year, is also shown in Figure 32. To confirm the model results and to document changes in PCE concentration, it is recommended that the data reported by AC Products to the RWQCB be utilized to track water quality. Specifically, data reported for existing AC Products wells along the current axis of the plume should be utilized, including:

- MW-8S, MW-8D
- MW-9S, MW-9D
- MW-12
- MW-14S, MW-14D-A, MW-14D-B, and MW-14D-C
- MW-20S, MW-20D-A, MW-20D-B, and MW-20D-C

The model results also indicate that PCE concentrations in wells to the south of the axis of the PCE plume between the AC Products facility and the Placentia Basin may show a temporary increase in PCE concentrations. The following AC Products wells are located in this area and, therefore, it is also recommended that reported data for these wells be utilized to measure changes in PCE concentrations and confirm model results:

- MW-13
- MW-15
- MW-16
- MW-17

These monitoring wells are perforated in the Shallow Aquifer as defined in this modeling effort. The frequency of monitoring will depend on recent changes in PCE concentrations and AC Products monitoring requirements.

To supplement the data reported by AC Products, two additional monitoring wells are recommended to be installed in the Shallow Aquifer. The locations of the proposed monitoring wells are shown in Figure 32. Wells SMW-1 and SMW-2 are situated to complement the existing wells for confirming modeling results in the south portion of the project area by monitoring any southerly component of transport downgradient of AC Products. The recommended perforated intervals are 95 to 125 feet bgs. In addition to the two Shallow Aquifer monitoring wells, one monitoring well, screened in the Principal Aquifer adjacent to SMW-1 is recommended. It is recommended that this proposed Well PMW-3 should be perforated from 270 to 300 feet bgs. The recommended screened intervals may be changed based on the observed stratigraphy encountered well boring activities.

The locations of the proposed wells are selected based on proximity to the projected plume under recharge conditions and assumed site accessibility. Monitoring the proposed wells should include measuring the depth to ground water and collecting water samples for chemical analysis using EPA Method 8260B. The results of the monitoring of the recommended wells shall be evaluated in conjunction with the data reported by AC Products to confirm the model results.

The wells should be installed prior to recharge because the model-predicted PCE concentrations are projected to change within a relatively short time after recharge occurs.

Respectfully submitted,

RUBICON ENGINEERING, INC.

David C Hogshead

David C. Hogshead, P.E.
Senior Engineer

Mohsen Mehran

Mohsen Mehran, Ph.D.
Project Manager

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Tables

TABLE 1

PRODUCTION WELL COMPLETION DETAILS

Well	Easting	Northing	Ground Surface Elevation (ft MSL)	Depth to Bottom of Well Screen (ft MSL)	Depth to Bottom of Well Screen (ft MSL)	Elevation Bottom of Well Screen (ft MSL)	Elevation Top of Well Screen (ft MSL)
A-26	6,065,627.0	2,259,411.0	197.8	266	383	-68.2	-185.2
A-6	6,055,667.0	2,256,609.8	162.9	310	610	-147.1	-447.1
CEM2-A	6,061,135.5	2,253,891.3	175.0	300	600	-125.0	-425.0
COCA-A	6,056,551.5	2,256,996.0	167.0	354	654	-187.0	-487.0
F-10	6,062,135.5	2,262,131.8	186.9	460	1,290	-273.1	-1,103.1
F-FS13	6,061,427.5	2,262,060.5	186.1	351	419	-164.9	-232.9
F-KIM1	6,059,376.0	2,261,554.3	167.3	339	572	-171.7	-404.7
F-KIM1A	6,059,677.0	2,261,547.0	172.0	500	1,225	-328.0	-1,053.0
F-KIM2	6,062,849.5	2,261,517.0	189.0	320	626	-131.0	-437.0
P-2	6,065,689.1	2,259,943.5	197.9	100	180	97.9	17.9
P-3	6,059,715.8	2,260,100.9	175.0	125	235	50.0	-60.0
P-3inj	6,059,715.9	2,260,092.1	175.0	375	455	-200.0	-280.0
SCWC-PBF3	6,069,377.5	2,263,420.3	226.0	220	475	6.0	-249.0
SCWC-PBF4	6,069,384.5	2,263,330.0	228.0	275	520	-47.0	-292.0
SCWC-PLJ2	6,067,601.0	2,260,284.8	200.0	402	492	-202.0	-292.0
STEP-A	6,056,098.0	2,257,617.0	161.9	210	275	-48.1	-113.1
TAOR-A	6,067,767.5	2,255,597.0	189.9	200	254	-10.1	-64.1

TABLE 2

SIMULATED PRODUCTION WELL EXTRACTION RATES
(All units are acre-feet per year)

Year	A-26	A-6	COCA-A	F-10	F-FS13(1)	F-KIM1(2)	F-KIM1A	F-KIM2	P-1(3)	P-2	P-3(4)	SCWC-PBF3	SCWC-PBF4	SCWC-PLJ2	STEP-A	TAOR-A
Recorded																
1982	4162.8	687.2	76.2	0.0	1935.8	1469.4	0.0	3020.2	0.0	0.0	0.0	570.1	639.3	803.5	18.1	1.2
1988	2809.7	1016.0	141.8	0.0	1612.2	1252.6	0.0	3096.7	0.0	0.0	0.0	567.2	579.7	808.9	11.3	0.8
1989	2594.4	379.6	111.0	0.0	1711.9	1317.8	0.0	2756.7	0.0	0.0	0.0	524.2	908.6	797.8	15.5	0.5
1990	0.0	0.0	147.2	0.0	1247.8	646.1	0.0	2797.9	0.0	0.0	0.0	577.6	928.8	704.7	11.1	0.9
1991	1524.6	978.4	104.9	1562.7	1359.9	1010.3	0.0	2615.1	0.0	0.0	0.0	549.2	642.2	749.3	4.9	0.8
1992	1979.4	1352.2	89.4	3463.3	1572.5	793.0	0.0	2885.1	0.0	0.0	0.0	567.6	518.5	717.7	3.5	0.8
1993	1836.1	1144.1	64.2	3380.8	787.9	232.2	0.0	2733.5	0.0	0.0	0.0	529.2	623.5	547.7	2.8	0.8
1994	1178.2	710.5	90.2	3243.8	989.7	777.6	0.0	2842.6	0.0	0.0	0.0	340.4	1117.5	530.8	3.8	0.8
1995	1516.4	887.5	79.6	3548.4	1781.9	1423.8	0.0	3210.2	30.6	0.0	0.0	311.0	1378.7	681.1	4.5	0.8
1996	1243.4	1461.7	75.7	3561.9	1415.0	1518.2	0.0	3065.0	128.9	0.0	0.0	490.3	1382.4	642.9	4.2	0.8
1997	1891.4	1468.9	47.9	3522.0	1532.4	1442.6	0.0	3101.6	107.4	0.0	0.0	665.4	1331.9	741.7	5.7	0.8
1998	1608.8	1412.3	45.2	2844.8	1878.9	1187.3	0.0	3243.9	0.0	0.0	0.0	554.9	1313.6	837.2	5.2	0.8
1999	1997.9	730.0	48.9	3393.2	819.1	1549.3	0.0	3083.7	0.0	0.0	0.0	577.7	1218.6	1311.2	6.5	0.8
2000	1451.3	0.0	32.7	3337.2	0.0	1705.8	0.0	3019.5	0.0	275.2	0.0	428.7	1071.6	1315.1	8.8	0.8
2001	1989.2	0.0	0.5	2816.0	0.0	205.5	0.0	2928.7	0.0	555.4	0.0	463.9	1243.6	1221.7	7.3	0.8
2002	1612.1	0.0	0.8	3373.2	0.0	0.0	468.8	2619.5	0.0	0.0	0.0	451.0	1067.0	1006.0	7.8	0.8
2003	1320.3	0.0	1.8	3354.2	0.0	0.0	3676.4	956.0	0.0	492.3	113.1	496.6	1141.1	659.6	9.6	0.8
Projected																
2004	1319.4	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2005	1319.4	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2006	1319.4	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2007	1319.4	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2008	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2009	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2010	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0,0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2011	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2012	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2013	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2014	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8
2015	0.0	0.0	1.8	2536.3	0.0	0.0	3337.2	2669.8	0.0	492.3	484.2	404.3	909.6	906.2	9.6	0.8

Notes
(1) F-FS13 taken out of service in 1994 due to increasing PCE concentration. Well was destroyed in 2002.
(2) F-KIM1 takent of of service in 2001 due to increasing PCE concentrations. Well was destroyed in 2002.
(3) P-1 extraction not included in flow simulation. Effects of PCE revoval via P-1 extraction impicit in decreasing source concentration term of transport model.
(4) Injection rate for P-3inj modeled as equal to the extraction rate for P-3

TABLE 3

SIMULATED RECHARGE IN THE PLACENTIA BASIN

Year	Volume (acre-ft)	Average Infiltration Rate[1] (feet/day)
1988	150	0.04
1989	1,050	0.26
1990	0	0.00
1991	0	0.00
1992	325	0.08
1993	1,004	0.25
1994	0	0.00
1995	900	0.22
1996	4	0.00
1997	0	0.00
1998	0	0.00
1999	0	0.00
2000	0	0.00
2001	0	0.00
2002	3,433	0.84
2003	1,864	0.46
2004	962	0.23
2005	2,100	0.51
2006	2,100	0.51
2007	2,100	0.51
2008	2,100	0.51
2009	2,100	0.51
2010	2,100	0.51
2011	2,100	0.51
2012	2,100	0.51
2013	2,100	0.51
2014	2,100	0.51
2015	2,100	0.51

Notes: (1) Based on a recharge area of 11.2 acres

TABLE 4

SIMULATED RECHARGE IN THE POTENTIAL LA JOLLA BASIN

	SCENARIO 1		SCENARIO 2		SCENARIO 3	
YEARS	Volume (acre-ft/yr)	Average Infiltration Rate[1] (feet/day)	Volume (acre-ft/yr)	Average Infiltration Rate[1] (feet/day)	Volume (acre-ft/yr)	Average Infiltration Rate[1] (feet/day)
1988 - 2005	0	0.00	0	0.00	0	0.00
2006 - 2015	0	0.00	4,500	2.05	9,000	4.11

Notes: (1) Based on a recharge area of 6 acres

TABLE 5

SIMULATED SOURCE CONCENTRATIONS

Year	Source Concentration (µg/L)
1988	35,458.73
1989	25,085.06
1990	17,763.06
1991	12,578.26
1992	8,906.83
1993	6,301.08
1994	4,461.88
1995	3,159.52
1996	2,237.29
1997	1,582.76
1998	1,120.77
1999	793.63
2000	561.98
2001	397.57
2002	281.53
2003	199.35
2004	141.16
2005	99.87
2006	70.72
2007	50.07
2008	35.46
2009	25.09
2010	17.76
2011	12.58
2012	8.91
2013	6.30
2014	4.46
2015	2.19

TABLE 6

MONITORING WELL COMPLETION DETAILS[1]

Owner	Well Name	Boring Depth (feet bgs)	Perforated Interval (feet bgs)
AC PRODUCTS, INC	MW-1	150	
	MW-2	150	110 - 150
	MW-3	150	110 - 150
	MW-4	NA[2]	NA
	MW-5	NA	NA
	MW-6	NA	NA
	MW-7	NA	NA
	MW-8S	115	80 - 115
	MW-8D	143	133 - 143
	MW-9S	115	80 - 115
	MW-9D	143	133 - 143
	MW-10S	115	79 - 114
	MW-10D	145	133 - 143
	MW-11	120	87 - 117
	MW-12	127	93 - 123
	MW-13	118	82 - 112
	MW-14S	131	101 - 131
	MW-14D-A	230	144 - 155
	MW-14D-B	230	180 - 190
	MW-14D-C	230	217 - 222
	MW-15	130	96 - 126
	MW-16	130	100 - 130
	MW-17	130	98 - 128
	MW-18	128	96 - 126
	MW-19	130	94 - 124
	MW-20S	132	102 - 132
	MW-20D-A	231	155 - 165
	MW-20D-B	231	185 - 195
	MW-20D-C	231	225 - 230
	MW-21	150	110 - 145
	MW-22	140	104 - 139
O.C. WATER DISTRICT	AM-8	300	268 - 285
	AM-29	365	340 - 358

NOTES: 1) Monitoring wells within area shown in Figure 32
2) NA denotes not available

Figures

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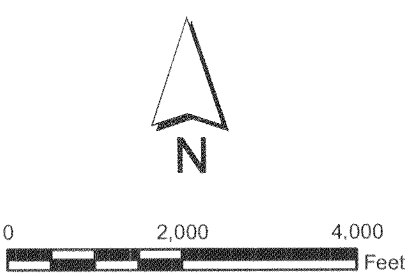


FIGURE 1

SITE LOCATION MAP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

REFERENCE

7.5 MINUTE U.S.G.S. TOPOGRAPHIC MAPS,
ORANGE AND ANAHEIM, CALIFORNIA QUADRANGLES
DATED: 1964, 1965
PHOTOREVISED: 1981

FIGURE 2

SITE AND VICINITY

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON

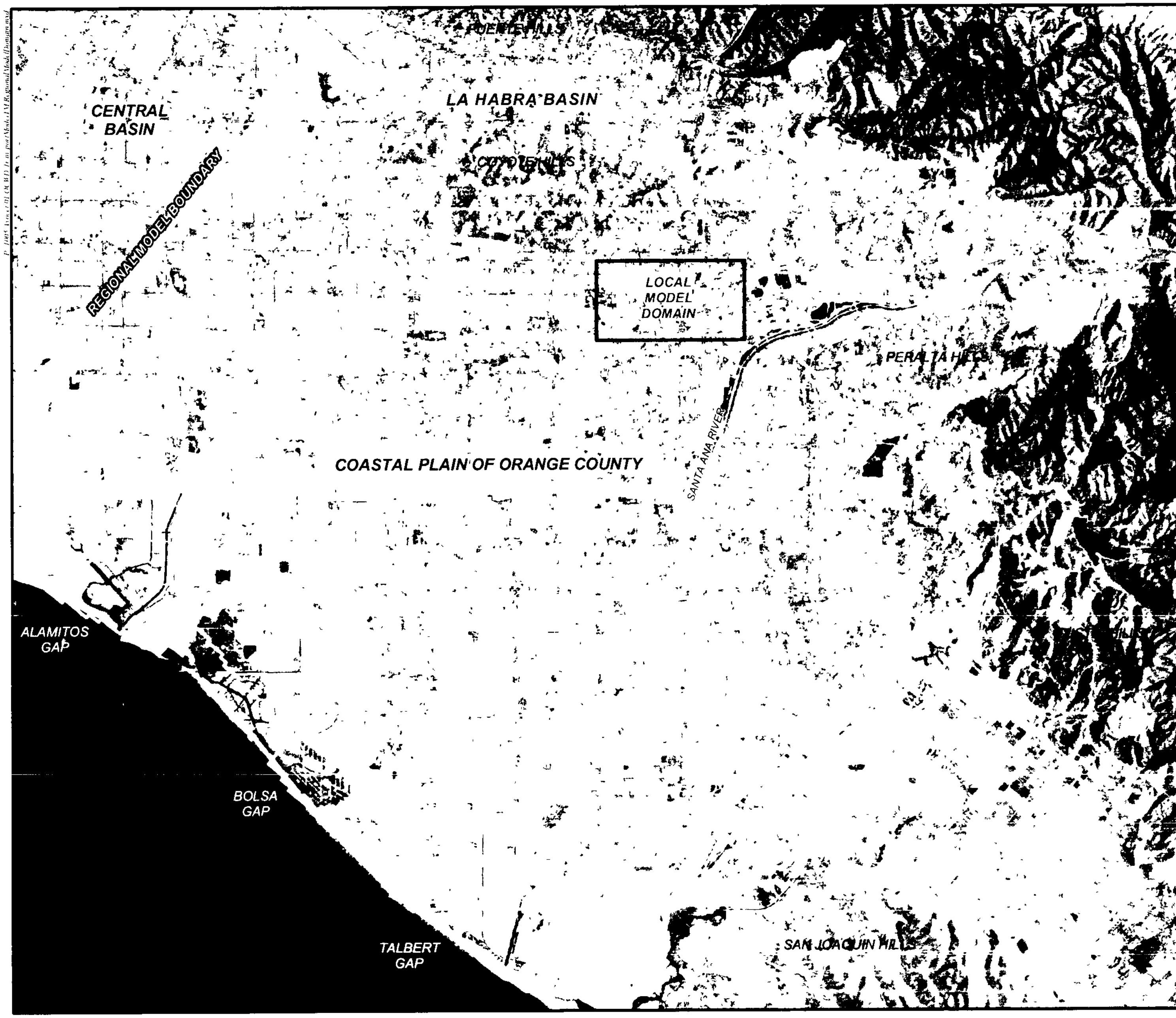


FIGURE 3

OCWD REGIONAL MODEL DOMAIN

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

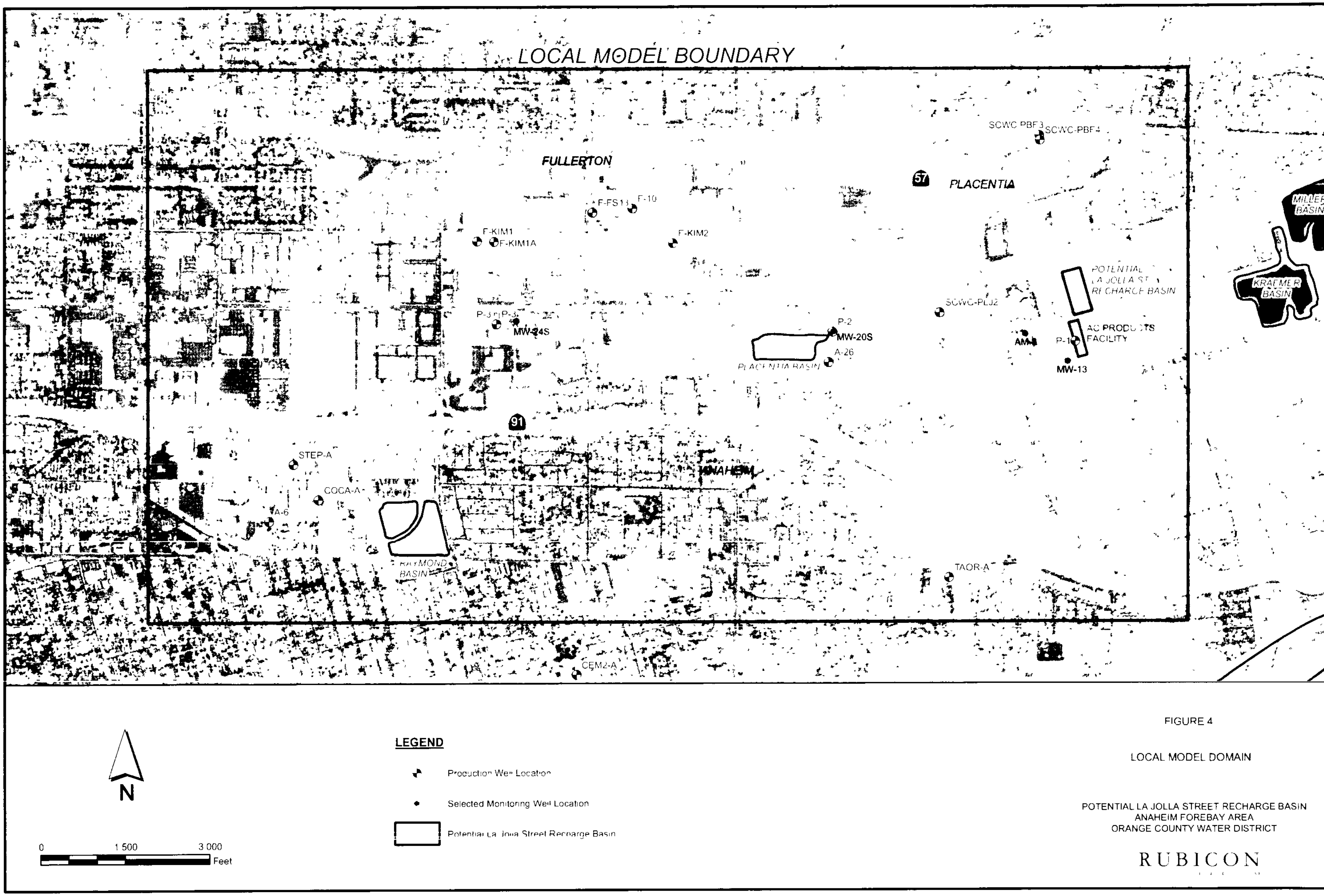


FIGURE 4

LOCAL MODEL DOMAIN

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON

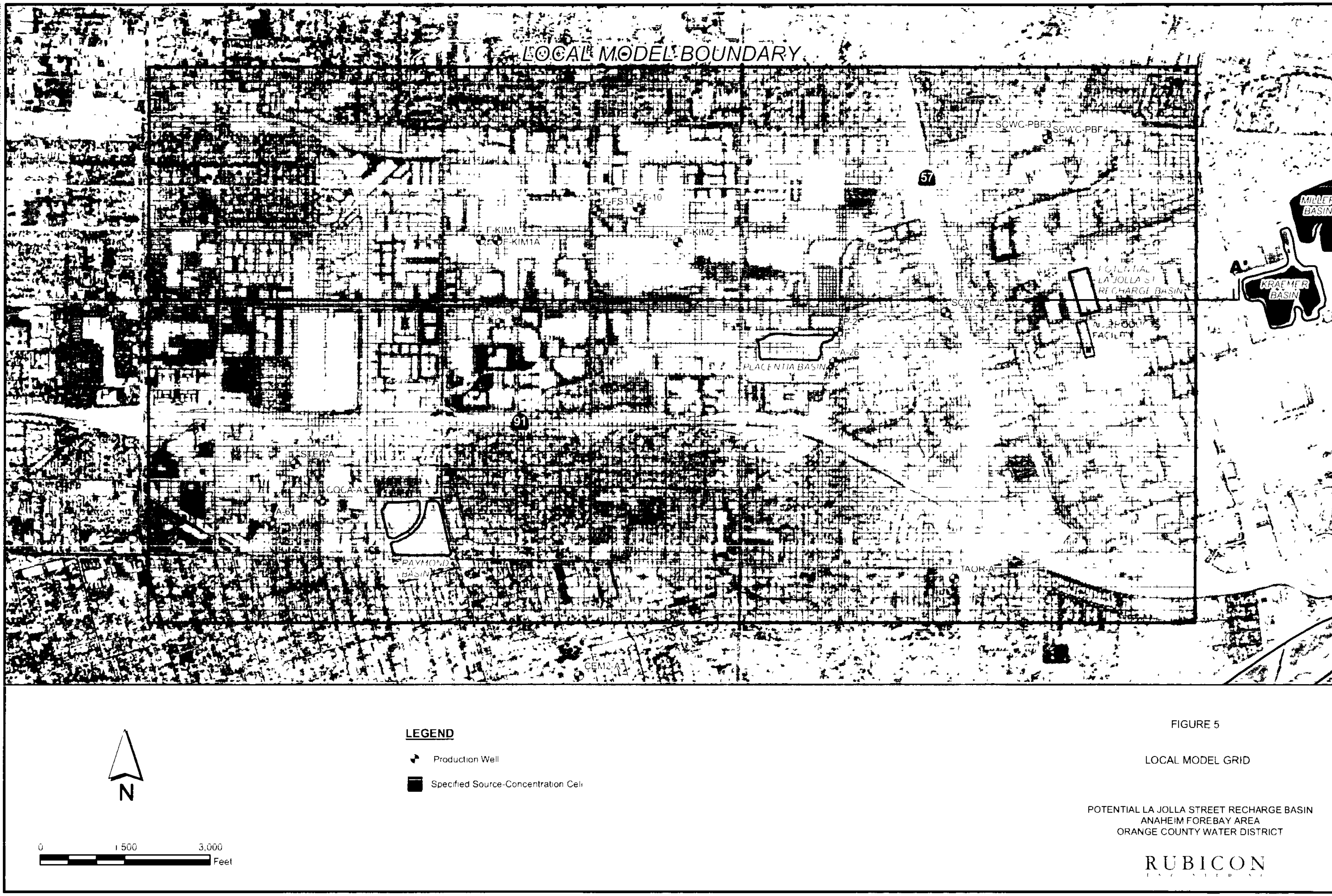


FIGURE 5

LOCAL MODEL GRID

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON

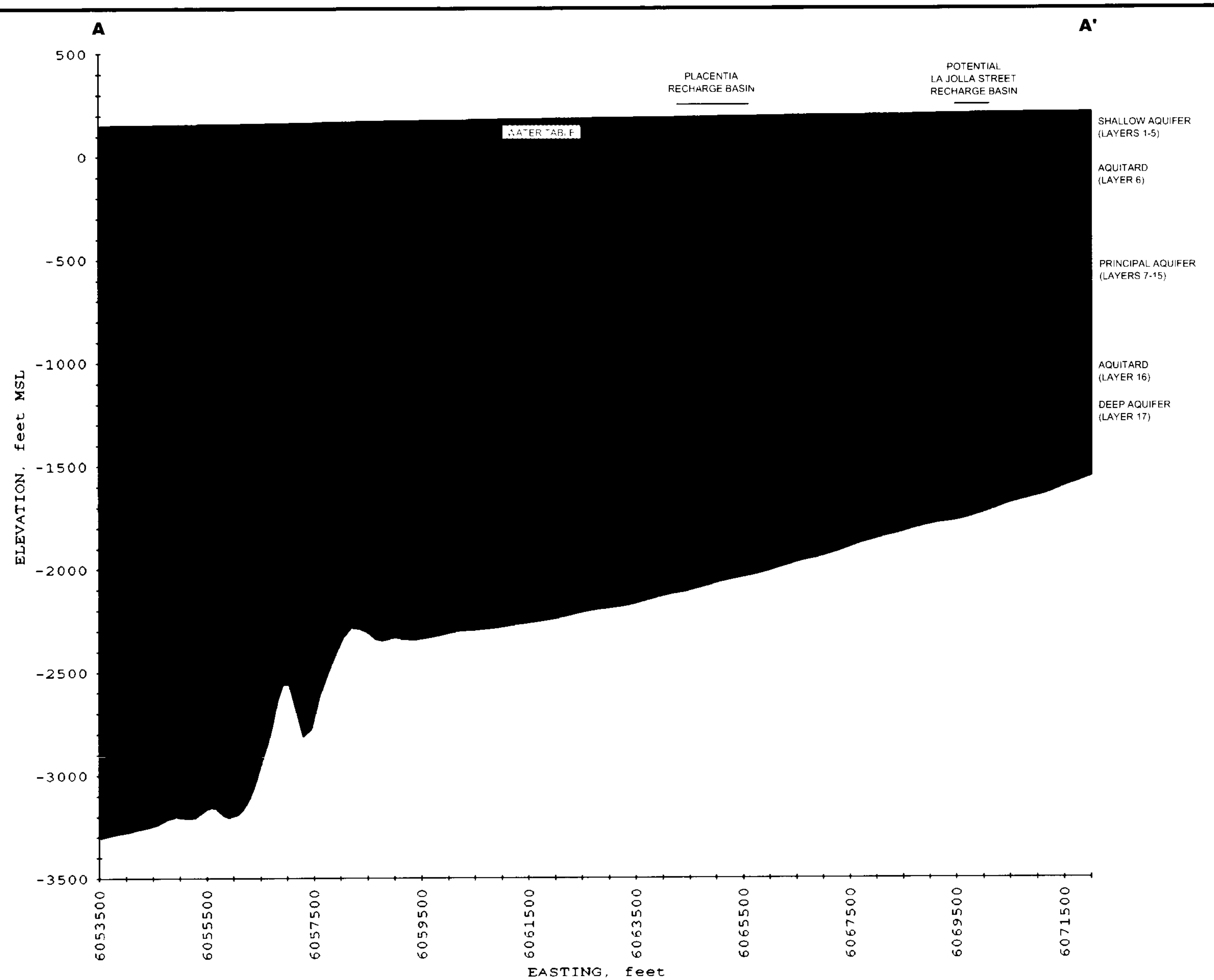


FIGURE 6

LOCAL MODEL GRID
CROSS-SECTION A-A'

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA

PREPARED FOR

ORANGE COUNTY WATER DISTRICT
FOUNTAIN VALLEY CALIFORNIA

RUBICON

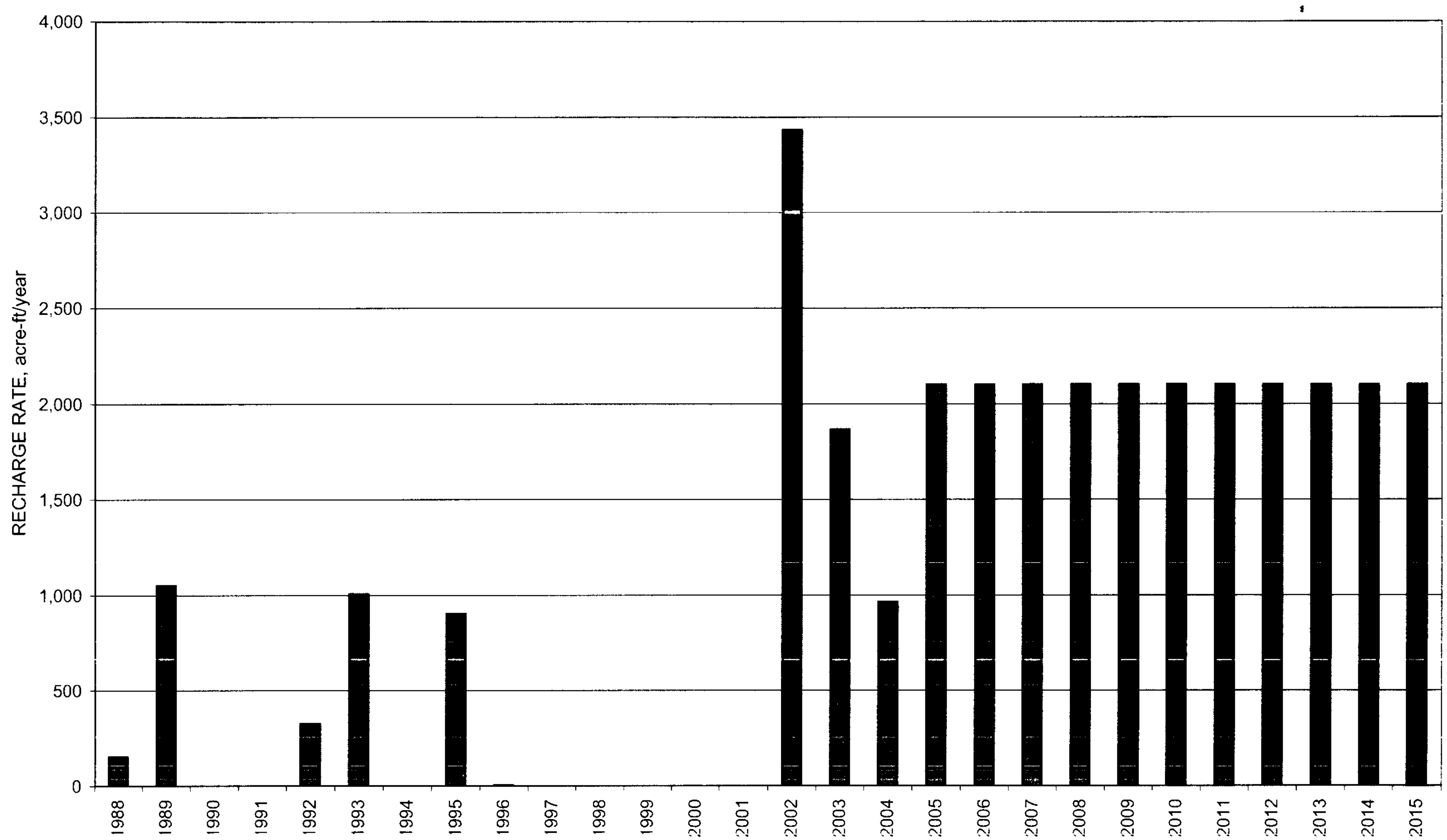


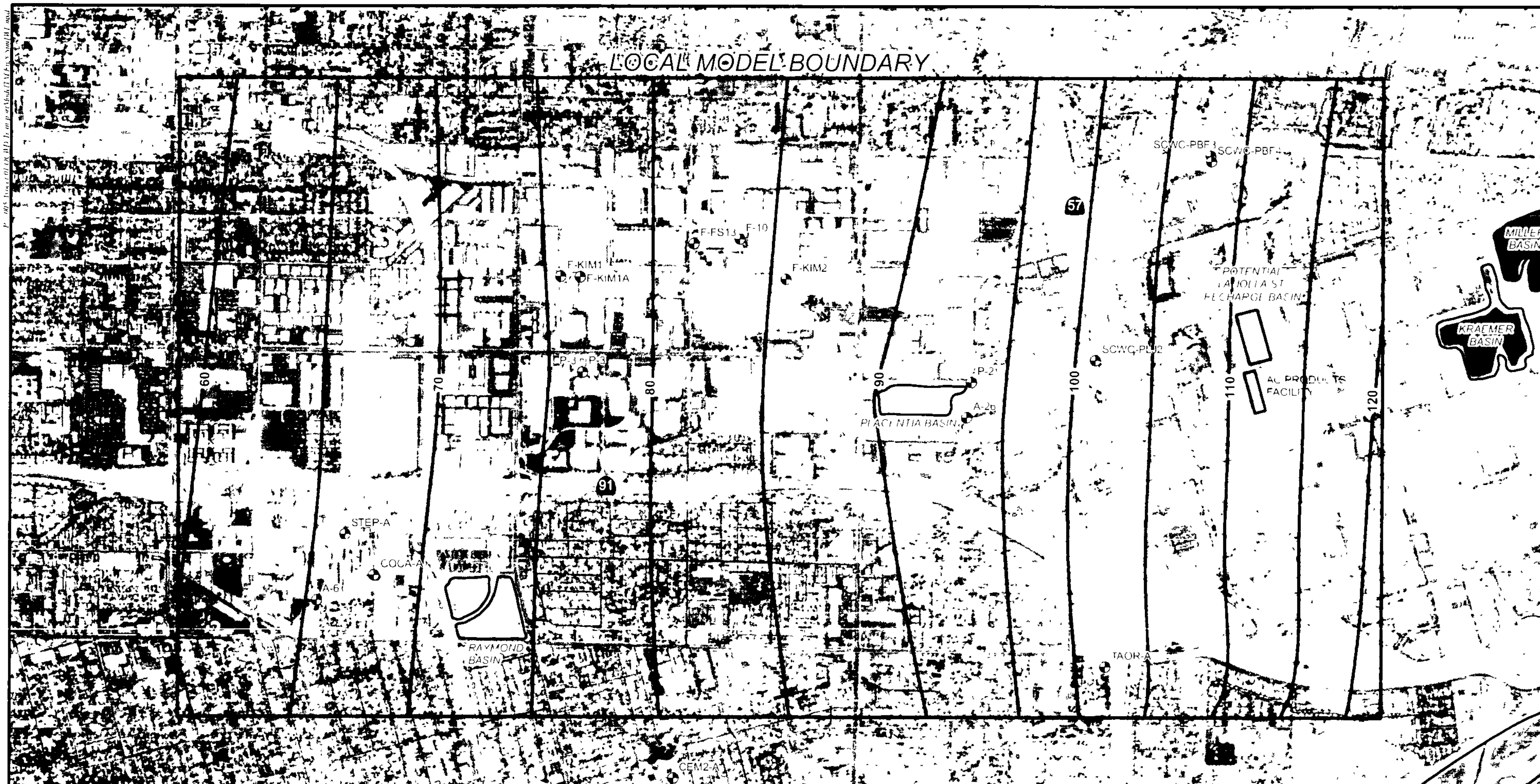
FIGURE 7

SIMULATED RECHARGE IN THE PLACENTIA BASIN

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

P:\1005 Avocet\01 OCWD\TransportModelTM\[Tables.xls]PlacentiaRechargeChart



LEGEND

Production Well

Line of Equal Water Elevation feet MSL

FIGURE 8

SCENARIO 1
NO LA JOLLA BASIN RECHARGE
WATER LEVELS
SHALLOW AQUIFER
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

LEGEND

Production Well

Line of Equal Potentiometric Surface Level feet MSL

N

0 1 500 3 000 Feet

FIGURE 9

SCENARIO 1
NO LA JOLLA BASIN RECHARGE
POTENTIOMETRIC SURFACE
PRINCIPAL AQUIFER
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

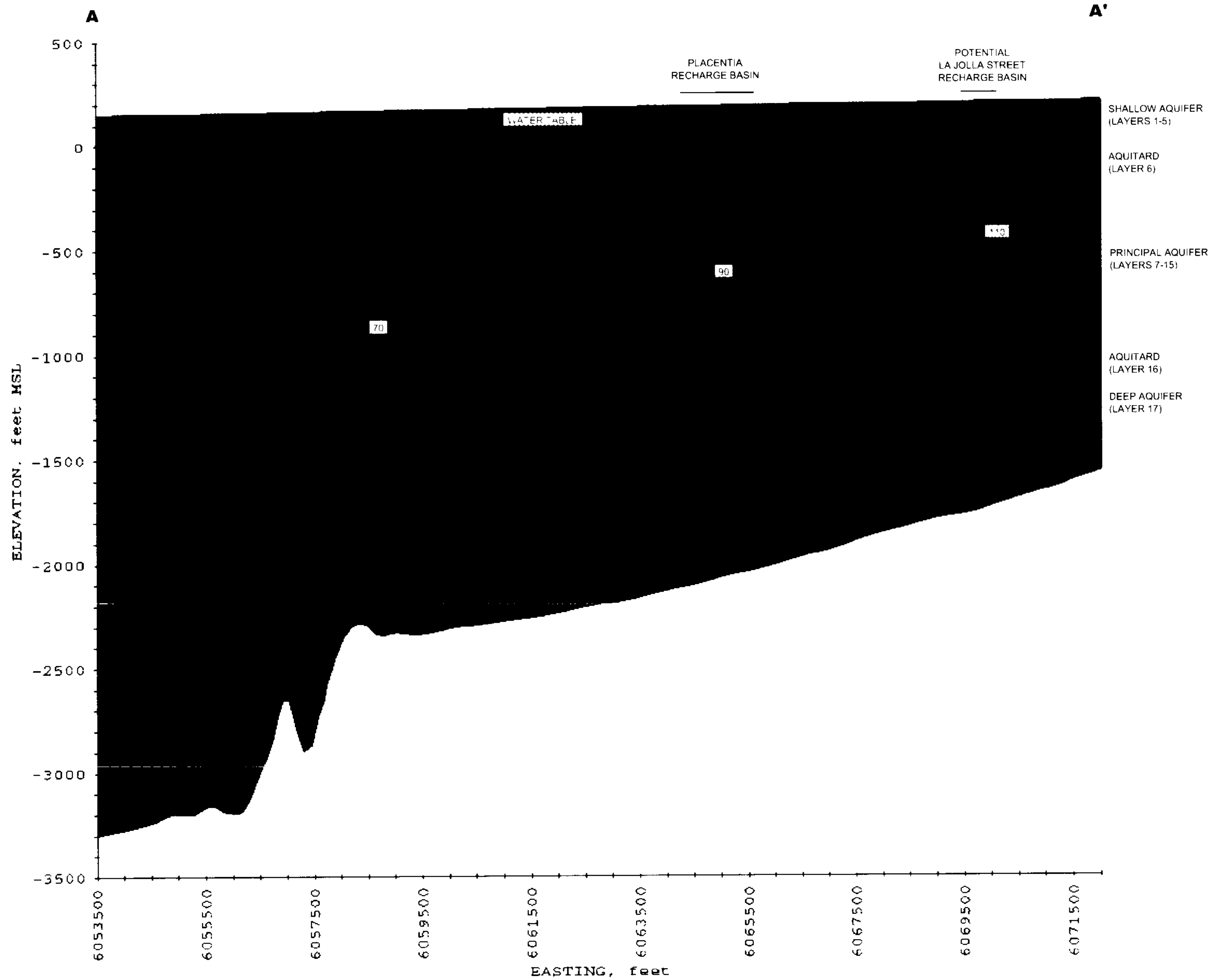


FIGURE 10

SCENARIO 1
NO LA JOLLA BASIN RECHARGE
WATER LEVELS
CROSS-SECTION A-A'
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA

PREPARED FOR

ORANGE COUNTY WATER DISTRICT
FOUNTAIN VALLEY, CALIFORNIA

RUBICON
ENGINEERING

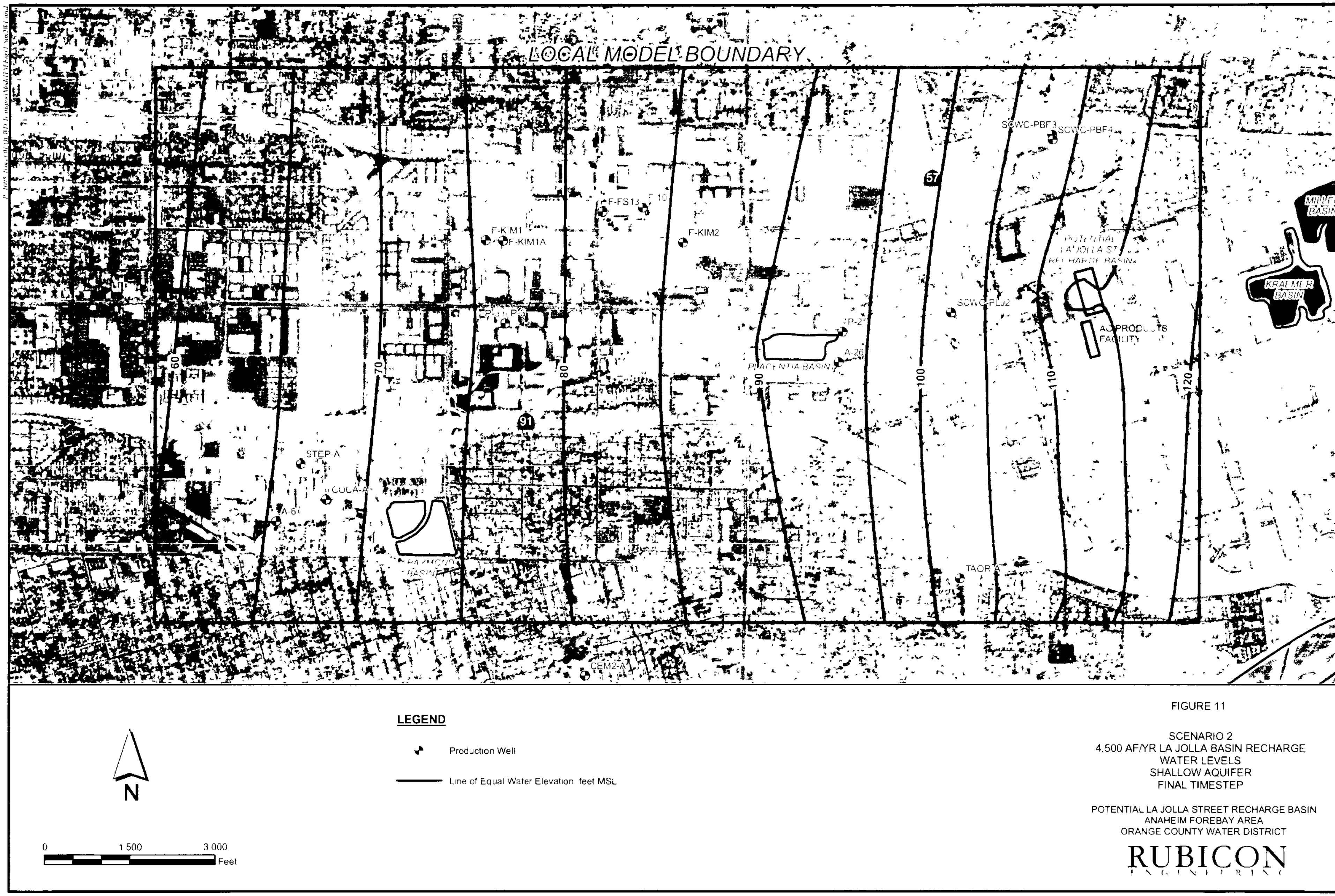


FIGURE 11

SCENARIO 2
4,500 AF/YR LA JOLLA BASIN RECHARGE
WATER LEVELS
SHALLOW AQUIFER
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON ENGINEERING

LEGEND

Production Well

Line of Equal Potentiometric Surface Level feet MSL

0 1 500 3 000 Feet

N

FIGURE 12

SCENARIO 2
4,500 AF/YR RECHARGE
POTENTIOMETRIC SURFACE
PRINCIPAL AQUIFER
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

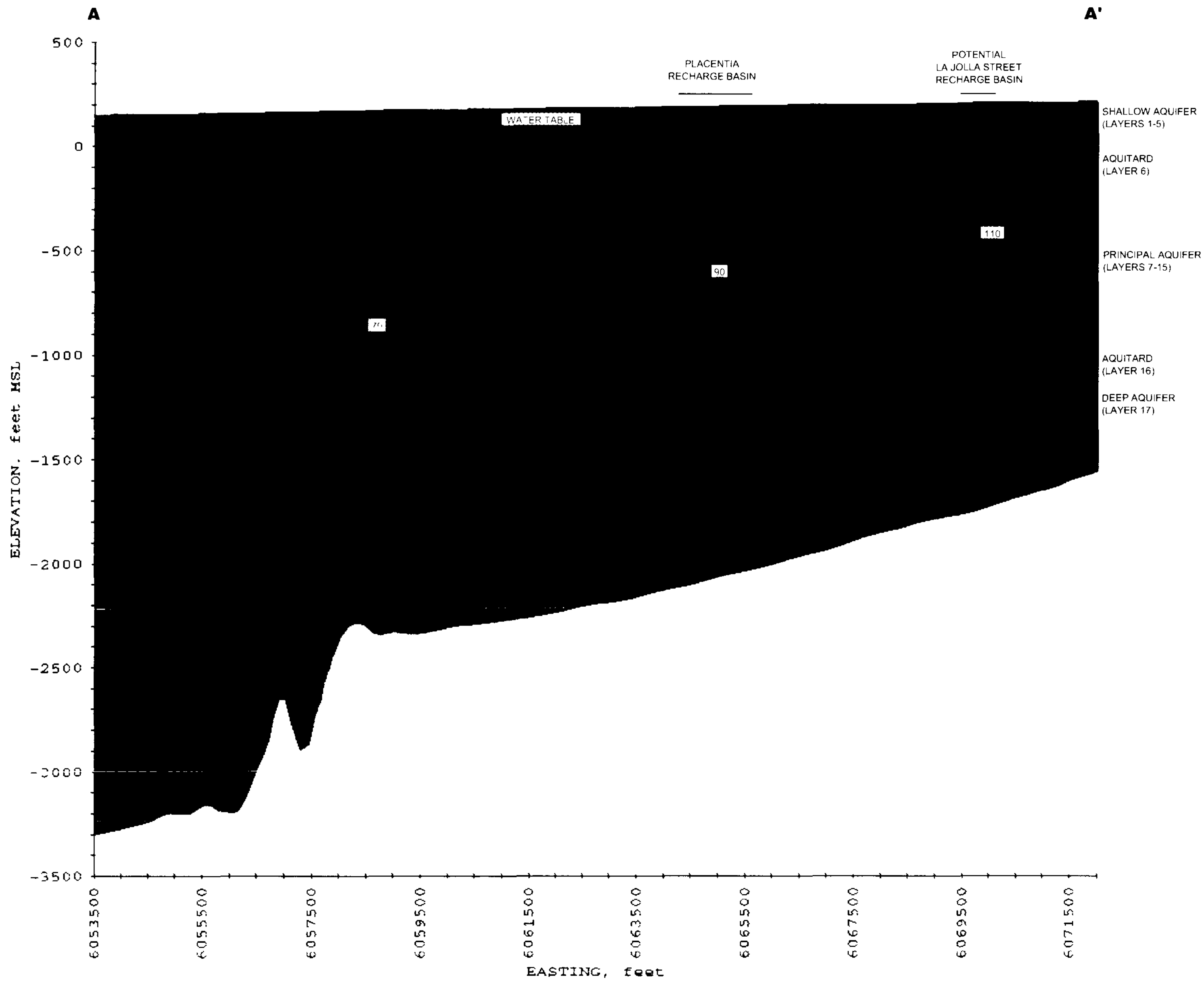


FIGURE 13

SCENARIO 2
4,500 AF/YR LA JOLLA BASIN RECHARGE
WATER LEVELS
CROSS-SECTION A-A'
FINAL TIMESTEP

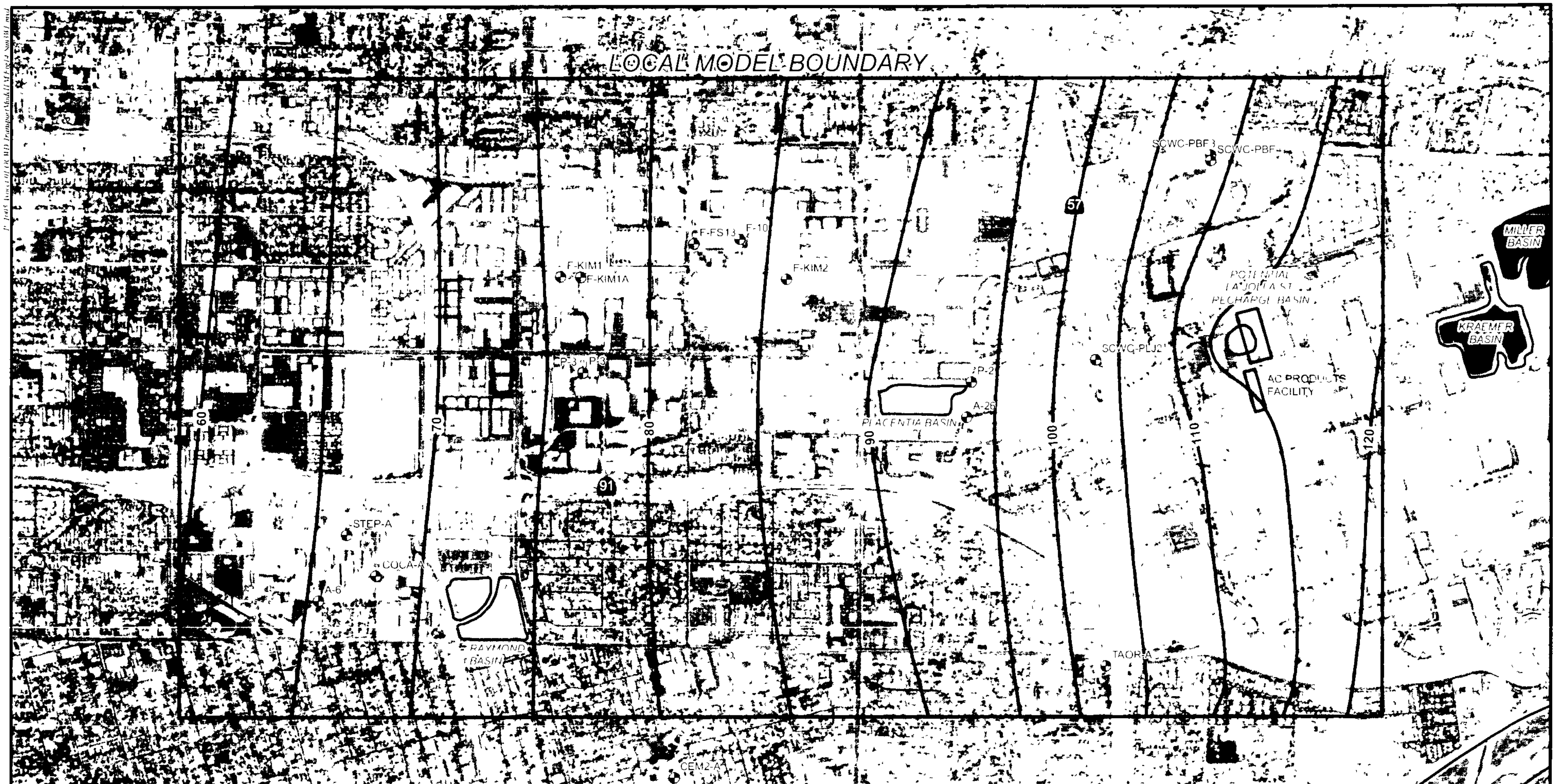
POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA

PREPARED FOR

ORANGE COUNTY WATER DISTRICT
FOUNTAIN VALLEY CALIFORNIA

RUBICON
ENGINEERING

P:\1005 Avocet\01 OCWD\TransportModel\TM\Figures 6 10 13 16 x-sect A-A .xls]Figure 13 (2)



N

0 1 500 3 000 Feet

LEGEND

Production Well

Line of Equal Water Elevation feet MSL

FIGURE 14

SCENARIO 3
9,000 AF/YR LA JOLLA BASIN RECHARGE
WATER LEVELS
SHALLOW AQUIFER
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON ENGINEERING

N

0 1 500 3 000 Feet

LEGEND

Production Well

Line of Equal Potentiometric Surface Elevation ft MSL

FIGURE 15

SCENARIO 3
9,000 AF/YR LA JOLLA BASIN RECHARGE
POTENTIOMETRIC SURFACE
PRINCIPAL AQUIFER
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

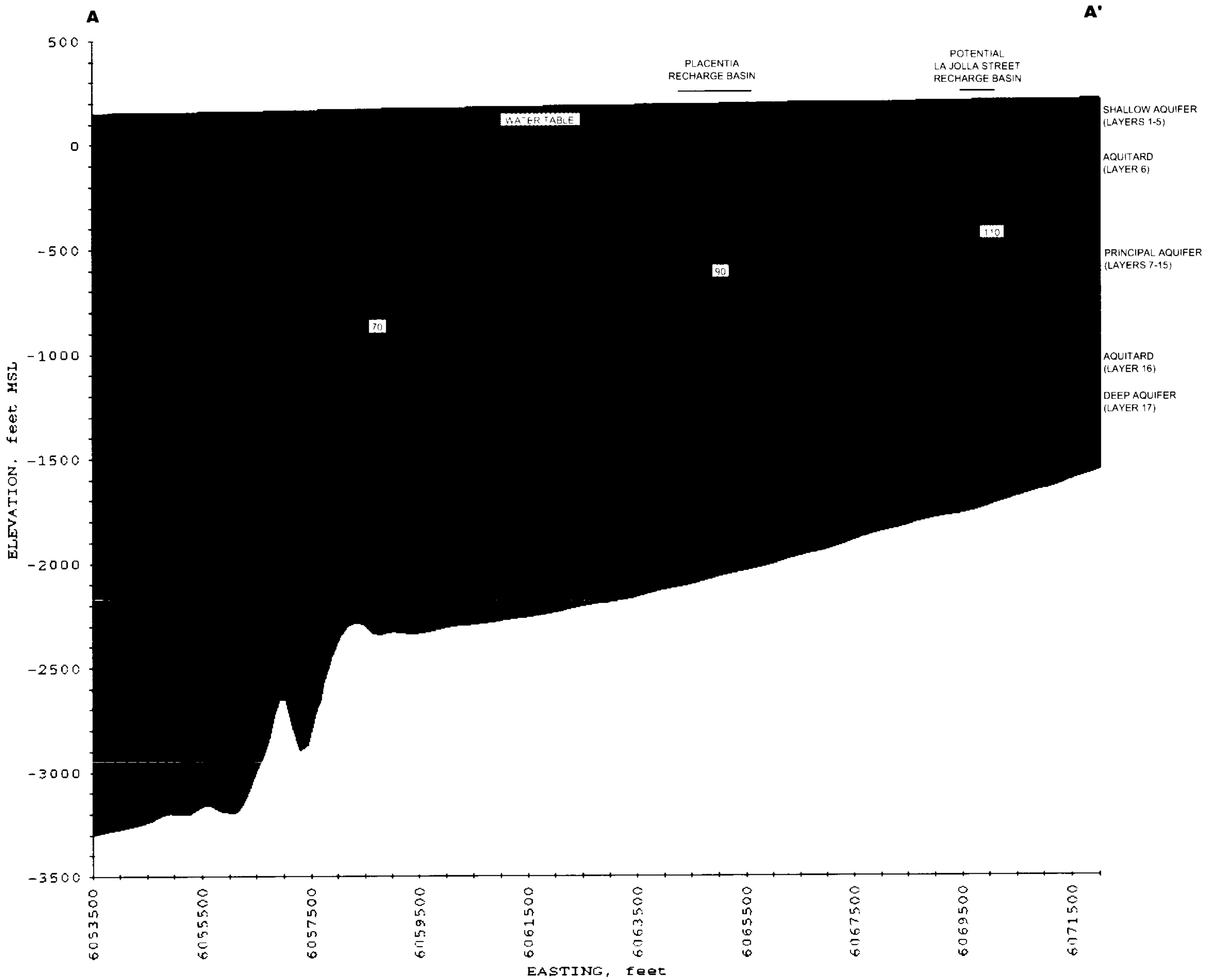


FIGURE 16

SCENARIO 3
9,000 AF/YR LA JOLLA BASIN RECHARGE
WATER LEVELS
CROSS-SECTION A-A'
FINAL TIMESTEP

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA

PREPARED FOR

ORANGE COUNTY WATER DISTRICT
FOUNTAIN VALLEY CALIFORNIA

RUBICON
ENGINEERING

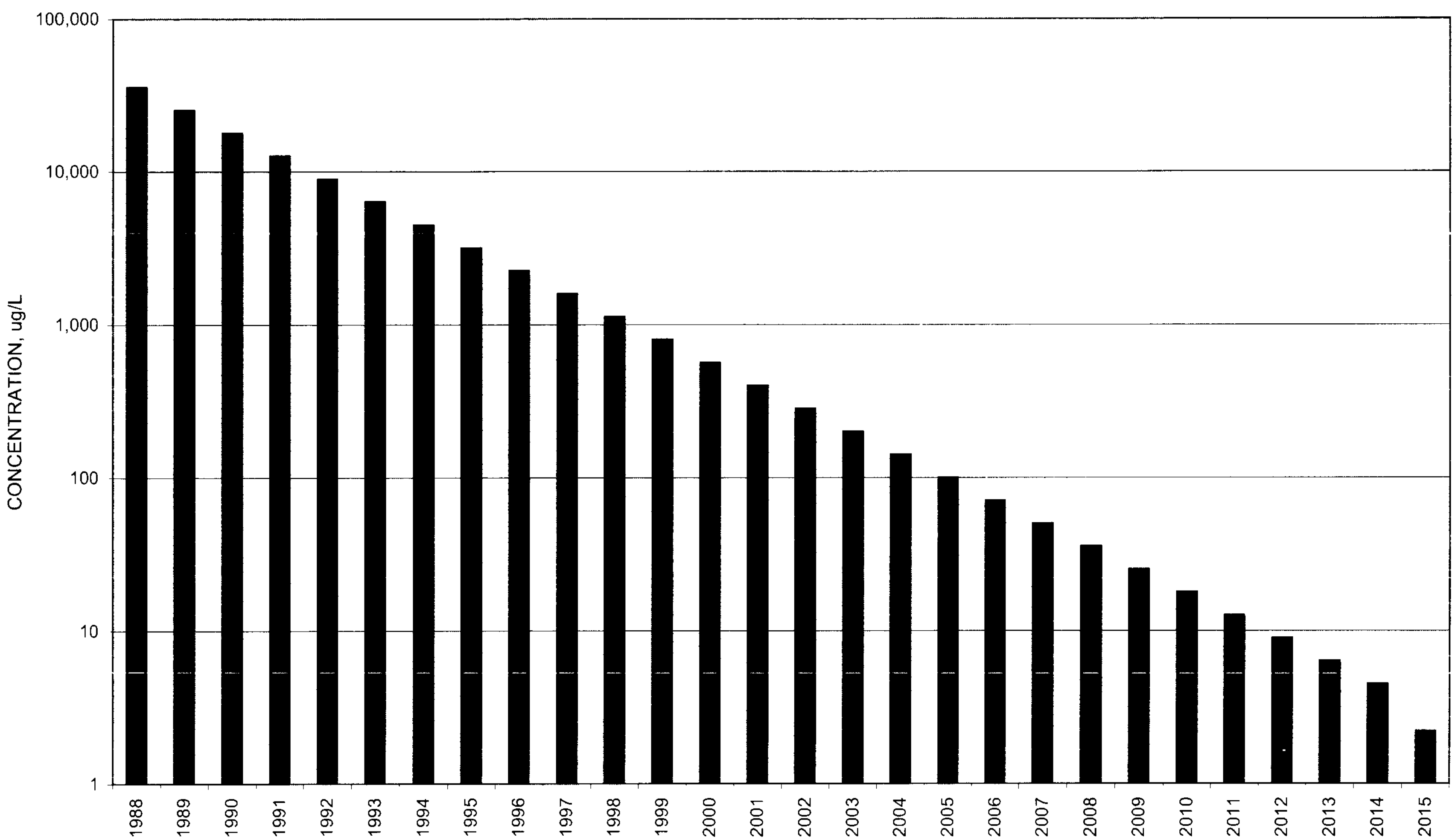


FIGURE 17

SIMULATED PCE SOURCE CONCENTRATIONS

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

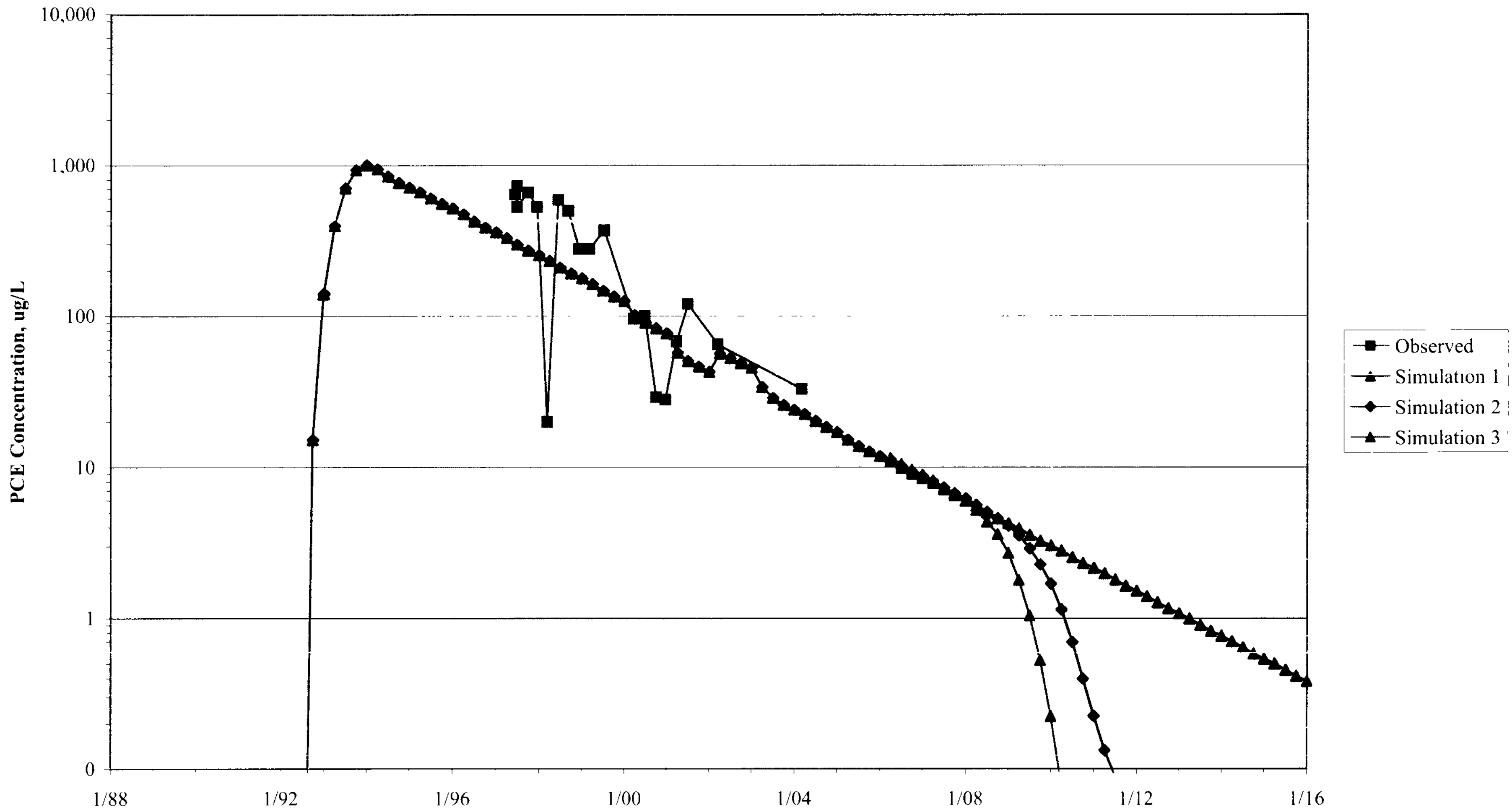


FIGURE 18

SIMULATED AND OBSERVED
PCE CONCENTRATIONS
AC PRODUCTS WELL MW-20S

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

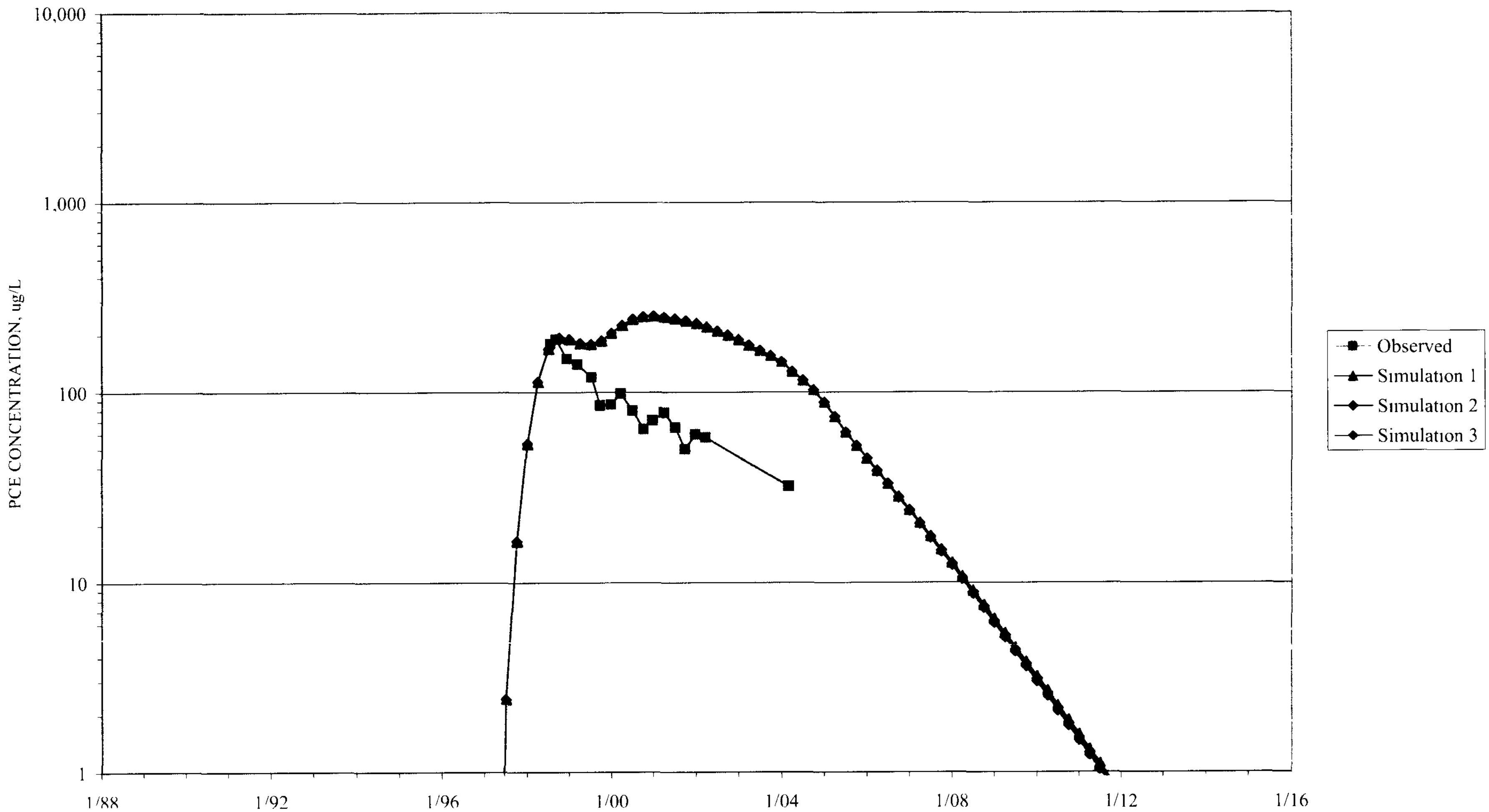
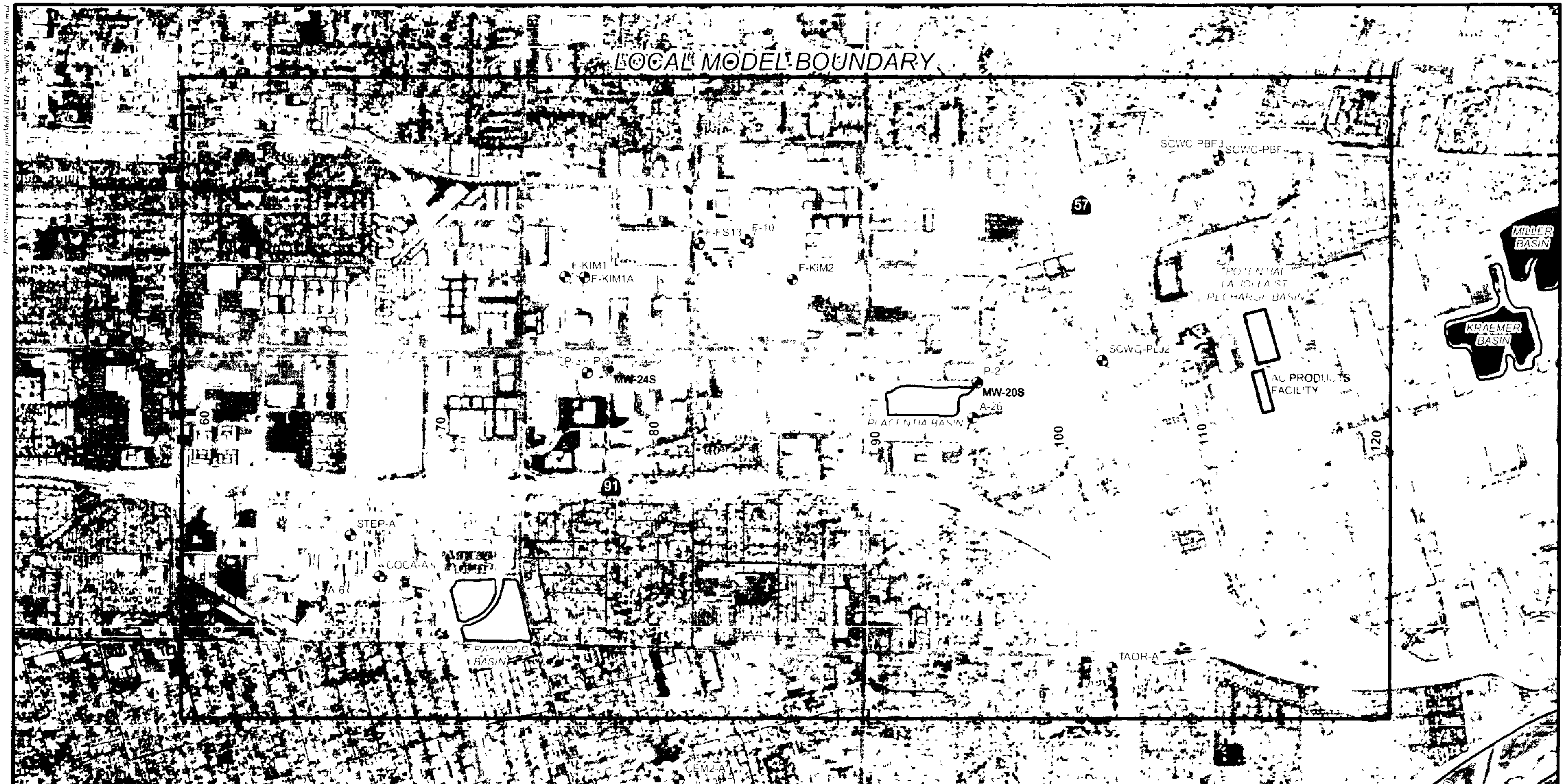


FIGURE 19

SIMULATED AND OBSERVED
PCE CONCENTRATIONS
AC PRODUCTS WELL MW-24S

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON ENGINEERING



LEGEND

Production Well

Extendt of PCE plume above MCL

Selected Monitoring Well Location

N

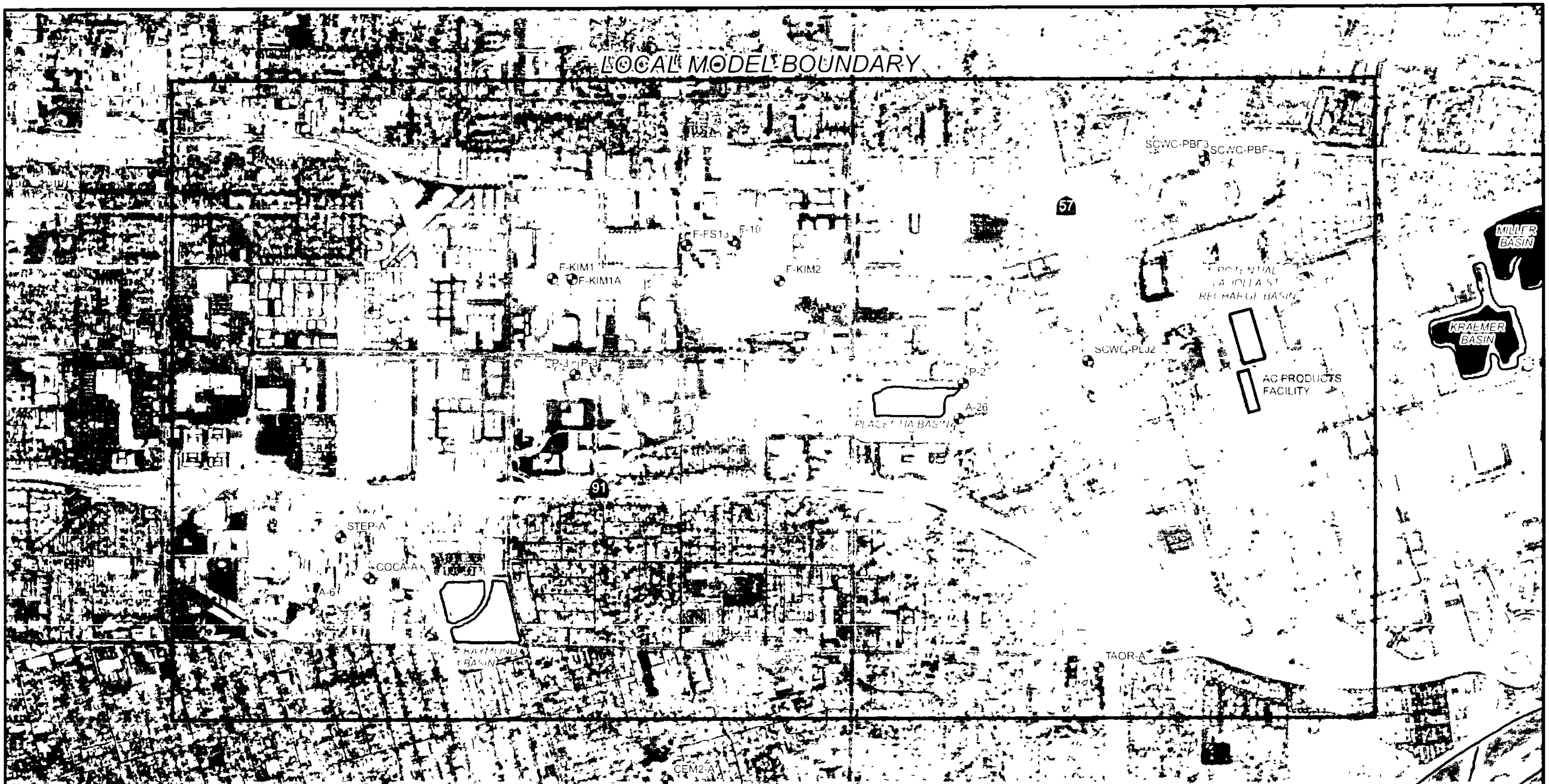
0 1 500 3 000 Feet

FIGURE 20

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
SHALLOW AQUIFER
JANUARY 1, 2006
(ASSUMED START DATE OF RECHARGE)

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

Production Well

Extent of PCE Plume above MCL

N

0 1 500 3 000 Feet

FIGURE 21

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
PRINCIPAL AQUIFER
JANUARY 1 2006
(ASSUMED START DATE OF RECHARGE)

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON ENGINEERING

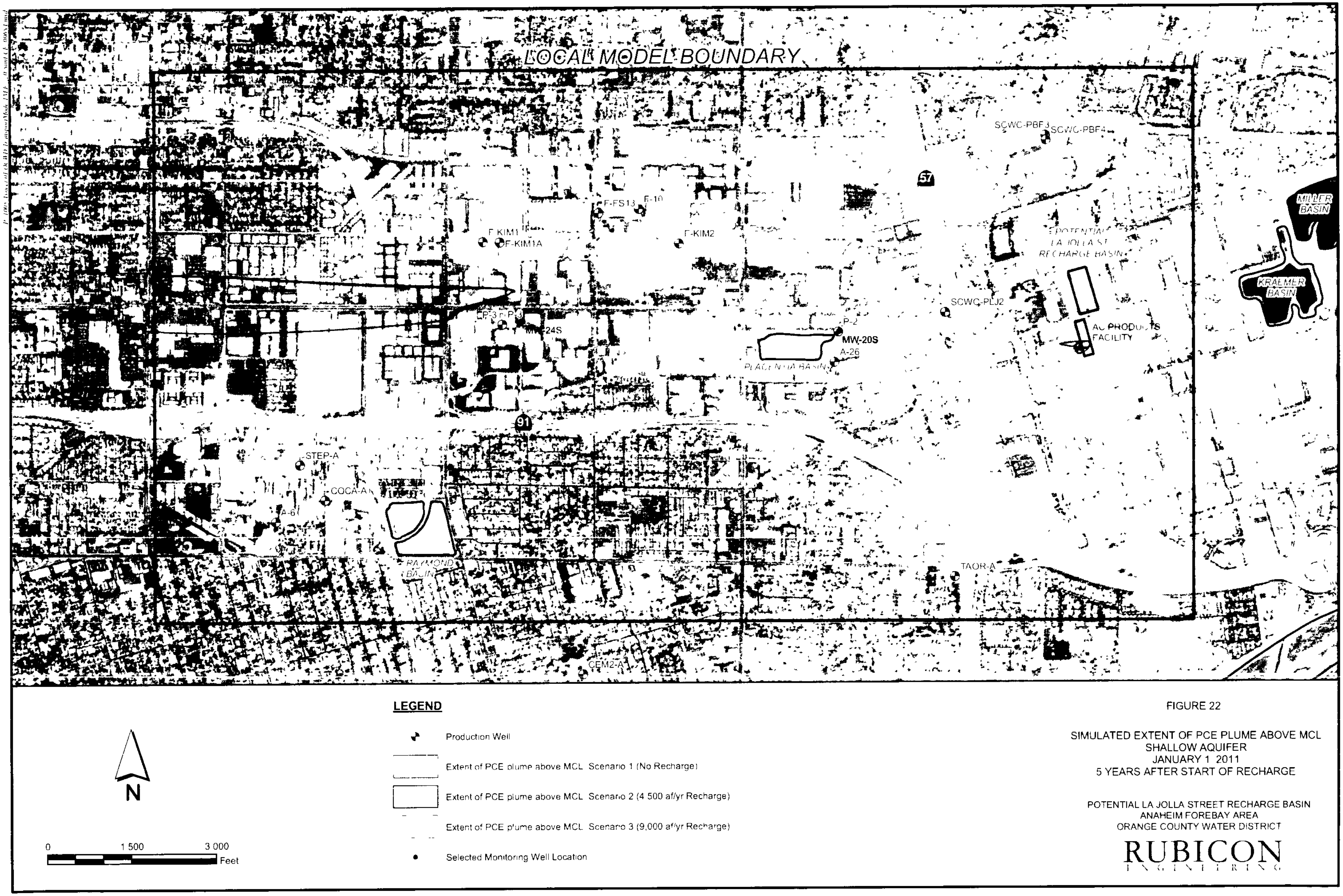
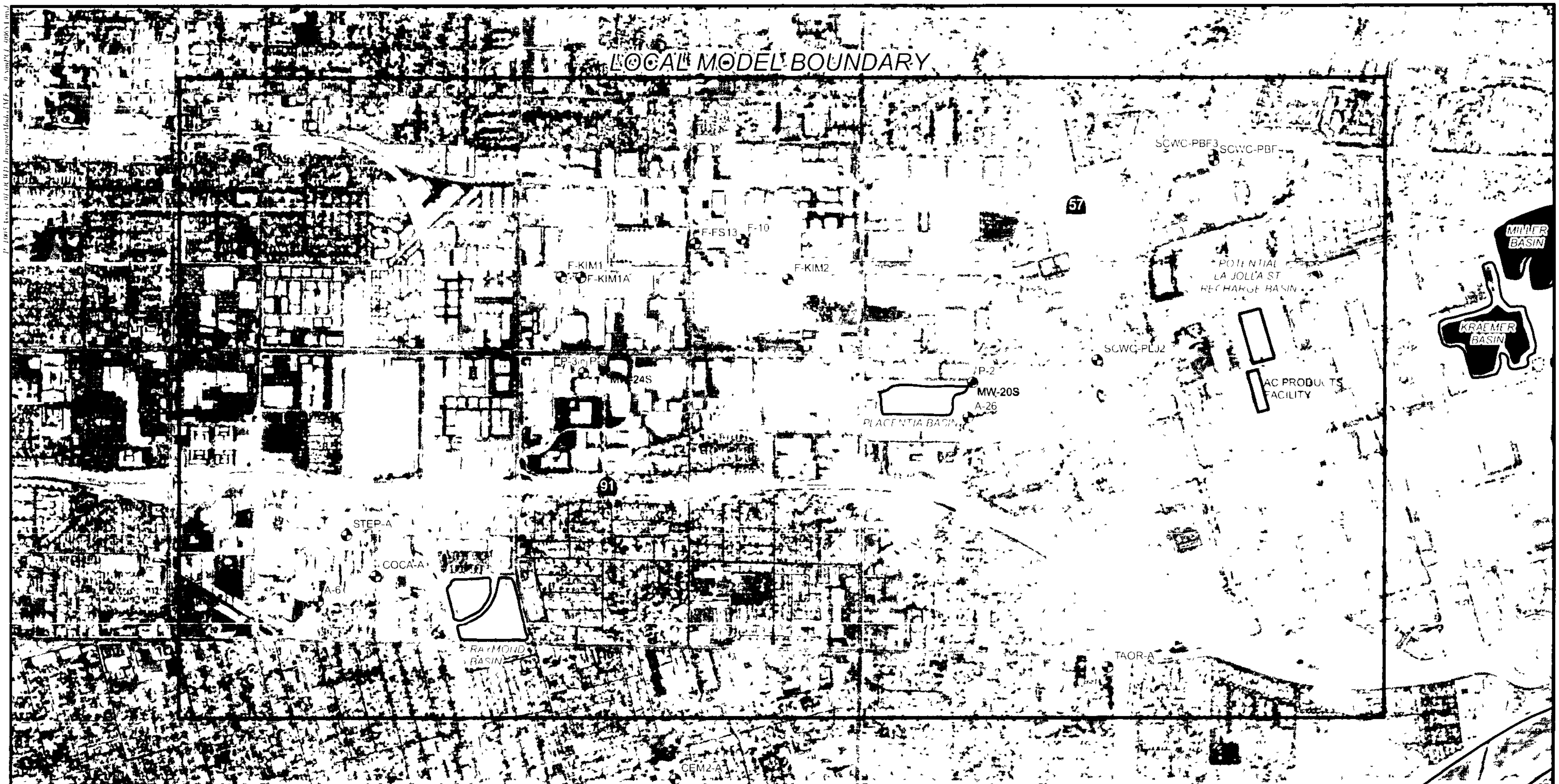


FIGURE 22

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
SHALLOW AQUIFER
JANUARY 1 2011
5 YEARS AFTER START OF RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

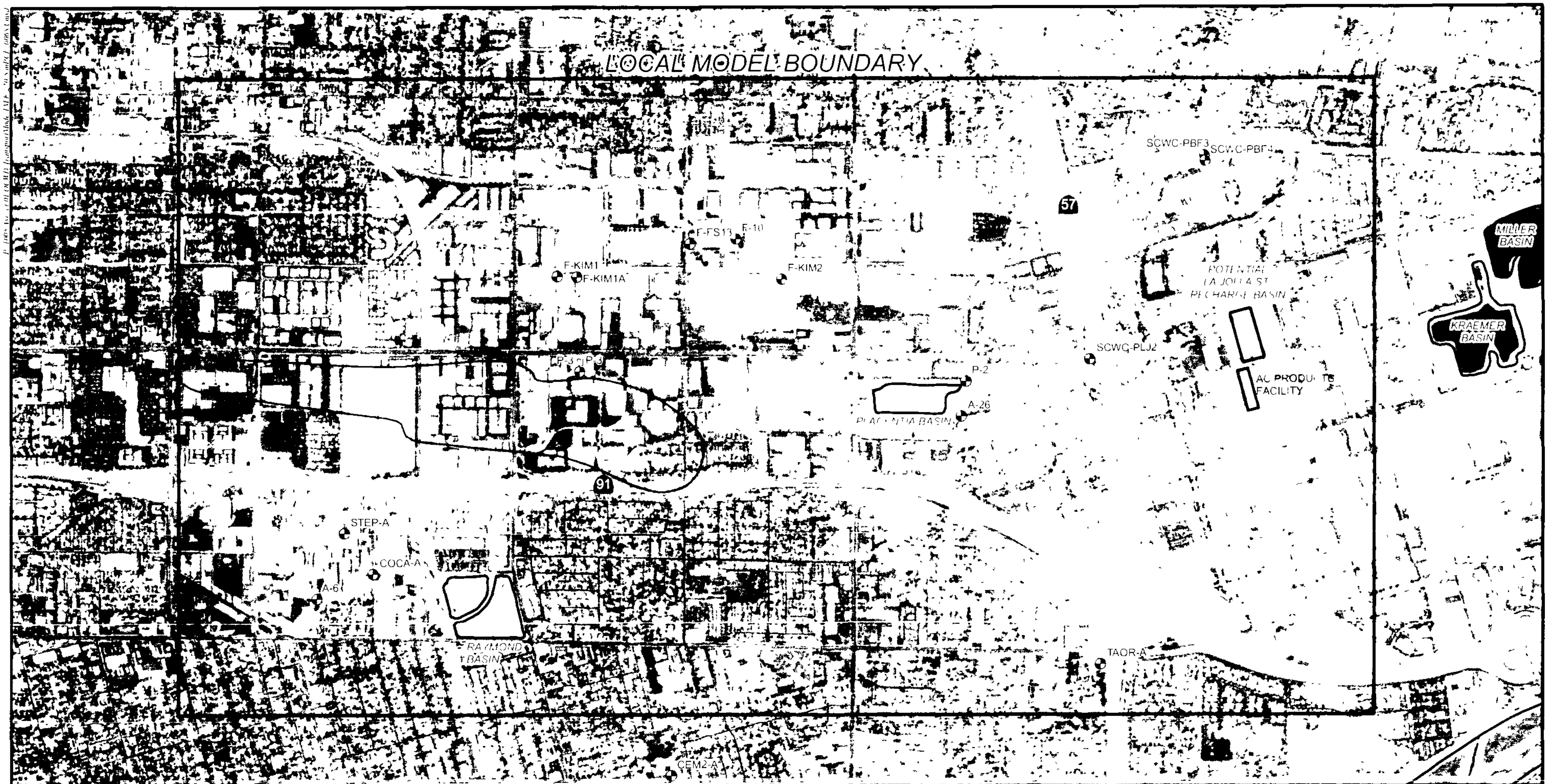
- Production Well
- Extent of PCE plume above MCL Scenario 1 (No Recharge)
- Extent of PCE plume above MCL Scenario 2 (4,500 af/yr)
- Extent of PCE plume above MCL Scenario 3 (9 000 af/yr)
- Selected Monitoring Well Location

FIGURE 23

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
SHALLOW AQUIFER
JANUARY 1, 2016
10 YEARS AFTER START OF RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

Production Well

Extent of PCE plume above MCL Scenario 1 (No Recharge)

Extent of PCE plume above MCL Scenario 2 (4 500 af/yr)

Extent of PCE plume above MCL Scenario 3 (9 000 af/yr)

Note Plume shown for the uppermost model layer within the Principal Aquifer (Model Layer 7)

FIGURE 24

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
PRINCIPAL AQUIFER
JANUARY 1, 2011
5 YEARS AFTER START OF RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
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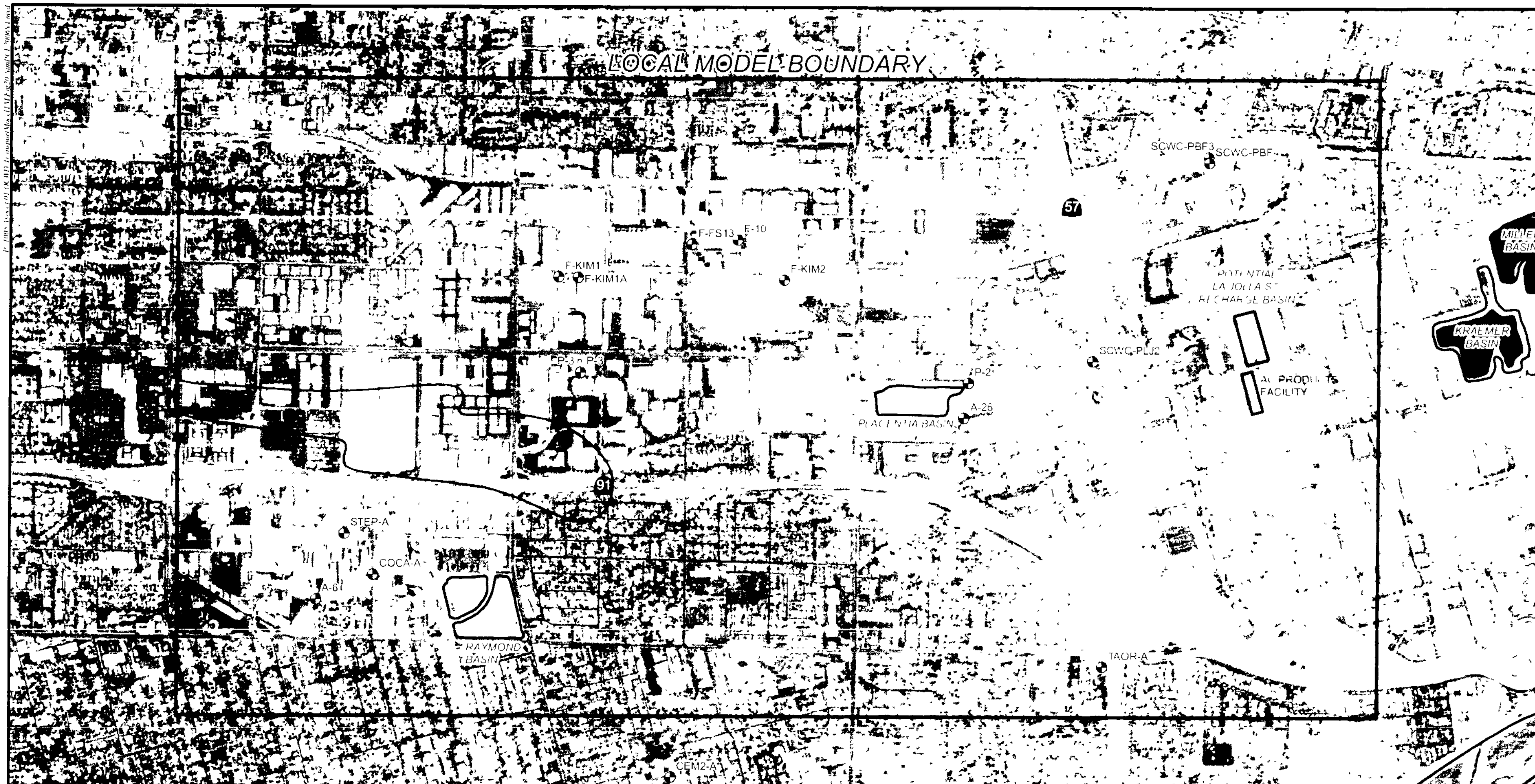
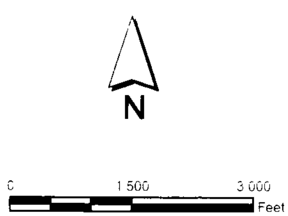




LEGEND

Production Well

Extent of PCE plume above MCL Scenario 1 (No Recharge)

Extent of PCE plume above MCL, Scenario 2 (4 500 af/yr)

Extent of PCE plume above MCL Scenario 3 (9 000 af/yr)

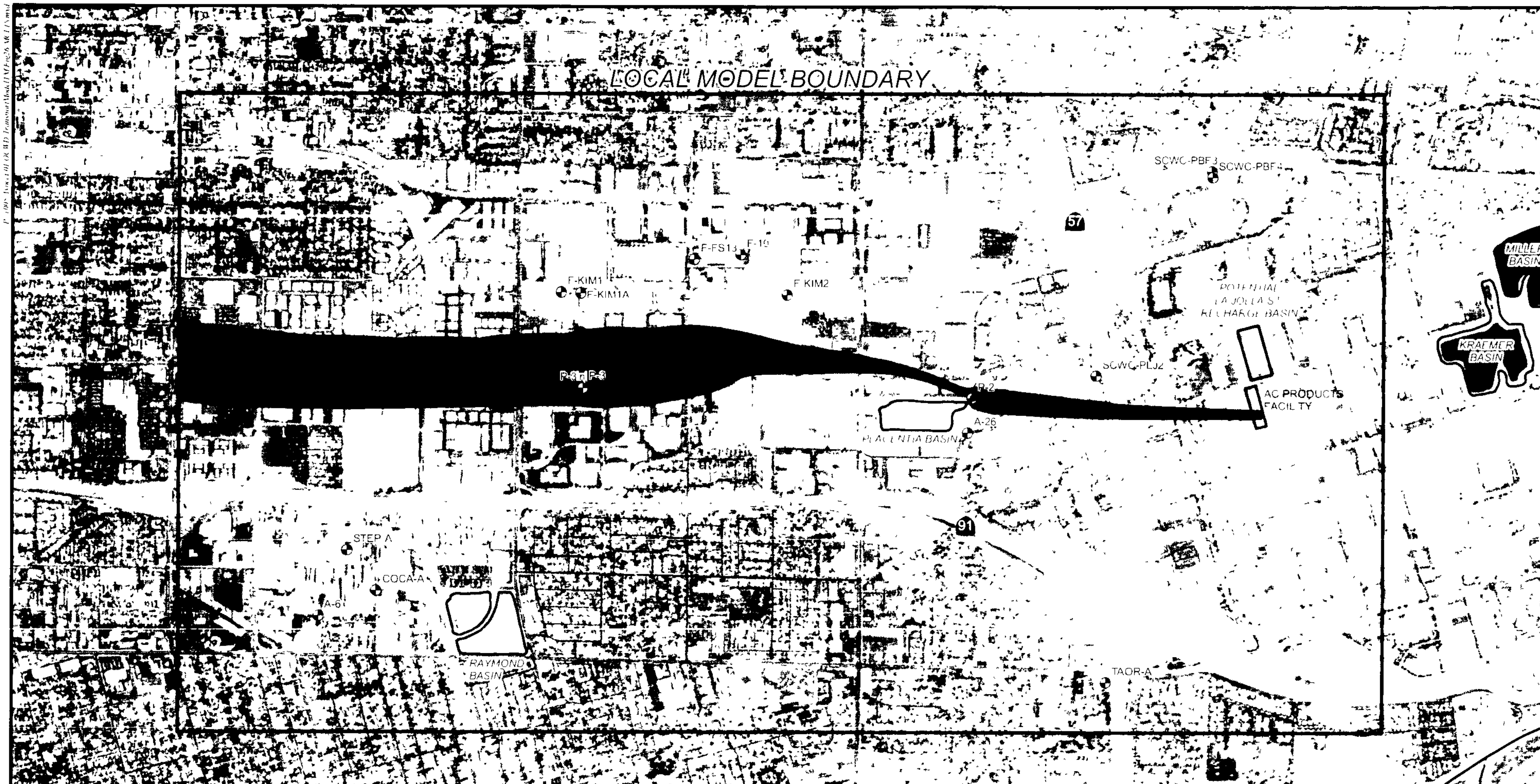
Note: Plume shown for the uppermost model layer within the Principal Aquifer (Model Layer 7)

FIGURE 25

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
PRINCIPAL AQUIFER
JANUARY 1, 2016
10 YEARS AFTER START OF RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON ENGINEERING



LEGEND

Selected Monitoring Well Location

Production Well

The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1 2006 to January 1 2016. The entire area of MCL exceedance is a composite of 11 overlays each representing the area above MCL at the end of each year

N

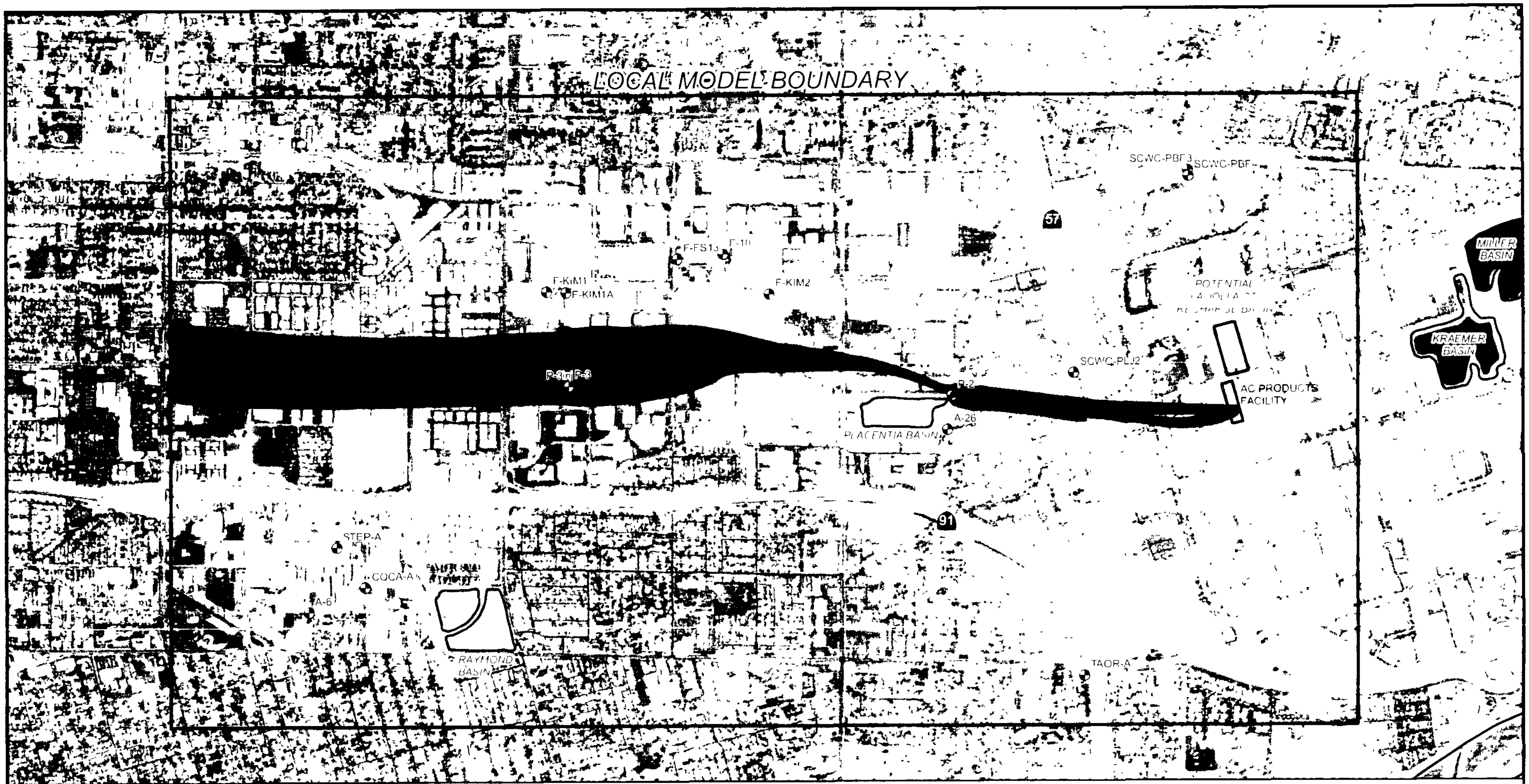
0 1 500 3 000 Feet

FIGURE 26

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
SHALLOW AQUIFER
SCENARIO 1
NO LA JOLLA BASIN RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

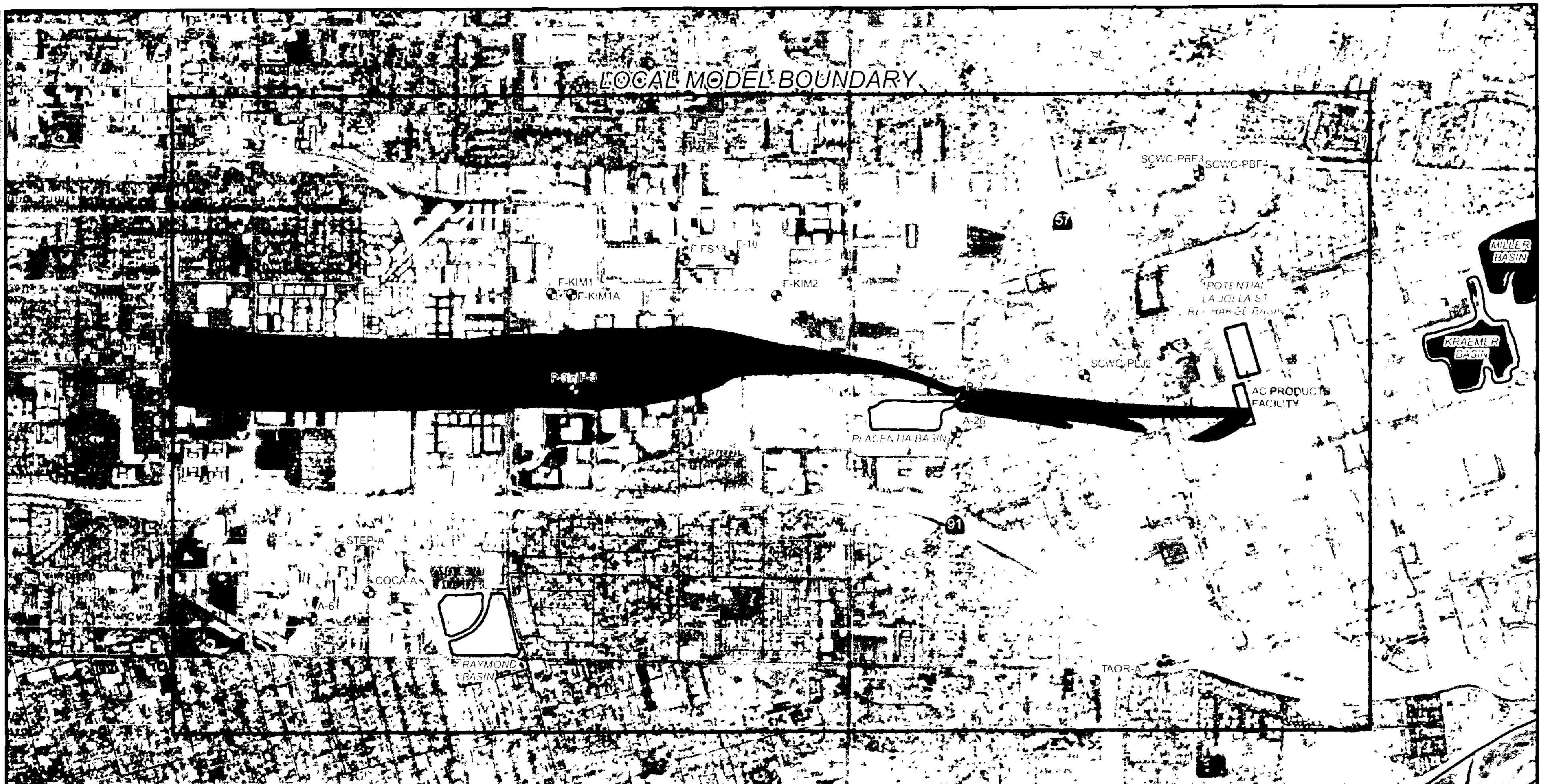
- Selected Monitoring Well Location
- Production Well
- The area shown represents that containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1 2006 to January 1 2016 The entire area of CL exceedance is a composite of 11 overlays each representing the area above MCL at the end of each year

FIGURE 27

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
SHALLOW AQUIFER
SCENARIO 2
4 500 AF/YR LA JOLLA BASIN RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

- Selected Monitoring Well Location
- Production Well
- The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1, 2006 to January 1 2016 The entire area of MCL exceedance is a composite of 11 overlays each representing the area above MCL at the end of each year

N

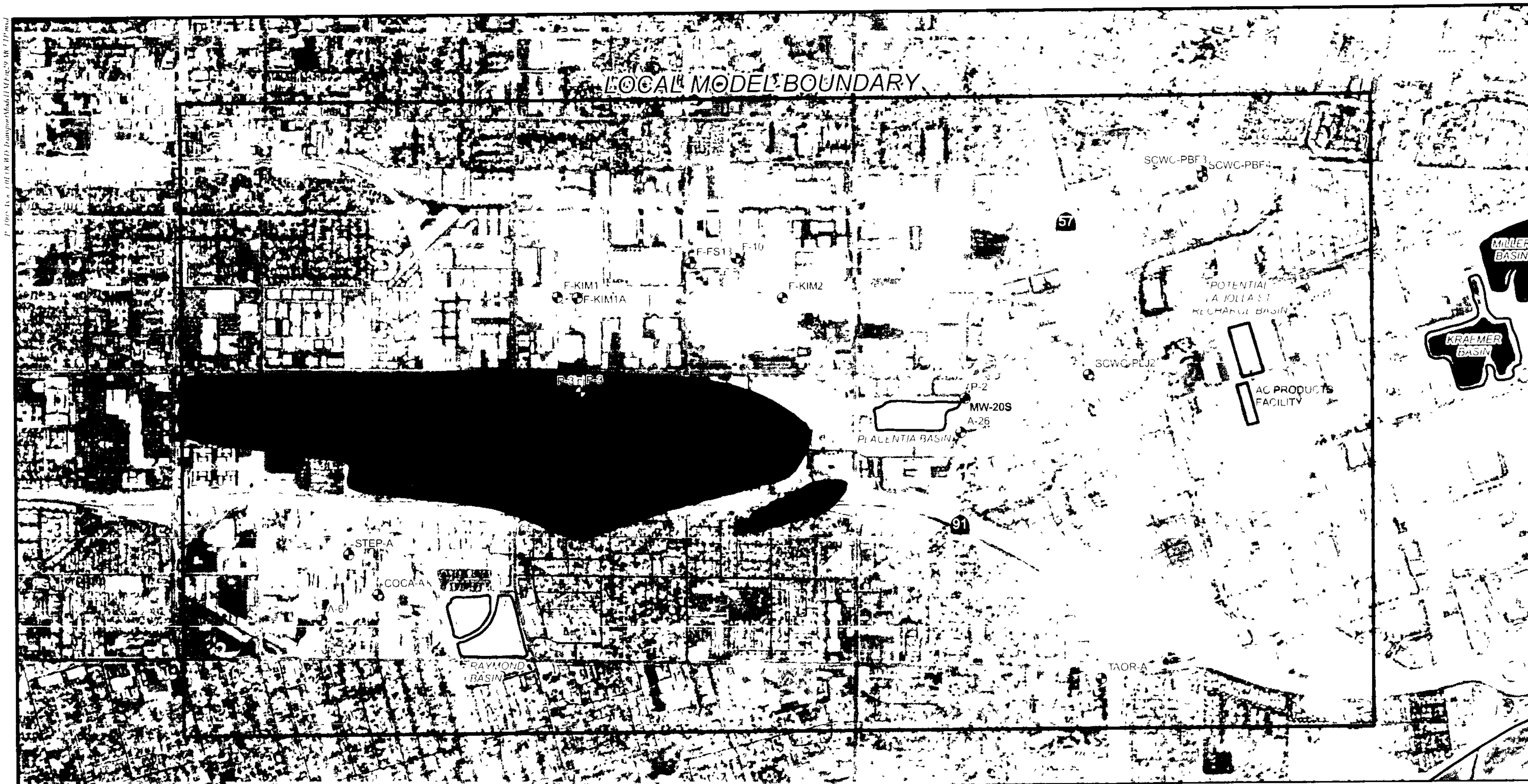
0 1 500 3 000 Feet

FIGURE 28

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
SHALLOW AQUIFER
SCENARIO 3
9,000 AF/YR LA JOLLA BASIN RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

- Selected Monitoring Well Location
- Production Well
- The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1, 2006 to January 1, 2016. The entire area of MCL exceedance is a composite of 11 overlays each representing the area above MCL at the end of each year

N

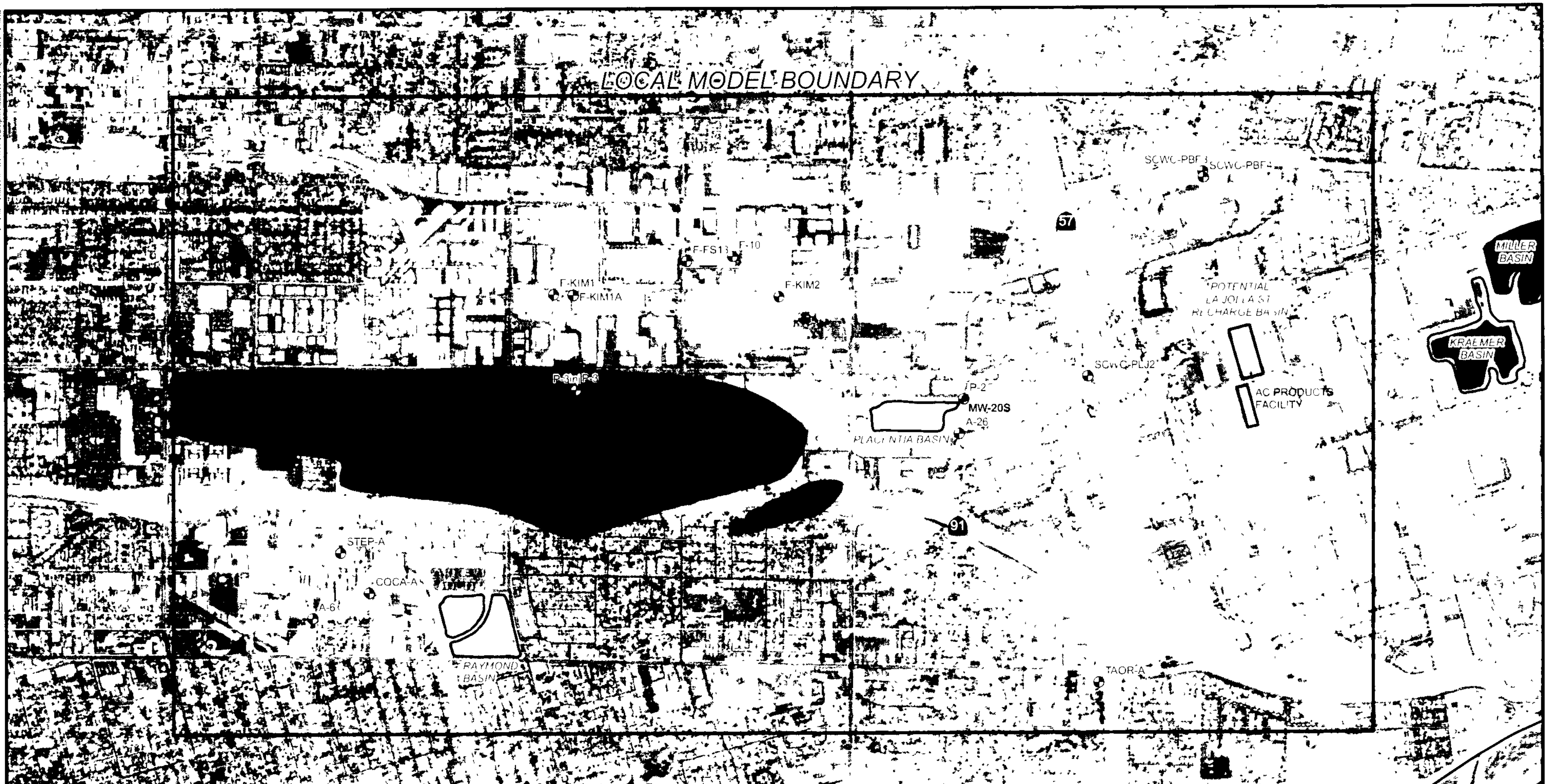
0 1,500 3,000 Feet

FIGURE 29

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
PRINCIPAL AQUIFER
SCENARIO 1
NO LA JOLLA BASIN RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

- Selected Monitoring Well Location
- Production Well
- The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1 2006 to January 1 2016. The entire area of MCL exceedance is a composite of 11 overlays, each representing the area above MCL at the end of each year

N

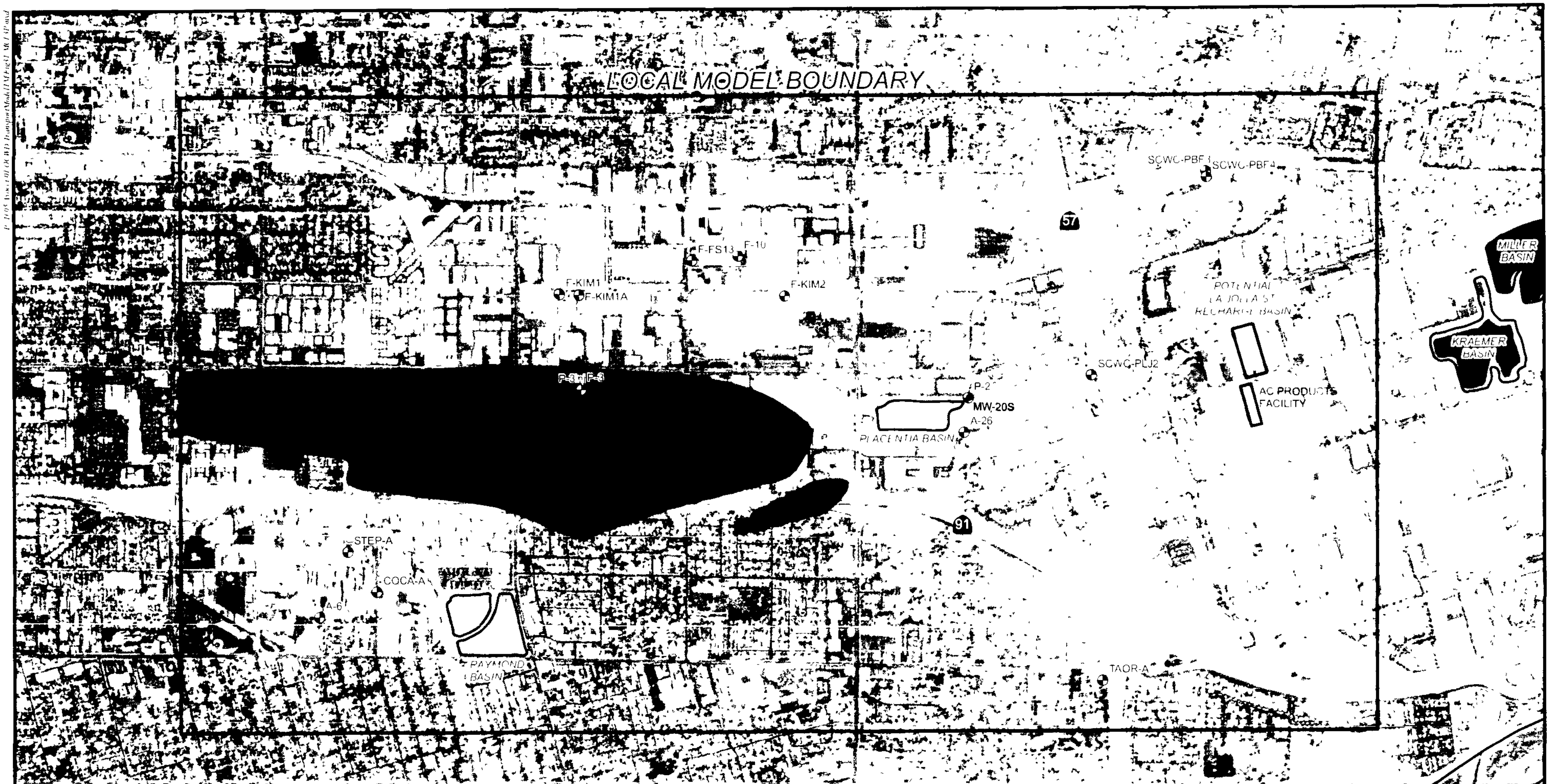
0 1 500 3,000 Feet

FIGURE 30

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
PRINCIPAL AQUIFER
SCENARIO 2
4,500 AF/YR LA JOLLA BASIN RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING



LEGEND

- Selected Monitoring Well Location
- Production Well
- The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1, 2006 to January 1 2016. The entire area of MCL exceedance is a composite of 11 overlays each representing the area above MCL at the end of each year

FIGURE 31

SIMULATED EXTENT OF PCE PLUME ABOVE MCL
PRINCIPAL AQUIFER
SCENARIO 3
9 000 AF/YR LA JOLLA BASIN RECHARGE

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON ENGINEERING

LEGEND

- Proposed Monitoring Well Locations
- Existing AC Products Monitoring Well Location
- Other Existing Monitoring Well Locations
- Production Well

The area shown represents the region containing PCE above the 5 ug/L MCL at any time during the recharge simulation period from January 1 2006 to January 1 2016 in both the 4,500 and 9,000 AF/YR recharge scenarios. The entire area of MCL exceedance is a composite of overlays each representing the area above MCL at the end of each year for both recharge scenarios

FIGURE 32

MONITORING WELL LOCATIONS

POTENTIAL LA JOLLA STREET RECHARGE BASIN
ANAHEIM FOREBAY AREA
ORANGE COUNTY WATER DISTRICT

RUBICON
ENGINEERING

Appendix A

Statement of Qualifications
Ground Water and Chemical Transport Modeling

A.0 RUBICON ENGINEERING CORPORATION

Rubicon Engineering Corporation (Rubicon) is a consulting firm and a licensed general engineering contractor. The company provides environmental, civil, and structural engineering services for the private sector and municipalities. Rubicon is capable of handling projects ranging from due diligence and preliminary environmental characterization to the design, construction, and operation of complex remediation systems. Rubicon's principal areas of practice include:

- Due diligence
- Environmental compliance
- Pollution prevention
- Preparation of Planning Documents
- Site characterization
- RCRA facility investigation
- Remedial investigation/feasibility study (RI/FS)
- Waste classification
- Evaluation, design, and implementation of remedial programs
- Operation and maintenance of remediation systems
- Ground water and contaminant transport modeling
- Air quality assessment/modeling
- Human health and environmental risk assessment
- Legal support and expert witness testimony

The focus of this Statement of Qualifications (SOQ) is on ground water and chemical transport modeling.

A.1 MODELING OBJECTIVES AND APPROACH

Modeling the flow of ground water and transport of chemical constituents in soil and ground water is a common and proven tool to understand and predict the behavior of the aquifer systems and to develop management alternatives. Long-term prediction of aquifer response, migration behavior of contaminants, testing various remedial scenarios, and evaluation of impact of contaminant sources on ground water are few examples of utility of the models.

We routinely apply models for designing and testing remedial systems. Therefore, modeling is an integral part of the feasibility studies to select and evaluate the most appropriate remedial alternative. We have utilized a wide spectrum of ground water and chemical transport models to test applicable remediation scenarios in the Superfund projects and other projects of the same scale.

Another model application at Rubicon is allocation of responsibility and cost to multiple potentially responsible parties (PRPs) that may have contributed to a commingled plume of contamination. Factors that contribute to the complexity of the allocation cases include potential migration of chemical constituents from various upgradient facilities, different time of releases and estimation of credits to the PRPs that may have performed extensive remediation.

In its consulting practice, Rubicon resorts to a phased modeling approach. Initially, simplified models are utilized because usually there is not sufficient input data. Darcy's law and its analytic variations are used to simplify flow problems. Examples of simplified transport models include RESSQ and TDAST. RESSQ is used to track contaminant pathways and to test extraction/injection scenarios. TDAST is used to estimate migration behavior of contaminants under various hydrogeologic conditions. As site characterization proceeds and properties are further defined, the models become more complex and also more representative of the site conditions.

Although we have utilized many numerical codes to model complex flow and transport problems, the most common and accepted model used for ground water flow simulation is MODFLOW, a three-dimensional finite difference code. We have applied MODFLOW to large-scale ground water basins and small-scale projects.

To simulate the transport of chemical constituents in ground water, the results of a flow model such as MODFLOW are used to define the flow field prior to adopting a transport model. The most common transport codes used by Rubicon include MT3D and RT3D. MT3D is capable of simulating the transport of dissolved chemical constituents considering advection, dispersion, and adsorption. The code RT3D has the same capabilities as the MT3D and can also address the chemical and biological transformations of various chemical species.

A.2 PERSONNEL QUALIFICATIONS

Rubicon's senior staff conducts various degrees of modeling based on project demand. This section, however, focuses on the qualifications of Dr. Mohsen Mehran and Mr. David Hogshead, P.E. because of their direct involvement in the subject project. The resumes of Dr. Mehran and Mr. Hogshead are attached.

Mohsen Mehran, Ph.D.

Dr. Mehran is a certified ground water professional with over 30 years of experience in hydrogeology, ground water quality, and environmental sciences and engineering. He has 10 years of experience in teaching and conducting research at the University of California at Davis and Berkeley. He has taught advanced ground water hydrology, contaminant transport modeling, physicochemical principals of soil behavior, and soil mechanics. From 1971 through 1979, he was responsible for modeling the transport and transformation of nitrogenous compounds in soil and ground water, a research grant sponsored by the National Science Foundation. Dr. Mehran has published more than 50 scientific articles.

Since 1981, during his consulting practice, Dr. Mehran has served in senior technical and management positions with responsibility for conducting large-scale investigation/remediation projects. He has also been responsible for performing complex ground water/contaminant transport modeling projects. The contaminants of concern have included volatile organic compounds, pesticides and herbicides, petroleum compounds, lead, chromium, arsenic, and copper.

Dr. Mehran has been the principal investigator in cost allocation projects in San Fernando Valley and Pointe Valley Operable Units. He was among the few consultants who performed individual plume analysis and developed models to estimate the contribution of more than 40 PRPs in each operable unit.

Dr. Mehran has extensive experience in litigation support and expert testimony cases. He has represented property developers, industrial clients, and government agencies. His cases have included evaluation of impact of pollutants on soil and ground water, assessment of off-site migration of contaminants, resolution of commingled plumes, and allocation of cost of remedy.

David Hogshead, P.E.

Mr. Hogshead is a registered civil engineer in California. He has 20 years of experience in modeling, data analysis, database development, conducting feasibility studies, designing remediation systems, and installation and operation of remediation systems. Mr. Hogshead has applied numerous analytic and numeric codes to solve ground water and contaminant transport problems. He has developed in-house codes, pre-processors, and post-processors to supplement and enhance existing codes. He has constructed animations and visualizations of contaminant transport in soil and ground water.

Mr. Higshead's design experience includes aquifer testing, vapor extraction pilot testing, and preparation of plans and specifications for soil vapor extraction and ground water remediation systems. Remediation technologies successfully applied by Mr. Hogshead include ground water treatment by air sparging, air stripping, activated carbon adsorption, chemical oxidation, and biological oxidation; and soil treatment by in-situ vapor extraction, chemical fixation, and excavation followed by off-site disposal or recycling.

MOHSEN MEHRAN, Ph. D.
Principal Hydrologist

FIELDS OF EXPERTISE

Dr. Mehran's hydrogeologic background includes both experimental and theoretical expertise in the areas of transport phenomena in fractured porous media. He has developed and applied numerous computer models to solve ground water flow problems and investigate the migration of various chemical compounds in fractured/porous media - e.g., petroleum compounds, hexavalent chromium and other metals, chlorinated solvents, herbicides, volatile organic compounds, and numerous other chemicals. He has applied this technical specialty to evaluation of mitigation alternatives, development of cleanup criteria, ground water restoration, site assessment and investigation, and soil remediation projects for clients in the aerospace, petroleum, electronics, chemical, wood preserving, communications, and other industries.

Dr. Mehran is active professionally by publishing and has been a reviewer for the *Journal of Ground Water* and *Journal of Ground Water Monitoring and Remediation*. Dr. Mehran provides legal support and expert witness testimony for cases related to causes of contamination, identification of multiple sources of contamination, and cost recovery/allocation. He has published more than 50 technical papers.

EDUCATION

Ph.D., 1971, Civil Engineering, University of California, Davis

M.S., 1966, Soil Physics, University of California, Davis

B.S., 1962, Agricultural Engineering, Tehran University

PROFESSIONAL REGISTRATIONS

Certified Ground Water Professional No. 189

Qualified Environmental Professional - Institute of Professional Environmental Practice

EMPLOYMENT HISTORY

2004 to present	Principal Hydrologist, Rubicon Engineering Corporation
2000 to 2004	Chief Executive Officer, England Geosystem, Inc.

1986 to 2000	Principal Hydrogeologist, Principal-in-Charge, Project Manager, and technical contributor in ground water investigation and remediation projects, Geosystem Consultants, Inc., Irvine, California
1981 to 1985	Project Manager/Technical Specialist – Hydrogeology, IT Corporation Irvine, California
1979 to 1981	Staff Scientist, Lawrence Berkeley Laboratory, Berkeley, California
1977 to 1979	Visiting Associate Professor, University of California, Davis, California
1974 to 1977	Associate Professor, Civil Engineering Department, Tehran Polytechnique, Iran
1971 to 1974	Post-Graduate Scientist, University of California, Davis, California

SELECT PROJECT EXPERIENCE

Soil and ground water remediation of primarily TCE and methylene chloride at a facility in Long Beach, California

- Principal Investigator for Focused Feasibility Study for remediation of chlorinated hydrocarbons, in soil and ground water at a manufacturing facility in Los Angeles. The scope of work includes using GIS for data organization, evaluation, analysis, visualization, and communication.
- Conducted hydrologic investigations and prepared site-specific numeric models of transport of contaminants in soils and ground water.
- Responsible for conducting evaluations of cleanup alternatives, negotiating with state and federal agencies, preparing Remedial Action Plans, and conducting remedial actions at sites throughout California.
- Designed and evaluated extraction/treatment system to remediate dissolved TCE migration in a fractured sandstone formation; assessed remedial action effectiveness.
- Investigated hexavalent chromium contamination in soil and ground water at Superfund sites, performed geochemical studies to assess sources of hexavalent chromium and its migration behavior, conducted Feasibility Studies to select the most appropriate remedial technology, and performed pilot tests to evaluate the feasibility of in situ remediation technologies.
- Evaluated migration pathways of TCE, 1,2-dichloroethene, and carbon tetrachloride in fractured limestone formation and developed containment and remedial technologies.
- Demonstrated natural attenuation of chlorinated hydrocarbons in drinking water aquifer to support site closure.

- Evaluated effectiveness of ground water remediation program to reduce the concentrations of methylene chloride, TCE, and tetrachloroethene in a multilayered aquifer system.

- Modeled ground water flow and ethylene dibromide (EDB) transport to evaluate the effectiveness of an extraction/injection program at a chemical manufacturing facility and prepared technical reports in accordance with the requirements of the California Regional Water Quality Control Board.

- Expert witness testimony services for the allocation of responsibility and costs of remediation related to volatile organic compounds and hexavalent chromium in ground water – Burbank versus Glendale Operating Units (OUs) and the Potentially Responsible Parties (PRPs) within the Glendale North and Glendale South. This included assessment of the contribution by Burbank to contamination in Glendale and by various PRPs within the Glendale OUs.

- Ground water and contaminant transport modeling for remediation and cost allocation among potentially responsible parties at EPA operable units in the San Fernando and San Gabriel Valley ground water basins.

- Conducted a soil and ground water investigation to delineate the extent of hexavalent chromium contamination in Ukiah, California – including site characterization, geochemical evaluation of leaching of chromium, hydrogeologic studies, Remedial Action Plan preparation, and in-situ remediation assessment.

- Performance of a comprehensive RI/FS at a site in Central Valley, California. Hexavalent chromium, trivalent chromium, and arsenic were the principal chemicals of concern. Activities involved over 50 ground water monitoring wells; drilling and sampling of more than 120 borings; evaluation of in-situ remediation technologies, and feasibility study.

- Taught courses in advanced ground water hydrology, contaminant transport modeling, and soil mechanics. Continued research in transport phenomena in fractured/porous media. Dr. Mehran has supervised numerous graduate students on various research topics.

- Responsible for fundamental formulation and computer model development of the simultaneous transport of water, contaminant, and heat in fractured/porous media and evaluation of the hydrogeologic consequences of dewatering deep formations. Utilizing numerical models, developed the capability of simulating the long-term effects of dewatering and reinvasion of water by considering saturated-unsaturated flow in fractured shale formations. A practical application of this research relates to the migration of dissolved organic constituents and radionuclides in fractured formations.

– Conducted research on transport and transformation of various nitrogen species in soils under saturated and unsaturated flow conditions, applied to nitrate pollution of ground water. This work was supported by the National Science Foundation. The computer models developed by Dr. Mehran have been successfully applied to the behavior of nitrogen and other chemical compounds in actual field problems.

PROFESSIONAL AFFILIATIONS

American Geophysical Union
Association of Ground Water Scientists and Engineers
National Ground Water Association
Member of the Research Advisory Board of the National Water Research Institute

PUBLICATIONS

Mehran, M., "Influence of Soil Moisture Suction on Soil Tensile and Compressive Strength," M.S. Thesis, University of California, Davis, 1966.

Mehran, M., "Development of Air Force Erosion Control Manual," report to Water Resources Engineers, Inc., Walnut Creek, California, 1969.

Mehran, M., "Electrical Dispersion and Electrokinetic Phenomena in Clays," Ph.D. Dissertation, University of California, 1971.

Mehran, M., and K.K. Tanji, "Chemical Transport in Flooded Rice Fields," paper presented before the Environmental Division of American Society of Agronomy Meeting, November 1, 1972, Miami, Florida.

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Tanji, K.K., M. Mehran, J.W. Biggar, and D.R. Nielsen, "Computer Modeling of Nitrogen Transformation and Transport in Cropped Irrigated Lands," Annual Report to the National Science Foundation for Grant No. GI34733X, July 1973.

Tanji, K.K., J.W. Biggar, M. Mehran, and D.W. Henderson, "Herbicide Persistence and Movement Studies with Molinate in Rice Irrigation Management," California Agriculture 28(5):10-12, 1974.

Tanji, K.K., T.K. Kam, M. Mehran, J.W. Biggar, and D.R. Nielsen, "Computer Modeling of Nitrogen Transformation and Transport in Cropped Irrigated Lands," Annual Report to the National Science Foundation for Grant No. GI34733X, July 1974.

Tanji, K.K., T.K. Kam, and M. Mehran, "Nitrogen Studies in Secondary Sewage Percolation Ponds," Symposium on Nitrogen Transport and Transformation, Chicago, Illinois, 1974.

Mehran, M., "Contamination of Surface and Ground Waters by Nitrogenous Compounds," Proceedings of 24th Iranian Medical Congress, Ramsar, Iran, September 1975.

Mehran, M., and K. Arulanandan, "Low Frequency Conductivity Dispersion in Clay-Water-Electrolyte Systems," Clays and Clay Minerals 25:38-48, 1977.

Tanji, K.K., F.E. Broadbent, M. Mehran, and M. Fried, "An Extended Version of a Conceptual Model for Evaluating Annual Nitrogen Leaching Losses from Croplands," Journal of Environmental Quality 8(1):114-120, 1979.

Tanji, K.K., and M. Mehran, "Nitrogen Modeling in Croplands," final report, Nitrate in Effluents from Irrigated Agriculture for National Science Foundation, Grant No. ENV 76-10283 A01, 1979.

Mehran, M., T.N. Narasimhan, and J.P. Fox, "An Investigation of Dewatering for the Modified In-situ Retorting Process, Peance Basin, Colorado," Lawrence Berkeley Laboratory Report No. LBL-11819, 1980.

Mehran, M., K.K. Tanji, and I.K. Iskandar, "Compartmental Modeling for Prediction of Nitrate Leaching Losses," Chapter 16 in: Modeling Wastewater Renovation by Land Treatment. I.K. Iskandar (ed.), John Wiley and Sons, 1981.

Gupta, S.K., K.K. Tanji, and M. Mehran, "Field Simulation of Water and Nitrogen Transport in Soil-Water-Plant Systems. Part I: Water Flow."

Mehran, M., K.K. Tanji, and S.K. Gupta, "Field Simulation of Water and Nitrogen Transport in Soil-Water-Plant Systems. Part II: Nitrogen Transport and Transformations."

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Mehran, M., T.N. Narasimhan, and J.P. Fox, "Hydrogeologic Consequences of Modified In-situ Retorting Process, Piceance Creek Basin, Colorado," 14th Oil Shale Symposium, Golden Colorado, April 1981.

Noorishad, J., M. Mehran, and T.N. Narasimhan, "On the Formulation of Saturated-Unsaturated Fluid Flow in Deformable Porous Media," Advances in Water Resources, Vol. 5, 61-62, 1982.

Noorishad, J., and M. Mehran, "An Upstream Finite Element Method for Solution of Transient Transport Equation in Fractured Porous Media," Water Resources Research, Vol. 18, No. 3, 588-596, 1982.

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Selim, H.M., M. Mehran, K.K. Tanji, and I.K. Iskandar, "Mathematical Simulation of Nitrogen Interactions in Soils," Mathematics and Computers in Simulation, Vol. 25, No. 3, 241-248, 1983.

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Mehran, M., and B.M. Rector, "Ground Water Treatment and Contaminant Migration Control," paper presented at a meeting of the Chemical Manufacturers Association, Atlanta, Georgia, September 1984.

Mehran, M., and R.L. Pellissier, "Geochemical Characteristics of Ethylene Dibromide," paper presented at the International Chemical Congress of Pacific Basin Societies, Honolulu, Hawaii, December 1984.

Mehran, M., "University-Industry Round-Table: Research Needs in Hazardous Waste Management," presented before the faculties of Civil Engineering and Environmental Engineering, University of Southern California, October 9, 1985.

Mehran, M., "Modeling of Volatile Organic Compounds in Ground Water Systems," paper presented at the University of Southern California, November 8, 1985.

Parmele, C.S., R.D. Allen, and M. Mehran, "Steam-Regenerated Activated Carbon -- An Emission-Free Cost-Effective Ground Water Treatment Process," presented at American Institute of Chemical Engineers Annual Meeting, Chicago, Illinois, November 13, 1985.

Parmele, C.S., T.L. Schomer, and M. Mehran, "Industrial Prospective on In-Situ Methodology," paper presented at Southeastern Symposium on In-Situ Treatment and Immobilization of Hazardous and Radioactive Waste, Knoxville, Tennessee, June 8-10, 1986.

Mehran, M., R.L. Olsen, and B.M. Rector, "Distribution Coefficient of Trichloroethylene in Soil Water Systems," Ground Water, Volume 25, No. 3,275-282, 1987.

Mehran, M., "Ground Water/Contaminant Transport Models -- Uses and Misuse," presented to the California Environmental Health Association, October 28, 1987.

Mehran, M., "Statistical Techniques for Waste Environmental Sampling," presented at a meeting of the American Statistical Association, New Orleans, Louisiana, August 1988.

Mehran, M., "Role of Geochemistry of Chromium on Soil and Ground Water Remediation at Wood Preserving Facilities," presented at a meeting of the American Wood Preservers Association, Seattle, Washington, September 1988.

Azari, A., M.H. Alemi, and M. Mehran, "Estimating Mean of Groundwater Trace Constituents and Toxic Compounds for Censored Data," presented at a meeting of the American Society of Agronomy, Anaheim, California, November 27 to December 2, 1988.

Mehran, M., "Environmental Considerations Related to Siting and Operation of Wood Preserving Facilities," presented at a meeting of the American Wood Preservers Association, Richmond, Virginia, September 12, 1989.

Mehran, M., R.L. Olsen, and R.W. Chappell, "Adsorption and Desorption Characteristics of Chlorinated Volatile Organic Compounds," presented at the Ground Water Geochemistry Conference of National Water Well Association, Kansas City, Missouri, February 21, 1990.

Mehran, M., "Evaluation of Hexavalent Chromium Migration for Ground Water Remediation," presented at the 84th Annual Meeting & Exhibition of Air & Waste Management Association, Vancouver, British Columbia, June 16 - 21, 1991.

Mehran, M., "Fate and Transport of Ethylene Dibromide in Soil and Ground Water Systems," presented at the 85th Annual Meeting & Exhibition of Air & Waste Management Association, Kansas City, Missouri, June 21 - 26, 1992.

Mehran, M., "Design of Extraction/Injection Systems Using Analytic Models," presented at the 85th Annual Meeting & Exhibition of Air & Waste Management Association, Kansas City, Missouri, June 21 - 26, 1992.

Mehran, M., "Soil and Ground Water Remediation by Vapor Extraction and Air Sparging," American Water Resources Association, Chicago, Illinois, November 1994.

Mehran, M., "Combined Effects of Water Table Drawdown, Vapor Extraction, and Air Sparging on Soil and Ground Water Remediation," Emerging Technologies in Hazardous Waste Management VII, American Chemical Society, Atlanta, Georgia, September 1995.

Mehran, M., "Soil and Ground Water Remediation by Vapor Extraction and Air Sparging," International Chemical Congress, Honolulu, Hawaii, December 1995.

Mehran, M., "Impacts of Pollutants on Ground Water Resources: Trends and Research Needs," International Conference on Industrial Pollution and Control Technologies, November 17 - 19, 1997, Hyderabad, India.

Mehran, M., "Natural Attenuation of Methylene Chloride in Ground Water," The 5th International Symposium on In-Situ and On-Site Bioremediation, April 1999, San Diego, California.

DAVID HOGSHEAD, P.E.

FIELDS OF EXPERTISE

Mr. Hogshead has 20 years of experience in environmental and hazardous waste-related projects with particular emphasis on ground water hydrology, modeling, and remedial design. Mr. Hogshead has a comprehensive background in site characterization, and the design and construction of soil and ground water remediation programs. He has been responsible for site assessment and remedial operations at sites contaminated with chlorinated solvents, petroleum hydrocarbons, and heavy metals. Mr. Hogshead has extensive experience in database development, geographical information systems (GIS), and in the application of computer models to the analysis of ground water flow and contaminant transport and dispersion of airborne contaminants.

EDUCATION

B.S., 1983, Mechanical Engineering, University of California, San Diego

OSHA 29 CFR 1910.120 initial and refresher site worker training

PROFESSIONAL REGISTRATIONS

Registered Civil Engineer in the State of California (RCE No. C 049188)

EMPLOYMENT HISTORY

2004 to present	Principal Engineer, Rubicon Engineering, Irvine, California
2000 to 2004	Senior Engineer and Manager, England Geosystem, Inc., Irvine, California
1988 to 2000	Project Manager/Senior Engineer, Geosystem Consultants, Inc., Irvine, California.
1986 to 1988	Staff Engineer, Geosystem Consultants, Inc., Irvine, California.
1984 to 1986	Engineer, IT Corporation

SELECT PROJECT EXPERIENCE

- Involved in environmental assessment and remediation projects where responsible for planning and performance of field investigations, development/design of site-specific remedial programs, evaluation of effectiveness of remediation systems, and ground water/contaminant transport modeling.

- Senior engineer in application of numerical models (MODFLOW and CFEST) to three-dimensional simulation of ground water flow and contaminant transport in multi-aquifer system in San Gabriel Valley. Objective of modeling effort was to evaluate various remedial alternatives and assess consequences of each alternative in terms of downgradient migration and achieving cleanup levels. The analysis was used for allocation purposes.

- Applied analytic and semi-analytic ground water flow/contaminant transport models to field-scale problems in numerous projects.

- Soil and ground water remediation at public utility facility in Riverside County with multiple plumes of gasoline and diesel contamination. Designed pump and treat system for gasoline-impacted ground water using air stripping, dual-phase pumping system for recovery of free-floating diesel product, and in-situ vapor extraction system for remediation of gasoline-containing soils. Responsible for air dispersion modeling and health risk assessment related to permitting air stripping and in-situ vapor extraction systems. As result of the modeling and risk assessment, South Coast Air Quality Management District waived requirement for vapor abatement, thereby saving client substantial sums of money.

- As project hydrologist, performed aquifer characterization and designed ground water extraction/treatment/reinjection system for federal Superfund site in San Joaquin Valley where the hexavalent chromium contaminated soil and ground water.

- Responsible for diesel product recovery project at large ranch in Arizona. To date, over 70,000 gallons of diesel fuel have been recovered from four extraction wells using aboveground water/diesel separation techniques.

- Project engineer on project involving shoring, dewatering, excavation, and aboveground treatment of about 10,000 cubic yards of petroleum- contaminated soil. Soil treated by aeration and disposed of cost-effectively at nearby Class II municipal landfill.

- Developed data management systems to compile, maintain, retrieve, and present hydrologic and soil/water quality data.

- Evaluated effectiveness of ground water remediation programs by analyzing hydraulic data, ground water/contaminant transport modeling, and computing efficiency of treatment systems.

- Performed in-situ vapor extraction tests to evaluate feasibility and effectiveness of ISVE/enhanced bioremediation in soils contaminated with volatile organic compounds.

- Prepared air emission inventory plans in response to Assembly Bill 2588.

- Performed feasibility study to select the most appropriate remedial technologies for 100,000 barrels of acid sludge generated at a refinery. Designed and implemented treatability study to test efficiency of on-site treatment/separation.

- Responsible for design, implementation, and testing of ground water extraction/treatment systems, application of ground water/contaminant transport models, design and implementation of extraction/injection systems.

- Conducted numerical modeling of ground water and solute transport for field-scale problems; performed underground tank integrity testing; installed monitoring wells; constructed project tracking system; responsible for database management.

APPENDIX 9.4
SUMMARY OF CONTAMINANT TRANSPORT MODELING RESULTS

Geomatrix Consultants, Inc.
August 2005

Geomatrix

August 15, 2005
010600

Mike DeVore
Senior Environmental Manager
Chambers Group, Inc.
17671 Cowan Avenue, Suite 100
Irvine, California 92614

Subject: Summary of Contaminant Transport Modeling Results
Potential La Jolla Street Recharge Basin

Dear Mr. DeVore

Geomatrix Consultants, Inc. (Geomatrix) has reviewed the following technical document prepared by Rubicon Engineering Corporation (Rubicon):

- Contaminant Transport Modeling, Potential La Jolla Street Recharge Basin, Anaheim Forebay Area, Orange County, California; dated March 15, 2005.

Following is a brief description of the scope and objectives, a summary of our understanding of the hydrogeological conditions in the general area of the Potential La Jolla Street Recharge Basin, a summary of the groundwater flow and the solute transport modeling efforts, and a summary and evaluation of the proposed groundwater monitoring system. Please note that our scope of work did not include in-depth review of the technical or numerical aspects of the model or of its underlying assumptions.

Scope and Objectives

It is our understanding that Orange County Water District (OCWD) has acquired a total of approximately 12 acres comprising three adjoining properties in the Anaheim Forebay area to construct a groundwater recharge basin. Chambers Group, Inc. is preparing an Environmental Impact Report for the project on behalf of the OCWD. The properties are located along the boundary of the cities of Placentia and Anaheim, approximately 0.5 mile east of State Highway 57. The boundaries of the combined property are La Jolla Street to the south, the Carbon Creek Channel to the north, and commercial properties to the east and west. Only six acres of the combined property will be used as the future recharge basin. To allow percolation of surface water diverted from the Santa Ana River and recharge the underlying aquifer, the existing improvements on the properties will be removed and a recharge basin excavated to a depth of 9 feet below ground surface. The OCWD is planning to recharge up to 9,000 acre feet of water per year at the future recharge basin.

510 Superior Avenue, Suite 200
Newport Beach, California 92663-3627
Tel 949.642.0245
Fax 949.642.4474
www.geomatrix.com

Rubicon has developed a numerical model of groundwater flow and contaminant transport to evaluate the potential effects of future groundwater recharge at the proposed La Jolla Street recharge basin on a contaminant plume that has originated from the nearby AC Products, Inc. facility (AC Products). In addition, Rubicon has provided recommendations for monitoring of the contaminant plume as the La Jolla Street basin is constructed and recharge activities are initiated.

Hydrogeologic Conditions

The site area is located on the eastern part of the Coastal Plain of Los Angeles and Orange counties. The Santa Ana River channel is the most prominent hydrologic feature on this part of the Coastal Plain. The Anaheim Forebay is a portion of the Coastal Plain several miles inland of the mouth of the Santa Ana River and extending westward from the mouth of Santa Ana canyon.

Structural geology of the area is marked by a northwest trending synclinal trough composed of metamorphic rocks at greater depths overlain by marine and continental clastic sedimentary rocks of Cretaceous through Pleistocene age. A series of unconsolidated alluvial deposits overlie these sediments. The fresh groundwater resources of this area are within the uppermost 500 to 2000 feet thick sequence of the alluvial deposits. California Department of Water Resources (CDWR) has designated the sequence of water-bearing sediments in the area as the Upper, Middle, and Lower aquifer systems. Most of the aquifers beneath the Coastal Plain dip gently southwesterly, and certain aquifers occur at or near the ground surface in the eastern parts of the basin in the Anaheim Forebay area. These conditions are generally favorable for OCWD's operation of groundwater recharge basins in the Anaheim Forebay area.

According to previous studies, the Upper aquifer system in the vicinity of the site is composed of medium- to coarse-grained sands and gravels with thin layers of fine-grained low permeability sediments. These low permeability layers may not be continuous in a large scale; nonetheless they can inhibit groundwater flow on a local scale. The depth to the top of the Upper aquifer in the site vicinity has been reported to vary from 80 to 120 feet between 1992 and 1997. The groundwater flow direction is toward the west under a horizontal hydraulic gradient of 0.003 to 0.007. Hydraulic conductivity of the Upper aquifer has been reported as 200 to 300 feet per day (ft/day) under the AC Products facility and approximately 870 ft/day in the vicinity of the Placentia Flood Control Basin.

Water Quality Conditions in the Vicinity of the Site

Based on review of related documents, AC Products operates a maskant and adhesive facility at 172 E. La Jolla in Placentia, California. This facility is located on the opposite side of La Jolla Street from the site. Release of volatile organic compounds (VOCs) from the AC Products facility has impacted the underlying groundwater and the dissolved VOCs have moved approximately two miles downgradient (westward) in groundwater.

Groundwater Flow and Solute Transport Model

Rubicon has developed a local groundwater flow model and a solute transport model to simulate the potential impact of future groundwater recharge activities on the AC Products VOC plume. The Rubicon groundwater flow model has been developed based on OCWD's basin-wide regional groundwater flow model constructed by OCWD and which utilizes the U.S. Geological Survey's Three-Dimensional Finite-Difference Modular Ground-Water Flow code (MODFLOW). Rubicon has performed contaminant transport modeling utilizing the numerical code MT3DMS, which uses the same finite difference model numerical grid of the MODFLOW code. Both MODFLOW and MT3DMS models are widely accepted and utilized by groundwater professionals for numerical simulation of groundwater flow and transport of chemicals in groundwater.

The Rubicon local groundwater flow model is a refined and updated version of a previous local flow model developed by England Geosystem, Inc. (EGI). As such, the subsurface hydrogeologic units, the aquifer systems, and the input and output parameters of the OCWD regional and the previous local groundwater flow models have been used in developing the Rubicon local groundwater flow model. The previous local groundwater flow model was a steady-state flow simulation (i.e. had one set of flow conditions, including regional flow gradients and directions, extraction and recharge rates). The refined model (Rubicon flow model) has been changed to a transient flow model to accommodate groundwater flow conditions and movement of the AC Products plume over the time.

The area covered by the Rubicon model is 3.5 miles east-west by 1.9 miles north-south and includes the proposed La Jolla Basin, the AC Products VOC plume, two existing flood control basins (the Placentia and Raymond Basins) and active groundwater production and extraction wells. The vertical layering of the previous local model has been modified from 5 layers in the initial local flow model to 17 layers in the Rubicon model to allow refined simulation of the potential downward movement of VOCs. Layers 1 through 5 of the Rubicon model are assigned to the Shallow Aquifer, layers 7 through 15 to Principal Aquifer, and layer 17 to the Deep Aquifer system. The layers representing these aquifers are separated by layers of lower permeability aquitards (represented by layers 6 and 16). The thicknesses of the aquitards vary from place to place within the modeled area. Specifically, the aquitard separating the Shallow and the Principal Aquifers thins in the vicinity of the potential La Jolla Basin.

Model calibration involved analysis of hydraulic parameters, sources and sinks, and initial and boundary conditions. The local model simulation reproduced Principal Aquifer head values generated from the regional model. The modeled water levels produced for the Shallow Aquifer for May 31, 1998 simulation date were compared to those generated during AC Products site investigation and monitoring of June 9, 1998. The hydraulic conductivities and boundary conditions of the local model Layer 1 were adjusted to match the water levels in the Shallow Aquifer. The boundary conditions of the Rubicon model were set as constant value, specified head and adjusted to produce flow directions that conform to the observed regional flow direction of the Shallow Aquifer. Other dynamic factors such as the simulated production well extraction rates, and the water recharge at the Placentia Basin were varied to reflect historical data. The hydraulic conductivities of Layer 1 of the local model were adjusted until the measured hydraulic gradient determined from AC Products June 9, 1998 water level measurement was matched. The initial runs showed extremely close match of the head values generated during the May 1998 stress period of the regional model.

The simulation time period extends from January 1988 (the assumed time when the Shallow Aquifer first became impacted by VOCs at AC Products) to January 2016 (28 years total). Groundwater recharge to the proposed La Jolla Basin is assumed to begin in January 2006. Thirteen production wells within the model domain were active from 1988 through 2003. In addition, three extraction wells (P-1, P-2, and P-3) were installed by AC Products in the Shallow Aquifer as part of its groundwater remediation program. Consequently, potential effects of groundwater extraction and mass removal of VOCs have been accounted for in the Rubicon model. Basin recharge rates were varied over time to reflect recorded historical values.

Rubicon has presented three transient model simulation scenarios. All boundary conditions have been kept unchanged, and the three scenarios differ only in the modeled recharge to the proposed La Jolla Basin. The first scenario is a baseline simulation that involves no recharge in the La Jolla Basin. This scenario is intended to predict groundwater flow and PCE transport under conditions of no groundwater recharge at the La Jolla Basin. The second scenario is based on OCWD's best estimate of the recharge rate, which involves a constant recharge of

4,500 acre-ft/year (corresponding to 2.05 feet per day recharge over 6 acres), starting in January 2006. The third scenario is based on OCWD's estimate of maximum recharge conditions of 9,000 acre-ft/year (4.1 ft/day); which will require continuous operation and cleaning.

Although the simulated hydraulic head values vary throughout the modeled period in response to varying extraction and recharge rates, the regional flow direction in the Shallow Aquifer remains westward. Also the potentiometric surface of the Principal Aquifer slopes toward the southwest during all simulations, indicating a southwesterly flow direction. A local groundwater mound appears corresponding to the recharge activities in the Placentia basin.

Observation of the simulated head values for the first scenario (no recharges from La Jolla Basin) indicates that beneath the La Jolla Basin, where the aquitard separating the Shallow and Principal Aquifers is thin or absent, no significant vertical gradient exists between those two aquifers; however, a vertical downward gradient (indicative of downward flow) is evident farther west and away from the La Jolla Basin, where the aquitard underlying the Shallow Aquifer thickens. This indicates that the hydraulic head in the Shallow Aquifer and the Principal Aquifer beneath the La Jolla Basin are approximately equal under conditions of no recharge from the La Jolla Basin. The influence of recharge of 4,500 or 9,000 acre-ft/year at the La Jolla Basin is evident as a hydraulic mound is developed beneath the basin under scenarios two and three.

Rubicon utilized the numerical code MT3DMS to simulate movement of the PCE plume originating at the AC Products site. This transport model is capable of utilizing the finite difference model grid and other elements of the MODFLOW groundwater flow model. Calibration of the transport model was performed by varying different fate and transport parameters (i.e., advection, dispersion, adsorption, decay) to match the historical concentrations of PCE detected in selected AC Products groundwater monitoring wells. To be conservative, it has been assumed that no PCE degradation occurs during the simulation period. One of the selected monitoring wells (MW-20S) is located in an area that is expected to be highly influenced by the future recharge activities at the La Jolla Basin. As part of the calibration process, a PCE source concentration of 35,458 micrograms per liter (ug/l) has been assigned for January 1988, the beginning of the simulation period. This source concentration was logarithmically reduced with time to 100 ug/l in 2005 and 10 ug/l in 2011 to match the observed historical concentrations in downgradient wells.

Rubicon has simulated the effects of future recharge activities at the proposed La Jolla Basin on the PCE plume under the three recharge scenarios of zero recharge, 4,500 acre-ft/year recharge, and 9,000 acre-ft/year recharge starting in January 2006. Under the zero recharge scenario, simulated PCE concentrations in the Shallow Aquifer near Well MW-20S decrease gradually, however, PCE continues to be present through the end of the simulation (year 2016). For the 4,500 and 9,000 acre-ft/year scenarios, simulated PCE concentrations near well MW-20S decrease more rapidly due to dilution and plume redirection. Under these recharge scenarios, the simulated areas of Shallow Aquifer containing PCE concentrations greater than its MCL of 5 ug/l are translated southward by approximately 225 and 380 feet as recharge rates of 4,500 and 9,000 acre-ft/year, respectively, are applied in the future La Jolla basin beginning in January 2006.

The results of Rubicon's modeling indicate that the anticipated future recharge activities at the La Jolla Basin will have no effect on the PCE concentrations or movement in the Principal Aquifer. The modeling results indicate that no new above maximum contaminant level (MCL) PCE plume appears in the Principal Aquifer near the AC Products facility as a result of the proposed recharge at the future La Jolla Basin.

Proposed Groundwater Monitoring System

As stated above, Rubicon Model predicts that, as recharge into the La Jolla Basin begins, PCE concentrations in wells located along the axis of the dissolved PCE plume in the Shallow Aquifer will decrease with time. Rubicon recommends the following measures to monitor and confirm the model results and to assess the potential effects of future recharge and any remedial measures on PCE concentrations:

- Utilize the data reported to the RWQCB by AC Products to track water quality. Specifically, utilize reported data for the following wells located along the axis of the AC Products plume:
    - MW-8S, MW-8D
    - MW-9S, MW-9D
    - MW-12
    - MW-14S, MW-14D-A, MW-14D-B, and MW-14D-C

    - MW-20S, MW-20D-A, MW-20D-B, and MW-20D-C

- Utilize reported data for the following specific wells located to the south of the axis of the PCE plume between the AC Products facility and the Placentia Basin to confirm the modeling results and predictions for that area of the project:

    - MW-13
    - MW-15
    - MW-16
    - Mw-17

- Install two additional monitoring wells (SMW-1 and SMW-2) in the Shallow Aquifer and one additional monitoring well (PMW-3) in the Principal Aquifer adjacent to SMW-1 to supplement the data reported by AC Products. All these additional wells are recommended to be installed in the southern portion of the project area to monitor any potential southerly component of PCE transport downgradient of AC Products.

Additional Remarks

The groundwater flow model presented by Rubicon is based on the regional flow model and the widely accepted MODFLOW code. Also, the chemical transport model presented by Rubicon is based on a widely accepted and utilized MT3DMS fate and transport code. The calibration of the flow model to the actual groundwater heads supports its validity and allows its use as the foundation for the transport model and a basis for the assessment of the fate and transport of PCE in groundwater. The transport model has incorporated the main mechanisms (i.e., advection, dispersion, and retardation) of fate and transport of PCE in groundwater. The model also accounts for PCE source concentration reduction at the AC Products facility. The model does not account for potential degradation of PCE, and therefore may provide a conservative representation of future PCE concentrations (i.e., actual PCE concentrations should be lower than predicted concentrations).

Rubicon has presented three model scenarios including zero, 4,500, and 9,000 acre-ft/year recharge at the proposed La Jolla Basin. With exception of the recharge rates, all other model parameters are kept constant in performing simulations; therefore, the results presented are reasonable for comparing the effect of the stated discharge rates irrespective of model uncertainty.

The monitoring program recommended by Rubicon is reasonable and should provide necessary data to confirm the modeling results and assess the actual effect of the recharge at the La Jolla Basin on the PCE plume in the Shallow and Principal Aquifers in the vicinity of the AC Products facility.

Please call me at (949)642-0245 if you have any questions.

Sincerely yours,
GEOMATRIX CONSULTANTS, INC.

Hassan Amini

Hassan Amini, Ph.D., CHG
Vice President
Principal Hydrogeologist

APPENDIX 9.5
URBEMIS 2002 AIR QUALITY MODELING DATA

URBEMIS 2002 Air Quality Model Output

Project Construction Emissions

URBEMIS 2002 For Windows 7.5.0

File Name: C:_work\8378_OCWD_LaJollaBasinEIR\data_References\Air Quality\urbemis2002\la
Project Name: La Jolla Recharge Basin - full site
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: November, 2005
Construction Duration: 8
Total Land Use Area to be Developed: 9.3 acres
Maximum Acreage Disturbed Per Day: 1 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 1000

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2005***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	15.12	-	15.12
Off-Road Diesel	5.80	46.36	41.41	-	2.12	2.12	0.00
On-Road Diesel	2.27	49.56	8.47	0.69	1.20	1.02	0.18
Worker Trips	0.11	0.18	2.15	0.00	0.01	0.00	0.01
Maximum lbs/day	8.18	96.10	52.03	0.69	18.45	3.14	15.31
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	20.00	-	20.00
Off-Road Diesel	12.56	95.97	93.09	-	4.33	4.33	0.00
On-Road Diesel	1.42	31.09	5.31	0.43	0.75	0.64	0.11
Worker Trips	0.06	0.03	0.66	0.00	0.01	0.00	0.01
Maximum lbs/day	14.04	127.09	99.06	0.43	25.09	4.97	20.12
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	14.04	127.09	99.06	0.69	25.09	4.97	20.12
*** 2006***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	20.00	-	20.00
Off-Road Diesel	12.56	91.62	96.00	-	4.02	4.02	0.00
On-Road Diesel	1.34	29.11	4.98	0.43	0.68	0.57	0.11
Worker Trips	0.06	0.03	0.63	0.00	0.01	0.00	0.01
Maximum lbs/day	13.96	120.76	101.61	0.43	24.71	4.59	20.12
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	2.57	18.49	19.69	-	0.77	0.77	0.00
Bldg Const Worker Trips	0.12	0.06	1.31	0.00	0.02	0.00	0.02
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.16	-	-	-	-	-	-
Asphalt Off-Road Diesel	5.15	33.27	42.74	-	1.36	1.36	0.00
Asphalt On-Road Diesel	0.05	0.67	0.18	0.01	0.13	0.02	0.11
Asphalt Worker Trips	0.03	0.01	0.33	0.00	0.01	0.00	0.01
Maximum lbs/day	8.08	52.50	64.26	0.01	2.29	2.15	0.14
Max lbs/day all phases	13.96	120.76	101.61	0.43	24.71	4.59	20.12

Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Nov '05
Phase 1 Duration: 1.5 months
Building Volume Total (cubic feet): 672000
Building Volume Daily (cubic feet): 36000
On-Road Truck Travel (VMT): 1667.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	6.0
1	Rubber Tired Dozers	352	0.590	6.0
1	Rubber Tired Loaders	165	0.465	6.0
1	Tractor/Loaders/Backhoes	79	0.465	6.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Dec '05
Phase 2 Duration: 5 months
On-Road Truck Travel (VMT): 1045
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	6.0
2	Rubber Tired Dozers	352	0.590	6.0
2	Rubber Tired Loaders	165	0.465	6.0
1	Scrapers	313	0.660	6.0
1	Trenchers	82	0.695	6.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: May '06
Phase 3 Duration: 1,5 months
Start Month/Year for SubPhase Building: May '06
SubPhase Building Duration: .75 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	6.0
1	Rough Terrain Forklifts	94	0.475	6.0
1	Skid Steer Loaders	62	0.515	6.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '06
SubPhase Asphalt Duration: .75 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	6.0
1	Pavers	132	0.590	6.0
1	Paving Equipment	111	0.530	6.0
1	Rollers	114	0.430	6.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2005***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	15.12	-	15.12
Off-Road Diesel	5.80	31.90	41.41	-	0.16	0.16	0.00
On-Road Diesel	2.27	34.10	8.47	0.69	0.56	0.38	0.18
Worker Trips	0.11	0.18	2.15	0.00	0.01	0.00	0.01
Maximum lbs/day	8.18	66.17	52.03	0.69	15.84	0.53	15.31
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	4.14	-	4.14
Off-Road Diesel	12.56	66.03	93.09	-	0.32	0.32	0.00
On-Road Diesel	1.42	21.39	5.31	0.43	0.35	0.24	0.11
Worker Trips	0.06	0.03	0.66	0.00	0.01	0.00	0.01
Maximum lbs/day	14.04	87.45	99.06	0.43	4.81	0.56	4.26
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.00	-	-	-	-	-	-
Asphalt Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
Asphalt On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max lbs/day all phases	14.04	87.45	99.06	0.69	15.87	0.56	15.31

*** 2006***

Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	4.14	-	4.14
Off-Road Diesel	12.56	63.03	96.00	-	0.30	0.30	0.00
On-Road Diesel	1.34	20.03	4.98	0.43	0.32	0.21	0.11
Worker Trips	0.06	0.03	0.63	0.00	0.01	0.00	0.01
Maximum lbs/day	13.96	83.09	101.61	0.43	4.77	0.51	4.26
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	2.57	12.72	19.69	-	0.06	0.06	0.00
Bldg Const Worker Trips	0.12	0.06	1.31	0.00	0.02	0.00	0.02
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.16	-	-	-	-	-	-
Asphalt Off-Road Diesel	5.15	22.89	42.74	-	0.50	0.50	0.00
Asphalt On-Road Diesel	0.05	0.46	0.18	0.01	0.12	0.01	0.11
Asphalt Worker Trips	0.03	0.01	0.33	0.00	0.01	0.00	0.01
Maximum lbs/day	8.08	36.15	64.26	0.01	0.71	0.57	0.14
Max lbs/day all phases	13.96	83.09	101.61	0.43	4.83	0.57	4.26

Construction-Related Mitigation Measures

Phase 1: Off-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 1: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 1: Off-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 1: On-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 1: On-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: Soil Disturbance: Apply soil stabilizers to inactive areas
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Soil Disturbance: Replace ground cover in disturbed areas quickly
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 15.0%)
Phase 2: Soil Disturbance: Water exposed surfaces - 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 34.0%)
Phase 2: Off-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 2: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 2: Off-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: On-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 2: On-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 3.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 3: Off-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 3: Off-Road Diesel Exhaust: Use diesel particulate filter
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 80.0%)
Phase 3: Off-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: Off-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 3: Off-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: On-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 3: On-Road Diesel Exhaust: Use lean-NOx catalyst

Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 1 - Demolition Assumptions
Start Month/Year for Phase 1: Nov '05
Phase 1 Duration: 1.5 months
Building Volume Total (cubic feet): 672000
Building Volume Daily (cubic feet): 36000
On-Road Truck Travel (VMT): 1667.5
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	6.0
1	Rubber Tired Dozers	352	0.590	6.0
1	Rubber Tired Loaders	165	0.465	6.0
1	Tractor/Loaders/Backhoes	79	0.465	6.0

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Dec '05
Phase 2 Duration: 5 months
On-Road Truck Travel (VMT): 1045
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	6.0
2	Rubber Tired Dozers	352	0.590	6.0
2	Rubber Tired Loaders	165	0.465	6.0
1	Scrapers	313	0.660	6.0
1	Trenchers	82	0.695	6.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: May '06
Phase 3 Duration: 1.5 months
Start Month/Year for SubPhase Building: May '06
SubPhase Building Duration: .75 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Other Equipment	190	0.620	6.0
1	Rough Terrain Forklifts	94	0.475	6.0
1	Skid Steer Loaders	62	0.515	6.0

SubPhase Architectural Coatings Turned OFF
Start Month/Year for SubPhase Asphalt: May '06
SubPhase Asphalt Duration: .75 months
Acres to be Paved: 1
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	6.0
1	Pavers	132	0.590	6.0
1	Paving Equipment	111	0.530	6.0
1	Rollers	114	0.430	6.0

URBEMIS 2002 Air Quality Model Output

Project Operational Emissions

URBEMIS 2002 For Windows 7.5.0

File Name: \8378_OCWD_LaJollaBasinEIR\data_References\Air Quality\urbemis2002\operati
Project Name: La Jolla Recharge Basin - operations only
Project Location: South Coast Air Basin (Los Angeles area)
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2006 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	1.60	11.58	13.06	0.02	12.94	0.43	12.51
TOTALS (lbs/day, mitigated)	0.25	6.51	2.19	0.02	3.71	0.01	3.70

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.07	0.01	0.48	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.25	0.16	1.75	0.00	12.68
TOTALS (lbs/day, mitigated)	0.25	0.16	1.75	0.00	12.68

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.31	0.16	2.23	0.00	12.68

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

APPENDIX 9.6
ARCHAEOLOGICAL RECORDS SEARCH AND SURVEY REPORT

CHAMBERS GROUP, INC.
JUNE 2004

ARCHAEOLOGICAL RECORDS SEARCH AND SURVEY REPORT FOR THE LA JOLLA RECHARGE BASIN PROJECT, ANAHEIM, CALIFORNIA

By:

Roger D. Mason, Ph.D., RPA

Prepared For:

ORANGE COUNTY WATER DISTRICT
10500 Ellis Avenue
Fountain Valley, California 92708

Prepared By:

Chambers Group, Inc.
17671 Cowan Avenue, Suite 100
Irvine, California 92614

JUNE 2004

USGS 7.5' Orange Quad
Approximately 9 acres

MANAGEMENT SUMMARY

A cultural resources records search and field survey were conducted for the 9 acre O'Hara Nursery property located in the northern part of Anaheim, Orange County. The records search and survey were performed in order to identify any archaeological resources that could be impacted by proposed use of the property for a recharge basin by the Orange County Water District. No archaeological resources were identified as a result of the records search and survey. Because the property is located along Carbon Creek and three prehistoric archaeological sites have been recorded along Carbon Creek in the project vicinity, monitoring of earthmoving activity by an archaeologist is recommended.

INTRODUCTION

A cultural resources records search and field survey were conducted for the O'Hara Nursery property located in Anaheim, Orange County (Figure 1). The O'Hara property consists of approximately 9 acres of level land south of Carbon Creek. The records search and survey were performed at the request of the Orange County Water District in order to identify any archaeological resources that could be impacted by proposed use of the property for a recharge basin by the Orange County Water District. The survey was carried out by Chambers Group archaeologist Roger D. Mason, Ph.D. Historical buildings and structures are the subject of a separate report by San Buenaventura Research Associates.

LOCATION AND SETTING

As illustrated on the U.S. Geological Survey (USGS) 7.5' Orange Quadrangle (1964; Photorevised 1981), the project area is located in the unsectioned San Juan Cajon de Santa Ana land grant in Township 3 South, Range 9 West of the San Bernardino Base Meridian (Figure 2). More specifically, the project property runs north-south between E. La Jolla Street and Carbon Creek. Property addresses are 2885, 2901, 2911, 2915, and 2921 E. La Jolla Street.

The property is relatively level and is located on the south bank of Carbon Creek on an alluvial terrace at an elevation of about 210 feet. Soil consists of recent alluvial flood deposits (silt and clay). There are five houses facing La Jolla Street. Nursery greenhouses made of fiberglass cover most of the rest of the property.

PREHISTORIC BACKGROUND

The Milling Stone Period (about 9,000 B.P. [before present] to 3,000 B.P.) represents a long period of time characterized by smaller more mobile groups compared to later time periods. These groups probably had a seasonal round of settlement, which included both inland and coastal residential bases (Mason, Koerper, and Langenwalter 1997). They relied on grass and sage seeds to provide calories and carbohydrates. Although fewer projectile points occur, compared to later periods, faunal data indicate the same animals were hunted. Inland Milling Stone Period sites are characterized by numerous manos, metates, and hammerstones while shell middens are common along the coast. Quartzite, rhyolite, and other coarse grained materials are more common than chert as the preferred materials for making flaked stone tools (Mason and Peterson 1994).

The period from 1000 B.C. to A.D. 750 is known archaeologically as the Intermediate Period. During this period mortars and pestles appear, indicating the beginning of acorn exploitation (Koerper and Drover 1983). Use of the acorn, a storable high calorie food source, probably allowed greater sedentism, especially in inland areas. Large projectile points indicate that the bow and arrow, characteristic of the Late Prehistoric Period, had not yet been introduced. Hunting was probably conducted using a dart thrower. Settlement patterns during this period are not well known. The semi-sedentary settlement pattern characteristic of the Late Prehistoric Period may have begun during the Intermediate Period, although lower population densities may have meant less territoriality.

FIGURE 1. GENERAL LOCATION OF LA JOLLA RECHARGE BASIN PROPERTY

NORTH
SCALE: 1:250,000
SOURCE: DeLorme Xmap 4.5

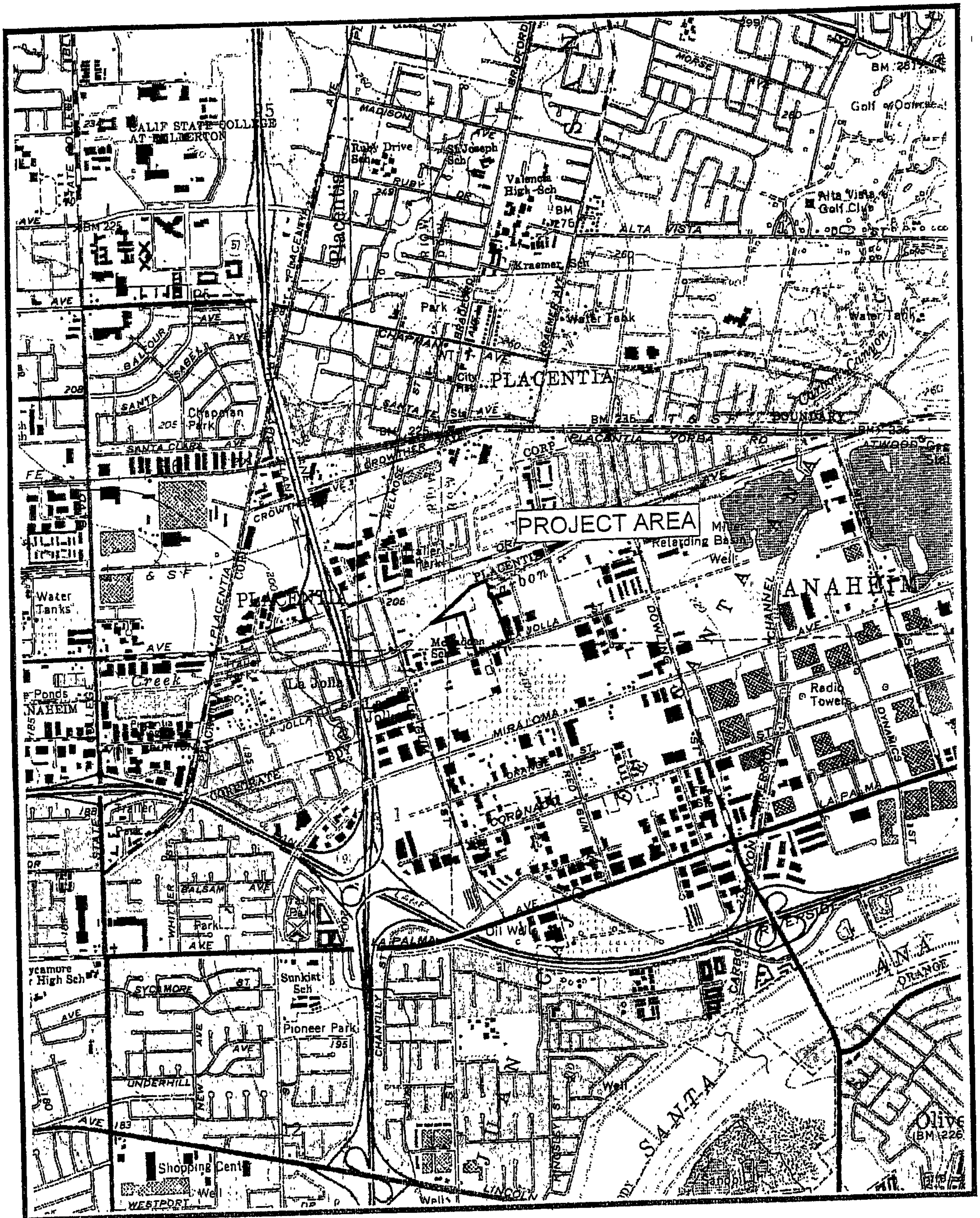

FIGURE 2. SPECIFIC LOCATION OF LA JOLLA RECHARGE BASIN PROPERTY

NORTH
SCALE: 1:24,000
SOURCE: USGS 7.5' Orange Quad

The project area was part of territory occupied by the Tongva Native American group (renamed Gabrielinos by Spanish missionaries, who took them to San Gabriel Mission) when the Spanish arrived in A.D. 1769. The Orange County area is also claimed by the Acjachemem Native American group (renamed Juaneños by Spanish missionaries who took them to San Juan Capistrano Mission). Tongva and Acjachemem settlement and subsistence systems may extend back in time to the beginning of the Late Prehistoric Period about A.D. 750. The Tongva and Acjachemem were semi-sedentary hunters and gatherers. One of the most important food resources for inland groups were acorns gathered from oak groves in canyons, drainages, and foothills. Acorns were ground with a mortar and pestle. Seeds from sage and grasses, goosefoot, and California buckwheat were collected and ground using manos and metates. Protein was supplied by hunting deer, rabbits, and other animals using a bow and arrow, as well as various traps and snares. Coastal dwellers collected shellfish and engaged in fishing for bay/estuary, nearshore, and kelp bed species. Dried shellfish and fish were probably exchanged for inland products such as acorns (Koerper, Mason, and Peterson 2002).

The Tongva and Acjachemem lived in villages of up to 150 people located near permanent water sources and a variety of food resources (Earle and O'Neil 1994). The village was the center of a territory from which resources were gathered. Work parties left the village for short periods of time to hunt, fish, and gather plant foods. While away from the village they established temporary camps and resource processing locations. Archaeologically, such locations are indicated by manos and metates for seed processing, bedrock mortars for acorn processing, and lithic scatters indicating manufacturing or maintenance of stone tools (usually made of chert) used in hunting or butchering. Overnight stays in field camps are indicated by fire-affected rock used in hearths (Mason and Peterson 1994).

The Tongva village of Hutukna was probably located in east Anaheim on the bank of the Santa Ana River. Over 240 people from this village were baptized at San Gabriel Mission (Earle and O'Neil 1994:21).

METHODS

A records search was completed for the O'Hara property by the South Central Coastal Information Center (SCCIC) at California State University, Fullerton (Appendix A). The records search provided data on previous archaeological studies and cultural resources documented within the project area and a one-mile radius surrounding the property. Additional inventories of historic resources were reviewed, including the California Office of Historic Preservation's Historic Property Data File, the National Register of Historic Places, California State Historic Landmarks, and the California Points of Historic Interest. The Native American Heritage Commission was also asked to perform a records search of its sacred lands files.

An archaeological field survey of the O'Hara property was performed by Roger D. Mason, Ph.D., an Orange County certified archaeologist, on May 26, 2004. The survey was conducted on foot and all open ground surfaces were inspected. Only the areas between the greenhouses could be surveyed.

RESULTS

Records Search Results

According to current records at the SCIC, the O'Hara property was included in a previous reconnaissance of a large area of northeast Anaheim. Eight other cultural resources investigations have been documented within 1 mile of the project area (see Appendix A).

No cultural resources have previously been identified within the O'Hara property. One prehistoric archaeological site has been recorded within 1 mile of the project area. This site, P30-000428, was located near Carbon Creek and contained manos and metates. Two other prehistoric archaeological sites were also recorded along Carbon Creek just beyond the one-mile records search radius.

A records search of the Native American Heritage Commission's sacred lands files failed to indicate the presence of Native American cultural resources in the immediate project vicinity (see Appendix B).

Field Survey Results

No archaeological material was identified within the O'Hara property as a result of the cultural resources field survey conducted by Chambers Group.

SUMMARY AND RECOMMENDATIONS

A cultural resources records search shows that no cultural resources have been recorded previously on the property. During a survey of the property by Chambers Group, no archaeological resources were identified on the property.

However, there are three prehistoric archaeological sites recorded along Carbon Creek near the project area. This indicates the potential for buried prehistoric archaeological resources on the project property located on the south side of Carbon Creek.

Recommendations are as follows:

> Any excavation necessary for construction of the recharge basin shall be monitored by a qualified archaeological monitor under the supervision of a Project Archaeologist on the Orange County List of Certified Archaeologists. If cultural material is encountered, the monitor shall have the power to halt or divert earthmoving equipment in the vicinity of the find until it can be evaluated.
>
> If cultural material is encountered it will be evaluated using CRHR eligibility criteria. This may require an archaeological test program. If the Project Archaeologist recommends a test program, he or she shall prepare a test plan and implement it.
>
> If the cultural material is evaluated as eligible, mitigation will consist of avoidance and preservation, if feasible. If avoidance is not feasible, the Project Archaeologist will prepare a data recovery plan that states how the data necessary to address scientifically consequential research topics will be recovered. The data recovery plan will then be implemented.

REFERENCES CITED

Earle, David D. and Stephen O'Neil
1994 Newport Coast Archaeological Project: An Ethnohistoric Analysis of Population, Settlement, and Social Organization in Coastal Orange County at the End of the Late Prehistoric Period. Prepared for Coastal Community Builders, Newport Beach, by The Keith Companies Archaeology Division, Costa Mesa. Report on file at UCI Library Special Collections and the PCAS Library.

Koerper, Henry C. and Christopher E. Drover
1983 Chronology Building for Coastal Orange County: The Case from CA-ORA-119-A. *Pacific Coast Archaeological Society Quarterly* 19(2):1-34.

Koerper, Henry C., Roger D. Mason, and Mark L. Peterson
2002 Complexity, Demography, and Change in Late Holocene Orange County. In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, edited by J. M. Erlandson and T. L. Jones, pp. 63-81. Perspectives in California Archaeology, Volume 6. Cotsen Institute of Archaeology, University of California, Los Angeles.

Mason, Roger D, Henry C. Koerper, and Paul E. Langenwalter II
1997 Middle Holocene Adaptations on the Newport Coast of Orange County. In *Archaeology of the California Coast During the Middle Holocene*, edited by J.M. Erlandson and M.A. Glassow, pp. 35-60. Perspectives in California Archaeology, Volume 4. Institute of Archaeology, University of California, Los Angeles.

Mason, R. D. and M. L. Peterson
1994 Newport Coast Archaeological Project: Newport Coast Settlement Systems, Analysis and Discussion. The Keith Companies, Costa Mesa. Report on file at the South Central Coastal Archaeological Information Center, California State University, Fullerton.

APPENDIX A

RECORDS SEARCH RESULTS

South Central Coastal Information Center
California Historical Resources Information System
California State University, Fullerton
Department of Anthropology
800 North State College Boulevard
Fullerton, CA 92834-6846
714.278.5395 / FAX 714.278.5542
anthro.fullerton.edu/sccic.html - sccic@fullerton.edu

Ventura
Los Angeles
Orange

SCCIC # 4328.1835

May 26, 2004

Dr. Roger D. Mason, Ph.D., RPA
Chambers Group
17671 Cowan Ave., Suite 100
Irvine, CA 92614
(949) 261-5414

RE: 8378-OCWD La Jolla, City of Anaheim, Orange County

Dear Dr. Mason,

As per your request received on May 20, 2004 a records search was conducted for the above referenced project. This search includes a review of all recorded archaeological sites within a 1-mile radius of the project site as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest (PHI), the California Historical Landmarks (CHL), the California Register of Historic Places (CR), the National Register of Historic Places (NR), and the California State Historic Resources Inventory (HRI) were reviewed for the above referenced project. The following is a discussion of the findings.

<u>Anaheim, La Habra, Orange, and Yorba Linda 7.5' USGS Quadrangles</u>

ARCHAEOLOGICAL RESOURCES:

One archaeological site (30-000428) has been identified within a 1-mile radius of the project site. No archaeological sites are located within the project site. No sites are listed on the Archaeological Determination of Eligibility (DOE) list. No isolates have been identified within a 1-mile radius of the project site. No isolates are located within the project site.

HISTORIC RESOURCES:

No additional cultural resources have been identified within a 1-mile radius of the project site. No cultural resources are located within the project site.

Copies of the historic maps for the project site- Anaheim (1896 and 1942) 15' USGS - are enclosed for your review.

The California Point of Historical Interest (2004) of the Office of Historic Preservation, Department of Parks and Recreation, lists one property within a 1-mile radius of the project site (see below).

Orange 7.5' USGS Quadrangle

ORA-018 Placentia Mutual Orange Assn. Packing House
341 Melrose Street
Placentia
#30-162291

The California Historical Landmarks (2004) of the Office of Historic Preservation, Department of Parks and Recreation, lists no properties within a 1-mile radius of the project site.

The California Register of Historic Places (2004) lists no properties within a 1-mile radius of the project site.

The National Register of Historic Places (2004) lists no properties within a 1-mile radius of the project site.

The California Historic Resources Inventory (2004) lists 25 properties that have been evaluated for historical significance within a 1-mile radius of the project site (See enclosed list).

PREVIOUS CULTURAL RESOURCES INVESTIGATIONS:

Nine studies (OR1596, OR1836, OR2042, OR2142, OR2501*, OR2558, OR2572, OR2591, and OR2716) have been conducted within a 1-mile radius of the project site. Of these, one is located within the project site. There are twenty additional investigations located on the Anaheim, La Habra, Orange, and Yorba Linda 7.5' USGS Quadrangles that are potentially within a 1-mile radius of the project site. These reports are not mapped due to insufficient locational information.
(* = Located within the project site)

Please forward a copy of any reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you **do not include** records search maps in your report. If you have any questions regarding the results presented herein, contact the office at 714.278.5395 Monday through Thursday 8:00 am to 3:30 pm.

Should you require any additional information for the above referenced project, reference the SCCIC number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Sincerely,
SCCIC

Thomas D. Shackford

Thomas D. Shackford
Staff Researcher

Enclosures:

(X) Map – 7.5' USGS Quadrangle, 15' USGS Quadrangle
(X) Bibliography – 3 pages
(X) HRI – 2 pages
(X) National Register Status Codes
(X) Site Records – 30-000428 and 30-162291
(X) Confidentiality Form
(X) Invoice # 4328.1835

Bibliography: 8378-OCWD La Jolla, City of Anaheim, Orange County

IC ID#: OR1596 DATE: 1974 PAGES: 13

AUTHOR: Clewlow, William C.

FIRM: University of California, Los Angeles

TITLE: Preliminary Report of the Potential Impact on Archaeological Resources of the Proposed Gas Transmission Pipeline From Los Angeles Harbor to Yorba Linda - Southern California Gas Co.: Environmental Analysis

AREA: 37 li mi

SITES: 30-000277

QUADNAME: San Pedro, Long Beach, Los Alamitos, Anaheim, Orange, Yorba Linda

MEMO:

IC ID#: OR1836 DATE: 1998 PAGES: 31

AUTHOR: Padon, Beth

FIRM: Discovery Works, Inc.

TITLE: Cultural Resource Review for Groundwater Replenishment System Program EIR/Tier I/EIS, Orange County Water District and County Sanitation Districts of Orange County

AREA: 17.3 li mi

SITES: none

QUADNAME: Orange, Anaheim, Newport Beach

MEMO:

IC ID#: OR2042 DATE: 1999 PAGES: 8

AUTHOR: Duke, Curt

FIRM: LSA

TITLE: Cultural Resource Assessment for the AT&T Wireless Services Facility Number R070, County of Orange, California

AREA: 1 ac

SITES: none

QUADNAME: Anaheim

MEMO:

Bibliography: 8378-OCWD La Jolla, City of Anaheim, Orange County

IC ID#: OR2142 DATE: 1999 PAGES: 11

AUTHOR: Mason, Roger

FIRM: Chambers Group, Inc.

TITLE: Cultural Resources Records Search and Literature Review Report for A Pacific Bell Mobile Services Telecommunications Facility: CM 446-11, in the City of Anaheim

AREA: 0.25 ac

SITES: none

QUADNAME: Orange

MEMO:

IC ID#: OR2501 DATE: 1994 PAGES: 14

AUTHOR: Conkling, Steven W., Deborah McLean, and Brad Sturn

FIRM: LSA

TITLE: Cultural Resources Assessment for Five Vacant lots and 42 Potential Historic Buildings within the Northeast Anaheim Redevelopment Area, Orange County, California

AREA: 60 ac

SITES: none

QUADNAME: Orange

MEMO:

IC ID#: OR2558 DATE: 2002 PAGES: 24

AUTHOR: McLean, Deborah

FIRM: LSA

TITLE: Cultural Resource Assessment: Orange County Water District Lakeview Water Transfer Pipeline Project, Cities of Placentia and Anaheim, County of Orange, CA

AREA: 6 line miles

SITES: none

QUADNAME: Orange

MEMO:

Bibliography: 8378-OCWD La Jolla, City of Anaheim, Orange County

IC ID#: OR2572 DATE: 2002 PAGES: 26
AUTHOR: MCKENNA, JEANETTE A.
FIRM: MCKENNA ET AL
TITLE: HISTORIC PROPERTY SURVEY REPORT-NEGATIVE FINDINGS
AREA: 1.1 LI MI
SITES: NONE

QUADNAME: ORANGE
MEMO:

IC ID#: OR2591 DATE: 2002 PAGES: 26
AUTHOR: MCKENNA, JEANETTE A.
FIRM: MCKENNA ET AL
TITLE: HISTORIC PROPERTY SURVEY REPORT-NEGATIVE FINDINGS
AREA: 5 LI MI
SITES: NONE

QUADNAME: ORANGE
MEMO:

IC ID#: OR2716 DATE: 2001 PAGES: 8
AUTHOR: Duke, Curt
FIRM: LSA Associates, Inc.
TITLE: Cultural Resource Assessment Cingular Wireless Facility No. SC 049-01 Orange County, California
AREA: .25 ac
SITES:

QUADNAME: Orange
MEMO:

APPENDIX B

CORRESPONDENCE

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

June 15, 2004

Roger Mason
Chambers Group., Inc
17671 Cowan Avenue, Suite 100
Irvine, CA 92614

Sent by Fax: 949-261-8950
Number of Pages: 3

RE: The proposed OCWD La Jolla Recharge Basin project, Job No. 8378, Orange County

Dear Mr. Mason:

A record search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-6251.

Sincerely,

Carol Gaubatz

Carol Gaubatz
Program Analyst

APPENDIX 9.7
HISTORIC RESOURCES REPORT

San Buenaventura Research Associates
June 2004

Historic Resources Report
2285-2921 E. La Jolla Street
Anaheim, California

16 June 2004

Prepared for:

Chambers Group, Inc.
17671 Cowan Ave
Irvine C A 92614

Prepared by:

SAN BUENAVENTURA
RESEARCH ASSOCIATES
HISTORIC · RESOURCES · CONSULTING
1328 WOODLAND DRIVE SANTA PAULA CA 93060

1. Introduction

This report was prepared for the purpose of assisting the Orange County Water District in their compliance with the California Environmental Quality Act (CEQA) as it relates to historic resources, in connection with the construction of a recharge basin on East La Jolla Street in the City of Anaheim. [Figure 1]

This report will assess the historical and architectural significance of these properties in accordance with the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) Criteria for Evaluation. A determination will be made as to whether adverse environmental impacts on historic resources may occur as a consequence of the proposed project, and mitigation measures recommended, as appropriate.

This report was prepared by San Buenaventura Research Associates of Santa Paula, California, Judy Triem, Historian; and Mitch Stone, Preservation Planner, for Chambers Groupe, Inc, and is based on a field investigation and research conducted in May and June, 2004. The conclusions contained herein represent the professional opinions of San Buenaventura Research Associates, and are based on the factual data available at the time of its preparation, the application of the appropriate local, state and federal regulations, and best professional practices.

2. Administrative Setting

The California Environmental Quality Act (CEQA) requires evaluation of project impacts on historic resources, including properties "listed in, or determined eligible for listing in, the California Register of Historical Resources [or] included in a local register of historical resources." A resource is eligible for listing on the California Register of Historical Resources if it meets any of the criteria for listing, which are:

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; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

Historic resources as defined by CEQA also includes properties listed in "local registers" of historic properties. A "local register of historic resources" is broadly defined in §5020.1 (k) of the Public Resources Code, as "a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution." Local registers of historic properties come essentially in two forms: (1) surveys of historic resources conducted by a local agency in accordance with Office of Historic Preservation procedures and standards, adopted by the local agency and maintained as current, and (2) landmarks designated under local ordinances or resolutions. (Public Resources Code §§ 5024.1, 21804.1, 15064.5)

By definition, the California Register of Historical Resources also includes all "properties formally determined eligible for, or listed in, the National Register of Historic Places," and certain specified State Historical Landmarks. The majority of "formal determinations" of NRHP eligibility occur when properties are evaluated by the State Office of Historic Preservation in connection with federal environmental review procedures (Section 106 of the National Historic Preservation Act of 1966). Formal determinations of eligibility also occur when properties are nominated to the NRHP, but are not listed due to owner objection.

The criteria for determining eligibility for listing on the National Register of Historic Places (NRHP) have been developed by the National Park Service. Properties may qualify for NRHP listing if they:

A. are associated with events that have made a significant contribution to the broad patterns of our history; or
B. are associated with the lives of persons significant in our past; or

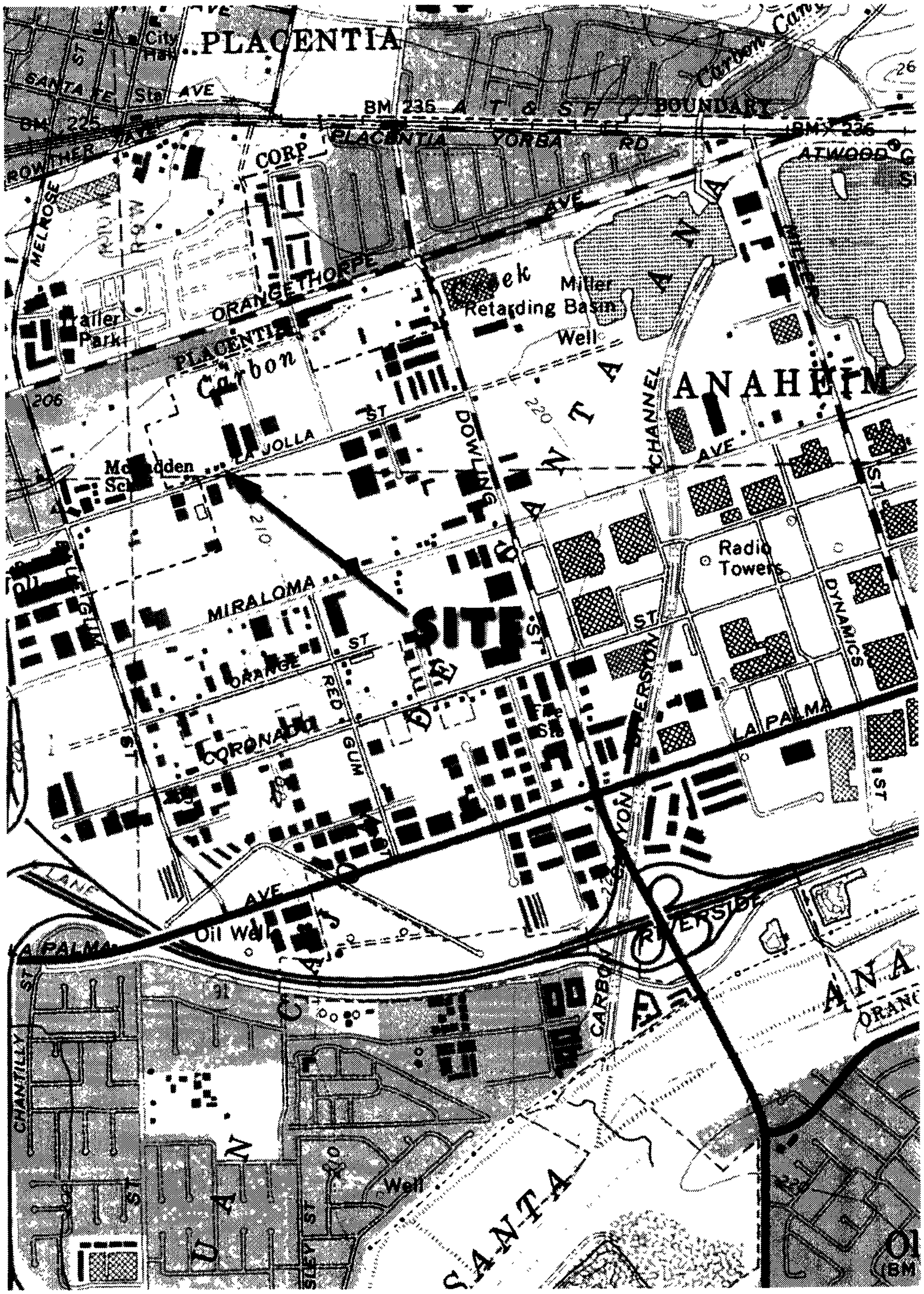

Figure 1. SITE LOCATION
Source: USGS 7.5 Minute Quadrangle, Orange CA, 1964 updated to 1985

C. embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. have yielded, or may be likely to yield, information important in prehistory or history.

According to the National Register of Historic Places guidelines, the "essential physical features" of a property must be present for it to convey its significance. Further, in order to qualify for the NRHP, a resource must retain its integrity, or "the ability of a property to convey its significance."

The seven aspects of integrity are: Location (the place where the historic property was constructed or the place where the historic event occurred); Design (the combination of elements that create the form, plan, space, structure, and style of a property); Setting (the physical environment of a historic property); Materials (the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property); Workmanship (the physical evidence of the crafts of a particular culture or people during any given period of history or prehistory); Feeling (a property's expression of the aesthetic or historic sense of a particular period of time), and; Association (the direct link between an important historic event or person and a historic property).

The relevant aspects of integrity depend upon the National Register criteria applied to a property. For example, a property nominated under Criterion A (events), would be likely to convey its significance primarily through integrity of location, setting and association. A property nominated solely under Criterion C (design) would usually rely primarily upon integrity of design, materials and workmanship. The California Register procedures include similar language with regard to integrity.

The minimum age criterion for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) is 50 years. Properties less than 50 years old may be eligible for listing on the NRHP if they can be regarded as "exceptional," as defined by the NRHP procedures, or in terms of the CRHR, "if it can be demonstrated that sufficient time has passed to understand its historical importance" (Chapter 11, Title 14, §4842(d)(2))

3. Impact Thresholds and Mitigation

According to PRC §21084.1, "a project that may cause a substantial change in the significance of an historical resource is a project that may have a significant effect on the environment." The Public Resources Code broadly defines a threshold for determining if the impacts of a project on an historic property will be significant and adverse. By definition, a substantial adverse change means, "demolition, destruction, relocation, or alterations," such that the significance of an historical resource would be impaired (PRC §5020.1(6)). For purposes of NRHP eligibility, reductions in a resource's integrity (the ability of the property to convey its significance) should be regarded as potentially adverse impacts.

Further, according to the CEQA Guidelines, "an historical resource is materially impaired when a project... [d]emolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources [or] that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant."

The lead agency is responsible for the identification of "potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource." The specified methodology for determining if impacts are mitigated to less than significant levels are the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* and the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (1995), publications of the National Park Service. (PRC §15064.5(b)(3-4))

4. Historical Setting

General Historical Context

Anaheim was founded in 1857 by a group of German-Americans from the San Francisco Bay Area, who had invested $750 each in the Los Angeles Vineyard Society, an organization founded by John Frohling, Charles Kohler and surveyor George Hansen. The three men subdivided 200 acres of the 1,160 acres of rancho lands Hansen had purchased from Juan Pacifico Ontiveros. This subdivision would form the present-day Anaheim central city area, bounded by North, South, East and West streets. The investors planted the 20 acre homesites in grape vines and constructed an irrigation system in anticipation of the arriving colonists.

Surviving numerous early hardships, by the early 1880s, Anaheim had become a successful center of wine and grape production. This era would be short-lived, however. Within a matter of only a few years after the first harvests were produced, the vines were destroyed by pests. The colonists uprooted their vineyards and turned to citrus cultivation, as well as other tree and row crops.

Although it had grown little during its first decades, as one of the few organized settlements in the Santa Ana Valley, Anaheim would be well-positioned to exploit the growth opportunities resulting from the railroad-inspired real estate boom of the late 1880s, particularly after the arrival of the Santa Fe Railroad in 1887. An increasingly important population and economic center, Anaheim vied unsuccessfully with Santa Ana to become the county seat of Orange County, when it was separated from Los Angeles County in 1889. The community would also fully participate in the rapid expansion of the regional citrus industry during the decades of the 1890s through the 1920s.

The postwar era would usher in a second major transformation in the region, driven by suburbanization. A community of 14,556 in 1950, the city would annex and subdivide nearly 7,500 acres of farmland during the years 1953-55. In this brief time-span, the size of the City of Anaheim would quadruple, both in area and population, and its course was set towards becoming one of the county's largest bedroom communities. Other major transformative events for the city during this period were the opening of the Disneyland theme park in 1955 and the relocation of the Los Angeles Angels baseball team to the city in 1966.

The expansion of citriculture in Orange County, particularly during the 1920s, resulted in the extensive importation of agricultural labor, in large part from Mexico. These racially segregated decades produced at least 18 distinct Mexican-American communities, called *colonias*, within the agricultural areas of Orange County. One of these colonias, known as La Jolla, was located near the intersection of Orangethorpe Boulevard and Blue Gum Street, between the cities of Anaheim and Placentia. This rural settlement, the site of which is now split between the corporate limits of these two cities, was created by subdivision in 1921. Beginning as a tent colonia, the community at its peak included homes, a Catholic mission, market, school and other community facilities.

Established on the banks of Carbon Creek, La Jolla Colonia would be heavily damaged by flooding in the Spring of 1938. The community was at least partially rebuilt thereafter, but within the next three decades, La Jolla and the other colonias in Orange County would be absorbed by the rapid expansion of the neighboring incorporated cities, and their separate identities erased by the suburbanization trend.

5. Potential Historic Resources

2885 E. La Jolla Street. This property consists of a one story Ranch-style single family residence clad in horizontal lap and vertical plank siding. The roof shapes are low hips with intersecting dormers with medium open eaves featuring exposed rafter tails. The windows are wood frame with diamond-pane mullions. It appears to be unaltered. According to Orange County Assessors records, this building was constructed in 1964, though it was probably constructed one or two years earlier. The earliest known occupant was J. Mohic, a rancher, in 1963, and it was later used as a fraternity house. [Photo 1]

2901 E. La Jolla Street. This one story, stucco-clad stylistically indeterminate single family residence features intersecting medium-pitched gable roofs with medium, open eaves. An inset porch supported by square posts is located on the right side of the front elevation. Windows are woodframe sash units. This residence appears to be largely unaltered, although the current stucco finish does not appear to be original. According to Orange County Assessors records, this building was constructed in 1947, which appears to be accurate based on visual evidence. The earliest known occupant was Mary White, occupation unknown, in 1963. [Photo 2]

2911 E. La Jolla Street. This one story single family Ranch-style residence features intersecting, low-pitched hipped roofs with medium, open eaves. Construction is concrete block, and the windows are steel casement units on brick sills. It appears to be unaltered. According to Orange County Assessors records, this building was constructed in 1948, which is verified by visual evidence. The earliest known occupant of the property was Iamsu Sadamitsu, a gardener, who lived here from at least 1963 through 1971. [Photo 3]

2915 E. La Jolla Street. This property consists of two buildings. The front building is a stylistically indistinct one story, stucco-clad single family residence with a medium hip roof featuring shallow, open eaves. Located to the rear of the residence is a flat-roofed concrete block industrial building featuring a single overhead garage door. Both appear to be unaltered. Based on visual evidence, the residence was probably constructed during the late 1940s and the industrial building during the 1980s. The earliest identified resident on this property is Blas Heredia, occupation unknown, in 1971. [Photo 4]

2921 E. La Jolla Street. This property consists of a one story, stucco-clad single family Ranch-style residence featuring a medium-pitch hip roof with shallow open eaves and aluminum frame windows. The entry is inset above a low wood deck. The date of construction for this building appears to be circa 1960, and it is unaltered. The earliest known resident is Raymond Iriye, who lived here from at least 1963 into the early or mid-1970s. He is listed in directories as being associated with Iriye Farms. By 1978, the property is occupied by T. O'Hara, Inc. [Photo 5]

Located to the rear of the residence are 20 large greenhouses organized into six rows. Each greenhouse is clad in corrugated fiberglass panels and consists of five, parallel half-cylindrical roofs covered in plastic . The date of construction is unknown, but all appear to be of identical construction and probably date from the 1970s. Numerous other small service buildings associated with the commercial nursery operation are located on the property. [Photo 6]

6. Eligibility of Historic Resources

National and California Registers: Significance, Eligibility and Integrity

None of these properties appear to be potentially eligible for the NRHP under **Criterion A** and CRHR **Criterion 1** (significant historical events) because they do not appear to be connected to any specific historical event of importance to the history of Anaheim and environs. Three of the residences were probably generally associated with the later phases of La Jolla Colonia, but do not appear to be related to, or representative of, the founding or growth of this community in any historically significant manner. No information could be located on either Iriye Farms, which appears to have been started circa 1960 or O'Hara, Inc., a commercial nursery operation which apparently began circa 1975.

None of the properties appear to be potentially eligible under NRHP **Criterion B** and CRHR **Criterion 2** (lives of persons significant in our past). No information could be located on any of the identified residents of these properties or the owner of the nursery. None of the properties appear to be potentially eligible under NRHP **Criterion C** and CRHR **Criterion 3** (design and construction). The buildings which are of sufficient age to be considered as potentially eligible are minimal examples of common architectural styles.

Conclusion

No property on the project site appears to be eligible for listing on the NRHP or CRHR.

Local Significance and Eligibility

The California Environmental Quality Act defines as historically significant all properties listed in "local registers" of historic properties. Local registers include lists "of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution," and surveys of historic resources maintained as current by the local agency. These properties are "presumed to be historically or culturally significant... unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant." (PRC §§ 5024.1, 21804.1, 15064.5)

The City of Anaheim has not adopted an ordinance for the designation or protection of historic properties.

7. Project Impacts

Due to their ineligibility for listing on the NRHP or CRHR, the proposed demolition of the buildings on the project site will have not have adverse impacts on historic resources, as defined by CEQA.

8. Selected Sources

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González, Gilbert G. *Labor and Community: Mexican Citrus Workers in a Southern California County, 1900-1950*. Chicago: University of Illinois Press, 1994.

Luskey's Directories. Various years.

Meadows, Don. *Historic Place Names in Orange County*. Balboa Island: Paisano Press, 1966.

McAlester, Virginia & Lee. *A Field Guide to American Houses*. New York: Alfred A. Knopf, 1984.

PHOTO 1. 2885 E. La Jolla Street, Anaheim, southern elevation (26 May 2004).

PHOTO 2. 2901 E. La Jolla Street, Anaheim, southern elevation (26 May 2004).

PHOTO 3. 2911 E. La Jolla Street, Anaheim, southern elevation (26 May 2004).

PHOTO 4. 2915 E. La Jolla Street, Anaheim, southern elevation (26 May 2004).

PHOTO 5. 2921 E. La Jolla Street, Anaheim, southern elevation (26 May 2004).

PHOTO 6. 2921 E. La Jolla Street, Anaheim, greenhouses (26 May 2004).

ATTACHMENT 1

MITIGATION MONITORING AND REPORTING PROGRAM
LA JOLLA RECHARGE BASIN

INTRODUCTION

Public Resources Code Section 21081.6 requires public agencies to adopt programs to monitor and report on the implementation of mitigation measures that have been adopted to avoid or reduce environmental impacts of projects that agencies have approved in accordance with the California Environmental Quality Act (CEQA). Consequently, the Orange County Water District (OCWD) has developed a Mitigation Monitoring and Reporting Program (MMRP) for the La Jolla Recharge Basin project.

DEVELOPMENT OF THE MITIGATION MONITORING PROGRAM

The basic elements of the Mitigation Monitoring and Reporting Program are the mitigation measures identified by each impact category addressed in Chapter 4.0 of the Draft EIR. The MMRP also incorporates standard conditions, which are requirements of applicable regulatory and/or other responsible agencies. For analytical purposes in the Draft EIR, compliance with these regulatory requirements is not considered mitigation or a component of the project. However, the application of standard regulatory requirements lessens or avoids many issues of environmental concern. By including standard conditions with mitigation measures in the MMRP, the District can ensure that their implementation occurs at the appropriate phase of project design, construction, or operation. The development of the program was based on the following procedures necessary to initiate and complete the monitoring process.

- Identification of the specific mitigation measures proposed for the project from Chapter 4.0 of the La Jolla Recharge Basin EIR.
- Identification of the key periods and events in the project implementation schedule.
- Identification of the key personnel and agencies responsible for environmental monitoring.
- Monitoring of the implementation of the mitigation measures and documentation that the measures have been properly and thoroughly implemented.
- Development of the written document on the implementation of all the mitigation measures, identification of any areas of non-compliance, and proposed activities to bring the project into compliance with the mitigation monitoring and reporting program.

AUTHORITY TO REQUIRE AND ENFORCE A MITIGATION MONITORING PROGRAM

The OCWD has the authority to require and enforce the provisions of California Resource Code Section 21081.6. The OCWD will be responsible for approving the Mitigation Monitoring and Reporting Program and for preparing the written report documenting the implementation of project mitigation measures.

Table 1 summarizes the mitigation measures that have been adopted for the project, specifies the timing for implementation of each measure and identifies the responsible parties for ensuring implementation and the satisfactory completion of each measure. The procedures for implementing the Mitigation Monitoring and Reporting Program are:

Monitoring Procedures

1. An Environmental Monitor, appointed by OCWD, will be responsible for coordinating review of project plans and activities, the construction site, and/or operations to ensure that the mitigation measures are properly and thoroughly implemented through the course of the project.

2. Written documentation that each mitigation measure in Table 1 has been implemented will be prepared. This documentation can be on a OCWD mitigation monitoring checklist or a similar form that clearly indicates the timing or schedule for implementation, whether the measure has, in fact, been implemented, or in the case of measures that are ongoing, that a process has been developed to ensure continued implementation of the measure.

Reporting Procedures

1. The Environmental Monitor appointed by OCWD on this project will be responsible for periodically reviewing the program in Table 1 with the OCWD Environmental Compliance Advisor.

2. The Environmental Monitor will prepare a written report for the OCWD documenting the completion of the implementation of all the mitigation measures. For those measures not implemented or for activities that do not fully comply with mitigation measures included in Table 1, an explanation of the areas of noncompliance will be prepared, including a proposal to bring those elements of the project into compliance with the Mitigation Monitoring and Reporting Program.

The final report on the Mitigation Monitoring and Reporting Program will be kept on file at the following address:

Orange County Water District
10500 Ellis Avenue
Fountain Valley, CA 92708

TABLE 1
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
4.1 HYDROLOGY AND WATER QUALITY			
Surface Water Quality – Construction Period ***Summary:*** *The Standard Conditions and the Corps' Special Conditions contain BMPs that are widely used in construction projects and are proven to minimize pollutant loading in stormwater runoff. With the combined oversight of the Corps and OCWD, no significant water quality impacts would occur during the construction period and no mitigation measures are necessary.*			
SC 4.1-1 – SWPPP Contents: OCWD shall file a notice of intent (NOI) with the appropriate fees for coverage of the project under the General Construction Activity Storm Water Runoff Permit. The NOI shall be submitted to the Regional Water Quality Control Board prior to initiation of construction activity at the site. As required by the NPDES permit, a SWPPP shall be prepared and shall establish BMPs to prevent pollutant runoff, soil erosion, and sedimentation during construction. The SWPPP shall be prepared in compliance with the County of Orange 2004-05 Local Implementation Plan and the Orange County Stormwater Program's BMP fact sheets associated with the various program elements of the 2003 Drainage Area Management Plan. The District Engineer, or designee, shall ensure that the requirements of the SWPPP are defined on permit plan cover sheets as either general or special notes. During construction, the contractors shall follow the specifications of the SWPPP, a copy of which shall be kept on the job site at all times. The SWPPP shall establish BMPs for erosion and sediment control; non-storm water management; post-construction storm water management, waste management and disposal; maintenance, inspection, and repair of construction equipment and vehicles; employee training to perform inspections of the BMPs at the construction site; and proper storage, handling, use, and disposal of fuels and other toxic materials, as well as establishing fuel and maintenance areas away from Carbon Creek Channel.	**Responsible Party(s)** ▪ OCWD ▪ Construction Contractor **Phase** ▪ Pre-construction ▪ Construction	**Responsible Party(s)** ▪ District Engineer ▪ RWQCB **Monitoring Period** ▪ Pre-construction ▪ Construction **Frequency** ▪ As necessary during construction	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
SC 4.1-2 – Sediment Control BMPs: The SWPPP shall include a description and illustration of BMPs that will be implemented to prevent the transport of sediment in stormwater runoff. Sediment control BMPs shall be in place at appropriate locations along the site perimeter and at all operational internal inlets to the storm drain system at all times during construction. The discharger shall consider site-specific and seasonal conditions when selecting and designing sediment control BMPs. At a *minimum, the discharger/operator must be prepared to implement an* effective combination of erosion and sediment control on all disturbed areas in anticipation of rainfall. Effective filtration devices and/or barriers shall be selected, installed and maintained properly. A proposed schedule for deployment of sediment control BMPs shall be included in the SWPPP. Sediment controls can include straw bale dikes, earth dikes, brush barriers, drainage swales, check dams, subsurface drain, sandbag dikes, fiber rolls, diversion velocity dissipaters, desilting basins, detention/retention ponds and/or other controls, as determined appropriate by the District's project engineer. Additionally, the SWPPP shall include a description of the BMPs to reduce the tracking of sediment onto public roads at all times. These public roads shall be inspected and cleaned at defined intervals approved by the District. Road cleaning BMPs shall be discussed in the SWPPP and shall not rely on the washing of accumulated sediment or silt into the storm drain system.	**Responsible Party(s)** ▪ OCWD ▪ Construction Contractor **Phase** ▪ Design ▪ Pre-construction through post-construction	**Responsible Party(s)** ▪ District Engineer **Monitoring Period** ▪ Pre-construction through post-construction **Frequency** ▪ As necessary during design and construction phases	
SC 4.1-3 – Timing of Diversion Facility Construction: All project facilities proposed to be constructed within the Carbon Creek Channel, or that will be constructed across the flood control channel, shall be constructed during the dry season (normally May 1 through September 30 of each year). Flood control facilities disturbed by construction shall be fully restored to their original design condition prior to the onset of the rainy season (October 1) so that the flood control capacity of the affected County facilities are not compromised.	**Responsible Party(s)** ▪ OCWD ▪ Construction Contractor **Phase** ▪ Construction	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Construction scheduling **Frequency** ▪ As necessary during design phase	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
Surface Water Quality – Operations ***Summary:*** *To minimize the potentially adverse health and environmental resource effects of excessive irrigation runoff and improper application of fertilizers and pesticides, OCWD will prepare a Water Quality Management Plan. As a regulatory compliance action under the Countywide NPDES program, WQMP preparation is considered a Standard Condition*			
SC 4.1-4: OCWD shall consult the 2003 Orange County Drainage Area Management Plan to determine whether the proposed recharge basin project is subject to Site Design BMPs, Source Control BMPs, or project-based Treatment Control BMPs. Subject to the 2003 DAMP provisions, OCWD shall prepare a WQMP that references the DAMP's Model Integrated Pest Management, Pesticides and Fertilizer Guidelines for the selection of structural and non-structural BMPs for long-term, post-construction stormwater management. The applicable BMPs shall be incorporated into the project design and shown on the project plans prior to construction. The specific BMPs employed will be determined by OCWD during project design and in consultation with the DAMP and its appendices. The WQMP will address the following issue areas and performance criteria: • <u>Landscape Design</u> – Natural landscaping (i.e., a native plant palette) will be used to ensure drought tolerance, minimal irrigation runoff, and reduced pesticide and fertilizer usage. If pesticide and/or fertilizer usage is necessary, the landscape plan will consider the use of a buffer strip, which is an area of grass or other vegetation between the treated landscaping and the site perimeter that receives no applications of fertilizers or pesticides. Landscape maintenance will include application of mulch to reduce weeds, keep the soil cool and moist, and prevent soil erosion and sedimentation in storm drain facilities. • <u>Irrigation Design</u> – Irrigation design will consider the use of irrigation techniques such as drip irrigation or soaker hoses to reduce runoff water and ensure water reaches the plant roots. If drip irrigation is found to be impractical, sprinkler systems will be well-maintained and will not water driveways, sidewalks, streets or other impervious surfaces. All irrigation plans will employ rain-triggered shutoff devices to prevent irrigation after precipitation, and will feature flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Design	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Design **Frequency** ▪ As necessary during design phase	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
4.2 HYDROGEOLOGY AND GROUNDWATER QUALITY			
Summary: *Potential impacts related to groundwater quantity and quality, recharge source water quality, and project-related contaminant transport would all be less than significant. In particular, the contaminant transport modeling demonstrates that the La Jolla Recharge Basin project will not adversely affect the rate or direction of movement of the AC Products PCE contamination plume. To confirm the predictions, and out of an abundance of caution, OCWD will implement measures to monitor the potential effects that future recharge might have on PCE concentrations. The following Project Design Features (PDFs) will be implemented.*			
PDF 4.2-1: OCWD will use the data reported to the RWQCB by AC Products to track local groundwater quality. Specifically, OCWD will acquire reported data for the following wells located along the axis of the AC Products VOC contamination plume: • MW-8S, MW-8D • MW-9S, MW-9D • MW-12 • MW-14S, MW-14D-A, MW-14D-B, and MW-14D-C • MW-20S, MW-20D-A, MW-20D-B, and MW-20D-C These monitoring wells are perforated in the Shallow Aquifer. The frequency of monitoring will depend on recent and future changes in PCE concentrations, as well as AC Products' monitoring requirements.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Operations	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Operations **Frequency** ▪ As needed during operation phase	
PDF 4.2-2: OCWD will use reported data for the following specific wells located to the south of the axis of the PCE plume between the AC Products facility and the Placentia Basin to confirm the modeling results and predictions for that area of the project: • MW-13 • MW-15 • MW-16 • MW-17 These monitoring wells are perforated in the Shallow Aquifer. The frequency of monitoring will depend on recent and future changes in PCE concentrations, as well as AC Products' monitoring requirements.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Operations	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Operations **Frequency** ▪ As needed during operation phase	
PDF 4.2-3: OCWD will install two additional monitoring wells (SMW-	**Responsible Party(s)**	**Responsible Party(s)**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
1 and SMW-2) in the Shallow Aquifer and one additional monitoring well (PMW-3) in the Principal Aquifer adjacent to SMW-1 to supplement the data reported by AC Products. These additional wells will be installed in the southern portion of the project area to monitor any potential southerly component of PCE transport downgradient of AC Products. The new wells will be installed prior to recharge because the Rubicon model predicts that PCE concentrations would change within a relatively short time after recharge occurs. To confirm the Rubicon model findings, the monitoring results will be evaluated in conjunction with the data reported by AC Products. Monitoring wells SMW-1 and SMW-2 will have perforated intervals at 95 to 125 feet below ground surface. Well PMW-3 will be perforated from 270 to 300 feet bgs. The recommended screened intervals may be changed by OCWD based on the observed stratigraphy encountered during well boring activities. During monitoring of the proposed wells, OCWD will measure the depth to groundwater and collect water samples for chemical analysis using EPA Method 8260B for VOCs.	▪ OCWD **Phase** ▪ Operations	▪ OCWD **Monitoring Period** ▪ Operations **Frequency** ▪ As needed during operation phase	
4.3 HAZARDS AND HAZARDOUS MATERIALS			
Soil Contamination and Underground Storage Tanks ***Impact 4.3-1:*** *As indicated in the Phase II ESA, petroleum hydrocarbons were not detected in any of the soil samples from waste oil storage areas or from fuel storage and dispensing areas. However, OCWD will implement the following mitigation measures to address the possibility of encountering previously undetected storage tanks and/or soil contamination during demolition and grading activities.*			
MM 4.3-1a: If any Underground Storage Tanks are encountered during site grading and excavation activities, they shall be removed in accordance with the existing standards and regulations of, and oversight by, the Orange County Health Care Agency. The process for UST removal is detailed in the OCHCA's AST/UST Removal Report and Remediation Procedures Report. Soil samples from areas where storage tanks have been removed or where soil contamination is suspected shall be analyzed for hydrocarbons including gasoline and diesel in accordance with procedures set forth in the AST/UST Removal Report and Remediation Procedures Report and as directed by OCHCA.	**Responsible Party(s)** ▪ Construction Contractor ▪ OCHCA ▪ OCWD **Phase** ▪ Pre-construction	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Pre-construction ▪ Excavation	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
If hydrocarbons are identified in the soil, the appropriate response/remedial measures will be implemented as directed by OCHCA or other appropriate agency until all specified requirements of the oversight agencies are satisfied and a no-further-action status is attained. Any Aboveground Storage Tanks (ASTs) in existence at the commencement of site development shall be removed in accordance with all applicable regulations under the oversight of OCHCA. These procedures are detailed in the UST/AST Removal Report.	▪ Excavation	**Frequency** ▪ Once before construction ▪ As needed during excavation	
MM 4.3-1b: The removal of onsite facilities and containers previously used for waste oil storage or fuel storage and dispensing shall be overseen by a qualified professional who is equipped to collect samples if stained, odorous, or hydrocarbon-saturated soil is encountered. This shall include the area around the existing aboveground storage tanks in the southeast corner of the site. As specified in Mitigation Measure 4.3-1a, if stained, odorous, or hydrocarbon-saturated soils are encountered, OCWD shall notify the Orange County Health Care Agency and other regulatory agencies as necessary prior to undertaking remedial action. If determined necessary, OCWD, or assigned contractor, shall also prepare a written contaminated soil mitigation plan in accordance with Mitigation Measure 4.5-2a (refer to Section 4.5 - Air Quality).	**Responsible Party(s)** ▪ OCWD ▪ Qualified specialist **Phase** ▪ Pre-construction	**Responsible Party(s)** ▪ OCWD ▪ Construction Contractor **Monitoring Period** ▪ Pre-construction **Frequency** ▪ As necessary during pre-construction	
Asbestos-Containing Materials ***Impact 4.3-2:*** *Existing irrigation piping that must be removed during grading and demolition activities could contain asbestos-containing material, which poses a health hazard if it becomes airborne during demolition activities.*			
MM 4.3-2a: Prior to demolition and grading activities, a licensed Asbestos Inspector shall be retained to determine the presence of asbestos-containing material (ACM) within structures to be demolished and in irrigation piping to be removed from the project site. If ACMs are present on-site, OCWD shall comply with all applicable State and federal ACM abatement policies and procedures for removal of ACMs.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Pre-demolition	**Responsible Party(s)** ▪ Asbestos Inspector **Monitoring Period** ▪ Pre-construction **Frequency**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
		▪ Once before construction	
MM 4.3-2b: If any irrigation piping encountered during site grading and excavation activities is found to contain asbestos fibers, removal shall be conducted in accordance with the remediation and mitigation procedures established by all federal, State, and local standards including federal and California Occupation Safety and Health Administration (OSHA), and Air Quality Management District (AQMD) regulations for the excavation, removal, and proper disposal of the transite pipe [CFR Title 29 OSHA, CFR Title 29 California Health & Safety Code, and SCAQMD Regulation X - National Emission Standards For Hazardous Air Pollutants, Subpart M - National Emission Standards For Asbestos]. The material shall be disposed of at a certified asbestos landfill.	**Responsible Party(s)** ▪ Construction Contractor **Phase** ▪ Grading and Construction	**Responsible Party(s)** ▪ OCWD ▪ Construction Contractor **Monitoring Period** ▪ Grading and Construction **Frequency** ▪ Continuous during site grading and excavation	
Lead-Based Paints ***Impact 4.3-3:*** *The existing residential and/or commercial structures constructed before 1978 might contain lead-based paint on internal and external surfaces. Lead-based paint poses a health hazard if it becomes airborne during demolition activities or leaches into on-site soils.*			
MM 4.3-3: Prior to demolition of residential and/or commercial structures constructed before 1978, OCWD shall retain a licensed Lead-Based Paint Inspector to conduct a survey of buildings for lead-based paint. Documentation of the lead survey shall be consistent with existing State and federal regulations for the management and mitigation of lead-based paint. Where lead-based paint exists, abatement shall be completed prior to any demolition activities that would create lead dust or fume hazard. Lead-based paint removal shall be performed in accordance with California Code of Regulations Title 8, Section 1532.1, which provides for exposure limits, exposure monitoring, respiratory protection and mandates good worker practices by workers exposed to lead. Contractors performing lead-based paint removal shall provide evidence to OCWD of certified training for lead-related construction work.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Pre-demolition	**Responsible Party(s)** ▪ Lead Based Paint Inspector ▪ OCWD **Monitoring Period** ▪ Pre-demolition **Frequency** ▪ As needed before demolition	
4.4 TRANSPORTATION AND CIRCULATION			
Summary: *The project site is near an existing PYLUSD elementary school on La Jolla Street and adjacent to a proposed middle school site. Though not a*			

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
significant impact, OCWD recognizes the importance of vehicle and pedestrian safeguards during construction of the proposed project and will implement the following measures:			
MM 4.4-1: Should construction occur within the right-of-way of any streets in the cities of Anaheim or Placentia, OCWD shall coordinate construction plans with the respective cities' Public Works Departments. OCWD shall also obtain the necessary encroachment permit(s) to temporarily relocate on street parking and/or construct project improvements within city streets before any project construction takes place.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Pre-construction ▪ Design	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Pre-construction **Frequency** ▪ As needed during design phase	
MM 4.4-2: The project contactor shall provide the Placentia-Yorba Linda Unified School District with a written schedule for completion of project site improvements, subject to prior review and concurrence by OCWD. Additionally, the project contractor shall ensure unimpeded pedestrian and vehicular access to Melrose Elementary School and the proposed Southwest Middle School site during project construction activities.	**Responsible Party(s)** ▪ Construction Contractor **Phase** ▪ Pre-construction ▪ Construction	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Pre-construction ▪ Construction **Frequency** ▪ As needed during construction phases	
MM 4.4-3: To ensure minimal circulation disruption, OCWD shall prepare a traffic management plan to be implemented by the construction contractor(s). Although not subject to local agency approval, the plan shall be coordinated through the City of Anaheim and shall be based upon a careful consideration of construction traffic routes to minimize impacts.	**Responsible Party(s)** ▪ Construction Contractor **Phase** ▪ Design	**Responsible Party(s)** ▪ OCWD ▪ City of Anaheim **Monitoring Period** ▪ Design **Frequency**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
		▪ As needed during design	
4.5 AIR QUALITY			
Equipment Emissions ***Impact 4.5-1:*** *Heavy equipment emissions would exceed the SCAQMD daily threshold for NOx during the grading and excavation phase of project construction.*			
MM 4.5-1a: During grading and construction activities, OCWD shall require that construction contractors use low-emission mobile construction equipment to reduce the release of undesirable emissions. OCWD shall require the use of construction equipment having lean-NOx catalysts. The use of such equipment will reduce NOx emissions below the threshold level. Additionally, OCWD shall require the use of aqueous diesel fuel and/or diesel particulate filters for use in all off-road diesel powered construction equipment to further reduce NOx emissions.	**Responsible Party(s)** ▪ Construction Contractor **Phase** ▪ Construction	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Construction **Frequency** ▪ As needed during construction	
MM 4.5-1b: OCWD shall stipulate in project plans and contractor specifications that equipment and supply staging areas shall be located as far as practicable from the nearest sensitive receptors during construction and periodic maintenance activities. Idling shall be limited to 10 minutes for trucks and heavy equipment, and equipment staging areas shall be located at least 300 feet away from the western property boundary (i.e., nearest McFadden Park and Melrose Elementary School).	**Responsible Party(s)** ▪ Contractor **Phase** ▪ Design	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Design **Frequency** ▪ Once during Design	
Dust Control *Although SCAQMD thresholds for most criteria pollutants (ROG, SOx, CO, PM10) will not be exceeded and mitigation is not required, OCWD will nonetheless implement the following standard measures, consistent with common construction practice, to further reduce construction emissions:*			
MM 4.5-1c: On-going during grading and construction activities, normal wetting procedures and other dust palliative measures shall be followed to minimize fugitive dust emissions in compliance with SCAQMD Rule 403. At a minimum, those measures shall include the following: • The simultaneous daily disturbance area shall be limited to one acre,	**Responsible Party(s)** ▪ Construction Contractor **Phase**	**Responsible Party(s)** ▪ OCWD **Monitoring Period**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
or enhanced dust control shall be used for such activities on up to 20 percent of the project property. • Construction contractors shall limit traffic speeds on all unpaved road surfaces to 15 miles per hour or less in order to reduce the release of fugitive dust. • Construction contractors shall suspend grading operations during first and second stage smog alerts and suspend all grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour or visible dust plumes emanate from the site. • Construction contractors shall develop a traffic plan to minimize traffic flow interference from construction activities. • All exposed earth surfaces shall be watered a minimum of twice daily. • Access points to paved surfaces shall be washed or swept daily. Public streets shall be swept for at least 50 feet on either side of site access points if silt accumulation is visible in the roadway. • Dirt hauled off-site shall be in a semi-moist state and loads shall be covered prior to transport.	▪ Construction	▪ Construction **Frequency** ▪ As needed during construction	
MM 4.5-1d: Construction plans and contractor specifications shall stipulate that the emissions of fugitive dust from any open silt storage piles will not remain visible in the atmosphere beyond the property line. Prior to off-site transport, silt storage piles shall be stabilized by watering, application of soil binders, and/or covered with tarps.	**Responsible Party(s)** ▪ Construction Contractor **Phase** ▪ Construction	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Construction **Frequency** ▪ As needed	
Air Toxics – Potentially Contaminated Soils ***Impact 4.5-2:*** *Grading and excavation of soils in certain areas of the project site could trigger compliance with SCAQMD Rule 1166 concerning the emissions of volatile organic compounds.*			
MM 4.5-2a: Any contaminated soils encountered on the project site during tank removal, site clearance, or excavation shall be sampled to	**Responsible Party(s)** ▪ OCWD	**Responsible Party(s)** ▪ OCWD	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
determine the nature and extent of the contamination and disposed of off-site in accordance with applicable hazardous waste regulations, including SCAQMD Rule 1166 where soil samples reveal VOC levels in excess of 50 parts per million. The District shall notify the Orange County Health Care Agency and other regulatory agencies as necessary prior to undertaking remedial action.	▪ Construction Contractor **Phase** ▪ Tank removal, clearance, excavation	**Monitoring Period** ▪ Tank removal, clearance, excavation **Frequency** ▪ As-needed	
MM 4.5-2b: During excavation, if additional soil testing indicates the probability of encountering VOC contaminated soils, the District, or assigned contractor, shall prepare a written VOC Contaminated Soil Mitigation Plan in accordance with the SCAQMD Rule 1166 – VOC Emissions from Decontamination of Soil – and submit the plan for SCAQMD approval. A VOC-Contaminated Soil Mitigation Plan shall be written to minimize VOC emissions to the atmosphere during excavation, grading, handling and treatment of VOC contaminated soil. SCAQMD approval of the mitigation plan shall be obtained before proceeding with the excavation and grading in the affected areas, as clearly delineated in the plan. Additionally, soil excavation in excess of 5,000 cubic yards shall be subject to a pre-approved AQMD Rule 403 Fugitive Dust Plan. The approved plan shall contain mitigation measures designed to reduce emissions and fugitive dusts and odors from handling and disposing of potentially contaminated soils.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Excavation	**Responsible Party(s)** ▪ OCWD ▪ SCAQMD **Monitoring Period** ▪ Excavation **Frequency** ▪ As-needed	
Impact 4.5-3: *Grading and excavation of soils in certain areas of the project site may expose construction personnel and nearby sensitive receptors to pesticide-contaminated dust emissions.*			
MM 4.5-3: Prior to site grading and excavation, OCWD shall ensure that the construction contractor has an AQMD-approved plan for the removal and disposal of pesticide-contaminated soils. In formulating a comprehensive plan, the contractor shall comply with all relevant AQMD rules and reasonable conditions. The conditions shall include, but may not be limited to, conducting air monitoring and implementing dust control procedures to prevent airborne transport of site contaminants during site grading and excavation. After the pesticide-contaminated soil is removed, the removal contractor shall perform confirmation sampling to ensure that the desired clean-up levels are achieved. Additional plans elements shall include procedures for ensuring responsibility for the implementation of the plan;	**Responsible Party(s)** ▪ Construction Contractor ▪ OCWD **Phase** ▪ Pre-grading/excavation	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Pre-grading/excavation **Frequency** ▪ Design	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
accessibility to the site for AQMD staff; notification of actions required by the plan; identification of emission receptors; monitoring and testing; suppression and covering of stockpiles; prevention of public nuisance from dust emissions; prevention of fugitive emissions of contaminated soil; loading of truck trailers; and disposal and treatment.			
Air Toxics – Asbestos-Containing Materials ***Impact 4.5-4:*** *Existing structures could contain asbestos-containing materials, which would pose a health hazard if asbestos becomes airborne during demolition activities.*			
MM 4.5-4: If asbestos-containing materials (ACMs) are found during the site survey required by Mitigation Measure 4.3-2a (see Section 4.3 – Hazards and Hazardous Materials), abatement of asbestos shall be completed prior to any demolition activities that would disturb ACMs or create airborne asbestos hazard. Actions to remove ACM shall be accomplished in accordance with SCAQMD Rule 1403 – Asbestos Emissions from Demolition and Renovation Activities, which requires that: • Asbestos removal shall be performed by a State-certified asbestos containment contractor; • A survey of the facility shall be conducted prior to issuance of a permit by SCAQMD; • SCAQMD shall be notified of intent to remove ACMs prior to demolition activity; • ACMs shall be removed in accordance with prescribed procedures; • Collected ACMs shall be placed in leak-tight containers or wrapping; and • ACMs shall be properly disposed.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Design	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Design **Frequency** ▪ One-time site survey	
4.6 NOISE			
Summary: *Although no significant project-related impacts have been identified, OCWD routinely includes standard noise provisions as part of construction specifications. The measures that OCWD will apply to this project include, but are not limited to, the following:*			
MM 4.6-1: Short-term construction noise intrusion shall, at a minimum, be limited by compliance with the Anaheim Municipal Code on hours of allowable disturbance, as stated in conditions on contractor	**Responsible Party(s)** ▪ Construction Contractor	**Responsible Party(s)** ▪ OCWD	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
specifications. Those same documents shall also specify construction *access routing to minimize construction truck traffic past existing* schools, residential neighborhoods, or other noise-sensitive uses in the project vicinity.	**Phase** ▪ Construction	**Monitoring Period** ▪ Construction **Frequency** ▪ As needed during construction	
MM 4.6-2: Prior to commencement of demolition or construction, a note shall be placed on the plans requiring compliance with the following measures ongoing during demolition, grading, and construction operations: a. *All construction equipment, fixed or mobile, shall be equipped with* properly operating and maintained mufflers consistent with manufacturers' standards. All internal combustion equipment used for construction and drilling shall be properly tuned-up to minimize noise emissions, and shall use mufflers and noise shrouds no less effective than those originally installed on the equipment. No equipment shall have unmuffled exhaust. This measure shall be added to the construction contract and enforced by the District Engineer or designee; b. All stationary construction equipment shall be located in staging areas that will create the greatest distance between construction-related noise sources and McFadden Park (which is located west of the project site) and all equipment shall be oriented so that emitted noise is directed away from McFadden Park, as feasible; and, **c.** The construction contractor shall be required to adhere to all Noise Ordinance provisions of the City of Anaheim. Additionally, noisy *construction within 500 feet of existing homes shall be limited to the* hours of 7 a.m. and 7 p.m. on weekdays, 7 a.m. to 6 p.m. on Saturdays and not at any time on Sunday or Federal holidays.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Pre-demolition, pre-construction	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Pre-demolition, Pre-construction **Frequency** ▪ Once during design	
MM 4.6-3: If monitoring well drilling occurs within 300 feet of schools or residences, the drill sites shall be enclosed on all sides with an acoustical barrier that provides a minimum sound transmission class rating of 30. The height of the barriers is crucial in terms of effectiveness, as the higher the barrier the more the noise reduction.	**Responsible Party(s)** ▪ OCWD ▪ Construction Contractor	**Responsible Party(s)** ▪ District Engineer **Monitoring Period**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
Types of shielding may include leaded blankets, an acoustic blanket, or several layers of plywood. This measure shall be added to the construction contract and enforced by the District Engineer or designee.	**Phase** ▪ Design ▪ Well Drilling	▪ Design ▪ Well drilling **Frequency** ▪ As-needed	
MM 4.6-4: For project construction activities within 300 feet of an occupied school, the District shall confer with the City of Anaheim to determine whether project construction should continue on weekends and holidays while school is in session in an effort to avoid impacting noise-sensitive uses on weekdays. This approach is consistent with the City of Anaheim General Plan Noise Element, which generally discourages construction on weekends or holidays, except in the case of construction proximate to schools where the noise-generating operations could disturb the classroom environment.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Design	**Responsible Party(s)** ▪ OCWD ▪ City of Anaheim **Monitoring Period** ▪ Design **Frequency** ▪ As needed during design phase	
4.7 LAND USE AND RELATED PLANNING			
Summary: *The proposed recharge basin project would not create land use conflicts with any existing or future uses, including the proposed Southwest Middle School project that is planned by PYLUSD. Post-construction activity levels on the site would be relatively minor compared to future adjacent uses. The nature of the proposed recharge basin project is such that its operations would be unaffected by intensified uses on neighboring properties. Although significant land use impacts will not result from project construction or operation, the following measure will be implemented:*			
MM 4.7-1: To ensure compatibility with future land uses and adjacent school site planning efforts, final construction documents and a copy of the project plans shall be made available by OCWD to interested and affected public agencies, including the Placentia-Yorba Linda Unified School District, the County of Orange, and the cities of Anaheim and Placentia.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Design	**Responsible Party(s)** ▪ OCWD **Monitoring Period** ▪ Design **Frequency** ▪ As needed during design phase	
4.8 GEOLOGY AND SEISMICITY			

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
Summary: *Ninyo & Moore's (2003) evaluation of soils and geotechnical conditions concludes that recharge basin construction and operation is feasible from a geotechnical point of view. OCWD will incorporate the conclusions and recommendations presented in that report into design and construction of the recharge basin and site improvements. A geotechnical engineer will also conduct on-site review of potential structural and soils-related hazards during the construction process. Adherence to those procedures will ensure that potential geotechnical and seismic impacts remain below a level of significance.*			
4.9 BIOLOGICAL RESOURCES			
Impact 4.9-1: *Removal of the trees and large shrubs at the proposed project site could have an impact on nesting activity of native resident or migratory birds that could potentially nest on-site.*			
MM 4.9-1: OCWD shall obtain the services of a wildlife biologist familiar with the project area resources to conduct a pre-construction survey no more than two (2) days prior to demolition or construction work in the area to verify the presence or absence of nesting birds on the project site. The area surveyed shall include all construction and staging areas, as well as areas within 100 feet outside the boundaries of the areas to be cleared, or as otherwise determined by the biologist. The results of the survey shall be documented in a letter report of findings that shall describe the methods used to conduct the surveys, existing conditions of biological resources onsite, and results of the surveys. If the presence of nesting birds in the area of construction activity influence is confirmed, vegetation removal shall be delayed until outside the breeding season (February 1 through August 31) to avoid destruction of resident native bird nests and to ensure reproductive success for native bird species using the site for nesting purposes. If it is not feasible to avoid the nesting season, the biologist shall flag off the area(s) supporting bird nests, providing a minimum buffer of 100 feet between the nests and limits of construction. The construction crew shall be instructed to avoid any activities in this zone until the nest(s) is/are no longer active. Limits of construction to avoid the nest(s) shall be established within the field with flagging and stakes or construction fencing.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Pre-construction	**Responsible Party(s)** ▪ Wildlife Biologist **Monitoring Period** ▪ Pre-construction	
4.10 AESTHETICS			
Summary: *No significant visual impacts have been identified; however, the project landscape plan and site plan will be submitted to several requesting agencies as a courtesy for their review and comment.*			
MM 4.10-1: A perimeter landscape plan shall be prepared showing	**Responsible Party(s)**	**Responsible Party(s)**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
vegetation types, locations, and presumed or actual heights of vegetation. The landscape plan shall also include measures for maintenance and replanting, if necessary. The District shall submit the proposed landscape plan and site plan to the County of Orange, the City of Anaheim, and OCTA for their review and comment prior to implementation of the project. Further, where feasible and practical, the final landscape plan shall include designs to comply with City of Anaheim recommendations.	▪ OCWD **Phase** ▪ Design	▪ Orange County ▪ Anaheim ▪ OCTA **Monitoring Period** ▪ Design **Frequency** ▪ As needed during design phase	
4.11 CULTURAL RESOURCES			
Impact 4.11-1: *Future development activities involving earthmoving have the potential to significantly impact potential archaeological resources.*			
MM 4.11-1a: Any excavation necessary for the proposed project shall be monitored by a qualified archaeological monitor under the supervision of a qualified Project Archaeologist who is on the Orange County List of Certified Archaeologists. If cultural material is encountered, the monitor shall have the power to halt or divert earthmoving equipment in the vicinity of the find until it can be evaluated.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Excavation	**Responsible Party(s)** ▪ Certified archaeological monitor **Monitoring Period** ▪ Excavation **Frequency** ▪ As needed during excavation	
MM 4.11-1b: If cultural material is encountered it will be evaluated using CRHR eligibility criteria. This may require an archaeological test program. If the Project Archaeologist recommends a test program, he or she shall prepare a test plan and implement it.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Excavation	**Responsible Party(s)** ▪ Project Archaeologist **Monitoring Period** ▪ Excavation **Frequency**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
		▪ As needed during excavation	
MM 4.11-1c: If the cultural material is evaluated as eligible, mitigation shall consist of avoidance and preservation, if feasible. If avoidance is not feasible, the Project Archaeologist shall prepare a data recovery plan that states how the data necessary to address scientifically consequential research topics will be recovered. The data recovery plan shall then be implemented.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Excavation	**Responsible Party(s)** ▪ Project Archaeologist **Monitoring Period** ▪ Excavation **Frequency** ▪ As needed during excavation	
Impact 4.11-2: *Future development activities involving earthmoving have the potential to significantly impact Native American human remains.*			
MM 4.11-2: If Native American remains are discovered during construction, construction activities shall be halted or diverted until the provisions of Section 7050.5 of the Health and Safety Code and Section 5097.98 of the Public Resources Code have been implemented. These provisions include notifying the County Coroner, taking into account the recommendations of the Most Likely Descendant appointed by the Native American Heritage Commission, and reburying the remains where they will not be further disturbed.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Excavation	**Responsible Party(s)** ▪ Project Archaeologist **Monitoring Period** ▪ Excavation **Frequency** ▪ As needed during excavation	
4.12 PALEONTOLOGICAL RESOURCES			
Impact 4.12-1: *Project implementation could adversely affect a paleontological site that may be discovered during excavation of the recharge basin.*			
MM 4.12-1a: Prior to earthmoving, a project paleontologist shall be retained by the Orange County Water District (OCWD) and shall develop a mitigation plan and a discovery clause/treatment plan to be implemented during earthmoving on the project site. At a minimum, the treatment plan shall require the recovery and subsequent treatment of any fossil remains and associated data uncovered by earthmoving. As part of the plan, the project paleontologist shall develop a storage agreement with an Orange County institution with right-of-first-refusal	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Pre-earthmoving	**Responsible Party(s)** ▪ Project Paleontologist **Monitoring Period** ▪ Pre-earthmoving ▪ During earthmoving	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
(i.e., the Orange County Archaeo/Paleo Resource Management Facility [APRMF]) or, if necessary, the Natural History Museum of Los Angeles County Vertebrate Paleontology Section, San Bernardino County Museum, or another acceptable museum repository to allow for the permanent storage and maintenance of any fossil remains recovered as a result of the mitigation program, and for the archiving of associated specimen data and corresponding geologic and geographic site data at the museum repository.		**Frequency** ▪ As needed during earthmoving activities	
MM 4.12-1b: The paleontologist and a paleontologic construction monitor shall attend a pre-grade meeting to explain the mitigation program to grading contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earthmoving.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Pre-grading	**Responsible Party(s)** ▪ Construction monitor **Monitoring Period** ▪ Pre-grading **Frequency** ▪ Once pre-grading	
MM 4.12-1c: Paleontologic monitoring of earthmoving shall be conducted by the monitor when older Quaternary sediments will be disturbed.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Construction	**Responsible Party(s)** ▪ Paleontological monitor **Monitoring Period** ▪ Construction **Frequency** ▪ As needed	
MM 4.12-1d: If fossil remains are found by the monitor, earthmoving shall be diverted temporarily around the fossil site until the remains have been recovered and the monitor agrees to allow earthmoving to proceed.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Construction	**Responsible Party(s)** ▪ Paleontological monitor **Monitoring Period** ▪ Construction **Frequency**	

IMPACTS, MITIGATION MEASURES, AND/OR STANDARD CONDITIONS	IMPLEMENTATION	MONITORING	NOTES / INITIALS
		▪ As needed	
MM 4.12-1e: Any recovered fossil remains shall be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains then shall be curated and catalogued, at the expense of the OCWD, and associated specimen data and corresponding geologic and geographic site data shall be archived at the museum repository by a laboratory technician. The remains then shall be accessioned into the museum repository fossil collection, where they shall be permanently stored, maintained, and, along with associated specimen and site data, made available for future study by qualified investigators.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Construction	**Responsible Party(s)** ▪ Paleontological monitor **Monitoring Period** ▪ Construction **Frequency** ▪ As needed	
MM 4.12-1f: A final report of findings shall be prepared by the paleontologist for submission to OCWD and the museum repository following accessioning of the specimens into the museum repository fossil collection. The report shall describe geology/stratigraphy; summarize field and laboratory methods used; include a faunal list and an inventory of curated/catalogued fossil specimens; evaluate the scientific importance of the specimens; and discuss the relationship of any newly recorded fossil site in the parcel to relevant fossil sites previously recorded from other areas.	**Responsible Party(s)** ▪ OCWD **Phase** ▪ Post-construction	**Responsible Party(s)** ▪ Project Paleontologist **Monitoring Period** ▪ Post-construction **Frequency** ▪ Once post-construction	

Notice of Determination

Notice of Determination

NOTICE OF DETERMINATION

Appl: cant + lead

To: ☒ County of Orange
County Clerk, EIR Desk
12 Civic Center Plaza, Room 106
Santa Ana, California 92701

☒ Office of Planning and Research
P. O. Box 3044
Sacramento, CA 95812-3044

From: Orange County Water District (Lead Agency)
P.O. Box 8300
Fountain Valley, CA 92728-8300
Contact: Heather McPherson
Telephone: (714) 378-3211

10500 Ellis Ave
Fountain Valley
Ca 92728

POSTED
MAY 18 2006
TOM DALY, CLERK-RECORDER
By ______ DEPUTY

FILED
MAY 18 2006
TOM DALY, CLERK-RECORDER
By ______ DEPUTY

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

State Clearinghouse Number: 2003041190

Project Title: La Jolla Recharge Basin

Project Location: The La Jolla Recharge Basin project is proposed on an approximately 9.3-acre site in the City of Anaheim, Orange County, California. The project site is on West La Jolla Street, between South Melrose Street (City of Placentia) and Red Gum Street (City of Anaheim). The site is about 0.4 mile east of State Route 57 (Orange Freeway) and one mile north of State Route 91 (Riverside Freeway).

Project Description:

Construction and operation of a groundwater recharge basin that will increase recharge into the Orange County Groundwater Basin. The new recharge basin would add approximately 9,000 acre-feet of recharge capacity per year. The proposed 9.3-acre site will include an approximately 5.7-acre recharge basin, a perimeter access road, 3:1 side slopes, a maximum depth of 9 feet, a basin access ramp, and an area where accumulated silt removed from the basin during cleaning can be temporarily stored. Water for the recharge basin will be provided from the Miller Recharge Basin via Carbon Creek Channel by means of a diversion dam.

This is to advise that the Orange County Water District (Lead Agency) has approved the above-described project on May 17, 2006, 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. ☒ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were **not**] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☒ was ☐ was **not**] adopted for this project.
5. A Statement of Overriding Considerations [☐ was ☒ was **not**] adopted for this project.
6. Findings [☒ were ☐ were **not**] made pursuant to the provisions of CEQA.

This is to certify that the Final EIR, with comments and responses and record of project approval, is available to the General Public at the Orange County Water District, 10500 Ellis Avenue, Fountain Valley, California 92708.

Signature: Virginia Grebbien | Date: 5-17-06 | Title: General Manager

Date received for filing and posting at SCH:

Recorded in Official Records, Orange County
Tom Daly, Clerk-Recorder
NO FEE
200685000465 01:10pm 05/18/06
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MAY 1 8 2006

TOM DALY, CLERK-RECORDER

By________ DEPUTY

CALIFORNIA DEPARTMENT OF FISH AND GAME

CERTIFICATE OF FEE EXEMPTION

De Minimis Impact Finding

FILED

MAY 1 8 2006

TOM DALY, CLERK-RECORDER

By________ DEPUTY

Project Title/Location:

La Jolla Recharge Basin, Orange County

The La Jolla Recharge Basin project is proposed on an approximately 9.3-acre site in the City of Anaheim, Orange County, California. The project site is on West La Jolla Street, between South Melrose Street (City of Placentia) and Red Gum Street (City of Anaheim). The site is about 0.4 mile east of State Route 57 (Orange Freeway) and one mile north of State Route 91 (Riverside Freeway).

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Findings: Exempt from fees.

Certification:

I hereby certify that the public agency has made the above finding and that the project will not individually or cumulatively have an adverse effect on wildlife resources, as defined in Section 711.2 of the Fish and Game Code.

Heather McPherson

Heather McPherson

Title:	Engineer
Lead Agency:	Orange County Water District
Date:	May 18, 2006

LIFORNIA - THE RESOURCES AGENCY
OF FISH AND GAME
TAL FILING FEE CASH RECEIPT

276869

Lead Agency: unty of Orange, water district Date: 5/18/06

County / State Agency of Filing: Orange County Clerk-Recorder Document No.: 200685000465

Project Title: La Jolla Recharge Basin

Project Applicant Name: OC Water District Phone Number: 714 378 3211

Project Applicant Address: 10500 Ellis Ave Fountain Valley CA 92728

Project Applicant (check appropriate box): Local Public Agency ☒ School District ☐ Other Special District ☐ State Agency ☐ Private Entity ☐

CHECK APPLICABLE FEES:

( ) Environmental Impact Report	$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~~	$ 0
( ) Project that is exempt from fees		
	TOTAL RECEIVED	$

Signature and title of person receiving payment:

WHITE-PROJECT APPLICANT YELLOW-DFG/FASB PINK-LEAD AGENCY GOLDENROD-STATE AGENCY OF FILING

Agency)

LED

8 2006

ERK-RECORDER

DEPUTY

...y of Anaheim) ... South Melrose Street (City of Placentia) and Red Gum Street (City of Anaheim). The site is about 0.4 mile east of State Route 57 (Orange Freeway) and one mile north of State Route 91 (Riverside Freeway).

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Signature: Virginia Grebbien Date: 5-17-06 Title: GENERAL MANAGER

Date received for filing and posting at SCH:

Recorded in Official Records, Orange County
Tom Daly, Clerk-Recorder

NO FEE

200685000465 01:10pm 05/18/06

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