Attachment 1

Authorization and Eligibility Requirements

Integrated Regional Water Management Implementation
Prop 84, Round 1

Santa Ana Watershed Project Authority

Santa Ana One Water One Watershed IRWM
Prop 84, Round 1 Implementation Proposal

EASTERN MUNICIPAL WATER DISTRICT
SINCE 1950

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PROJECT AUTHORITY
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December 17, 2010

Ms. Celeste Cantu, General Manager
Santa Ana Water Project Authority
11615 Sterling Ave.
Riverside, CA 92503

SUBJECT: Hemet/San Jacinto Water Management Plan 2009 Annual Report

Dear Ms. Cantu:

On November 8, 2010, the above referenced report was approved by the Hemet/San Jacinto Water Management Plan Cities, Attorneys, and Managers (CAM) Committee.

For your convenience, the report has been posted on EMWD's website. You can access it at the following site: *www.emwd.org*

Sincerely,

B Mortazavi

Behrooz Mortazavi
Assistant General Manager
Resource Development

MN:tm

c: Records Management

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN

EASTERN MUNICIPAL WATER DISTRICT

JUNE 8, 1995

ADDENDUM

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN
Draft September 1994

MAY 1995

Eastern Municipal Water District

GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN
September 1994 Draft

ADDENDUM - May 1995

(~~Strikeout~~ indicates deletion and
underline indicates insertion.)

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Page iii — Last item under Section 7: ~~TRANSFER~~ **EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE ~~USERS~~ USES FROM GROUNDWATER TO RECLAIMED WATER.**

Section 1 - Executive Summary

Page 1-1 — 1st ¶, 3rd bullet item: • ~~structural adequacy~~ capacity of the delivery system is limited;

Last ¶, last sentence: One such action that could adversely affect EMWD's local water resources is a claim recently filed by a neighboring water district ~~Orange County Water District,~~ which underscored the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

Page 1-3 — 2nd ¶, last line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company ...

Page 1-4 — 2nd ¶, 2nd and 3rd sentences: Water requirements by these subagencies ~~varies~~ vary depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, ~~city~~ City of Perris, ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company and Nuevo Water Company.

Page 1-5 — 2nd ¶: **Local Planning and Regulatory Agencies.** Other local agencies that may have a significant influence on groundwater management include:

Riverside County Flood Control and Water Conservation Agency. This agency plans, constructs and operates flood control and water

conservation facilities in Riverside County. The construction of ... significant impact. This agency issues the following permits:

a. Separate Application for Flood Plain Management (County Ordinance No. 458)

b. Encroachment Permits

Same ¶, last section: ~~Riverside County Health Department.~~ County of Riverside Department of Environmental Health. The County of Riverside Department of Environmental Health will review NPDES and solid waste facility permits and compatibility of well construction policies and well abandonment and destruction programs with County Ordinance No. 682. EMWD fully intends to coordinate with the County when development of well construction policies and development of a well abandonment and destruction program are developed as part of Plan implementation. ~~The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.~~

Page 1-6 4th ¶: Groundwater production estimates for 1993 were estimated from annual reports of groundwater production on file at the State Water Resources Control Board and from Southern California Association of Governments (SCAG) ~~SCAG~~ land use.

Page 1-7 1st ¶, add to end of ¶: Non-irrigated, vacant land will accommodate most of the urbanization growth in the area.

Page 1-8 2nd ¶, 12th line: ... such as SWP water~~.~~ and demineralization.

3rd ¶, 1st line: ... water distribution ~~plan~~ system ...

Page 1-9 1st ¶, 5th line: 3,360 acre-ft/yr of potable water.

Page 1-14 3rd ¶, **Ultimate Plan Description.** The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints of this plan. Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 1-15 2nd ¶, **Monitoring of Groundwater Level and Quality**, 3rd sentence: EMWD will measure groundwater levels and quality from select private wells. EMWD's measurements will not interfere with the well owners' use of the wells. EMWD's measurements will be provided to participating well owners free of charge upon request.

3rd ¶, **Development of Well Construction Policies**, last sentence: These policies will be related to water quality and health protection only and will not limit, or suspend, or unreasonably increase the cost of current or future groundwater production by ~~existing groundwater producers~~ private landowners for use within the plan boundary.

Page 1-16 2nd ¶, **Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use**, 1st sentence: The intent of this element is to increase the groundwater yield available for municipal use by either ~~retiring~~ voluntary retirement of agricultural and non-potable demands or by voluntarily substituting reclaimed water for groundwater used for agricultural and other non-potable uses.

Page 1-17 Top of page, 4th bullet item: • Administration and Monitoring of Well Construction, Abandonment and Destruction

Page 1-20 2nd ¶, **Financing the Groundwater Management Plan**: The cost of implementing and operating the West San Jacinto Groundwater Basin management plan ~~should~~ shall be borne by municipal water users in the management area... There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft and groundwater producers choose to participate in the groundwater replenishment program in order to access supplemental water supplies instead of curtailing their own groundwater production or enjoining the groundwater production of others in the affected subbasin. In the event of continued overdraft, an equitable cost sharing plan should be developed to allocate costs among EMWD, other benefitted municipal water suppliers, and participating groundwater producers to correct the overdraft.

Page 1-21 1st ¶, last line: The following tasks will be completed in Phase ~~I~~ 1.

2nd ¶, last 2 sentences under **Phase 2 Refine the Ultimate Groundwater Management Plan**: ... management plan. The complexity and ...

Page 1-22 Last ¶, Schedule and Cost. The cost to complete Phases 1 and 2 is estimated to range between 3 to 5 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2. The cost to implement and operate the Groundwater Management Plan is estimated to be between $50 million and $70 Million. Estimates at this time are very rough and they will be refined when the specific projects are identified and designed.

Section 2 - Introduction

Page 2-1 — 1st ¶, 3rd bullet item: • ~~structural adequacy~~ capacity of the delivery system is limited;

Last ¶, last sentence: One such action that could adversely affect EMWD's local water resources is a claim recently filed by a neighboring water district ~~Orange County Water District,~~ which underscored the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

Page 2-4 — 2nd ¶ under **Approach to Development of Groundwater Management Plan**, second sentence: These goals can be modified during the plan development process within the constraints of this plan. These goals will determine the magnitude of the plan, beneficiaries of the plan, and will guide the technical work that shapes the plan. Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 2-5 — Mid-page, 3rd bullet item: ... plan goals; ~~and~~

Page 2-6 — Last ¶, last line: ~~Dr.~~ Mr. P. Ravishanker.

Section 3 - Existing Water Resources Framework

Page 3-2 — 2nd ¶, 5th line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company, ...

5th ¶, 1st line: ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company.

Page 3-3 — Substitute section titled "**Colorado River Water**" with the following:
MWD has water delivery contracts for Colorado River water with the U.S. Department of the Interior for 1.212 million acre-feet per year (MAF/Y) and an additional 180,000 acre-feet per year (AF/Y) of surplus water. The capacity of MWD's Colorado River Aqueduct is 1,800 cubic feet per second or 1.3 MAF/Y. However, as a result of the 1964 U.S. Supreme Court decree in Arizona v. California, MWD's dependable supply of Colorado River water was reduced to less than 550,000 AF/Y. This reduction in dependable supply occurred with the commencement of Colorado River deliveries by the Central Arizona Project.
MWD has a priority to divert 550,000 AF/Y of California's 4.4 MAF/Y basic apportionment under its water delivery contract with the Secretary of the

Interior. In addition, MWD has entered into agreements with other agencies serving Colorado River Water for agricultural purposes in the California desert to increase its dependable supplies. Water use by holders of present perfected rights (Indian reservations, towns, and other individuals along the Colorado River that predate MWD's rights) is estimated to reduce dependable diversions by about 30,000 AF/Y. Conveyance losses along the Colorado River Aqueduct of 10,000 AF/Y further reduce the amount of Colorado River water received in the coastal plain. MWD's dependable Colorado River supplies are projected to total 626,000 acre-feet upon completion of a cooperative water conservation program with Imperial Irrigation District.

Based on an annual determination, the Secretary of the Interior has allowed MWD in recent years to divert Colorado River water apportioned to, but unused, by Arizona and Nevada. Arizona and Nevada are not expected to use their full apportionments until the years 2036 and 2005, respectively. MWD is pursuing several projects to increase the reliability of its Colorado River supplies.

Page 3-4 Substitute the section titled "**State Project Water**" with the following:

SWP water comes from Northern California, is transported through the Sacramento-San Joaquin Delta, and is delivered to MWD through the California Aqueduct. MWD, one of 29 agencies that have contracted with the State for SWP supplies, holds a contract for entitlement to 2.01 MAF/Y, or nearly half of the total contracted entitlement of 4.23 MAF/Y. Initial SWP facilities completed in the early 1970s have produced yields adequate to meet just over half of the total contracted entitlement on a dependable basis. While it was intended that addition SWP facilities would be constructed to meet contractor demands as they increased, this has not occurred. In addition, constraints placed on SWP operations in the Delta under State and federal Endangered Species acts have reduced available SWP supplies. However, the December 1994 consensus agreement on interim standards for Delta flows and water quality brings more certainty to SWP supply availability during the next three years, and is the foundation for immediate initiation of a process for identifying a long-term solution to water supply and fishery problems in the Delta. In the future, if additional facilities are not completed, availability of water from the SWP is expected to decrease due to increased use of water in Northern California, and increasing allocations of water for environmental needs in the Bay-Delta.

Page 3-9 1st ¶, 3rd line: The proposed regulations are included in Appendix A-2 ~~A-1~~.

Page 3-10 4th ¶, 1st line: A summary of existing and proposed water quality standards is presented in Appendix A-3 ~~A-2~~.

Last ¶, 1st section: **Riverside County Flood Control and Water Conservation Agency.** This agency ... Riverside County. The construction of ... significant impact. This agency issues the following permits:

a. Separate Application for Flood Plain Management (County Ordinance No. 458)

b. Encroachment Permits

Last ¶, last section: ~~Riverside County Health Department.~~ County of Riverside Department of Environmental Health. The County of Riverside Department of Environmental Health will review NPDES and solid waste facility permits and compatibility of well construction policies and well abandonment and destruction programs with County Ordinance No. 682. EMWD fully intends to coordinate with the Department when development of well construction policies and development of a well abandonment and destruction program are developed as part of Plan implementation. ~~The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.~~

Section 4 - Groundwater Resources in the West San Jacinto Basin

Page 4-5 — 1st ¶, insert after 1st sentence: ... on the north. The San Jacinto River flows through this subbasin include tributary flows from Potrero Creek and Laborde Canyon.

2nd ¶, 3rd line: San Jacinto ~~Creek~~ River

Table 4-2 — 10th line of data is a duplicate: ~~0 0 0 0 800 1,200 2,000~~

Page 4-9 — 5th ¶: The total outflow in the basin, from all sources, ranges from a low of zero ~~1,300~~ acre-ft/yr from the Menifee ~~San Jacinto Lower Pressure~~ subbasin, to a high of 4,000 ~~4,600~~ acre-ft/yr for the Lakeview ~~Menifee~~ subbasin. The total outflow for the management area is about 10,200 ~~14,800~~ acre-ft/yr.

Page 4-10 — 3rd ¶, 5th line: San Jacinto ~~Creek~~ River

Page 4-14 — 2nd ¶, 1st sentence: The principle sources of groundwater in this basin are underflow from the San Jacinto Lower Pressure, Perris South I, Perris South II subbasins, storm flow percolation in the San Jacinto River ~~Creek~~ which includes flow from Potrero Creek and Laborde Canyon tributaries, and runoff from the Lakeview Mountains and Bernasconi Hills.

2nd ¶, insert: Most of the groundwater in the basin is sodium chloride in character. Potentially contaminated surface water flows from Potrero Creek and Laborde Canyon may impact groundwater quality in the basin. The Casa Loma fault ...

Page 4-16 1st ¶, last sentence under **Future Groundwater Quality**: ... These estimates, however, are based on a model that:

- has not been calibrated for TDS or nitrate;
- has each subbasin ~~is~~ represented by only one node and thus the resolution of the analysis is crude; and
- has future water supply and wastewater plans ~~that were~~ used in these studies that are not representative of ~~the~~ future plans.

Last ¶, last sentence: The planning tool would consist of groundwater flow and simulation models similar to those models ~~that were~~ developed and ~~that are~~ in current use in other basins. ~~to develop the Chino Basin Water Resources Management Plan (Montgomery Watson & Wildermuth, Mark J., 1992; Montgomery Watson & Wildermuth, Mark J., 1993).~~

Section 5 - Future Water Supply and Wastewater Flows

Page 5-1 1st ¶, Reclamation Plant List: ~~Temescal~~ Temecula Valley

1st ¶, add following last sentence: Non-irrigated, vacant land will accommodate most of the urbanization growth in the area.

Last ¶, 1st line: seasonal discount are~~:~~ to: achieve ...

Page 5-5 2nd ¶, 2nd sentence: ~~All agricultural demands would be satisfied with reclaimed water by the year 2010.~~

Section 6 - Groundwater Management Goals

Page 6-1 3rd ¶, 2nd sentence: Much of the r~~R~~emaining agricultural water demand will be converted to reclaimed water.

Page 6-2 2nd sentence: The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved ~~or equitably replaced~~.

Section 7 - Elements of Groundwater Management Plan

Page 7-2 — 2nd ¶, 2nd sentence: The monitoring of groundwater quality includes the collection and review of groundwater quality data that can be used to assess current and future trends in groundwater quality, and to evaluate groundwater quality response to groundwater management activities and climate. EMWD's monitoring activities will not interfere with the well owners' use of the wells. EMWD's monitoring data will be provided to participating well owners free of charge upon request.

Page 7-3 — Insert new ¶ following 3rd bullet item: EMWD will coordinate with the County of Riverside Department of Environmental Health when development of well construction policies and development of a well abandonment and destruction program are developed as part of the Groundwater Management Plan implementation.

Page 7-8 — 3rd ¶, last sentence: ... Reclaimed water can be recharged in the San Jacinto Lower Pressure, Menifee and Winchester subbasins by injection. Recharge of reclaimed water will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where reclaimed water recharge interferes with such construction, operation, or use of a well, suitable arrangements will by made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's reclaimed water recharge activities.

Page 7-9 — Last bullet item: Water harvesting in the Lakeview subbasin. Storm water captured in ~~EMWD's~~ Mystic Lake ~~project~~ could be ~~captured and~~ conveyed to test recharge basins in the Lakeview subbasin.

1st ¶ under **Recovery of Contaminated Groundwater**: ... Other treatment technologies may be required if water quality conditions change or new types of contamination are discovered.
Recovery of contaminated groundwater will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where groundwater recovery activities interfere with such construction, operation or use of a well, suitable arrangements will be made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's groundwater recovery activities.

Page 7-14 3rd ¶: ... Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.
Conjunctive use activities will be implemented in a manner that avoids adverse impacts to construction, operation and use of wells by private landowners. Where conjunctive use activities interfere with such construction, operation, or use of a well, suitable arrangements will be made for EMWD to provide alternative water supplies to meet both the short-term and long-term needs of the impacted landowner, or for EMWD to provide monetary compensation for the interference caused by EMWD's conjunctive use activities.

Page 7-15 2nd ¶, **EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE ~~USERS~~ USES FROM GROUNDWATER TO RECLAIMED WATER.** The exchange of agricultural and other non-potable groundwater production to municipal uses can occur through

- Voluntary retirement of agricultural lands, that is, the conversion of agricultural lands to non-agricultural uses; and
- by voluntarily substituting other supplies such as reclaimed water.

Section 8 - Groundwater Management Plan

Page 8-3 4th ¶, 3rd line: ... ~~city~~ City of Perris ...

4th ¶, 4th line: ... ~~Edgemont Gardens~~ Moreno Valley Mutual Water Company, ...

2nd ¶, **ULTIMATE PLAN DESCRIPTION**, 1st sentence: The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints of this plan: Involuntary groundwater production assessments and groundwater pumping restrictions are not authorized as part of this management plan except as necessary to prevent unauthorized production of water stored by EMWD.

Page 8-4 2nd ¶, **Monitoring of Groundwater Level and Quality**, beginning with 3rd sentence: EMWD will measure groundwater levels and quality from select private wells. EMWD's measurements will not interfere with the well owners' use of the wells. EMWD's measurements will be provided to participating well owners free of charge upon request.

3rd ¶, 2nd line: ... Riverside County ~~Health Department~~ Department of Environmental Health ...

Last ¶, 2nd line: ... Riverside County ~~Health Department~~ Department of Environmental Health ...

Last ¶, last sentence: These policies will be related to water quality and health protection only and will not limit, or suspend, or unreasonably increase the cost of current or future groundwater production by ~~existing groundwater producers~~ private landowners for use within the plan boundary.

Page 8-5 1st ¶, 5th line: ... Riverside County ~~Health Department~~ Department of Environmental Health ... (Riverside Co. Dept. Environmental Health)

3rd ¶, **Exchange of Agricultural and Other Non-Potable Groundwater Production to Municipal Use**, 1st sentence: The intent of this element is to increase the groundwater yield available for municipal use by either ~~retiring~~ voluntary retirement of agricultural and non-potable demands or by voluntarily substituting reclaimed water for groundwater used for agricultural and other non-potable uses.

Page 8-11/12 2nd ¶ of **Financing the Groundwater Management Plan**: The cost of implementing and operating the West San Jacinto Groundwater Basin management plan ~~should~~ shall be borne by municipal water users in the management area... There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft and groundwater producers choose to participate in the groundwater replenishment program in order to access supplemental water supplies instead of curtailing their own groundwater production or enjoining the groundwater production of others in the affected subbasin. In the event of continued overdraft, an equitable cost sharing plan should be developed to allocate costs among EMWD, other benefitted municipal water suppliers, and participating groundwater producers to correct the overdraft.

Page 8-12 3rd ¶: The benefits and costs associated with the groundwater management plan should be accounted for locally, that is, by subbasin or some other geographic unit, to insure the benefits and costs are equitably distributed among municipal water users and other voluntary participants.

Page 8-15 2nd ¶, 3rd line: Prepare Project Specific Environmental ~~Impact Report~~ Reviews.

3rd ¶: **Task 2-2 Prepare Project Specific Environmental** ~~Impact Reports (EIR)~~ **Reviews**. ~~EIR's will be prepared~~ CEQA reviews will be performed for the implementation of specific groundwater management ~~elements~~ projects that are developed in Phase 1. This Task consists of the following subtasks.

~~Prepare and Distribute Notice of Preparation (NOP). The NOP will be prepared based on the results of initial environmental study prepared in Task 1-5 and the facility and operational plans developed in Task 2-1. The final scope of work for the EIR studies will be based on the NOP and comments received on the NOP.~~

Initial Study. CEQA reviews will be done on each project proposed under the Groundwater Management Plan. An Initial Study will be done such that the need for either a Negative Declaration or an EIR can be determined, based on project-specific design parameters and project site characteristics.

Estimate Environmental Impacts and Develop Mitigation Plans. This work ~~will~~ could include: biological assessments, archaeological assessments, impact assessments and development of mitigation plans as needed on a project-specific basis.

Page 8-16 3rd line: Prepare and Distribute ~~Draft EIR(s)~~ CEQA Documents and Notices.

4th line: ~~Conduct Meetings, Public Hearings and Respond to Comments.~~

5th line: ~~Finalize EIR(s).~~

Page 8-19 Last ¶: The cost to complete Phases 1 and 2 is estimated to range between 2 to 3 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2. The cost to implement and operate the Groundwater Management Plan is estimated to be between $50 million and $70 million. Estimates at this time are very rough and they will be refined when the specific projects are identified and designed.

References

~~Montgomery Watson, Wildermuth, Mark J., "Final Task 4 Memorandum, New Planning Model Implementation Plan", prepared for Santa Anna Watershed Project Authority, May 1992~~

~~Montgomery Watson, Wildermuth Mark J., "Draft task 6 Memorandum, Develop Three Dimensional Groundwater Model, prepared for Santa Anna Watershed Project Authority, November 1993~~

DRAFT
GROUNDWATER MANAGEMENT PLAN
WEST SAN JACINTO GROUNDWATER BASIN

Prepared for

EASTERN MUNICIPAL WATER DISTRICT

SEPTEMBER 1994

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SECTION 1

SECTION 1
EXECUTIVE SUMMARY

THE NEED FOR GROUNDWATER MANAGEMENT

EMWD, together with the majority of water purveyors in Southern California, have been heavily relying on imported supplies from Metropolitan Water District of Southern California (Metropolitan). Recently, Metropolitan's ability to supply the ever-growing needs of Southern California has become increasingly unreliable due to the following reasons:

- ❑ demand for water is continuing to increase;
- ❑ environmental constraints at the point of origin may limit the water available for export;
- ❑ structural adequacy of the delivery system is limited;
- ❑ climatological uncertainties can limit delivery; and
- ❑ inadequate local storage facilities.

EMWD could purchase imported water from Metropolitan to meet these projected municipal demands. Metropolitan's sources, however, are not reliable and will be very expensive in the future. Metropolitan, with its current planning and future projects, will experience shortages in four of five years, with shortages reaching as high as 30 percent. The cost of imported water from Metropolitan is currently (July 1994) $412 per acre-ft for treated water and is projected to reach about $1,100 per acre-ft by 2010. These rising costs and lack of water to meet all of the demands has encouraged some local agencies in Southern California to claim water rights in the service areas of other agencies. One such action that could adversely affect EMWD's local water resources is a claim recently filed by Orange County Water District, which underscores the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

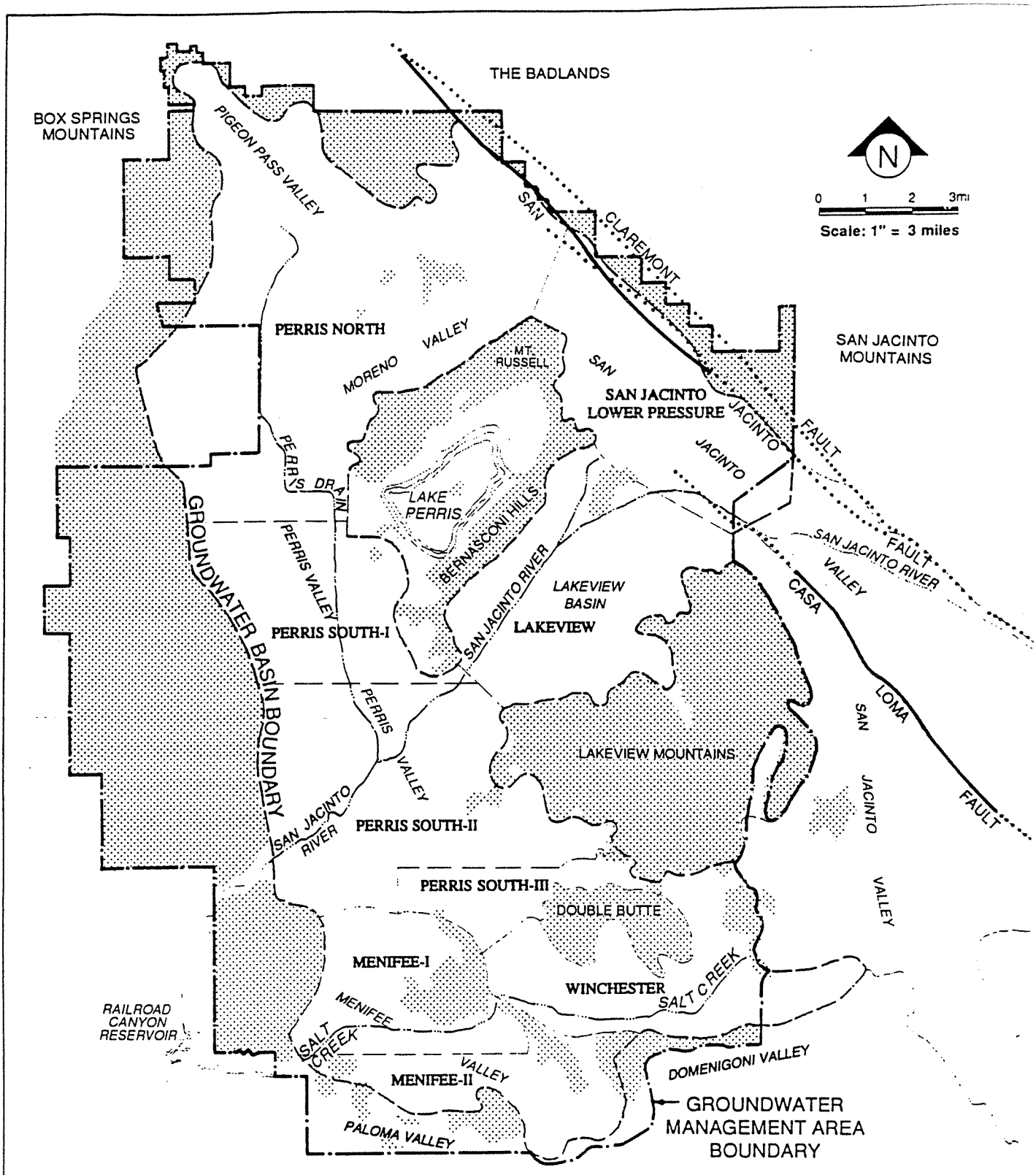
The West San Jacinto Groundwater Basin underlies a large portion of the Eastern Municipal Water District (EMWD). The West San Jacinto Groundwater Basin includes the Perris North, Perris South, Menifee, Winchester, Lakeview and the San Jacinto Lower Pressure subbasins. The location of these subbasins is shown in Figure 1-1. This area is experiencing rapid land use conversion from agriculture to urban uses. Total municipal water demands are expected to increase from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010.

Three sources of water supply for these demands can be considered: groundwater, imported water and reclaimed water. Groundwater in the West San Jacinto Groundwater Basin, for the most part, is of poor quality due to natural causes and irrigated agriculture. Most of the groundwater resources cannot be used as municipal supply due to poor quality - the groundwater quality either violates drinking water standards or is too high in total dissolved solids (TDS) or other water quality constituents to be discharged after municipal use. To meet increasing demands, EMWD could purchase imported water from Metropolitan. However, availability and costs might limit this alternative. EMWD has reclaimed water resources that could be used to meet agricultural demands and non-potable municipal demands. Reclaimed water cannot be directly used for potable demand unless, after groundwater recharge and dilution, it meets Title 22 requirements (State Department of Health Services Reclaimed Water Regulations). Additionally, groundwater treatment practices can convert non-potable water supplies to potable supplies.

The availability and reliability of the total water supply can be improved through the joint, optimized (conjunctive) management of all the water supply sources. It is the intent of Assembly Bill AB 3030, which was incorporated into the Water Code in 1992 (Part 2.75 commencing with Section 10750 of Division 6) with amendments by AB 1152 of 1993, to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions. Authorization to adopt and implement a plan is contained in the following section of AB 3030:

> "§10753 (a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area."

The components of a groundwater management plan may include the following:



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-1
LOCATION MAP

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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"§10753.7 (a) The control of saline water intrusion.
(b) Identification and management of wellhead protection areas and recharge areas.
(c) Regulation of the migration of contaminated groundwater.
(d) The administration of a well abandonment and well destruction program.
(e) Mitigation of conditions of overdraft.
(f) Replenishment of groundwater extracted by water producers.
(g) Monitoring of groundwater levels and storage.
(h) Facilitating conjunctive use operations.
(i) Identification of well construction policies.
(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.
(k) The development of relationships with state and federal regulatory agencies.
(l) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination."

EMWD's Board of Directors adopted resolution No. 3039 to develop a Groundwater Management Plan for the West San Jacinto Groundwater Basin and published a Notice of Intent on August 25, 1993. The groundwater management plan for the West San Jacinto Groundwater Basin is being developed under the authority of Assembly Bill 3030 (AB 3030), which allows a local water agency to take the lead in development of a plan. Up to two years can be taken for development of a plan. Local water purveyors, both public and private, have been involved in development of the plan. There are approximately forty-five (45) pumpers in the area. Public meetings, workshops and hearings were held during the preparation of the draft plan. Cooperative agreements with EMWD have already been signed by Nuevo Water Company, Edgemont Gardens Mutual Water District and the City of Perris.

EXISTING WATER RESOURCES FRAMEWORK

Eastern Municipal Water District

EMWD encompasses over 540 square miles in the western portion of Riverside County as shown on Figure 1-2. It is bounded on the west by Western Municipal Water District, on the north by mountains which approximately parallel the San Bernardino County boundary, on the east by the San Jacinto Mountains, and on the south by mountains which parallel the San Diego County line. Only about half of the area within EMWD's boundary receives water service at this time. EMWD is the only wastewater treatment entity in the West San Jacinto groundwater management area.

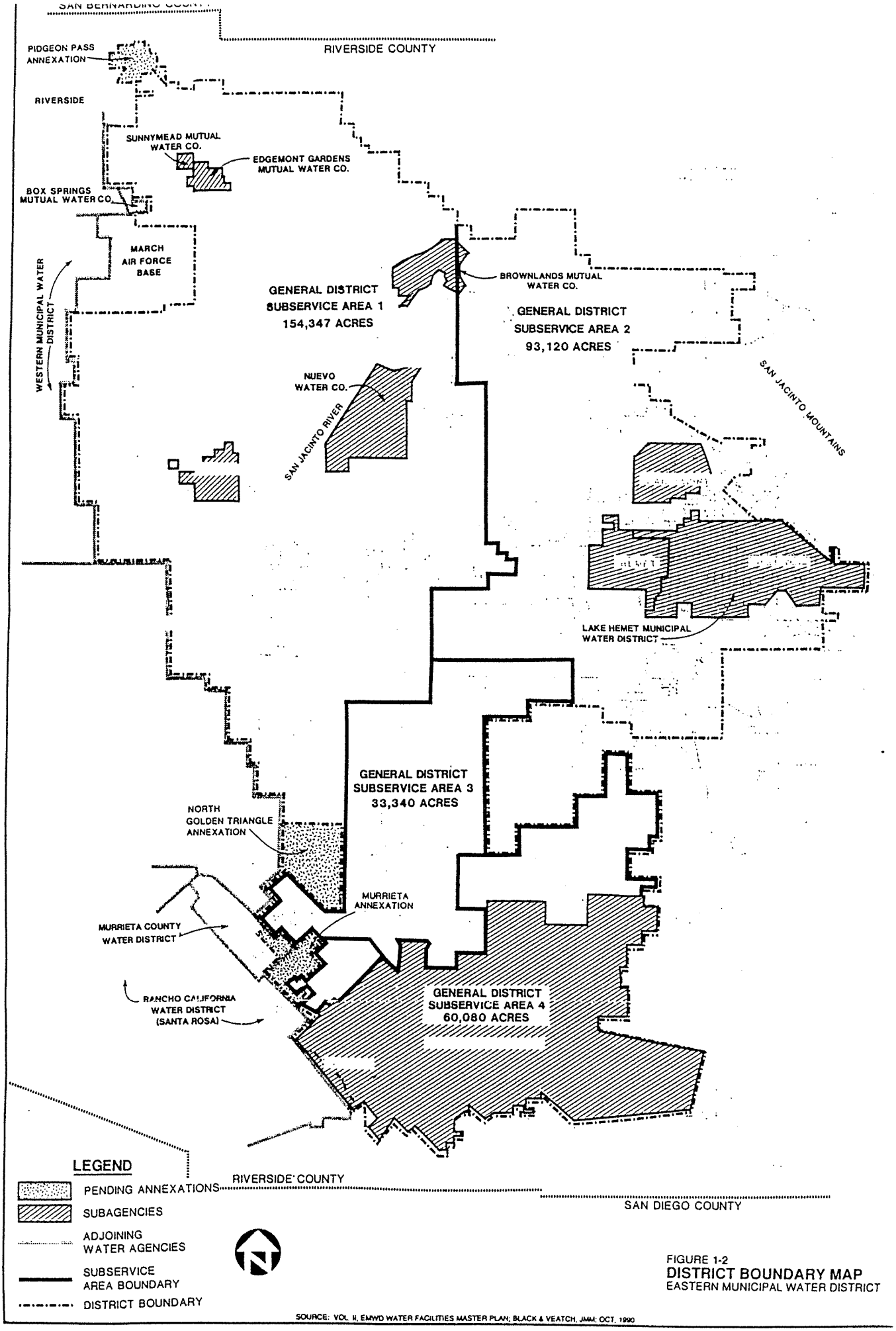


FIGURE 1-2
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

SOURCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT. 1990

EMWD has divided its service area into four subservice areas for the distribution of water as shown on Figure 1-2. The boundary of the groundwater management area is approximately the same as EMWD Service Area 41, which is supplied by Metropolitan's Mills and Skinner treatment plants. The management area includes the cities of Moreno Valley and Perris, and the unincorporated areas in western Riverside County such as the communities of Lakeview, Nuevo, Sun City and Winchester.

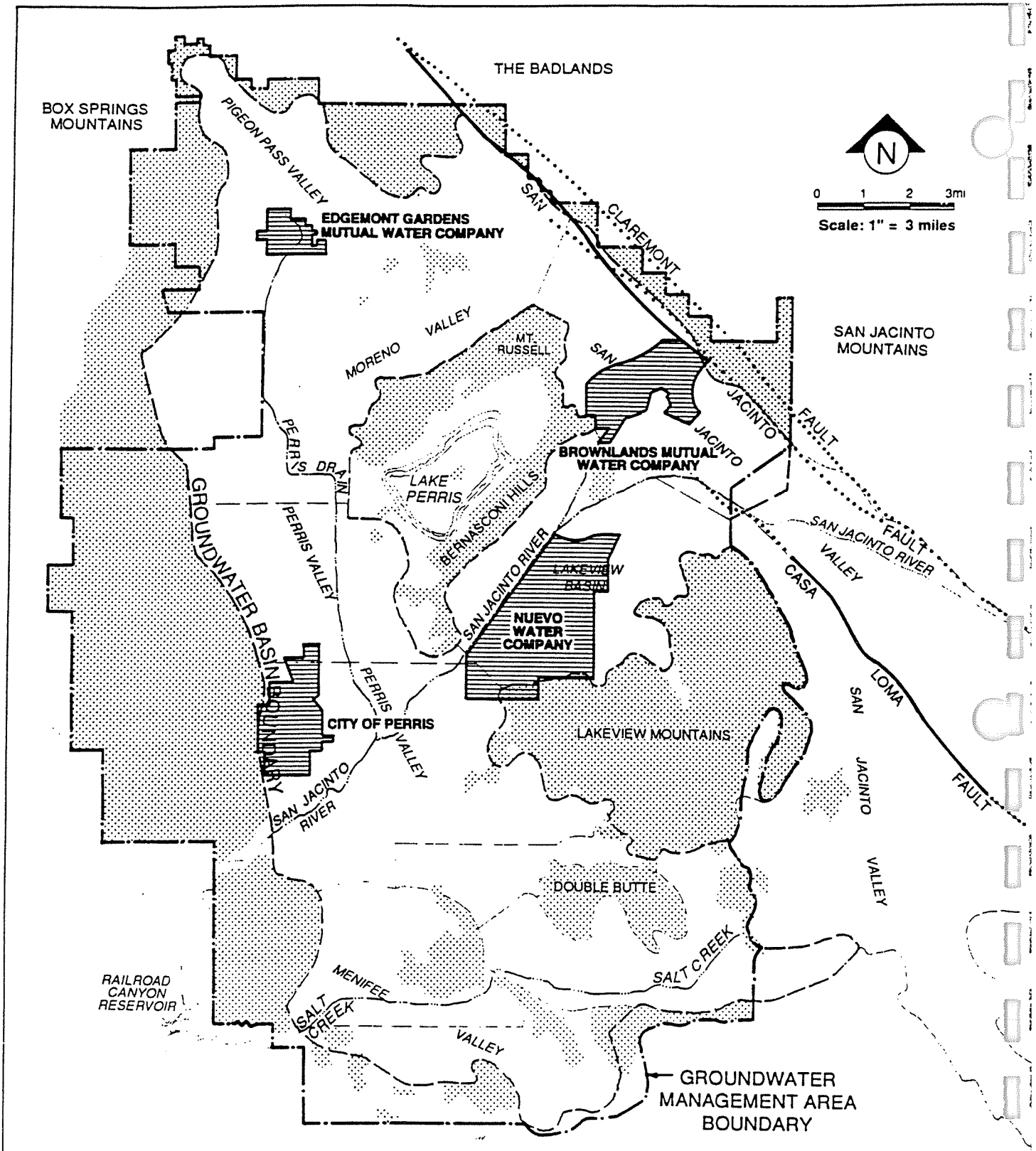
EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, city of Perris, Edgemont Gardens Mutual Water Company and Nuevo Water Company. The location of these entities within the West San Jacinto Groundwater Management area are shown in Figure 1-3.

Metropolitan Water District of Southern California

Metropolitan Water District of Southern California (Metropolitan) is a wholesale water agency serving supplemental imported water to 27 member cities and water agencies in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of about 15 million people. Approximately one-half of the total water used throughout the entire Metropolitan service area is imported water purchased from Metropolitan to supplement the local water supplies of the study area. Metropolitan obtains imported supplies from the Colorado River and the State Water Project (SWP). Figure 1-4 shows the locations of Metropolitan's, state and EMWD imported water facilities.

Regulation of Wastewater

The West San Jacinto Groundwater Management plan will be influenced by the plans and policies of the Federal Environmental Protection Agency, State Water Resources Control Board, California Regional Water Quality Control Board, Santa Ana Region as well as the state and local health departments.



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-3
SUBAGENCIES

REFERENCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT. 1990.

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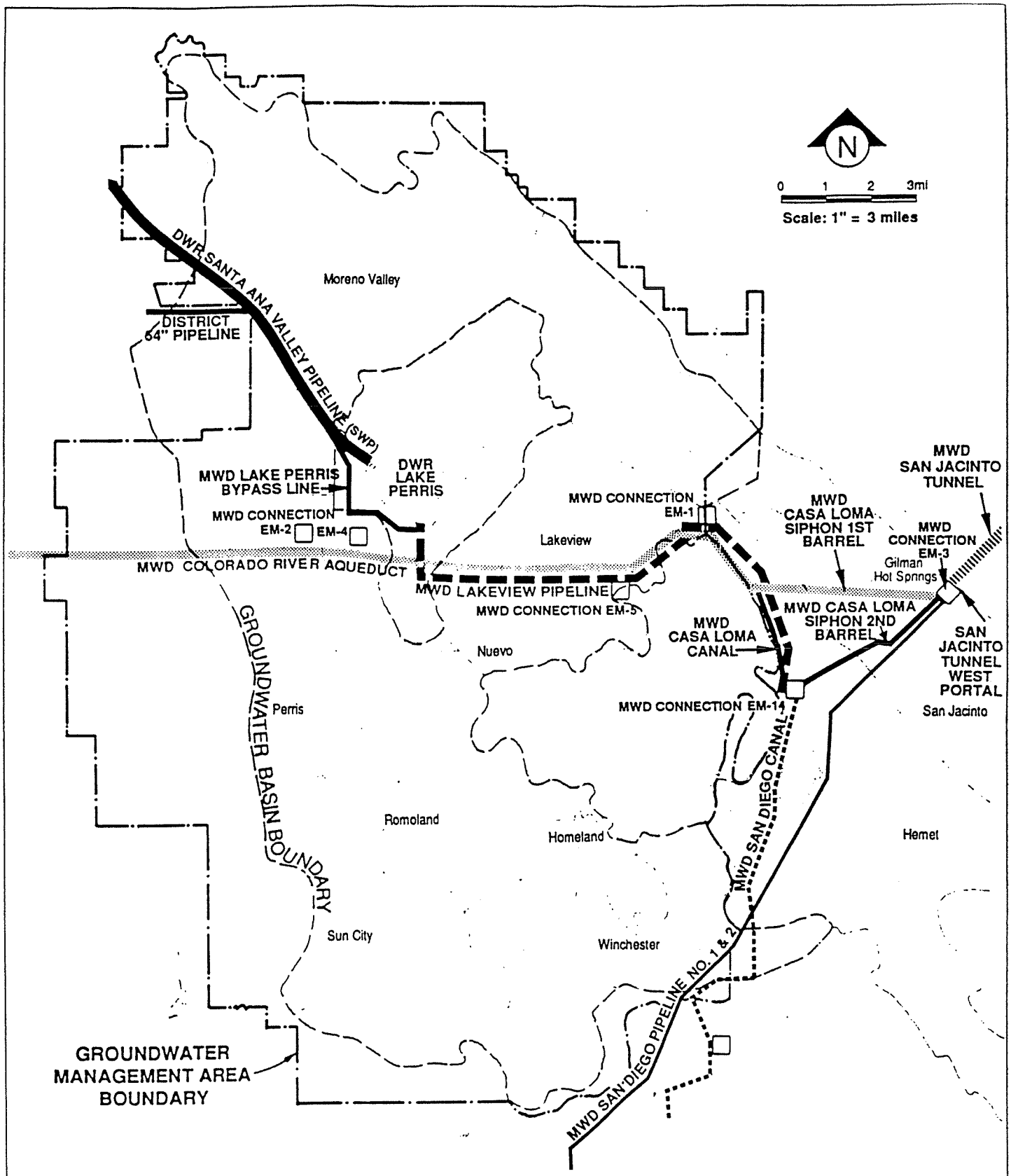

Figure 1-4
IMPORTED WATER FACILITIES

REFERENCE: EMWD WATER FACILITIES MASTER PLAN, *FIG. 4-3: SOURCES OF SUPPLY MAP*, OCTOBER, 1990.

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Water Resources Engineer

Regulation of Drinking Water

Drinking water quality standards are enforced in California by California Department of Health Services (DHS). Groundwater developed in the groundwater management plan for municipal uses must satisfy the standards described in Title 22 of California Code of Regulations.

Local Planning and Regulatory Agencies

Other local agencies that may have a significant influence on groundwater management include:

Riverside County Flood Control and Water Conservation District. This agency plans, constructs and operates flood control and water conservation facilities in Riverside County. The construction of flood control and water conservation facilities affects the volume of recharge to groundwater and thus, has a potentially significant impact.

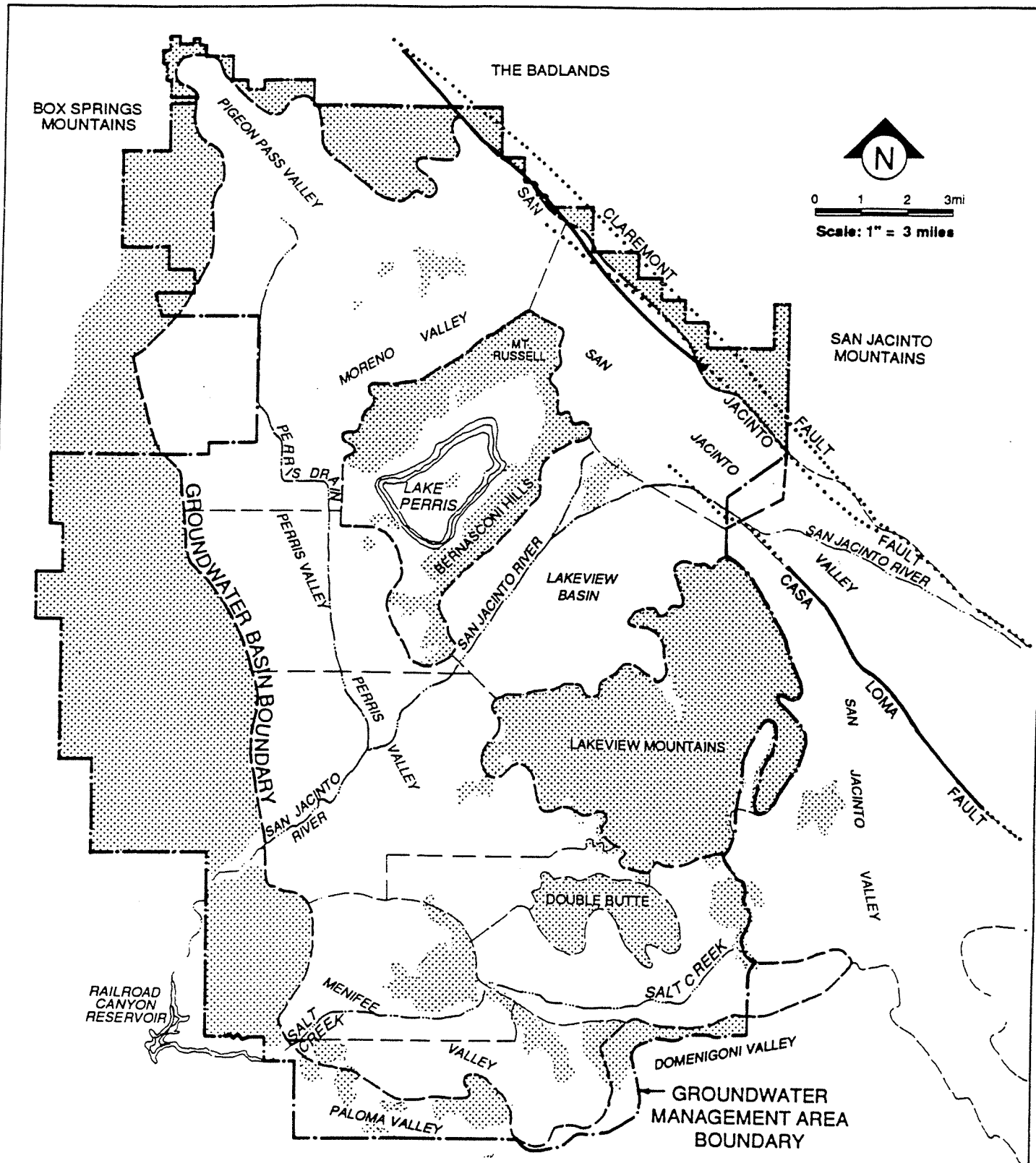
Riverside County Planning Department. Riverside County Planning Department develops and reviews general plans for all unincorporated areas in the county. Thus, this agency will review the groundwater management plan for consistency with general plans under their jurisdiction.

Riverside County Health Department. The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.

GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

Figure 1-5 shows the major physical features, waterbearing and non-waterbearing areas of the groundwater management area. The major physical features in the study area include the San Jacinto mountains, the Badlands, the San Jacinto River, Salt Creek, Perris Valley Drain, the San Jacinto and Casa Loma faults, the Lakeview mountains, the Bernasconi Hills, and Double Butte. The management area groundwater basins are shown in Figure 1-6 and include Perris South I, II and III, Menifee I and II, Lakeview, the San Jacinto Lower-Pressure and portions of Perris North and Winchester subbasins.

The safe yield, volume of groundwater in storage, storage capacity, and water quality characteristics in the subbasins are summarized in Table 1-1. The safe yield of the individual subbasins ranges from about 1,600 for the Winchester subbasin to about 13,700 acre-ft/yr for the Perris North subbasin. The total safe yield of the West San Jacinto Groundwater Basin is about 36,200 acre-ft/yr. The safe yield increases if the volume of other planned groundwater recharge



LEGEND:

NONWATER-BEARING PORTION

KNOWN FAULTS

INFERRED OR CONCEALED FAULTS

Figure 1-5

MAJOR PHYSICAL FEATURES

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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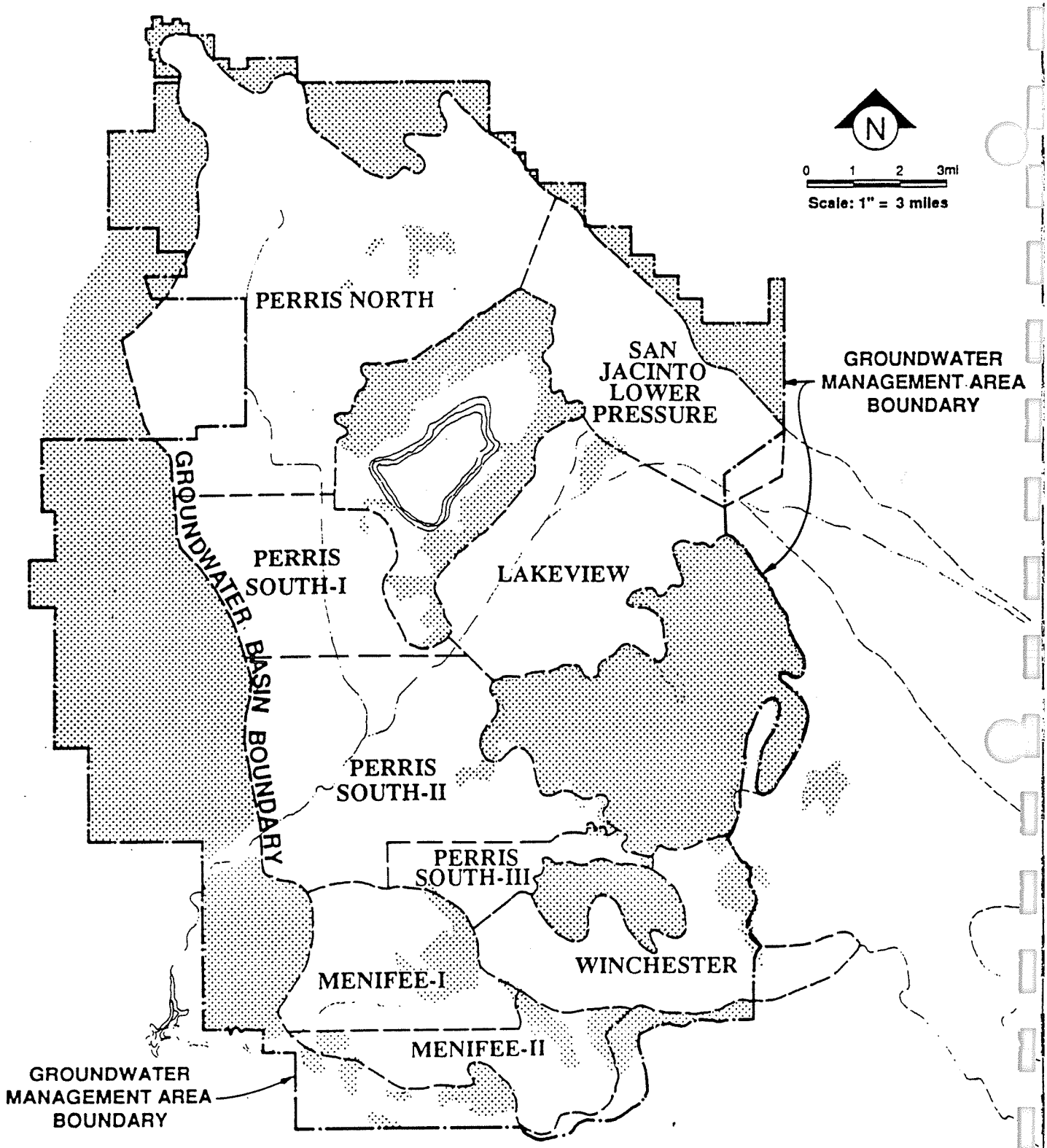

Figure 1-6
GROUNDWATER SUBBASINS

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Water Resources Engineer

TABLE 1-1
AVAILABILITY OF GROUNDWATER IN THE WEST SAN JACINTO BASIN

Subbasin	Volume in Storage (acre-ft)	Storage Capacity (acre-ft)	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield (acre-ft/yr)	Safe Yield with Wastewater Recharge (acre-ft/yr)	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration (mg/L)	Average Nitrate Concentration (as Nitrogen) (mg/L)
Perris North	123,000	347,000	11%	13,700	19,500	41%	450	7
Lakeview	283,000	515,000	25%	6,800	6,800	14%	500	3
Perris South	248,000	402,000	22%	8,300	12,800	27%	920	5
San Jacinto Lower Pressure	382,000	391,000	34%	2,500	2,500	5%	1,000	4
Winchester	36,000	41,000	3%	1,600	1,800	4%	2,000	8
Menifee	56,000	101,000	5%	3,300	4,700	10%	2,250	6
Totals	1,128,000	1,797,000	100%	36,200	48,100	100%		
Average							891	5

Mark J. Wildermuth
Water Resources Engineer

water is included in the safe yield estimate. The safe yield, including reclaimed water percolation for the West San Jacinto Groundwater Basin, is about 48,100 acre-ft/yr.

The volume of groundwater in storage ranges from about 36,000 acre-ft for the Winchester subbasin to about 382,000 acre-ft for the San Jacinto Lower Pressure subbasin. The total volume of groundwater in storage in West San Jacinto Groundwater Basin is about 1,128,000 acre-ft. The volume of existing groundwater in storage that can economically be extracted is less than half the current volume in storage. On the other hand, all the water that is added to groundwater storage above the existing levels of groundwater storage can be recovered

Groundwater storage capacity ranges from about 41,000 acre-ft for the Winchester subbasin to about 515,000 acre-ft for the Lakeview subbasin. The total storage capacity for West San Jacinto Groundwater Basin is about 1,797,000 acre-ft.

Groundwater production estimates for 1993 were estimated from annual reports of groundwater production on file at the State Water Resources Control Board and from SCAG land use. Using reported groundwater production data, the total groundwater production from the West San Jacinto Groundwater Basin is about 8,200 acre-ft/yr. Combining reported groundwater production from municipal agencies, groundwater production estimates based on agricultural land uses and deducting agricultural use of reclaimed water yields a basin wide production estimate of about 26,100 acre-ft/yr.

Groundwater quality in most areas renders the groundwater marginal to unacceptable for direct use as a municipal supply. Groundwater from the Lakeview, Perris North, and parts of Perris South I can be used directly for municipal supply. Groundwater from parts of the Perris South I, Perris South II and Perris South III, and San Jacinto Lower Pressure subbasins could be blended with state project water and then used directly. Groundwater from Menifee, parts of Perris South II and Perris III, and the Winchester subbasins will need to be demineralized before use as a municipal supply.

FUTURE WATER DEMANDS AND WASTEWATER FLOWS

Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 1-2 and shown graphically in Figure 1-7. These estimates are based on land use and population projections and projected water use rates. Municipal demands in the West

TABLE 1-2
PROJECTIONS OF MUNICIPAL AND AGRICULTURAL DEMANDS
WEST SAN JACINTO GROUNDWATER BASIN

Year	Municipal Demands(1) (acre-ft/yr)	Agricultural Demands (acre-ft/yr)
1995	47,000	33,000
2000	63,000	32,000
2005	84,000	31,000
2010	112,000	31,000

Sources: (1) EMWD Projections 8/94

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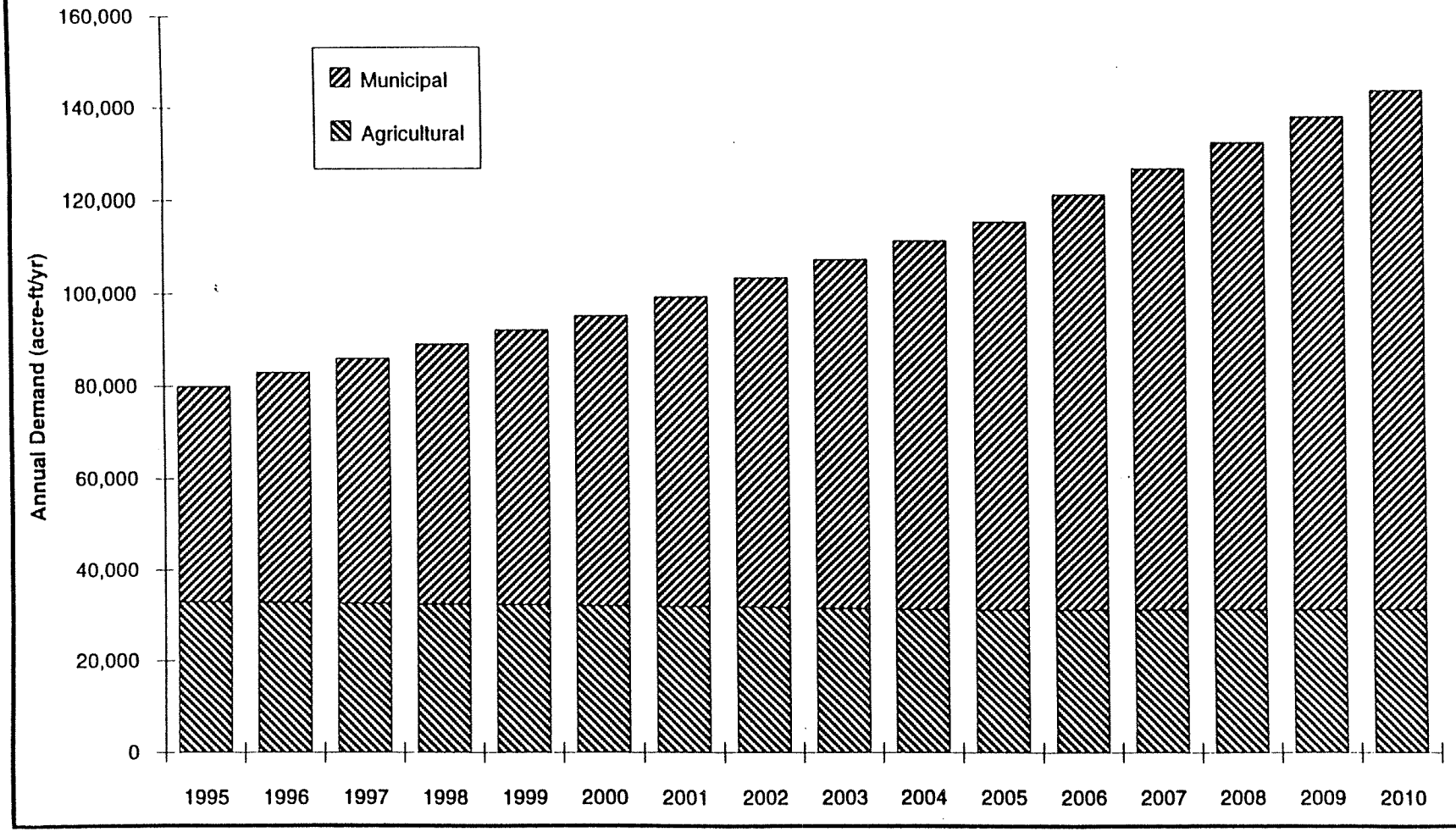
FIGURE 1-7 WATER DEMAND PROJECTIONS FOR THE WEST SAN JACINTO GROUNDWATER MANAGEMENT AREA



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San Jacinto Groundwater Management Area range from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010. Agricultural demands are projected to decline from about 33,200 acre-ft/yr in 1995, to 31,000 acre-ft/yr in 2010.

The sources of supply to the West San Jacinto Groundwater Management area include imported water from Metropolitan, groundwater, and reclaimed water.

Imported Water from Metropolitan. The quality of treated imported water is generally excellent and meets all drinking water regulations. Metropolitan adopted a schedule of projected water rate increases in 1991. The water rates established included:

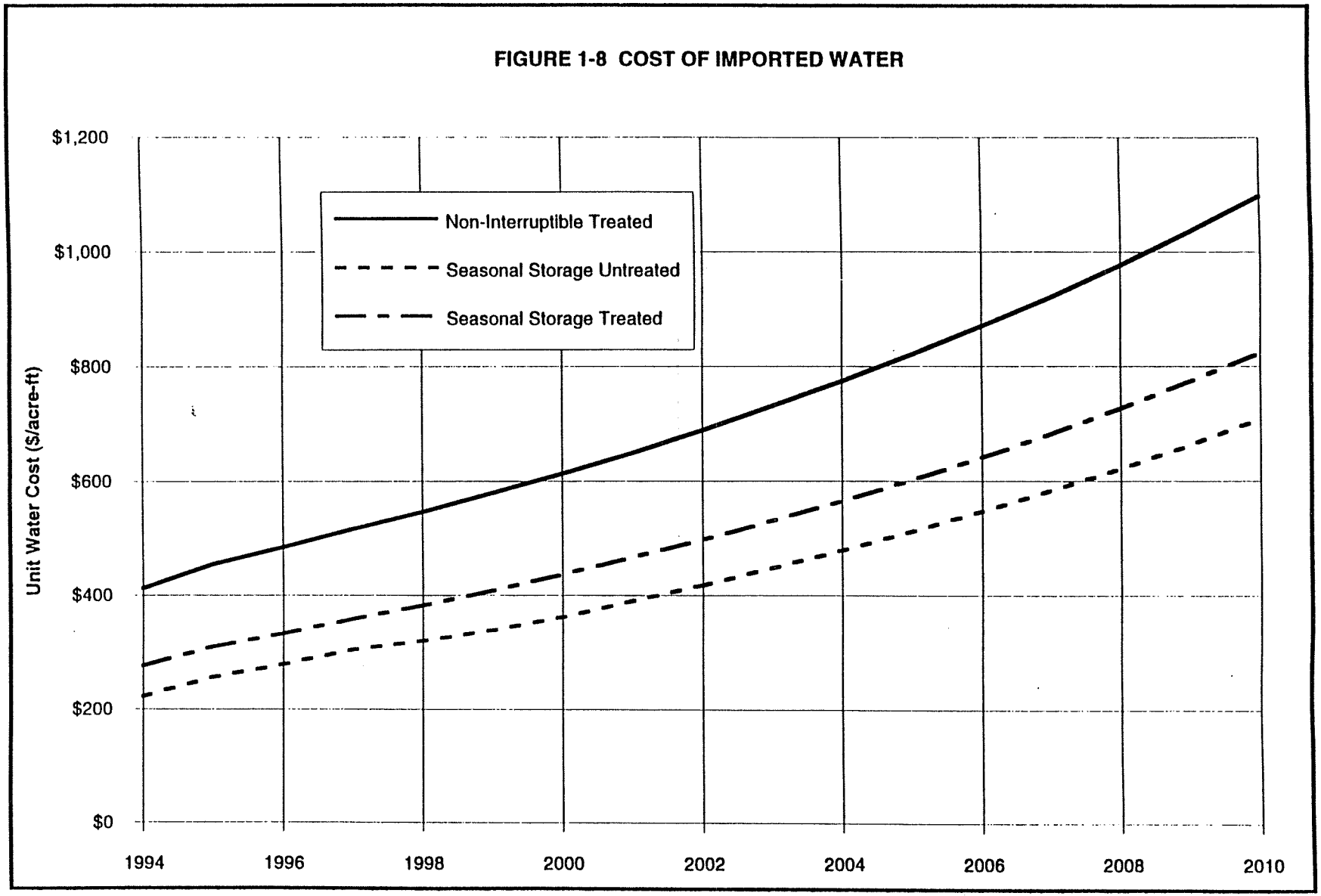
- a base (non-interruptible) rate;
- a treatment surcharge to be added to the base rate for purchases of treated water; and
- a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

The goals of the seasonal discount are: to achieve greater conjunctive use of imported supplies and local supplies; encourage the construction of additional local production facilities; and reduce member agencies' dependence on Metropolitan deliveries during the summer months. Recently, Metropolitan announced water prices for 1993 and forecasted rates for the following ten years. The projected cost of imported water purchased from Metropolitan is shown graphically in Figure 1-8.

Metropolitan is currently evaluating supply reliability for its service area (Metropolitan Water District of Southern California, 1994). Metropolitan is projecting that with year 2000 demands, shortages in retail supplies will occur at least four out of five years, with shortages up to 30 percent. By the year 2020, shortages will occur on average once in five years, with shortages up to 20 percent. The frequency and magnitude of retail shortages will be comparable to Metropolitan shortages for areas that depend heavily on Metropolitan.

Groundwater. Groundwater is available throughout the management area in that most of the management area overlies the West San Jacinto Basin. However, the quality of groundwater precludes the use of some of the management area groundwater for municipal supply. TDS and nitrate are the water quality constituents that limit the use of groundwater. TDS is regulated as a secondary standard. Secondary standards are for those substances that are not hazardous to

FIGURE 1-8 COST OF IMPORTED WATER



health, but may cause taste, order, color, staining or other conditions that adversely affect the aesthetics of drinking water. The maximum contaminant level (MCL) for TDS is expressed as follows:

> *Recommended MCL* - 500 mg/L. TDS concentrations less than or equal to the *Recommended MCL* are desirable for a higher level of consumer acceptance.
>
> *Upper MCL* - 1,000 mg/L. TDS concentrations ranging up to the *Upper MCL* are acceptable if it is neither reasonable nor feasible to provide more suitable waters.
>
> *Short Term MCL* - 1,500 mg/L. TDS concentrations ranging up to the *Short Term MCL* are acceptable only for existing systems on a temporary basis, pending the construction of treatment facilities or the development of acceptable new water sources.

Nitrate is regulated under primary standards. The MCL for nitrate is 10 mg/L (as nitrogen). Table 1-1 lists the average TDS and nitrate concentrations for each groundwater subbasin in the management area. The subbasins are ranked in Table 1-1 from lowest to highest in TDS. From a drinking water perspective, approximately 36 percent of the yield of the West San Jacinto Basin could be developed from the Lakeview and Perris North subbasins for direct use, without additional treatment for TDS and nitrate. Some groundwater in the Perris South-I subbasin could also be used without treatment and San Jacinto Lower Pressure, Perris South-II and Perris South-III groundwater could be used if blended with SWP water. Groundwater from the Menifee-I, Menifee-II, Winchester and parts of the Perris South-II and Perris South-III subbasins will require treatment if groundwater from these subbasins is to be used as a municipal drinking water supply. The treatment processes that would make these basins useful as a water supply source are blending with low TDS supplies such as SWP water, and demineralization. The cost to produce groundwater, exclusive of treatment, is estimated at about $68 per acre-ft.

Reclaimed Water. EMWD is constructing a reclaimed water distribution plan that will make reclaimed water available throughout the management area. The reclaimed water system consists of five reclamation plants and about 79 miles of backbone distribution pipelines. The use of reclaimed water replaces non-potable demand on groundwater and imported supplies.

Water Supply Plan without a Groundwater Management Plan

The water supply plan for the management area, in the absence of a groundwater management plan, consists of the use of imported water for all new municipal uses and a combination of groundwater and reclaimed water for agricultural uses. All agricultural demands would be satisfied with groundwater and reclaimed water. The Menifee desalter would be operational in 1997, producing about 3,360 acre-ft/yr. The water supply plan for the management area is listed in Table 1-3.

The cost of this water supply plan is described in Table 5-6 in Section 5 of this report. Table 5-6 shows the annual demand, supplies by source and cost of each source in terms of annual cost, total annual cost and present value of all cost over the 1995 to 2010 planning period. The fractions of total supply and total supply cost by source are listed below.

Source	Fraction of Total Supply	Fraction of Total Supply Cost
Imported Water	64%	91%
Reclaimed Water	10%	2%
Menifee Desalter	3%	4%
Groundwater	23%	3%

The present value cost of future water supplies in the management area for the period 1995 to 2010 is about $557,000,000.

GROUNDWATER MANAGEMENT GOALS

The mission statement of EMWD is:

> ***The mission of the Eastern Municipal Water District is to deliver a dependable supply of safe, quality water and provide sewage collection services to its customers in an economical, efficient and publicly responsible manner.***

The water supply part of EMWD's mission statement is a goal shared by all purveyors of water in the West San Jacinto Groundwater Basin management area. The safe yield of the West San

TABLE 1-3
WATER SUPPLY PLAN IN THE ABSENCE OF
A GROUNDWATER MANAGEMENT PLAN
(acre-ft/yr)

Year	1995		2000		2005		2010	
	Volume	Fraction	Volume	Fraction	Volume	Fraction	Volume	Fraction
Municipal Demand	47,000	100%	63,000	100%	84,000	100%	112,000	100%
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Menifee Desalter	0	0%	3,360	5%	3,360	4%	3,360	3%
Reclaimed Water	0	0%	1,000	2%	2,000	2%	3,000	3%
Groundwater	2,500	5%	2,500	4%	2,500	3%	2,500	2%
Agricultural Demand	33,000	100%	32,000	100%	31,000	100%	31,000	100%
Reclaimed Water	8,900	27%	8,900	28%	8,900	29%	8,900	29%
Groundwater	24,100	73%	23,100	72%	22,100	71%	22,100	71%
Total Demand	80,000	100%	95,000	100%	115,000	100%	143,000	100%
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Menifee Desalter (1	0	0%	3,360	4%	3,360	3%	3,360	2%
Reclaimed Water	8,900	11%	9,900	10%	10,900	9%	11,900	8%
Groundwater (2)	26,600	33%	25,600	27%	24,600	21%	24,600	17%

Mark J. Wildermuth
Water Resources Engineer

Jacinto Basin is about 36,200 acre-ft/yr. Projections of groundwater usage in the management area range from about 26,600 acre-ft/yr in 1995, to 24,600 acre-ft/yr in 2010.

Agricultural groundwater use will decrease slightly in the future, from about 24,100 acre-ft/yr to 22,100 acre-ft/yr, as agricultural lands are converted to urban uses. The majority of this agricultural water demand will be satisfied by reclaimed water. The need for potable water will increase dramatically in the future. Potable water demands in the management area will range from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr by 2010.

In the absence of a groundwater management plan, most of the new potable demand will be met from treated imported water purchased from Metropolitan. Metropolitan's supplies are projected to increase in cost about 142 percent over the 1995 to 2010 planning period, from $454 per acre-ft in 1995, to about $1,100 per acre-ft in 2010. Metropolitan's supply is also not entirely reliable. For year 2000 demands, Metropolitan has projected shortages in four years out of five years, ranging from 10 to 30 percent.

There are many private groundwater producers in the management area that do not rely on EMWD for water supply. The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved.

The goal of the groundwater management plan is to

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin Management area.***

ELEMENTS OF A GROUNDWATER MANAGEMENT PLAN

The groundwater management plan consists of four elements that include adoption of groundwater management policies, development of groundwater yield enhancement programs, conjunctive use with imported supplies and the exchange of groundwater from agricultural and other non-potable uses with reclaimed water.

Groundwater Management Policies

Management policy elements consist of developing and implementing policies, regulations and coordinated activities among the groundwater producers. Currently, there is no routine monitoring of groundwater production, groundwater level and groundwater quality in the management area. There are no programs or institutions that routinely collect and review these data. There are no management tools available to forecast the impact of existing and future groundwater management practices. There is no coordination or oversight of well construction in the management area. There is no systematic plan to manage unused and obsolete wells. The management plan needs to include policies to manage well construction and to ensure their destruction when wells become obsolete. The following management policy elements should be included in the groundwater management plan.

- ❑ Establishment of Groundwater Basin Manager
- ❑ Groundwater Production Monitoring
- ❑ Groundwater Level and Quality Monitoring
- ❑ Development of Well Construction Policies.
- ❑ Development of Well Abandonment and Destruction Policies
- ❑ Monitoring of Well Construction, Abandonment and Destruction
- ❑ Groundwater Quality Protection

Yield Enhancement Elements

Yield enhancement refers to increasing the useful yield of the groundwater resource. In the West San Jacinto Groundwater Management area there are two yield enhancement elements that could be incorporated in the groundwater management plan -- artificial recharge and recovery of contaminated groundwater.

Artificial recharge can be done in spreading basins, injection wells and exchange. Groundwater storage capacity and favorable hydrogeologic conditions favor artificial recharge in the Lakeview, Perris North and parts of Perris South I and Perris South II subbasins. The other subbasins are full and have poor hydrogeologic characteristics for recharge. The source water

for artificial recharge would consist of small quantities of local runoff and significantly larger quantities of state project water from Metropolitan and reclaimed water from EMWD.

Recovery of contaminated groundwater consists of the pumping and treatment of contaminated groundwater. The types of treatment that are included in this element include demineralization and blending; although other types of treatment may be required depending on water quality conditions. Demineralization will be necessary to remove salt accumulating in groundwater and to develop municipal supplies from parts of the Perris South II and Perris South III, and the Winchester subbasins. Blending could be used to recover degraded groundwater from parts of the Perris South I, Perris South II and Perris South III, and San Jacinto Lower Pressure subbasins. This assessment is based on limited water quality data and therefore the type of treatment necessary to recover contaminated groundwater may change when better data becomes available.

Conjunctive Use

Conjunctive use is an operational strategy that combines the operations of multiple sources of water and storage resources in such a way that the combined yield is greater than the yield that would occur from the sum of independent, uncoordinated operations of the sources. The same definition would apply if other objectives could be achieved by coordinated operation and the yield remained at an acceptable level. Other objectives might include reduced cost, more reliable supply, and the attainment of environmental objectives. In most cases, conjunctive use results in increased yield and lower cost. Conjunctive use is commonly associated with storing of imported water in groundwater basins for use during periods of shortage. The more general definition could involve EMWD reclamation and municipal distribution facilities, Metropolitan facilities and resources, state project facilities and resources, groundwater basins within EMWD, and, potentially, groundwater basins outside of EMWD. Conjunctive use can operate seasonally, over-year, or both. Seasonal conjunctive use would bank water during seasonal period(s) of over-supply or abundance for use during dry times of the year. Over-year conjunctive use would bank water during years of over-supply or abundance for use during drought periods and imported water shortages.

Based on current knowledge of groundwater conditions, EMWD could bank local runoff, imported water purchased from Metropolitan and reclaimed water in the Lakeview, Perris North and Perris South subbasins during the period of October 1 through April 30, for use either during

the summer, during periods of imported water shortages, or both. The unused storage capacity of the Lakeview, Perris North and Perris South subbasins is about 600,000 acre-ft. EMWD could use up to half (and possibly more) of this unused storage capacity for seasonal and over-year storage, thereby reducing the cost of imported water purchases and providing an additional source of water during periods of imported supply shortage. Recharge would be accomplished with a combination of new spreading basins and injection wells. Recovery of recharge will be through existing and new production wells. Reclaimed water could be a source of recharge in a conjunctive use program for augmentation of potable supplies. EMWD should be able to shift about 30,000 to 50,000 acre-ft year of non-interruptible rate purchases to off-peak with conjunctive use projects in the Lakeview, Perris North and Perris South subbasins. The reduction in cost would be much more substantial if a blend of reclaimed water and imported water were recharged during the winter.

Based on current knowledge of groundwater conditions, conjunctive use with imported supplies and local runoff in the San Jacinto Lower Pressure, Menifee and Winchester subbasins appears to be more difficult to implement and of less benefit. Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.

GROUNDWATER MANAGEMENT PLAN

Contents of the Management Plan

The management plan described herein is a program to achieve the management plan goals and includes conceptual descriptions of elements of the plan, and a description of the process to define and implement these elements consistent with the management plan goal. The groundwater management program includes: the development and implementation of policies, engineering investigations, facilities construction and operation, and other management activities. There are significant deficiencies in the knowledge of the groundwater resources of the West San Jacinto Groundwater Basin management area. These deficiencies preclude the definitive descriptions for some of the physical and institutional elements of the groundwater management plan. The groundwater management program includes studies to obtain additional information that is necessary to develop all the institutional and physical elements described in the plan.

The goal of the management plan is:

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin management area***

This goal extends to all groundwater users. Groundwater users that are not dependent on EMWD should benefit from the groundwater management plan. Adverse impacts, if any, from the groundwater plan will be minimized or mitigated. The rights of private groundwater producers will be protected. Groundwater producers who extract 10 acre-ft/yr or less would be exempt from the operation and implementation of the groundwater management plan.

Ultimate Plan Description

The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints. The management plan includes implementation of new policies, institutional arrangements, and physical projects. EMWD will be the agency responsible for implementation of the groundwater management plan. Based on the information developed in this study and presented in the previous sections, the ultimate groundwater management plan should include the following elements.

Establishment of a Groundwater Basin Manager. EMWD will implement the groundwater management plan. EMWD Board of Directors will be the decision-making body responsible for directing the implementation of the groundwater management plan. EMWD staff will serve as the staff to assist the EMWD Board of Directors in implementing the plan.

Upon adoption of the groundwater management plan, EMWD Board of Directors will appoint an Advisory Committee. The Advisory Committee will be composed of seven members, with one member each from city of Moreno Valley, city of Perris, Nuevo Mutual Water Company, Edgemont Gardens Mutual Water Company, and EMWD; and two members representing agricultural producers. The Advisory Committee will study, review and provide comments on all groundwater management plan activities directly to the EMWD Board of Directors.

EMWD staff, will prepare an annual engineering report describing the operation of the management plan for review by the EMWD board of directors, Advisory Committee and groundwater producers. EMWD, in consultation with the Advisory Committee and participating groundwater producers, will develop a coordinated operating strategy on an annual basis, based on the management plan and the findings of the annual report.

Monitoring of Groundwater Production. EMWD, in cooperation with the Advisory Committee, will implement a groundwater production monitoring program. Detailed estimates of the safe yield will be developed during the first year of the program. Groundwater production estimates will be developed by EMWD based on totalizing meters, energy usage and land use. EMWD will produce a groundwater production report and estimates of overdraft (if any). These data will be included in the annual report provided to the management committee. The production monitoring program will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Groundwater Level and Quality. EMWD, in cooperation with the Advisory Committee, will implement a groundwater level and quality monitoring program. Groundwater level and quality data will be collected from well owners. EMWD will measure groundwater levels and quality from select private wells. Groundwater levels and quality data from agencies' wells will be provided to EMWD by the agencies. EMWD will compile these data and develop estimates of the groundwater in storage, change in storage, overdraft and groundwater quality conditions. These data will be included in the annual report provided to the management committee.

Development of Well Construction Policies. EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, will develop well construction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies will be updated continuously based on new regulatory requirements and data. These policies will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Well Construction. EMWD has compiled and digitized most, if not all the well construction information that is available for existing wells. EMWD, in cooperation with other groundwater producers, will collect well construction data for new wells. EMWD will provide comments and suggestions to supplement design criteria that will be required by other agencies, including the Department of Health Services and the Riverside County Health Department.

Development of a Well Abandonment and Destruction Program. EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, should develop well abandonment and destruction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies should be updated continuously based upon new regulatory requirements and data.

Groundwater Quality Protection. EMWD, in cooperation with the Advisory Committee and parties responsible for groundwater quality degradation, should develop cooperative plans to prevent further degradation of groundwater and to integrate the solution of existing water quality problems to maximize the beneficial use of groundwater. The known areas of concern are the high TDS groundwater in the Perris South II (Ski Land area) and Winchester subbasins, and the groundwater contamination associated with March Air Force Base. The existing efforts undertaken by EMWD to rehabilitate the Menifee subbasins (the Menifee desalter project) will be completed independent of the groundwater

management plan. Additional degraded groundwater areas could be discovered through groundwater monitoring.

Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use. The intent of this element is to increase the groundwater yield available for municipal use by either retiring agricultural and non potable demands or by substituting reclaimed water for groundwater used for agricultural and other non-potable uses. Incentives should be developed to encourage the exchange of agricultural groundwater production to municipal use.

Maximize Yield Augmentation with Local Resources - Local Runoff and Reclaimed Water. Yield augmentation through the recharge of runoff (water harvesting) and through the recharge of reclaimed water should be implemented where consistent with water quality objectives and other elements of the groundwater management plan. The Lakeview, Perris North and Perris South subbasins appear to be the most feasible areas for this element.

Maximize Conjunctive Use. Conjunctive use should be implemented in the West San Jacinto Groundwater Basin management area. The unused storage capacity in the West San Jacinto Groundwater Basin management area is about 670,000 acre-ft, with about 600,000 acre-ft or 90 percent in the Lakeview, Perris North and Perris South subbasins. The yield from conjunctive use, exclusive of safe yield, could range from 30,000 to 50,000 acre-ft, or perhaps larger. Conjunctive use will improve overall water supply reliability, groundwater quality, and will lower water supply cost. These benefits will be realized by all groundwater users.

The specifics of recharge, extraction, conveyance and treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate conjunctive use alternatives.

Groundwater Treatment. Groundwater treatment in the form of blending and demineralization should be done in the West San Jacinto Groundwater Basin management area to recover contaminated groundwater for municipal use. The specifics of treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to evaluate groundwater treatment feasibility.

Groundwater Management Plan Alternatives

Four groundwater management alternatives were developed to evaluate the economic benefits to all water users in the groundwater management area from increasingly complex and capital-intensive groundwater management plans. All four of these alternatives include the following management elements:

- ❑ Establishment of a Groundwater Basin Manager
- ❑ Monitoring of Groundwater Production

- ❑ Monitoring of Groundwater Level and Quality
- ❑ Development of Well Construction Policies
- ❑ Development of Well Abandonment and Destruction Policies
- ❑ Monitoring of Well Construction, Abandonment and Destruction.
- ❑ Groundwater Quality Protection

Alternative 1 - Agricultural Exchange and Blending. Alternative 1 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 17,500 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use.

Alternative 2 - Agricultural Exchange, Blending and Demineralization. Alternative 2 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 21,700 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use. Five thousand three hundred acre-ft/yr of highly mineralized groundwater from the Perris South and Winchester subbasins will be pumped and demineralized to produce about 4,200 acre-ft of drinking water.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use. Alternative 3 includes all the elements of Alternative 2, plus conjunctive use. Conjunctive use will be implemented in the Perris North, Perris South I, Perris South II and Lakeview subbasins. Recharge would occur in spreading basins. Source water is state project water and reclaimed water. Average annual increase in recharge and extraction from conjunctive use will be about 30,000 acre-ft/yr.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use.. Alternative 4 is identical to Alternative 3 except that the conjunctive use element has been expanded to 50,000 acre-ft/yr.

Economic Evaluation of the Groundwater Management Plan Alternatives

Tables 8-1 through 8-4 in Section 8 illustrate the economic benefits that water users in the West San Jacinto Groundwater Basin management area would realize if a groundwater management plan were implemented. Each table lists the projected total demand for water and shows how that demand would be satisfied with each groundwater management plan alternative. For economic evaluation purposes, the plan elements are assumed on line in 1999, that is, all elements would be implemented in five years. Actual implementation could take place over a

longer period of time ranging from five to fifteen years. The groundwater management plan alternatives are compared to the *no groundwater management plan case* in Table 1-4. The difference in costs between the *with management plan* cases and *without management plan* case occurs in years 1999 through 2010.

Alternative 1 - Agricultural Exchange and Blending groundwater management plan case has a present value savings of about $108,000,000 over the no groundwater management plan case. The saving comes from the exchange of up to 17,500 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water.

Alternative 2 - Agricultural Exchange, Blending and Demineralization groundwater management plan is identical to Alternative 1 except that the agricultural exchange of groundwater production to municipal uses has been expanded to about 21,700 acre-ft/yr and municipal groundwater production has been expanded by about 4,200 acre-ft/yr through construction of a demineralization facility. Alternative 2 has a present value savings of about $104,000,000 over the *no groundwater management plan case* and is comparable to the cost of Alternative 1. The cost savings over the *no groundwater management plan case* come from the exchange of up to 21,600 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water. The cost of Alternative 2 is slightly higher than Alternative 1 because the demineralization costs are higher than the cost of imported water prior to 2010. After 2010 demineralization costs will be less than imported water. Alternative 2 would have costs savings greater than Alternative 1 if the economic analysis were extended beyond 2010.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 2 plus the incorporation of 30,000 acre-ft/yr of conjunctive use. The source water for conjunctive use is 20,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the *no management plan case* to 26 percent. The demand for untreated seasonal water has risen to 14 percent. Treated non-interruptible and seasonal untreated imported water make up 40 percent of municipal supplies. Alternative 3 has a present value savings of about $172,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $66,000,000 over Alternatives 1 and 2. About 62 percent of the cost savings comes from the agricultural exchange,

TABLE 1-4 (revised 9/7/94)
COMPARISON OF GROUNDWATER MANAGEMENT PLAN ALTERNATIVES

Alternative	Percentage of Total Supply			Size of Groundwater Management Plan Elements				Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
	Non Interruptible Treated Imported Water	Seasonal Treated Imported Water	Seasonal Untreated Imported Water	Agricultural Exchange (acre-ft/yr)	Blending (acre-ft/yr)	Demineralization (acre-ft/yr)	Conjunctive Use (acre-ft/yr)		
No Groundwater Management Plan	64%	0%	0%	0	0	0	0	$557,000,000	na
1 Agricultural Exchange and Blending	49%	0%	0%	17,510	7,100	0	0	$449,000,000	$108,000,000
2 Agricultural Exchange, Blending and Demineralization	46%	0%	0%	21,690	7,100	4,180	0	$453,000,000	$104,000,000
3 Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use (all recharge through spreading)	26%	0%	14%	21,690	7,100	4,180	30,000	$385,000,000	$172,000,000
4 Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use (80 recharge through spreading, 20 % through injection)	18%	4%	18%	21,690	7,100	4,180	50,000	$371,000,000	$186,000,000

Mark J. Wildermuth
Water Resources Engineer

blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due to conjunctive use.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 3 except that conjunctive use has been expanded from 30,000 to 50,000 acre-ft. The source water for conjunctive use is 40,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the no management plan case to 18 percent. Untreated seasonal water has risen to 18 percent and treated seasonal water to 4 percent. Treated non-interruptible, treated seasonal and seasonal untreated imported water make up 40 percent of municipal supplies. Treated seasonal water would be used for recharge by injection. Alternative 4 has a present value savings of about $186,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $80,000,000 over Alternatives 1 and 2. About 57 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due conjunctive use.

The groundwater management plan development costs and the costs of recharge of basins and blending facilities have not been included in these analyses. These costs could have a present value ranging from $50,000,000 to $70,000,000. The cost savings from implementation of any of these alternatives far exceed the cost of implementation. The projected cost savings from the groundwater management plan illustrated in Tables 8-1 through 8-4 are for the 15-year period of 1999 to 2010 in which the capital-intensive facilities, such as spreading basins, have been in operation (and amortized) for 11 years. If these analyses were extended to the period of time over which capital-intensive facilities were to be financed, say 20 years, the cost saving would be significantly greater.

There are two additional significant benefits from a groundwater management plan. First, imported water for direct use has been reduced by half, which will improve overall water supply reliability. The volumetric impact of water shortages in the imported water supply could be reduced by half. Second, the recharge of state project water into the Lakeview, Perris North and Perris South subbasins will improve the quality of the groundwater in these subbasins.

Financing the Groundwater Management Plan

The primary beneficiaries of the plan are municipal water users in the West San Jacinto Groundwater Basin management area. Private groundwater producers such as farmers, dairy operators and individuals with small domestic wells will either be beneficially impacted or have no impacts. It is the intent of the plan to mitigate all significant adverse groundwater impacts to private groundwater producers. The types of beneficial impacts that private well owners could experience will be stabilized or increased groundwater levels where overdraft is occurring, such as the Lakeview subbasin, and reduced supply cost for those groundwater producers that can use reclaimed water in lieu of groundwater.

The cost of implementing and operating the West San Jacinto Groundwater Basin management plan should be born by municipal water users in the management area. The cost savings experienced by the local private groundwater users should be their incentive to participate in the groundwater management plan. There could be some cost to local groundwater producers if groundwater replenishment is necessary due to groundwater overdraft. In the event of overdraft, an equitable cost sharing plan should be developed to correct the overdraft.

Some of the elements of the management plan are capital intensive such as recharge facilities, wells, treatment plants, pipelines, etc. EMWD will need to develop a plan to finance these elements of the groundwater management plan with cost recovery based on the sale of water developed by the plan, or some other method as appropriate. Economic analyses show that the management plan should easily pay for itself.

Implementation of the Groundwater Management Plan

Upon adoption of the groundwater management plan, EMWD will form the Advisory Committee and begin implementation of the policy and physical elements of the management plan. The implementation of the groundwater management plan will occur in a phased process and consist of the following:

Phase 1	Short Term Implementation
Phase 2	Refine the Ultimate Groundwater Management Plan
Phase 3	Ultimate Groundwater Management Plan Implementation

Phase 1 Short Term Implementation. The goals of the short term implementation phase are to: implement those elements of the groundwater management plan that are easy to implement; where existing information is adequate for implementation; and to develop and implement demonstration projects that will provide engineering information necessary for design of management elements in the ultimate plan. The following tasks will be completed in Phase I.

- ❑ Groundwater Resources Evaluation
- ❑ Develop Groundwater Management Policies
- ❑ Construct and Operate Demonstration Projects for Blending, Demineralization and Conjunctive Use
- ❑ Develop Water Resources Planning Model
- ❑ Develop and Evaluate Feasibility Level Plans for physical elements of the Management Plan

Phase 2 Refine the Ultimate Groundwater Management Plan. *Phase 1 Short Term Implementation* will develop policies and data necessary for defining the ultimate groundwater management plan. Phase 2 consists of the detailed engineering, environmental and financial work to describe and implement the ultimate management plan The complexity and cost for the tasks listed below are dependent on the management plan elements included in the management plan.

- ❑ Prepare Facility and Operation Plans
- ❑ Prepare Financial Plan
- ❑ Prepare Project Specific Environmental Impact Reports
- ❑ Prepare Engineering Report for a Planned Recharge Project
- ❑ Institutional Planning

Phase 3 Ultimate Groundwater Management Plan Implementation. The facility plans, environmental documentation and draft agreements developed in Phase 2 will be converted to construction documents, project-specific environmental documentation and final agreements. These projects will then be constructed and operated. The sequencing and sizing of the management elements will depend on actual future water demands and the availability of funds for construction. It is premature to speculate on the magnitude of the effort required by most of these tasks because of uncertainties in what facilities and operating plans will be included in the groundwater management plan and the timing of the tasks.

Management and Monitoring

The management and monitoring of the groundwater management plan will occur while the elements of the ultimate groundwater management plan are being implemented. The management and monitoring activities developed in Phase 1 will be adopted by EMWD board action. Future modifications to management and monitoring programs will be incorporated as warranted by changing conditions.

Schedule and Cost

The Phase 1 work should take about two years to complete. Phase 2 will take about two years to complete and will overlap Phase 1 by about one year. The cumulative time required to complete phases 1 and 2 will be about three to four years. Phase 3 could take up to 10 years to complete with some projects (e.g., blending) coming on line within a couple of years and other projects (e.g., large scale surface recharge) taking 5 years to implement.

The cost to complete Phases 1 and 2 is estimated to range between 3 to 5 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2.

SECTION 2

SECTION 2
INTRODUCTION

THE NEED FOR GROUNDWATER MANAGEMENT

EMWD, together with the majority of water purveyors in Southern California, have been heavily relying on imported supplies from Metropolitan Water District of Southern California (Metropolitan). Recently, Metropolitan's ability to supply the ever-growing needs of Southern California has become increasingly unreliable due to the following reasons:

- demand for water is continuing to increase;
- environmental constraints at the point of origin may limit the water available for export;
- structural adequacy of the delivery system is limited;
- climatological uncertainties can limit delivery; and
- inadequate local storage facilities.

EMWD could purchase imported water from Metropolitan to meet these projected municipal demands. Metropolitan's sources, however, are not reliable and will be very expensive in the future. Metropolitan, with its current planning and future projects, will experience shortages in four of five years, with shortages reaching as high as 30 percent. The cost of imported water from Metropolitan is currently (July 1994) $412 per acre-ft for treated water and is projected to reach about $1,100 per acre-ft by 2010. These rising costs and lack of water to meet all of the demands has encouraged some local agencies in Southern California to claim water rights in the service areas of other agencies. One such action that could adversely affect EMWD's local water resources is a claim recently filed by Orange County Water District, which underscores the urgent need for action by EMWD to protect the water resources within its service area for use by EMWD consumers.

The West San Jacinto Groundwater Basin underlies a large portion of the Eastern Municipal Water District (EMWD). The West San Jacinto Groundwater Basin includes the Perris North, Perris South, Menifee, Winchester, Lakeview and the San Jacinto Lower Pressure subbasins. The location of these subbasins is shown in Figure 2-1. This area is experiencing rapid land use conversion from agriculture to urban uses. Total municipal water demands are expected to increase from 47,000 acre-ft/yr in 1995, to 112,000 acre-ft/yr in 2010.

Three sources of water supply for these demands can be considered: groundwater, imported water and reclaimed water. Groundwater in the West San Jacinto Groundwater Basin, for the most part, is of poor quality due to natural causes and irrigated agriculture. Most of the groundwater resources cannot be used as municipal supply due to poor quality - the groundwater quality either violates drinking water standards or is too high in total dissolved solids (TDS) or other water quality constituents to be discharged after municipal use. To meet increasing demands, EMWD could purchase imported water from Metropolitan. However, availability and costs might limit this alternative. EMWD has reclaimed water resources that could be used to meet agricultural demands and non-potable municipal demands. Reclaimed water cannot be directly used for potable demand unless, after groundwater recharge and dilution, it meets Title 22 requirements (State Department of Health Services Reclaimed Water Regulations). Additionally, groundwater treatment practices can convert non-potable water supplies to potable supplies.

The availability and reliability of the total water supply can be improved through the joint, optimized (conjunctive) management of all the water supply sources. It is the intent of Assembly Bill AB 3030, which was incorporated into the Water Code in 1992 (Part 2.75 commencing with Section 10750 of Division 6) with amendments by AB 1152 of 1993, to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions. Authorization to adopt and implement a plan is contained in the following section of AB 3030:

> "§10753 (a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area."

The components of a groundwater management plan may include the following:

> "§10753.7 (a) The control of saline water intrusion.
> (b) Identification and management of wellhead protection areas and recharge areas.
> (c) Regulation of the migration of contaminated groundwater.
> (d) The administration of a well abandonment and well destruction program.
> (e) Mitigation of conditions of overdraft.
> (f) Replenishment of groundwater extracted by water producers.
> (g) Monitoring of groundwater levels and storage.
> (h) Facilitating conjunctive use operations.
> (i) Identification of well construction policies.
> (j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.
> (k) The development of relationships with state and federal regulatory agencies.
> (l) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination."

EMWD's Board of Directors adopted resolution No. 3039 to develop a Groundwater Management Plan for the West San Jacinto Groundwater Basin and published a Notice of Intent on August 25, 1993. The groundwater management plan for the West San Jacinto Groundwater Basin is being developed under the authority of Assembly Bill 3030 (AB 3030), which allows a local water agency to take the lead in development of a plan. Up to two years can be taken for development of a plan. Local water purveyors, both public and private, have been involved in development of the plan. There are approximately forty-five (45) pumpers in the area. Public meetings, workshops and hearings were held during the preparation of the draft plan. Cooperative agreements with EMWD have already been signed by Nuevo Water Company, Edgemont Gardens Mutual Water District and the City of Perris.

APPROACH TO DEVELOPMENT OF GROUNDWATER MANAGEMENT PLAN

EMWD's approach to developing a groundwater management plan consists of the following elements:

- Establishing a clear set of management goals;
- Resolving major uncertainties in the knowledge of the groundwater resources;
- Integration of the planning activities and goals of all interested entities;
- Evaluation of the benefits, costs and impacts to interested entities; and
- Providing an environment that obtains consensus at key decision points in the plan development.

A set of management goals must be established early in the plan development process. These goals can be modified during the plan development process. These goals will determine the magnitude of the plan, beneficiaries of the plan, and will guide the technical work that shapes the plan.

There are many uncertainties regarding hydrogeology, hydrology and water quality of the West San Jacinto Groundwater Basin (management area). The entities having an interest in the groundwater management plan have different interpretations of the management area groundwater resources and management issues affecting these resources. Therefore, one of the first steps in the planning process is to develop a complete description of groundwater resources that is understood and accepted by the entities having an interest in the plan.

The water development and wastewater management activities of the entities having an interest in the management area must be integrated into the groundwater management plan. This does not mean that these activities will be included in the plan; rather, these activities will be accommodated in the plan. The plan development process must identify and describe all relevant water development and wastewater planning activities in the management area.

The benefits, costs and other impacts must be evaluated for entities having an interest in the management area. Equity among these entities must be incorporated into the plan in order for the plan to be accepted and implemented. Therefore, the plan development process must include steps to identify and evaluate the benefits, costs and other impacts to the interested entities.

The plan development process will succeed only if there is consensus among the interested entities. Therefore, the process must provide an environment conducive to consensus. The first step to gaining consensus is to invite all the potentially interested entities in the management area to participate in the plan development process. Workshops and meetings were held to inform interested parties during the plan development process. EMWD took the leadership role in the plan development and in disseminating information regarding the plan to all interested parties.

PURPOSE OF THIS REPORT

The purpose of this report is to:

- document what is known about the groundwater resources and water supply needs;
- develop management goals;
- describe the elements of a groundwater management plan consistent with plan goals; and
- describe the management plan; and
- describe what additional information will be required to develop and implement the groundwater management plan.

This report describes the types of groundwater management practices that are being used in other groundwater basins and their applicability to the West San Jacinto Groundwater Basin. The types of information necessary to implement these groundwater management elements are also described. This report presents groundwater management practices in the context of the future water demands and the water resources of the management area. Finally, this report describes a groundwater management plan for the West San Jacinto Groundwater Basin and a program to implement the management plan.

Implementation of the groundwater management plan will occur over the next 20 to 40 years. As mentioned above, information describing the groundwater basins is inadequate to definitively describe the groundwater management plan. New information will need to be developed during plan implementation. Over the course of the next 20 to 40 years, new technologies, water quality standards and operating concepts will be developed. Therefore the management plan must have

alternatives to achieve the management plan goals and be flexible to accommodate future changes.

ORGANIZATION OF THIS REPORT

This report consists of eight sections and two appendices. The remaining seven sections of this report are:

Section 1 Executive Summary

Section 3 Existing Water Resources Management Framework

Section 4 Groundwater Resources in the West San Jacinto Basin

Section 5 Future Water Demands and Wastewater Flows

Section 6 Groundwater Management Goals

Section 7 Elements of the Groundwater Management Plan

Section 8 Description of the Groundwater Management Plan

ACKNOWLEDGMENTS

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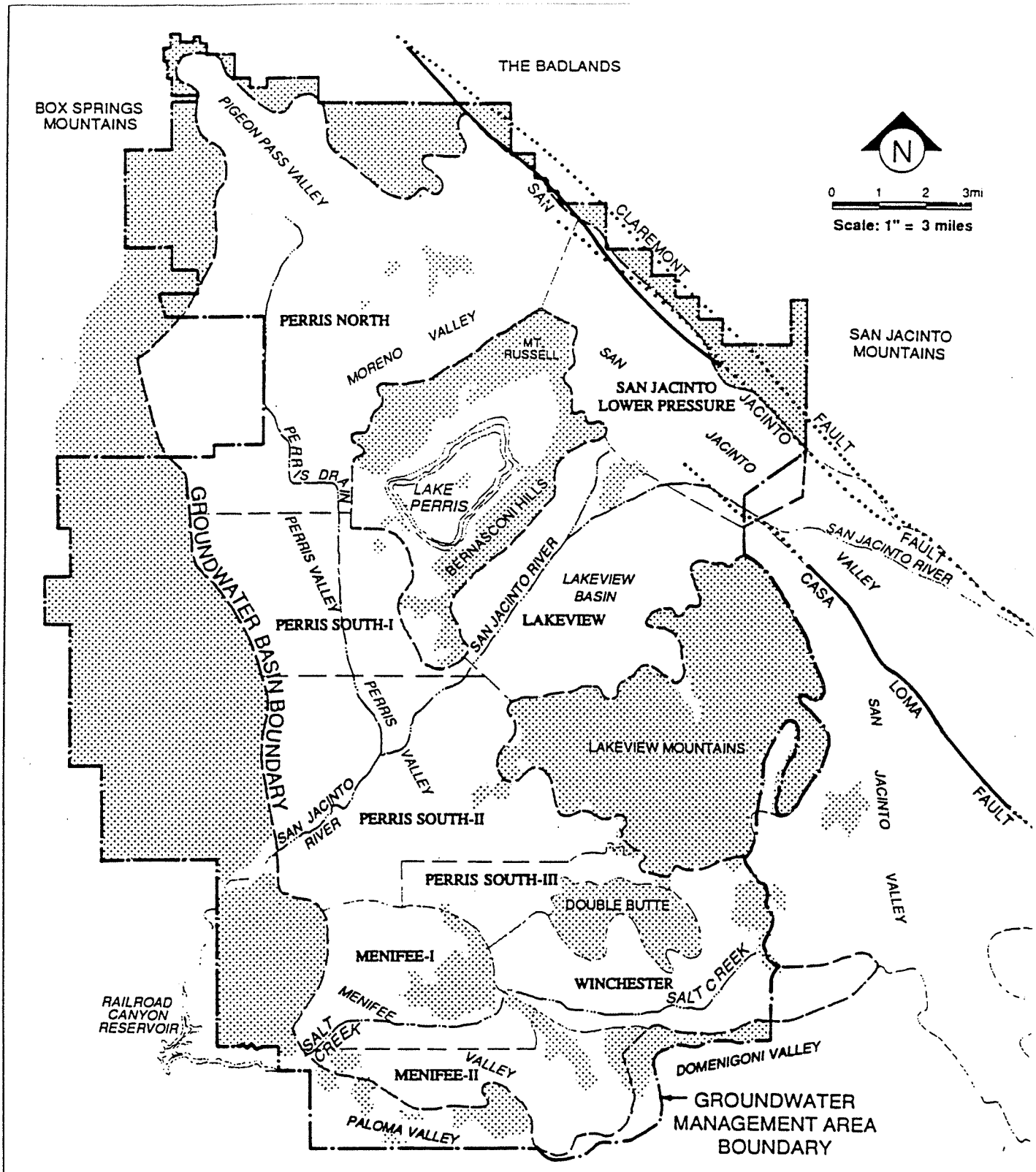

LEGEND:

- NONWATER-BEARING PORTION
- KNOWN FAULTS
- INFERRED OR CONCEALED FAULTS

Figure 2-1
LOCATION MAP

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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SECTION 3

SECTION 3
EXISTING WATER RESOURCES FRAMEWORK

This section describes the existing institutional and regulatory framework for the groundwater management plan. First, the agencies that sell, import and otherwise provide water for the management area are listed and described. The regulatory constraints for the management of wastewater and drinking water are also described.

WATER SUPPLY AND WASTEWATER AGENCIES

Eastern Municipal Water District

EMWD encompasses over 540 square miles in the western portion of Riverside County as shown on Figure 3-1. It is bounded on the west by Western Municipal Water District, on the north by mountains which approximately parallel the San Bernardino County boundary, on the east by the San Jacinto Mountains, and on the south by mountains which parallel the San Diego County line. Only about half of the area within EMWD's boundary receives water service at this time. Other areas will receive service by EMWD as they develop. EMWD is the only wastewater treatment entity in the West San Jacinto groundwater management area. EMWD's sphere of influence extends easterly to the San Jacinto and Santa Margarita watershed boundaries.

EMWD has divided its service area into four subservice areas for the distribution of water as shown on Figure 3-2. The divisions are based on location, local water resources, existing water deliveries, and proximity to sources of imported water. Water can be transferred from one subservice area to another. Each subservice area encompasses a specific section of EMWD. Service Area 41, which is mainly supplied by MWD's Mills Filtration Plant, includes Moreno Valley, Perris and the community of Sun City. The area including the cities of Hemet and San Jacinto and unincorporated Winchester is supplied mainly by well water and is in Subservice Area 42. Subservice Area 43 encompasses the Antelope-French-Domenigoni Valley and the

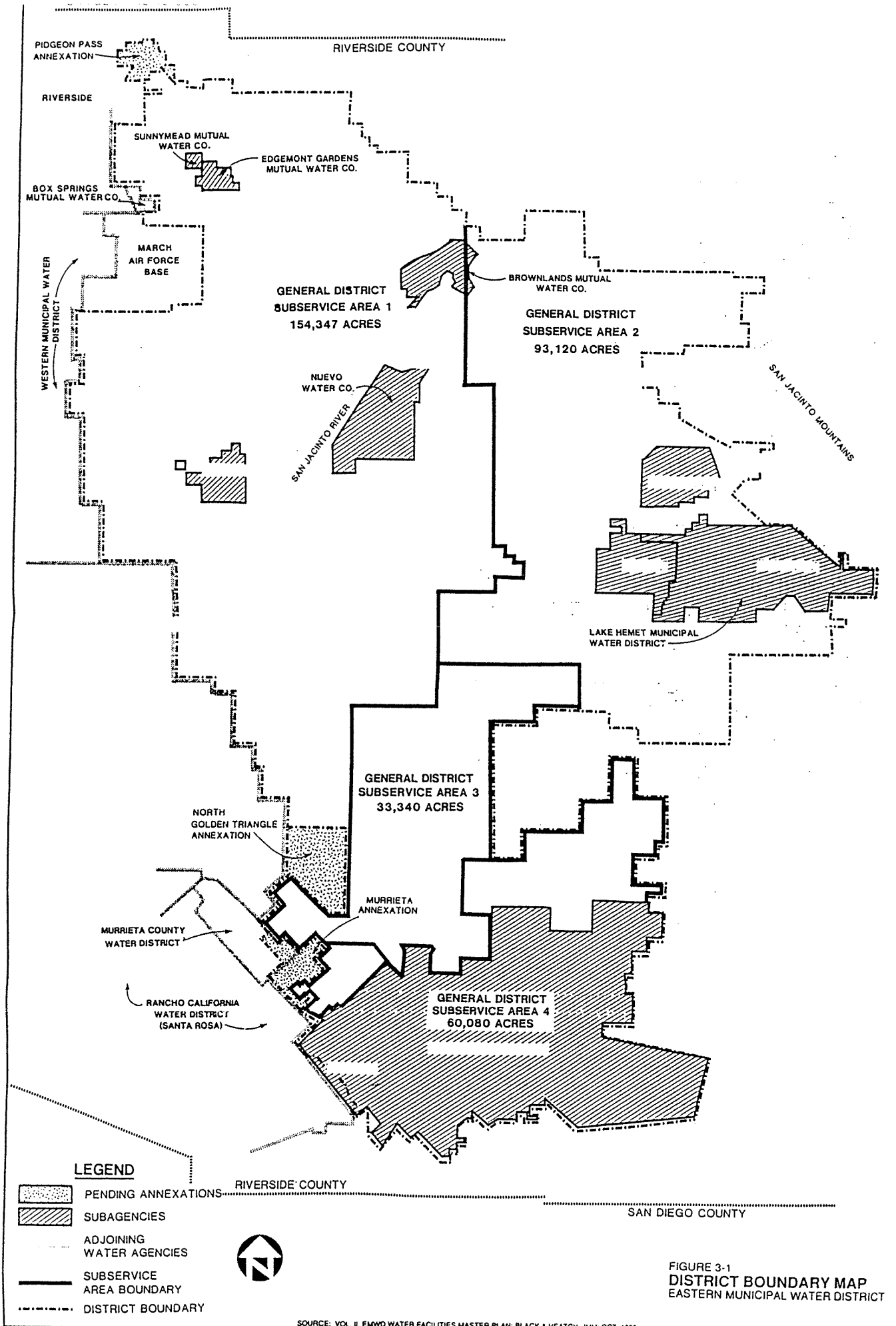

FIGURE 3-1
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

SOURCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM: OCT, 1990

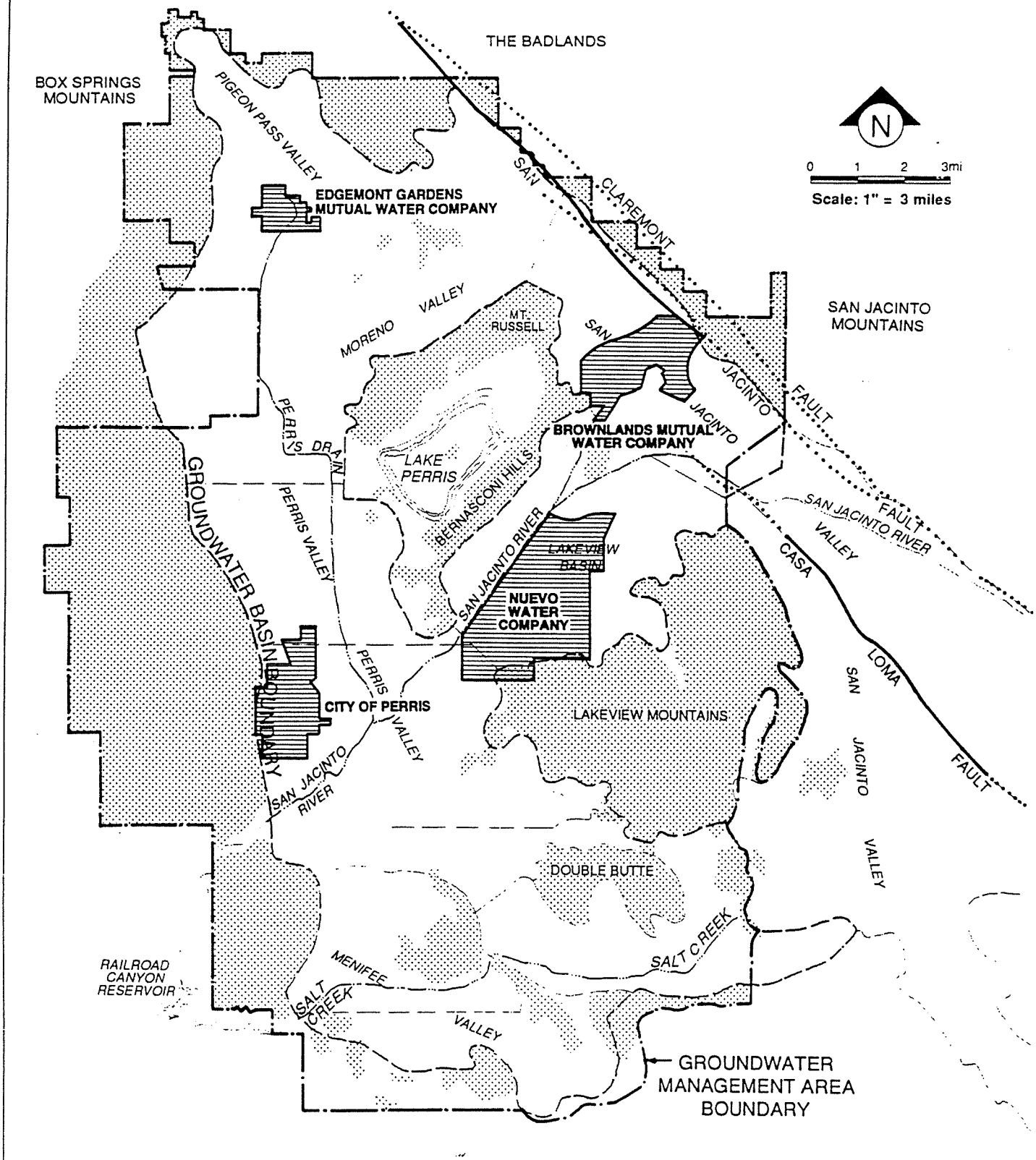

Figure 3-2
SUBAGENCIES

REFERENCE: VOL. II, EMWD WATER FACILITIES MASTER PLAN; BLACK & VEATCH, JMM; OCT, 1990.

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Water Resources Engineer

Murrieta Hot Springs Region of EMWD. The Golden Triangle and Dutch Village developments are also located in this subservice area and will eventually receive almost their entire supply from MWD's Skinner Filtration Plant. At the extreme southern end of EMWD is the historic town of Temecula and surrounding Rancho California which is a rapidly developing, planned 87,500 acre, agricultural, industrial, commercial and residential community which is bisected by Interstate 15. Temecula and the eastern 41,000 acres of Rancho California are located in Subservice Area 44. The water supply to this area is from the Rancho California Water District, which is a subagency of EMWD. The supply for the area is well water supplemented with water from MWD's Skinner Filtration Plant.

EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public agencies include the Brownlands Mutual Water Company, city of Hemet, city of Perris, city of San Jacinto, Edgemont Gardens Mutual Water Company, Lake Hemet Municipal Water District, Nuevo Water Company, and Rancho California Water District. EMWD also supplies water, wholesale, to Elsinore Valley Municipal Water District and March Air Force Base, in accordance with contracts with Western Municipal Water District. The entities and public agencies within the West San Jacinto Groundwater Management area are shown in Figure 3-2 and are described below.

City of Perris. The city of Perris relies entirely on EMWD for its supply since local well water is high in TDS and chlorides. Water is supplied directly through three connections to EMWD's 1627 (Perris) pressure zone, and is provided on a demand basis. The city has water storage facilities consisting of a 1.0 MG and a 1.25 MG steel tank which have high water elevations of 1,595 feet.

Nuevo Water Company. Nuevo Water Company encompasses approximately 4,064 acres and supplies approximately 1,260 connections. The company has two wells with capacities of 1.01 mgd (700 gpm) and 0.58 mgd (400 gpm) and a 12-inch connection to EMWD's system. District water is used only as a supplemental supply to meet total maximum day summer demands of approximately 2.3 mgd.

Edgemont Gardens Mutual Water Company. Edgemont Gardens Mutual Water Company serves 661 acres and approximately 950 connections in the city of Moreno Valley. Their supply is provided by two 350-gpm wells and three connections to EMWD. Water from EMWD is used

to supplement their normal supply and to provide fire protection since their system does not have water storage facilities.

Brownlands Mutual Water Company. Brownlands Mutual Water Company encompasses 2,042 acres east of Lake Perris near the Badlands. The company does not have a water system and consequently, does not provide water service. A connection to EMWD's system has never been constructed for this subagency. In the future these areas will probably be supplied directly by EMWD.

Metropolitan Water District of Southern California

Metropolitan Water District of Southern California (Metropolitan) is a wholesale water agency serving supplemental imported water to 27 member cities and water agencies in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura counties. This service area has a current population of about 15 million people. Approximately one-half of the total water used throughout the entire Metropolitan service area is imported water purchased from Metropolitan to supplement the local water supplies of the study area. Metropolitan obtains imported supplies from the Colorado River and the State Water Project (SWP). Figure 3-3 shows the locations of Metropolitan's, state and EMWD imported water facilities.

Colorado River Water. The Colorado River Aqueduct, owned and operated by Metropolitan, transports water from Lake Havasu on the Colorado River, 242 miles to its terminus at Lake Matthews in Riverside County. Construction of the Colorado River Aqueduct began in 1931 and the first deliveries of water to member agencies took place in 1941.

Metropolitan's total entitlement to Colorado River water is approximately 1.39 million acre-ft/yr. This entitlement consists of a fourth priority right to 550,000 acre-ft/yr, a fifth priority right of 662,000 acre-ft/yr and surplus contract rights of 180,000 acre-ft/yr. Several irrigation districts hold higher priority rights to 3.85 million acre-ft/yr. Certain Indian reservations, towns and individuals also hold present perfected rights that predate Metropolitan's rights. In 1964, the United States Supreme Court limited California's diversions on a dependable basis to 4.4 million acre-ft/yr in the case *Arizona v. California*. As such, Metropolitan's diversions from the Colorado River on a dependable basis were limited to less than 550,000 acre-ft/yr. During declarations of surplus, Metropolitan has the highest priority of any California contractor to divert these surplus waters.

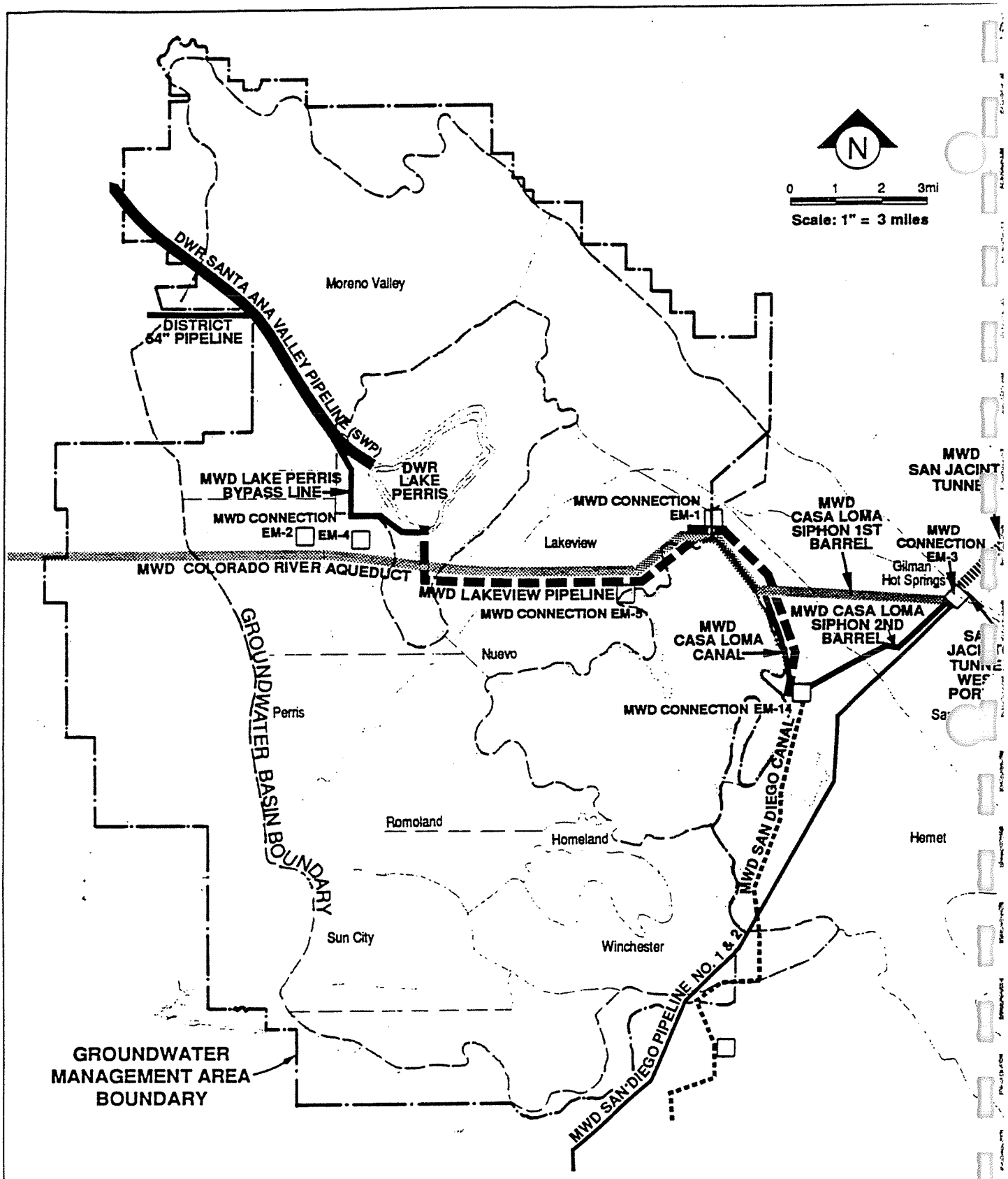

Figure 3-3
IMPORTED WATER FACILITIES

REFERENCE: EMWD WATER FACILITIES MASTER PLAN, *FIG. 4-3: SOURCES OF SUPPLY MAP*, OCTOBER, 1990.

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Water Resources Engineering

The Secretary of the Interior has the discretion to allow California to use any water that Arizona and Nevada have available from the Colorado River, but do not use. It is difficult to predict the criteria the Secretary will use in determining whether to release unused water to California. If the agricultural agencies in California do not use the entire supply available to them, Metropolitan has the right to divert the unused portion. Although agricultural use was less than 3.85 million acre-ft/yr throughout much of the mid 1980's, there was no unused agricultural priority water available in 1989.

Metropolitan is actively seeking additional water supplies from the Colorado River. Metropolitan recently signed a long-term agreement with the Imperial Irrigation District that will yield 106,110 acre-ft/yr of Colorado River water from implementation of specific water-saving measures. Metropolitan is pursuing several other projects to obtain increased Colorado River supplies including:

- ❑ Additional water conservation measures with Imperial Irrigation District
- ❑ Lining of the All-American and Coachella Canals to stop water seepage losses
- ❑ Groundwater storage project on the East Mesa of Imperial County
- ❑ Land fallowing program with Palo Verde Irrigation District

If all of these projects are implemented, Metropolitan's total Colorado River supplies could be about 1,000,000 acre-ft/yr by the year 2000 (Montgomery Watson, 1993).

State Project Water. Metropolitan's second source of water is the State Water Project (SWP). The SWP is owned by the State of California and operated by the California Department of Water Resources (DWR). This project transports water from the Sacramento-San Joaquin Delta via the California Aqueduct to thirty contract agencies in the state. The total length of the California Aqueduct is 444 miles.

Metropolitan has an entitlement to SWP water of 2,011,500 acre-ft/yr out of a total maximum contractual entitlement of 4.23 million acre-ft/yr for the 30 contractors. As currently developed, and under current Delta water quality standards, the SWP has an average yield during extended dry periods of approximately 2.4 million acre-ft/yr. Requested deliveries for 1993 totaled 3.6 million acre-ft/yr (agricultural contractors have had a 100 percent deficiency applied against them). Initial deliveries were estimated to be ten percent of the requests before the recent wet

period. Demands for SWP water are expected to increase to 4.15 million acre-ft/yr by the year 2010.

Metropolitan's water supply from the SWP also faces potential limitations in the future. The current firm yield of the SWP can currently supply only about one-half of the contract entitlements due to capacity limitations of existing facilities. The State Department of Water Resources is developing a program to increase the firm yield of the SWP through a combination of additional pumping facilities at the Delta, improved water management in the Delta, new surface reservoirs, and groundwater storage. These projects are expected to increase the dry period yield to 3.2 million acre-ft/yr by the year 2010 [DWR, Bulletin 132-89]. Metropolitan is pursuing its own program of groundwater storage and water transfers from other SWP contractors to increase its firm supplies.

The State Water Resources Control Board (SWRCB) has been conducting hearings and other proceedings in an on-going process to review the water quality objectives for the San Francisco Bay/Sacramento-San Joaquin Delta estuary. The SWRCB recently proposed more stringent water quality requirements for the Delta through its draft Decision D-1630. If adopted in its current form, D-1630 is expected to reduce deliveries to the SWP, the Central Valley Project and other Delta diverters by as much as 1.2 million acre-ft/yr depending on water supply conditions in the Delta. The impact of this decision on Metropolitan is still under study; however, preliminary estimates indicate a reduction on the order of 200,000 acre-ft/yr (Montgomery Watson, 1993).

REGULATION OF WASTEWATER

The West San Jacinto Groundwater Management plan will be influenced by the plans and policies of the Federal Environmental Protection Agency, State Water Resources Control Board, California Regional Water Quality Control Board, Santa Ana Region as well as the state and local health departments. A summary of the more important regulations of these agencies is presented in the following paragraphs.

Federal Environmental Protection Agency

On October 18, 1972, Congress passed the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500). Those amendments have been acclaimed as "one of the most significant, most comprehensive, most thoroughly debated pieces of environmental legislation

ever to be considered by the Congress." The 1972 Act has been amended several times. The 1977 Amendments included a change in name to the Clean Water Act; however, the Act's goals and policy remain the same. Section 101(a) of the Act states:

> The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this Act--
>
> (1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
>
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection of and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;
>
> (3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;
>
> (4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;
>
> (5) it is the national policy that area wide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State; and
>
> (6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans.

To reach these goals, the Act requires that a discharge of waste or waste-containing water be of a specified, improved quality before its release from a point source to the receiving water, or in some cases, that the discharge be prohibited. To assure that the improved quality is attained, the Act provides a new authority to the Federal and State governments to continue and fully develop a basin plan program as well as a national permit system. These two programs are discussed later in this Section under the California Regional Water Quality Control Board, Santa Ana Region.

State Water Resources Control Board

California's Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) establishes the responsibilities and authorities of the State Water Resources Control Board and the nine Regional Water Quality Control Boards. That Act names the Boards "...the principal state agencies with primary responsibility for the coordination and control of water quality."

In carrying out this responsibility, the State Water Resources Control Board coordinates a oversees the activities of the nine Regional Boards. It has also adopted several statewide po controlling specific aspects of water quality. These policies which apply to the San Jacin Water Reclamation Program include:

Nondegradation Policy (1968). This is the single most important statewide water qu control policy (CRWQCB, SAR, 1984). It was adopted as SWRCB Resolution No. 68- "Statement of Policy with Respect to Maintaining High Quality Waters in California". policy requires that high quality water be maintained and protected unless: (1) allowing so degradation is clearly in the best interests of the people of California as a whole, (2) that allowable degradation does not preclude an identified (present or future) beneficial use, an that the applicable Basin Plan or some statewide policy takes note of the change in question a concedes that it is appropriate.

Reclamation Policy (1977). The "Policy and Action Plan for Water Reclamation in Califo recognizes the present and future need for increased amounts of water in California, primarily support growth. This policy commits both the State Board and the nine Regional Boar support reclamation and reclamation projects which are consistent with sound principles a demonstrated needs.

California Regional Water Quality Control Board, Santa Ana Region

The California Regional Water Quality Control Board, Santa Ana Region, controls water quali within its region by adoption and implementation of a basinwide water quality control pl (Basin Plan) and waste discharge requirements for individual dischargers within its regio These two programs, as they relate to the West San Jacinto Groundwater Management Pla discussed in the following paragraphs.

Basin Plan. The Porter-Cologne Act directs each Regional Board to "...formulate and ad water quality control plans for all areas within the region." A water quality control pla defined as having three components: beneficial uses which are to be protected, water qu objectives which protect those uses, and an implementation plan which accomplishes the objectives. For the Santa Ana Region, the original basin plan was adopted in 1975 and ame d in 1983. As required, that plan is again being reviewed and updated where necessary.

The objective of that plan entitled: "Water Quality Control Plan for the Santa Ana River Basin (8)" is to show how the quality of the surface and ground waters in the Santa Ana Region should be controlled to provide the maximum benefit possible. As stated in that plan:

> The uses made of water and the benefits derived from it are varied, and the quality of the water is an important factor. For example, drinking water has to be of higher quality than water used to irrigate pastures. Both are legitimate uses, but the quality requirements for irrigation are different from those for domestic use. The plan recognizes such variations. First, it lists the uses to which the various waters are put (Beneficial Uses, Chapter 3). Second, it describes the water quality which must be maintained to allow those uses (Water Quality Objectives, Chapter 4). Federal terminology is somewhat different, in that beneficial uses and water quality objectives are combined and the combination is called Water Quality Standards. Chapter 5, the Implementation Plan, then describes the programs, projects and other actions which are necessary to achieve the goals of this plan. Chapter 6, Monitoring and Assessment, discusses the impacts the plan will have.

Applicable sections of the 1994 Basin Plan are summarized in the following paragraphs.

Beneficial uses. Beneficial uses that are to be protected in the West San Jacinto Groundwater Management Plan are shown in Tables 3-1 and 3-2.

Water Quality Objectives. The narrative objectives below apply to all inland surface waters, including bays and estuaries, and to groundwaters, as noted within the region. In addition, specific numerical objectives are listed in Tables 3-3 and 3-4. Where more than one objective is applicable, the stricter shall apply.

Trace constituents. The concentrations of trace constituents in groundwaters designated MUN shall not exceed the values listed immediately below.

Arsenic	0.05 mg/l	Iron	0.3 mg/l
Barium	1.0 mg/l	Lead	0.05 mg/l
Cadmium	0.01 mg/l	Manganese	0.05 mg/l
Chromium	0.05 mg/l	Mercury	0.002 mg/l
Cobalt	0.2 mg/l	Selenium	0.01 mg/l
Cyanide	0.2 mg/l	Silver	0.05 mg/l
Fluoride	1.0 mg/l		

California Department of Health Services

Recharge of reclaimed water can occur through surface spreading, direct injection and by over irrigation. Recharge by percolation and injection is subject to regulatory approval. The Department of Health Services (DHS) has released proposed regulations for planned recharge projects that recharge reclaimed water. If the proposed regulations are adopted, strict criteria

TABLE 3-1
BENEFICIAL USES OF SURFACE WATERS

Water Body	Municipal and Domestic Supply	Industrial Service Supply	Agricultural Supply	Groundwater Recharge	Water Contact Recreation	Non-contact Water Recreation	Warm Freshwater Habitat	Wildlife Habitat	Cold Freshwater Habitat
San Jacinto River					I		I		
Reach 3	I		I	I	I	I	I	I	
Reach 4	I		I	I	I	I	I	I	
Canyon Lake *	X	X	X	X	X	X	X	X	X
Lake Elsinore					X	X	X	X	

I = Intermittent Beneficial Use
X = Present or Potential Beneficial Use
*Note - Canyon Lake is Reach 2

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TABLE 3-2
GROUNDWATER BENEFICIAL USES

Groundwater Subbasin	Municipal and Domestic Supply	Agricultural Supply	Industrial Service Supply	Industrial Process Supply
San Jacinto - Lower Pressure	X	X	X	
Lakeview	X	X	X	X
Perris North	X	X	X	X
Perris South I	X	X		
Perris South II	X	X		
Perris South III		X		
Winchester	X	X		
Menifee I	X	X	X	
Menifee II	X	X	X	

I = Intermittent Beneficial Use

X = Present or Potential Beneficial Use

Mark J. Wildermuth
Water Resources Engineer

TABLE 3-3
SURFACE WATER QUALITY OBJECTIVES
(mg/l)

Water body	Total Dissolved Solids	Total Hardness	Sodium	Chloride	Total Inorganic Nitrogen	Sulfate	Filtered Biochemical Oxygen Demand	Filtered Chemical Oxygen Demand
San Jacinto River								
Reach 3	820	400		250	6		7	15
Reach 4	500	220	75	125	5	65		
Canyon Lake*	700	325	100	90	8	290		

Note - Canyon Lake is Reach 2

TABLE 3-4
GROUNDWATER QUALITY OBJECTIVES
(mg/l)

Groundwater Subbasin	Total Dissolved Solids	Total Hardness	Sodium	Chloride	NItrate as NItrogen	Sulfate
San Jacinto - Lower Pressure	800	380	120	100	3	330
Lakeview	500	190	80	160	2	25
Perris North	300	100	70	90	3	15
Perris South I	1000					
Perris South II	2000					
Perris South III	1500					
Winchester	1200					
Menifee I	2000					
Menifee II	1500					

Mark J. Wildermuth
Water Resources Engineer

must be satisfied for a planned recharge project using reclaimed water. In the interim, the Regional Board and the DHS are requiring agencies interested in recharge of reclaimed water to follow the proposed regulations. The proposed regulations are included in Appendix A-1.

The proposed regulations define four categories of recharge projects:

> Project Category I - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment), disinfected and subjected to organics removal.
>
> Project Category II - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment) and disinfected.
>
> Project Category III - Surface spreading project that uses reclaimed water that has been oxidized (secondary treatment) and disinfected.
>
> Project Category IV - Direct injection project that uses reclaimed water that has been oxidized (secondary treatment), filtered (tertiary treatment), disinfected and subjected to organics removal.

For project categories I and IV, the maximum amount of reclaimed water that can be captured by any well is a function of the total organic carbon (TOC) in the reclaimed water. The maximum contribution of reclaimed water at a well for categories I and IV is 50 percent. Table 3-5 shows the maximum allowable contributions of reclaimed water in a well as a function of the TOC in the reclaimed water after organics removal. Table 3-6 summarizes other important operational criteria from the proposed recharge guidelines. The maximum allowable reclaimed water contributions in any well for categories II and III is 20 percent. With the exception of nitrogen compounds, reclaimed water quality used for planned recharge projects must meet Title 22 standards for drinking water quality (Title 22, Division 4, Chapter 15, Sections 64435, 64443, 64444.5 and 64473). The total nitrogen concentration of reclaimed water used in recharge projects shall not exceed 10 mg/L as nitrogen, unless the project sponsor can demonstrate that the standard can be consistently met prior to reaching the groundwater level. The minimum retention time in the groundwater prior to production shall be six months for categories I and II, and twelve months for categories III and IV. The minimum horizontal separation between the recharge facility and a producing domestic well is 500 feet for categories I and II; 1000 feet for category III and 2,000 feet for category IV. The project sponsor must have the authority to prevent the use of groundwater for drinking water within the area required to achieve the minimum retention time and minimum horizontal separation. The proposed regulations require rigorous groundwater and reclaimed water monitoring.

TABLE 3-5
MAXIMUM ALLOWABLE TOC AFTER
ORGANICS REMOVAL IN RECLAIMED WATER

Reclaimed water Contribution (%)	Maximum TOC Concentration (mg/L) Surface Spreading Category I	Direct Injection Category IV
0 - 20	20	5
21 - 25	16	4
26 - 30	12	3
31 - 35	10	3
36 - 45	8	2
46 - 50	6	2

TABLE 3-6
KEY CRITERIA FOR RECLAIMED WATER RECHARGE PROJECT

Criterion	Category I	Category II	Category III	Category IV
Maximum Contribution of Reclaimed Water in Water at Domestic Wells (1)	50%	20%	20%	50%
Minimum Horizontal Separation Between Point of Recharge and Domestic Wells (feet)	500	500	1,000	2,000
Minimum Retention Time in Groundwater (months)	6	6	12	12

note - (1) see Table 7-1 for categories I and IV

Table 3-5 and 3-6 one pg
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Water Resources Engineer

Direct Discharge into a Water System. A plan that involves direct discharge into a domestic water supply system or storage unit for the near future (within the next decade) is not acceptable because of the uncertain health implications. DHS will recommend against the element of a basin plan which contains such a proposal.

Where a plan requiring a near-term decision involves options or alternatives for the use or disposal of the wastewater, DHS will reject the domestic water reuse alternative and consider the remaining options as the proposals for evaluation.

Direct discharge into a water system may be presented in a plan as a future option which may be appraised as additional information becomes available and future needs and attitudes are clearer.

REGULATION OF DRINKING WATER

A summary of existing and proposed water quality standards is presented in Appendix A-2. Both primary Maximum contaminant Levels (MCLs) and Secondary Maximum Contaminant Levels (SMCLs) are shown as proposed, promulgated, and implemented by EPA and DHS. The more rigorous of the two standard MCLs for any contaminant must be satisfied.

LOCAL PLANNING AND REGULATORY AGENCIES

Other local agencies that may have a significant influence on groundwater management include:

Riverside County Flood Control and Water Conservation District. This agency plans, constructs and operates flood control and water conservation facilities in Riverside County. The construction of flood control and water conservation facilities affects the volume of recharge to groundwater and thus has a potentially significant impact.

Riverside County Planning. Riverside County Planning Department develops and reviews general plans for all unincorporated areas in the county. Thus this agency will review the groundwater management plan for consistency with general plans under their jurisdiction.

Riverside County Health Department. The Riverside County Health Department will review water supply and wastewater plans that could be embodied in the groundwater management plan.

SECTION 4

SECTION 4
GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN

PHYSICAL FEATURES

Figure 4-1 shows the major physical features, waterbearing and non-waterbearing areas of the groundwater management area. The major physical features in the study area include the San Jacinto mountains, the Badlands, the San Jacinto River, Salt Creek, Perris Valley Drain, the San Jacinto and Casa Loma faults, the Lakeview mountains, the Bernasconi Hills, and Double Butte. The management area groundwater basins are shown in Figure 4-2 and include the Perris North, Perris South I, II and III, Menifee I and II, Winchester, Lakeview and the San Jacinto Lower-Pressure subbasins.

The San Jacinto mountain range, which dominates the area, was formed about 130 million years ago when subsurface activity thrust the igneous (formed under extreme heat) rock upward. Continued erosion reduced the mountain range and its adjacent area, and the resulting sediments were deposited in the valleys of the management area. These are called alluviated valleys and the deposited sediments are termed alluvium (California Department of Water Resources, 1978). The aquifers in the management area consist of interbedded gravels, sands, silts, and clays. In general, coarser alluvium occurs near the sources of the alluvium and the finer alluvium occurs further away from the sources. The sources of alluvium include the mountains, hills and badland areas that border the management area. Coarser alluvium also occurs in the vicinity of significant streambeds grading to finer alluvium away from the streambeds.

The Perris Subbasins

The Perris Basin has been subdivided into Perris North, Perris South-I, Perris South-II and Perris South-III subbasins. This division is based on water quality variations and has no hydrologic

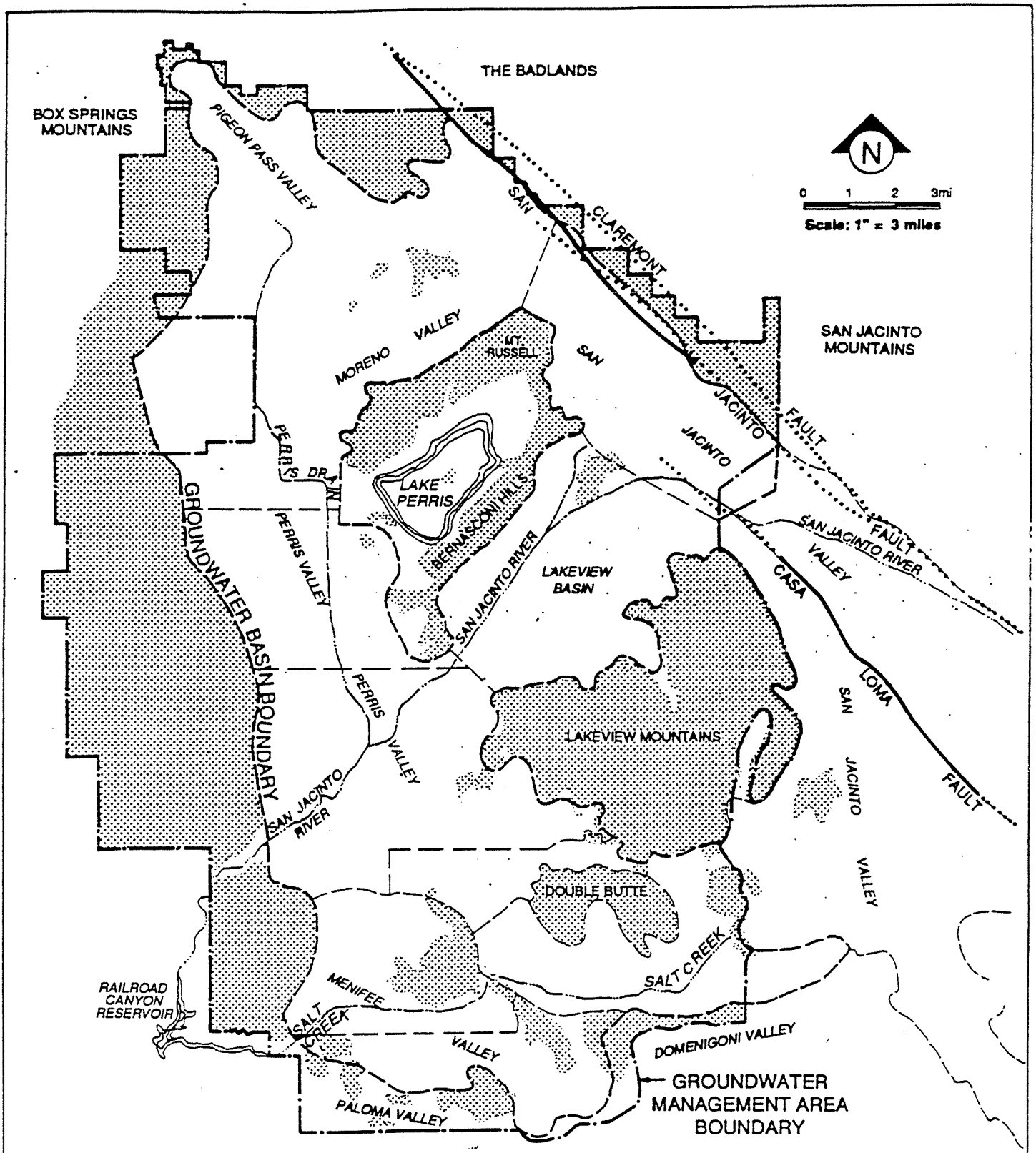

Figure 4-1
MAJOR PHYSICAL FEATURES

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

Mark J. Wildermuth
Water Resources Engineer

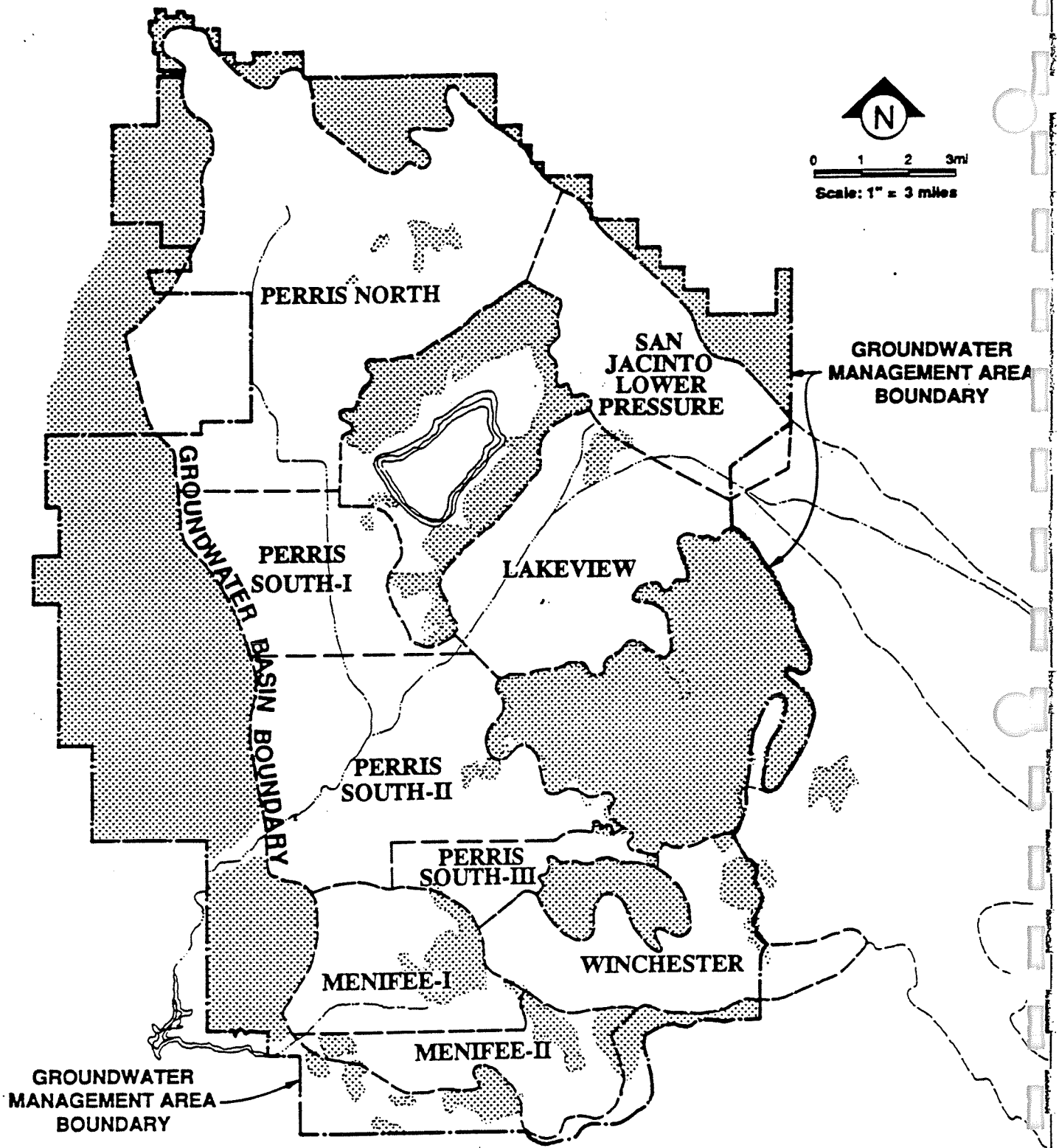

Figure 4-2
GROUNDWATER SUBBASINS

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significance. The Perris North subbasin is bounded on the north by Box Springs Mountains and the Badlands; on the east by San Jacinto Lower-Pressure subbasin and unnamed hills north of Lake Perris; on the south by the Perris South-I subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

The Perris South-I subbasin is bounded on the north by the Perris North subbasin; on the east by the southerly extension of the Bernasconi Hills; on the south by the Perris South-II subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

Perris South-II is bounded on the North by the Perris South-I subbasin, on the east by the Lakeview subbasins and the Lakeview mountains; on the south by the Menifee-I and Perris South-III subbasins; and on the west by a series of extensive non-waterbearing hills and plateaus.

The Perris South-III subbasin is bounded on the north and west sides by the Perris South-II subbasin; on the east by the Lakeview mountains and the Winchester subbasin; and on the south by the Double Butte hills, the Winchester subbasin and the Menifee-I subbasin.

The Perris subbasins are considered one hydrologic basin. The Perris North subbasin consists of tonalite and granodiorite mountains surrounding alluvium and older alluvium to 600 feet in depth, over tonalite and granodiorite basement rocks. The northeasterly section near Moreno consists of alluvium up to about 850 feet in depth, over undifferentiated granitic basement rocks.

The Perris South I and Perris South II subbasins consist of alluvium at depths ranging from a few hundred to 1,000 feet, extending southerly, through the mid Perris Valley and into the Menifee subbasin to the south. The base of the aquifer consists of tonalite and granodiorite basement rocks. Mountains composed of tonalite and granodiorite basement rocks bound the southwestern and southeastern area. Clays and gravels are in the central and southern sections, with waterbearing sediments beginning at a depth of 100 feet.

Table 4-1 summarizes available well test data and aquifer characteristics (California Department of Water Resources, 1978). The depth of wells in the Perris North and South subbasins is reported to range from 200 to 800 feet below ground surface (ft-bgs), with production rates ranging from 90 to about 1,000 gallons per minute (gpm). Based on interpretation of well efficiency tests, the transmissivity of these subbasins is estimated to range between 3,600 to 64,800 gallons per day, per foot (g/d/ft). Transmissivity is a measure of how well the aquifer

TABLE 4-1
AVAILABLE PUMP TEST DATA
WELL CHARACTERISTICS AND AQUIFER PROPERTIES

Basin	Number of wells	Depth of Wells (ft-bgs)			Production (gpm)			Transmissivity (gpm/ft/day)			Specific Yield		
		Low	High	Avg	Low	High	Avg	Low	High	Avg	Low	High	Avg
Perris	42	200	800	440	90	1,000	400	3,600	64,800	16,200	0.04	0.14	0.08
Lakeview	31	300	1,000	450	100	2,000	690	1,800	90,000	34,200	0.04	0.16	0.12
Winchester	9	200	600	450	100	850	300	3,600	14,400	10,800	0.04	0.11	0.09
Menifee	7	100	600	500	10	1,000	330	1,800	108,000	23,400	0.06	0.11	0.08

Source: Water Resources Evaluation of the San Jacinto Area, DWR, 1978; Plate 2, TIR 1335-11-A-2 Preliminary Evaluation of Storage Capacity and Specific Yield of Groundwater Basins in the San Jacinto Study by Area.

transmits water. Transmissivities for large municipal wells usually exceed 30,000 g/d/ft, with larger values being better. Specific yield is a measure of the aquifer's ability to store water. Specific yield is numerically equal to the fraction of the water that, after saturation, can be drained by gravity from the unit volume of the aquifer. Larger values of specific yield imply greater storage capacity and less regional drawdown. Based on well construction logs, the specific yield in the Perris subbasins is estimated to range from .04 to .14.

The Menifee Subbasins

The Menifee basin has been subdivided into the Menifee-I and Menifee-II subbasins. As with the Perris subbasins, this division is based on water quality variations and has no hydrologic significance. The Menifee-I subbasin is bounded on the North by the Perris South-II and Perris South-III subbasins; on the east by unnamed hills and the Winchester subbasin; on the south by Menifee-II subbasin and on the west by a series of extensive non-waterbearing hills and plateaus.

The Menifee-II subbasin is bounded on the north by the Menifee-I and Winchester subbasins and unnamed hills; on the east by Domenigoni Valley; and on the south by a saddle-shaped feature consisting of unnamed hills and Paloma Valley.

Alluvium, up to 900 feet in the north, extends into the Railroad Canyon area in the west and toward the east and southeast boundaries. The base of the aquifer consists of tonalite and granodiorite basement rocks. Waterbearing sediments consist of coarse gravel and sandy disintegrated coarse granite. The base of the aquifer occurs at a depth of 800 feet in the center of the valley and reaches 1,200 feet in the northern and eastern portions of the valley.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Menifee subbasins is reported to range from 100 to 600 ft-bgs, with production rates ranging from 10 to about 1,000 gpm. The transmissivity is estimated to range between 1,800 to 108,000 g/d/ft. The specific yield is estimated to range from .06 to .11.

Winchester Subbasin

The Winchester subbasin is bounded on the north by the Double Butte hills and Lakeview mountains; on the east by the Hemet subbasin; on the south by a line of unnamed hills that

separate the Winchester subbasin from Domenigoni and Menifee valleys; and on the west by Perris South-III.

The western and southern sections mainly consist of alluvium from depths of a few hundred to 1,000 feet. The base of the aquifer consists of tonalite and granodiorite along the western, southern and northern boundaries and to the north are tonalite and granodiorite basement rocks and the underlying basement tonalite and granodiorites of the surrounding mountains. Clay and gravel with uniform stratification prevail except for fine sands in the northern and southern borders. Salt Creek, a San Jacinto River tributary, crosses the subbasin from east to west, providing surface drainage.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Winchester subbasin is reported to range from 200 to 600 ft-bgs with production rates ranging from 100 to about 850 gpm. The transmissivity is estimated to range between 3,600 to 14,400 g/d/ft. The specific yield is estimated to range from .04 to .11.

Lakeview Subbasin

The Lakeview subbasin is bounded on the northwest by the Bernasconi hills; on the northeast by the San Jacinto Lower Pressure subbasin; on the southeast by the Lakeview Mountains; and on the southwest by the Perris South-I and Perris South-II subbasins. The subsurface geology consists mainly of alluvium reaching over 1000 feet in depth.

In the northeast section near the base of the Badlands, waterbearing sediments are at about 100 feet in sandy shales. Elsewhere, in the north and northeast sections, waterbearing sediments are at depths over 150 feet or more, in relatively thin strata, with clay predominating. The central and southern sections are clays and gravels with waterbearing sediments occurring at 100-foot depths or more.

Table 4-1 summarizes available well test data and aquifer characteristics. The depth of wells in the Lakeview subbasin is reported to range from 300 to 1,000 ft-bgs with production rates ranging from 100 to about 2,000 gpm. The transmissivity is estimated to range between 1,800 to 90,000 g/d/ft. The specific yield is estimated to range from .04 to .16.

San Jacinto Lower Pressure Subbasin

The San Jacinto Lower Pressure subbasin is bounded by the San Jacinto Mountains on the east, Bridge Street on the south, the Casa Loma fault on the west, and the westerly line of Range 2 West on the north. This subbasin has alluvium to about 1,200 feet deep, is comprised mostly of clays and silt and produces little water. The transmissivity of the subbasin has not been characterized.

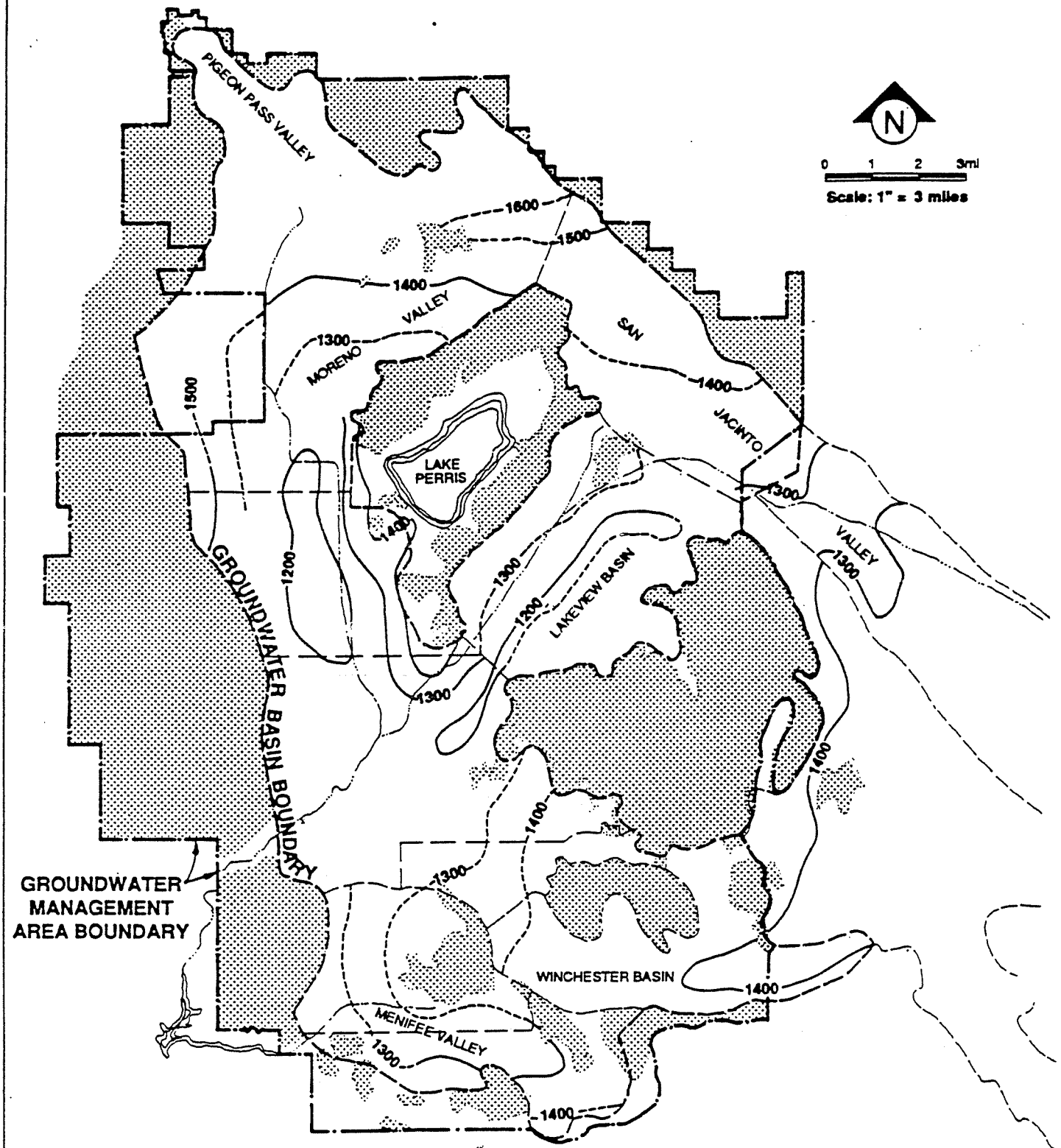
GROUNDWATER HYDROLOGY OF THE WEST SAN JACINTO BASIN

Groundwater Levels and Movement

Historically, the movement of groundwater generally followed the land surface profile toward and along the San Jacinto River and Salt Creek. Groundwater intersected the ground surface in San Jacinto Creek as the creek left the Perris South-II subbasin, and where Salt Creek exited the Menifee-I subbasin. The natural groundwater flow pattern has been altered by groundwater production.

Figure 4-3 is a groundwater elevation map for the West San Jacinto Groundwater basin area that corresponds to Spring 1974 conditions (California Department of Water Resources, 1978). Figure 4-4 is a comparable map for 1993. In 1974 there was subsurface flow from the San Jacinto Lower Pressure and Perris South I subbasins into Lakeview subbasin indicating that groundwater production in the Lakeview subbasin was large enough to reverse the historical groundwater flow direction from Lakeview to Perris South II subbasins. Groundwater originating in Perris North subbasin flowed into the San Jacinto Lower Pressure and Perris South subbasins. Groundwater in Perris South I flowed south to Perris South II. Groundwater in the Menifee subbasins and Winchester subbasin flowed north into Perris South II and Perris South III respectively. The groundwater from the Hemet subbasin flowed west into the Winchester subbasin.

Flow patterns have changed slightly in the intervening period of 1974 to 1993. Currently, groundwater continues to flow from the San Jacinto Lower Pressure and Perris South II subbasins into Lakeview subbasin; and from the Perris North subbasin into the Perris South I subbasin and continuing to Perris South II. The differences are as follows: there is a groundwater divide in the Menifee subbasin with some groundwater flowing north into Perris



LEGEND:

NONWATER-BEARING PORTION

1200 CONTOURS IN FEET BASED ON NEARBY DATA

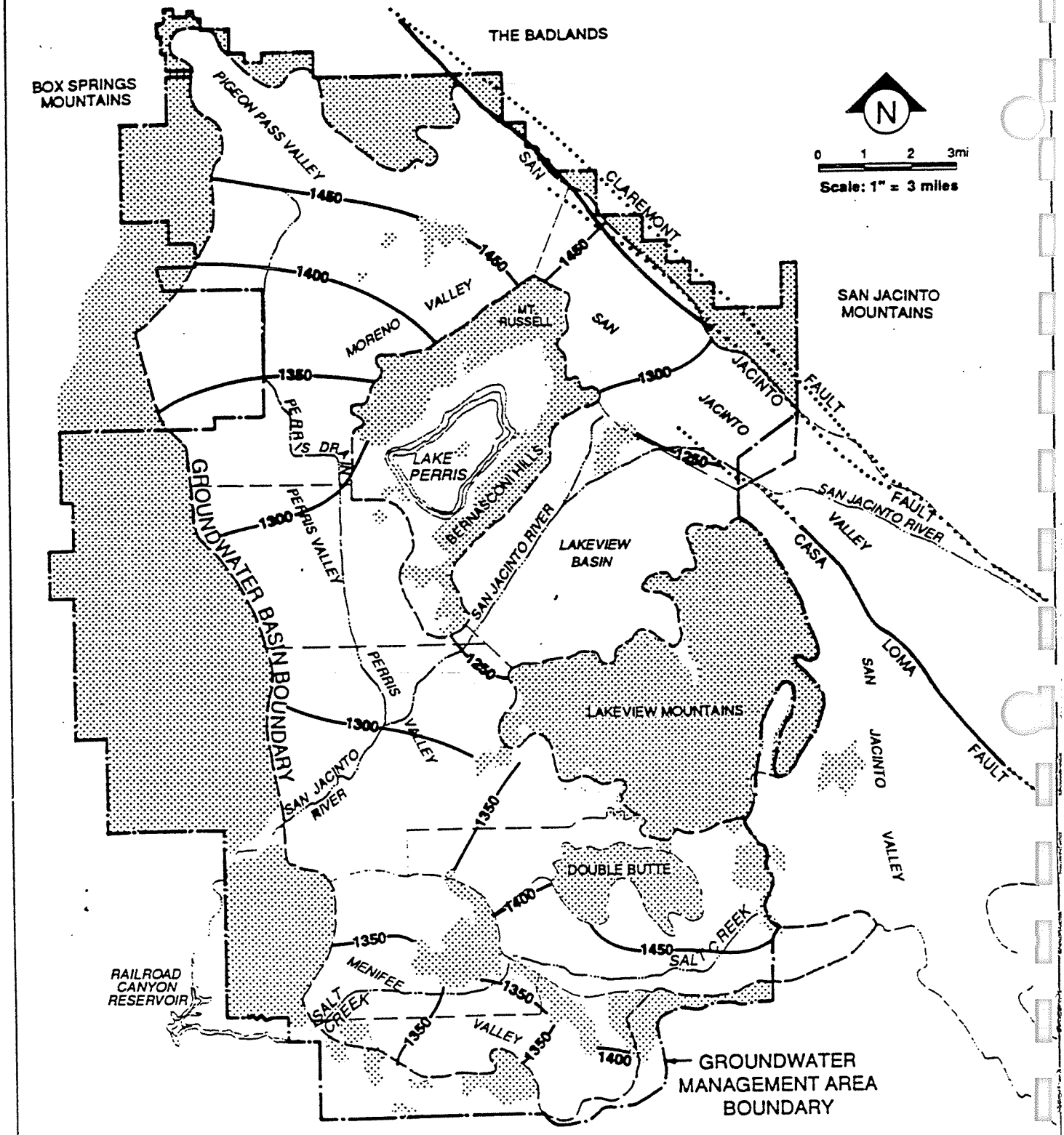
INFERRED CONTOURS

Figure 4-3

GROUNDWATER ELEVATION MAP, 1974

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

Mark J. Wildermuth
Water Resources Engineer



LEGEND:

- NONWATER-BEARING PORTION
- KNOWN FAULTS
- INFERRED OR CONCEALED FAULTS
- —1450— CONTOURS IN FEET BASED ON NEARBY DATA

Figure 4-4

GROUNDWATER ELEVATION MAP, 1993

Mark J. Wildermuth
Water Resources Engineering

South II subbasin, the remainder to a pumping depression in the Menifee II subbasin; groundwater in the Winchester subbasin flows northwest into the Perris South III subbasin and to the east into the Hemet subbasin.

The groundwater elevation changes between 1974 and 1993 are as follows:

San Jacinto Lower Pressure	-50 to -100 feet
Perris North	generally unchanged
Perris South I	+50 to +100 feet
Perris South II	+50 to +100 feet
Perris South III	+25 to +50 feet
Menifee I	+50 feet
Menifee II	+50 feet
Winchester	+25 to +50 feet
Lakeview	slightly less

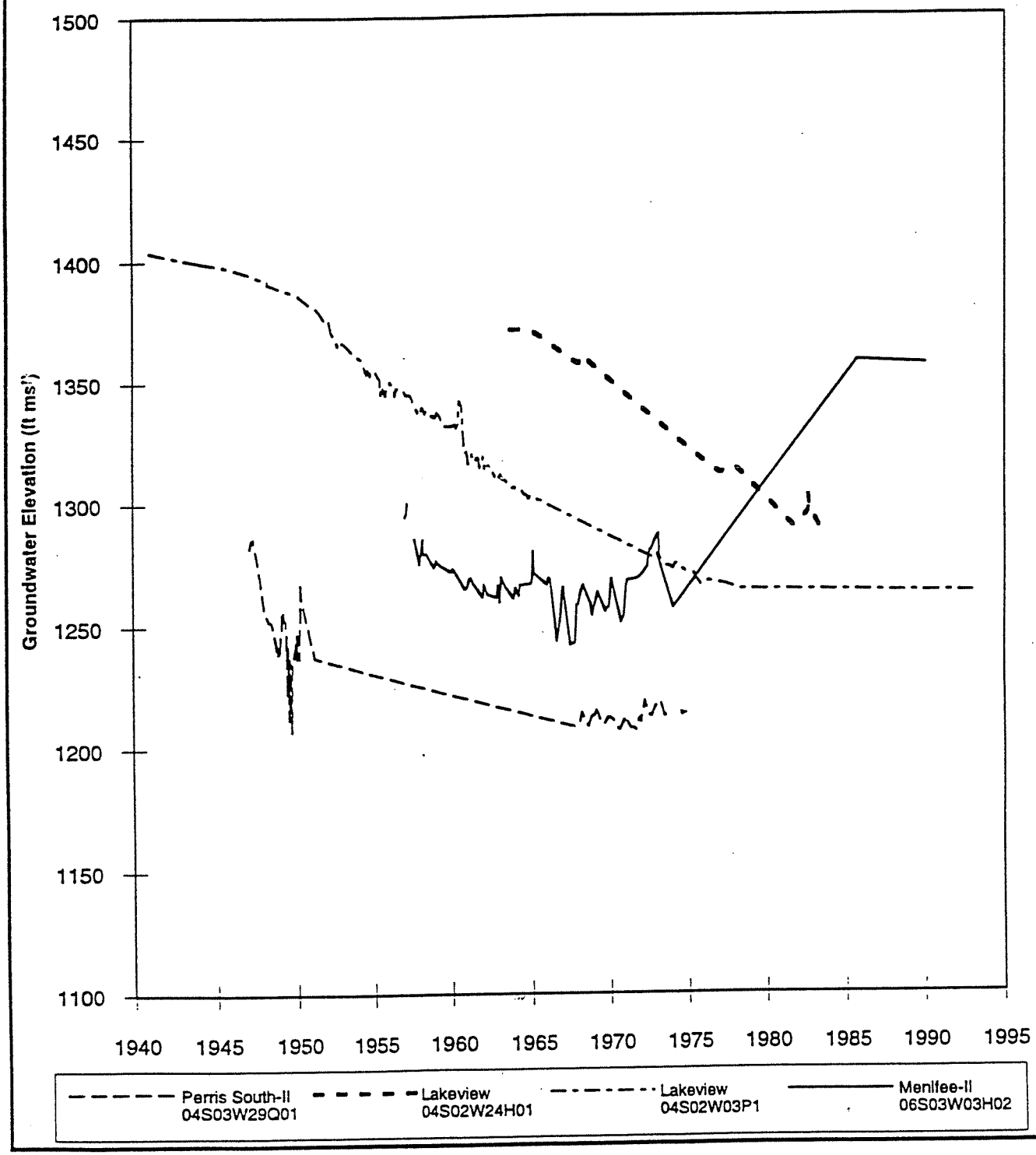
Generally, water levels will fluctuate both seasonally and on a long-term basis. Records of water levels in wells for the last 45 years generally indicate that the water table declined during the period of 1945 to the mid-seventies and recovered somewhat from the mid-1970's to the present. This long term trend was caused by a drought period that occurred from the mid 1940's to 1977, which was followed by an extremely wet period from 1978 to 1983. Agricultural use of groundwater has declined over the last twenty years without a concurrent increase in domestic groundwater usage.

Water levels are usually higher in the winter and spring months, when precipitation is greatest and there is less pumping than in the summer and fall months. When water levels in an area are declining from year to year, this indicates that more ground water is being removed from the area than is being replenished. Water levels were declining on a yearly basis through the mid 1970's. Groundwater elevation time-histories for selected wells are shown in Figure 4-5 for the Perris, Lakeview and Menifee subbasins; and Figure 4-6 for the Winchester and San Jacinto Lower Pressure subbasins. These hydrographs indicate the degree of groundwater level fluctuations that can occur in groundwater levels over the long term and seasonally.

Groundwater Hydrology

The occurrence and quality of groundwater in the West San Jacinto Basin groundwater management area are directly affected by the volume and quality of the water that recharges the area.

FIGURE 4-5 GROUNDWATER ELEVATION IN PERRIS, LAKEVIEW AND MENIFEE SUBBASINS



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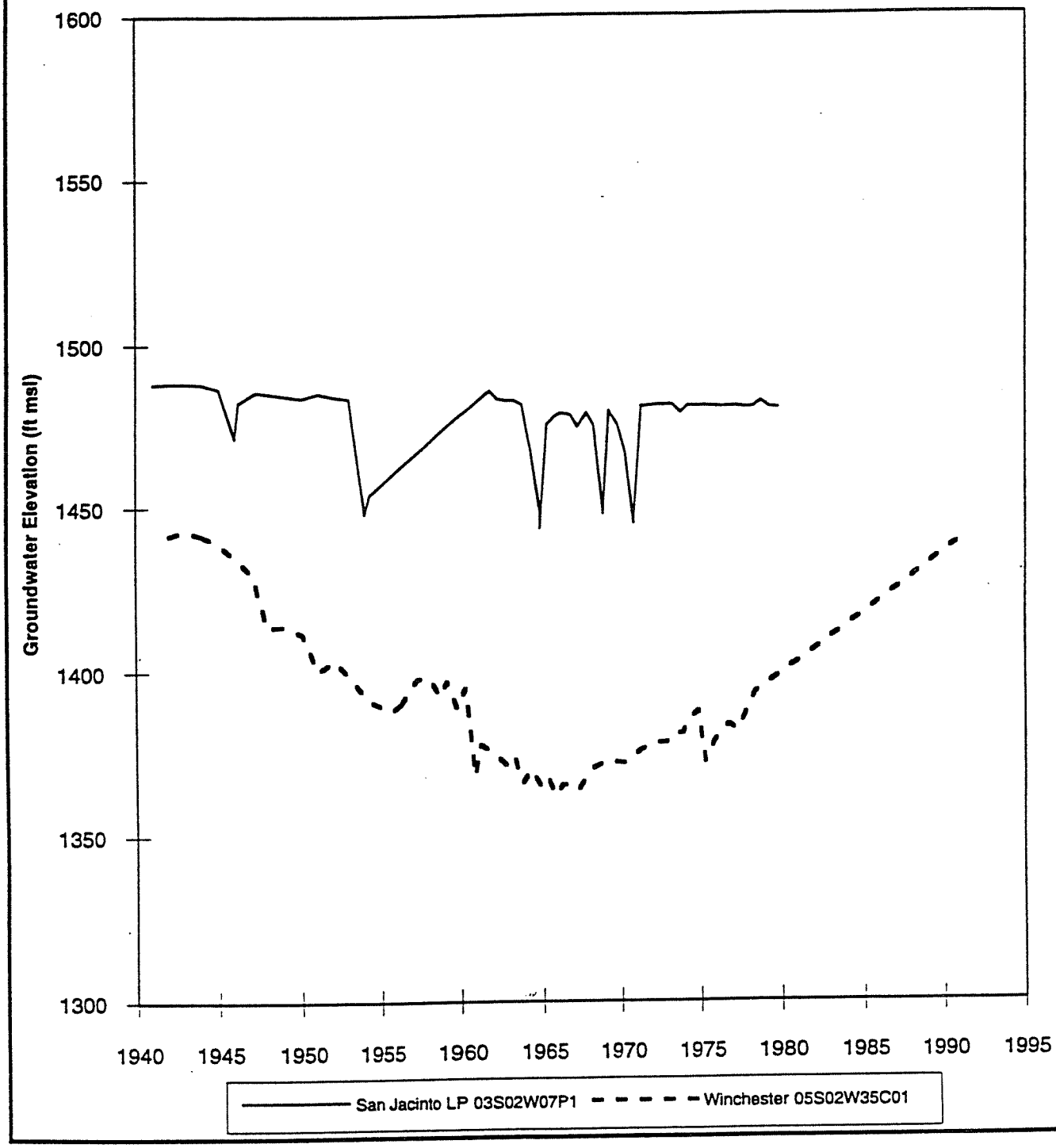
Mark J. Wildermuth
Water Resources Engineer

FIGURE 4-6 GROUNDWATER ELEVATION IN SAN JACINTO AND WINCHESTER SUBBASINS



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Water Resources Engineer

Recharge Components. Recharge in the management area consists of the following hydrologic components:

- deep percolation of stormflows
- deep percolation of precipitation
- deep percolation of applied water
- artificial recharge of imported water
- subsurface inflow from adjacent groundwater basins; and
- subsurface inflow from adjacent non-groundwater areas.

Estimates of these components were made by Water Resources Engineers in 1973 (Water Resources Engineers, 1973) and were updated in 1988 (Camp, Dresser & McKee, 1988). Table 4-2 lists the average annual value for each of these recharge components for year 2000 land use conditions for each subbasin. Values for Perris South-I, Perris South-II and Perris South-III are aggregated into Perris South. The Menifee subbasins have also been aggregated into one subbasin. These data were used in the 1994 Water Quality Control Plan (Basin Plan) developed by the Santa Ana Regional Water Quality Control Board (Regional Board). These components are described below.

Streambed Percolation. Stormflow percolation consists of percolation of stormflow in unlined channels and spreading grounds. The major unlined streams in the management area are the San Jacinto River, Perris Valley drain and Salt Creek. Table 4-2 contains estimates of stormflow percolation for each subbasin. Long term average stormflow percolation varies from about 300 acre-ft/yr for the Menifee subbasin, to a high of about 3,500 acre-ft/yr for the Perris North subbasin. The total stormflow percolation for the management area averages about 8,700 acre-ft/yr.

Percolation of Precipitation. Deep percolation of precipitation occurs when precipitation exceeds soil moisture demand. Soil moisture demand is the total water necessary to fully wet the soil and satisfy consumptive requirements of local vegetation. In most years, precipitation will not directly recharge groundwater unless the soil is kept wet from high precipitation and irrigation. Figure 4-7 shows the average annual precipitation in the management area. The average annual

TABLE 4-2
HYDROLOGIC COMPONENTS OF THE WEST SAN JACINTO BASINS
YEAR 2000 CONDITIONS PER BASIN PLAN
(acre-ft/yr)

Hydrologic Components	Subbasin						Total for West San Jacinto Basin
	Lakeview	Menifee	Perris North	Perris South	San Jacinto Lower Pressure	Winchester	
Inflow Components							
Stream Bed Percolation	1,200	300	3,500	1,600	1,000	1,100	8,700
Percolation of Precipitation	1,600	1,200	1,100	1,200	900	400	6,400
Imported Water Recharge	0	0	0	0	0	0	0
Local Stream Flow Diverted for Recharge	0	0	0	0	0	0	0
Subsurface Inflows from Mountain Boundaries	1,500	0	1,300	0	0	0	2,800
Deep Percolation of Applied Water	2,500	3,200	13,600	10,000	1,400	1,500	32,200
Municipal Wastewater	0	1,400	5,800	4,500	0	200	11,900
Irrigation	2,500	1,800	7,800	5,500	1,400	1,300	20,300
Subtotal Inflow	6,800	4,700	19,500	12,800	3,300	3,000	50,100
Outflow Components							
Subsurface Outflows to	0	0	0	0	800	1,200	2,000
Outside of WSJ Area	0	0	0	0	800	1,200	2,000
Groundwater Production(1)	4,000	0	2,300	1,400	500	0	8,200
Subtotal Outflow	4,000	0	2,300	1,400	1,300	1,200	10,200
Summary Statistics							
Approximate Net Inflow (natural safe yield)	6,800	3,300	13,700	8,300	2,500	1,600	36,200
Approximate Net Inflow plus Intentional Wastewater Recharge	6,800	4,700	19,500	12,800	2,500	1,800	48,100
Volume of Groundwater in Storage	283,000	56,000	123,000	248,000	382,000	36,000	1,128,000
Storage Capacity	515,000	101,000	347,000	402,000	391,000	41,000	1,797,000

Source - All hydrologic components from Basin Planning Model projections (JMM, 1991) except for groundwater production which was estimated from data in Table 4-3 and EMWD; and intentional wastewater recharge which came from EMWD (EMWD,1993).

(1) Excludes groundwater production from individual residences where production is less than 25 acre-ft/yr; groundwater production estimates based on land use are much higher and are projected to be about 26,600 acre-f/yr.

(2) Subtotal excludes subsurface flows between subbasins within the West San Jacinto Basin.

Mark J. Wildermuth
Water Resources Engineer

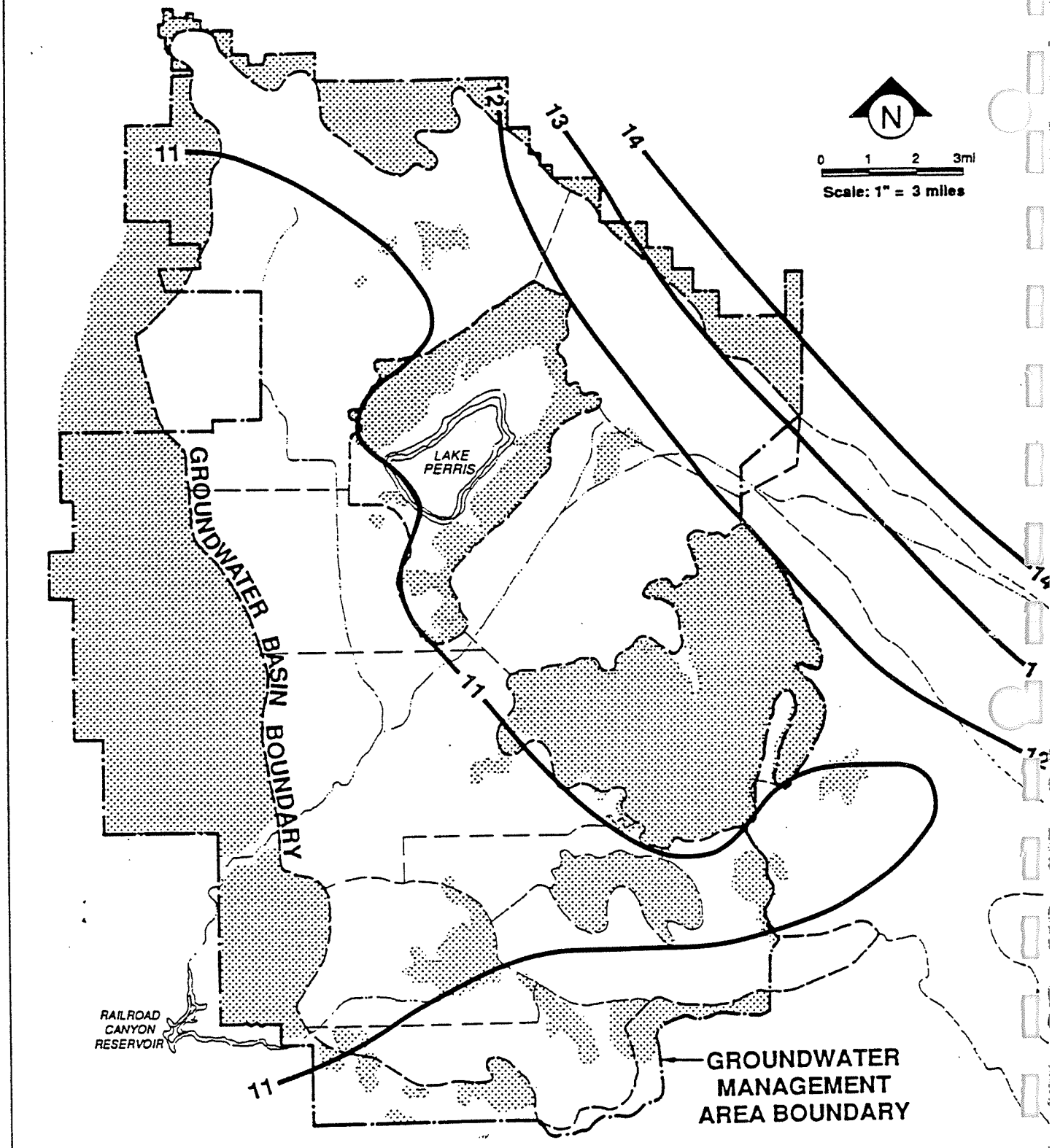

Figure 4-7

AVERAGE ANNUAL PRECIPITATION IN GROUNDWATER MANAGEMENT AREA

LEGEND:

NONWATER-BEARING PORTION

—11— EQUAL PRECIPITATION IN INCHES (Snowfall Converted to Equivalent Rainfall)

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

Mark J. Wilde... Water Resources E...

precipitation in the management area ranges between 10 to 12 inches per year. By contrast, the potential evapotranspiration in the management area is about 50 inches (California Department of Water Resources, 1978). Deep percolation of precipitation will occur in wet years, during periods of very high precipitation. In the management area, deep percolation of precipitation varies from about 400 acre-ft/yr in the Winchester subbasin, to a high of about 1,600 acre-ft year in the Lakeview subbasin. The long term deep percolation of precipitation for the management area is about 6,400 acre-ft/yr.

Deep Percolation of Applied Water. The deep percolation of applied water includes recharge from percolation ponds at municipal water plants, septic and irrigation return flows. Recharge from municipal wastewater plants, in order of magnitude, occurs in Perris South (from the Sun City and Perris reclamation plants), Perris North (from the Moreno Valley reclamation plant), and Winchester subbasins (from the Rancho Temecula reclamation plant). The annual recharge of reclaimed water in the management area is projected to be about 11,900 acre-ft/yr (Eastern Municipal Water District, 1993).

The deep percolation of irrigation ranges from about 1,300 acre-ft/yr in the Winchester subbasin, to 7,800 acre-ft/yr in the Perris North subbasin. The long term deep percolation of irrigation and septic tank returns for the management area is about 20,300 acre-ft/yr.

The deep percolation of applied water from reclamation plants, irrigation returns and septic tank disposal ranges from about 1,400 acre-ft/yr for the San Jacinto Lower Pressure subbasin, to about 13,600 acre-ft/yr for the Perris South subbasin.

Subsurface Inflow . Subsurface inflow along mountain boundaries is defined as the sum of subsurface inflows from the mountain boundaries plus runoff that percolates to groundwater along the mountain - aquifer contact. Subsurface inflow is projected to be about 2,800 acre-ft/yr.

Subtotal Inflow. The total inflow or recharge to the management area ranges from a low of 3,000 acre-ft/yr for the Winchester subbasin, to a high of about 19,500 acre-ft/yr for the Perris South subbasin. The total of all recharge into the management area is about 50,200 acre-ft/yr.

Outflow Components. Outflow from the management area consists of the following hydrologic components:

- ❑ subsurface outflow to areas outside the management area;
- ❑ groundwater production; and
- ❑ consumptive use from riparian vegetation.

Table 4-2 lists the average value for each of these recharge components for year 2000 land use conditions for each subbasin. These components are described below.

Subsurface Outflow. Subsurface outflow to areas outside the management area ranges from a low of zero for the Lakeview Menifee, Perris North and Perris South subbasins, to a high of about 1,200 acre-ft/yr for the Winchester subbasin. The total water lost to subsurface outflow is about 2,000 acre-ft/yr in the management area.

Groundwater Production. Groundwater production data was obtained for the period 1987 through 1991, the last five year period for which the State Water Resources Control Board (SWRCB) had compiled records of reported groundwater production. These data are listed in Table 4-3. Actual groundwater production is significantly larger because some groundwater producers do not report their groundwater production to the SWRCB. Groundwater production, while a hydrologic component, is omitted from the table because it is unknown. The safe yield estimate shown in Table 4-2 is based on total inflows minus non pumping outflows.

Losses to Riparian Vegetation. Losses to riparian vegetation are negligible. In the predevelopment past, uptake of groundwater by riparian vegetation was probably large, but has dropped to insignificance because of agricultural land development and lower groundwater levels.

Subtotal Outflow. The total outflow in the basin, from all sources, ranges from a low of 1,300 acre-ft/yr for the San Jacinto Lower Pressure subbasin, to a high of 4,600 acre-ft/yr for the Menifee subbasin. The total outflow for the management area is about 14,800 acre-ft/yr.

Volume of Groundwater in Storage. The volume of groundwater in storage was estimated from the Basin Planning Model simulations used in the 1993 Basin Plan. These estimates are listed in Table 4-2 and correspond to the year 2000. The volume of groundwater in storage is estimated as the product of the thickness of saturated sediments, times the specific yield, times the area of saturated sediments. The volume of groundwater in storage ranges from about 36,000

TABLE 4-3
HISTORICAL GROUNDWATER PRODUCTION

User	State Well ID	Reported Groundwater Production (acre-ft/yr) 1987	1988	1989	1990	1991
		Lakeview Subbasin Production				
Hammerschmidt	4S/2W 07J	750	750	750		
Monte	4S/2W 10C		600.3	792	653.4	428.1
Monte	4S/2W 09A	579	600.4	201	507.2	26.8
Nuevo Water Co.	4S/2W 18A	527	580.5	780.6	720	382.7
Nuevo Water Co.	4S/2W 18B	522.6	568.3	520	407	777.5
Nutriline	4S/2W 08Q	83	100.1	102.4	124.8	70
Nutriline	4S/2W 08K	53.7	120.6	102.8	120	130
Nutrilite	4S/2W 08	361.6	1199.2	1166.9	1132.1	980
Verger	4S/2W 10B	724		620	600	510
Verger	4S/02W 10A	440		430	420	350
Total Annual Production for Lakeview Subbasin		4,041	4,519	5,466	4,685	3,655
		Perris North Subbasin Production				
E.G.M.W.C.	3S/3W 06N	13.8	12.5	77.6	1.1	0.3
EMWD	3S/3W 6D	6176	763	613.8	601.5	231.3
Knox	3S/3W 30Q	200				3.6
Schori	3S/3W 31Q			750		
UCR	3S/3W 21C	39.9	56.5	71.5	34.1	61.8
UCR	3S/3W 22D	266.5	325.5	181.4	276.3	266.8
UCR	3S/3W 21A	35.9	71.4	30.9	42.3	46
Warmington	3S/3W 21 F1		847		845	
Total Annual Production for Perris North Subbasin		6,732	2,076	1,725	1,800	610
		Perris South-I Subbasin Production				
Smith	4S/3W 16N	94.8				
Total Annual Production for Perris South-I Subbasin		95	0	0	0	0
		Perris South-II Subbasin Production				
Monte	5S/3W 11M	556	558	716	318	421.2
Underwood Farms	5S/3W 14P	375	365	365	365	350
Total Annual Production for Perris South-II Subbasin		931	923	1,081	683	771
		Perris South-III Subbasin Production				
Agri-Empire	5S/3W 13A	455	442	496	441	381
Agri-Empire	5S/3W 13Q	205	168	170	164	148
Agri-Empire	5S/3W 13A1					165
Total Annual Production for Perris South-III Subbasin		660	610	666	605	694
		San Jacinto Lower Pressure Subbasin Production				
Agri-Empire	4S/2W 35D1	576		638	293	204
H. Welch	3S/2W 33R1	20.2				
Hill & Sooy	3S/2W 28Q	166	208	214	211	172
Total Annual Production for San Jacinto Lower Pressure Subbasin		762	208	852	504	376
Total Reported Groundwater Production West San Jacinto Groundwater Basin		13,221	8,336	9,790	8,277	6,106

Table 4-3, reported GW prod
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Mark J. Wildermuth
Water Resources Engineer

acre-ft for the Winchester subbasin, to about 380,000 acre-ft in the San Jacinto Lower Pressure subbasin. The total groundwater in storage in the management area is about 1,130,000 acre-ft.

The storage capacity of these subbasins is also shown in Table 4-2. The storage capacity is equal to the volume of groundwater that could be stored in the basin with a minimum 50 feet depth to water. The storage capacity of groundwater in storage ranges from about 41,000 acre-ft for the Winchester subbasin, to about 515,000 acre-ft for the Lakeview subbasin. The total storage capacity in the management area is about 1,800,000 acre-ft

Safe Yield. Two estimates of the safe yield are presented in Table 4-2. The natural safe yield of the groundwater basins is assumed equal to the net inflow and is numerically equal to the long term average inflow, minus subsurface outflow from the management area, minus the average annual percolation of reclaimed water. The natural safe yield ranges from a low of 1,600 acre-ft/yr for the Winchester subbasin, to a high of about 13,700 acre-ft/yr for the Perris North subbasin. The natural safe yield for the management area is about 36,200 acre-ft. If the percolation of reclaimed water is included in the yield, then the safe yield will range from 1,800 acre-ft/yr for Winchester subbasin, to 19,500 acre-ft/yr for the Perris North subbasin. The safe yield of the management area is about 48,100 acre-ft/yr.

GROUNDWATER QUALITY

The water quality trends in the West San Jacinto Groundwater Basin are typical of the arid southwest. There are three principle sources of water quality degradation in operation in the management area. Naturally occurring brackish groundwater occurs in the vicinity of Salt Creek in the Menifee and Winchester subbasins; and in the Perris South-II subbasin in the vicinity of San Jacinto Creek. Groundwater production patterns in these areas have caused the brackish groundwater to spread out and thus affect larger areas.

The second principle cause of water quality degradation is irrigated agriculture. The mineral content in irrigation return flows to groundwater is three to four times the mineral content of the irrigation source. The irrigation returns degrade the groundwater. If the groundwater is subsequently reused, the mineral content of the irrigation returns are further increased causing additional groundwater degradation. Groundwater will continuously degrade unless additional sources of high quality recharge are introduced to the basin.

Finally, elevated boron and fluoride levels in groundwater have been observed near faults, in particular near the Casa Loma and San Jacinto faults. Boron, fluoride and elevated groundwater temperatures are common near faults. The area degraded by these contaminants is near the Casa Loma and San Jacinto faults.

Groundwater quality descriptions are presented below for each subbasin. These descriptions are based on all groundwater quality data currently available for the management area. Most of the discussion is based on the groundwater quality descriptions developed by the DWR in *Water Resources Evaluation of the San Jacinto Area* (California Department of Water Resources, 1978). With the exception of the Menifee-I, Menifee-II and Winchester subbasins, very little new water quality data has been collected since the DWR prepared the above-mentioned report. Data collected after 1978, including a recent round of water quality sampling by the United States Geological Survey (USGS), were reviewed in detail and, where appropriate, modifications to the DWR's descriptions were developed and included herein.

The water quality discussion presented herein is limited to general minerals, nitrate and chloride due to the lack of data on heavy metals, organics and radionuclides. An inventory of the available water quality data at wells is included in Appendix B. The available water quality data base contains water quality data for about 300 wells. The average period of record for these wells is about 5 years, with 62 percent of the wells having only one water quality sample. On the average, about half of the water quality data is from before 1980 and about 72 percent before 1990. Most of the recent data was obtained from wells in the Menifee subbasins as part of EMWD's Menifee desalter studies, and groundwater quality sampling surveys by the USGS. It should be emphasized that there is practically no information on heavy metals, organics or radionuclides.

New groundwater quality data will need to be collected and a new water quality characterization of the West San Jacinto Groundwater Basin will need to be prepared in the implementation of the groundwater management plan. The need for new data will become obvious in the discussion of Sections 7 and 8. A plan to obtain these data has been incorporated into the management plan described in Section 8.

Perris North Subbasin

Figure 4-8 shows the distribution of TDS in the management area as interpreted by the DWR (DWR 1978). TDS, nitrate and the general inorganic chemistry for the Perris North subbasin is shown in Figure 4-9. Figure 4-9 is based on all available data and corresponds approximately to 1993 conditions. In the Perris North subbasin, TDS concentrations generally range from about 300 mg/L to 600 mg/L with some wells exceeding 800 mg/L. The chemical character of its water is mostly sodium chloride, probably because of the extensive irrigated agriculture. Evapotranspiration and the frequent application of irrigation water produce changes in the relative concentrations of the mineral constituents that leave more sodium and chloride in solution. Recycling of this water further concentrates these ions. The only source of dilution is the deep percolation of precipitation and stormflow which are small compared to total recharge in the subbasin (see Table 4-2).

Nitrate concentrations range from about 1 to 12 mg/L (as nitrogen) with most values between 4 mg/L to 9 mg/L. Nitrate concentrations have increased over the years as a result of fertilization practices in the valley. Figures 4-10, 4-11, and 4-12 show TDS, nitrate and chloride trends in the Perris North subbasin. Figure 4-11 suggests an increasing trend of nitrate concentration.

Most of the water ranges from soft to moderately hard. Fluoride and boron concentrations are relatively high in certain wells in the area, possibly indicating the presence of unmapped faults. For human consumption, water from some wells in the area may not meet Department of Health Services standards for nitrate and fluoride concentrations.

Perris South Subbasins

Figure 4-13 illustrates the TDS, nitrate and general inorganic chemistry of the Perris South I and Lakeview subbasins and Figure 4-14 shows the same interpretation for the Perris South II and Perris South III subbasins. Figures 4-13 and 4-14 are based on all available data and correspond approximately to 1993 conditions. The variations in TDS and nitrate concentrations in the Perris South subbasins are listed below (mg/L).

Subbasin	TDS	Nitrate (as N)
Perris South-I	500 to 1300	0.0 to 7.2
Perris South-II	640 to 14,000	0.0 to 9.0
Perris South-III	400 to 3,300	5.0 to 31

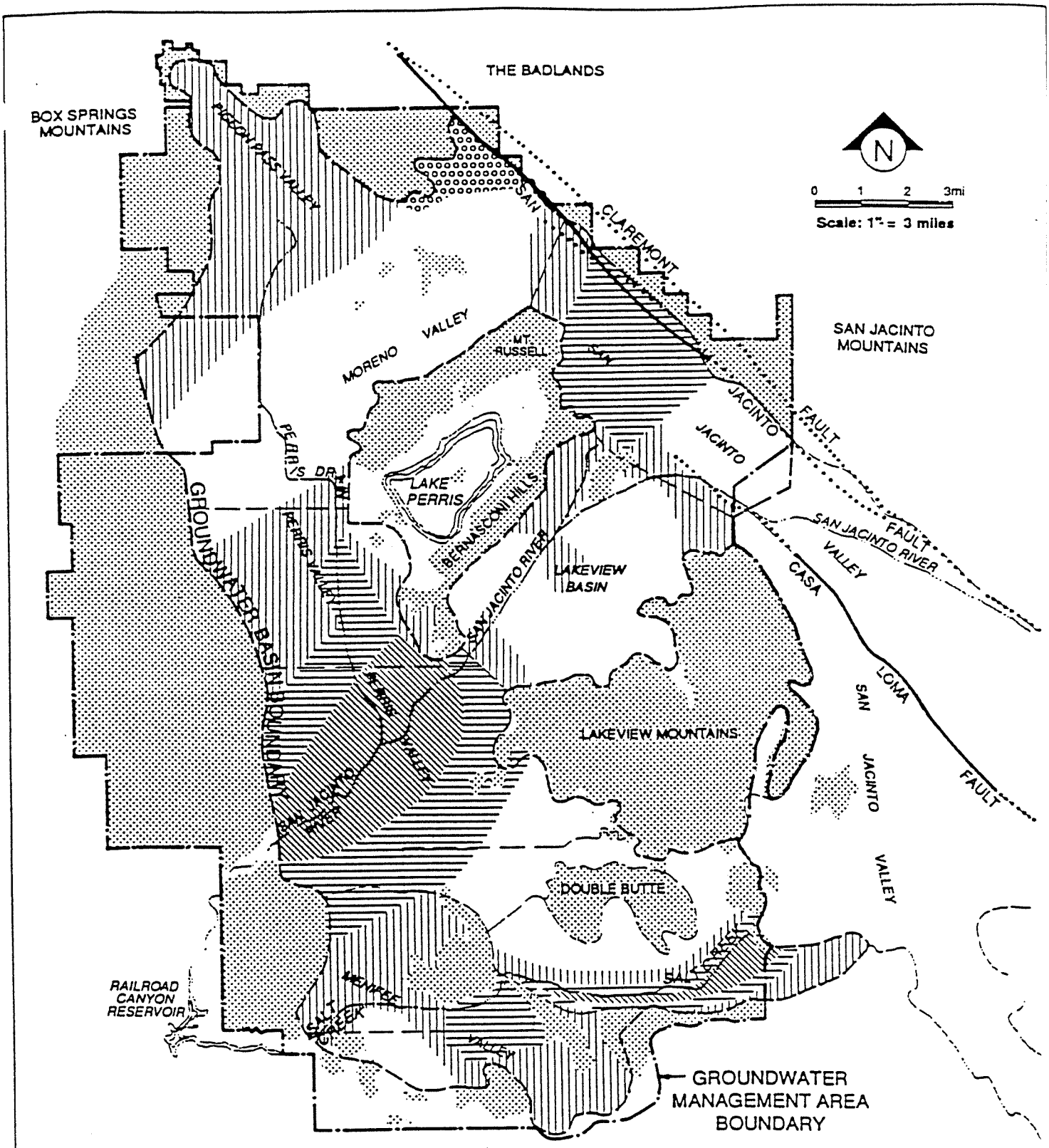

Figure 4-8
GENERAL TDS MAP, 1974

REFERENCE: DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1977.

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Water Resources Engineer

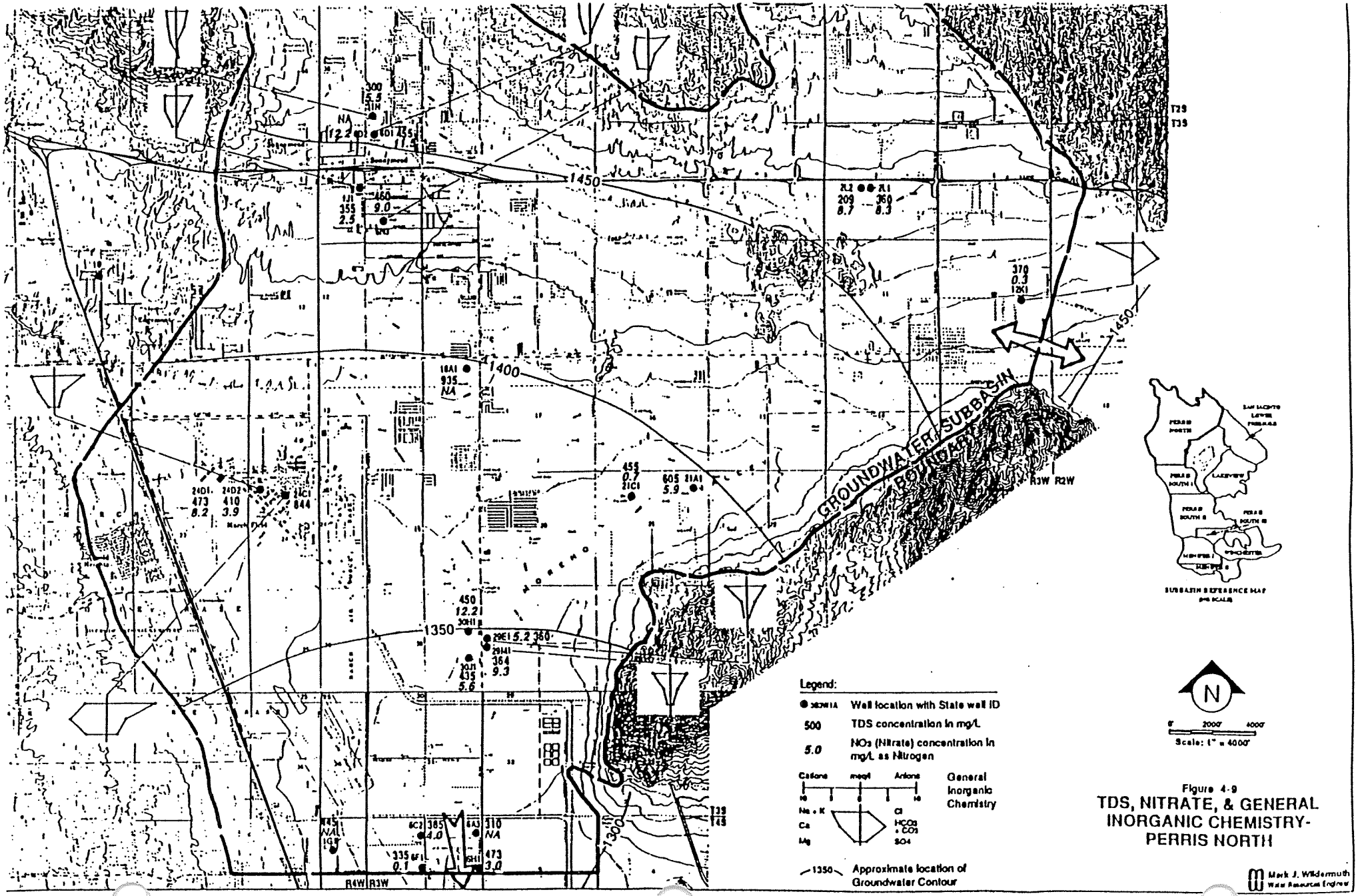
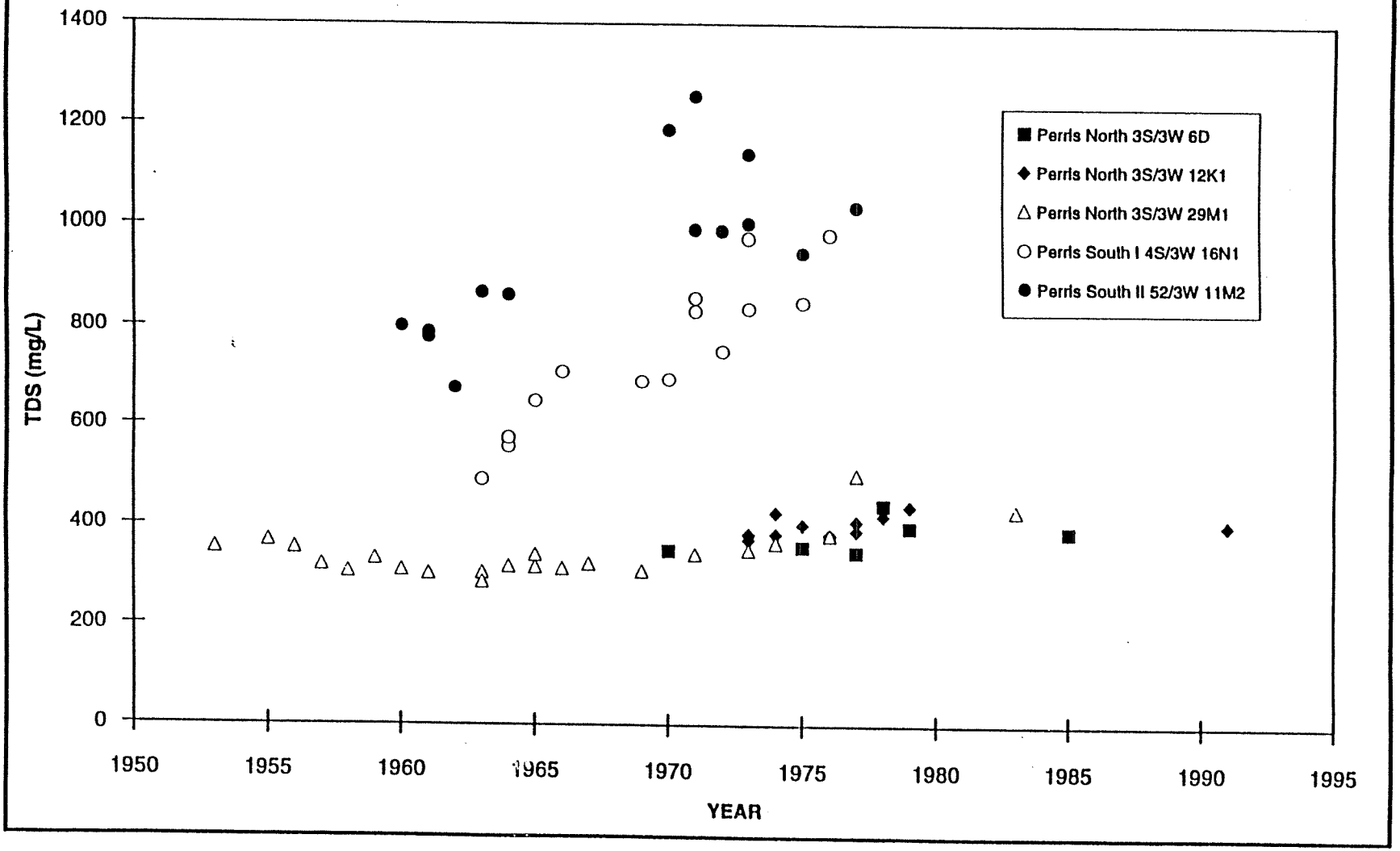


Figure 4-9

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY- PERRIS NORTH

Mark J. Wildermuth
Water Resource Engineer

FIGURE 4-10 TDS CONCENTRATION IN PERRIS NORTH AND SOUTH BASINS



TDS Plot Perris N&S
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Water Resources Engineer

FIGURE 4-11 NITRATE-N CONCENTRATION PERRIS NORTH AND SOUTH BASINS

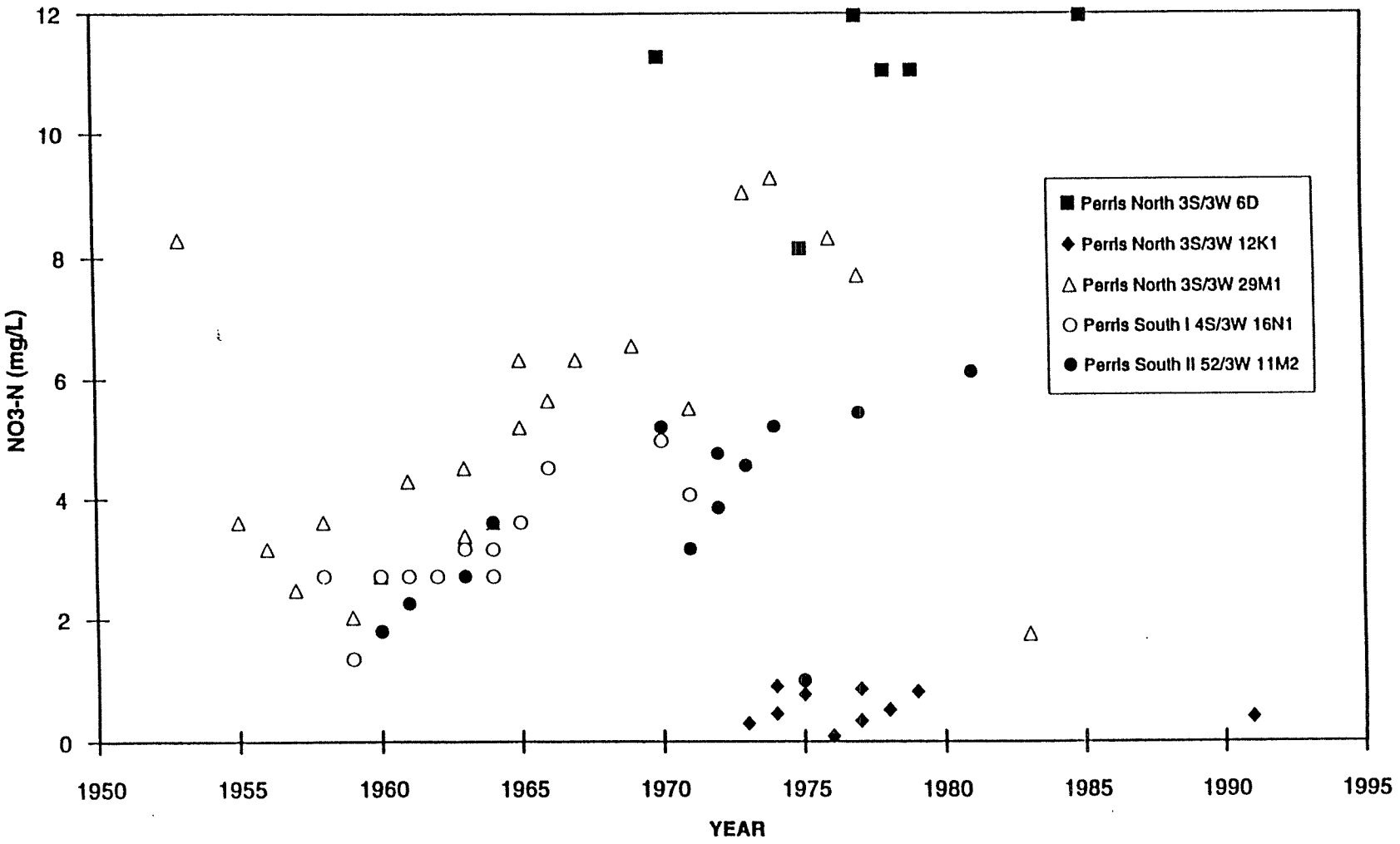
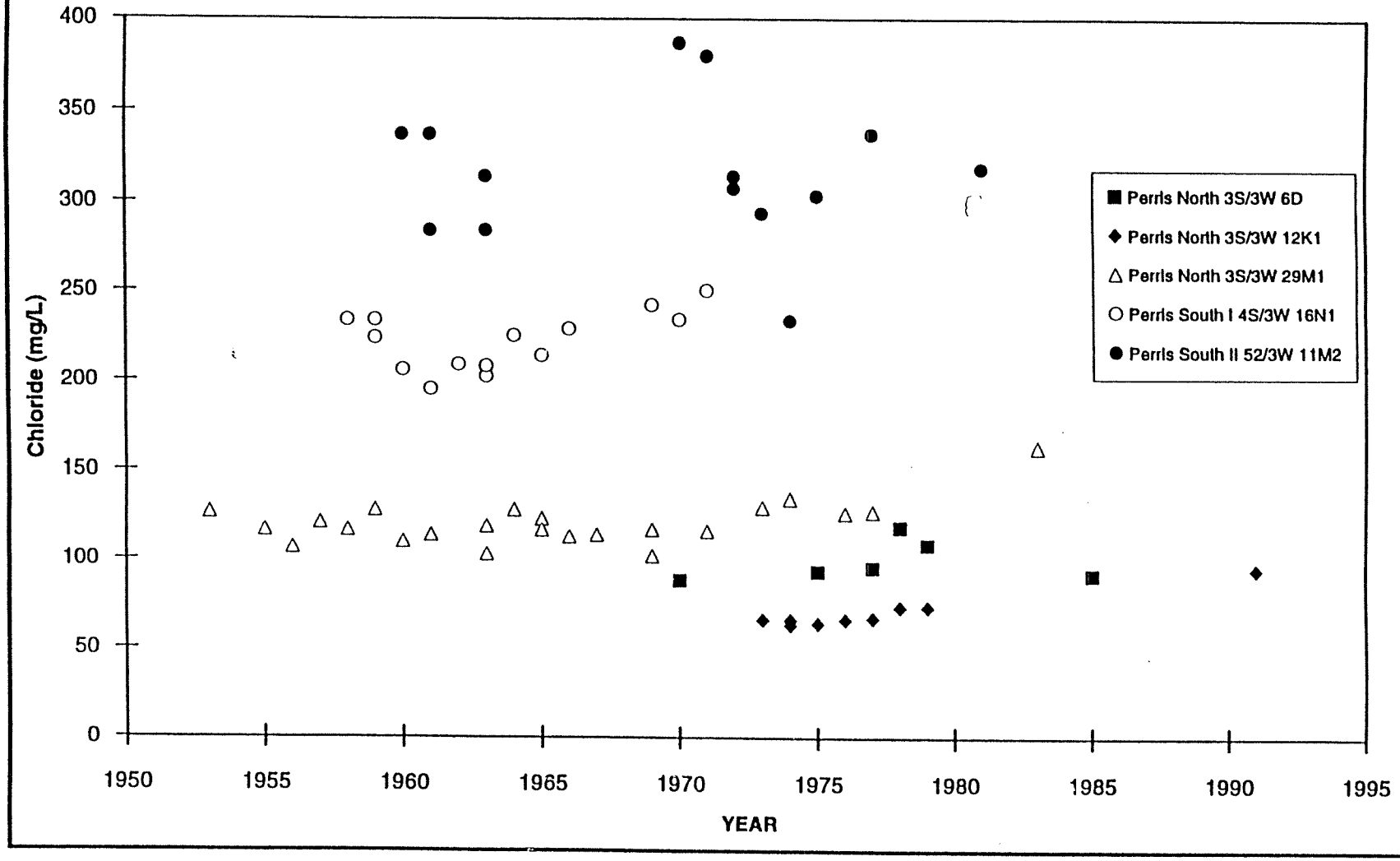


FIGURE 4-12 CHLORIDE CONCENTRATION PERRIS NORTH AND SOUTH BASINS



Chloride Plot Perris N&S
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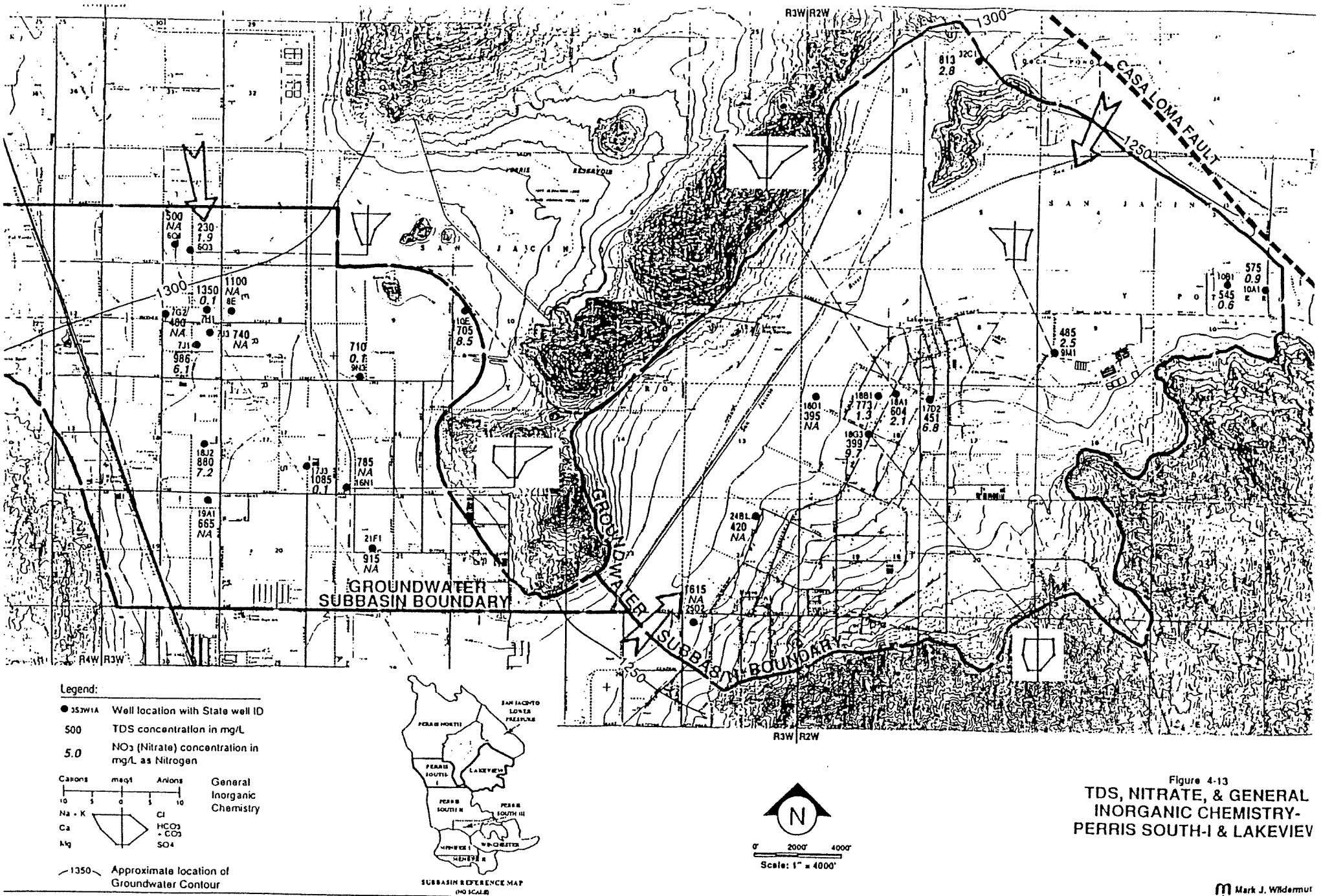

Figure 4-13
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-
PERRIS SOUTH-I & LAKEVIEV

Mark J. Wildermut
Water Resources Engine

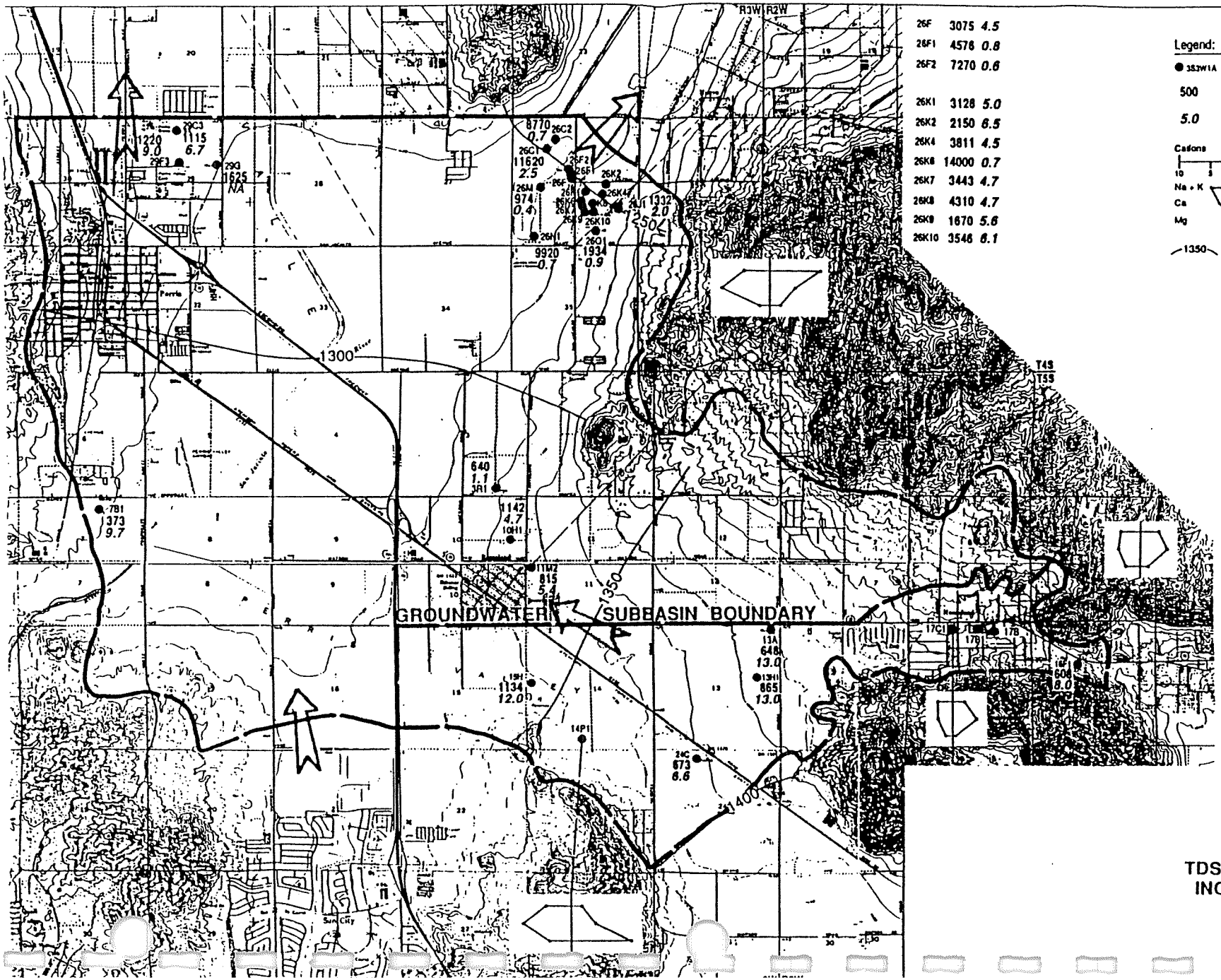

Figure 4-14

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY- PERRIS SOUTH-II & PERRIS SOUTH-III

The poorest quality water is found near the San Jacinto River in the Perris South-II subbasin. This brackish water is believed to be the result of the large evapotranspiration losses incurred because of the high water table that existed in the past. As wells were abandoned because of this brackish water, pumping increased in the areas of better quality to the north and south. As a result, brackish water has spread out toward these areas. Thus, the TDS concentration of the groundwater has increased as water levels have declined in the areas north and south of the river. Figures 4-10, 4-11, and 4-12 illustrate TDS, nitrate and chloride trends in the Perris South subbasins. Figure 4-10 shows this increase in TDS concentration. The Ski Land area has anomalously high TDS concentrations ranging from 1,700 mg/L to 14,000 mg/L.

Menifee Subbasins

Figure 4-15 illustrates the TDS, nitrate and general inorganic chemistry of the Menifee-I and Menifee-II subbasins. Figure 4-15 is based on all available data and corresponds approximately to 1993 conditions.

Groundwater flow between Menifee and the adjacent subbasins is negligible. The volume of groundwater in storage for Menifee-I and Menifee-II is relatively small and is estimated at about 56,000 acre-ft (Table 4-2). Groundwater produced in these subbasins was, and is, used for agriculture and landscape irrigation. Returns from irrigation have contributed to increased mineral concentrations in these subbasins.

Under natural conditions, groundwater flowed toward Salt Creek from all directions and from Salt Creek westward, where high groundwater caused large evapotranspiration losses and concurrent salt buildup. In time, brackish water developed in these areas and, under normal conditions, remained close to the creek. TDS concentrations throughout the basin ranged from 300 to 1,500 mg/L in 1974, and have increased to range from 800 to 3,700 mg/L.

Most groundwater in the Menifee-I and Menifee-II subbasins cannot be used for domestic supply without demineralization or blending with imported water. Agricultural usage is somewhat limited due to high chloride and sodium concentrations.

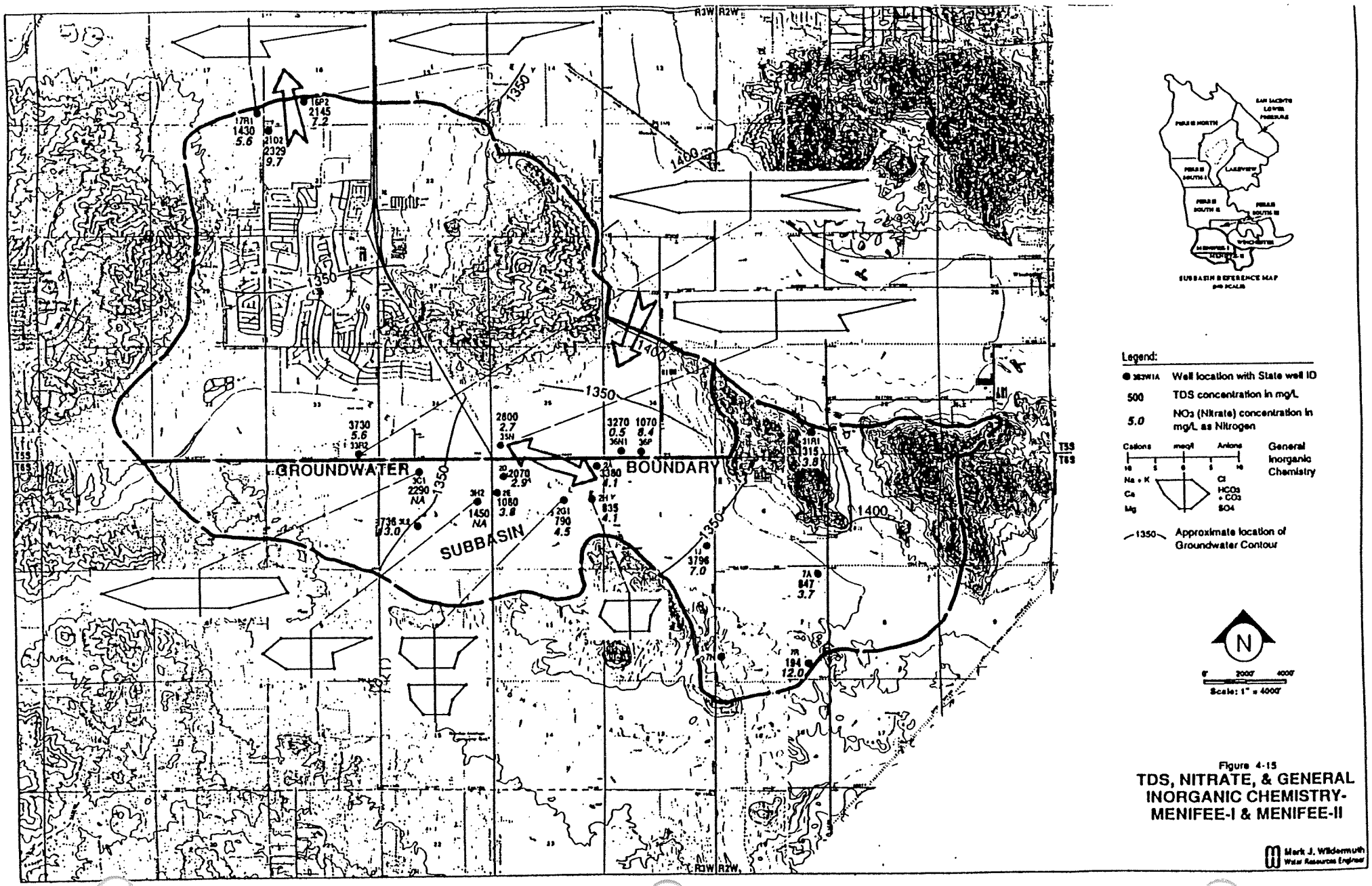

Figure 4-15

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-MENIFEE-I & MENIFEE-II

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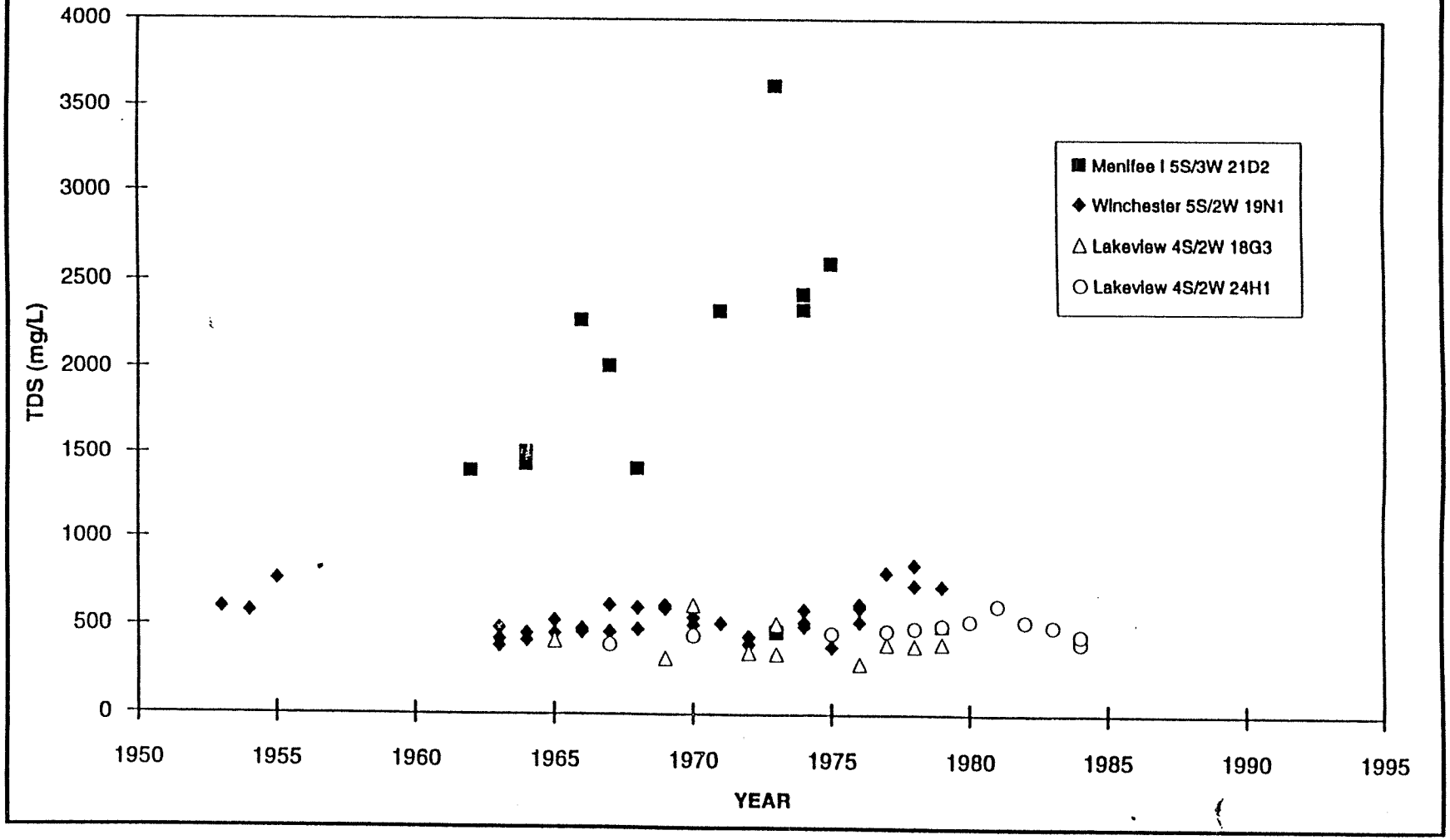
Lakeview Subbasin

Figure 4-13 illustrates the TDS, nitrate and general inorganic chemistry of the Lakeview subbasin. Figure 4-13 is based on all available data and corresponds approximately to 1993 conditions. Figures 4-16, 4-17 and 4-18 contain time histories for two wells in the Lakeview subbasin covering the period of 1957 to 1989.

The principle sources of groundwater in this basin are underflow from the San Jacinto Lower Pressure, Perris South I, Perris South II subbasins, stormflow percolation in San Jacinto Creek, and runoff from the Lakeview Mountains and Bernasconi Hills. Groundwater quality under natural conditions has been altered by a groundwater level drop of about 200 feet that has changed the direction of flow of groundwater. Groundwater flows toward Lakeview from all sides. Groundwater on the northwest and southeast sides of the basin has TDS concentrations of below 500 mg/L as a direct result of the recharge of the Bernasconi Hills and Lakeview Mountains, respectively. Brackish groundwater is entering from the Perris South-II subbasin because of lowered groundwater levels near Lakeview. The most conspicuous constituents of the brackish water are sodium and chloride. TDS concentrations range from 400 to 1,600 mg/L, with more typical values ranging from 400 to 600 mg/L. Nitrates range from 1 to 9 mg/L as nitrogen, with typical values less than 6 mg/L. Most of the groundwater in the basin is sodium chloride in character. The Casa Loma fault, which forms the eastern boundary of the basin, affects the quality of water in that area. Both boron and fluoride concentrations are relatively high near the fault and in a few other specific areas of the basin. Chloride is generally high and most of the groundwater is moderately hard.

With the exception of some instances of elevated fluoride, groundwater in the Lakeview subbasin is suitable for domestic and municipal supply. Agricultural usage is somewhat limited due to high boron and chloride concentrations.

FIGURE 4-16 TDS CONCENTRATION IN MENIFEE, WINCHESTER, LAKEVIEW BASINS



TDS Plot Men-Win-Lak
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Water Resources Engineer

FIGURE 4-17 NITRATE-N CONCENTRATION MENIFEE I, WINCHESTER, AND LAKEVIEW BASINS

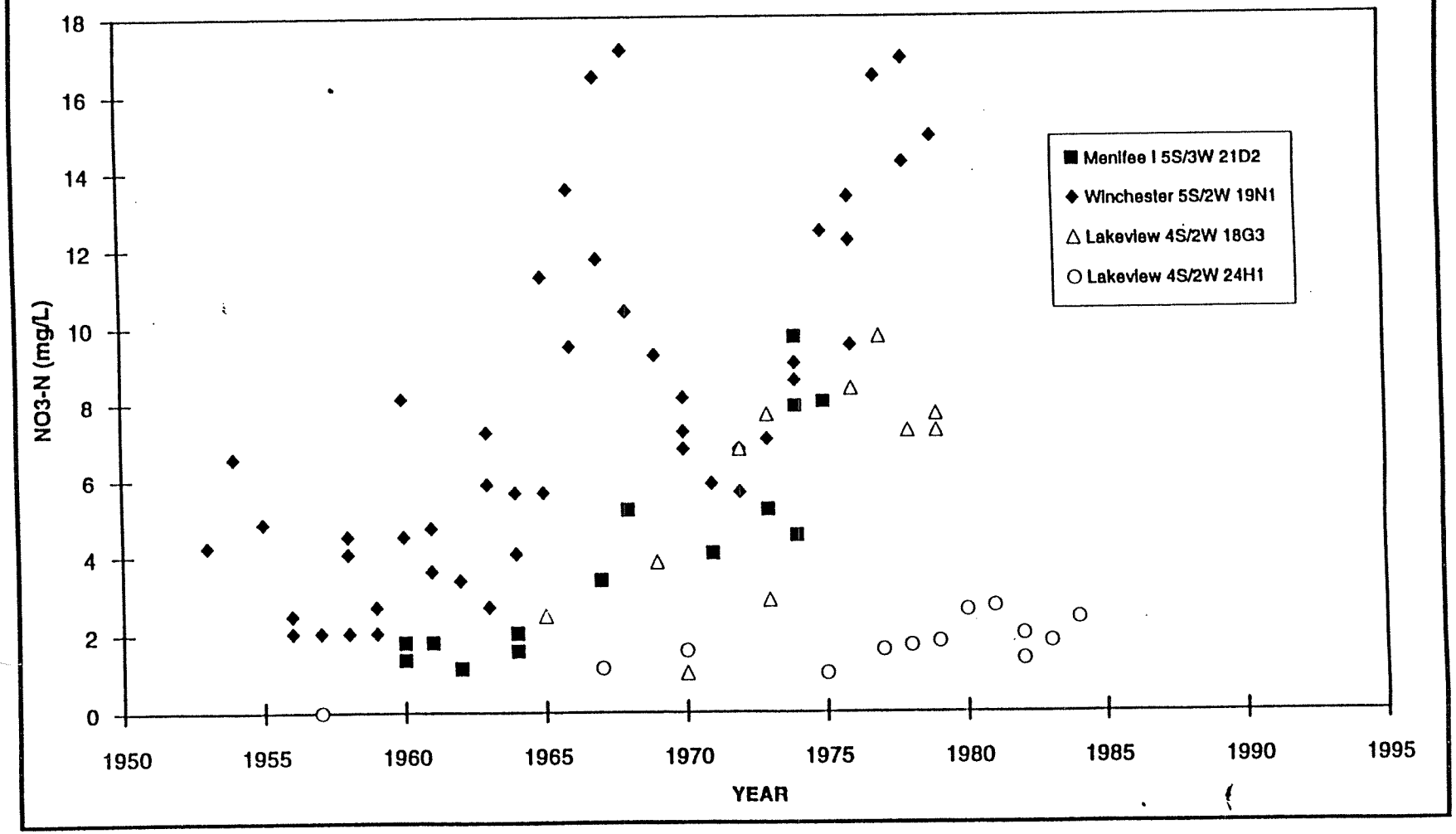
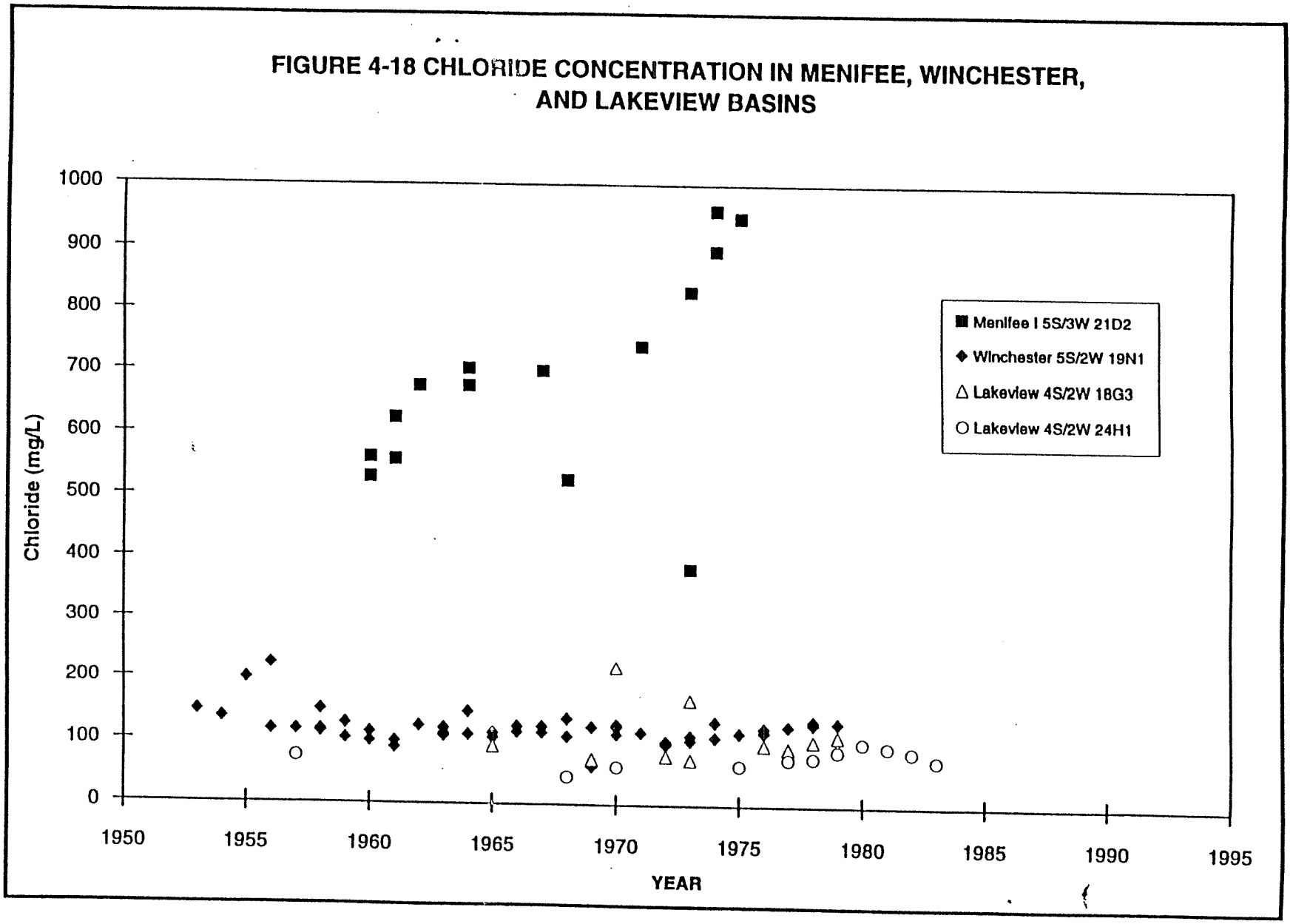


FIGURE 4-18 CHLORIDE CONCENTRATION IN MENIFEE, WINCHESTER, AND LAKEVIEW BASINS



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Winchester Subbasin

Figure 4-19 illustrates the TDS, nitrate and general inorganic chemistry of the Winchester subbasin. Figure 4-19 is based on all available data and corresponds approximately to 1993 conditions. Winchester is the smallest of the groundwater basins, with about 36,000 acre-ft in storage and capacity of about 41,000 acre-ft. TDS concentrations range from 700 to 6,400 mg/L, with more typical values ranging from 1,000 to 3,000 mg/L. Nitrates range from 1 to 51 mg/L as nitrogen, with typical values ranging from 2 to 12 mg/L. TDS mapping in Figure 4-8 (California Department of Water Resources, 1978) indicates that brackish groundwater occurs in a half-mile-wide strip along the entire length of Salt Creek. This high TDS water is probably the result of evaporite deposits caused by past high-water-table conditions.

Under natural conditions, the primary source of recharge in the Winchester subbasin was subsurface inflow from the Hemet subbasin. The TDS in the subsurface inflow from the Hemet subbasin ranged from 500 to 1,000 mg/L. Currently, the Winchester subbasin flows into the Hemet subbasin causing groundwater degradation in that basin.

TDS, hardness and, occasionally, nitrate limit the use of Winchester groundwater for domestic purposes. Some groundwater in the Winchester subbasin cannot be used for municipal supply without demineralization. Agricultural usage is somewhat limited due to high boron and chloride concentrations.

San Jacinto Lower Pressure Subbasin

Figure 4-20 illustrates the TDS, nitrate and general inorganic chemistry of the San Jacinto Lower Pressure subbasin. Figure 4-20 is based on all available data and corresponds approximately to 1993 conditions. Water quality time histories could not be developed for this subbasin due to lack of data.

TDS concentrations in groundwater typically range from 500 to 1,500 mg/L. Nitrates range from near zero to 33 mg/L as nitrogen, with typical values less than 3 mg/L. Although data in the northwestern part of the subbasin are limited, the faults in the area appear to affect nearby groundwater because high boron and fluoride concentrations are found there.

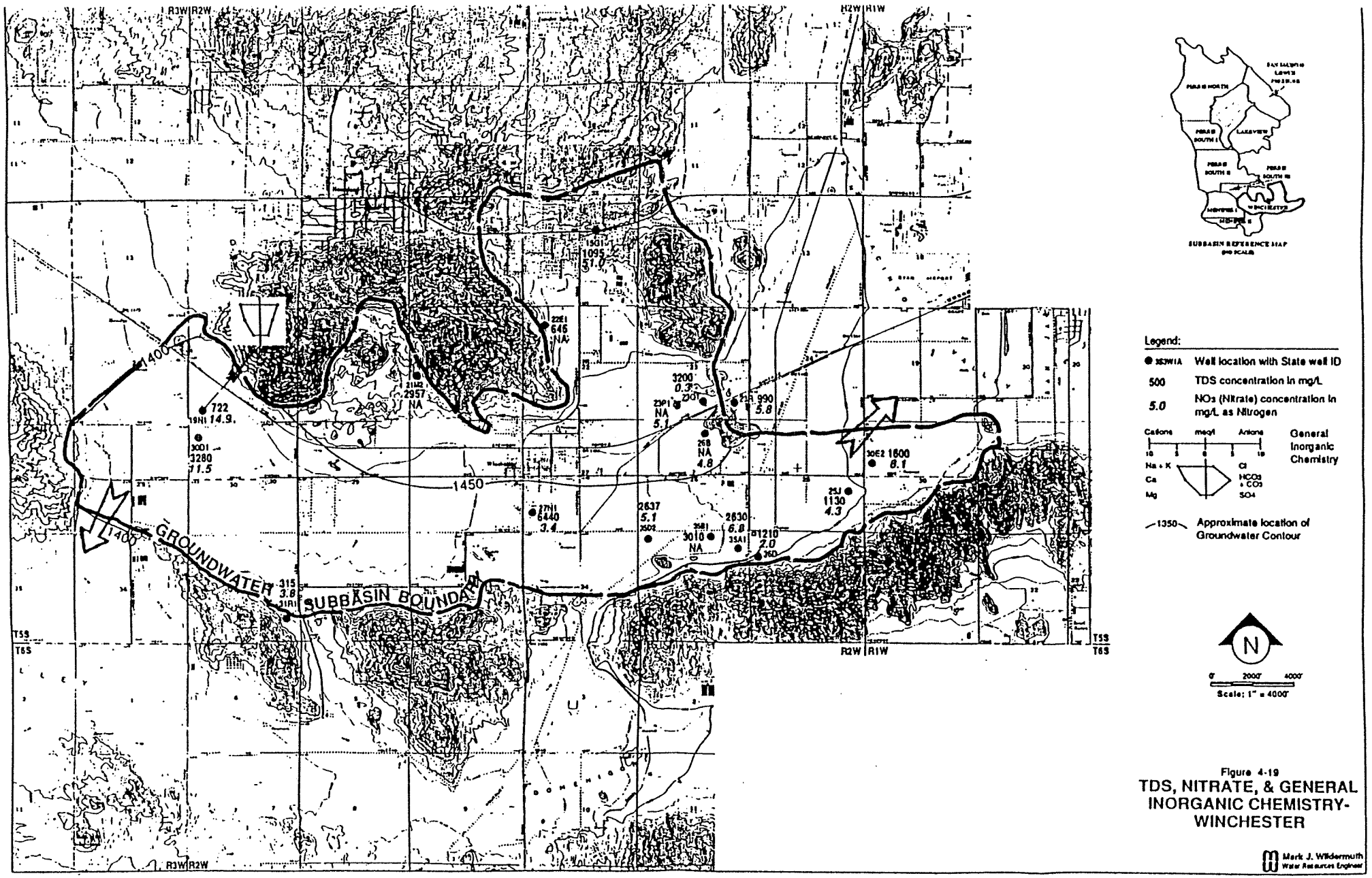

Figure 4-19
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-WINCHESTER

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Water Resource Engineer

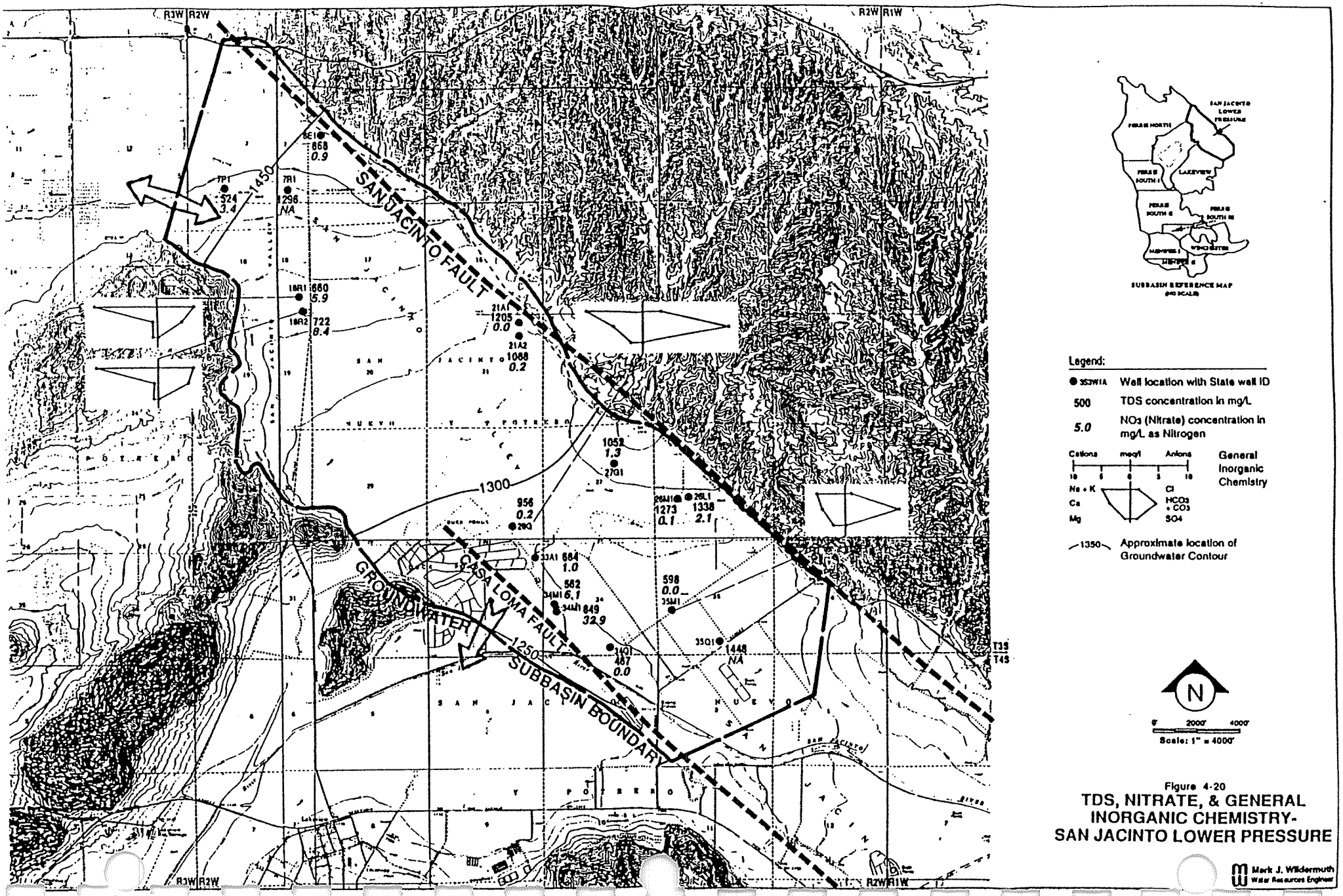

Figure 4-20

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY- SAN JACINTO LOWER PRESSURE

Mark J. Wildermuth
Water Resources Engineer

FUTURE GROUNDWATER QUALITY

Future projections of groundwater quality in the West San Jacinto Groundwater basin were prepared by SAWPA as part of the *Nitrogen and TDS Studies, Santa Ana River Watershed* (James M. Montgomery, 1989). These studies developed future projections of TDS and nitrate by subbasin for the period 1990 through 2005. These estimates, however, are based on a model that:

- has not been calibrated for TDS or nitrate;
- each subbasin is represented by only one node and thus the resolution of the analysis is crude; and
- future water supply and wastewater plans that were used in these studies are not representative of the future.

Therefore, the results are questionable and not of much value as a management tool for the West San Jacinto Groundwater Basin.

There is a need for a planning tool to estimate the groundwater level and quality response to groundwater management practices. The planning tool would consist of groundwater flow and simulation models similar to those models that were developed and that are in current use to develop the Chino Basin Water Resources Management Plan (Montgomery Watson & Wildermuth, Mark J., 1992; Montgomery Watson & Wildermuth, Mark J., 1993).

SECTION 5

SECTION 5
FUTURE WATER DEMANDS AND WASTEWATER FLOWS

WATER DEMANDS AND SOURCES OF SUPPLY

Projected Demands

Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 5-1 and shown graphically in Figure 5-1. These estimates are based on land use and population projections and projected water use rates. The projections in Table 5-1 were developed by the planning staff of EMWD and represent an update of the water demand projections developed for the 1990 Water Facilities Master Plan (Black & Veatch, James M. Montgomery, Inc., 1990). Municipal demands in the West San Jacinto Groundwater Management Area range from 47,000 acre-ft/yr in 1995 (58 percent of total demand), to 112,000 acre-ft/yr in 2010.

Agricultural demands are based on land use and are projected to decline from about 33,200 acre-ft/yr in 1995, to 31,000 acre-ft/yr in 2010. In 1990, about eight percent of the imported water served by EMWD was delivered to agricultural users. Throughout the planning period we assumed that agricultural demands would be satisfied with groundwater and reclaimed water.

Sources of Supply

The sources of supply to the West San Jacinto Groundwater Management area include imported water from Metropolitan, groundwater, and reclaimed water.

Imported Water from Metropolitan. The quality of treated imported water is generally excellent and meets all drinking water regulations. TDS in Colorado River water and, occasionally, SWP water, causes TDS concentration in wastewater to exceed the TDS limit specified for wastewater plants. The TDS concentrations in water will increase from 200 to 300

TABLE 5-1
PROJECTIONS OF MUNICIPAL AND AGRICULTURAL DEMANDS
WEST SAN JACINTO GROUNDWATER BASIN

Year	Municipal Demands(1) (acre-ft/yr)	Agricultural Demands (acre-ft/yr)
1995	47,000	33,000
2000	63,000	32,000
2005	84,000	31,000
2010	112,000	31,000

Sources: (1) EMWD Projections 8/94

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FIGURE 5-1 WATER DEMAND PROJECTIONS FOR THE WEST SAN JACINTO GROUNDWATER MANAGEMENT AREA

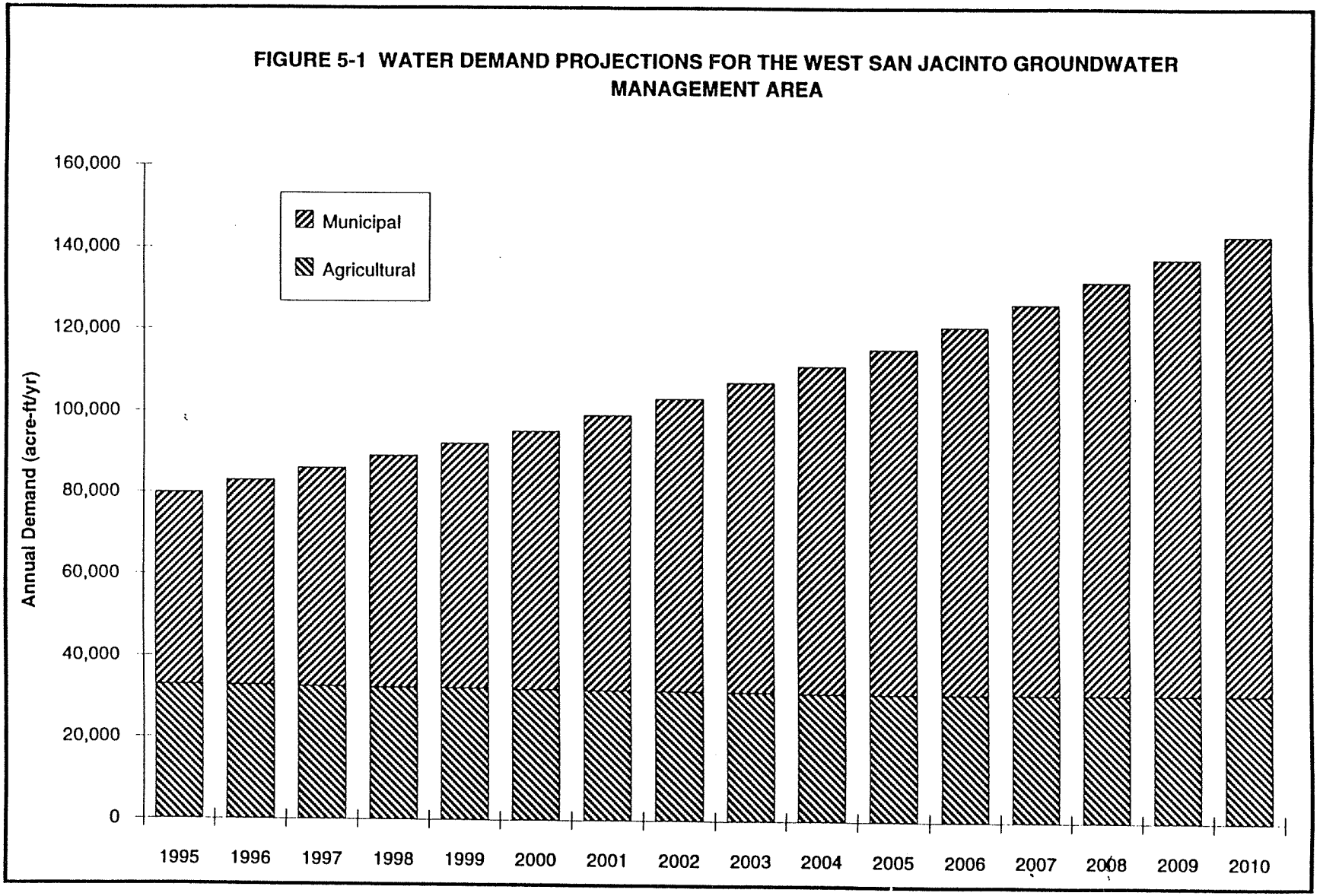

fig 5-1 Water Demands
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mg/L through typical municipal use. Thus, if the average TDS concentration in a water supply is 400 mg/L, the TDS concentration in the resulting wastewater will be about 600 to 700 mg/L. The TDS limits for EMWD's reclamation plants and the TDS required in the water supply to meet the TDS limits are listed below.

Reclamation Plant	TDS Limit (mg/L)	Water Supply TDS in the Tributary Area (mg/L)
Hemet-San Jacinto	575	325
Moreno Valley	550	300
Perris Valley	825	575
Sun City	950	700
Temescal	700	450

Figure 5-2 shows the TDS concentration of SWP water and Colorado River water available from Metropolitan in the management area. The average TDS concentration for SWP water is about 250 mg/L for the period shown in Figure 5-2. The comparable average for Colorado River water is about 660 mg/L. SWP water can be used in the areas tributary to all five reclamation plants listed above without causing violations, with the exception of the Moreno Valley plant that would have TDS concentrations in excess of the TDS limitations about 29 percent of the time. The use of Colorado River water or other sources with high TDS could cause TDS violations to occur at all five plants.

Metropolitan adopted a schedule of projected water rate increases in 1991. The water rates established included:

- a base rate;
- a treatment surcharge, to be added to the base rate for purchases of treated water; and
- a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

The goals of the seasonal discount are: to achieve greater conjunctive use of imported supplies and local supplies; encourage the construction of additional local production facilities; and reduce member agencies' dependence on Metropolitan deliveries during the summer months. Recently, Metropolitan announced water prices for 1993 and forecasted rates for the following ten years. The projected cost of imported water purchased from Metropolitan is listed in Table 5-2 and is shown graphically in Figure 5-3. Imported water costs after 2002 are assumed to increase 6 percent per year.

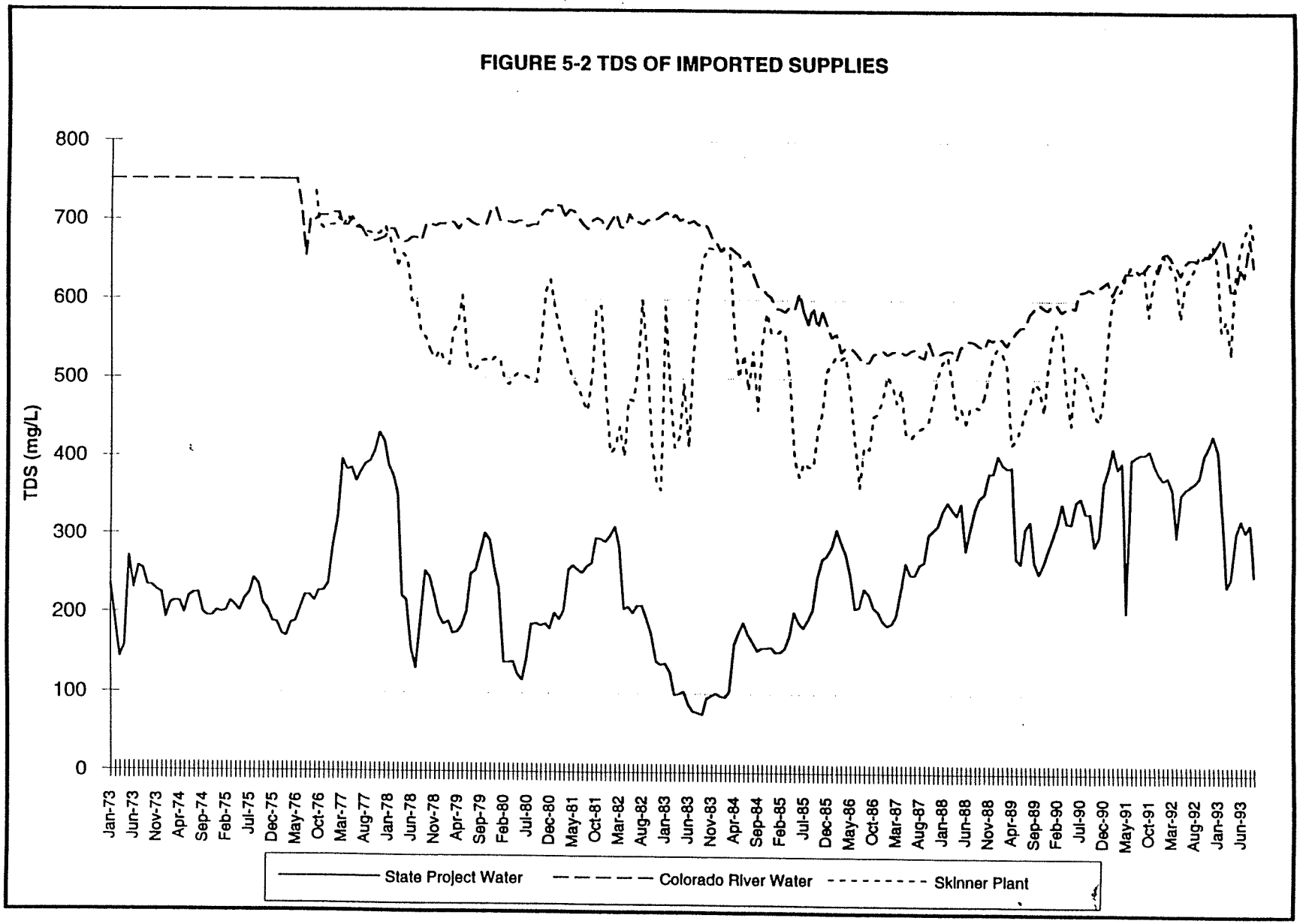

Figure 5-2 MWD
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TABLE 5-2
METROPOLITAN WATER RATE PROJECTIONS

4/2/94

Year	Treatment Surcharge	Base Rate	Base Treated	Seasonal Storage (1) Untreated	Seasonal Storage (1) Treated
1994	$77	$335	$412	$222	$275
1995	$77	$377	$454	$256	$256
1996	$78	$405	$483	$278	$279
1997	$78	$437	$515	$304	$304
1998	$89	$456	$545	$319	$328
1999	$98	$480	$578	$338	$345
2000	$104	$509	$613	$361	$366
2001	$105	$544	$649	$389	$390
2002	$109	$579	$688	$417	$420
2003	$114	$616	$730	$447	$451
2004	$119	$654	$773	$477	$481
2005	$124	$696	$820	$511	$515
2006	$130	$739	$869	$545	$550
2007	$136	$785	$921	$582	$587
2008	$142	$834	$976	$621	$626
2009	$148	$887	$1,035	$664	$669
2010	$154	$943	$1,097	$708	$713

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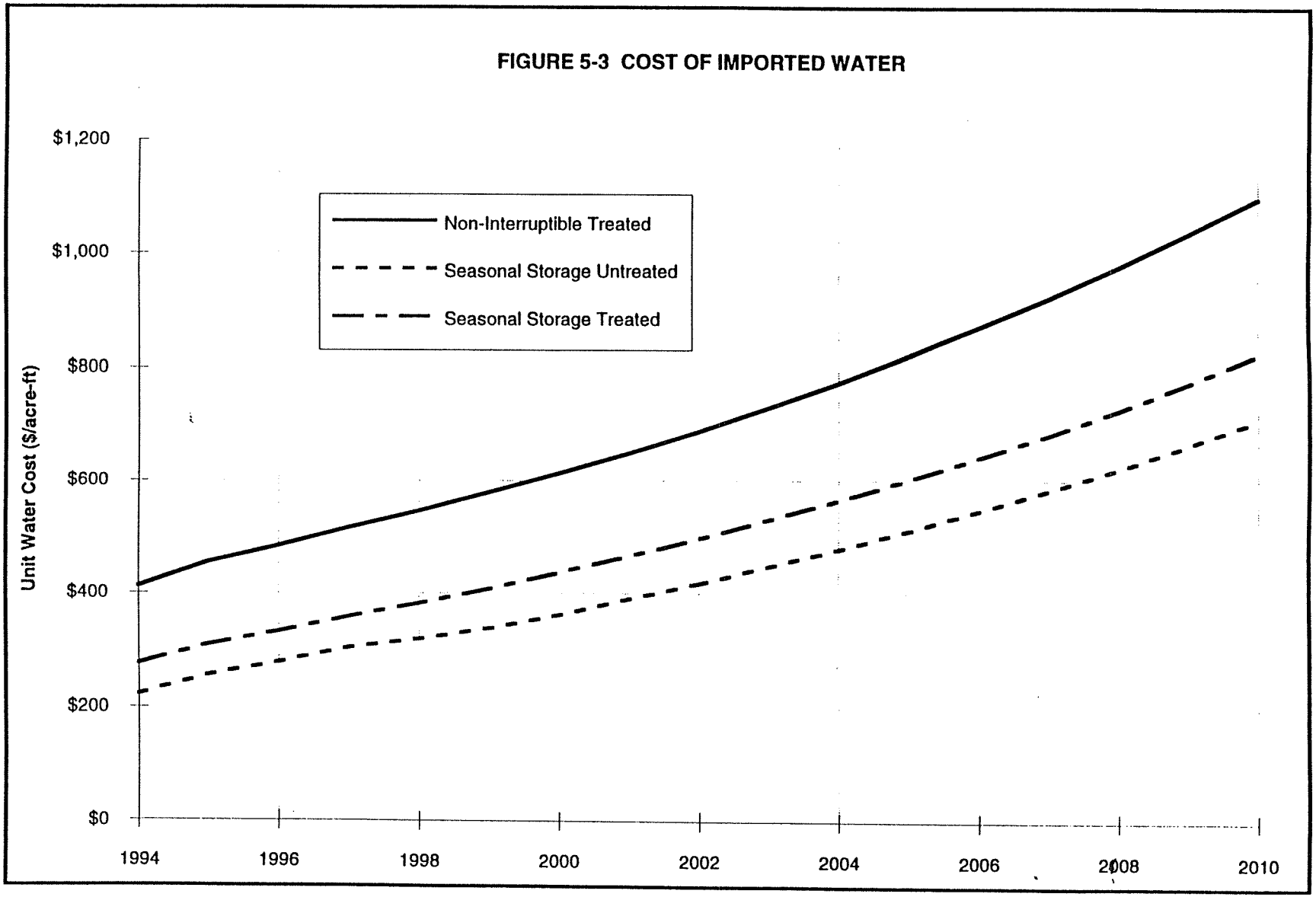

Figure 5-3
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Metropolitan is currently evaluating supply reliability for its service area (Metropolitan Water District of Southern California, 1994). Metropolitan is projecting that with year 2000 demands, shortages in retail supplies will occur at least four out of five years, with shortages up to 30 percent. By the year 2020, shortages will occur on average once in five years, with shortages up to 20 percent. The frequency and magnitude of retail shortages will be comparable for areas that depend heavily on Metropolitan.

Groundwater. Groundwater is available throughout the management area in that most of the management area overlies the West San Jacinto Basin. However, the quality of groundwater precludes the use of some of the management area groundwater for municipal supply. TDS and nitrate are the water quality constituents that limit the use of groundwater. TDS is regulated as a secondary standard. Secondary standards are for those substances that are not hazardous to health, but may cause taste, order, color, staining or other conditions that adversely affect the aesthetics of drinking water. The maximum contaminant level (MCL) for TDS is expressed as follows:

> *Recommended MCL* - 500 mg/L. TDS concentrations less than or equal to the *Recommended MCL* are desirable for a higher level of consumer acceptance.
>
> *Upper MCL* - 1,000 mg/L. TDS concentrations ranging up to the *Upper MCL* are acceptable if it is neither reasonable nor feasible to provide more suitable waters.
>
> *Short Term MCL* - 1,500 mg/L. TDS concentrations ranging up to the *Short Term MCL* are acceptable only for existing systems on a temporary basis, pending the construction of treatment facilities or the development of acceptable new water sources.

Nitrate is regulated under primary standards. The MCL for nitrate is 10 mg/L (as nitrogen). Table 5-3 lists the groundwater in storage, storage capacity, safe yield, and average TDS and nitrate concentrations for each groundwater subbasin in the management area. The subbasins are ranked in Table 5-3 from lowest to highest in TDS. From a drinking water perspective, approximately 36 percent of the yield of the West San Jacinto Basin could be developed from the Lakeview and Perris North subbasins for direct use, without additional treatment for TDS and nitrate. Some groundwater in the Perris South-I subbasin could also be used without treatment and San Jacinto Lower Pressure, Perris South-II and Perris South-III groundwater could be used

TABLE 5-3
AVAILABILITY OF GROUNDWATER IN THE WEST SAN JACINTO BASIN
YEAR 2000 CONDITIONS

Subbasin	Volume in Storage (acre-ft)	Storage Capacity (acre-ft)	Fraction of Groundwater in West San Jacinto Basin	Natural Safe Yield (acre-ft/yr)	Safe Yield with Wastewater Recharge (acre-ft/yr)	Fraction of Yield in West San Jacinto Basin	Average TDS Concentration (mg/L)	Average Nitrate Concentration (as Nitrogen) (mg/L)
Perris North	123,000	347,000	11%	13,700	19,500	41%	430	7
Lakeview	283,000	515,000	25%	6,800	6,800	14%	500	3
Perris South	248,000	402,000	22%	8,300	12,800	27%	920	5
San Jacinto Lower Pressure	382,000	391,000	34%	2,500	2,500	5%	1,000	4
Winchester	36,000	41,000	3%	1,600	1,800	4%	2,000	8
Menifee	56,000	101,000	5%	3,300	4,700	10%	2,250	6
Totals	1,128,000	1,797,000	100%	36,200	48,100	100%		
Average							891	5

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Water Resources Engineer

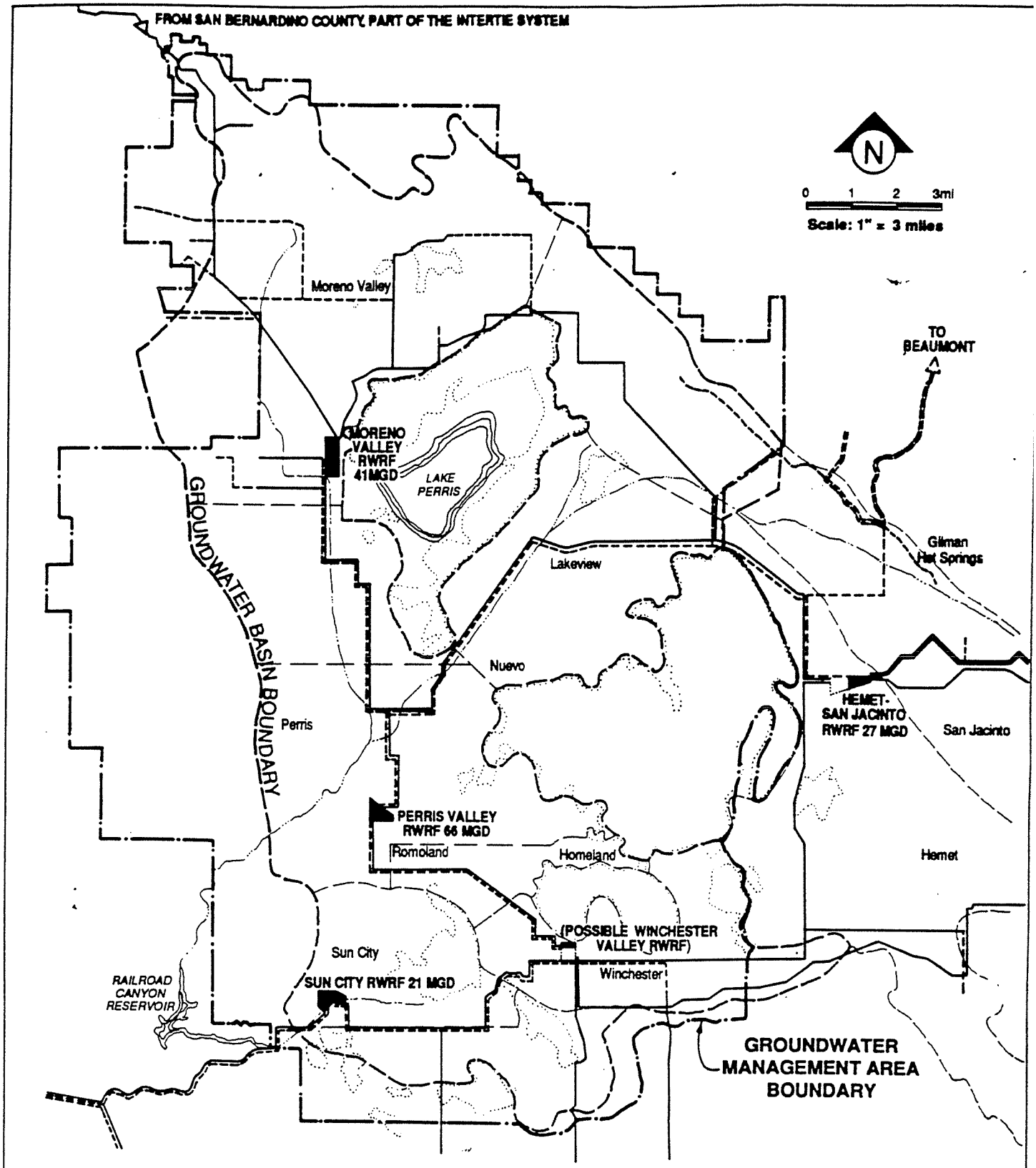
if blended with SWP water. Groundwater from the Menifee-I, Menifee-II, Winchester and parts of the Perris South-II subbasins will require treatment if groundwater from these subbasins is to be used as a municipal drinking water supply. The treatment processes that would make these basins useful as a water supply source are blending with low TDS supplies such as SWP water, and demineralization. From a wastewater perspective, most of the groundwater in the West San Jacinto Basin would have to be treated prior to use as a municipal supply.

EMWD is currently designing a groundwater demineralization facility in the Menifee area. This facility will produce about 3 mgd (3,360 acre-ft/yr) of potable water for municipal use. The source water to the desalter will have a TDS of about 2,400 mg/L. The product water will have a TDS concentration of about 400 mg/L. This project will develop the full yield of the Menifee-I and Menifee-II subbasins for municipal use.

The cost to use groundwater, exclusive of treatment, includes capital cost and operations and maintenance costs. The capital cost for new municipal wells ranges from about $400,000 to $500,000. This is equivalent to about $32 per acre-ft, assuming a 1,500 gpm well (2,420 acre-ft/yr), six percent amortization rate, 20-year amortization period and 50% usage . Fixed operating and maintenance costs are about $6 per acre-ft. Power costs vary according to lift and pumping plant efficiency. The cost for a pumping lift of 200 feet and overall plant efficiency of 60 percent is about $30 per acre-ft. Thus, the total cost to produce groundwater for a 1,500-gpm well, operating year round with a total lift of 200 feet would be about $68 per acre-ft.

Reclaimed Water. Currently, EMWD is in a phased process of implementing a reclaimed water distribution plan that will make reclaimed water available throughout the management area. The reclaimed water system consists of five reclamation plants and about 79 miles of backbone distribution pipelines. Figure 5-4 shows the layout of the pipelines and the location of reclamation plants. Table 5-4 shows the projections of the availability of reclaimed water during the planning period. Reclaimed water sources include the discharge of up to 30 mgd or 33,600 acre-ft/yr of reclaimed water from the city of San Bernardino. The TDS of reclaimed water from San Bernardino is projected to range between 480 mg/L to 500 mg/L, which is lower than any of the reclaimed water generated in EMWD. The use of reclaimed water replaces non-potable demand on groundwater and imported supplies.

For this study, we have assumed the cost of producing and distributing reclaimed water in the EMWD service area to be a sunk cost. EMWD must treat and dispose of reclaimed water. The



LEGEND:

——— EXISTING RECLAIMED WATER SYSTEM (CONSTRUCTED OR DESIGNED)

----- ULTIMATE RECLAIMED WATER SYSTEM

■ RWRF LOCATION, WITH ULTIMATE CAPACITY

Figure 5-4

ULTIMATE RECLAIMED WATER SYSTEM

REFERENCE: EMWD RECLAIMED WATER FACILITIES MASTER PLAN, 1993. (DOCUMENT FILE NAME: DFILEOIN.DGN, REV. 6/93)

Mark J. Wildermuth
Water Resources Engineer

TABLE 5-4
PROJECTED RECLAIMED WATER FLOWS
(acre-ft/yr)

Reclamation Plant	1995	2000	2005	2010
Moreno Valley	10,328	15,274	20,435	25,597
Perris Valley	8,110	11,994	16,041	20,089
Sun city	2,532	3,750	5,013	6,275
Temecula Valley (1)	5,332	7,897	10,558	13,219
Hemet-San Jacinto (1)	5,646	8,343	11,165	13,987
Subtotal	31,947	47,258	63,213	79,167
San Bernardino (2)	0	11,201	12,322	20,723
Totals	31,947	58,459	75,534	99,890

Sources: Wastewater Facilities Master Plan Black & Veatch and James M. Montgomery, 1990; Projected Water Demands and Planned Storage for the Years 1995 to 2005, Eastern Municipal Water District, 1993.

Note - (1) Reclaimed water from outside of West San Jacinto Groundwater Basin management area.
(2) Reclaimed water pumped to EMWD from city of San Bernardino.

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Water Resources Engineer

cost of the reclaimed water distribution system is the cost of disposal. The value of the reclaimed water as a resource to non-potable water users is equal to their next least costly source of water. For a farmer, the value of the reclaimed water is approximately the same as the cost to produce groundwater. A typical 1,000 gpm agricultural well cost would be about $250,000. Assuming the well is operated half the year, the amortization cost is about $27 per acre-ft. Total operation and maintenance costs would be about $36 per acre-ft for a total lift of 200 feet. The total cost of operating a well for an agricultural supply is about $63 per acre-ft. These costs would be about the same for industrial and large urban landscape users. These costs vary with depth to groundwater and location in the study area.

WATER SUPPLY PLAN WITHOUT GROUNDWATER MANAGEMENT PLAN

The water supply plan for the management area, in the absence of a groundwater management plan, consists of the use of imported water for all municipal uses and a combination of groundwater and reclaimed water for agricultural uses. All agricultural demands would be satisfied with reclaimed water by the year 2010. The Menifee desalter would be operational in 1997, producing about 3,360 acre-ft/yr. The water supply plan for the management area is listed in Table 5-5. Groundwater usage in 1995 is estimated to range from 26,600 acre-ft/yr (33 percent of total supply) in 1995, to 28,000 acre-ft/yr by 2010 (19 percent of total supply). The Menifee desalter will require about 4,200 acre-ft/yr of groundwater to produce 3,360 acre-ft/yr of product water.

Imported water use in the management area is projected to range from about 44,500 acre-ft/yr (56 percent of total supply) in 1995, to 103,000 acre-ft/yr (72 percent of total supply) by the year 2010. Imported water is used for municipal purposes only. Reclaimed water use in the management area is projected to range from about 8,900 acre-ft/yr (11 percent of total supply) in 1995, to 11,900 acre-ft/yr (8 percent of total supply) by the year 2010. Reclaimed water would be used for agricultural and non-potable municipal purposes.

The cost of this water supply plan, exclusive of the distribution costs, is summarized in Table 5-6. Table 5-6 shows the annual demand, supplies by source and cost of each source in terms of annual cost, total annual cost and present value of all cost over the 1995 to 2010 planning period. The fractions of total supply and total supply cost by source are listed below.

TABLE 5-5
WATER SUPPLY PLAN IN THE ABSENCE OF
A GROUNDWATER MANAGEMENT PLAN
(acre-ft/yr)

Year	1995		2000		2005		2010	
	Volume	Fraction	Volume	Fraction	Volume	Fraction	Volume	Fraction
Municipal Demand	47,000	100%	63,000	100%	84,000	100%	112,000	100%
Imported Water	44,500	95%	56,140	89%	76,140	91%	103,140	92%
Menifee Desalter	0	0%	3,360	5%	3,360	4%	3,360	3%
Reclaimed Water	0	0%	1,000	2%	2,000	2%	3,000	3%
Groundwater	2,500	5%	2,500	4%	2,500	3%	2,500	2%
Agricultural Demand	33,000	100%	32,000	100%	31,000	100%	31,000	100%
Reclaimed Water	8,900	27%	8,900	28%	8,900	29%	8,900	29%
Groundwater	24,100	73%	23,100	72%	22,100	71%	22,100	71%
Total Demand	80,000	100%	95,000	100%	115,000	100%	143,000	100%
Imported Water	44,500	56%	56,140	59%	76,140	66%	103,140	72%
Menifee Desalter (1	0	0%	3,360	4%	3,360	3%	3,360	2%
Reclaimed Water	8,900	11%	9,900	10%	10,900	9%	11,900	8%
Groundwater (2)	26,600	33%	25,600	27%	24,600	21%	24,600	17%

note - (1) actual groundwater production for the Menifee desalter will be about 4,200 acre-ft/yr with 3,360 acre-ft/yr of potable water and 1,840 acre-ft/yr.

Mark J. Wildermuth
Water Resources Engineer

TABLE 5-6
COST OF WATER SUPPLY FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
WITHOUT A GROUNDWATER MANAGMENT PLAN

Year	Demand	Imported Water			Reclaimed Water			Groundwater										Total Cost of Groundwater Production	Total Cost	Composite Unit Cost of Supply
								Menifee Desalter			Agricultural Use			Municipal Use						
	(acre-ft/yr)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)				
1995	80,000	44,500	$454	$20,203,000	8,900	$63	$560,700	0	$501	$0	24,100	$63	$1,518,300	2,500	$68	$170,000	$1,688,300	$22,452,000	$281
1996	83,000	47,500	$483	$22,942,500	9,100	$66	$596,232	0	$516	$0	23,900	$66	$1,565,928	2,500	$71	$176,800	$1,742,728	$25,281,460	$305
1997	86,000	47,140	$515	$24,277,100	9,300	$68	$633,709	3,360	$532	$1,787,520	23,700	$68	$1,614,937	2,500	$74	$183,872	$3,586,329	$28,497,138	$331
1998	89,000	50,140	$545	$27,326,300	9,500	$71	$673,231	3,360	$549	$1,844,640	23,500	$71	$1,665,361	2,500	$76	$191,227	$3,701,228	$31,700,759	$356
1999	92,000	53,140	$578	$30,714,920	9,700	$74	$714,901	3,360	$578	$1,942,080	23,300	$74	$1,717,235	2,500	$80	$198,876	$3,858,191	$35,288,012	$384
2000	95,000	56,140	$613	$34,413,748	9,900	$77	$758,826	3,360	$613	$2,059,752	23,100	$77	$1,770,595	2,500	$83	$206,831	$4,037,178	$39,209,752	$413
2001	99,000	60,140	$649	$39,030,784	10,100	$80	$805,122	3,360	$649	$2,180,716	22,900	$80	$1,825,476	2,500	$86	$215,104	$4,221,296	$44,057,202	$445
2002	103,000	64,140	$688	$44,128,240	10,300	$83	$853,908	3,360	$688	$2,311,760	22,700	$83	$1,881,914	2,500	$89	$223,708	$4,417,383	$49,399,531	$480
2003	107,000	68,140	$730	$49,742,115	10,500	$86	$905,308	3,360	$730	$2,452,885	22,500	$86	$1,939,947	2,500	$93	$232,657	$4,625,489	$55,272,912	$517
2004	111,000	72,140	$773	$55,764,130	10,700	$90	$959,454	3,360	$773	$2,597,370	22,300	$90	$1,999,611	2,500	$97	$241,963	$4,838,944	$61,562,528	$555
2005	115,000	76,140	$820	$62,434,704	10,900	$93	$1,016,484	3,360	$820	$2,755,296	22,100	$93	$2,060,944	2,500	$101	$251,642	$5,067,882	$68,519,069	$596
2006	120,600	81,540	$869	$70,858,158	11,100	$97	$1,076,540	3,360	$869	$2,919,942	22,100	$97	$2,143,382	2,500	$105	$261,707	$5,325,031	$77,259,729	$641
2007	126,200	86,940	$921	$80,071,632	11,300	$101	$1,139,775	3,360	$921	$3,094,668	22,100	$101	$2,229,117	2,500	$109	$272,175	$5,595,960	$86,807,367	$688
2008	131,800	92,340	$976	$90,123,726	11,500	$105	$1,206,346	3,360	$976	$3,279,474	22,100	$105	$2,318,282	2,500	$113	$283,062	$5,880,819	$97,210,890	$738
2009	137,400	97,740	$1,035	$101,160,779	11,700	$109	$1,276,419	3,360	$1,017	$3,417,239	22,100	$109	$2,411,013	2,500	$118	$294,385	$6,122,637	$108,559,835	$790
2010	143,000	103,140	$1,097	$113,144,452	11,900	$113	$1,350,167	3,360	$1,041	$3,497,882	22,100	$113	$2,507,454	2,500	$122	$306,160	$6,311,496	$120,806,115	$845
Total Volume	1,719,000	1,100,959			166,400			47,041			364,600			40,000					
Fraction of Total	100%	64%			10%			3%			21%			2%					
Total Cost				$866,336,287			$14,527,124			$36,141,224			$31,169,495					$951,884,301	
Fraction of Total				91%			2%			4%			3%						
Present Value																		$556,663,649.25	

Table 5-6
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Mark J. Wildern
Water Resources Engr

Source	Fraction of Total Supply	Fraction of Total Supply Cost
Imported Water	64%	91%
Reclaimed Water	10%	2%
Menifee Desalter	3%	4%
Groundwater	23%	3%

The most expensive water in the supply plan is Menifee desalter water, ranging from $532 to $1,041 per acre-ft over the planning period. The second most expensive water in the supply plan is imported water, ranging from $454 to $1097 per acre-ft over the planning period. The cost of reclaimed water and groundwater are about one-tenth that of imported water, ranging from about $63 to $122 per acre-ft over the planning period. From a purely economic viewpoint, the cost of future supplies could be reduced if more groundwater and reclaimed water can be used for municipal supplies. The present value cost of future water supplies in the management area, exclusive of new pipelines, pump stations and reservoirs, is about $557,000,000 for the period of 1995 to 2010.

SECTION 6

SECTION 6
GROUNDWATER MANAGEMENT GOALS

The mission statement of EMWD is:

> ***The mission of the Eastern Municipal Water District is to deliver a dependable supply of safe, quality water and provide sewage collection services to its customers in an economical, efficient and publicly responsible manner.***

The water supply part of EMWD's mission statement is a goal shared by all purveyors of water in the West San Jacinto Groundwater Basin management area. Groundwater, as a potentially important part of the water supply in the management area, should be incorporated into the water supply plans of the management area. The safe yield of the West San Jacinto Basin is about 32,000 acre-ft/yr. Projections of groundwater usage in the management area range from about 30,000 acre-ft/yr in 1995, to 28,000 acre-ft/yr in 2010.

Agricultural groundwater use will decrease slightly in the future, from about 24,100 acre-ft/yr to 22,100 acre-ft/yr, as agricultural lands are converted to urban uses. Remaining agricultural water demand will be converted to reclaimed water. The need for potable water will increase dramatically in the future. Potable water demands in the management area will range from 69,600 acre-ft/yr in 1995, to 167,000 acre-ft/yr by 2010.

Most of the new potable demand will be met from treated imported water purchased from Metropolitan. Metropolitan's supplies are projected to increase in cost about 142 percent over the 1995 to 2010 planning period, from $454 per acre-ft in 1995, to $1097 per acre-ft in 2010. Metropolitan's supply is also not entirely reliable. For year 2000 demands, Metropolitan has projected shortages in four years out of five years, ranging from 10 to 30 percent.

There are many private groundwater producers in the management area that do not rely on EMWD for water supply. The negative impacts, if any, of a groundwater management plan on these users must be minimized; and the ability of these groundwater producers to continue producing groundwater for beneficial use must be preserved or equitably replaced.

Based on the above comments, the goal of the groundwater management plan is to

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin Management area.***

There are several elements that could go into the management plan to achieve this goal. The next section describes these elements.

SECTION 7

SECTION 7
ELEMENTS OF GROUNDWATER MANAGEMENT PLAN

This section describes the features or elements that can be used to build a groundwater management plan that is consistent with the management plan goal described in Section 6 and A.B. 3030. These elements include: new management policies, yield enhancement programs, conjunctive use, and the exchange of agricultural and other non-potable water users from groundwater to reclaimed water. These elements are described below.

MANAGEMENT POLICY ELEMENTS

Management policy elements consist of developing and implementing policies, regulations and coordinated activities among the groundwater producers. Currently, there is no routine monitoring of groundwater production, groundwater level and groundwater quality in the management area. There are no programs or institutions that routinely collect and review these data. There are no management tools available to forecast the impact of existing and future groundwater management practices. Consequently, there is little information available to site new groundwater recharge and extraction facilities.

Currently, there is no coordination or oversight of well construction in the management area. There is no systematic plan to manage unused and obsolete wells. The management plan needs to include policies to manage well construction and to ensure their destruction when wells become obsolete.

Monitoring of Groundwater Production, Groundwater Levels and Groundwater Quality

Groundwater Production. There is very little reported groundwater production data in the management area. The reported groundwater production volumes for the period ranged from 6,000 to 13,000 acre-ft/yr during the five-year period of 1987 to 1991 (see table 4-3). The 1991

estimate of agricultural demand in the management area, based on land use, is about 33,200 acre-ft/yr, of which about 27,000 acre-ft is estimated to be satisfied with groundwater. Groundwater production needs to be limited to the long term safe-yield of the management area and, locally, to the safe yield of the individual subbasins in the management area. Temporary overdraft could be allowed and, occasionally, encouraged during periods of imported supply shortages, as long as there is a way to replenish the overdraft. Uncontrolled overdraft, similar to that which occurred prior to the mid 1970's, will cause groundwater levels to drop, some wells to dry up, increase the cost of producing groundwater and lead to groundwater quality degradation. Therefore, it is important to obtain accurate information on groundwater production volume and to make a determination of the hydrologic balance for each subbasin in the management area.

Groundwater Level and Quality Monitoring. The monitoring of groundwater level (or storage) data includes the routine collection and review of groundwater level data to determine the hydraulic and volumetric response of the groundwater basin to groundwater management activities and climate. The monitoring of groundwater quality includes the collection and review of groundwater quality data that can be used to assess current and future trends in groundwater quality, and to evaluate groundwater quality response to groundwater management activities and climate.

Administration and Monitoring of Well Construction

Monitoring of Well Construction. The monitoring of well construction and location is extremely important to the understanding of current groundwater conditions and for future groundwater development. Well construction information includes the size and design of the well, lithology and aquifer test data. These data are necessary for the interpretation of groundwater production, level and quality data; and the evaluation of the aquifer as a source of supply. For the management plan, all these data should be collected, digitized and placed into a data base for future use. EMWD is in the process of completion of this data base for most of the existing wells in the management area. These data would be made available to all groundwater producers so that the producers can more reliably construct and operate new wells. These data would be used in future groundwater studies.

Administration of Well Construction Policies. Poor well construction can lead to groundwater contamination and excessive drawdown. Contamination can occur from inadequate sanitary seals, location of wells in, or near, contaminated groundwater, and cross contamination.

Excessive drawdown could be caused by over-extraction, interference from other adjacent wells or poor aquifer properties. Policies need to be developed that:

- Specify criteria that will be used to locate wells. Well location criteria would be established to ensure that new wells do not contribute to groundwater quality degradation. The intent of this policy is to minimize the redirection and acceleration of known contaminated groundwater to areas of potable supply.

- Develop minimum well construction standards. Minimum well construction standards would be developed based on existing state and county standards and additional standards that will be unique to the management area.

- Review and approval of proposed new well locations and well designs. The intent of the policy is to protect groundwater quality consistents with well siting criteria and construction standards.

Administration of Well Abandonment and Destruction Program

There are many obsolete and unused wells in the management area that are potentially useful for future production and monitoring of groundwater levels and quality. Unused wells could also be a source of contamination. Illegal disposal of wastes sometimes occurs in unused wells. Cross contamination between aquifers can occur through wells when contaminated groundwater in one aquifer flows into a well, vertically, through the casing and out of the well into an uncontaminated aquifer. The management plan should contain policies and regulations that will locate all obsolete and unused wells, and make a determination as to the most beneficial fate of each such well. Obsolete and unused wells that do not present a water quality contamination threat and have a potential use should be preserved. Otherwise, these wells should be properly destroyed.

Groundwater Quality Protection

Groundwater quality protection will maintain existing yield and reduce the future cost of water treatment. There are two parallel tracks to follow:

- prevention of pollution

- control and mitigation of existing groundwater quality problems.

EMWD should develop an aggressive groundwater pollution prevention program that, at a minimum, embodies the Basin Plan. Groundwater quality should be constantly monitored to assess spatial and time trends in groundwater quality in the groundwater management area. At a minimum, these efforts should include the monitoring of water quality data from municipal and agricultural wells, landfills, chemical and industrial operations, underground storage tanks, areas undergoing groundwater remediation such as March Air Force Base, sludge disposal areas and reclaimed water recharge areas. EMWD should consider obtaining authority to act proactively to prevent pollution and to take immediate action on new pollution threats when they occur.

The control and mitigation of existing groundwater quality problems consists of the containment and, potentially, the remediation of existing water quality problems, such that adjacent high quality groundwater resources are not degraded. Three major areas of concern in the West San Jacinto Groundwater Management Plan area are high TDS groundwater in the Perris South II subbasin (Ski Land area), migration of high TDS groundwater from the Winchester subbasin into the Hemet subbasin, and the organics contamination at March Air Force Base. The groundwater management plan should contain elements that will ensure that these three problems are controlled and mitigated.

EMWD has initiated a pollution prevention program in the Menifee subbasin. This program will intercept and treat saline groundwater that would otherwise migrate to areas with high quality groundwater and cause the abandonment of wells. This program will lead to the eventual recovery of the entire Menifee subbasin.

YIELD ENHANCEMENT ELEMENTS

Artificial Recharge

Artificial recharge is the recharge of water from sources that are not normally tributary to groundwater. There are three sources of water for artificial recharge in the West San Jacinto Groundwater Basin management area: local runoff, imported water and reclaimed water.

Artificial recharge with local runoff. There are several ways local runoff can be captured and recharged. The most common approach is to divert storm flows into spreading basins where the captured water can percolate into the underlying groundwater basin. Spreading basins can have

multiple uses including flood peak attenuation, water treatment, recharge of imported water and reclaimed water, wildlife habitat enhancement and recreational use.

Several factors must be considered for the development of a spreading basin. They include:

- ❑ Water rights
- ❑ Availability of recharge water
- ❑ Surface flow and flood hazard impacts
- ❑ Percolation rates
- ❑ Subsurface permeability and the presence of barriers or aquitards that hinder percolation
- ❑ Depth to groundwater
- ❑ Underlying groundwater quality
- ❑ Recharge water quality
- ❑ Proximity to major areas of groundwater production
- ❑ Creation of undesirable conditions such as high groundwater levels or vector problems
- ❑ Economic feasibility

Runoff generated on individual lots can be retained and recharged on individual lots. This would require special grading and drainage specifications on individual lots and is only practical for new development. The same considerations for spreading basins apply to artificial recharge through local retention and recharge.

Most of the precipitation for frequently occurring precipitation events that falls on undeveloped land is lost to evapotranspiration. Groundwater recharge occurred only during periods of heavy rainfall prior to the development of the land. About 60 to 80 percent of the land becomes impervious as land is developed for urban uses. The remaining land is irrigated and has relatively high soil moisture. Consequently, precipitation that falls on developed land is either:

- ❑ converted to runoff; or
- ❑ recharges the groundwater basin through presaturated soils.

New runoff due to developed land can be collected and recharged, a process referred to as water harvesting. EMWD has conducted studies of water harvesting in the San Jacinto and Hemet subbasins, but has not yet conducted such studies in the West San Jacinto Groundwater Management Area. EMWD is currently evaluating these studies and proceeding to implement water harvesting in these subbasins. EMWD has stated a goal of reaching 10,000 acre-ft/yr of additional yield in its service area using water harvesting.

Artificial recharge of runoff can occur anywhere in the management area where suitable recharge facilities can be sited. The DWR published a draft report in 1975, *TIR 1335-11-A-3 Preliminary Evaluation of Potential Artificial Recharge sites and Sink Sites in the San Jacinto Study Area* (California Department of Water Resources, 1975) that concluded that conditions conducive to artificial recharge through spreading basins exist in the Lakeview, Perris North and Perris South subbasins. In the Lakeview subbasin, there is a one mile-wide band of tight surface sediments along the San Jacinto River. The rest of the subbasin appears to have good recharge characteristics. Water quality in this subbasin is generally good and the unused storage capacity is about 230,000 acre-ft (see Table 5-3). Recharge in the Perris North subbasin could occur along a small creek that drains the Pigeon Pass Valley, in spreading basins located at the base of the hills on the south side of the subbasin and near major drainage features such as the Perris Valley drain. There may be other areas suitable for spreading basins. Water quality in the Perris North subbasin is good. The unused storage capacity in the Perris North subbasin is about 220,000 acre-ft.

Groundwater quality in the Perris South subbasins ranges from acceptable to poor. The soils and geology appear to favor recharge in spreading basins. However, due to existing groundwater quality conditions, it may not be possible to recover additional potable groundwater without groundwater treatment. The unused storage capacity in the Perris South subbasins is about 120,000 acre-ft. The San Jacinto Lower Pressure, Menifee I, Menifee II and Winchester subbasins have soil and geologic conditions that appear non-suitable for surface spreading.

Imported Water. Recharge of imported water can occur through surface spreading, direct injection and by in-lieu recharge. Surface spreading is done by conveying imported water to spreading basins for percolation. Untreated water can be used for surface spreading. Untreated off-peak water can be purchased at substantially lower rates if spreading is done between October 1 to April 30.

Conventional injection of imported water is accomplished by conveying treated water to wells and injecting the water into the saturated part of the groundwater basin. Imported water is discharged into the well below the standing water level in the well. The pressure in the well forces the water into the aquifer. Water used for injection into the saturated zone must be treated to drinking water standards prior to injection. Treatment consists of filtration and disinfection and can be obtained by either purchasing treated water from Metropolitan or by purchasing untreated water from Metropolitan and using other treatment facilities. Treated off-peak water can be purchased at substantially lower rates if injection is done between October 1 to April 30.

In-lieu recharge occurs when imported water is used in lieu of groundwater, allowing groundwater to accumulate in the groundwater basin. The basic premise is that imported water would be used when there is an abundance of imported water, allowing groundwater to accumulate. Groundwater production in excess of the normal extraction rates could occur when imported water is scarce due to drought or shortages in the imported water system.

The areas that are suitable for artificial recharge of imported water in spreading basins are identical to the areas described in *artificial recharge of runoff* above. Artificial recharge of imported water by injection can occur almost anywhere in the management area where groundwater production is practical. Considerations in siting injection facilities include favorable hydrogeologic conditions, proximity to source water facilities, proximity of recovery wells, and unused groundwater storage capacity. Unlike spreading basins that create a veneer of imported water on top of ambient groundwater, injection wells create a zone of imported water around the injection well. The injected water within this zone drifts slowly away from the injection well with the regional groundwater flow. The water quality in wells that tap into the injected water zone will have a water quality that is similar to the imported water.

Reclaimed water. Recharge of reclaimed water can occur through surface spreading, direct injection and by over irrigation. Recharge by percolation and injection is subject to regulatory approval. The DHS proposed regulations for planned recharge projects that recharge reclaimed water were described in Section 3 and are contained in Appendix A.

Reclaimed water can be used to augment potable supplies through groundwater recharge. The volume of natural recharge is small in the West San Jacinto Groundwater Basin management area. The dilution of reclaimed water that can be obtained in the groundwater basin could be

small and insufficient to achieve the dilution requirements in the proposed guidelines. Therefore, reclaimed water may have to be blended with other non-reclaimed water prior to recharge. The most probable source of blending water will be imported water purchased from Metropolitan.

The groundwater basins can also be used for seasonal storage of reclaimed water. Reclaimed water can be stored in the groundwater basins during the winter when demand for reclaimed water is low and recovered in the spring, summer and fall when reclaimed water demands exceed supply.

The subbasins in the management area that are conducive to recharge of reclaimed water, either by spreading or injection, include the Perris North, Lakeview and Perris South subbasins. Reclaimed water can be recharged in the San Jacinto Lower Pressure, Menifee and Winchester subbasins by injection.

Increase in Yield. The increase in yield from artificial recharge is approximately equal to the long term average annual volume of artificial recharge. That is, if the annual volume of artificial recharge is 30,000 acre-ft, then the increase in groundwater yield would be about 30,000 acre-ft. The Lakeview, Perris North and Perris South subbasins are the most promising subbasins for artificial recharge that can increase potable supplies to the West San Jacinto Groundwater Basin management area. These basins have a combined unused storage capacity of about 600,000 acre-ft, good water quality and reasonably good aquifer properties. The natural replenishment in these subbasins is small, averaging about 29,000 acre-ft/yr (Table 4-1). Hydrogeologic conditions and economics control the size of artificial recharge projects in these subbasins. Based on current information, it seems reasonable to expect that the combined increase in groundwater yield from artificial recharge could range from 30,000 to 50,000 acre-ft/yr.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of potential artificial recharge projects. The types of new information and studies that are required include:

- ❑ geophysical studies to determine aquifer boundaries and geometry
- ❑ hydrogeologic studies to determine aquifer hydraulic properties
- ❑ geochemical studies to establish ambient groundwater quality, trends, and compatibility of ambient groundwater with recharge water

- facility studies to site and evaluate engineering and facility requirements
- economic studies
- environmental studies

Part of these investigations should include demonstration or pilot projects. Demonstration-level artificial recharge projects should be done to test the technical and institutional feasibility of artificial recharge. Demonstration projects should include the following:

- Surface spreading in The Perris North, Perris South and Lakeview subbasins. Small recharge basins, observation wells and pipelines would be constructed and operated to develop data and design criteria for full scale projects. The source water would be imported water from Metropolitan and reclaimed water from EMWD.
- Groundwater Injection in The Perris North, Perris South and Lakeview subbasins. Injection of imported water could be done in the winter time using EMWD's existing wells in these subbasins. Small observation wells may need to be constructed.
- Water Harvesting in the Lakeview subbasin. Storm water captured in EMWD's Mystic Lake project could be captured and conveyed to test recharge basins in the Lakeview subbasin.

Recovery of Contaminated Groundwater

Some of the groundwater in the West San Jacinto Groundwater Management area is contaminated and cannot be put to beneficial use without treatment. Currently, production of contaminated groundwater is avoided. Contaminated groundwater takes up storage in the aquifer and reduces the useful storage capacity in the groundwater basins. Contaminated groundwater can be put to beneficial use through treatment. The types of treatment that are appropriate depend on the nature of contamination and the intended water use. The types of treatment that appear appropriate in the West San Jacinto Management area are blending, demineralization and nitrate removal through ion exchange. Other treatment technologies may be required if water quality conditions change or new types of contamination are discovered.

Blending. Blending is a very simple form of treatment and consists of mixing a poor quality supply with a suitable amount of high quality water such that the blend is of adequate quality for its intended use. Table 7-1 lists the groundwater subbasins, the reclamation plants that receive water from these subbasins, reclamation plant TDS regulatory limitations, estimated average

TABLE 7-1
BLENDING WATER REQUIREMENTS TO MEET TITLE 22 DRINKING WATER REGULATIONS AND WASTE DISCHARGE REQUIREMENTS AT RECLAMATION PLANTS

Subbasin	Supply Tributary to EMWD Reclamation Plant (1)	Reclamation Plant TDS Objective (mg/L)	Estimated Average TDS in Subbasin (2) (mg/L)	Required Water Supply TDS (mg/L)	Blending Ratio of SWP Water to Groundwater for SWP Water TDS (in mg/L) of 250	300
Perris North	Moreno Valley	550	450	300	3.0	Infeasible
Lakeview	Perris Valley	825	500	575	No Blending Required	No Blending Required
Perris South-I	Perris Valley	825	700	575	0.4	0.5
Perris South-II	Perris Valley	825	1,100	575	1.6	1.9
Perris South-III	Sun City	950	1,100	700	0.9	1.0
Menifee-I	Sun City	950	3,000	700	5.1	5.8
Menifee-II	Sun City	950	2,200	700	3.3	3.8
Winchester	(3)	na	2,000	na	na	na
San Jacinto Lower Pressure	Perris Valley	825	1,000	575	1.3	1.5

note - (1) based on Figure 3-1 Existing Wastewater Service Areas, Wastewater Facilities Master Plan, (Black & Veatch, James M. Montgomery, 1990); revised by EMWD 1993.

(2) Subbasin averages based on available data, and in most cases, old data. Average for Perris South-II excludes Ski Land area.

(3) Winchester subbasin is currently unsewered. In the future, the Winchester subbasin area will either be sewered to a new reclamation plant in Winchester area or sewered to an existing reclamation plant.

TDS concentration for each subbasin, the water supply TDS requirement and the blending ratios for SWP water to groundwater. Based on existing groundwater quality information, blending SWP water with groundwater from the San Jacinto Lower Pressure, Perris North, Perris South-I, parts of Perris South-II, and parts of Perris South-III, could provide potable water that is also within the waste discharge requirements of EMWD reclamation plants. Generally, blending ratios around one are considered economically feasible and blending ratios of two could be feasible. Lakeview groundwater will not need to be blended. Perris North groundwater will need three parts of SWP water if it is to be used in the area tributary to the Moreno Valley reclamation plant. Groundwater from Perris South-I, Perris South-II, Perris South-III, and the San Jacinto Lower Pressure subbasins can easily be blended with SWP water. Menifee-I, Menifee-II and Winchester cannot be economically blended.

Demineralization. Demineralization is a treatment process that reduces the mineral content of groundwater to a specified level that is established for the use of the product water. Demineralization facilities, often called desalters, have been constructed in the Arlington subbasin, near Riverside, and are in design for the Chino Basin and the Menifee area.

The proposed Menifee desalter will convert 4,200 acre-ft/yr of groundwater pumped from the Menifee I and II subbasins with a TDS concentration of 2,400 mg/L to 3,360 acre-ft of potable water, with a TDS concentration of 400 mg/L (Black & Veatch, 1993). Product water from the Menifee desalter will be served in EMWD service area.

Demineralization could be used to recover the yield of the San Jacinto Lower Pressure, Perris South-I, Perris South-II, Perris South-III, and Winchester subbasins. These basins are excessively mineralized, partly from irrigated agriculture and partly from natural sources. The proposed Menifee desalter will recover the yield of the Menifee-I and Menifee-II subbasins. EMWD is considering treating groundwater from the Perris South II, Perris South III and Winchester subbasins at the Menifee desalter site in a future expansion of that facility.

Other Treatment Technologies. Other treatment technologies can be used to recover groundwater when other contaminants render groundwater unusable. Selective ion exchange can be used to remove specific ions such as nitrate or uranium. Granulated activated carbon (GAC), air stripping and advanced oxidation can be used individually, or in combination, to remove organic compounds. The need for these treatment technologies is unknown at this time due to the lack of water quality data.

Increase In Supply. Currently, contaminated groundwater is either avoided, or is used for non-potable demands such as agricultural or landscape irrigation. These non potable demands, whenever possible, could be supplied with reclaimed water, allowing the contaminated groundwater to be treated and supplied for municipal use. The volume of contaminated groundwater that can be recovered and used through blending will cause an equal reduction in the demand for imported water. The volume of contaminated groundwater that can be recovered through demineralization varies between 70 and 85 percent of the water produced for demineralization; the remaining water is a brine which must be exported. The volume of potable water produced by the demineralization will cause an equal reduction in the demand for imported water. The increase in supply from the recovery of contaminated groundwater is equal to the safe yield of the subbasins where the recovery projects will occur, minus the existing level of groundwater pumping in those subbasins. Table 7-2 summarizes considerations for blending and demineralization of elements and presents an estimate of the groundwater production that could be used for blending or demineralization. The volume of groundwater available for blending or demineralization is estimated as the safe yield of the subbasin, minus reported groundwater production. The safe yield used in this estimate includes the recharge of EMWD reclaimed water. The estimates of groundwater available for blending and demineralization shown in Table 7-2 are slightly higher than would be implemented because actual groundwater production by local producers is higher than reported production. Estimates of actual groundwater production will need to be developed prior to implementing blending or demineralization elements.

Cost. The cost of blending consists of the capital and operations and maintenance costs associated with wells, pipelines and reservoirs required to implement blending. The costs of these types of facilities are highly sensitive to location of wells, blending water sources and the design flow rates (e.g., base load or peaking). The development of these costs is beyond the scope of this investigation. Most of the facilities that will be required for blending will be required even if blending were not used. Thus, the incremental cost associated with blending facilities will be small, relative to the cost of future water distribution facilities. The volume of groundwater used with blending would offset the need for an equal amount of imported water. The SWP water used for blending is not a new imported water demand. The blending water would come from SWP water that would have been used if there were no blending with groundwater. Therefore, blending will cause a net decrease in imported water demands.

The cost of demineralization varies depending on source water quality, product water quality, well field(s), distribution system and the treatment technology. The Menifee desalter is a three

TABLE 7-2
CONSIDERATIONS FOR BLENDING AND DEMINERALIZATION ELEMENTS

Conjunctive Use Characteristics	Subbasin					
	Lakeview	Menifee	Perris North	Perris South (1)	San Jacinto Lower Pressure	Winchester
Groundwater Quality (2)	Good	Poor	Good	Poor	Poor	Poor
Range in Capacity of Producing Wells (gpm)	100-2,000	10-1,000	90-1,000	90-1,000	Unknown	100-850
Safe Yield						
Natural Safe Yield	6,800	3,300	13,700	8,300	2,500	1,600
Natural Safe Yield plus Reclaimed Water Recharge (acre-ft/yr)	6,800	4,700	19,500	12,800	2,500	1,800
Average Reported Groundwater Production 1987 to 1991 (2) (acre-ft/yr)	4,000	0	2,300	1,400	500	0
Potential Groundwater Production That could Be Used for Blending and Demineralization (acre-ft/yr)	Not Applicable	4,700	Not Applicable	12,100	700	1,800

note - (1) part of Perris South-I and -II have good quality water
(2) Production values shown in Table 4-3 and excludes small producers (<25 acre-ft/yr).

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mgd treatment plant with a capital cost estimated to range from $14,000,000 to $17,000,000. Table 7-3 lists the capital and operations and maintenance cost opinions for the Menifee desalter (Black & Veatch, 1993). The 1995 cost to produce water from the Menifee desalter is about $501 per acre-ft, which is slightly higher than comparable water imported from Metropolitan. By 2001, the unit cost of water from the Menifee desalter will be equal to water from Metropolitan.

Metropolitan has instituted a Groundwater Recovery (GWR) program that will subsidize the cost of these desalters up to $250 per acre-ft. In the GWR program, Metropolitan will purchase the product water from the desalter for up to $250 over Metropolitan's base treated rate and sell the water back to EMWD at the base treated rate. Metropolitan instituted this program to encourage the recovery of contaminated groundwater. Table 7-3 shows how the GWR program will work for the Menifee desalter.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of projects to recover contaminated groundwater. The types of new information and studies that are required include:

- geophysical studies to determine aquifer boundaries and geometry
- hydrogeologic studies to determine aquifer hydraulic properties
- geochemical studies to establish ambient groundwater quality, and trends
- facility studies to site and evaluate engineering and facility requirements
- economic studies
- environmental studies

Part of these investigations should include demonstration or pilot projects. Demonstration-level projects for the recovery of contaminated water should be done to test the technical and institutional feasibility of full scale projects. Demonstration projects should include the following:

- Pilot scale demineralization projects in Winchester, Perris South and San Jacinto Lower Pressure subbasins. These tests would provide design data for large scale projects.

- Well scale blending projects. Poor quality groundwater from out-of-service EMWD wells could be injected into EMWD's distribution system. This could be done with EMWD's Falico well in the Perris South subbasin

TABLE 7-3
MENIFEE DESALTER COSTS AND METROPOLITAN'S GROUNDWATER RECOVER PROGRAM

Year	Menifee Desalter Cost				Metropolitan Treated Base Rate	Metropolitan GWR Subsidy	Purchase Price to Metropolitan	Remaining Unsubsidized Cost	Unit Cost to EMWD
	Amortized Capital cost ($)	Annual O & M Cost ($)	Total Annual Cost (1) ($)	Unit Cost (2) ($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)	($/acre-ft)
1995	$919,652	$1,748,734	$2,668,386	$794	$454	$250	$704	$90	$544
1996	$919,652	$1,801,196	$2,720,848	$810	$483	$250	$733	$77	$560
1997	$919,652	$1,855,232	$2,774,884	$826	$515	$250	$765	$61	$576
1998	$919,652	$1,910,889	$2,830,541	$842	$545	$250	$795	$47	$592
1999	$919,652	$1,968,216	$2,887,868	$859	$578	$250	$828	$31	$609
2000	$919,652	$2,027,262	$2,946,914	$877	$613	$250	$863	$14	$627
2001	$919,652	$2,088,080	$3,007,732	$895	$649	$246	$895	$0	$649
2002	$919,652	$2,150,722	$3,070,374	$914	$688	$226	$914	$0	$688
2003	$919,652	$2,215,244	$3,134,896	$933	$730	$203	$933	$0	$730
2004	$919,652	$2,281,701	$3,201,353	$953	$773	$180	$953	$0	$773
2005	$919,652	$2,350,152	$3,269,804	$973	$820	$153	$973	$0	$820
2006	$919,652	$2,420,657	$3,340,309	$994	$869	$125	$994	$0	$869
2007	$919,652	$2,493,277	$3,412,929	$1,016	$921	$95	$1,016	$0	$921
2008	$919,652	$2,568,075	$3,487,727	$1,038	$976	$62	$1,038	$0	$976
2009	$919,652	$2,645,117	$3,564,769	$1,061	$1,035	$26	$1,061	$0	$1,035
2010	$919,652	$2,724,471	$3,644,123	$1,085	$1,097	$0	$1,085	$0	$1,097

note (1) annual O & M cost escalate at three percent per year
(2) desalter produces 3,360 acre-ft/yr

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Water Resource Engineer

and other wells in Winchester and the Lower San Jacinto subbasins, as appropriate.

CONJUNCTIVE USE

Conjunctive use is an operational strategy that combines the operations of multiple sources of water and storage resources in such a way that the combined yield is greater than the yield that would occur from the sum of independent, uncoordinated operations of the sources. The same definition would apply if other goals could be achieved by coordinated operation and the yield remained at an acceptable level. Other goals might include reduced cost, more reliable supply, and the attainment of environmental objectives. In most cases, conjunctive use results in increased yield and lower cost. Conjunctive use is commonly associated with storing of imported water in groundwater basins for use during periods of shortage. The more general definition could involve EMWD reclamation and municipal distribution facilities, Metropolitan facilities and resources, state project facilities and resources, groundwater basins within EMWD, and, potentially, groundwater basins outside of EMWD. Conjunctive use can operate seasonally, over-year or both. Seasonal conjunctive use would bank water during seasonal period(s) of over-supply or abundance for use during dry times of the year. Over-year conjunctive use would bank water during years of over-supply or abundance for use during drought periods and imported water shortages.

Table 7-4 summarizes the considerations for conjunctive use projects by subbasin. Based on current knowledge of groundwater conditions, EMWD could bank local runoff, imported water purchased from Metropolitan and reclaimed water in the Lakeview, Perris North and Perris South subbasins during the period of October 1 through April 30, for use either during the summer, during periods of imported water shortages, or both. The unused storage capacity of the Lakeview, Perris North and Perris South subbasins is about 600,000 acre-ft. EMWD could use up to half (and possibly more) of this unused storage capacity for seasonal and over-year storage, thereby reducing the cost of imported water purchases and providing an additional source of water during periods of imported supply shortage.

Recharge would be accomplished with a combination of new spreading basins and injection wells. Recovery of recharge will be through existing and new production wells. Where practical, injection and production will occur at the same well. That is, injection will take place

TABLE 7-4
CONSIDERATIONS FOR CONJUNCTIVE USE PROJECTS

Conjunctive Use Characteristics	Subbasin					
	Lakeview	Menifee	Perris North	Perris South(1)	San Jacinto Lower Pressure	Winchester
Unused Groundwater Storage Capacity (acre-ft)	230,000	40,000	220,000	150,000	9,000	5,000
Groundwater Quality (2)	Good	Poor	Good	Poor	Poor	Poor
Range in Capacity of Producing Wells (gpm)	100-2,000	10-1,000	90-1,000	90-1,000	Unknown	100-850
Recharge Methods	Spreading Basins In-Lieu Injection	Injection In-Lieu	Spreading Basins In-Lieu Injection	Spreading Basins In-Lieu Injection	Injection In-Lieu	Injection In-Lieu
Spreading Basin Potential	Yes	No	Yes	Yes	No	No
Proximity to Imported Water Facilities	State Project Water Colorado River Water		State Project Water	State Project Water Colorado River Water		State Project Water Colorado River Water
Proximity to Reclaimed Water Facilities	Yes	Yes	Yes	Yes	Yes	Yes
Proximity to Major Drainage Facilities	San Jacinto River	Salt Creek	Perris Valley Drain	San Jacinto River Salt Creek	San Jacinto River	Salt Creek

note - (1) part of Perris South-I and -II have good quality water

(2) good quality water has a TDS less than 500 mg/L; poor quality water has TDS greater than 500 mg/L and generally greater than 1,000 mg/L

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during the recharge period of October 1 through April 30, followed by groundwater production at the same well during the period of May 1 to September 30. This type of aquifer storage and recovery scheme is ideal for areas where spreading is infeasible due to land use, low recharge rates or groundwater quality limitations.

Reclaimed water could be a source of recharge in a conjunctive use program for augmentation of potable supplies. Parts of groundwater subbasins could be used for the seasonal storage of reclaimed water.

Based on current knowledge of groundwater conditions, conjunctive use with imported supplies and local runoff in the San Jacinto Lower Pressure, Menifee and Winchester subbasins appears to be more difficult to implement and of less benefit. Limited conjunctive use in these subbasins could be done in conjunction with groundwater treatment.

Increase in Supply. The increase in supply from conjunctive use could not be determined at this level of study. Under a worst case scenario, conjunctive use would reduce shortages that EMWD customers would face during imported water shortages and would reduce the cost of imported water use through the purchase of off-peak supplies and use of reclaimed water for recharge. EMWD should be able to shift about 30,000 to 50,000 acre-ft year of base rate purchases to off-peak, with large conjunctive use projects in the Lakeview, Perris North and Perris South subbasins. The reduction in cost would be much more substantial if a blend of reclaimed water and imported water were recharged during the winter.

Information Needs. New information and engineering studies are required to develop definitive estimates of the size and benefits of potential artificial recharge projects. The types of new information and studies that are required include:

- ❑ geophysical studies to determine aquifer boundaries and geometry
- ❑ hydrogeologic studies to determine aquifer hydraulic properties
- ❑ geochemical studies to establish ambient groundwater quality, trends, and compatibility of ambient groundwater with imported water
- ❑ facility studies to site and evaluate engineering and facility requirements
- ❑ economic studies
- ❑ environmental studies

Demonstration projects should be developed to test injection of treated imported water in the Lakeview, Perris North and Perris South subbasins. These demonstration projects would test the feasibility of well injection for groundwater recharge and aquifer storage and recovery for conjunctive use. Demonstration level injection well tests should be done for blends of treated imported water and reclaimed water.

EXCHANGE OF AGRICULTURAL AND OTHER NON-POTABLE WATER USERS FROM GROUNDWATER TO RECLAIMED WATER

The exchange of agricultural and other non-potable groundwater production to municipal uses can occur through:

- retirement of agricultural lands, that is, the conversion of agricultural lands to non-agricultural uses; and
- by substituting other supplies such as reclaimed water.

Agricultural demands are projected to range from 33,000 acre-ft/yr in 1995 to 31,000 acre-ft/yr in 2010. The average agricultural demand during this period is approximately equal to the total yield of the West San Jacinto Basin. The substitution of reclaimed water for agriculture groundwater production and other non-potable uses is a prerequisite to developing municipal supplies from the West San Jacinto Groundwater Basin. There are some agricultural demands that cannot be satisfied with reclaimed water, such as dairy cow washing and processing of produce for market.

Increase in Supply. The increase in municipal supply that will occur from the exchange of agricultural and other non-potable groundwater production to municipal production is approximately one acre-ft for each acre-ft of exchange. Agricultural groundwater production is projected to range from about 24,100 acre-ft/yr in 1995, to 22,100 acre-ft/yr in 2010. A reasonable goal would be to exchange between 10,000 to 20,000 acre-ft of agricultural and other non-potable groundwater production to municipal production.

Demonstration-level projects for the exchange of agricultural and other non-potable users from groundwater to reclaimed water should be done to test the technical and institutional feasibility of full scale projects. Long term use of reclaimed water for irrigation may impact the drainage characteristics of the soil. Demonstration projects should be done to investigate the impacts from irrigation with reclaimed water on soils and evaluate appropriate soil and irrigation management practices. EMWD is currently in the process of completing exchange agreements similar to that

described above with Moreno Valley Ranch Golf Course and University of California, Riverside, in the Perris North subbasin and Mr. John D. Mott in Lakeview Subbasin.

Cost. The cost associated with supplying reclaimed water to agricultural users is the capital, operations and maintenance cost associated with the conveyance of reclaimed water to the agricultural and other non-potable water users. This cost is a sunk cost as EMWD must treat and dispose of reclaimed water whether any water exchange occurs or doesn't occur. The water supply cost associated with the exchange of agricultural groundwater production to municipal production with the retirement of agricultural lands is assumed to be zero.

SECTION 8

SECTION 8
GROUNDWATER MANAGEMENT PLAN

CONTENTS OF THE MANAGEMENT PLAN

The management plan described herein is a program to achieve the management plan goals and includes conceptual descriptions of elements of the plan, and a description of the process to define and implement these elements consistent with the management plan goal. This plan, when adopted, will be the groundwater management program for the West San Jacinto Groundwater Basin management area. The groundwater management program will include: the development and implementation of policies, engineering investigations, facilities construction and operation, and other management activities. There are significant deficiencies in the knowledge of the groundwater resources of the West San Jacinto Groundwater Basin management area. These deficiencies preclude the definitive descriptions for some of the physical and institutional elements of the groundwater management plan. The groundwater management program includes studies to develop additional information that is necessary to develop all the institutional and physical elements described in the plan.

MANAGEMENT PLAN CRITERIA

The goal of the management plan stated in Section 6 is:

> ***maximize the use of groundwater for potable demands in such a way as to lower the cost of water supply and to improve the reliability of the <u>total</u> water supply for <u>all water users in the West San Jacinto Groundwater Basin management area</u>***

This goal extends to all groundwater users. Groundwater users that are not dependent on EMWD should benefit from the groundwater management plan. Adverse impacts, if any, from the

groundwater plan will be minimized or mitigated. The rights of private groundwater producers will be protected. Groundwater producers who extract 10 acre-ft/yr or less shall be exempt from the operation and implementation of the groundwater management plan.

The implementation of this goal and its attendant constraints requires a set of criteria from which to test the various elements of the Management Plan. These criteria include:

- ❑ meet future water demands
- ❑ minimize dependence on imported water
- ❑ adequate (safe) water supply quality
- ❑ minimum cost
- ❑ ease of implementation

The groundwater management plan must be an integral part of satisfying the water demands in the West San Jacinto Groundwater Basin management area. Each element of the plan must, on its own, either add to the water supply or, by complementary action, cause the yield of another element to increase.

Minimizing the dependence on imported water is driven by the need for reliability and cost. The management area will, for the foreseeable future, be heavily dependent on imported water. Imported water is expensive and prone to shortage. Groundwater, properly managed, can be used to minimize peak seasonal demand on imported supplies and can provide carry-over storage for use when shortages occur in the imported supply.

The yield developed by the management program should, when delivered to water users, be of suitable quality. For municipal users this will be potable quality. For private groundwater producers, groundwater quality should be improved or the same as if the groundwater management plan did not exist.

The cost of municipal water supplies should be less with the management plan. The water supply cost for private water users should be less or unchanged. The yield of the management plan is part of the mix of water sources available in the management area. The groundwater management elements incorporated in the groundwater management plan will be such as to minimize the cost of the total water supply and will not be based on the individual element cost.

The groundwater management plan should be implementable. The benefits, cost and institutional complexity should be such that it will be feasible to implement the groundwater management plan.

ULTIMATE PLAN DESCRIPTION

The groundwater management plan consists of a series of elements that, when implemented, will achieve the management plan goal stated above within the constraints. The management plan includes implementation of new policies, institutional arrangements, and physical projects. EMWD will be the agency responsible for implementation of the groundwater management plan. Based on the information developed in this study and presented in the previous sections, the ultimate groundwater management plan should include the following elements.

Establishment of a Groundwater Basin Manager

EMWD will implement the groundwater management plan. EMWD Board of Directors will be the decision-making body responsible for directing the implementation of the groundwater management plan. EMWD staff will serve as the staff to assist the EMWD Board of Directors in implementing the plan.

Upon adoption of the groundwater management plan, EMWD Board of Directors will appoint an Advisory Committee. The Advisory Committee will be composed of seven members, with one member each from city of Moreno Valley, city of Perris, Nuevo Mutual Water Company, Edgemont Gardens Mutual Water Company, and EMWD; and two members representing agricultural producers. The Advisory Committee shall study, review and provide comments on all groundwater management plan activities directly to the EMWD Board of Directors.

EMWD staff will prepare an annual engineering report describing the operation of the management plan for review by the EMWD Board of Directors, Advisory Committee and groundwater producers. EMWD, in consultation with the Advisory Committee and participating groundwater producers, will develop a coordinated operating strategy on an annual basis, based on the management plan and the findings of the annual report.

Monitoring of Groundwater Production

EMWD, in cooperation with the Advisory Committee, will implement a groundwater production monitoring program. Detailed estimates of the safe yield will be developed in the first year of the groundwater production monitoring. Groundwater production estimates will be developed by EMWD based on totalizing meters, energy usage and land use. EMWD will produce a groundwater production report and estimates of overdraft (if any). These data will be included in the annual report provided to the Advisory Committee. The production monitoring program will not limit or suspend groundwater production by existing groundwater producers.

Monitoring of Groundwater Level and Quality

EMWD, in cooperation with the Advisory Committee, will implement a groundwater level and quality monitoring program. Groundwater level and quality data will be collected from well owners. EMWD will measure groundwater levels and quality from select private wells. Groundwater levels and quality data from agencies' wells will be provided to EMWD by the agencies. EMWD will compile these data and develop estimates of the groundwater in storage, change in storage, overdraft and groundwater quality conditions. These data will be included in the annual report provided to the management committee.

Development of Well Construction Policies

EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, will develop well construction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies will be updated continuously based on new regulatory requirements and data. These polices will not limit or suspend groundwater production by existing groundwater producers.

Development of a Well Abandonment and Destruction Program

EMWD, in cooperation with the Advisory Committee, the Department of Health Services and the Riverside County Health Department, should develop well abandonment and destruction policies that are specific to the West San Jacinto Groundwater Basin management area. These policies should be updated continuously based upon new regulatory requirements and data.

Monitoring of Well Construction, Abandonment and Destruction

EMWD has compiled and digitized most, if not all the well construction information that is available for existing wells. EMWD, in cooperation with other groundwater producers, will collect well construction data for new wells. EMWD will provide comments and suggestions to supplement design criteria that will be required by other agencies, including the Department of Health Services and the Riverside County Health Department. EMWD, through the monitoring of groundwater production, will determine wells that are inactive and make recommendations to well owners regarding the fate of these wells.

Groundwater Quality Protection

EMWD, in cooperation with the Advisory Committee and parties responsible for groundwater quality degradation, should develop cooperative plans to prevent further degradation of groundwater and to integrate the solution of existing water quality problems to maximize the beneficial use of groundwater. The known areas of concern are the high TDS groundwater in the Perris South II (Ski Land area) and Winchester subbasins, and the groundwater contamination associated with March Air Force Base. The existing efforts undertaken by EMWD to rehabilitate the Menifee subbasins (the Menifee desalter project) will be completed independent of the groundwater management plan. Additional degraded groundwater areas could be discovered through groundwater monitoring.

Exchange of Agricultural and Other Non-potable Groundwater Production to Municipal Use

The intent of this element is to increase the groundwater yield available for municipal use by either retiring agricultural and non potable demands or by substituting reclaimed water for groundwater used for agricultural and other non-potable uses. It is the goal of this element to maximize the exchange of groundwater production from non-potable uses to municipal uses. Incentives should be developed to encourage the exchange of agricultural groundwater production to municipal use. From an agricultural perspective, the cost of using reclaimed water should be equal to, or less than, the cost of groundwater.

EMWD should consider providing reliable reclaimed water service to individual farms and other non-potable users by constructing pipelines from EMWD reclamation facilities to logical points

in the farm irrigation systems. The farmer would pay for the reclaimed water at a rate that would make the farmer indifferent to either groundwater or reclaimed water; or at a rate slightly less than his groundwater production cost. The rate should be based on the actual cost of groundwater production and the usefulness of the farmer's well to EMWD. The farmer would pay for reclaimed water based on the operation and maintenance cost of his well. The farmer would produce only enough groundwater for potable uses on the farm, and future potable demands, when the land is developed, would be served by EMWD.

If the agricultural well were suitable for municipal use, then the farmer's well and necessary easements could be purchased by EMWD. The purchase price would be reflected in the cost of reclaimed water. In this case, the farmer would pay for reclaimed water based on the operation and maintenance cost of his well, less the amortized purchase price of the farmer's well. In either case, the reclaimed water rate may have to be discounted slightly to cause the exchange to occur.

Use of reclaimed water on some soils may reduce the drainage rate of soil and lead to water logged and other undesirable soil conditions. Each site where reclaimed water could be applied in lieu of groundwater needs to be evaluated to ensure that the reclaimed water can safely be applied to the soil. This evaluation will be completed prior to formalizing agreements to exchange groundwater for reclaimed water.

Maximize Yield Augmentation with Local Resources - Local Runoff and Reclaimed Water

Yield augmentation through the recharge of runoff (water harvesting) and through the recharge of reclaimed water should be implemented where consistent with water quality objectives and other elements of the groundwater management plan. The Lakeview, Perris North and Perris South subbasins appear to be the most feasible areas for this element. The cost associated with the recharge of runoff and reclaimed water are the capital and operation costs for the facilities to capture and recharge runoff and reclaimed water.

The specifics of recharge and conveyance facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate yield augmentation alternatives.

Maximize Conjunctive Use

Conjunctive use should be implemented in the West San Jacinto Groundwater Basin management area. The unused storage capacity in the West San Jacinto Groundwater Basin management area is about 670,000 acre-ft, with about 600,000 acre-ft or 90 percent in the Lakeview, Perris North and Perris South subbasins. The yield from conjunctive use, exclusive of safe yield, could range from 30,000 to 50,000 acre-ft, or perhaps larger. Conjunctive use will improve overall water supply reliability, groundwater quality, and will lower water supply cost. These benefits will be realized by all groundwater users.

The specifics of recharge, extraction, conveyance and treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to develop and evaluate conjunctive use alternatives.

Groundwater Treatment

Groundwater treatment in the form of blending and demineralization should be done in the West San Jacinto Groundwater Basin management area to recover contaminated groundwater for municipal use. The specifics of treatment facilities will be developed after a thorough groundwater resources evaluation is performed and planning studies are done to evaluate groundwater treatment feasibility.

Groundwater Management Plan Alternatives

Four groundwater management alternatives were developed to evaluate the economic benefits to all water users in the groundwater management area. All four of these alternatives include the following management elements:

- ❑ Establishment of Groundwater Basin Manager
- ❑ Monitoring of Groundwater Production
- ❑ Monitoring of Groundwater Level and Quality
- ❑ Development of Well Construction Policies
- ❑ Development of a Well Abandonment and Destruction Program
- ❑ Monitoring of Well Construction, Abandonment and Destruction
- ❑ Groundwater Quality Protection

Alternative 1 - Agricultural Exchange and Blending. Alternative 1 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 17,500 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use.

Alternative 2 - Agricultural Exchange, Blending and Demineralization. Alternative 2 consists of the above-mentioned common elements plus the exchange of agricultural groundwater production, of which 2,000 acre-ft/yr are permanent transfers from land use conversions and about 21,700 acre-ft/yr of exchange of groundwater production for reclaimed water. Seven thousand one hundred acre-ft/yr of poor quality groundwater will be pumped from the San Jacinto Lower Pressure and Perris South subbasins and blended with imported water for municipal use. Five thousand three hundred acre-ft/yr of highly mineralized groundwater from the Perris South and Winchester subbasins will be pumped and demineralized to produce about 4,200 acre-ft of drinking water.

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use. Alternative 3 includes all the elements of Alternative 2, plus conjunctive use. Conjunctive use will be implemented in the Perris North, Perris South I, Perris South II and Lakeview subbasins. Recharge would occur in spreading basins. Source water is state project water and reclaimed water. Average annual increase in recharge and extraction from conjunctive use will be about 30,000 acre-ft/yr.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use.. Alternative 4 is identical to Alternative 3 except that the conjunctive use element has been expanded to 50,000 acre-ft/yr.

Economic Evaluation of the Groundwater Management Plan Alternatives

Tables 8-1 through 8-4 illustrate the economic benefits that water users in the West San Jacinto Groundwater Basin management area would realize if a groundwater management plan were implemented. Each table lists the projected total demand for water and shows how that demand would be satisfied with each groundwater management plan alternative. For economic

TABLE 8-1
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 1 - AGRICULTURAL EXCHANGE AND BLENDING

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization Volume	Demineralization Rate	Direct Municipal Use Volume	Direct Municipal Use Rate	Municipal Use of Groundwater: Blending Volume	Municipal Use of Groundwater: Blending Rate	Municipal Use of Groundwater: Cost	Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	44,500	$20,203,000	8,900	$63	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,300	0	$483	47,300	$22,845,900	10,849	$66	10,849	$710,826	22,351	$66	$1,464,438	0	$0	2,500	$71	0	$71	$176,800	2,500	24,851	$25,197,964	$304
1997	86,000	46,740	0	$515	46,740	$24,071,100	12,798	$68	12,798	$872,066	20,602	$68	$1,403,837	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	26,462	$28,466,235	$331
1998	89,000	49,540	0	$545	49,540	$26,999,300	14,747	$71	14,747	$1,045,067	18,853	$71	$1,336,045	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	24,713	$31,560,759	$355
2000	95,000	34,635	5,500	$578	40,135	$24,615,015	16,696	$74	16,696	$1,230,513	17,104	$74	$1,260,583	3,360	$609	8,636	$80	7,100	$80	$3,298,045	19,096	36,200	$28,391,254	$309
2001	99,000	36,706	5,500	$649	42,206	$27,391,494	18,645	$77	18,645	$1,429,123	15,355	$77	$1,176,947	3,360	$627	10,385	$83	7,100	$83	$3,553,296	20,845	36,200	$30,774,381	$324
2002	103,000	38,757	5,500	$688	44,257	$30,448,816	20,594	$80	20,594	$1,641,653	13,606	$80	$1,084,604	3,360	$649	12,134	$86	7,100	$86	$3,835,566	22,594	36,200	$33,953,516	$343
2003	107,000	40,808	5,500	$730	46,308	$33,804,840	22,543	$83	22,543	$1,868,898	11,857	$83	$982,989	3,360	$688	13,883	$89	7,100	$89	$4,189,309	24,343	36,200	$37,490,013	$364
2004	111,000	42,859	5,500	$773	48,359	$37,381,507	24,492	$86	24,492	$2,111,697	10,108	$86	$871,510	3,360	$730	15,632	$93	7,100	$93	$4,568,301	26,092	36,200	$41,356,348	$387
2005	115,000	44,910	5,500	$820	50,410	$41,336,200	26,441	$90	26,441	$2,370,929	8,359	$90	$749,540	3,360	$773	17,381	$97	7,100	$97	$4,966,679	27,841	36,200	$45,468,654	$410
2006	120,600	50,310	5,500	$869	55,810	$48,498,890	28,390	$93	28,390	$2,647,521	6,610	$93	$616,418	3,360	$820	19,130	$101	7,100	$101	$5,395,423	29,590	36,200	$49,995,562	$435
2007	126,200	55,710	5,500	$921	61,210	$56,374,410	28,790	$101	28,790	$2,903,904	6,610	$101	$666,718	3,360	$869	19,130	$105	7,100	$105	$5,665,672	29,590	36,200	$57,578,455	$477
2008	131,800	61,110	5,500	$976	66,610	$65,011,360	28,990	$105	28,990	$3,041,040	6,610	$105	$693,387	3,360	$976	19,130	$113	7,100	$113	$6,249,252	29,590	36,200	$65,895,257	$522
2009	137,400	66,510	5,500	$1,035	72,010	$74,530,350	29,190	$109	29,190	$3,184,501	6,610	$109	$721,122	3,360	$1,035	19,130	$118	7,100	$118	$6,366,287	29,590	36,200	$74,995,039	$569
2010	143,000	71,910	5,500	$1,097	77,410	$84,918,770	29,390	$113	29,390	$3,334,573	6,610	$113	$749,967	3,360	$1,085	19,130	$122	7,100	$122	$6,857,835	29,590	36,200	$85,002,260	$619
Total Volume	1,719,000	765,929	66,000		831,929		350,045				201,955			47,040		202,831		85,200			335,071	537,026	$95,861,145	$670
Fraction of Total		45%	4%				20%				12%			3%		12%		5%						
Total Cost						$641,033,264				$31,725,830			$15,937,480							$65,742,269			$754,438,842	
Fraction of Total						85%				4%			2%							9%				
Present Value																							$449,025,159	

cmative 1

Mark J. Wilder
Water Resources Engi

TABLE 8-2
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 2 - AGRICULTURAL EXCHANGE, BLENDING AND DEMINERALIZATION

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost	Municipal Use of Groundwater: Demineralization: Volume	Demineralization: Rate	Direct Municipal Use: Volume	Direct Municipal Use: Rate	Blending: Volume	Blending: Rate	Municipal Cost	Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)		($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($)	(acre-ft/yr)	($/acre-ft)	($)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	44,500	$20,203,000	8,900	$63	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,300	0	$483	47,300	$22,845,900	11,269	$66	11,269	$738,345	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,197,964	$304
1997	86,000	46,740	0	$515	46,740	$24,071,100	13,638	$68	13,638	$929,304	19,762	$68	$1,346,598	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	25,622	$28,466,235	$331
1998	89,000	49,540	0	$545	49,540	$26,999,300	16,007	$71	16,007	$1,134,359	17,593	$71	$1,246,753	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,560,759	$355
2000	95,000	32,555	5,500	$613	38,055	$23,327,715	20,745	$77	20,745	$1,590,086	13,255	$77	$1,015,984	7,540	$627	8,305	$83	7,100	$80	$5,644,789	20,776	36,200	$29,766,958	$324
2001	99,000	34,186	5,500	$649	39,686	$25,756,214	23,114	$80	23,114	$1,842,535	11,086	$80	$883,722	7,540	$649	10,474	$86	7,100	$86	$6,405,557	25,114	36,200	$34,888,027	$352
2002	103,000	35,817	5,500	$688	41,317	$28,426,096	25,483	$83	25,483	$2,112,635	8,917	$83	$739,252	7,540	$688	12,643	$89	7,100	$89	$6,954,190	27,283	36,200	$38,232,173	$371
2003	107,000	37,448	5,500	$730	42,948	$31,352,040	27,852	$86	27,852	$2,401,395	6,748	$86	$581,812	7,540	$730	14,812	$93	7,100	$93	$7,543,390	29,452	36,200	$41,878,637	$391
2004	111,000	39,079	5,500	$773	44,579	$34,459,567	30,221	$90	30,221	$2,709,876	4,579	$90	$410,593	7,540	$773	16,981	$97	7,100	$97	$8,159,104	31,621	36,200	$45,739,140	$412
2005	115,000	40,710	5,500	$820	46,210	$37,892,200	32,590	$93	32,590	$3,039,193	2,410	$93	$224,745	7,540	$820	19,150	$101	7,100	$101	$8,825,036	33,790	36,200	$49,981,175	$435
2006	120,600	46,110	5,500	$869	51,610	$44,849,090	32,790	$97	32,790	$3,180,158	2,410	$97	$233,735	7,540	$869	19,150	$105	7,100	$105	$9,300,185	33,790	36,200	$57,563,169	$477
2007	126,200	51,510	5,500	$921	57,010	$52,506,210	32,990	$101	32,990	$3,327,537	2,410	$101	$243,085	7,540	$921	19,150	$109	7,100	$109	$9,802,183	33,790	36,200	$65,879,015	$522
2008	131,800	56,910	5,500	$976	62,410	$60,912,160	33,190	$105	33,190	$3,481,619	2,410	$105	$252,808	7,540	$976	19,150	$113	7,100	$113	$10,331,196	33,790	36,200	$74,977,783	$569
2009	137,400	62,310	5,500	$1,035	67,810	$70,183,350	33,390	$109	33,390	$3,642,703	2,410	$109	$262,920	7,540	$1,035	19,150	$118	7,100	$118	$10,894,942	33,790	36,200	$84,983,916	$619
2010	143,000	67,710	5,500	$1,097	73,210	$80,311,370	33,590	$113	33,590	$3,811,103	2,410	$113	$273,437	7,540	$1,085	19,150	$122	7,100	$122	$11,395,584	33,790	36,200	$93,791,494	$670
Total Volume	1,719,000	724,349	66,000		790,349		394,145				157,855			97,200		194,251		85,200			376,651	534,506		
Fraction of Total		41%	4%		46%		23%				9%			6%		11%		5%						
Total Cost						$605,726,384				$35,855,879			$11,807,430							$105,904,608			$759,294,301	
Fraction of Total						80%				5%			2%							14%				
Present Value																							$452,553,506	

Alternative 2

Mark J. Wilden
Water Resources Engi

TABLE 8-3 (revised 9/7/94)
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 3 - AGRICULTURAL EXCHANGE, BLENDING, DEMINERALIZATION AND
30,000 ACRE-FT CONJUNCTIVE USE (ALL RECHARGE THROUGH SPREADING)

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Untr. Seasonal Water: Conj. Use	Imported Water: Untr. Seasonal Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost (1)	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Conj. Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost (1)	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost (1)	Municipa. Use of Groundwater: Demineralization: Volume	Municipa. Use of Groundwater: Demineralization: Rate	Municipa. Use of Groundwater: Direct + Conj. Use: Volume	Municipa. Use of Groundwater: Direct + Conj. Use: Rate	Municipa. Use of Groundwater: Blending: Volume	Municipa. Use of Groundwater: Blending: Rate	Municipa. Use of Groundwater: Cost	Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost (1)	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)			(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)		(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)		($/acre-ft)
1995	80,000	44,500	0	$454	0	$256	44,500	$20,203,000	8,900	$63	0	$0	8,900	$560,700	24,100	$63	$1,518,300	0	$0	2,500	$68	0	$68	$170,000	2,500	26,600	$22,452,000	$281
1996	83,000	47,500	0	$483	0	$278	47,500	$22,942,500	11,069	$66	0	$0	11,069	$725,241	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,281,460	$305
1997	86,000	47,140	0	$515	0	$304	47,140	$24,277,100	13,238	$68	0	$0	13,238	$902,048	19,762	$68	$1,346,598	3,360	$576	2,500	$74	0	$74	$2,119,232	5,860	25,622	$28,644,978	$333
1998	89,000	50,140	0	$545	0	$319	50,140	$27,326,300	15,407	$71	0	$0	15,407	$1,091,839	17,593	$71	$1,246,733	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,845,239	$358
2000	93,000	3,353	5,300	$613	20,000	$361	29,055	$12,774,715	19,745	$77	10,000	$0	29,745	$1,313,437	13,255	$77	$1,015,984	7,540	$609	36,136	$80	7,100	$80	$4,031,300	50,776	66,200	$21,976,908	$239
2001	99,000	5,386	5,300	$649	20,000	$389	30,886	$14,849,014	21,914	$80	10,000	$0	31,914	$1,746,877	11,086	$80	$883,722	7,540	$627	38,305	$83	7,100	$83	$4,484,045	52,945	66,200	$23,788,181	$250
2002	103,000	7,217	5,300	$688	20,000	$417	32,717	$17,093,296	24,083	$83	10,000	$0	34,083	$1,996,570	8,917	$83	$739,252	7,540	$648	42,643	$89	7,100	$89	$9,638,691	57,283	66,200	$29,467,809	$286
2003	107,000	9,048	5,300	$730	20,000	$447	34,348	$19,557,320	26,252	$86	10,000	$0	36,252	$2,263,444	6,748	$86	$581,812	7,540	$730	44,812	$93	7,100	$93	$10,335,271	59,452	66,200	$32,737,846	$306
2004	111,000	10,879	5,300	$773	20,000	$477	36,179	$22,204,378	28,421	$90	10,000	$0	38,421	$2,548,473	4,579	$90	$410,593	7,540	$773	46,981	$97	7,100	$97	$11,062,661	61,621	66,200	$36,226,104	$326
2005	115,000	12,710	5,300	$820	20,000	$511	38,210	$25,142,468	30,590	$93	10,000	$0	40,590	$2,852,682	2,410	$93	$224,745	7,540	$820	49,150	$101	7,100	$101	$11,844,734	63,790	66,200	$40,064,630	$348
2006	120,600	18,110	5,300	$869	20,000	$545	43,610	$31,422,808	30,790	$97	10,000	$0	40,790	$2,986,187	2,410	$97	$233,735	7,540	$869	49,150	$105	7,100	$105	$12,440,672	63,790	66,200	$47,083,402	$390
2007	126,200	23,310	5,300	$921	20,000	$582	49,010	$38,363,837	30,990	$101	10,000	$0	40,990	$3,125,807	2,410	$101	$243,085	7,540	$921	49,150	$109	7,100	$109	$13,068,288	63,790	66,200	$54,801,017	$434
2008	131,800	28,910	5,300	$976	20,000	$621	54,410	$46,014,012	31,190	$105	10,000	$0	41,190	$3,271,819	2,410	$105	$252,808	7,540	$976	49,150	$113	7,100	$113	$13,727,946	63,790	66,200	$63,266,586	$480
2009	137,400	34,310	5,300	$1,035	20,000	$664	59,810	$54,477,596	31,390	$109	10,000	$0	41,390	$3,424,511	2,410	$109	$262,920	7,540	$1,035	49,150	$118	7,100	$118	$14,427,562	63,790	66,200	$72,592,590	$528
2010	143,000	39,710	5,500	$1,097	20,000	$708	65,210	$63,758,026	31,590	$113	10,000	$0	41,590	$3,584,184	2,410	$113	$273,437	7,540	$1,085	49,150	$122	7,100	$122	$15,069,509	63,790	66,200	$82,685,156	$578
Total Volume	1,719,000	385,349	66,000		240,000		691,349		373,145						157,855			97,200		554,251		85,200			736,651	894,506		
Fraction of Total		22%	4%		14%		40%		22%						9%			6%		32%		5%						
Total Cost								$451,919,843						$33,889,189			$11,807,430							$141,763,865			$639,380,327
Fraction of Total								71%						5%			2%							22%				
Present Value																											$384,636,284	

Mark J. Wilden
Water Resources Engr

TABLE 8-4 (revised 9/7/94)
PRELIMINARY ESTIMATE OF COST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 4 - AGRICULTURAL EXCHANGE, BLENDING, DEMINERALIZATION AND
50,000 ACRE-FT CONJUNCTIVE USE (80% RECHARGE THROUGH SPREADING, 20% RECHARGE THROUGH INJECTION)

Year	Demand	Imported Water: Treated Base Water: Direct Use	Imported Water: Treated Base Water: Blending	Imported Water: Treated Base Water: Rate	Imported Water: Untreated Seasonal Water: Conj. Use	Imported Water: Untreated Seasonal Water: Rate	Imported Water: Treated Seasonal Water: Conj. Use	Imported Water: Treated Seasonal Water: Rate	Imported Water: Total: Imported Volume	Imported Water: Total: Imported Cost (1)	Reclaimed Water: Direct Use	Reclaimed Water: Rate	Reclaimed Water: Conj. Use	Reclaimed Water: Rate	Reclaimed Water: Total Recl. Water Use	Reclaimed Water: Cost (1)	Agricultural Groundwater: Volume	Agricultural Groundwater: Rate	Agricultural Groundwater: Cost (1)	Municipal Use of Groundwater: Demineralization: Volume	Municipal Use of Groundwater: Demineralization: Rate	Municipal Use of Groundwater: Direct + Conj. Use: Volume	Municipal Use of Groundwater: Direct + Conj. Use: Rate	Municipal Use of Groundwater: Blending: Volume	Municipal Use of Groundwater: Blending: Rate	Municipal Use of Groundwater: Blending: Cost	Municipal Use of Groundwater: Total Mun. Use of Groundwater	Total Groundwater Usage	Total Cost (1)	Composite Unit Cost
	(acre-ft/yr)	(acre-ft/yr)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)			(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)		(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)	(acre-ft/yr)	($/acre-ft)		(acre-ft/yr)	(acre-ft/yr)		($/acre-ft)
1995	80,000	44,500	0	$454	0	$356		$309	44,500	$20,203,000	8,900	$43	0	$0	8,900	$360,700	24,100	$43	$1,318,300	0	$0	2,500	$66	0	$68	$170,000	2,500	24,600	$22,452,000	$281
1996	83,000	47,500	0	$483	0	$278		$332	47,500	$22,942,500	11,069	$66	0	$0	11,069	$725,241	24,931	$64	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$25,281,460	$305
1997	86,000	47,140	0	$365	0	$304		$337	47,140	$24,277,100	13,238	$68	0	$0	13,238	$900,048	19,762	$68	$1,346,398	3,360	$376	2,500	$74	0	$74	$2,119,232	5,860	25,022	$28,644,978	$333
1998	89,000	50,140	0	$345	0	$319		$381	50,140	$27,326,300	15,407	$71	0	$0	15,407	$1,091,839	17,593	$71	$1,244,753	3,360	$392	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,845,239	$358
2000	95,000	0	5,500	$578	21,362	$338	1,362	$408	28,224	$10,954,780	17,576	$74	10,000	$0	27,576	$1,295,370	15,424	$74	$1,136,766	7,540	$609	38,860	$80	7,100	$80	$8,247,996	53,500	66,924	$21,634,911	$233
2001	99,000	0	5,500	$649	22,693	$389	2,693	$465	30,886	$13,652,783	21,914	$80	10,000	$0	31,914	$1,746,877	11,086	$80	$883,722	7,540	$649	45,860	$86	7,100	$86	$9,450,228	60,500	71,386	$25,733,610	$260
2002	103,000	0	5,500	$688	23,609	$417	3,609	$496	32,717	$15,422,561	24,083	$83	10,000	$0	34,083	$1,996,570	8,917	$83	$739,231	7,540	$688	49,860	$89	7,100	$89	$10,284,492	64,500	73,417	$28,442,875	$276
2003	107,000	0	5,500	$730	24,524	$447	4,524	$529	34,548	$17,368,898	26,252	$86	10,000	$0	36,252	$2,263,444	6,748	$86	$581,811	7,540	$730	53,860	$93	7,100	$93	$11,177,302	68,500	75,248	$31,391,455	$293
2004	111,000	0	5,500	$773	25,439	$473	5,440	$564	36,379	$19,457,314	28,421	$90	10,000	$0	38,421	$2,548,473	4,579	$90	$410,993	7,540	$773	57,860	$97	7,100	$97	$12,115,387	72,500	77,079	$34,531,966	$311
2005	115,000	0	5,500	$820	26,355	$511	6,355	$601	38,210	$21,786,477	30,390	$93	10,000	$0	40,390	$2,852,641	2,410	$93	$224,745	7,540	$820	61,860	$101	7,100	$101	$13,124,060	76,500	78,910	$37,987,995	$330
2006	120,000	0	5,500	$869	29,055	$545	9,055	$641	43,610	$26,423,415	30,390	$97	10,000	$0	40,390	$2,966,187	2,410	$97	$233,733	7,540	$869	67,260	$105	7,100	$105	$14,334,479	81,900	84,310	$43,979,816	$365
2007	126,200	3,510	5,500	$921	30,000	$582	10,000	$682	49,010	$32,388,651	30,990	$101	10,000	$0	40,990	$3,123,807	2,410	$101	$243,083	7,540	$921	69,150	$109	7,100	$109	$15,245,692	83,790	84,200	$51,203,235	$406
2008	131,800	8,910	5,500	$976	30,000	$621	10,000	$726	54,410	$39,970,938	31,190	$105	10,000	$0	41,190	$3,271,819	2,410	$105	$252,806	7,540	$976	69,150	$113	7,100	$113	$15,992,446	83,790	84,200	$59,488,012	$451
2009	137,400	14,310	5,500	$1,035	30,000	$664	10,000	$773	59,810	$48,148,719	31,390	$109	10,000	$0	41,390	$3,424,511	2,410	$109	$262,920	7,540	$1,035	69,150	$118	7,100	$118	$16,782,642	83,790	84,200	$68,618,794	$499
2010	143,000	19,710	5,500	$1,097	30,000	$708	10,000	$823	65,210	$57,129,354	31,590	$113	10,000	$0	41,590	$3,584,184	2,410	$113	$273,437	7,540	$1,085	69,150	$122	7,100	$122	$17,518,792	83,790	84,200	$78,505,767	$549
Total Volume	1,719,000	235,720	66,000		314,814		74,814		691,349		373,145						157,855			97,200		703,880		85,200			886,280	1,044,135		
Fraction of Total		14%	4%		18%		4%		40%		22%						9%			6%		41%		5%						
Total Cost										$409,664,993						$33,884,189			$11,807,430							$157,700,273			$613,061,887	
Fraction of Total										67%						6%			2%							26%				
Present Value																														$371,114,039

Mark J. Wildt
Water Resources Eng

evaluation purposes, all the plan elements are assumed on line in 1999, that is, all elements would be implemented in five years. Actual implementation could take place over a longer period of time ranging from five to fifteen years. This analysis assumes an amortization period of 20 years, amortization rate of six percent and an inflation rate of four percent. Capital, operations and maintenance costs for recharge facilities, and blending facilities are not included. Salvage costs are not included for the wells and desalters.

Tables 8-1 through 8-4 list the annual cost of water supply and the total present value cost of the water supply plan with the implementation of a groundwater management plan. Similar costs are presented in Table 5-6 for a case without a groundwater management plan. The groundwater management plan alternatives are compared to the *no groundwater management plan case* in Table 8-5. The difference in costs between the *with management plan* cases and *without management plan* case occurs in years 1999 through 2010.

Alternative 1 - Agricultural Exchange and Blending groundwater management plan case has a present value savings of about $108,000,000 over the no groundwater management plan case illustrated in Table 5-6. The saving comes from the exchange of up to 17,500 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water.

Alternative 2 - Agricultural Exchange, Blending and Demineralization groundwater management plan is identical to Alternative 1 except that the agricultural exchange of groundwater production to municipal uses has been expanded to about 21,700 acre-ft/yr and municipal groundwater production has been expanded by about 4,200 acre-ft/yr through construction of a demineralization facility. Alternative 2 has a present value savings of about $104,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and is comparable to the cost of Alternative 1. The cost savings over the *no groundwater management plan case* come from the exchange of up to 21,600 acre-ft/yr of agricultural groundwater production to municipal uses and the reduction in the use of a like amount of imported water. The cost of Alternative 2 is slightly higher than Alternative 1 because the demineralization costs are higher than the cost of imported water prior to 2010. After 2010 demineralization costs will be less than imported water. Alternative 2 would have costs savings greater than Alternative 1 if the economic analysis were extended beyond 2010.

TABLE 8-5 (revised 9/7/94)
COMPARISON OF GROUNDWATER MANAGEMENT PLAN ALTERNATIVES

Alternative	Percentage of Total Supply			Size of Groundwater Management Plan Elements				Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
	Non Interruptible Treated Imported Water	Seasonal Treated Imported Water	Seasonal Untreated Imported Water	Agricultural Exchange (acre-ft/yr)	Blending (acre-ft/yr)	Demineralization (acre-ft/yr)	Conjunctive Use (acre-ft/yr)		
No Groundwater Management Plan	64%	0%	0%	0	0	0	0	$557,000,000	na
1 Agricultural Exchange and Blending	49%	0%	0%	17,510	7,100	0	0	$449,000,000	$108,000,000
2 Agricultural Exchange, Blending and Demineralization	46%	0%	0%	21,690	7,100	4,180	0	$453,000,000	$104,000,000
3 Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use (all recharge through spreading)	26%	0%	14%	21,690	7,100	4,180	30,000	$385,000,000	$172,000,000
4 Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use (80 recharge through spreading, 20 % through injection)	18%	4%	18%	21,690	7,100	4,180	50,000	$371,000,000	$186,000,000

Alternative 3 - Agricultural Exchange, Blending, Demineralization and 30,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 2 plus the incorporation of 30,000 acre-ft/yr of conjunctive use. The source water for conjunctive use is 20,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the *no management plan case* to 26 percent. The demand for untreated seasonal water has risen to 14 percent. Treated non-interruptible and seasonal untreated imported water make up 40 percent of municipal supplies. Alternative 3 has a present value savings of about $172,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $66,000,000 over Alternatives 1 and 2. About 62 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due to conjunctive use.

Alternative 4 - Agricultural Exchange, Blending, Demineralization and 50,000 acre-ft/yr Conjunctive Use management plan has all the elements contained in Alternative 3 except that conjunctive use has been expanded from 30,000 to 50,000 acre-ft. The source water for conjunctive use is 40,000 acre-ft of state project water and 10,000 acre-ft/yr of reclaimed water. The demand for treated non-interruptible water from Metropolitan has dropped from 64 percent for the no management plan case to 18 percent. Untreated seasonal water has risen to 18 percent and treated seasonal water to 4 percent. Treated non-interruptible, treated seasonal and seasonal untreated imported water make up 40 percent of municipal supplies. Treated seasonal water would be used for recharge by injection. Alternative 4 has a present value savings of about $186,000,000 over the *no groundwater management plan case* illustrated in Table 5-6 and about $80,000,000 over Alternatives 1 and 2. About 57 percent of the cost savings comes from the agricultural exchange, blending and demineralization elements included in Alternatives 1 and 2; the remaining cost savings are due conjunctive use.

The groundwater management plan development costs and the costs of recharge of basins and blending facilities are not included in Tables 8-1 through 8-4. These costs could have a present value ranging from $50,000,000 to $70,000,000. The cost savings from implementation of any of these alternatives far exceed the cost of implementation. The projected cost savings from the groundwater management plan illustrated in Tables 8-1 through 8-4 are for the 15-year period of 1999 to 2010 in which the capital-intensive facilities, such as spreading basins, have been in operation (and amortized) for 11 years. If these analyses were extended to the period of time

over which capital-intensive facilities were to be financed, say 20 years, the cost saving would be significantly greater.

There are two additional significant benefits from a groundwater management plan. First, imported water for direct use has been reduced by half, which will improve overall water supply reliability. The volumetric impact of water shortages in the imported water supply could be reduced by half. Second, the recharge of state project water into the Lakeview, Perris North and Perris South subbasins will improve the quality of the groundwater in these subbasins.

The groundwater management alternatives illustrated in Tables 8-1 through 8-4 clearly show that the economic benefits, water supply reliability benefits and water quality benefits of a groundwater management plan are very significant. Tables 8-1 through 8-4 assume that the conjunctive use elements are operational in 1999. As mentioned above, it could take an additional five years (till 2004) to implement the large scale conjunctive use projects described in these examples. Other management elements, yield augmentation in particular, should also be included in the management plan. Cooperative efforts among the water users in the management area, and results of future engineering and economic studies will define which elements will ultimately be used in the management plan.

FINANCING THE GROUNDWATER MANAGEMENT PLAN

The primary beneficiaries of the plan are municipal water users in the West San Jacinto Groundwater Basin management area. Private groundwater producers such as farmers, dairy operators and individuals with small domestic wells will either be beneficially impacted or have no impacts. It is the intent of the plan to mitigate all significant adverse groundwater impacts to private groundwater producers. The types of beneficial impacts that private well owners could experience will be stabilized or increased groundwater levels where overdraft is currently occurring, such as the Lakeview subbasin, and reduced supply cost for those groundwater producers that can use reclaimed water in lieu of groundwater.

The cost of implementing and operating the West San Jacinto Groundwater Basin management plan should be born by municipal water users in the management area. The cost savings experienced by the local private groundwater users should be their incentive to participate in the groundwater management plan. There could be some cost to local groundwater producers if

groundwater replenishment is necessary due to groundwater overdraft. In the event of continued overdraft, an equitable cost sharing plan should be developed to correct the overdraft.

EMWD, acting as manager of the West San Jacinto Basin Groundwater Basin, will not levy and/or collect any rate, fee or charge from any groundwater producer unless authorized by law or contract with the producer, or in the event a producer extracts water stored in a basin by entities participating in the management plan. The plan will not require financial participation by any producer unless there is a consideration provided to such producer in the form of a quantifiable benefit to the producer.

The benefits and costs associated with the groundwater management plan should be accounted for locally, that is, by subbasin or some other geographic unit, to insure the benefits and costs are equitably distributed. The benefits to municipal users in the management area are essentially uniform throughout the management area and thus, the costs associated with those benefits should be distributed uniformly to all municipal water users in the management area. Localized benefits or costs to the Nuevo Water Company and the Edgemont Gardens Mutual Water Company should be estimated when the projects implemented by the groundwater management plan are better defined. EMWD and these agencies may need to develop adjustments in the cost of water supplied to these agencies by EMWD to compensate for localized benefits and costs to these agencies that are caused by the management plan.

Some of the elements of the management plan are capital intensive such as recharge facilities, wells, treatment plants, pipelines, etc. EMWD will need to develop a plan to finance these elements of the groundwater management plan with cost recovery based on the sale of water developed by the plan, or some other method as appropriate. The economic analysis presented previously in this section show that the management plan should easily pay for itself.

IMPLEMENTATION OF THE GROUNDWATER MANAGEMENT PLAN

Upon adoption of the groundwater management plan, EMWD will form the Advisory Committee and implement the groundwater management plan. The implementation of the groundwater management plan will occur in phases and consist of the following:

Phase 1 Short Term Implementation

Phase 2 Refine the Ultimate Groundwater Management Plan

Phase 3 Ultimate Groundwater Management Plan Implementation

Phase 1 Short Term Implementation

The goals of the short term implementation phase are to: implement those elements of the groundwater management plan that are easy to implement, where existing information is adequate for implementation; and to develop and implement demonstration projects that will provide engineering information necessary for design of management elements in the ultimate plan. This phase consists of five tasks that are described below.

Task 1-1 Groundwater Resources Evaluation. Section 4 described what is currently known about the groundwater resources in the management area, based on available reports and data. Most of the water quality data and groundwater elevation data is fifteen to twenty years old. There are no definitive studies evaluating the feasibility of surface water recharge. A complete groundwater resource evaluation should be done to define the groundwater resources in the management area. This effort will include the following sub tasks.

Define the Hydrogeologic Characteristics of the basin including: geology; flow controlling features such as faults, barriers, aquicludes, effective base of the aquifer, and hydraulic conductivity. This will involve: review of existing well logs, new aquifer tests, drilling new test holes, and geophysical studies.

Describe Groundwater Quality Conditions Historical groundwater quality data will be mapped and reviewed. EMWD has recently collected and entered these data into a data base, which will greatly facilitate this effort. A completely new groundwater quality monitoring program will be conducted evaluating the groundwater quality for constituents described in Title 22, plus other constituents that could be regulated and constituents that can be used to understand the groundwater hydrology, such as isotopes of oxygen and hydrogen.

Describe the Occurrence of Groundwater including: groundwater levels, groundwater hydrology, volume of groundwater in storage, unused groundwater storage, and groundwater production and use. This will involve an extensive

groundwater level survey, and review/estimation of historical and future groundwater production.

Task 1-2 Develop Groundwater Management Policies. In this task EMWD, in cooperation with the Advisory Committee and participating groundwater producers, will develop policies for monitoring of groundwater production, monitoring groundwater level and quality, monitoring of well construction, well construction, well abandonment and destruction. Policies for the exchange of agricultural and other non-potable groundwater production to municipal use will be developed in this Task.

Task 1-3 Construct and Operate Demonstration Projects for Blending, Demineralization and Conjunctive Use. EMWD will evaluate the technical feasibility of blending, demineralization, irrigation with reclaimed water, and conjunctive use through small scale demonstration projects. The experience and data developed in this task will be used in subsequent tasks for design of large scale projects. The demonstration projects described in Section 7, or similar projects, will be constructed and operated. The feasibility of water harvesting will be evaluated.

Task 1-4 Develop Water Resources Planning Model. A water resources planning model will be used to evaluate the groundwater level response, groundwater quality response, water supply reliability, water supply quality and wastewater quality responses of the management plan. This model will be used to evaluate management plan alternatives in Phase 1 and in subsequent phases.

Task 1-5 Develop and Evaluate Feasibility Level Plans for the Management Plan Elements. The management elements and new management elements that arise from Tasks 1-1 and 1-2 efforts, will be combined and developed into alternatives. The capacity, size and operational characteristics of the management elements will be defined and analyzed using the data from Tasks 1-1, 1-3 and 1-4. An initial environmental study will be done to assess probable environmental impacts and help develop the scope of work for environmental studies in Phase 2.

Phase 2 Refine the Ultimate Groundwater Management Plan

Phase 1 Short Term Implementation will develop policies and data necessary for defining the ultimate groundwater management plan. Phase 2 consists of the detailed engineering, environmental and financial work to describe and implement the ultimate management plan. The complexity and cost for the analyses described below are dependent on the management plan elements included in the management plan. Phase 2 consists of four tasks that are described below.

Task 2-1 Prepare Facility and Operation Plans. This task will produce an initial set of facility and operational plans. The initial plans will be based on the results of Phase 1 and will be used in *Task 2-2 Prepare Project Specific Environmental Impact Report.* The initial facility and operational plans will include plans and cost opinions. The facility and operational plans will be modified in this task, based on the Task 2-2 effort to minimize undesirable environmental impacts and to include mitigation measures. The facility and operational plan will be finalized with the EIR prepared in Task 2-2. An optimum management plan will be developed that is consistent with the management plan goal and its constraints.

Task 2-2 Prepare Project Specific Environmental Impact Reports (EIR). EIR's will be prepared for the implementation of specific groundwater management elements that are developed in Phase 1. This Task consists of the following sub tasks.

Prepare and Distribute Notice of Preparation (NOP). The NOP will be prepared based on the results of the initial environmental study prepared in Task 1-5 and the facility and operational plans developed in Task 2-1. The final scope of work for the EIR studies will be based on the NOP and comments received on the NOP.

Estimate Environmental Impacts and Develop Mitigation Plans. This work will include: biological assessments, archaeological assessments, impact assessments and development of mitigation plans. This Task includes the evaluation of other environmental impacts such as construction related impacts, growth inducing impacts and cumulative impacts. Alternative facility and operational plans and mitigation measures will be developed in coordination with *Task 2-1 Prepare*

Facility and Operation Plans. This task includes the development of mitigation and mitigation monitoring plans.

Prepare and Distribute Draft EIR(s).

Conduct Meetings, Public Hearings and Respond to Comments.

Finalize EIR(s).

Task 2-3 Prepare Engineering Report for a Planned Recharge Project. California Department of Health Services is requiring that new projects that involve planned recharge of reclaimed water follow the proposed regulations for planned recharge projects. This has recently occurred in the Los Angeles Central Basin, the Chino Basin and in the Riverside-Colton Basins. The data and models developed in Phase 1 will be used to evaluate the hydraulic and water quality response from reclaimed water recharge. This task consists of the following subtasks.

Describe the Impacts from Reclaimed Water Recharge. This subtask includes estimating the impacts of wastewater recharge at the regional and local levels. The data and models developed in Phase I will be used to estimate the regional and local impacts. If warranted, the facility and operational plans will be revised and the impact analysis repeated.

Develop a Groundwater Production Management and Monitoring Plan. A groundwater production management and monitoring plan will be developed consistent with proposed DHS regulations. The implementation of this plan will be included in the EIR's developed in Task 2-2 and the institutional plan developed in Task 2-4.

Prepare Engineering Report.

Task 2-4 Institutional Planning. This task consists of institutional planning necessary for implementation of the groundwater management plan. The work will be iterative with the institutional plans and agreements evolving throughout Phase 2. This task consists of the following subtasks.

Describe Powers and Limitations of Entities Involved in Groundwater Management Plan. This subtask consists of identifying and describing the

statutory responsibilities, powers and limitations of participants, regulatory agencies and third party interests.

Describe Regulatory and Water Rights Implications of Groundwater Management Plan. This task consists of describing the existing and proposed regulatory limits and water rights implications of the groundwater management plan; and the development of institutional arrangements and agreements necessary for implementation of plan elements.

Conduct Economic Analysis of Groundwater Management Plan. The capital and operating costs of the groundwater management plan will be evaluated and updated throughout Phase 2. Using Task 2-1 results, the economic benefits and costs for participating entities and third parties will be evaluated. The results of the economic analysis will feed back to Task 2-1, providing the opportunity to optimize the groundwater management plan.

Develop Preliminary Financing Plan. Financing alternatives will be developed throughout the Phase 2 effort that will be consistent with the facilities described in Task 2-1 and the financing capabilities of the participating agencies.

Describe Institutional Arrangements Necessary to Implement Groundwater Management Plan. This subtask consists of finalizing alternative institutional arrangements for participation, facility construction, ownership and management, payment and collection of fees, etc..

Develop Agreements. This subtask consists of preparing draft agreements for all the agreements that will be necessary to implement the ultimate groundwater management plan.

Phase 3 Ultimate Groundwater Management Plan Implementation

The facility plans, environmental documentation and draft agreements developed in Phase 2 will be converted to construction documents, project-specific environmental documentation and final agreements. These projects will then be constructed and operated. The sequencing and sizing of the management elements will depend on actual future water demands and the availability of

funds for construction. It is premature to speculate on the magnitude of the effort required by most of these tasks because of uncertainties in what facilities and operating plans will be included in the groundwater management plan and the timing of the tasks.

Task 3-1 Prepare Final Design and Bid Documents. This task consists of final engineering, design and preparation of bid documents. The types of facilities that will be included are wells, pipelines, reservoirs, treatment facilities, and spreading basins.

Task 3-2 Prepare Project Specific Supplemental EIR's and Negative Declarations. This task consists of the preparation of supplemental project-specific EIR's and negative declarations (if applicable). These documents will be for specific elements in groundwater management plan projects that will include wells, pipelines and recharge facilities.

Task 3-3 Prepare Final Agreements. This task consists of developing and finalizing the agreements that allow the groundwater management plan to be constructed and operated.

Construction and Operation. Several series of tasks will need to be developed to describe the construction and operational process for the groundwater management plan elements that will actually be constructed.

MANAGEMENT AND MONITORING

The management and monitoring of the groundwater management plan will occur while the elements of ultimate groundwater management plan are being implemented. The management and monitoring activities developed in Phase 1 will be adopted by EMWD board action. Future modifications to management and monitoring programs will be incorporated as warranted by change conditions.

SCHEDULE AND COST

The Phase 1 work should take about two years to complete. Phase 2 will take about two years to complete and will overlap Phase 1 by about one year. The cumulative time required to complete phases 1 and 2 will be about three years. Phase 3 could take up to 10 years to complete with

some projects (e.g., blending) coming on line within a couple of years and other projects (e.g., large scale surface recharge) taking 10 years to implement.

The cost to complete Phases 1 and 2 is estimated to range between 2 to 3 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2.

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APPENDIX A

A-1

AB 3030 with AB 1152 Amendments

PART 2.75

GROUNDWATER MANAGEMENT

Chapter		Sectio
1.	General Provisions	107
2.	Definitions	107
3.	Groundwater Management Plans	107
4.	Finances	107
5.	Miscellaneous	107

Part 2.75 was added by Stats.1992, c. 947 (A.B.3030), § 2.

Former Part 2.75, Groundwater Resources, consisting of §§ 10750 to 10767, was added by Stats.1991, c. 903 (A.B.255), § 1, and repealed by Stats.1992, c. 947 (A.B.3030), § 1.

CHAPTER 1

GENERAL PROVISIONS

Section		Section	
10750.	Legislative findings, declarations and intent.		ny without agreement prohibited application of section.
10750.2.	Application of part.	10750.8.	Management by local agencies within service area of another agency without agreement prohibited; application of section.
10750.4.	Adoption of groundwater management plan or program not required.	10750.9.	Groundwater management program procedures to establish commence prior to January 1, 1993; completion amendment.
10750.6.	Authority of local agencies or watermaster to manage groundwater not affected.	10750.10.	Other powers.
10750.7.	Management by local agencies within service area of another agency, water corporation or mutual water compa-		

Chapter 1 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10750. Legislative findings, declarations and intent

The Legislature finds and declares that groundwater is a valuable natural resource in California, and should be managed to ensure both its safe production and its quality. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

(a) Subject to subdivision (b), this part applies to all groundwater basins in the state.

(b) This part does not apply to any portion of a groundwater basin that is subject to groundwater management by a local agency or a watermaster pursuant to other provisions of law or a court order, judgment, or decree, unless the local agency or watermaster agrees to the application of this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10750, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.4. Adoption of groundwater management plan or program not required

Nothing in this part requires a local agency overlying a groundwater basin to adopt or implement a groundwater management plan or groundwater management program pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.6. Authority of local agencies or watermaster to manage groundwater not affected

Nothing in this part affects the authority of a local agency or a watermaster to manage groundwater pursuant to other provisions of law or a court order, judgment, or decree.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.7. Management by local agencies within service area of another agency, water corporation or mutual water company without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency, a water corporation regulated by the Public Utilities Commission, or a mutual water company without the agreement of that other entity.

(b) This section applies only to groundwater basins that are not critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.8. Management by local agencies within service area of another agency without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency without the agreement of that other entity.

(b) This section applies only to groundwater basins that are critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.9. Groundwater management program; procedures to establish commenced prior to January 1, 1993; completion; amendment

(a) A local agency that commences procedures, prior to January 1, 1993, to adopt an ordinance or resolution to establish a program for the management of groundwater pursuant to Part 2.75 (commencing

with Section 10750), as added by Chapter 903 of the Statutes of 1991, may proceed to adopt the ordinance or resolution pursuant to * * * Part 2.75, and the completion of those procedures is deemed to meet the requirements of this part.

(b) A local agency that has adopted an ordinance or resolution pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may amend its groundwater management program by ordinance or resolution of the governing body of the local agency to include any of the plan components set forth in Section 10753.7.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 1.)

§ 10750.10. Other powers

This part is in addition to, and not a limitation on, the authority granted to a local agency pursuant to other provisions of law.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10766, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10751. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

The repealed section, added by Stats.1991, c. 903 (A.B. 255), § 1, set forth definitions. See, now, § 10752.

CHAPTER 2

DEFINITIONS

Section
10752. Definitions.

Chapter 2 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10752. Definitions

Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Groundwater" means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water which flows in known and definite channels.

(b) "Groundwater basin" means any basin identified in the department's Bulletin No. 118, dated September 1975, and any amendments to that bulletin, but does not include a basin in which the average well yield is less than 100 gallons per minute.

(c) "Groundwater extraction facility" means any device or method for the extraction of groundwater within a groundwater basin.

(d) "Groundwater management plan" or "plan" means a document that describes the activities intended to be included in a groundwater management program.

(e) "Groundwater management program" or "program" means a coordinated and ongoing activity undertaken for the benefit of a groundwater basin, or a portion of a groundwater basin, pursuant to a groundwater management plan adopted pursuant to this part.

(f) "Groundwater recharge" means the augmentation of groundwater, by natural or artificial means, with surface water or recycled water.

(g) "Local agency" means any local public agency that provides water service to all or a portion of its service area, and includes a joint powers authority formed by local public agencies that provide water service.

(h) "Recharge area" means the area that supplies water to an aquifer in a groundwater basin and includes multiple wellhead protection areas.

(i) "Watermaster" means a watermaster appointed by a court or pursuant to other provisions of law.

(j) "Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 2.)

Historical and Statutory Notes

1992 Legislation
Former § 10752 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.

Derivation: Former § 10751, added by Stats.1991, c. 903 (A.B.255) § 1.

CHAPTER 3. GROUNDWATER MANAGEMENT PLANS

Section		Section	
10753.	Adoption or implementation of plan.	10753.6.	Written protest; contents; majority protest.
10753.2.	Hearing; notice; resolution of intention to adopt plan.	10753.7.	Plan components.
10753.3.	Publication of resolution of intention.	10753.8.	Rules and regulations to implement and enforce plan.
10753.4.	Preparation of plan; adoption; expiration of resolution of intention.	10753.9.	Potential impact of rules and regulations on business activities; consideration.
10753.5.	Second hearing; notice; protests to adoption of plan.		

Chapter 3 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10753. Adoption or implementation of plan

(a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area.

(b) Notwithstanding subdivision (a), a local public agency, other than an agency defined in subdivision (g) of Section 10752, that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service, may exercise the authority of this part within a groundwater basin * * * that is located within its boundaries within areas that are either of the following:

(1) * * * Not served by a local agency.

(2) * * * Served by a local * * * agency * * * whose governing body, by a majority vote, declines to exercise the authority of this part and enters into an agreement with the local public agency pursuant to Section 10750.7 or 10750.8.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 3.)

Historical and Statutory Notes

1992 Legislation
Former § 10753 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.2.

Derivation: Former § 10752, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.2. Hearing; notice; resolution of intention to adopt plan

(a) Prior to adopting a resolution of intention to draft a groundwater management plan, a local agency shall hold a hearing, after publication of notice pursuant to Section 6066 of the Government Code, on whether or not to adopt a resolution of intention to draft a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(b) At the conclusion of the hearing, the local agency may draft a resolution of intention to adopt a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10753, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.3. Publication of resolution of intention

(a) After the conclusion of the hearing, and if the local agency adopts a resolution of intention, the local agency shall publish the resolution of intention in the same manner that notice for the hearing held under Section 10753.2 was published.

(b) Upon written request, the local agency shall provide any interested person with a copy of the resolution of intention.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10754, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.4. Preparation of plan; adoption; expiration of resolution of intention

The local agency shall prepare a groundwater management plan within two years of the date of the adoption of the resolution of intention. If the plan is not adopted within two years, the resolution of intention expires, and no plan may be adopted except pursuant to a new resolution of intention adopted in accordance with this chapter.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.5. Second hearing; notice; protests to adoption of plan

(a) After a groundwater management plan is prepared, the local agency shall hold a second hearing to determine whether to adopt the plan. Notice of the hearing shall be given pursuant to Section 6066 of the Government Code. The notice shall include a summary of the plan and shall state that copies of the plan may be obtained for the cost of reproduction at the office of the local agency.

(b) At the second hearing, the local agency shall consider protests to the adoption of the plan. At any time prior to the conclusion of the second hearing, any landowner within the local agency may file a written protest or withdraw a protest previously filed.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10755, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.6. Written protest; contents; majority protest

(a) A written protest filed by a landowner shall include the landowner's signature and a description of the land owned sufficient to identify the land. A public agency owning land is deemed to be a landowner for the purpose of making a written protest.

(b) The secretary of the local agency shall compare the names and property descriptions on the protest against the property ownership records of the county assessors.

(c) (1) A majority protest shall be determined to exist if the governing board of the local agency finds that the protests filed and not withdrawn prior to the conclusion of the second hearing represent more than 50 percent of the assessed value of the land within the local agency subject to groundwater management pursuant to this part.

(2) If the local agency determines that a majority protest exists, the groundwater plan may not be adopted and the local agency shall not consider adopting a plan for the area proposed to be included within the program for a period of one year after the date of the second hearing.

(3) If a majority protest has not been filed, the local agency, within 35 days after the conclusion of the second hearing, may adopt the groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former §§ 10756, 10757, added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10753.7. Plan components

A groundwater management plan may include components relating to all of the following:

(a) The control of saline water intrusion.

(b) Identification and management of wellhead protection areas and recharge areas.

(c) Regulation of the migration of contaminated groundwater.

(d) The administration of a well abandonment and well destruction program.

(e) Mitigation of conditions of overdraft.

(f) Replenishment of groundwater extracted by water producers.

(g) Monitoring of groundwater levels and storage.

(h) Facilitating conjunctive use operations.

(i) Identification of well construction policies.

(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.

(k) The development of relationships with state and federal regulatory agencies.

(*l*) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.8. Rules and regulations to implement and enforce plan

(a) A local agency shall adopt rules and regulations to implement and enforce a groundwater management plan adopted pursuant to this part.

(b) Nothing in this part shall be construed as authorizing the local agency to make a binding determination of the water rights of any person or entity.

(c) Nothing in this part shall be construed as authorizing the local agency to limit or suspend extractions unless the local agency has determined through study and investigation that groundwater replenishment programs or other alternative sources of water supply have proved insufficient or infeasible to lessen the demand for groundwater.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.9. Potential impact of rules and regulations on business activities; consideration

In adopting rules and regulations pursuant to Section 10753.8, the local agency shall consider the potential impact of those rules and regulations on business activities, including agricultural operations, and to the extent practicable and consistent with the protection of the groundwater resources, minimize any adverse impacts on those business activities.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

CHAPTER 4

FINANCES

Section		Section	
10754.	Local agencies; water replenishment district powers; fees and assessments.		payment of costs; remediation program excluded.
10754.2.	Annual fees and assessments based on amount of groundwater extracted;	10754.3.	Elections to authorize assessments or fees.

Chapter 4 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10754. Local agencies; water replenishment district powers; fees and assessments

For purposes of groundwater management, a local agency that adopts a groundwater management plan pursuant to this part has the authority of a water replenishment district pursuant to Part 4 (commencing

with Section 60220) of Division 18 and may fix and collect fees and assessments for groundwater management in accordance with Part 6 (commencing with Section 60300) of Division 18.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation

Former § 10754 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.3.

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.2. Annual fees and assessments based on amount of groundwater extracted; payment of costs; remediation program excluded

(a) Subject to Section 10754.3, except as specified in subdivision (b), a local agency that adopts a groundwater management plan pursuant to this part, may impose equitable annual fees and assessments for groundwater management based on the amount of groundwater extracted from the groundwater basin within the area included in the groundwater management plan to pay for costs incurred by the local agency for groundwater management, including, but not limited to, the costs associated with the acquisition of replenishment water, administrative and operating costs, and costs of construction of capital facilities necessary to implement the groundwater management plan.

(b) The local agency may not impose fees or assessments on the extraction and replacement of groundwater pursuant to a groundwater remediation program required by other provisions of law or a groundwater storage contract with the local agency.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 4.)

Historical and Statutory Notes

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.3. Elections to authorize assessments or fees

Before a local agency may levy a water management assessment pursuant to Section 10754.2 or otherwise fix and collect fees for the replenishment or extraction of groundwater pursuant to this part, the local agency shall hold an election on the proposition of whether or not the local agency shall be authorized to levy a groundwater management assessment or fix and collect fees for the replenishment or extraction of groundwater. The local agency shall be so authorized if a majority of the votes cast at the election is in favor of the proposition. The election shall be conducted in the manner prescribed by the laws applicable to the local agency or, if there are no laws so applicable, then as prescribed by laws relating to local elections. The election shall be conducted only within the portion of the jurisdiction of the local agency subject to groundwater management pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10761, added by Stats.1991, c. 903 (A.B.255), § 1.

CHAPTER 5

MISCELLANEOUS

Section		Section	
10755.	Annexed land; compliance with plan.		powers agreements; agreements with public entities or private parties.
10755.2.	Coordinated plans for local agencies within same groundwater basin; joint	10755.3.	Meetings to coordinate plans.
		10755.4.	Limitation on application of part.

Chapter 5 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10755. Annexed land; compliance with plan

(a) If a local agency annexes land subject to a groundwater management plan adopted pursuant to this part, the local agency annexing the land shall comply with the groundwater management plan for the annexed property.

(b) If a local agency subject to a groundwater management plan adopted pursuant to this part annexes land not subject to a groundwater management plan adopted pursuant to this part at the time of annexation, the annexed territory shall be subject to the groundwater management plan of the local agency annexing the land.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation

Former § 10755 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.5.

Derivation: Former § 10764, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10755.2. Coordinated plans for local agencies within same groundwater basin; joint powers agreements; agreements with public entities or private parties

(a) It is the intent of the Legislature to encourage local agencies, within the same groundwater basin, that are authorized to adopt groundwater management plans pursuant to this part, to adopt and implement a coordinated groundwater management plan.

(b) For the purpose of adopting and implementing a coordinated groundwater management program pursuant to this part, a local agency may enter into a joint powers agreement pursuant to Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code with public agencies, or a memorandum of understanding with public or private entities providing water service.

(c) A local agency may enter into agreements with public entities or private parties for the purpose of implementing a coordinated groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), §5.)

Historical and Statutory Notes

Derivation: Former §§ 10758, 10763 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10755.3. Meetings to coordinate plans

Local agencies within the same groundwater basin that conduct groundwater management programs within that basin pursuant to this part shall, at least annually, meet to coordinate those programs.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10755.4. Limitation on application of part

Except in those groundwater basins that are subject to critical conditions of groundwater overdraft, as identified in the department's Bulletin 118–80, revised on December 24, 1982, the requirements of a groundwater management plan that is implemented pursuant to this part do not apply to the extraction of groundwater by means of a groundwater extraction facility that is used to provide water for domestic purposes to a single-unit residence and, if applicable, any dwelling unit authorized to be constructed pursuant to Section 65852.1 or 65852.2 of the Government Code.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§§ 10756 to 10767. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

Sections 10756 and 10757, see, now, § 10753.6.

Section 10758, see, now, § 10755.2.

Sections 10759 and 10760, see, now, §§ 10754 and 10754.2.

Section 10761, see, now, § 10754.3.

Section 10762, see, now, §§ 10750.7 and 10750.8.

Section 10763, see, now, § 10755.2.

Section 10764, see, now, § 10755.

Section 10766, see, now, § 10750.10.

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Proposed Regulation: Title 22, California Code of Regulations
Division 4. Environmental Health, Chapter 3 Reclamation Criteria

PROPOSED REGULATION:

Title 22, CALIFORNIA CODE OF REGULATIONS

DIVISION 4. ENVIRONMENTAL HEALTH

CHAPTER 3. RECLAMATION CRITERIA

ARTICLE 1. DEFINITIONS

Section 60301. Definitions.

(a) **Reclaimed Water.** Reclaimed water means water which, as a result of treatment of domestic wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.

(b) **Reclamation Plant.** Reclamation plant means an arrangement of devices, structures, equipment, processes and controls which produce a reclaimed water suitable for the intended reuse.

(c) **Regulatory Agency.** Regulatory agency means the California Regional Water Quality Control Board in whose jurisdiction the reclamation plant is located.

(d) **Direct Beneficial Use.** Direct beneficial use means the use of reclaimed water which has been transported from the point of production to the point of use without an intervening discharge to waters of the State.

(e) **Food Crops.** Food crops mean any crops intended for human consumption.

(f) **Spray Irrigation.** Spray irrigation means application of reclaimed water to crops by spraying it from orifices in piping.

(g) **Surface Irrigation.** Surface irrigation means application of reclaimed water by means other than spraying such that contact between the edible portion of any food crop and reclaimed water is prevented.

(h) **Restricted Recreational Impoundment.** A restricted recreational impoundment is a body of reclaimed water in which recreation is limited to fishing, boating, and other non-body-contact water recreation activities.

(i) **Nonrestricted Recreational Impoundment.** A nonrestricted recreational impoundment is an impoundment of reclaimed water in which no limitations are imposed on body-contact water sport activities.

(j) **Landscape Impoundment.** A landscape impoundment is a body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include public contact.

(k) **Approved Laboratory Methods.** Approved laboratory methods are those specified in the latest edition of "Standard Methods for the Examination of Water and Wastewater," prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control

Federation and which are conducted in laboratories approved by the State Department of Health.

(l) **Unit Process.** Unit process means an individual stage in the wastewater treatment sequence which performs a major single treatment.

(m) **Primary Effluent.** Primary effluent is the effluent from a wastewater treatment process which provides removal of sewage solids so that it contains not more than 0.5 milliliter per liter per hour of settleable solids as determined by an approved laboratory method.

(n) **Oxidized Wastewater.** Oxidized wastewater means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

(o) **Biological Treatment.** Biological treatment means methods of wastewater treatment in which bacterial or biochemical action is intensified as a means of producing an oxidized wastewater.

(p) **Secondary Sedimentation.** Secondary sedimentation means the removal by gravity of settleable solids remaining in the effluent after the biological treatment process.

(q) **Coagulated Wastewater.** Coagulated wastewater means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated by the addition of suitable floc-forming chemicals or by an equally effective method.

(r) **Filtered Wastewater.** Filtered wastewater means an oxidized, coagulated, clarified wastewater which has been passed through natural undisturbed soils or filter media, such as sand or diatomaceous earth, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 turbidity units and does not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(s) **Disinfected Wastewater.** Disinfected wastewater means wastewater in which the pathogenic organisms have been destroyed by chemical, physical or biological means.

(t) **Multiple Units.** Multiple units means two or more units of a treatment process which operate in parallel and serve the same function.

(u) **Standby Unit Process.** A standby unit process is an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment for the entire design flow of the unit for which it is a substitute.

(v) **Power Source.** Power source means a source of supplying energy to operate unit processes.

(w) **Standby Power Source.** Standby power source means an automatically actuated self-starting alternate energy source maintained in immediately operable condition and of sufficient

capacity to provide necessary service during failure of the normal power supply.

(x) **Standby Replacement Equipment.** Standby replacement equipment means reserve parts and equipment to replace broken-down or worn-out units which can be placed in operation within a 24-hour period.

(y) **Standby Chlorinator.** A standby chlorinator means a duplicate chlorinator for reclamation plants having one chlorinator and a duplicate of the largest unit for plants having multiple chlorinator units.

(z) **Multiple Point Chlorination.** Multiple point chlorination means that chlorine will be applied simultaneously at the reclamation plant and at subsequent chlorination stations located at the use area and/or some intermediate point. It does not include chlorine application for odor control purposes.

(aa) **Alarm.** Alarm means an instrument or device which continuously monitors a specific function of a treatment process and automatically gives warning of an unsafe or undesirable condition by means of visual and audible signals.

(bb) **Person.** Person also includes any private entity, city, county, district, the State or any department or agency thereof.

(cc) **Direct Injection.** The controlled subsurface addition of water directly into the groundwater basin that results in the

replenishment of groundwater used or suitable for use as a source of domestic water supply.

(dd) **General Mineral.** Water analyses for bicarbonate, carbonate, and hydroxide alkalinity, calcium, chloride, copper, foaming agents, iron, magnesium, manganese, pH, sodium, sulfate, specific conductance, total dissolved solids, total hardness, and zinc.

(ee) **General Physical.** Water analyses for color and odor.

(ff) **Initial Percolative Capacity.** The rate (unit volume per unit area per unit time or unit length per unit time) at which water moves through the soil prior to recharge conditions.

(gg) **Organics Removal.** Granular activated carbon adsorption or reverse osmosis treatment designed to remove organic compounds from the reclaimed water.

(hh) **Planned Groundwater Recharge Project.** Any water reclamation project designed for the purpose of recharging groundwater suitable for use as a source of domestic water supply.

(ii) **Project Category I.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(jj) **Project Category II.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, and disinfected.

(kk) **Project Category III.** A surface spreading recharge project which uses reclaimed water that has been oxidized and disinfected.

(ll) **Project Category IV.** A direct injection recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(mm) **Project Sponsor.** An agency or agencies that receives from a Regional Water Quality Control Board water reclamation requirements for a planned groundwater recharge project.

(nn) **Surface Spreading.** The controlled application of water to the ground surface for the purpose of replenishing groundwater used or suitable for use as a source of domestic water supply.

(oo) **Total Organic Carbon (TOC).** The oxidizable organic carbon present in the reclaimed water measured by the methods prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation in Section 5310 of the 17th edition of Standard Methods for the Examination of Water and Wastewater and which are conducted in laboratories approved by the State Department of Health Services.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

ARTICLE 5.1. GROUNDWATER RECHARGE

~~Section 60320. Groundwater Recharge.~~

~~(a) Reclaimed water used for groundwater recharge of domestic water supply aquifers by surface spreading shall be at all times of a quality that fully protects public health. The State Department of Health Services' recommendations to the Regional Water Quality Control Boards for proposed groundwater recharge projects and for expansion of existing projects will be made on an individual case basis where the use of reclaimed water involves a potential risk to public health.~~

~~(b) The State Department of Health Services' recommendations will be based on all relevant aspects of each project, including the following factors: treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time, and distance to withdrawal.~~

~~(c) The State Department of Health Services will hold a public hearing prior to making the final determination regarding the public health aspects of each groundwater recharge project. Final recommendations will be submitted to the Regional Water Quality Control Board in an expeditious manner.~~

Section 60320.01. Planned Groundwater Recharge Projects.

(a) This article shall apply only to planned groundwater recharge projects using reclaimed water. The creation or operation of recharge facilities to cause the infiltration or

injection of reclaimed water into a groundwater basin is evidence of a planned groundwater recharge project.

(b) A wastewater disposal project which is not designed for groundwater recharge, but which incidentally results in portions of the treated wastewater reaching groundwater or discharging to an ephemeral stream, is not covered by this article.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.02. Source Control.

All reclaimed water used for planned groundwater recharge projects shall be from a wastewater collection system operating under a comprehensive program for the control of discharge of toxic wastes from point sources, which is approved by the Regional Water Quality Control Board.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.03. Treatment Requirements and Performance Standards.

(a) Reclaimed water used for planned groundwater recharge projects shall comply with the following treatment requirements and treatment performance standards. Monitoring requirements and the basis for determining compliance with treatment performance standards are specified in Section 60320.06.

(1) Oxidized Wastewater.

Oxidized wastewater is required for all project categories. The oxidized wastewater prior to recharge shall not exceed 20 milligrams per liter (mg/L) total organic carbon (TOC), 30 mg/L suspended solids (SS), and 30 mg/L biochemical oxygen demand (BOD).

(2) Filtered Wastewater.

(A) Filtered wastewater is required for project categories I, II, and IV.

(B) The turbidity of the filtered wastewater prior to recharge shall not exceed an average of 2 turbidity units.

(C) The turbidity of the filtered wastewater prior to recharge shall not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(3) Disinfected Wastewater.

(A) Disinfected wastewater is required for all project categories.

(B) For project categories I, II, and IV, the median number of total coliform organisms in the disinfected wastewater shall not exceed 2.2 per 100 milliliters (mL). The number of total coliform organisms shall not exceed 23 per 100 mL in more than one sample within any 30-day period.

(C) For project category III, the median number of total coliform organisms in the disinfected wastewater shall not exceed 23 per 100 mL. The number of total coliform organisms shall not exceed 240 per 100 mL in more than one sample within any 30-day period.

(4) Organics Removal.

Reclaimed water used for project categories I and IV shall be subjected to organics removal. The TOC in the wastewater prior to recharge shall be reduced to the concentration specified in Table 1 as identified by the reclaimed water contribution to any affected domestic water supply well and by project category. The entire reclaimed water stream used for project category IV shall be subjected to organics removal.

Table 1. Maximum Allowable TOC after Organics Removal

Reclaimed Water Contribution (%)	Maximum TOC (mg/L)	
	Surface Spreading (Category I)	Direct Injection (Category IV)
0-20	20	5
21-25	16	4
26-30	12	3
31-35	10	3
36-45	8	2
46-50	6	2

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.04. Reclaimed Water Quality Requirements.

(a) The level of general physical characteristics, radioactivity, and the concentration of general mineral, inorganic chemicals (excepr nitrogen compounds), and organic chemicals in the reclaimed water prior to recharge shall not exceed the maximum contaminant levels specified in Chapter 15, Sections 64435, 64443, 64444.5, and 64473.

(b) The total nitrogen concentration of the reclaimed water shall not exceed a standard of 10 mg/L as nitrogen unless the project sponsor demonstrates that the standard can be consistently met prior to reaching the groundwater level.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.05. Recharge Site Requirements.

(a) Maximum Reclaimed Water Contribution.

(1) For project categories II and III, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 20 percent of the total flow.

(2) For project categories I and IV, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 50 percent of the total flow.

(3) Calculation of the percent in section 60320.05(a)(1 and 2) shall be based upon the reclaimed water contribution of all planned groundwater recharge projects affecting the basin.

(b) Minimum Depth-To-Groundwater Requirement.

(1) Planned groundwater recharge projects using surface spreading shall meet the minimum depth-to-groundwater requirements specified in Table 2 by project category and initial percolative capacity.

(2) Planned groundwater recharge projects shall not be allowed where the initial percolative capacity exceeds 0.3 in/min.

(3) The initial percolative capacity shall be determined once by representative testing of the spreading area prior to the start of groundwater recharge and shall reflect conditions throughout the required depth to groundwater. The testing procedure and results shall be described in the engineering report submitted pursuant to Section 60320.07.

(A) For existing surface spreading basins using reclaimed water or other waters, the initial percolative capacity shall be determined at least 14 days after the basins which make up a spreading area have been drained and at least 24 hours after pre-recharge conditions have been restored in the bottom of the basin.

(B) For proposed surface spreading basins, the initial percolative capacity shall be determined in a prototype basin or basins.

Table 2. Minimum Required Depth-to-Groundwater for Surface Spreading Groundwater Recharge Projects

	Minimum Depth-to-Groundwater (ft)		
Initial Percolative Capacity (in/min)	Project Category		
	I	II	III
≤0.2	10	10	20
≤0.3	20	20	50

(c) Minimum Retention Time Underground and Horizontal Separation Requirements.

(1) Reclaimed water shall be retained underground a minimum of 6 months prior to being withdrawn at a domestic water supply well for project categories I and II.

(2) Reclaimed water shall be retained underground a minimum of 12 months prior to being withdrawn at a domestic water supply well for project categories III and IV.

(3) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic

water supply well shall be 500 feet for project categories I and II.

(4) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic water supply well shall be 1000 feet for project category III.

(5) The minimum horizontal separation between the point where reclaimed water is applied by direct injection and a domestic water supply well shall be 2000 feet for project category IV.

(6) The project sponsor shall prevent the use of groundwater for drinking water within the area required to achieve the minimum retention time and minimum horizontal separation pursuant to Section 60320.05 (c)(1-5).

(d) Monitoring Wells.

Monitoring wells shall be provided to detect the influence of the recharge operation. As a minimum, monitoring wells shall be located at points one-quarter and one-half of the distance (plus or minus 10%) from the recharge area to the nearest domestic water supply well. The number and location of the proposed monitoring wells shall be described in the engineering report submitted pursuant to Section 60320.07.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.06. Monitoring and Compliance.

(a) Treatment Performance Standards.

(1) Oxidized Wastewater. For all project categories, the BOD, SS, and TOC concentration of the oxidized wastewater shall be determined from 24-hour composite samples. Compliance with Section 60320.03(a)(1) shall be determined monthly for each constituent by averaging the results of all samples collected during the month and comparing the average to the standard in Section 60320.03(a)(1).

(A) The BOD samples for all project categories shall be collected at least weekly.

(B) The SS samples for all project categories shall be collected at least daily.

(C) The TOC samples for project categories II and III shall be collected at least daily.

(D) The TOC samples for project categories I and IV shall be collected at least weekly.

(2) Filtered Wastewater. For project categories I, II, and IV, the turbidity of the filtered wastewater shall be continuously measured and recorded.

(A) Turbidity measurements shall be read at least once every 4 hours. Compliance with the average operating turbidity pursuant to Section 60320.03(a)(2)(B) shall be

determined monthly by averaging the results of all turbidity samples read during the month and comparing the average to the turbidity standard in Section 60320.03(a)(2)(B).

(B) The turbidity record shall be read daily. Compliance with the high turbidity duration standard pursuant to Section 60320.03(a)(2)(C) shall be determined monthly by determining the highest percent of a day during the month that the filtered wastewater exceeded 5 turbidity units and comparing that percent to the standard in Section 60320.03(a)(2)(C).

(3) **Disinfected Wastewater.** For all project categories, bacteriological samples shall be collected and tested for coliform to monitor the performance of the disinfection process each day reclaimed water is produced for planned groundwater recharge projects. Compliance with the disinfected wastewater requirements pursuant to Section 60320.03(a)(3) shall be determined daily by determining the median coliform result of the last 7 days for which analyses have been completed and comparing that median to the appropriate coliform standard in Section 60320.03(a)(3).

(4) **Organics Removal.** For project categories I and IV the TOC concentration in the wastewater after the organics removal process shall be determined daily from 24-hour composite samples. Compliance with the organics removal requirement pursuant to Section 60320.03(a)(4) shall be determined daily

by averaging daily TOC concentrations for the last 90 days of operation and comparing that average to the appropriate maximum TOC concentration in Section 60320.03(a)(4).

(b) Reclaimed Water Quality.

(1) On a quarterly basis, grab or 24-hour composite samples of reclaimed water shall be collected and analyzed for the general mineral and general physical constituents listed in subsections 64433(1) and (2), for the inorganic chemicals (excepr nitrogen compounds) listed in Section 64435 (Table 2), and for gross alpha and gross beta. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64473 (Table 6), Section 64435 (Table 2), and Section 64443 (Table 4).

(2) On a quarterly basis, grab samples of reclaimed water shall be collected and analyzed for the organic chemicals in Table 5, Section 64444.5. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64444.5 (Table 5).

(3) On a weekly basis, grab or 24-hour composite samples shall be collected and analyzed for total nitrogen. Compliance with Section 60320.04(b) shall be determined annually by averaging the results of all samples collected

during the previous 12 months and comparing the average to the total nitrogen standard in Section 60320.04(b).

(c) Recharge Site Requirements.

(1) Maximum Reclaimed Water Contribution.

(A) The reclaimed water contribution, pursuant to Sections 60320.03(a)(4) and 60320.05(a), shall be determined annually and at the domestic water supply well which receives the highest percentage of reclaimed water. The method used for the annual determination shall be described in the engineering report pursuant to Section 60320.07. Compliance with the maximum reclaimed water contribution shall be determined by averaging the last five annual determinations of reclaimed water contribution and comparing that average to the appropriate maximum percent contribution in Section 60320.05(a).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services that the maximum reclaimed water contribution pursuant to Section 60320.05(a) will not be exceeded.

(2) Minimum Depth-to-Groundwater Requirement.

(A) The depth-to-groundwater shall be measured every day reclaimed water is present in the spreading basin.

Compliance with Section 60320.05(b) shall be determined daily by averaging the previous 30 daily depth-to-groundwater measurements taken when reclaimed water was present in the spreading basin and comparing the result to the appropriate standard in Table 2.

(B) When the average depth-to-groundwater is less than the depth-to-groundwater requirement pursuant to Section 60320.05(b), the discharge of reclaimed water onto the spreading basin shall be halted until the depth-to-groundwater measurement exceeds the required depth-to-groundwater pursuant to Section 60320.05(b).

(C) The depth-to-groundwater shall be measured at at least one monitoring well located at each spreading basin. The location of this well shall be specified in the engineering report pursuant to Section 60320.07. The monitoring well shall be sited so that the groundwater level is measured at a point where it is closest to the bottom of the spreading basin.

(3) Minimum Retention Time Underground and Horizontal Separation Requirements.

(A) The retention time underground, pursuant to Section 60320.05(c), shall be determined annually and at the domestic water supply well in which the reclaimed water has the shortest retention time underground. The method used for the annual determination shall be described in the

engineering report pursuant to Section 60320.07. Compliance with the minimum retention time underground shall be determined by averaging the last five annual determinations of retention time and comparing that average to the appropriate retention time in Section 60320.05(c).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and Department of Health Services that the minimum retention time underground pursuant to Section 60320.05(c) will not be exceeded.

(C) Compliance with the horizontal separation requirement pursuant to Section 60320.05(c) for surface spreading and direct injection projects shall be determined by taking field measurements of the shortest distance between a point of recharge and a domestic water supply well. In no case shall the distance be less than the horizontal separation requirement pursuant to Section 60320.05(c).

(d) Monitoring Well Requirements.

Samples shall be collected from monitoring wells at least quarterly and analyzed for TOC and total nitrogen.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.07. Engineering Report.

(a) Any project sponsor proposing a groundwater recharge project using reclaimed water shall submit an engineering report on the proposed groundwater recharge project to the regulatory agency. The report shall be prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, in conjunction with a geologist, experienced in hydrogeology and registered in California.

(b) Groundwater recharge projects not in operation by January 1, 1993, shall not recharge reclaimed water until the project sponsor submits a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services. For direct injection projects, the Department will not schedule a hearing pursuant to section 13540, Article 6, until a complete engineering report has been received by the Department.

(c) For existing groundwater recharge projects, project sponsors have five years from January 1, 1993 to submit a completed engineering report to the Regional Water Quality control Boards and Department of Health Services.

(d) For existing and proposed groundwater recharge projects, the engineering report shall consist of a thorough investigation and evaluation of the groundwater recharge project, impacts on the existing and potential uses of the impacted groundwater basin, and proposed means for achieving compliance with Sections

60320.01 to 60320.06. The engineering report shall include, but not be limited to the following:

(1) An engineering plan of the reclamation plant, transmission facilities, spreading basins/direct injections wells, and monitoring wells.

(2) A physical description of the proposed groundwater recharge project.

(3) A hydrogeologic study on the impacted groundwater basin. The study shall describe the impact of the recharge project on domestic groundwater sources. The study shall describe the source, area of recharge, quantity, quality, and groundwater flow patterns of all basin recharge waters. The study shall identify all quantities and sources of water used to determine the percent reclaimed water contribution. The study shall identify the aquifer zone in which the maximum allowed reclaimed water contribution is not met pursuant to Section 60320.05(a). The study shall identify the aquifer zone in which the provided organics removal is not sufficient for the reclaimed water contribution to the groundwater pursuant to Section 60320.03(a)(4). The study shall identify all wells that will be impacted by the proposed project and describe the groundwater quality in the impacted basin. The study shall identify the well(s) subject to the highest reclaimed water contribution and shortest reclaimed water retention time. The study shall also include quantitative

descriptions of the soil, soil layers, infiltration rates, aquifer transmissivity, groundwater movement, historic depth-to-groundwater, safe yield of the basin, and usable storage capacity of the basin.

(4) A description of the operational and management personnel, their qualifications, experience, and responsibilities.

(5) A description of how the project will be operated to comply with the recharge site requirements of maximum reclaimed water contribution, minimum depth-to-groundwater, horizontal separation, and retention time underground pursuant to Section 60320.05 (b and c).

(6) Identification of the agency responsible for preventing the use of groundwater for drinking water within certain areas pursuant to Section 60320.05 (c)(6), and the mechanism that will be used.

(7) A contingency plan for redirection of reclaimed water when treatment performance standards or depth-to-groundwater requirements are not met.

(8) A description of the methods of determination and results for initial percolative capacity, maximum reclaimed water contribution, minimum retention time underground, and horizontal separation.

(9) The number and location of monitoring wells in the spreading basin and groundwater basin.

(10) A plan for the monitoring well network to monitor groundwater flow and water quality in the impacted groundwater basin.

(11) A water quality monitoring plan for the treated wastewater, reclaimed water, and monitoring wells.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.08. Alternatives.

(a) Alternatives to the recharge site requirements specified in Section 60320.05 (b) and (c) (2, 4, and 5), or the treatment performance standards specified in Section 60320.03 (a)(1 to 4) may be allowed if the project sponsor demonstrates to the regulating agency that the proposed alternative reliably achieves an equal degree of public health protection. Alternatives may not be used to reduce the retention time below 6 months in Section 60320.05 (c)(2) or the horizontal separation below 500 feet in Section 60320.05 (c)(4 and 5). Alternatives to Sections 60320.01 to 60320.07, inclusive, shall not be allowed, unless the planned groundwater recharge projects meet the requirements of Section 60320.08 (b to e) or 60320.09

(b) Alternatives to achieve a disinfected and filtered wastewater pursuant to Section 60320.03(a)(2) and (a)(3)(B and C)

shall be accepted if the project sponsor demonstrates to the regulating agency that the alternatives reliably provide an equal degree of public health protection. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(c) Alternatives to the granular activated carbon or reverse osmosis treatment processes shall be accepted if the project sponsor demonstrates to the regulating agency that the organics removal treatment performance standards pursuant to Section 60320.03 (4) can be reliably met. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(d) The results of any alternative demonstration shall be presented in a complete report prepared and signed by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply. Such alternatives shall not be accepted until the Regional Water Quality Control Boards and the Department of Health Services have reviewed the reports.

(e) Within 60 days following the first full year of operation of any alternative approved by the regulating agency, the project

sponsor shall submit an report, prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, describing the effectiveness of the plant operation. The report shall include results of all water quality tests performed and shall evaluate compliance with established performance standards under actual operating conditions. It shall also include an assessment of problems experienced, corrective actions needed, and a schedule for providing needed improvements.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.09. Research and Demonstration Projects.

The maximum percentage reclaimed water contribution in the total flow extracted from any domestic water supply well pursuant to Section 60320.05(a)(2) shall not apply to a project which the Department has designated as a research and demonstration project for the purpose of conducting special monitoring, treatment, health effects, or other research studies.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

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Drinking Water Standards and Health Advisories Table

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

DECEMBER 1993

DRINKING WATER AND GROUNDWATER PROTECTION BRANCH

Contact: Bruce Macler, Regional Toxicologist, (415) 744-1884

REGION 9 DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

The USEPA Region 9 Drinking Water Standards and Health Advisories Table is a compendium of numerical standards, advisories and related information for chemicals and other contaminants which may be found in ground and surface waters. It provides a comprehensive listing of all current and proposed National Primary Drinking Water Regulations (NPDWRs), specific Maximum Contaminant Levels (MCLs) for California, Arizona and Hawaii, and California Drinking Water Action Levels. Where available, it includes USEPA Integrated Risk Information System (IRIS) cancer risk levels and oral reference dose (RfD) values, and USEPA Office of Ground Water and Drinking Water (OGWDW) Health Advisories for drinking water contaminants.

In order to make this table a manageable size, very few explanations or caveats for the values are included in the body of the table. Because of this, and the fact that background documentation and understanding of the derivation of specific values are critical to the proper use of this information, this table should not be used as a sole source of information for decision making. While the Appendix contains brief explanations of the different standards, criteria and advisories, consideration must be given to the context in which these numbers will be used. The appropriate reference materials should be consulted to determine the applicability of the number being considered. Some references are listed in the Appendix.

The values in this table are current to the publication date, but are subject to change. The user is advised to contact Bruce Macler, Regional Toxicologist, USEPA Region 9, at (415) 744-1884, if questions arise regarding current values.

INFORMATION IN THIS TABLE

The information for specific contaminants in this table is arranged by contaminant type. Inorganic chemicals are listed first, followed by radionuclides, organic chemicals, microbial contaminants and water quality factors.

For each contaminant, any applicable or proposed USEPA National Primary Drinking Water Regulation is listed. These include the enforceable **Maximum Contaminant Levels (MCLs)**, the health-based **Maximum Contaminant Level Goals (MCLGs)**, and the aesthetics-based **Secondary MCLs**. A given contaminant may have both a MCL and a Secondary MCL, as well as a MCLG. The regulatory status of these values is indicated. **Proposed MCLs or MCLGs** have been formally proposed by USEPA, but not promulgated. **Final MCLs or MCLGs** have been promulgated, but are not yet effective as of the

publication date. The effective date, if available, is indicated. **Current MCLs or MCLGs** are in effect.

In addition to regulatory information, health risk information is provided in the table. Data from IRIS for cancer and non-cancer health effects associated with drinking water contaminants is listed. The **RfD** is the daily oral intake (on a body weight basis) that is below the level USEPA believes to be without adverse, non-cancer health risks (i.e., zero risk). The IRIS **10^{-6} risk level** is that contaminant concentration (in ug/liter) in drinking water that might yield no greater than an additional risk of one-in-a-million (10^{-6}) after a lifetime of drinking that water. The USEPA OGWDW Health Advisories provide information on acceptably safe levels of exposures to contaminants in drinking water. The **Acute 10-day** values apply specifically to acute toxic effects on children, but should be protective for adults. The **chronic (lifetime)** values for non-cancer health effects should be protective of health even with a lifetime exposure. In most cases, this value will be the same as the MCLG, if one has been established. The chronic (lifetime) values for cancer are set at a level that should yield no greater than an additional 10^{-6} risk over a lifetime exposure. EPA **cancer weight of evidence** determinations are listed to provide additional information on EPA's judgement of carcinogenicity for each chemical. The weight of evidence classifications are as follows:

A known human carcinogen
B1 probable human carcinogen based on human data
B2 probable human carcinogen based on animal data
C possible human carcinogen based on animal data
D insufficient data to classify chemical
E not a human carcinogen

APPLICABILITY AND USES OF THIS TABLE

The different types of standards and advisories contained in this table are based upon approaches and assumptions that are specific to each and consequently may have varying applications depending on their derivation. Use of specific types of information should be guided by the relevant legal requirements and an understanding of the meaning of the information itself.

MCLs and treatment techniques are the only federally enforceable NPDWRs. They are set to be health protective as well as feasible. More stringent state-specific MCLs are enforceable in the indicated state. MCLGs are not enforceable, but provide health-based guidance for decision making. MCLGs for chemicals causing non-carcinogenic health effects are based on the RfD and set at a level believed to be safe. MCLGs for chemicals believed to be carcinogens are set at zero, from the perspective that no level of carcinogen is safe. Feasibility is not considered in setting MCLGs. Secondary MCLs are not enforceable, but provide information on aesthetics and palatability.

Health advisories and criteria are not formally promulgated in regulations and are subject to change as new data and analyses become available. MCLGs, values in IRIS and health advisories are developed by different offices and on different schedules. Therefore, values for similar effects from a given chemical may not be consistent throughout the table. The derivations of MCLGs and chronic (lifetime) health advisories for non-carcinogenic chemicals are based on the same assumptions regarding endpoints of toxicity. In theory, the MCLG and lifetime health advisory should be the same for a specific contaminant. Slight differences in the table are due to rounding of numbers.

When considering a value to use for determining an acceptable level of contaminant in drinking water, the MCL should be selected first. In the absence of existing or proposed MCLs, users may have to decide which criteria are most appropriate. USEPA recommends a priority ranking to first consider any proposed MCLG (if other than zero), followed by the IRIS RfD or cancer risk level, and finally the chronic health advisory values.

Under the **Superfund Program**, remdial actions must comply with the **Applicable or Relevant and Appropriate Requirements (ARARs)**. For actions involving contamination of drinking water supplies, the ARARs under the Safe Drinking Water Act are the MCLs. Where there are no MCLs, or where the MCLs are determined to be insufficiently protective because of multiple contaminants, reference should be made to Superfund guidance documents to determine clean-up policy. For remedial actions impacting aquatic organisms and waters regulated under the Clean Water Act, consult the National Ambient Water Quality Criteria (NAWQC).

SYMBOLS USED IN THE TABLE

mg/l = milligrams per liter, equivalent to parts per million (**ppm**)
ug/l = micrograms per liter, equivalent to parts per billion (ppb)

Note: values in table are in ug/l unless otherwise stated

IRIS = USEPA Integrated Risk Information System
RfD = Reference dose for daily oral ingestion in micrograms per kilogram body weight per day (ug/kg-d)
10^{-6} = one in a million excess lifetime cancer risk
TT = treatment technique, set in lieu of numeric MCL
+ = value from USEPA Final Draft Health Advisory
td = temperature dependent value
LOQ = Limit of quantification
T&O = taste and odor refers to a value based upon organoleptic data for controlling undersirable taste and odor qualities

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aluminum	Secondry	50-200								1000		
Ammonia							30,000		D			
Antimony	Current	6	6	0.4		15	3		D			
Arsenic	Current	50		0.3	0.02			0.02	A	50		50
Asbestos	Current	7E+6 long fi	7E+6 bers						A			
Barium	Current	2,000	2,000	70			2,000+		D	1,000		1000
Beryllium	Current	4	4	5	.008	30,000		0.008	B2			
Boron				90		900	600		D			
admium	Current	5	5	.5		40+	5+		D	10		10
Chloramine				100		1000	2600		D			
Chlorate									D			
Chloride	Secondry	250ppm										
Chlorine									D			
Chlorine Dioxide				3			80		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorite												
Chromium(Total)	Current	100	100	5		1,000+	100+		D	50		50
Copper	Current Secondry	TT## 1,000	1,300						D			
Cyanide	Current	200	200	22		200+	200+		D			
Fluoride	Current Proposed secondry	4,000 2,000	4,000	120					D	1400-2400td		
Iron	Secondry	300										
Lead	Current	TT#	0						B2	50		
Manganese	Secondry	50		140								
Mercury (inorganic)	Current	2	2	0.3			2+		D	2		
Molybdenum				5		80	35		D			
Nickel	Current	100	100	20		1,000+	100+		D			
Nitrate (as N)	Current	10ppm	10ppm	1600		10,000+***			D	45ppm as NO3		10ppm (as N)
Nitrite (as N)	Current	1,000	1,000	160		1,000+***			D			
Selenium	Current	50	50	5						10		50

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
- Treatment technique triggered at Action Level of 1300 ppb
td - td- temperature dependent value
- Treatment technique and public notification triggered at Action Level of 15 ppb
*** - 10-day HA for nitrate/nitrite for 4kg child (protective of 10kg child & adults); also used for chronic (lifetime)

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Silver	Secondry	100		5		200	100		D	50		50
Strontium				600		25,000	17,000		D			
Sulfate	Secondry	250 ppm										
Thalium	Current	2	0.5	0.07		7	0.4					
Vanadium				7					D			
Zinc	Secondry	5,000		300		6,000	2,000		D			5,000
Acrylonitrile					0.06	20+		0.06+	B1			10
RADIONUCLIDES												
Gross Alpha, excl. Uranium & Radon	Current	15pCi/l						.15pCi/l	A	15pCi/l		
Gross Beta	Current	4mrem per yr						0.04mrem per year	A	50pCi/l		
Radium 226	Current Proposed	5 pCi/l (+228) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radium 228	Current Proposed	5 pCi/l (+226) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radon	Proposed	300 pCi/l	0					1.5pCi/l	A			
Strontium 90									A	8pCi/l		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

RADIONUCLIDES Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Tritium									A	20nCi/l		
Uranium	Proposed	20 ppb	0					0.7 ppb	A	20pCi/l		35pCi/l
ORGANIC												
Acenaphthylene (acenapthene)				60								
Acephate				4					C			
Acetone				100					D			
Acetophenone				100								
Acifluorfen				13	1.0	2,000+		1.0+	B2			
Acrolein									C			320
Acrylamide	Current	TT	0	0.2	.01	30+		0.01+	B2			
Adipates (di(ethylhexyl)-adipate)	Current	400	400	600	0.03	20,000	400	0.03	C			
Alachlor	Current	2	0	10	0.4	100+		0.4+	B2		LOQ (.2)	0.2
Aldicarb	Final(a)	3	1	1.0			7+		D		10	9
Aldicarb Sulfone	Final(a)	2	1	1.0			7+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
a - Effective date postponed

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aldicarb Sulfoxide	Final(a)	4	1	1.0			7+		D			
Aldrin				0.03	.002	0.3		0.002	B2		LOQ (0.05)	
Allyl alcohol				5								
Ametryn				9		9,000+	60+		D			
Ammonium Sulfamate				280		20,000+	2,000+		D			
Anthracene (PAH)				300					D			
Atrazine	Current	3	3	35	0.16	100+	3+		C	3		(HI 3)
Baygon (Propoxur)				4		40+	3+		C		90	
.nefin				300								
Bentazon (Basagran)				2.5		300+	20+		D	18		
Benzene	Current	5	0		1	200+		1.0+	A	1		5
Benzene hexachloride α, β isomers (BHC)											0.7 α 0.3 β	
Benz(a)anthracene (PAH)	Proposed	0.1	0						B2			
Benzo(a)pyrene (PAH)	Current	0.2	0						B2			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Benzo(b)fluoranthene (PAH)	Proposed	0.2	0						B2			
Bolero (thiobencarb)										70		
Bromacil				130		5,000+	90+		C			
Bromochloromethane				13		1,000	90					
Bromodichloro-methane (THM)	Current	100 @		20	0.6	7,000+		0.6	B2			
Bromoform (THM)	Current	100 @		20	4	2,000		4	B2			
Bromomethane (Methyl Bromide)				1		100+	10+		D			2.5
Butyl benzyl-phthlate (PAE)	Proposed	100	0	200					C			
Butylate				50		2,000+	350+		D			
Captafol				2	4				C			
Captan				130					B2		350	
Carbaryl				100		1,000+	700+		D		60	
Carbofuran	Current	40	40	5		50+	40+		E	18		36
Carbon Disulfide				100								830

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Carbon Tetrachloride	Current	5	0	0.7	0.3	200+		0.3+	B2	0.5		5
Carboxin				100		1,000+	700+		D			
Chloral Hydrate				0.2		1,400	60		D			
Chloramben				15		3,000+	100+		D			
Chlordane	Current	2	0	0.06	0.03	60+		0.03+	B2	0.1		
2,4-Dinitrotoluene				2	50	500		50	B2			
Chlorobenzene (Monochlorobenzene)	Current	100	100	20		2,000+	100+		D	30		
Chlorodibromomethane (THM)	Current	100 @		20		7,000	60		C			
Chloroform (trichloromethane) (THM)	Current	100 @		10	6	4,000		6.0	B2			
bis-2-Chloroiso-propyl ether				40		4,000+	300+		D			
Chloromethane				4		400	3		C			
2-Chlorophenol				5		50	40		D			
Chloropicrin											50(37 T&O)	
Chlorothalonil				15	1.5	200+		1.5+	B2			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorotoluene(o,p)				20		2,000+	100+		D			
CIPC (Chlorpropham) (isopropylN(3chloro-phenyl) carbamate)				200							350	
Chlorpyrifos				3		30+	20+		D			
Cresol(o,m)				500					C			
Cyanazine				2		100+	1		C			
DDT				0.5	0.1				B2			
Dalapon	Current	200	200	26		3,000+	200+		D			
DCPA (Dacthal)				500		80,000+	4,000+		D			
Di(ethylhexyl)-adipate (Adipates)	Current	400	400	600	0.03	20,000	400+	0.03	C			
Diazinon				0.09		20+	0.6+		E		14	
Dibromochloro-methane (THM)	Current	100 @		20		7,000	60		C			
1,2-Dibromo-3-chloro propane (DBCP)	Current	0.2	0		0.03	50+		0.03	B2	0.2		(HI.04)
Dibutyl phthalate (PAE)				100					D			
Dicamba				30		300+	200+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Dichloroacetic Acid				8		50,000+			B2			
Dichloroacetonitrile				8		1000+	6+		C			
1,2-Dichlorobenzene (o-Dichlorobenzene)	Current Proposed secondry	600 10	600	90		9,000+	600+		D		130 *** (10T&O)	
1,3-Dichlorobenzene (m-Dichlorobenzene)	Current	600	600	90		9,000+	600+		D		130 *** (20T&O)	
1,4-Dichlorobenzene (p-Dichlorobenzene)	Current Proposed secondry	75 5	75	100		10,000+	75+		C	5		750
Dichlorodifluoro-methane (Freon 12)				200		40,000+	1,000+		D			1.0
1,1-Dichloroethane										5		
1,2-Dichloroethane	Current	5	0		0.4	700+		0.4	B2	0.5		5.0
1-Dichloroethylene	Current	7	7	9		1,000+	7+		C	6		7.0
cis-1,2-Dichloro-ethylene	Current	70	70	10		3,000+	70+		D	6		
trans-1,2-Dichloro-ethylene	Current	100	100	20		2,000+	100+		D	10		
Dichloromethane (Methylene chloride)	Current	5	0	60		2,000+		5+	B2		40	
2,4-Dichlorophenol				3		30+	20+		D			
2,4-Dichlorophenoxy -acetic acid (2,4-D)	Current	70	70	10		300+	70+		D	100		100

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
*** - Action Level is for a single isomer or sum isomers

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,2-Dichloropropane	Current	5	0		0.5	90+		0.5+	B2	5		
1,3-Dichloropropene				0.3	0.2	30+		0.2+	B2	0.5		
Dieldrin				0.05	.002	0.5+		0.002+	B2		LOQ-(0.05)	
Diethylphthalate (PAE)				800			5000+		D			
Diisopropylmethyl-phosphonate				80		8,000+	600+		D			
Dimethoate				0.2							140	
Dimethrin				300		10,000+	2,000+		D			
Dimethylaniline				20	0.05				C			
2,4-Dimethylphenol				200							400 (T&O)	
2,6-Dinitrotoluene				1.0	50 (tg)	400		50 (tg)	B2 (TG)			
1,3 Dinitrobenzene				0.1		40	1		D			
Dinoseb	Current	7	7	1		300+	7+		D			
1,4-Dioxane (p-Dioxane)					7	400+		7+	B2			
Dioxin (2,3,7,8-TCDD)	Current	3E-5	0	1E-6	2E-7	1E-4		2E-7+	B2			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
tg - technical grade dinitrotoluene only

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Diphenamid(e)				30		300+	200+		D		40	
Di(ethylhexyl)-phthalate (PAE) (Phthalates)	Current	6	0	20	3			3+	B2	4		
Diquat	Current	20	20	2.2			20+		D			
Disulfoton				0.04		10+	0.3+		E			
Diuron				2		1,000+	10+		D			
Endothall	Current	100	100	20		800+	100+		D			
Endrin	Current	2	2	0.3		20+	2+		D	.2		0.2
Epichlorohydrin	Current	TT	0	2	4	100+		4	B2			
hion				0.5							35	
Ethylbenzene	Current Proposed secondry	700 30	700	100		3,000+	700+		D	680		
Ethylene Dibromide (dibromoethane) (EDB)	Current	0.05	0		4E-4	8		0.0004	B2	0.02		(HI.04)
Ethylene Glycol				2,000		6,000+	7,000+		D			
Ethylene Thiourea (ETU)				0.08	0.3	300+		0.3	B2			
Fenamiphos				0.25		9+	2+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Fluometuron				13		2,000+	90+		D			
Fluorotrichloro-methane				300		7,000+	2,000+		D			
Folpet				100					B2			
Fonofos				2		20+	10+		D			
Formaldehyde				150		5,000+	1,000+		B1		30	
Glycidaldehyde				4					B2			
Glyphosate	Current	700	700	100		20,000+	700+		D	700		
HMX				50		5,000+	400+		D			
Heptachlor	Current	0.4	0	0.5	.008	10+		0.008+	B2	0.01		
Heptachlor epoxide	Current	0.2	0	0.013	.004			0.004	B2	0.01		
Hexachlorobenzene (Perchlorobenzene) (HCB)	Current	1	0	0.8	0.02	50+		0.02+	B2			
Hexachlorobutadiene				2		300+	1+		C			
Hexachlorocyclo-pentadiene (HEX)	Current Proposed secondry	50 8	50	7					D			
n-Hexane						4,000+			D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Hexazinone				33		3,000+	200+		D			
Isophorone				200		15,000+	100+		C			
Lindane (gamma-HCCH) (gamma-BHC)	Current	0.2	0.2	0.3		1,000+	0.2+	0.03	C	4		
Linuron				2					C			
MCPA				1.5		100+	11+		E			
Malathion				20		200+	200+		D		160	
Maleic Hydrazide				500		10,000+	4,000+		D			
Cresol(p)				5					C			
erphos				0.3								
Methomyl (Lannate)				25		300+	200+		D			
Methoxychlor	Current	40	40	5		50	40		D	100		
Methylene Chloride (Dichloromethane)	Current	5	0	60	5	2,000+		5+	B2		40	
Methyl ethyl ketone (MEK,2-Butanone)				600					D			
Methyl Parathion				.25		300+	2+		D		30	

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona
Methyl t-butyl ether				5		3,000+	40+		D			
Metolachlor				150		2,000+	100+		C			
Metribuzin				25		5,000+	200+		D			
Mirex				0.2	.02				B2			
Molinate				2						20		
Naphthalene				4		500+	20+		D			
Nitroguanidine				100		10,000+	700+		D			
Oxamyl (Vydate)	Current	200	200	25		200+	200+		E			
Paraquat				4.5		100+	30+		E			
Parathion (Ethyl Parathion)				6					C		30	
Pentachloronitro-benzene (Terrachlor)				3	0.1				C		0.9	
Pentachlorophenol	Current	1	0	30	0.3	300+		0.3	B2		30	
Phenol				600		6,000+	4,000+		D		5(T&O) Cl2Syst	
Phthalates (di(ethylhexyl)-phthalate)	Current	6	0	20	3			3+	B2	4		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Picloram	Current	500	500	70		20,000+	500+		D			
Polychlorinated Biphenyls (PCBs)	Current	0.5	0		.005			0.005	B2			
Polynuclear Aromatic Hydrocarbons (PAHs) (benzo(a)pyrene)	Current	0.2	0						B2			
Prometon				15		200+	100+		D			
Pronamide				75		800+	50+		C			
Propachlor				13		500+	90+		D			
Propazine				20		1,000+	10+		C			
Propham				20		5,000+	100+		D			
ɔx				3	0.3	100+	2+	.3	C			
Simazine	Current	4	4	5		70	4+		C	10		
Styrene	Current Proposed secondry	100 10	100	200		2,000+	100+		C			
Tebutiuron				70		3,000+	500+		D			
Terbacil				13		300+	90+		E			
Terbufos				.13		5+	0.9+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Terrachlor (pentachloro-nitrobenzene)				3	0.1				C		0.9	
1,1,1,2-Tetrachloro-ethane				30	1	2,000+	70+	1+	C			
1,1,2,2-Tetrachloro-ethane									C	1		
Tetrachloroethylene (Perchloroethylene)	Current	5	0	10	0.7	2,000+		0.7+	B2	5		
2,3,7,8-Tetrachloro-dibenzo-p-dioxin (Dioxin)	Current	3E-5	0	1E-6	2E-7	1E-4+		2E-7+	B2			
Thiobencarb										70		
Toluene	Current Proposed secondry	1,000 40	1,000	200		2,000+	1,000+		D		100	
Toxaphene	Current	3	0	100	0.03	40+		0.03+	B2	5		5
Tribromomethane (Bromoform)(THM)	Current	100 @		20	4	2,000+		4	B2			
1,1,2-Trichloro-1,2, 2-Trifluoroethane (Freon 113)										1200		
Trichloroacetic acid				40		2000	1000		C			
1,2,4-Trichloro-benzene	Current	70	70	10		100+	70		D			
1,3,5-Trichloro-benzene				6		600+	40+		D			
1,1,1-Trichloro-ethane	Current	200	200	35		40,000+	200+		D	200		200

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,1,2-Trichloroethane	Current	5	3	4		400+	3+		C	32		
Trichloroethylene	Current	5	0		3			3	B2	5		5
Trichlorofluoromethane (Freon 11)				700						150	150	
2,4,6-Trichlorophenol					3			3	B2			
2,4,5,-Trichlorophenoxyacetic acid (2,4,5-T)				10		800+	70+		D			
2,4,5 Trichlorphenoxypropionic acid (2,4,5-TP) (Silvex)	Current	50	50	7.5		200+	50+		D	10		10
1,2,3-Trichloropropane				6		600+	40+		B2			(HI .8)
Trifluralin				7.5		80+	5+	5+	C			
ihalomethanes (THM) (See Chloroform)	Current	100 @							B2	100		
Trinitroglycerol						5	5					
Trinitrotoluene				0.5	1	20	2	1	C			
Trithion											7	
Vinyl Chloride	Current	2	0		.015	3,000+		0.015+	A	0.5		
Xylenes- sum of isomers	Current Proposed secondry	10ppm 20	10ppm	2000		40,000+	10,000+		D	1750		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
TT - Treatment technique in lieu of numeric MCL

MICROB.-TURBIDITY Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
MICROB.-TURBIDITY												
Giardia Lamblia	Current	TT	0									
Heterotrophic Plate Count	Current	TT β	NA									
Legionella	Current	TT β	0									
Total Coliforms	Current	P/A ∞∞	0									
Turbidity	Current	1/5 NTU	NA									
Viruses	Current	TT β	0									
WATER QLTY.SECONDARY MAX.CONT.LEV												
Color	Secondry	15color units										
Corrosivity	Secondry	Noncor-rosive										
Foaming Agents	Secondry	500										
Odor (Odor threshold)	Secondry	3.0 OT#										
Total Dissolved Solids (TDS)	Secondry	500 ppm										
pH	Secondry	6.5-8.5										

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
β - Surface waters and groundwater under the direct influence of surface water only.
∞∞ - P/A - MCL is based on the presence/absence of total coliforms
∂ - 1 NTU Monthly average, 5 NTU two-day consecutive average
- Odor Threshold Numbers

TABLE 2

PRIORITY LIST OF CONTAMINANTS WHICH MAY REQUIRE REGULATION UNDER THE SDWA (1991 VERSION)

Microorganisms

Cryptosporidium

Inorganics

Aluminum
Boron
Chloramines
Chlorate
Chlorine
Chlorine dioxide
Chlorite
Cyanogen chloride
Hypochlorite ion
Manganese
Molybdenum
Strontium
Vanadium
Zinc

Pesticides

Asulan
Bentazon
Bromacil
Cyanazine
Cyromazine
DCPA (and acid metabolites)
Dicamba
Ethylenethiourea
Fomesafen
Latofen/Acifluorfen
Metalaxyl
Methomyl
Metolachlor
Metribuzin
Parathion degradation product (4-nitrophenol)
Prometon
2,4,5-T
Thiodicarb
Trifluralin

Synthetic Organic Chemicals

Acrylonitrile
Bromobenzene
Bromochloroacetonitrile
Bromodichloromethane
Bromoform
Bromomethane
Chloroethane
Chloroform
Chloromethane
Chloropicrin
o-Chlorotoluene
p-Chlorotoluene
Dibromoacetonitrile
Dibromochloromethane
Dibromomethane
Dichloroacetonitrile
1,3-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
2,2-Dichloropropane
1,3-Dichloropropane
1,1-Dichloropropene
1,3-Dichloropropene
2,4-Dinitrophenol

Synthetic Organic Chemicals (con't)

2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluorotrichloromethane
Hexachlorodutadiene
Hexachloroethane
Isophorone
Methyl ethyl ketone
Methyl isobutyl ketone
Methyl t-butyl ether
Naphthalene
Nitrobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrahydrofuran
Trichloroacetonitrile
1,2,3-Trichloropropane

Chlorination/ chloramination byproducts (misc.): haloacetic acids, haloketones, chloral hydrate, 3-chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX-2), N-organochloramines

Ozonation byproducts: aldehydes, epoxides, peroxides, nitrosamines, bromate, iodate

APPENDIX

DESCRIPTION OF STANDARDS AND ADVISORIES

Authority

Under the authority of the Safe Drinking Water Act (SDWA, Public Law 93-523), the USEPA is mandated to establish National Primary Drinking Water Regulations for contaminants occurring in drinking water. Primary NPDWRs are established and enforced to protect the public from adverse health effects resulting from a drinking water contaminant. Included in these regulations are the drinking water standards which set either 1) treatment techniques to control a contaminant, or 2) the Maximum Contaminant Level (MCL) allowable for the contaminant in drinking water. An MCL is set when an appropriate method of detection for the contaminant exists. A treatment technique approach is used when it is not possible to quantify the contaminant at the level necessary to protect public health. Secondary standards are established based on non-health related aesthetic qualities of appearance, taste and odor. These secondary standards are not federally enforceable.

States may choose to accept responsibility (Primacy Status) for the oversight and enforcement of US drinking water regulations. States which have primacy status from USEPA must adopt State drinking water standards that are at least as stringent as federal standards. A state may choose to enforce secondary standards as well as primary standards.

USEPA Maximum Contaminant Level Goals (MCLGs)

MCLGs are developed by the Office of Science and Technology in the USEPA Office of Water as a required first step toward promulgation of NPDWRs. MCLGs are non-enforceable health goals which are to be set at levels at which no known or anticipated adverse effects on the health of persons occur, and which allow for an adequate margin of safety. Prior to the SDWA Amendments of 1986, these levels were called Recommended Maximum Contaminant Levels (RMCLs). MCLGs are strictly health-based levels and are derived from relevant toxicological data.

For chemicals that produce adverse health effects and are not believed to be carcinogenic (non-carcinogens), the MCLG is based on the Reference Dose (RfD). A RfD is calculated from toxicological data to represent a contaminant level that should be without risk of adverse health effects even with a lifetime exposure. USEPA assumes that a threshold exists for non-cancer health effects from chemical contaminants, below which the effect will not occur. Thus the MCLG will be a non-zero number. The RfD, which is based on the

total daily amount of contaminant taken up by a person on a body weight basis, is converted to a Drinking Water Equivalent Level (DWEL) concentration and adjusted for the percentage contribution of other sources (relative source contribution, RSC) of the contaminant besides drinking water (air, food, etc) to arrive at the MCLG. This calculation assumes a lifetime consumption of 2 liters of drinking water per day by a 70 kg adult. Unless otherwise noted, the RSC from drinking water for organic and inorganic compounds is respectively 20% and 10%.

USEPA assumes that no threshold exists for cancer and thus, there is no absolutely safe level of contamination. For chemicals that are known (Group A) or probable (Group B) human carcinogens, USEPA policy directs that the MCLG be set at zero, in accordance with a recommendation by the US Congress. For contaminants believed to be possible human carcinogens (Group C), the MCLG may be derived based on relevant non-cancer health effects as described above. In this case, the RfD is divided by an additional uncertainty factor of 10. In some cases, Group C chemicals will have MCLGs set based on calculated maximum lifetime cancer risks of between 1/10,000 and 1/million.

Maximum Contaminant Levels (MCLs)

MCLs are federally enforceable limits for contaminants in drinking water established as NPDWRs. The MCL for a given contaminant is set as close to the corresponding MCLG as is feasible. "Feasible" is defined in the 1986 SDWA Amendments as "feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration)." To promulgate a MCL for a contaminant requires that a method of detection for that contaminant is available suitable for the level desired and a Best Available Technology is identified that can feasibly remove the contaminant to the desired level.

Secondary Maximum Contaminant Levels

Secondary MCLs are established under the SDWA to protect the public welfare. Such regulations apply to contaminants in drinking water that adversely affect its odor, taste or appearance and consequently cause a substantial number of persons to discontinue its use. Secondary MCLs are not based on direct adverse health effects associated with the contaminant, although some contaminants may have both a MCL and a SMCL. SMCLs are considered as desirable goals and are not fereally enforceable. However, states may choose to promulgate and enforce SMCLs at the state level.

Health Advisories

Health Advisories (HAs) for drinking water contaminants are levels considered to be without appreciable health risk for specific durations of exposure. HAs should be considered guidance and are not enforceable drinking water standards. HAs were previously know as Suggested No Adverse Response Levels (SNARLs).

USEPA HAs are developed and published initially as External Review Drafts, and then as a Final Draft. This designation indicates that the HA will be always subject to change as additional information becomes available. HAs are developed for one-day, 10-day, longer-term (approximately 7 years) and lifetime (70 year) exposures based on data describing non-carcinogenic health effects resulting from the contaminant. One-day and 10-day HAs use parameters which reflect exposures and effects for a 10 kg child consuming 1 liter of water per day. Lifetime HAs consider a 70 kg adult consuming 2 liters of water per day. Longer-term HAs can incorporate either child or adult parameters. A relative source contribution from water is also factored into the lifetime HA calculation to account for exposures from other sources (air, food, soil, etc) of the contaminant.

For known or probably human carcinogens, the lifetime HA level is based on an upper-bound excess lifetime cancer risk of 1/million. This means that **USEPA considers that the risk from a lifetime consumption of water at the given level is unlikely to be greater than 1/million, is most likely substantially less and may be zero.**

Reference Dose (RfD) and Drinking Water Equivalent Level (DWEL)

The RfD is a daily exposure level which is believed to be without appreciable health risk to humans over a lifetime. The RfD is usually derived from an experimental "no observed adverse effect level" (NOAEL), identified as the highest dose in the most relevant study that did not result in a known adverse effect. The NOAEL is divided by various uncertainty factors to derive the RfD. These uncertainty factors account for the variation in human response, extrapolation to human responses if animal experiments were used, data quality and relevance. The RfD takes the form of dose ingested per unit body weight per day (ug/kg-d).

The DWEL is the conversion of the RfD into an equivalen water concentration. It assumes that a 70 kg adult consumes two liters of water per day and that the total dose to a person results solely from drinking water. It is important to remember that actual exposures in the environment may occur through other routes, such as inhalation or dermal contact, or from other sources, such as from food or soil.

California Action Levels

California Department of Health Services Action Levels are health-based criteria derived much in the same way as EPA Health Advisories. Specific approaches to determining cancer risks and exposure assumptions may differ in some ways from those used by USEPA. California Action Levels are not enforceable drinking water standards, but are levels at which CA DOHS strongly urges water purveyors to take corrective action to reduce the level of contamination in the water they supply. Action Levels cease to exist when CA State MCLS are promulgated.

Integrated Risk Information System (IRIS)

IRIS is an EPA catalogue of Agency risk assessment and risk management information for chemical substances. It is available electronically in several formats. The risk assessment information contained in IRIS, unless specifically noted, has been reviewed and agreed upon by intra-agency work groups and represents Agency consensus. Chemical contaminants listed in IRIS may have descriptions of relevant toxicological experiments and risk assessment approaches used in the determination of RfDs, cancer risks and health advisories. Extensive bibliographies are included. Regulations and regulatory status for different media may be presented.

REFERENCES

EPA MCLs: Code of Federal Regulations, Title 40, Part 141.

EPA Final Rule and Proposed Rule, Fluoride: Federal Register Vol. 50, No. 220, November 14, 1985.

EPA Final Rule and Proposed Rule, Volatile Synthetic Organic Chemicals: Federal Register Vol. 50, No. 219, November 13, 1985.

EPA Final Rule, Fluoride National Primary and Secondary Drinking Water Regulations: Federal Register Vol. 51, No. 63, April 2, 1986.

EPA Final Rule, Volatile Organic Chemicals Drinking Water Regulations: Federal Register Vol. 52, No. 130, July 8, 1987.

EPA Proposed Rule, National Primary and Secondary Drinking Water Regulations; Synthetic Organic Chemicals and Inorganc Chemicals Federal Register, Vol. 55, No. 143, July 25, 1990.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 20, January 30, 1991.

EPA Final Rule, Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Federal Register, Vol. 56, No. 110, June 7, 1991.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 126, July 1, 1991.

NAS Health Advisories: Drinking Water and Health, National Academy Press, Volumes 1 (1977), 3 (1980), 4 (1982), 5 (1983), 6 (1986), and 7 (1988).

EPA Health Advisories: are from the EPA Office of Drinking Water. These are published and are available from the National Technical Information Service (NTIS).

IRIS, Integrated Risk Information System, EPA, Office of Health and Environmental Assessment, Office of Research and Development, Washington, D.C. 20460.

Arizona Department of Health Services, Office of Risk Assessment and Investigation, 3008 N. 3rd Street, Phoenix, Arizona 85012.

California Department of Health Services, Office of Drinking Water, 2151 Berkeley Way, Berkeley, CA 94704.

APPENDIX B

TABLE B-1
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
T2S/3W 31N1	1955 - 1983			21	4	metals, organics
31R1	1957 - 1963			12		
_36E1	1949			1		
T2S/4W 36R1	1956 - 1960			2		
T3S/2W 7R	1985 - 1993	1	1	1		
7P1	1953 - 1967			29		
_8E1	1973			1		
18R1	1963 - 1973			3		
18R2	1973 - 1992			2		
21A1	1969			1		
21A2	1973			1		
21B1	1963			1		
21C1	1949			1		
26L1	1973			1		
26M1	1963 - 1973			3		
27G1	1963 - 1993	1	1	4		
28L	1992	1	1			
28Q1	1975 - 1992	1	1	2		
29R1	1952			1		
30C1	1963			1		
32C1	1967			1		
32G1	1959 - 1964			2		
32R1	1963 - 1965			2		
33A	1967			1		
34E	1992	1	1			
34M	1967			2		
34Q	1967			1		
34Q1	1967			1		
35M	1967 - 1992			2		
35M1	1965 - 1967			2		
35Q2	1973			2		
32E	1985			1		
32D1	1985			1		
T3S/3W 2H1						
2L1	1973			1		
2L2	1973 - 1991	2	2	2	2	metals, pesticides
6D	1970 - 1985			6		
6D2	1991			2	2	metals
6M1	1967 - 1970			2		
6N3	1967 - 1983			6	1	metals
7F1	1968			1		
7Q1	1977	1				
12K1	1973 - 1991	1		10		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
18A1	1977			1		
20A	1958 - 1960			2		
20G2	1977	1				
21A1	1977	1				
21A2	1965 - 1977			3		
21C	1958			1		
21C1	1950 - 1977	1		5		
22D1	1960 - 1976			9		
22D	1977	1				
_29E1	1958 - 1978	1		21		
29M1	1953 - 1983			24		
30H1	1977	1		1		
30J1	1977	1		1		
30Q1	1977	1		1		
31B1	1993	1	1			
32M1	1958 - 1959			1		
T3S/4W1J1	1974 - 1982			5		
4W10	1981 - 1983			3		
4W10	1981 - 1983				3	metals
24C1	1976 - 1982			2		
24D1	1976 - 1983			3		
24D2	1976 - 1983			3	1	pesticides
T4S/2W 2C	1953 - 1973			6		
2D1	1963 - 1967			2		
2D2	1965			1		
2K1	1973			1		
2N2	1949			1		
3P	1967			1		
7J	1991	1	1			
7P	1992	1	1			
7Q	1991	1	1			
8B	1991	1	1			
_8E1	1967			1		
8G	1993	1	1			
8Q	1967			1		
8R	1967 1993		1	1		
8K	1993		1			
8Q	1993		1			
9M1	1973 - 1979			8		
10A	1993	1	1			
10A1	1975 - 1993	1	1	1		
10B1	1975			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
10C1	1963 - 1967			2		
10E	1964 - 1993		1	2		
11B1	1964 - 1974			10		
11B2	1972 - 1974			4		
11C1	1963 - 1979			19		
11C2	1993	1	1			
11D1		1	1			
_11E1	1964			1		
_11E2	1963 - 1967			3		
11F	1964			1		
11F1	1972			1		
12N	1967			1		
12N1	1958			1		
17D2	1965 1976			10		
18A1	1965 1989		1	18		
18B1	1965 1989			13		
18D	1990	1	1			
18D1	1977	1				
18G1	1987		1			
18G3	1939 1979			13		
24H1	1957 1984		1	13	2	metals
24J1	1972 1973			2		
27H2	1974 1979			9		
_36E1	1993	1	1			
36J1	1954 1958			7		
36J2	1963			1		
36M	1985			1		
36N	1983 1991				2	bacteriological
T4S/3W 6A3	1975 - 1981	1		3		
6C	1991			3	1	organics
6C1	1994	1	1			
6C2	1975 - 1977	1		2		
6F1	1977	1		1		
6H1	1970 - 1979			6	2	pesticides
6H2	1973 - 1983			5		
6Q1	1954 - 1993	2	1	32	1	organics
6Q2	1986				2	organics
6Q3	1967 - 1988			15	5	organics,metals radiological
7G2	1953 - 1977	1		1		
7H1	1977	1		1		
7J1	1955 - 1977	1		28		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
7J2	1993	1	1			
_8E1	1969 - 1977	1		2		
8N1	1963			1		
9N2	1966			1		
9N3	1966 - 1977	1		4		
9P	1993	1	1			
10E	1981			2		
_10E1	1980 - 1983			2		
_10E3	1967			1		
13Q1	1955 - 1969			25		
16B				1		
16C	1985 - 1993			1	1	organics & metals
16N1	1958 - 1977	1		22		
17A1	1959 - 1968			18		
17C1	1954 - 1965			24		
17J1	1956 - 1978			11		
17J3	1977	1		1		
18	1970			1		
18J	1972			1		
18J2	1975 - 1988			7	4	organics & metals
19A1	1953 - 1993	2	1	3		
19A3	1977	1				
20P1	1954			1		
21F	1956 - 1976	1		28		
21D	1958 -			1		
24B	1990		1			
24B1	1963 - 1977	1		1		
24N	1969			1		
24P1	1943 - 1976			29		
25D2	1965 - 1977	1		3		
26J1	1958 - 1973			4		
26K	1989 - 1991	3	5	3		
28C1	1954					
28H1	1965 - 1968			13		
29C3	1977			2		
29G2	1970 - 1977	1		5		
29K1	1963 1977	1		2		
29Q	1969			1		
29Q1	1959 1969			2		
32B	1965			1		
4S/4W 1A1	1993	1	1			
4S/4W 1G1	1993	2	1			
T5S/1W 30D	1992			1		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
30D2	1977			1		
_30E2	1992			1		
30M1	1957 - 1960			8		
T5S/2W 7E	1990		1			
14R	1980 - 1981			2		
15A1	1958 - 1960			6		
_15E1	1953 - 1956			4		
15F1	1963			1		
15G1	1982 - 1985			2		
15H	1982	1	1			
16F	1982			1		
16F1	1993	1	1			
16G	1983			1		
17B	1982 - 1985	2	2	2		
17B	1982			1		
17B1	1969 - 1978			18		
17C	1982			1		
17C1	1953 - 1967			27		
17F	1982 - 1985			2		
19N1	1953 - 1979			49		
21M2	1993	1				
2.20E+03	1993	1				
23J	1972			1		
23P1	1989				4	bacteriological
23P1	1989		2			
23Q	1986			1		
23R	1989				3	bacteriological
23R	1986			1		
23R1	1973			1		
24B	1981			1		
24B1	1993	1	1			
25C	1979			1		
25C1	1965 - 1977			3		
_25E1	1959 - 1963			2		
25J	1991	1	1			
26B	1987			1		
26G1	1968			1		
26G2	1957			1		
26H2	1963			1		
26H3	1964			1		
26L1	1963			2		
27N1	1988		1	1	1	bacteriological
30D	1991			1	1	radiological
30J1	1975			1		
31N1	1975			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
31R	1987			1		
31R	1987				1	metals
33E	1981	1				
35A	1991			1		
35A1	1993	1				
35B1	1969 - 1993	1		1		
35D2	1993	1	1			
36D	1991			3		
36D4	1993		1			
T5S/3W 2Q1	1993	1	1			
3Q2	1975			1		
3R1	1963 - 1968			3		
3R1	1977	1				
3R2	1977	1				
7B1	1975			1		
10H1	1975			1		
11M1	1953			1		
11M2	1955 - 1981			23		
13A	1977 - 1981			2		
13A1	1993	1	1			
13H1	1993	1	1			
14P1	1985			1		
14P1	1977	1				
14P1	1975			1		
15H1	1993	1	1			
16D1	1993	1	1			
16F1	1993	1	1			
16P1	1955 - 1958			6		
16P2	1977 - 1981			2		
17R1	1991			1		
21C1	1975			1		
21C1	1977	1				
21D1	1962 - 1971			17		
21D2	1960 - 1975			16		
21D2	1977	1				
21K	1993	1	1			
24C1	1993	1	1			
27L1	1975			1		
28M1	1993	1	1			
28M2	1993	1	1			
28M3	1993	1	1			
28M4	1993	1	1			
29H1	1955 - 1959			8		
29Q1	1958			1		
32G	1976			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
33R2	1991			1		
33R2	1991				1	organics
35N	1992			1		
35P1	1956 - 1968			4		
35Q	1977 - 1993	2	1			
36D1	1963 - 1968			4		
36K1	1962 - 1963			2		
36N	1977	1				
36N1	1991			1		
36P	1992			5		
36P1	1953 - 1956			3		
36Q1	1958 - 1965			11		
T6S/2W 1A2	1976			1		
2G1	1963			1		
2N1	1963			1		
3R2	1962 - 1970			5		
4R1	1988			1		
4R2	1988		1			
7A	1988		1			
7A1	1993	1	1			
7N	1975			1		
7R2	1993	1	1			
T6S/3W 1	1991			4		
1D1	1965			1		
1D2	1975			1		
_1E1	1977	1				
1J1	1975			1		
1J2	1993	1	1			
2A	1993	1	1			
2F1	1963 - 1968			4		
2C1	1975			1		
2D	1993	1	1			
2E	1993	1	1			
2G	1991	2	2	5	2	organics
2H	1991	1	1	2	2	organics
3C	1967			1		
3C1	1975 - 1991			3		
3C2	1975			1		
3H2	1977 - 1991	1		1		
3L1	1993	1	1			
3L2	1993	1	1			
4K1	1953 - 1963			2		
9B1	1975			1		
Totals		106	79	1015	48	

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

	Statistics			
	Total	Average	Maximum	Minimum
Length of Record (years)		5.18	40	1
Number of Samples per Well		4.14	49	1
Samples per Year		1	11	0
Year of Last Sample		1979	1994	1949
Total Number of Wells with Data	301			
Fraction of Wells with Only One Sample	63%			

Mark J. Wildermuth
Water Resources Engineer

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

November 23, 2010

Mr. Leon Long
Assistant General Manager
West Valley Water Company
855 Baseline
Rialto, California 92377-0920

Dear Mr. Long:

The Department of Water Resources (DWR) has reviewed the West Valley Water Company's (WVWC) 2005 Urban Water Management Plan (Plan) submitted on January 13, 2006 in accordance with the Urban Water Management Planning Act. Based on our review, your plan is complete. DWR's review is enclosed.

WVWC can amend its 2005 Plan at any time. If you submit an amended or updated urban water management plan to DWR, we request that you submit three hard copies, one electronic copy, and proof of adoption to:

Mr. David Todd
Water Use and Efficiency Branch
Department of Water Resources
Post Office Box 942836
Sacramento, California 94236-0001

If you have questions about our review of your Plan, the changes to the Act, or amending or updating your Plan, you may contact me at (916) 651-7027 or by email at: dtodd@water.ca.gov for further assistance.

Sincerely,

David Todd

David Todd, Chief
Technical Assistance and
Outreach Branch

Enclosure

cc: Sergio Fierro
DWR Southern District Office

West Valley Water District

URBAN WATER MANAGEMENT PLAN

January 2006

Project No. 62026.155

Prepared by:

IE Engineering Resources
OF SOUTHERN CALIFORNIA, INC.

1820 Commercenter Circle
San Bernardino, CA 92408
(909) 890-1255

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SECTION ONE

AGENCY COORDINATION

1.1 Introduction

The purpose of this report is to provide an Urban Water Management Plan (UWMP) for the West Valley Water District (formerly West San Bernardino County Water District), as required by State Assembly Bill (AB) No. 797-Klehs. This Plan includes a brief description of West Valley Water District's (District) water system, develops information on water use and current water conservation measures, analyzes future projections of water supply needs, as well as alternate conservation measures, and includes their implementation schedules. The Plan is an update to the 2001 Plan prepared for the District by ***Engineering Resources of Southern California, Inc***.

District staff have reviewed this Plan and, based on their recommendation, will be adopted by the Board of Directors following a public hearing where testimony will be taken and the Plan modified, if necessary. The Plan then becomes the guideline for water conservation within the District's water system, requiring upgrading at least every five years.

1.2 Background

The California State Legislature passed the Urban Water Management Planning Act (AB 797, California Water Code, Division 6, Part 2.6, Section 10610-10657), which was signed into law by Governor Deukmejian on September 21, 1983. The State Water Code was further amended by Assembly Bill 2661, approved by the Governor on July 18, 1990 as it relates to urban water conservation. The Bill requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supply more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP. West Valley Water District falls under both definitions.

The Legislature enacted two measures that modified the Act in 1991. The first measure requires water suppliers to include an urban water shortage contingency analysis as part of its UWMP (AB 11). This measure also exempts the implementation of urban water shortage contingency plans from California Environmental Quality Act (CEQA). The second measure requires an UWMP to describe and evaluate water recycling activities, to be updated once every five years, to include an estimate of projected potable and recycled water use, and to describe activities relating to water audits and incentives (AB 1869).

In 1993, the Legislature enacted a measure, which allows members of the California Urban Water Conservation Council (CUWCC) to submit to the State a copy of their annual report to the Council to satisfy current reporting requirements relating to UWMPs (AB 892).

The Legislature enacted additional measures in 1994. The first measure, Senate Bill (SB) 1017, authorizes an urban water supplier to recover the costs incurred in preparing its Plan and implementing the reasonable water conservation measures included in the Plan. The second measure requires water suppliers to give greater consideration to recycled water in their UWMPs (AB 2853).

In 1995, the Legislature enacted two additional measures. The first measure requires urban water suppliers to include, as part of their UWMP, a prescribed water supply and demand assessment of the reliability of their water service to their customers during normal, dry, and multiple dry water years (AB 1845). The assessment shall compare total water supply sources available to the supplier with the total projected water use over the next 20 years, in 5-year increments. The second measure makes the following changes to the Urban Water Management Plan Act (SB 1011):

- Requires urban water suppliers to update their Plans at least once every five years on or before December 31 in the years ending in 5 and 0. Requires urban water suppliers to include a prescribed water supply and demand assessment.

- Requires suppliers to encourage active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during preparation of the Plan.

- Prior to adopting the Plan, the urban water supplier shall make the Plan available for public inspection and shall hold a public hearing.

- Exempts suppliers who are implementing a conservation program from conducting a cost-benefit analysis of those conservation programs.

- Requires the Department of Water Resources to submit a report to the Legislature summarizing the status of Plans on or before December 31 in the years ending in 1 and 6.

In 2001, the Legislature enacted AB 901 and SB 610. The first measure incorporates changes in Section 10631 of the Water Code (AB 901) and the second measure requires additional information to be included as part of the UWMP if groundwater is identified as a source of water (SB 610).

1.3 Scope of Work

In preparing the proposed Plan, the following scope of work was developed utilizing guidelines provided by the California Department of Water Resources.

1. Provide a brief summary and map describing the District's water system, including sources, facilities, and operations.

2. From available records, prepare a brief summary of historical, current and projected water use in terms of annual consumption. For the current year of record, estimate the percentage of use from various categories such as residential, industrial, commercial, etc.

3. Identify and describe the existing and planned sources of water available along with a description of the groundwater basins and the District's adjudicated pumping rights.

4. Discuss the reliability of the planned water sources and their vulnerability to seasonal, climatic shortage, and water quality.

5. Assess the water supply reliability and compare the total water supply sources available versus the projected future demands within the system.

6. Describe conservation measures currently in use by the District, how they are practiced and their success. Both structural measures such as meters and retrofit devices, and non-structural methods such as rates and public information programs, are to be described and their effectiveness analyzed.

7. For those conservation measures not currently practiced by the District, prepare an analysis of the potential for improved efficiency of water use if alternative conservation measures were adopted. In the analysis, address the potential costs and other significant economic, environmental, social, health, and technological impacts, as appropriate.

8. Develop a history and description of the District's supply deficiencies, if any. This description should include the available source(s), capacity, their production, frequency of problem, actions taken, and plans for development of new sources.

9. If a future expansion of water supplies is needed, identify the projected amount of additional water supply and sources necessary to operate the water system without deficiencies.

1.4 Organization

The District is a County Water District, a public agency of the State of California, organized and existing under the County Water District Law (Division 12, Section 30,000 of the Water Code) of the State of California. Among other typical political subdivision powers, it has the power of taxation and eminent domain.

1.5 Location

The West Valley Water District is located in southwestern San Bernardino County with a small part in northern Riverside County. The District is adjacent to the western limits of the City of San Bernardino on the east; adjacent to, and including the eastern part of the City of Fontana on the west; adjacent to the U.S. Forest Service boundary on the north; and the County of Riverside on the south. The District is divided into northern and southern sections by the central portion of the City of Rialto.

1.6 History

The District was formed in 1952 under the name of Bloomington County Water District. This early agency initially covered an area of only one (1) square mile and served water to approximately two hundred (200) households. It had no water rights of its own, but served water secured through stock owned in the Citizens Land and Water Company.

By 1959, the District's name had been changed to the Semi-Tropic County Water District. At about the same time, it became clear that the City of San Bernardino and perhaps the San Bernardino Valley Municipal Water District would condemn water rights of the Citizens Land and Water company and the Lytle Creek Water and Improvement Company, another mutual water company in the same general area. While the rights of the existing customers would be protected, all future growth and development in the service areas of these companies would be stopped by lack of adequate water supply. To deal with this concern, Semi-Tropic County Water District worked out a cooperative agreement to absorb the assets of the Citizens Land and Water Company, Lytle Creek Water and Improvement Company, and the Slover Mutual Water Company. Annexations to the District were completed and a revenue bond was floated to acquire the private companies' assets.

A new name was chosen, and in 1962 the West San Bernardino County Water District was formed. The new District acquired water rights that date back to 1897, facilities for surface diversion from Lytle Creek, 22 wells in four different water basins, storage and distribution facilities, administrative offices and equipment, and maintenance and operation facilities.

At that time, the largest portion of the District's water was used for irrigation of citrus, grapes, vegetables and a variety of other agricultural products. It was this large irrigation demand that allowed the U.S. Department of the Interior, Bureau of Reclamation, to enter into a loan agreement with the District. This financed the construction of the backbone water transmission and storage facilities in a large portion of the District. This area is known as Improvement District No. 1.

The District has acquired several other water suppliers since 1962, including the Park Water Company's Bloomington Water System in 1965, the Inter County Water Company in 1987, and Crestmore Heights Mutual Water Company in 1997. On April 7, 1989, the District joined the West End Water Development Treatment and Conservation Joint Powers Authority (JPA).

In 2003 the District went through yet another name change. Today, the District is known as the West Valley Water District and serves a population of over 60,000.

1.7 Update in General

The region has been experiencing a drought that started in 1999 and continued until late 2004 causing water levels in wells to decline. From December 2004 to May 2005, the region experienced above average rainfall that recharged the Lytle Basin which is the District's most heavily utilized water basin. Levels in the Lytle Basin groundwater have gone from the lowest the District has seen, up to normal year operating levels. In some wells the District has noted levels rising over 200 feet. Throughout the drought the District suffered a significant loss of production capacity with two wells (Well #1 and Well #5A) going dry and incurred higher energy costs due to lowering water tables in the Lytle Basin.

1.8 Data Sources

Frequent references and information used to compile this report have been obtained from data provided by the District, from judgments, ordinances, articles and reports in the attached appendix as well as the following:

Water Master Plan, of November 2004, prepared for the District by *Engineering Resources of Southern California, Inc.*

West San Bernardino County Water District Urban Water Management Plan, of February 2001, prepared for the District by *Engineering Resources of Southern California, Inc.*

Water Supply Assessment for the Cactus Specific Plan, of Sept. 2005, prepared for the District by *Engineering Resources of Southern California, Inc.*

Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan, of January 18, 2005, prepared by the *California Department of Water Resources.*

Water System Master Plan Report, of December 1996, prepared for the District by *Engineering Resources of Southern California, Inc.*

Portions of the **Department of Water Resources Draft State Water Project Delivery Reliability Report 2005**.

1.9 Agency Coordination

The District is a member of, has participated in, or works in conjunction with the following:

Lytle Creek Water Conservation Association - Over half of the District's water is pumped from the Lytle Creek Basin. A 1924 judgment adjudication allocated all water rights in the basin to the various user agencies.

Upper Santa Ana Water Resources Association (USAWRA) - An association of all the public retail water purveyors that pump out of the Bunker Hill Basin.

San Bernardino Valley Municipal Water District (SBVMWD) - SBVMWD covers a service area of about 325 square miles, contains a population of approximately 600,000 and is a State Water Contractor (SWC) with an annual entitlement of State Project Water (SPW). In addition to being a SWC, they have also been given the responsibility of overall groundwater management within its boundary. SBVMWD in conjunction with many of the retail water agencies within its boundary recently received a grant through Proposition 50 to create an Integrated Regional Groundwater Management Plan (IRGMP). The IRGMP will provide coordination between all of the existing planning documents and legal documents within their district which govern the management of groundwater and surface water.

Rialto Basin Management Association - The Rialto Basin supplies north San Bernardino, the Cities of Colton, Fontana, and Rialto.

Institutional Controls Settlement Agreement (ICSA) - The ICSA group administers the Consent Decree for the State of California and the City of San Bernardino Water Department vs United States Department of Army for the groundwater contamination management of the Bunker Hill Groundwater Basin for the Newmark and Muscoy Contamination Plumes. The District is a member of the ICSA Group for management of the groundwater basin for the Newmark and Muscoy Plumes.

The Fontana Water Company, the Cities of Rialto, Colton, San Bernardino, and SBVMWD have mutual aid agreements with the District to provide water under emergency conditions.

SECTION TWO

CONTENTS OF URBAN WATER MANAGEMENT PLAN

2.1 Appropriate Level of Planning for Size of Agency

The District is part of the greater San Bernardino-Riverside-Ontario metropolitan area and is located about fifty miles east of downtown Los Angeles. It is situated in an interior valley of Southern California known as the San Bernardino Valley and within the Santa Ana River Basin Watershed. Lands within the District have a gentle upward slope to the north with the foothills of the San Gabriel mountains and the San Bernardino National Forest providing its northern boundary. The major features of the District's climate are hot, dry summers and cool, wet winters. Most of the precipitation occurs from November to March with little to none occurring during the summer months of June through September. The average rainfall in the Valley is approximately 16 inches per year with occasional droughts on an average seven-year cycle. Summer temperatures commonly are above 85°F and may exceed 103°F.

Water use in the District's service area is related to economic, demographic, and climatic factors. Increases in population have offset decreases in agricultural water use over the last 25 years and economic growth will continue to influence water use in the future.

The majority of the District's service area lies within the boundaries of the SBVMWD. The SBVMWD and the Inland Empire Utilities Agency are two of many agencies contracting with the State of California to receive Northern California Water as a part of the California Water Plan.

2.1.1 Distribution System

The District's distribution system consists of eight pressure zones which are divided into North and South Systems with the City of Rialto serving the area in between. Elevations within the service area range from 850 feet to 2,180 feet above mean sea level. Water can be dropped to lower zones through pressure reducing valves or lifted to upper zones through a series of booster pump stations. There are ten booster pump stations that lift water to upper zones to replenish storage and to supply demand. Nine of the booster stations are operated 16 hours per day based on preset levels in the reservoirs to which they are pumping. The tenth booster pump station at the Oliver P. Roemer Water Filtration Facility operates when the facility is on line. Each zone's booster pump station is configured to boost the required supply with one pump on standby.

Storage for the system is provided by both welded steel and reinforced concrete tanks. Twenty three reservoirs with capacities ranging from 0.10 million gallons (mg) to 7.0 mg provide 65.6 mg of storage.

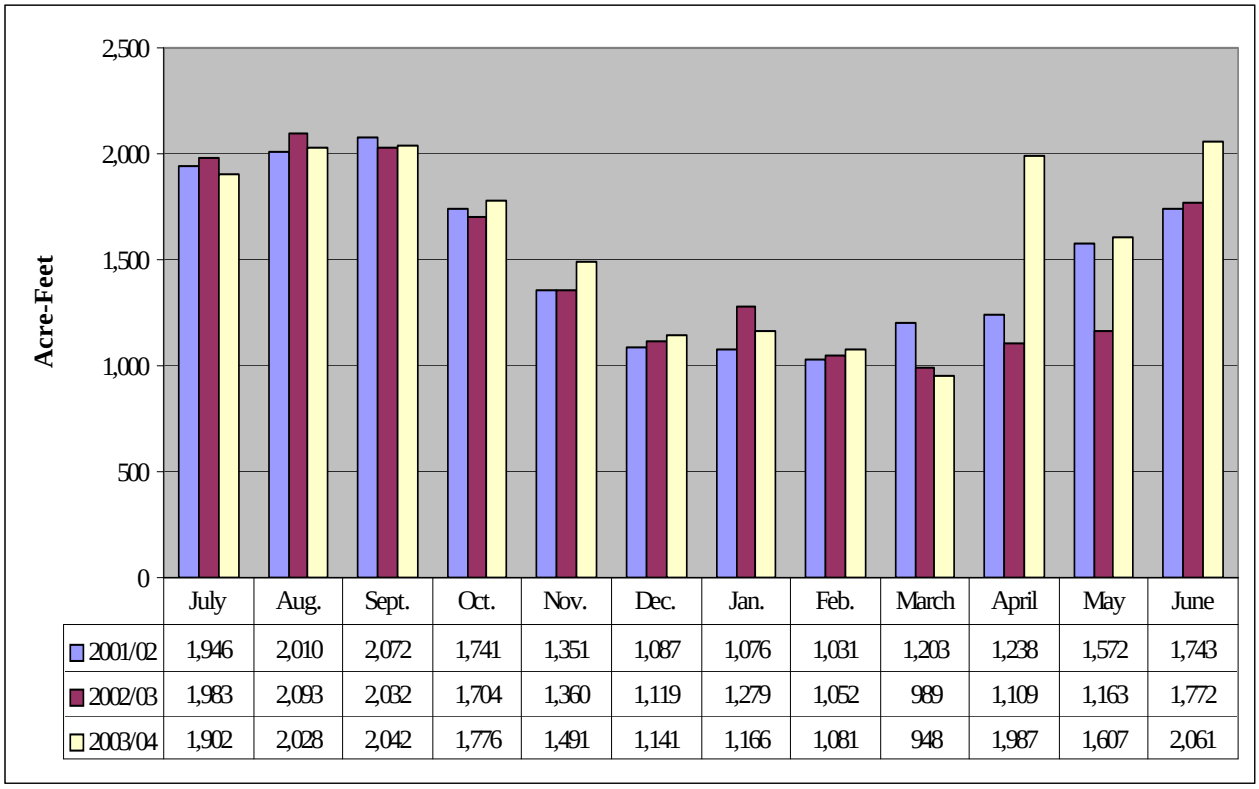
2.1.2 Production and Consumption

From the District's latest Public Water System Statistics for the year 2004, the average daily water production (for potable water) was 20.3 million gallons per day (mgd) or 22,734 acre feet per year (AF/Yr). This included domestic, commercial, bulk, hydrant meters, and unaccounted for water within the system. The estimated peak summer day production is assumed to be twice the average day or 40.6 mgd.

The District supplies non-potable water to the El Rancho Verde Golf Course with raw water from the State Water Project, surface water from Lytle Creek, and backwash water from the Oliver P. Roemer Water Filtration Facility (WFF). Backwash water accounts for 40% of the golf course's supply in the summer and as much as 60% in the winter, with the remaining water being supplied by Lytle Creek or State Project Water. The District's 2004 Water Master Plan reports that the golf course used 1,357 AF in fiscal year 2002/03.

Demand within the District increases during the summer months, June through September, when little or no precipitation occurs. Consumption for the past three years is shown below in Table 2-1.

Table 2-1
Past Domestic Water Consumption



	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
2001/02	1,946	2,010	2,072	1,741	1,351	1,087	1,076	1,031	1,203	1,238	1,572	1,743
2002/03	1,983	2,093	2,032	1,704	1,360	1,119	1,279	1,052	989	1,109	1,163	1,772
2003/04	1,902	2,028	2,042	1,776	1,491	1,141	1,166	1,081	948	1,987	1,607	2,061

Note: The data used in the above table was obtained from the District's Financial Statements June 30, 2002 through June 30, 2004.

The past and current water consumption measured in AF/Yr is shown below for the different categories of uses within the District.

Table 2-2
Past and Present Water Demands by Fiscal Year
(AF/Yr)

Category	1974/75	%	1989/90[1]	%	1994/95[1]	%	1999/00[2]	%	2003/04[2]	%
Domestic	7,004	76	10,426	77	11,424	81	15,680	80	19,230	92
Commercial/ Industrial	--[3]		1,846	14	1,970	14	2,800	14	--[3]	
Irrigation	2,197	24	1,259	9	306	2	730	4	630[4]	3
Wholesale/Bulk	0		0	0	480	3	490	3	1,100	5
TOTAL	**9,201**	**100**	**13,531**	**100**	**14,180**	**100**	**19,700**	**100**	**20,957**	**100**

(1) Metered water sales, does not include unaccounted for water.
(2) Includes unaccounted for water.
(3) Included in domestic.
(4) Does not include supply to golf course.

2.1.3 Water Filtration Facility

The District's existing Oliver P. Roemer Water Filtration Facility has a treatment capacity of 9.6 mgd. The facility utilizes a blend of primarily raw water from Lytle Creek and is supplemented with water from the State Water Project when flows from Lytle Creek are inadequate to satisfy demand. The facility utilizes a direct filtration treatment system consisting of rapid mix, clarification with coagulation, flocculation, dual-media filtration and disinfection. The Oliver P. Roemer Water Filtration Facility is currently under expansion and will have the ability to treat a total of 14.4 mgd by the end of 2005. When the expansion is complete, the WFF will be classified as a conventional treatment plant. The new facilities consist of flocculation and sedimentation basins and UV disinfection.

2.1.4 Well Supply

The District has 25 production wells (two wells utilized as standby/summer peaking and W-23A as standby only for W-24) with a total pumping capacity of 29,541 gallons per minute (gpm) or production capacity of 26.5 mgd (pumping 16 hours per day) as shown in Table 2-3. Basin levels have risen due to the above average rain fall last winter and production capacities will increase above those shown in Table 2-3. One well (W-17) was being tested for water quality, four wells (W-11, W-29, W-37 and W-39) need well head treatment, two wells (W-18A and W-42) have well head treatment, three wells (W-39, W-40 and W-54) need additional equipment for operation, and four more wells (W-43,W-44, W-55 and W-56) are planned to be drilled before the year 2008. The District currently operates all of its wells 16 hours per day during off-peak hours based on preset reservoir levels.

The following table represents the well capacity recorded from Edison Pump Tests of 2004 and 2005. Well levels were the lowest on record and reflect drought conditions for production capacity.

Table 2-3
Well Capacity as of May 2005

Zone	Designation	Basin	Location	Pumping Capacity (Gpm)	Production Capacity (Mgd)[1]
2	W-16	R	296 S. Eucalyptus Avenue, Rialto	1,255	1.2
2	W-17 [2]	R	404 S. Acacia Avenue, Rialto	1,075	0.0
2	W-18A	NR	1783 S. Sycamore Avenue, Colton	1,820	1.7
2	W-29	NR	180 W. Slover Avenue, Fontana	0	0.0
2	W-40 [3]	NR	157 Resource Drive, Rialto (Not equipped)	0	0.0
2	W-41	NR	3353 Industrial, Rialto	2,200	2.1
2,3,3A	W-15	BH	1950 W. 9th St., San Bernardino	1,115	1.1
2,3,3A	W-30	BH	2015 W. 9th St., San Bernardino	2,000	1.9
3	W-37 [4]	C	17186 ½ Slover Avenue, Fontana	1,640	1.6
3	W-39 [5]	C	10301 Linden Avenue TPP, Bloomington	0	0.0
3	W-42	NR	295 E. San Bernardino Avenue, Rialto	1,765	1.7
3A	W-11[4]	R	238 W. Victoria St., Rialto	1,650	1.6
3A	W-33	R	855 W. Baseline Road, Rialto	1,407	1.4
4	W-1	LC	19523 Country Club Drive, Rialto	1,100	1.1
4	W-2	LC	19973 Country Club Drive, Rialto	1,800	1.7
4	W-4A	LC	5914 N. Sycamore Avenue, Rialto	1,500	1.4
4	W-5A	LC	5914 N. Sycamore Avenue, Rialto	1,500	1.4
3,4	W-7	LC	6871 Martin PMP, San Bernardino	1,230	1.2
3,4	W-8A	LC	6871 Martin Road, San Bernardino	1,280	1.2
4	W-34	LC	19653 Country Club Drive, Rialto	1,110	1.1
4	W-35A	LC	5800 N. Sycamore Avenue, Rialto	500	0.0
3,4	W-36	LC	3401 Plant	1,600	1.5
4	W-22A	R	5700 N. Riverside Avenue, Rialto	1,000	1.0
6	W-23A [6]	R	4334 Riverside Avenue, Rialto	390	0.0
6	W-24	R	4334 Riverside Avenue, Rialto	604	0.6
			TOTAL	**29,541**	**26.5**

[1] 16-hours/day Pumping Time.
[2] Under evaluation for water quality and reactivation in 2003/04.
[3] To be on-line 2005/06.
[4] Standby Summer Peaking.
[5] To be on-line 2004/05.
[6] Standby for well W-24 only.

R = Rialto Basin - 5.8 mgd
NR = North Riverside Basin - 5.5 mgd
C = Chino Basin - 1.6 mgd
LC = Lytle Creek Basin - 10.6 mgd
BH = Bunker Hill Basin - 3.0 mgd

2.2 Service Area Information with 20 Year Projections
(California Water Code Section 10631 (a))

The District supplies water to over 60,000 people within the Cities of Rialto, Fontana and Colton, and the Counties of San Bernardino and Riverside. The distribution system covers an area of approximately 32 square miles with an additional 3,300 acres within the District's sphere of influence. Almost 50% of the District's service area is zoned residential, 29% is zoned commercial/industrial, with the remaining 21% classified as public facilities, open space, landfill, flood control/utility corridor, rail way corridor, parks, schools, and highway.

The water service area for the City of Rialto is located in the middle of the District, where limited growth will occur. The bulk of the population growth within the City of Rialto will be within the District's service area. The projected population numbers in the following table are the latest Southern California Association of Governments (SCAG) projections and do not reflect the unincorporated land to the north of Rialto that is anticipated to be within the District's service area when development in this area commences (Lytle Creek North Planned Development).

Table 2-4
SCAG Population - Current and Projected for the City of Rialto

Year				
2005	**2010**	**2015**	**2020**	**2025**
97,848	99,936	102,851	105,727	108,486

The District will not only see growth within the City of Rialto (which comprises the majority of the District's existing service area), but it will also see growth within the City of Fontana. A large portion of primarily undeveloped land in the District's northwestern section of its service area is within the City of Fontana. General plans for the City of Fontana allow a mix of open space, residential, and commercial development for this area.

The City of Fontana was estimated to be 60% built out in 2001 and a large section of the City of Fontana is yet to be populated. Significant growth will occur within the City of Fontana with the bulk of that population growth in the northern and southern sections of the City. The northern section will be served by the District, and in the southern section by Fontana Water Company. The population within Fontana on January 1, 2004 was estimated to be 154,800, an increase of 8,000 from the previous year. The future projected population for the City of Fontana is based on Department of Finance numbers and is presented in Table 2-5.

Table 2-5
Population Projections for the City of Fontana

Year				
2005	**2010**	**2015**	**2020**	**2025**
165,000	188,700	218,400	251,000	283,700

The current and future water demands within the District's service area are dependent on area conditions and characteristics. From 1984 to 2004, the District experienced a 106% increase in service connections. The following table shows the District's growth for those years.

Table 2-6
District Growth

Year	Total Connections [(1)]	% Increase
June 1984	8,142	
1985	9,220	13.2%
1986	11,241	21.9%
1987	11,897	5.8%
1988	11,943	0.4%
1989	12,644	5.9%
1990	13,155	4.0%
1991	13,994	6.4%
1992	14,036	0.3%
1993	14,346	2.2%
1994	15,092	5.2%
1995	15,112	0.1%
1996	15,148	0.2%
1997	15,240	0.6%
1998	15,390	1.0%
1999	15,663	1.8%
2000	16,005	2.2%
2001	16,360	2.2%
2002	16,488	0.8%
2003	16,718	1.4%
2004	16,832	0.7%

[(1)] Includes domestic, commercial, industrial and irrigation. Connection information obtained from the District's Financial Statements.

The northwestern section of the District contains more than 2,000 acres of generally undeveloped land. Over 900 acres zoned residential and commercial are either being developed or are in the planning stages. The residential developments include Coyote Canyon, Monarch Hills, Citrus Heights, Forecast Homes, Empire Companies, the Summit at Rosena, and the Cactus Specific Plan. In addition to these projects is the Lytle Creek North Planned Development, that will be north of the service area within the District's sphere of influence. These known developments will contain over 5,500 new dwellings. Based on this information, the District's population is expected to increase approximately 33% between June 2005 and June 2010.

Table 2-7
Expected Residential Growth by 2010

Development	Number of Projected Residential Connections by 2010	Average Day Demand (mgd)	Projected Domestic Demand Growth (AF/yr)
Coyote Canyon	645	0.45	504
Monarch Hills	305	0.26	291
Citrus Heights	560	0.46	515
Forecast Homes	100	0.084	94
Empire Companies	554	0.32	358
Summit at Rosena	399	0.375	420
Lytle Creek North Planned Development	2,270	1.59	1,781
Tract 16621	55	0.046	52
Cactus Specific Plan	785	0.66	739
Total	**5,673**	**4.245**	**4,755**

The projected population growth within the District's service area was based on several factors including expansion within the Cities of Rialto and Fontana, land use designations, known developments and the District's past growth rate. Projected population is based on an average of 3.5 people per household as reported in the District's Water Master Plan.

The following table shows the expected population and residential connection growth as well as the projected domestic water demand for the District from the year 2005 to 2025 in five year increments.

Table 2-8
Projected Residential Growth

Year	Growth per Year (%)	Projected Population	Total Connections	Projected Domestic Demand (AF/yr)
2005		60,200	17,200	16,200
2010	5.9	80,150	22,900	21,000
2015	3	92,900	26,500	25,000 [(1)]
2020	3	107,700	30,800	29,000 [(1)]
2025	3	124,900	35,700	33,600 [(1)]

[(1)] Based on 840 gpd per connection.

2.3 Water Sources

(California Water Code Section 10631 (b))

The District obtains water from canyon surface flows on the east side of the San Gabriel Mountains, including North Fork Lytle Creek, Middle Fork Lytle Creek, and South Fork Lytle Creek. It also receives imported water supplies from the State Water Project and from 25 wells in 5 different groundwater basins. All five of the groundwater basins have been adjudicated and are managed. Relevant portions of the judgments and decrees that specify the District's water rights are provided in the appendices of this report.

The District does not at this time plan to develop any new sources of water supply. Their plan is to utilize a greater amount from each source, up to their legal rights depending on the availability of each water supply source. Currently, only the Lytle Creek Basin and Lytle Creek surface water has been fully utilized by the District as a water supply source.

Of the water supplied within the distribution system, the current mix is 69% groundwater, 20% surface water and 11% purchased water.

2.3.1 Groundwater Sources

Lytle Creek Basin

The Lytle Creek Basin was adjudicated under the 1924 Judgment No. 17,030 from the Superior Court of San Bernardino County and is managed by the Lytle Creek Water Conservation Association (made up of the successors to the stipulated parties of the judgment). The District has nine existing wells in the Lytle Creek Basin, and the right to pump and export out of the Lytle Creek Region 12,105 gpm if they are diverting their full allotment (2,290 gpm) of surface flow from Lytle Creek. If flows from the Creek are low and the District is receiving a portion of their allotment, they can pump the difference from the wells to a combined maximum of 14,395 gpm from the basin, depending on how much water is available to pump and how much water is available to divert from Lytle Creek. The District has no restrictions on how much it can pump and serve within the Lytle Creek Region, including water that will be used to supply the Lytle Creek North Planned Development which is within that Region.

The Lytle Creek Groundwater Basin has an estimated long term safe yield of 35,000 to 45,000 acre-feet per year. The basin is highly porous and easily replenished during heavy precipitation years. The depth to groundwater in the basin varies from 50 feet to 400 feet depending on whether it is a drought cycle or wet cycle. Well production in the basin varies as the basin levels change from year to year. There is no known contamination within the Lytle Basin and no contamination is expected to be detected in the future.

The actual amount that The District can extract from the basin yearly is dependent on the availability of groundwater levels within the basin. In the past, they have pumped between 10,000 AF/Yr in normal years and an estimated 5,000 AF/Yr in the most severe drought periods. West Valley Water District and its predecessors have been utilizing the Lytle Creek Basin for water supply for nearly 100 years.

Chino Basin

The Chino Basin was adjudicated by the 1978 Judgment No. 164,327 of the Court of San Bernardino County and is managed by the court appointed Chino Basin Watermaster. The Judgment declares that the safe yield of the Chino Basin is 140,000 acre-feet. The District has a minimum of approximately 1,000 AF/Yr of extraction rights. Extractions above that amount must be replenished with SPW through a program with the Chino Basin Watermaster. Two (2) existing wells are in the Chino Basin with the capability of pumping up to 2,000 AF/Yr. During extended drought periods, the District projects that it will pump and utilize up to 1,000 AF/Yr from the Chino Basin. Should the District require additional water supply during a drought period, they would have the option of purchasing additional water supply from the Chino Basin and pay replenishment costs. The District and its predecessors have been utilizing the Chino Basin for water supply for over 40 years.

The Chino Basin consists of about 235 square miles of the Upper Santa Ana River Watershed. The Chino Basin is an alluvial valley that is mainly flat from east to west and slopes from the north to the south at a one to two percent grade. Elevations in the valley range from 2,000 feet to 500 feet at Prado Dam. It is one of the largest groundwater basins in southern California with about 5,000,000 acre-feet of water and an unused storage capacity of about 1,000,000 acre-feet.

Rialto Basin

The Rialto Basin was adjudicated under the 1961 Decree No. 81,264 from the Superior Court of San Bernardino County and is managed by the Rialto Basin Management Association (made up of the stipulated parties to the judgment). Groundwater storage capacity of the basin is about 210,000 acre-feet, with an estimated 120,000 acre-feet for the Rialto portion of the sub-basin and about 93,000 acre-feet for the Colton portion. The total storage capacity has been estimated at 2,517,000 acre-feet. The basin shows quick rises of water levels during high precipitation years and slower decline over several years.

Under normal conditions, when the basin is not in adjudication, the District has unlimited extraction rights. During drought conditions when the adjudication is in affect, their extraction right ranges from 3,067 AF/Yr in the most severe drought periods to a maximum of 6,134 AF/Yr. Since the Decree was stipulated in 1961, the least amount of water supplies that have been available to the District has been 6,134 AF/Yr. Seven existing wells are in the Rialto Basin which have the ability to extract up to 10,000 AF/Yr during normal conditions. The District and its predecessors have been utilizing the Rialto Basin for water supply for more than 80 years.

Bunker Hill Basin

The Bunker Hill Basin was adjudicated by the 1969 Judgment No.117,628 of the Court of Orange County and is managed by the court appointed Watermaster (SBVMWD and Western Municipal Water District). SBVMWD's primary function is to plan and develop a long-range water supply for water agencies within the upper Santa Ana River Basins. These two agencies have adopted a Regional Water Facilities Master Plan that manages the Bunker Hill Basin.

The objectives of the Master Plan are captured in the following Mission Statement:

"*Develop regional facilities to allow coordinated management of available water resources to meet the ultimate quantity and quality requirements of all water purveyors in the District, and increase the reliability of supplies by maximizing the use of local water resources and optimizing the use of imported water. The regional facilities should be cost effective, and be developed in a systematic, phased program with the cooperation of the water purveyors.*"

The District has restrictions on pumping and exporting from certain areas of the basin as is defined in the 1924 Judgment for the Lytle Creek Region and will be defined in a future City of San Bernardino Municipal Water Department's Basin Management Ordinance (this ordinance is expected to restrict the location of new wells, and amounts of overall pumping from the Bunker Hill Basin within the area defined by the expected Management Ordinance). The District has two existing wells in the Bunker Hill Basin within the defined area of the 1924 Judgment for the Lytle Creek Region. In addition to its two existing wells, they have a contract with SBVMWD for up to 5,000 AF/Yr from the Bunker Hill Basin. The District plans to extract up to a maximum of 15,000 AF/Yr during extended drought conditions and has plans for over 20 mgd of capacity in transmission pipelines within the next several years from the Bunker Hill Basin to their service area. The District and its predecessors have been utilizing the Bunker Hill Basin for over 50 years.

It is estimated that there is as much as 1.6 trillion gallons of water in the basin, with sufficient supply for many consecutive drought years without any natural recharge. Historically, ground water pumping within this basin has been partially controlled by a court judgment, which determined that the safe yield for the Bunker Hill Basin was 232,100 acre-feet per year. It is believed that this control on pumping, combined with State Project Water deliveries and annual rainfall is sufficient to replenish the basin storage level for all potential future demands. Plumes of various chemical pollutants have been detected in the Bunker Hill groundwater basin requiring installation of treatment or blending.

In addition to the District's groundwater wells, the District acquired an additional water supply on January 1, 1990 when they entered into a 20 year agreement with provisions to extend up to an additional 30 years on a cost proportionate basis with the SBVMWD, City of Rialto, and Riverside Highland Water Company to drill two wells in the Bunker Hill Basin and construct a 48" diameter transmission main. This project, referred to as the Baseline Feeder, started delivering water to the District in November 1990. This agreement is for 5,000 acre-feet per year of supplemental water to the District's existing supplies. The District owns up to 20 million gallons per day of transmission capacity in the Baseline Feeder.

North Riverside Basin
The North Riverside Basin is part of the 1969 Judgment No. 117,628, under the Bunker Hill Basin. The Riverside Groundwater Basin is a large alluvial fill basin that is bounded by major faults and topographic barriers. Recharge to the basin occurs by the underflow from basins to the north, contributions from the Santa Ana River, and from percolation of surface water runoff from the surrounding uplands, in particular the Box Spring Mountains to the east. The ultimate average year safe yield of the basin is 33,729 AF/Yr.

The District has five existing wells in the North Riverside Basin with no extraction restrictions. Extraction of 3,000 AF/Yr to 5,000+ AF/Yr from the North Riverside Basin is projected without depleting the groundwater basin. The District and its predecessors have been utilizing the North Riverside Basin for water supply for more than 60 years.

2.3.2 Surface Water Sources

Lytle Creek
Surface water from Lytle Creek was adjudicated under the 1924 Judgment No. 17,030 from the Superior Court of San Bernardino County and is managed by the Lytle Creek Water Conservation Association. The District has the right to divert and export out of the Lytle Creek Region 2,290 gpm when it is available. They also have the right to purchase an additional 1,350 gpm of Lytle Creek flows through an agreement with the City of San Bernardino (San Bernardino is not able to utilize their surface water flows), which is treated at the Oliver P. Roemer Water Filtration Facility. The District also utilizes Lytle Creek surface water flows for groundwater recharge in the Lytle Creek Basin and to supply non-potable customers. They have been able to utilize up to 5,500 AF/Yr during normal times from Lytle Creek surface flows and a minimum of 3,000 AF/Yr during severe extended drought conditions. The District and its predecessors have been utilizing Lytle Creek surface flows for water supply for more than 130 years.

State Water Project
The District has an agreement with the San Bernardino Valley Municipal Water District to purchase up to 20 mgd of water from the State Water Project through the Lytle Turnout off the San Gabriel Feeder Pipeline to utilize for groundwater recharge in the Lytle Creek Basin, to produce potable water from their Oliver P. Roemer Water Filtration Facility, and supply non-potable customers. The District has been utilizing water from the State Water Project through the Lytle Turnout since 1999.

The District plans to utilize a greater amount of SPW in the future. This additional supply will be treated at the Oliver P. Roemer Facility as well as the Lytle Creek North Planned Development.

The different water supply sources in the following table show ranges for yearly amounts of water supply that the District can reasonably expect from their water rights and the District's ability to utilize these water supply sources.

Table 2-9
Existing and Potential Water Supply Sources

SOURCES	Maximum when available WATER RIGHT	Range of PRODUCTION POTENTIAL in 2025 Approximate Max. to Min. (AF/Yr)
Lytle Creek Surface Water [1]		
Existing	5.09 cfs	3,500 to 2,000
City of San Bernardino (purchase)	3.00 cfs	2,000 to 1,000
State Project Water (purchased)	No Limit	23,000 [2]
Ground Water		
Lytle Creek Basin [3]	12,105 gpm	10,000 to 5,000
Rialto Basin [4] Maximum/Minimum	No Limit / 3,067 AF/yr	10,000 to 3,067
Chino Basin	No Limit	3,000 to 1,000
North Riverside Basin	No Limit	5,000 to 3,000
Bunker Hill Basin	No Limit	
Existing Wells		6,000 to 3,000
Future Wells		10,000 to 6,000
SBVMWD/Baseline Feeder [6]		10,000 to 6,000
TOTALS		**82,500 to 53,067**

(1) The amount of purchased SPW depends on the availability of Lytle Creek Water and the combined treatment capacity of the existing Oliver P. Roemer WWF, the proposed expansion and the North Villages WFF. The combined total for surface water treatment capacity is projected to be 26.4 mgd during normal conditions. Of the 26.4 mgd The City of Rialto owns 1.5 mgd capacity in the Oliver P. Roemer WFF.

(2) The number shown for purchased SPW reflects the amount of water that can be utilized at the Districts Water Filtration Facilities in the year 2025. The state water contractor (SBVMWD) has an 82% reliability of receiving 39,000 AF/Yr of SPW. The Districts minimum projected share of that is 7,000 AF/Yr. During a drought that reduces the available SPW allotment for SBVMWD, all of the water agencies receiving water from them will share in the deficit of the water budget on a percentage basis. It is highly unlikely that a drought in Northern California will coincide with a drought in Southern California.

(3) During extended drought periods, well production in Lytle Basin is projected to be 50% of normal conditions or less.

(4) The Rialto Groundwater Basin has perchlorate contamination problems that severely limit current production and is used mainly for standby purposes only. Perchlorate contamination is projected to be remediated for ultimate.

(6) The carrying capacity of the Baseline Feeder is limited to 14,000 gpm for WVWD. 1991 Agreement between District and SBVMWD.

2.3.3 Past Basin Production

The District's use of the different water supply sources depends on its daily demand which varies from winter to summer. If wells are not in service for maintenance or repair, WVWD has the ability and right to pump its wells up to 24 hours per day.

Table 2-10
Amount of Groundwater Pumped (AF/Yr)

Basin	2000	2001	2002	2003	2004
Lytle	7,335	7,201	7,157	6,476	7,178
North Riverside	2,224	2,355	3,198	4,135	3,335
Rialto	999	1,274	2,695	3,383	4,402
Bunker Hill	752	586	1,582	1,424	832
Chino	0	0	276	0	35
Total Well Supply	**11,310**	**11,416**	**14,908**	**15,418**	**15,782**
Total Production	**20,248**	**19,698**	**20,655**	**21,558**	**22,734**
% of Total Water Supply	**56%**	**58%**	**72%**	**72%**	**69%**

The annual amount of groundwater pumped for the past five years represents the District's production capacity during the most severe of drought conditions. The District's wells in 2004 were reported to be at the lowest pumping levels recorded. In order to continue production from several of the wells, the District lowered pumps, and replaced motors and columns. This enabled the District to provide sufficient groundwater to meet system demands.

2.3.4 Projected Basin Production

Above average rainfall during the winter of 2004/2005 has recharged groundwater basins back to levels seen in average water years. The District's well capacity will increase above that seen in recent years, enabling them to provide sufficient supply to meet the projected demands.

Table 2-11
Current and Planned Water Supplies (AF/Yr)[1]

	9/2003 to 9/2004	2010	2015	2020	2025
Lytle Basin	6,680	10,000	10,000	10,000	10,000
North Riverside Basin	4,020	6,000	8,000	6,000	5,000
Rialto Basin	4,890	10,000	10,000	10,000	10,000
Bunker Hill Basin	3,450	10,000	12,000	15,000	25,000
Chino Basin [2]	0	3,000	3,000	3,000	3,000
Total Well Supply	19,040	39,000	43,000	44,000	53,000
% of Total Water Supply	78%	66%	68%	66%	65%
Lytle Creek Surface	4,060	5,500	5,500	5,500	5,500
State Project Water	1,310	15,000	15,000	17,000	23,000
TOTAL	**24,410**	**59,500**	**63,500**	**66,500**	**81,500**

[1] Based on 16 hr/day pumping.
[2] Should the District require additional supplies, they have the option of purchasing water from the Chino Basin.

Due to drought conditions, the District has been preparing to shift its main source of supply from the Lytle Creek Basin to the Bunker Hill Basin which is not affected as much during droughts. The District plans to drill additional wells in the Bunker Hill Basin to meet future demands. The Bunker Hill Basin which has a safe yield of 232,100 acre-feet per year contains sufficient supply for many consecutive drought years without any natural recharge. With the construction of these wells and the planned water supply projects as outlined in Section 2.9, the District is projected to have sufficient groundwater available to meet future demands.

2.4 Reliability of Supply

(California Water Code Section 10631 (c))

As with all water supplies in Southern California, the District's water supply is vulnerable to chemical contamination and to seasonal and climatic changes within the area based upon precipitation patterns and may vary substantially from one year to the next.

Lytle Creek, which is a perennial stream in the upper watershed, provides a local surface water supply to the area. Water from Lytle Creek is treated by the District for domestic water use at their Oliver P. Roemer Water Filtration Facility. Surface flows fluctuate seasonally and the District's water rights could be prorated whenever Lytle Creek flow is below 800 miner inches (16 cubic feet per second (cfs)). Southern California Edison's records, for the past 30 years, indicate that the average flow for the summer months is 17 cfs and for the winter months is 37 cfs. Approximately ten days in the summer, Lytle Creek surface water flow will drop below 16 cfs which causes the District's water rights to be subject to proration. In addition to the flow fluctuation, the turbidity of Lytle Creek's surface water also varies seasonally. Southern California Edison (SCE) will shut down their power generation whenever the water turbidity exceeds their operation limit due to high runoff. This in turn will cause the Oliver P. Roemer Water Filtration Facility to be shut down.

The Lytle Creek Basin, which is recharged by water from the Lytle Creek watershed, is subject to extreme fluctuations based on precipitation in the watershed and has experienced up to 400-foot drops in groundwater levels with a subsequent loss of up to 50% of the Lytle Basin's potential as a water supply source.

The Rialto Basin has a perchlorate contamination plume that has reduced its potential from over 6,300+ acre-feet per year to a projected 3,067 acre-feet per year until there is an economical and practical treatment process for safely removing perchlorate from drinking water.

The Bunker Hill Basin has fluctuated up to 100 feet in groundwater levels from drought cycles to above normal precipitation cycles. The groundwater basin is expected to be a reliable long term water supply source even in drought periods. The Bunker Hill Basin is expected to make up any short fall in water supply that could be caused by a long term drought.

The North Riverside and Chino Basins do not appear to be affected by drought cycles. The North Riverside Basin has a projected safe yield of 33,729 AF/Yr. The City of Riverside which has not as yet utilized their 21,085 AF/Yr extraction rights within the Basin, is expected to in the future. This would then leave 12,644 AF/Yr available between four local water purveyors. The District's portion is estimated to be 5,000 AF/Yr.

The District is also planning to construct a 4.0 mgd water filtration facility (ultimate capacity of 6.0 mgd) that will be located in the Lytle Creek North Planned Development. This facility will utilize SPW supplied through the existing Glen Helen Turnout from the San Gabriel Feeder.

In addition to the new water filtration facility located at the Lytle Creek North Planned Development, the District plans to construct a second water filtration facility adjacent to the Oliver P. Roemer Water Filtration Facility which will treat an additional 6.0 mgd. This facility (Phase III) will consist of additional membrane filtration capacity, UV disinfection, and GAC contactors. This addition will expand production capacity at the Oliver P. Roemer Water Filtration Facility to 20.4 mgd.

The working draft of the 2005 State Water Project Delivery Reliability Report projects a minimum delivery of 5% of full entitlement compared to 20% in the SWP Delivery Reliability Report 2002 for a single dry year in Northern California. During an average water year in Northern California, they are projecting 69% to 77% of contracted deliveries. During a two to four year drought in Northern California, projections range from 38% to 43% between 2005 and 2025. In 75% of the years the annual SPW delivery is estimated to be at or above 65% and in 25% of the years the delivery is 100%. The District is projected to utilize between 1,000 AF/Yr under the most severe drought conditions for Northern California and up to 23,000 AF/Yr during drought conditions in Southern California.

2.4.1 Basis of Water Year Data

The basis for the water year data used for the supply reliability assessment is from USGS surface water data collected from the Lytle Creek watershed, from available historic data provided by the District and from information within the District's 1996 and 2004 Water Master Plan. The normal water year selected represents an average groundwater pumping year in terms of gpm production from the existing wells at that time.

Table 2-12
Basis of Water Year Data for Local Supply

Water Year Type	Base Year		
Normal Water Year [(1)]	1996		
Single-Dry Water Year	2000		
Multiple-Dry Water Years	2002	2003	2004

[(1)] The normal year selected of 1996 represents the average historical annual mean stream flow of Lytle Creek from data collected from 1919 to 2003 and represents an average pumping year for the District. The District's 2004 Water Master Plan (Well Pumping Facilities Designation) refers to 1996 as Normal Conditions.

Due to the size of the groundwater basins utilized by the District, a single dry year will not affect well production. Surface flow, however, during a year without rainfall can be significantly affected.

During a single dry year in Northern California (as seen in 1977) SPW delivery could be as low as 5% of normal supply. State Water reliability is based on the 2005 Reliability Report. Droughts in Northern California (location of SPW supply) do not usually coincide with drought periods in Southern California.

The region has been experiencing a drought that started in 1999 and continued until late 2004 causing water levels in the basins to decline. By 2004, levels in the Lytle Basin were the lowest the District has seen. For this reason the multiple dry years of 2002, 2003, and 2004 were selected. Delivery of SPW during a four-year drought as seen in 1931 through 1934 is projected to be 33% of normal supply.

The following table lists the existing water supply sources and projected availability of each of the sources during a single-dry year and multiple-dry years.

Table 2-13
Supply Reliability

	Average / Normal Water Year (1996)	Single Dry Water Year	Multiple Dry Water Years		
			Year 1 (2002)	Year 2 (2003)	Year 3 (2004)
Lytle Creek Basin	% of Normal	95	70	65	60
North Riverside Basin	% of Normal	100	100	90	80
Rialto Basin	% of Normal	95	90	86	83
Bunker Hill Basin [1]	% of Normal	95	70	60	53
Chino Basin	% of Normal	100	100	95	90
Lytle Creek Surface	% of Normal	55	80	70	60
State Project Water [2]	% of Normal	5	33	33	33

[1] Water from the Bunker Hill Basin includes water purchased through the Baseline Feeder.
[2] Droughts in Northern California (location of SPW supply) do not usually coincide with drought periods in Southern California. The SPW numbers are based on projected availability in 2025.

The annual amount produced in past normal, single dry, or multiple dry water years from a basin does not give an accurate representation of potential basin production. Factors such as lower system demand, cost of pumping, inoperable wells, pumping duration, replenishment costs, water quality, cost of supply and the ability to treat water all affect annual basin production numbers. The District will analyze all of these factors to determine the most economical source of supply to use. Additional wells, system operation, water rights and safe basin yields will impact basin production figures in the future. The basis for comparison used was pumping capacity in gpm. Well capacities in 1996 (normal water year) were compared to their capacities in 2004 (multiple dry water year).

Production from wells located in the Lytle Basin saw a 60% reduction in supply but would have been less had it not been for the District changing motors and pumps in these wells to increase their production capacity as the groundwater in this basin declined. The 53% reduction of normal supply for the Bunker Hill Basin also reflects declining groundwater levels. The District did not lower pumps and motors on wells in this basin but could do so to increase production.

The District's normal operating practice is to pump their wells 16 hours a day during off peak hours to take advantage of Southern California Edison's time of use rate. If, for some reason, wells are not in service (maintenance or repair), the District has the ability and right to pump its wells up to 24 hours per day. As shown in Table 2-3 the District has 42.54 mgd production capability from all of its wells in operation 24 hours per day. The District also has 9.6 mgd capacity in its Oliver P. Roemer WFF and 4.0 mgd in purchased water supplies through the Baseline Feeder. The three water sources have a combined production capacity of 56.14 mgd. With its largest water supply source out of service (Oliver P. Roemer Water Filtration Facility at 9.6 mgd), the District has the ability to supply up to 46.54 mgd. Due to the recharge of the basins, the production capacity of the District's wells will increase above those shown in Table 2-3.

2.5 Transfer and Exchange Opportunities

(California Water Code Section 10631 (d))

The District currently has interconnections with Fontana Water Company, the Cities of Rialto, Colton, and San Bernardino, and SBVMWD. The connections with Fontana Water Company are currently not in use but an exchange or transfer of water could be provided for emergency supplies.

The District has four interconnections with the City of Rialto. The City of Rialto can take water from two locations and the District can take water from the City of Rialto's water system at two locations. The Cedar Avenue connection is the delivery point for the City of Rialto's Lytle Creek surface water entitlement. Previous to the upsizing of this connection, the City of Rialto received its share of Lytle Creek surface water directly from the Oliver P. Roemer Water Filtration Facility.

In addition to the interconnections that the District has, they also purchase 1,350 gpm of Lytle Creek surface flow from the City of San Bernardino which is treated at the Oliver P. Roemer Water Filtration Facility.

The District, in a joint venture with the City of Rialto and SBVMWD constructed 25,000 feet of 48-inch transmission line known as the Baseline Feeder. Through an agreement with SBVMWD, the District can be provided up to 5,000 acre-feet per year of supply through this transmission line. The District has two wells connected to the Baseline Feeder that can pump 5,000 gpm into this system. Supplemental water could be provided by the City of San Bernardino through the Baseline Feeder if contracts for such an exchange were prepared.

2.6 Water Use by Customer - Past, Current and Future
(California Water Code Section 10631 (e))

The following table shows the past, current and projected water use within the District in five year increments for single family residential, commercial, agricultural, and wholesale. The single-family demand shown includes multi-family usage.

Table 2-14
Water Use by Customer - Past, Current and Future (AF/Yr)

Year		Single Family	Comm.[1]	Agri.[1]	Construction Hydrant Meter[2]	Sales to Marygold Mutual Water Company	Water Loss	Total
2000[3]	# of Accounts	15,487	801	22	N/A	0	N/A	16,310
	Deliveries (AF/Yr)	14,542	3,212	685	N/A	0	1,809	20,248
2001[3]	# of Accounts	16,061	364	22	N/A	0	N/A	16,447
	Deliveries (AF/Yr)	14,951	2,928	631	380	0	808	19,698
2002[3]	# of Accounts	16,855	461	24	N/A	0	N/A	17,340
	Deliveries (AF/Yr)	15,349	2,570	664	311	0	1,761	20,655
2003[3]	# of Accounts	16,957	479	24	N/A	1	N/A	17,461
	Deliveries (AF/Yr)	15,400	2,454	629	424	242	2,409	21,558
2004[3]	# of Accounts	16,742	474	29	N/A	1	N/A	17,246
	Deliveries (AF/Yr)	15,199	5,156	419	563	1,448	N/A	22,785
2010	# of Accounts	22,900	566	35	N/A	1	N/A	23,502
	Deliveries (AF/Yr)	21,000	3,537[4]	994	619	1,500	2,350	30,000
2015	# of Accounts	26,500	656	40	N/A	0	N/A	27,196
	Deliveries (AF/Yr)	25,000	4,101	1,136	613	0	2,850	33,700
2020	# of Accounts	30,800	761	47	N/A	0	N/A	31,608
	Deliveries (AF/Yr)	29,000	4,754	1,335	611	0	3,300	39,000
2025	# of Accounts	35,700	882	54	N/A	0	N/A	36,636
	Deliveries (AF/Yr)	33,600	5,511	1,534	605	0	3,750	45,000

[1] Estimated future Commercial and Agricultural connections projected at 3% growth per year. The agricultural demand takes into account additional demands such as irrigation for freeway landscape, public utility corridor, schools and parks.
[2] Hydrant Meter projections where based on 2004 usages.
[3] Information in the above table was obtained from the District's Public Water System Statistics Reports submitted to the Department of Water Resources for the Calendar Years 2000 through 2004.
[4] Projections based on 2003 Commercial usage and known commercial development that will occur within this time frame.

The District began supplying Marygold Mutual Water Company (MMWC) with supplemental water in July of 2003. Monthly supply has ranged from 28 acre-feet to 156 acre-feet. There is no formal agreement between the two agencies and the District could discontinue service if supplies are not available. The above table projects 1,500 AF/Yr supply to MMWC up to the year 2010. MMWC is constructing their own wells to supply groundwater to meet their demand and will not need supplemental water from the District beyond 2010.

Unaccounted for water within the District is approximately 8% annually. This percentage was then used to project future unaccounted for water losses within the system.

The demands shown in Table 2-14 include the projected demands for residential, commercial, industrial, agricultural, construction hydrant meters, and unaccounted for water losses within the system in five year increments through the year 2025. The District is projected to require 30,000 AF in 2010, 33,700 AF in 2015, 39,000 in 2020 and 45,000 AF by 2025.

2.7 Demand Management Measures

(California Water Code Section 10631 (f))

The District is not a member of the California Urban Water Conservation Council and does not have a Best Management Practice Report to accompany this report. The following section identifies the water demand management measures currently being implemented or scheduled for implementation by the District.

Water in the City of Rialto (City) is provided by both the City and the District. Water conservation programs and incentives offered by the City will also benefit the District. In order to assess the effectiveness of these programs and their contribution to the reduction of consumption within the District, data would need to be obtained from the City of Rialto. Currently the City does not track that data and therefore the District does not have a means of evaluating the effectiveness of these programs. Without this data, an estimate of the existing conservation savings on the water use within the system cannot be given. The District will make additional efforts to obtain and monitor this information for future reference and analysis.

The savings that are being realized by the demand management measures currently implemented will not effect the ability to further reduce demand. A request by the District to further reduce consumption within the service area would be possible. People are generally receptive to reducing consumption if the need to conserve is stressed. This reduction however may only be for a short duration.

The following data is based on information from District staff and from Article 24 entitled Water Conservation of Ordinance 68. This article describes the District's various measures presently being implemented. A copy of Article 24 - Water Conservation is provided in the Appendices.

(A) Water Survey Programs

The District does not perform water use surveys for their customers and has no plans to implement such a program.

(B) Residential Plumbing Retrofit

As a condition of continued water service, existing structures not so equipped, which require building permits to remodel or expand, shall be retrofitted with low-flow showers and faucets. Certification of compliance with Ordinance 68 shall be forwarded to the District.

As a condition of water service, all new structures shall be equipped with low-flow showers and faucets as per Title 24, Part 6, Article 1, T20-1406F of the California Administrative Code, in addition to the insulating of all hot water lines according to California Energy Commission Rules.

(C) System Water Audits, Leak Detection, and Repair

The District performs an annual audit to determine unauthorized and unaccounted for water losses. System meters are read and tabulated for water production and sales, and estimates are made of authorized unaccounted for water, such as: main flushing, construction uses, street cleaning, main breaks, and leaks.

Customer's Side - District personnel investigate high water bills at the customer's request. It has been the District's experience that in most situations, the cause of the unusual water use will consist of obvious malfunctions in plumbing fixtures such as toilets and sinks which can easily be corrected. This may indicate a need to better educate customers on the impact of seemingly small, but continuous leaks when they are occurring.

Valve Exercise Program - A valve exercising program can reduce water loss by identifying system valves in need of repair, or those which are improperly set. The District's crew operates system valves periodically, but does not have a regular scheduled program at this time.

(D) Metering with Commodity Rates and Retrofit of Existing Connections

All new and existing customer water services within the District are metered. It has been adequately illustrated that the metering of water services is a sure method of reducing total water use.

The existing base rate commodity charge within the District is $0.80 per 100 cubic feet and $1.20 per 100 cubic feet outside of the District.

Meter Calibration and Replacement Program. The District calibrates meters before placing them into service. Inoperative and inaccurate meters can contribute to an increased percentage of unaccounted for water. The District does minimal repairs in the field, instead meters are replaced.

The District has also implemented a new program to convert all meters within the system to Automated Remote Reading (ARM) by converting 1,000 meters per year.

(E) Large Landscape Conservation Program

The District offers financial incentives to improve landscape water use efficiency. Three irrigation commodity rates are offered within the District, including gravity irrigation water, pressure irrigation, and water for golf courses.

Irrigation Water (includes gravity) - Commodity Charge .40/100 cu.ft.

Pressure Irrigation - Commodity Charge .57/100 cu.ft.

Golf Courses - Commodity Charge .50/100 cu.ft.

Large water users, as determined by the District, are required to submit a water conservation plan to the District and implement it as a condition of continued service.

The use of lawns shall be minimized in new commercial, hotel, condominium, and high-density housing and shall be subject to District review and conditioning of projects.

The use of native or water-conserving trees, shrubs, lawns, grass, ground cover, vines, and other plant species for landscape planting or replanting purposes is required and shall be approved by the District. (A list of such plants can be obtained at the District office.)

(F) High-Efficiency Washing Machine Rebate Program

The Board of Directors has just authorized funds to implement a High-Efficiency Washing Machine Rebate Program. The details regarding incentives and or replacements have not been finalized and therefore this information is not available at this time. Implementation of this program is scheduled for 2006.

(G) Public Information Programs

To promote voluntary conservation, the District has initiated a public awareness and education plan.

- The District sponsors an annual poster coloring contest at local elementary schools where the students are required to draw a poster with a water conservation theme.

- Tours of the Oliver P. Roemer WFF are conducted with the local schools to educate today's youths on water conservation and awareness.

- Pamphlets, brochures, and stickers are distributed stressing the reasonable utilization of resources and explain that the quality of life need not suffer from the use of conservation techniques.

- The District provides each service customer with data on water use during the similar period from the previous year. Customers will use the data to informally evaluate the results of their conservation efforts taking into consideration climatic difference, exact billing period length, and any changes they have made to their households which could affect water consumption.

- A yearly Consumer Confidence Report which illustrates the quality of water provided by the District is posted on the District's web site and is distributed to customers.

(H) School Educational Programs

As previously mentioned, the District provides tours of the Oliver P. Roemer WFF for the local schools to educate today's youths on water conservation and awareness. The District also participates at the local State College Cal State Expo.

(I) Conservation Programs for Commercial, Industrial, and Institutional Customers

The District currently reviews the intended water usage of all new large water customers. They also provide non-potable industrial process water at a reduced rate. When non-potable sources are available, the District will use this source for development construction water such as SPW.

(J) Wholesale Agency Programs

SBVMWD has a web site that has links to water conservation measures. One link is a guide on lawn watering which shows customers how to determine the output of their sprinklers and suggests irrigation duration. Other links provide helpful hints to conserving water and even a water trivia page.

(K) Conservation Pricing

The District does not currently encourage conservation through a tiered rate water pricing system. A reduced price for dedicated irrigation water is in place.

Table 2-15
Irrigation Water Rates

User	Commodity Charge 100 Cubic Feet
Demand and Gravity Irrigation	$0.40
Pressure Irrigation	$0.57
Golf Course	$0.50
Domestic (in District)	$0.80

(L) Water Conservation Coordinator

The District does not have a dedicated conservation coordinator. Water conservation projects and programs are performed by members of the District's staff through engineering committee meetings of staff and Board members.

(M) Water Waste Prohibition

The District through Ordinance 68, Article 24, 2404. STAGE 1 - Normal Condition, lists uses of water considered non-essential to the public health, safety and welfare and, if allowed, would constitute the wasting of water which is prohibited, pursuant to Water Code Section 350 et seq., Water Code Section 71640 et. Seq., and the common law.

(N) Residential Low Flush Toilet Program

As a condition of water service, all new structures shall be equipped with ultra low-flush toilets (1.6 gallons per flush max) as per Section 17921.3 of the California Health and Safety Code.

As a condition of continued water service, existing structures not so equipped, which require building permits to remodel or expand, shall be retrofitted with toilet tank dams resulting in 1.6 gallon flushes unless the toilets are to be replaced, in which case the new toilets shall be ultra low-flush (1.6 gallons per flush max). Certification of compliance with Ordinance 68 shall be forwarded to the District.

2.8 Evaluation of Demand Management Measures Not Implemented
(California Water Code Section 10631 (g))

Of the 14 Demand Management Measures discussed in Section 2.7 (A-N) the District is currently implementing 12 and plans to implement the 13th "High-Efficiency Washing Machine Rebate Program" in 2006. The only Demand Management not being considered by the District at this time is the "Water Survey Program." The environmental, social, health, customer impact and technological factors of this measure is discussed below.

Water Survey Program - The overall goal of such a program is to motive customers to use water more wisely and to participate in conservation programs. The program would bring to light methods to conserve water and reduce water bills.

- Environmental Impact is positive. Less water will be used.
- Social Impact is positive, as people are reminded of water conservation, and their 'water consciousness' will be raised.
- There are no adverse Health and Safety Impacts.
- Customers will have reduced water bills following the implementation of the response to the survey.
- There are no Technological Factors involved.
- The Cost to implement such a program would include mailers that would be sent to customers, field personnel to perform the survey and the time to evaluate and respond back to the customer.
- The Benefit to the District would be the reduced demand resulting in lower supply, O&M and treatment costs.

A Water Survey Program for single-family and multifamily residential customers as outlined by the Department of Water Resources would require the District to check for leaks, including toilets, faucets, and water meters at each customer's home. The District would also have to check flow rates of shower heads and toilets along with an inspection of the customer's irrigation system and timers. A review of the customer's irrigation schedule and measuring the landscape area would also be required. This information would then have to be analyzed and the customer would need to be provided an evaluation of their existing water consumption habits and water saving recommendations would need to be supplied.

The District is not staffed for such a program. This sort of program requires both office and field personnel to perform the survey, analyze the data and respond with survey results. The anticipated water savings gained by such a program would not cover the costs to implement it.

2.9 Planned Water Supply Projects and Programs
(California Water Code Section 10631 (h))

The District plans to utilize a greater amount from each of their supply sources, up to their legal rights and availability from each source. Currently, only the Lytle Creek Basin and Lytle Creek surface water has been fully utilized by the District.

The 2004 Water Master Plan's Capital Improvement Plan recommended additional wells to be equipped and drilled. Expansion of the Oliver P. Roemer Water Filtration Facility (now under construction for an additional 4.8 mgd capacity) was substituted for drilling of new wells in the Bunker Hill Groundwater Basin for the time period of 2002 to 2005. To meet the future demands within the system the District has several proposed wells planned for various areas within the distribution system beyond the five-year Capital Improvement Plan.

Groundwater is not the only future supply source to be utilized by the District to meet the anticipated future demands within the system. The District is planning to construct a 4.0 mgd Water Filtration Facility located in the Lytle Creek North Planned Development. This water filtration facility would take SPW through the existing Glen Helen Turnout off the San Gabriel Feeder. The ultimate treatment capacity would be 6.0 mgd.

In addition to the new water filtration facility located at the Lytle Creek North Planned Development, the District plans to construct a second water filtration facility adjacent to the Oliver P. Roemer Water Filtration Facility which could treat an additional 6.0 mgd of SPW. This facility (Phase III) will consist of additional membrane filtration capacity, UV disinfection, and GAC contactors. This addition will expand production capacity at the Oliver P. Roemer facility to 20.4 mgd.

The following table outlines the future water supply projects being considered by the District. These projects are located throughout the District's eight pressure zones. The exact construction time frame of the projects is not known at this time and will commence when the District feels demand in this zone requires additional supply.

The projected AF/Yr supply from the projects is based on 16 hours per day, pumping 365 days a year. Although this is what is projected from the source, it is unlikely that any of these sources will be in operation for that length of time. Factors such as water quality, basin entitlements, system demands, cost of imported water, maintenance schedules and pumping costs will dictate what sources the District will use. Additionally, the production capacities from the future water supply projects are not additive. Existing and future adjudications will limit basin production numbers.

Table 2-16
Future Water Supply Projects

Project Name	Water Supply Source	Projected Completion Date	Normal Year [1] (AF/Yr)	Single-Dry Year [1] (AF/Yr)	Multiple Dry Water Year [1]		
					Year 1 (AF/Yr)	Year 2 (AF/Yr)	Year 3 (AF/Yr)
Rehab W-17	Rialto Basin	2004/05	1,260	1,000	1,000	1,000	1,000
Drill & Equip Well W35A	Lytle Basin	2004/05	900	800	800	625	450
Equip Well W-54	Rialto Basin	2004/05	780	700	700	685	670
Drill & Equip Well W-55	Bunker Hill Basin	2005/06	1,500	1,000	1,000	500	0
Drill & Equip Well W-45	Bunker Hill Basin	2005/06	3,000	2,700	2,700	2,700	2,800
Equip existing Well W-39 w/ wellhead treatment	Chino Basin	2005/06	1,075	1,075	1,075	1,075	1,075
Equip existing Well W-40w/ wellhead treatment	North Riverside Basin	2005/06	1,570	1,400	1,400	1,200	1,000
Expand and upgrade existing Filtration Facilities (Phase I and II -14.4 mgd total)	State Water Project	2005/06	5,377	During a drought that reduces the available SPW allotment for SBVMWD, all of the water agencies receiving water from them will share in the deficit of the water budget on a percentage basis.			
Construct North Village Filtration Facility (Phase I-4.0 mgd)	State Water Project	2007/08	4,480	During a drought that reduces the available SPW allotment for SBVMWD, all of the water agencies receiving water from them will share in the deficit of the water budget on a percentage basis.			
Drill & Equip Well W-43	Bunker Hill Basin	2006/07	3,000	2,700	2,700	2,400	2,100
Drill & Equip Well W-44	Bunker Hill Basin	2007/08	3,000	2,700	2,700	2,400	2,100
Drill & Equip Well W-46	Bunker Hill Basin	2007/08	3,000	2,700	2,700	2,400	2,100
Drill Well W-19A	North Riverside Basin	N/A	2,130	1,900	1,900	1,700	1,500
Drill Well W-29A	North Riverside Basin	N/A	1,570	1,570	1,570	1,570	1,570
Drill Well W-38	North Riverside Basin	N/A	2,020	1,800	1,800	1,600	1,400
Drill Well W-39	Chino Basin	N/A	1,075	1,020	1,020	970	915

Project Name	Water Supply Source	Projected Completion Date	Normal Year [1] (AF/Yr)	Single-Dry Year [1] (AF/Yr)	Multiple Dry Water Year [1]		
					Year 1 (AF/Yr)	Year 2 (AF/Yr)	Year 3 (AF/Yr)
Drill Well W-47	Bunker Hill Basin	N/A	3,000	2,700	2,700	2,400	2,100
Drill Well W-48	Bunker Hill Basin	N/A	3,000	2,700	2,700	2,400	2,100
Drill Well W-49	North Riverside Basin	N/A	2,130	1,900	1,900	1,700	1,500
Drill Well W-50	North Riverside Basin	N/A	2,130	1,900	1,900	1,700	1,500
Drill Well W-51	North Riverside Basin	N/A	2,130	1,900	1,900	1,700	1,500
Drill Well W-52	North Riverside Basin	N/A	2,130	1,900	1,900	1,700	1,500
Drill Well W-56	Bunker Hill Basin	N/A	1,770	1,000	1,000	600	0

[1] Estimated production capacity based on 16 hour per day pumping.
N/A = Not Available.

2.10 Development of Desalinated Water
(California Water Code Section 10631 (i))

The District is a considerable distance from the coast. There is no opportunity for development of desalinated or brackish water.

2.11 Current or Projected Supply
(California Water Code Section 10631 (k))

The District receives wholesale water from two sources. SBVMWD provides the District with groundwater from the Bunker Hill basin through the Baseline Feeder and SPW through the Lytle Turnout off from the San Gabriel Feeder Pipeline.

The District receives water through the Baseline Feeder under a 20 year agreement with provisions to extend up to an additional 30 years on a cost proportionate basis with the SBVMWD. The agreement provides up to 5,000 AF/Yr of supplemental water from the Bunker Hill Basin to the District's existing supplies.

The SPW is utilized for groundwater recharge in the Lytle Creek Basin, to produce potable water from their Oliver P. Roemer Water Filtration Facility, and supply non-potable customers. Additional supplies of SPW for treatment at the Oliver P. Roemer Water Filtration Facility and the Lytle Creek Water Filtration Facility will be utilized in the future, as well as additional supplies through the Baseline Feeder. The Baseline Feeder supply is a back-up in the event the SPW feeder line or the Oliver P. Roemer Water Filtration Facility is out of service. The following table represents the amount of SPW the District will be able to treat and utilize from their water filtration facilities (94% of the time) minus the anticipated Lytle Creek surface flow.

Table 2-17
SPW Projections Provided to Wholesale Provider (AF/Yr)

Wholesaler	2010	2015	2020	2025
San Bernardino Valley Municipal Water District (SBVMWD)	15,000	15,000	17,000	23,000

The District has provided written projections of SPW to SBVMWD for the next 20 years in 5-year increments as shown in the table above. As of the adoption of this report by the District's Board of Directors, SBVMWD has not provided written water availability projections for the next 20 years, of supply during a normal, single-dry or multiple-dry water years for the District, but has provided information regarding the reliability of their SPW allotment. During a drought that reduces the available SPW allotment for SBVMWD, all of the water agencies receiving water from them will share in the deficit of the water budget on a percentage basis.

SECTION THREE

DETERMINATION OF DEMAND MANAGEMENT MEASURE IMPLEMENTATION

3.1 Evaluation of Water Demand Management Measures
(California Water Code Section 10631.5)

Under normal conditions (Stage I), the District implements the measures described in Section Two, 2.7 Demand Management Measures including: metering of all users, distributing public information, school education, annual water audit, and those measures described in the District's Ordinance No. 68, Article 24 - Water Conservation.

The District's water production during the recent droughts has been sufficient to supply customer demands. The District has not had to implement Stages 2, 3 or 4 of Article 24. This is largely due to the District's construction of adequate water production facilities to meet adverse conditions. By continuing this philosophy, the District will be able to meet future demands, except under some extreme conditions where they may be forced, for a temporary period of time, to exercise the mandatory provisions of the District's Water Conservation Ordinance.

The District does not currently offer rebates for high-efficiency washers. This program is being considered by the District and could be implemented later this year. The following is a list of the water demand management activities and the status of each.

A)	Water Survey Programs	- Not Implemented
B)	Residential Plumbing Retrofit	- Implemented
C)	System Water Audits, Leak Detection, and Repair	- Implemented
D)	Metering with Commodity Rates	- Implemented
	Retrofit of Existing Connections	- Implemented
E)	Large Landscape Conservation Program	- Implemented
F)	High-Efficiency Washing Machine Rebate Program	- Implementation 2005/06
G)	Public Information Programs	- Implemented
H)	School Educational Programs	- Implemented
I)	Conservation Programs for Commercial Customers	- Implemented
J)	Wholesale Agency Programs	- Implemented
K)	Conservation Pricing	- Implemented
L)	Water Conservation Coordinator	- Implemented
M)	Water Waste Prohibition	- Implemented
N)	Residential Low Flush Toilet Program	- Implemented

SECTION FOUR

WATER SHORTAGE CONTINGENCY PLAN

General
The District is situated in the San Bernardino valley which is an arid desert region surrounded by mountains. The average rainfall in the valley is approximately 16-inches per year with occasional droughts on an average seven-year cycle.

During the droughts of 1986-1993 and 1999-2004, water levels in the District wells in the Lytle Basin were at their lowest recorded levels. The District suffered a significant loss of production capacity, but due to planning for drought periods, developing adequate water supplies the District was able to meet demands.

To offset the prolonged effects of the drought periods, the Board of Directors adopted a Water Conservation Plan with Ordinance No. 68 on July 5, 1990 by adding Article No. 24 entitled "Water Conservation" to its water service regulations and a Water Shortage Contingency Plan with Ordinance No. 69 on February 6, 1992 which amended portions of the Water Conservation Plan. On May 1, 2003 the Board of Directors adopted Resolution No. 390, rescinding all previous resolutions, which established water service regulations, schedules of rates, and charges.

Article No. 24 describes Water Conservation objectives and outlines four stages of action to be implemented during a water shortage. The District's Plan includes voluntary and mandatory stages. The purpose of Article 24 is to provide water conservation measures in order to minimize the effect of a water shortage on the citizens of, and the economic well-being of the communities the District serves. This Article adopts provisions that will significantly reduce the wasteful and inefficient consumption of water, thereby extending the available water resources required for the domestic, sanitation, and fire protection needs of the citizens of the communities they serve while reducing the hardship on the District and the general public to the greatest extent possible.

Priorities By Use - The priorities for the use of available water, based on California Water Code Chapter 3 and community input are:

Health and Safety - Interior Residential and Fire Fighting
Commercial, Industrial and Governmental - Maintain Jobs and Economic Base
Crops - Project Jobs
Existing Landscaping - Especially Trees and Shrubs
New Demand - New Development and Construction

4.1 Stages of Action

(California Water Code Section 10632 (a))

In order to minimize the social and economic impact of water shortages, the District will manage water supplies prudently. This Plan is designed to provide a supply during a severe or extended water shortage as nearly normal as possible. The Plans stages were established by the District to ensure that the above policy statements are implemented.

As the shortages become evident to the District Manager, he invokes the appropriate stage, unless the Board of Directors votes otherwise. Shortages may evoke a stage at any time. The four-stage rationing plan to be undertaken by the District in response to water supply shortages is listed below and is described in Table 4-4 along with an outline of specific water supply conditions which are applicable to each stage.

Table 4-1
Water Supply Shortage Stages and Conditions
Rationing Stages

Stage No.	Water Supply Conditions	% Shortage
Stage 1	Normal	Normal
Stage 2	Water Alert	10% to 25%
Stage 3	Water Warning	25% to 35%
Stage 4	Water Emergency	35% to 50%

Stage 1 - Normal Conditions

During times of normal supply, it is recommended that water conservation be practiced within the home or business and all restaurants are requested not to serve water to their customers unless specifically requested by the customer. Stage 1 also lists water uses considered non-essential to the public health, safety, and welfare, and would be considered wasting of water and are therefore prohibited. These include the following;

- There shall be no hose washing of paved, concrete or other hard surface area unless done with a hand held hose equipped with a trigger nozzle, except for the flushing of dangerous or unhealthy substances.

- No water shall be used to clean, fill, operate or maintain levels in decorative fountains unless the water is part of a recycling system.

- The repair of leaking plumbing fixtures shall be repaired in a timely manner so as to not waste water.

- Washing of automobiles, trucks, trailer, boats, and other mobile equipment is prohibited unless done with a hand held device equipped with an automatic shut off trigger nozzle. This does not apply to commercial car washes utilizing a recycling system or when the health and safety of the public would necessitate.

- Water used which results in flooding or run-off should be prevented and controlled.

- The use of sprinklers for any type of irrigation during high winds is prohibited.

The District's water rate schedule is based on a fixed monthly meter charge per meter size and a commodity charge per 100 cubic feet consumed. The following tables represent the adopted monthly meter charge and commodity rate.

Rate Schedule Adopted (September 2, 2004) - Monthly Service Charge by Meter Sizes

Table 4-2
Water Rate Schedule (Stages 1, 2,3 & 4)

METER SIZE	Inside District	Outside District
5/8" x 3/4"	$7.96	$11.94
1"	$11.87	$17.81
1 ½"	$17.51	$26.27
2"	$24.12	$36.18
3"	$35.02	$52.53
4"	$46.17	$69.26
6"	$70.05	$105.08
8"	$93.92	$140.88

Table 4-3
Water Rate Schedule

Water Usage	Inside District	Outside District
per 100 cu. ft.	$0.80	$1.20

Table 4-4
Water Conservation Provisions of Stages 2, 3 and 4

Stage 2 Water Alert	Stage 3 Water Warning	Stage 4 Water Emergency
Voluntary minimum 10% over last years consumption	Voluntary minimum 15% over last year's consumption, unless otherwise stated	Voluntary minimum 20% over last year's consumption, unless otherwise stated
Washing of automobiles, trucks and boats is prohibited unless it is done at a commercial carwash that recycles water	Same as Stage 2	Same as Stage 2
Commercial nurseries shall water only between 11pm and 6am - hand-held devices - drip irrigation - limited to 25% of last year's consumption	Commercial nurseries shall water only between 11pm and 6am - hand-held devices - drip irrigation - limited to 50% of last year's consumption	Same as Stage 3
All golf courses and large landscaped areas shall be irrigated between 11pm and 6am - Consumption reduced by 25% unless raw creek water or reclaimed water	School grounds to be watered on odd numbered days. All watering between 11pm and 6am. - Consumption reduced by 40%	No lawn or landscape watering
All publicly owned lawns, landscape watered between 11pm and 6am - Consumption reduced by 25%	All other publicly owned lawns, landscape watered on even numbered days - Consumption reduced by 50%	No lawn or landscape watering
All residential lawn watering to be done between 8pm to 6am	All residential lawn watering to be done on odd and even days corresponding to house number between 8pm to 6am	No lawn or landscape watering
		Water use limited to essential household, commercial, manufacturing or processing uses
Irrigation limited to crops presently planted	All agricultural water users shall irrigate only at times approved by the District	Same as Stage 3
	Swimming pools and fountains not to be refilled after draining	Same as Stage 3
Construction water shall be by permit only	Construction water shall be by permit only	No construction water, construction meters to be locked off or removed
All restaurants prohibited from serving water to their customers except when requested by customer	Same as Stage 2	Same as Stage 2

4.2 Estimate of Minimum Supply for Next Three Years
(California Water Code Section 10632 (b))

The District receives water supplies from various sources including groundwater from five basins, and surface water from two sources, Lytle Creek surface flows and imported SPW. Of these water sources, 69% of the District's supply in 2004 came from their groundwater wells, 20% from surface flows and 11% purchased water. Due to the fact that the majority of water supplied comes from the groundwater wells the loss of this source would represent the worst situation for the District.

The worst case supply availability for the District's groundwater wells would be the minimum well production capacity as shown in Table 2-9. Therefore Year 3 in the table below reflects the projected worst case groundwater supply. With the precipitation that the area received last winter recharging the Lytle Creek groundwater basin, it is highly unlikely that production will decrease within the next three years down to the District's worst projected supply availability. This scenario, however, has been used to demonstrate that the anticipated demands for this time frame can be met by the District under the most severe drought. During a drought in Southern California, it is highly unlikely that there will be a simultaneous drought in Northern California. For that reason, this report has utilized full State Project Water projections.

Table 4-5
Worst Case Water Supply Availability
Three-Year Estimated Minimum Water Supply (AF/Yr)

Source	Normal Supply Year (1996)	Year 1 (2006)	Year 2 (2007)	Year 3 (2008)
Lytle Creek Basin	20,836	8,000	6,500	5,000
North Riverside Basin	2,801	5,000	4,000	3,000
Rialto Basin	8,178	6,134 [(1)]	5,400	3,067
Bunker Hill Basin [(2)]	6,385	5,500	5,500	9,000 [(3)]
Chino Basin	2,689	2,000	1,500	1,000
Lytle Creek Surface Flow	4,480	5,500	4,500	3,000
State Water Project	0	8,800	10,000	10,000
TOTAL	**45,369**	**40,934**	**37,400**	**34,067**

(1) Due to the groundwater depletion by other water purveyors, 6,134 AF/Yr is thought to be the safe yield under adjudication.

(2) Includes existing wells and contracted allotment from SBVMWD through the Baseline Feeder. The District has agreed to limit their extraction in the basin for the next few years with the City of San Bernardino.

(3) Production in the Bunker Hill basin is expected to increase by 2008. This is due to the replacement of the Etiwanda Avenue pipeline and the drilling of 3 new wells in the Newmark Plume per agreement with the City of San Bernardino.

The normal supply year shown above is based on the potential capacity of existing wells at that time, not their actual production. The normal supply capacity is based on the District's 1996 Water Master Plan which designates 1996 as a normal water year.

The District's existing nine wells in the Lytle Creek Basin have had water levels decline over 300 feet from 1985 to 1990 while levels in the Bunker Hill Basin only declined 60 feet, in the same time period. Due to these drought conditions, the District has been preparing to shift its main source of supply from the Lytle Creek Basin to the Bunker Hill Basin. The Bunker Hill Basin contains over 5,000,000 acre feet of water and has sufficient supply for many consecutive drought years without any natural recharge. Groundwater pumping within this basin has been partially controlled by a court judgment, which determined that the safe yield for the Bunker Hill Basin to be 232,100 acre-feet per year. It is believed that this control on pumping, combined with SPW deliveries and annual rainfall, is sufficient to replenish the basin storage level for all potential future demands.

The District has a contract to receive up to 5,000 AF/Yr of water from SBVMWD through the Baseline Feeder and is planning additional wells in the Bunker Hill Basin in the next two years as a back-up water supply for its groundwater and surface flow supply in the Lytle Basin. The District has agreed with the City of San Bernardino to limit their extraction in the Bunker Hill Basin for the next few years, but production is expected to increase by 2008 when the additional wells are drilled. These wells when constructed and connected to the Baseline Feeder are expected to have the ability to deliver 5,000 AF/Yr under normal conditions.

As can be seen from Table 4-5 the worst case water supply availability of 34,067 acre-feet in 2008 will be sufficient to supply the projected demand for the Districts service area of 27,600 acre-feet.

4.3 Catastrophic Supply Interruption Plan

(California Water Code Section 10632 (c))

Extended multi-week supply shortages due to natural disasters or accidents which damage all water sources are unlikely. The District's 23 storage reservoirs hold 65.6 million gallons, which is sufficient water to meet the health and safety requirements of 50 gallons per day per capita for the 60,121 customers for 21 days. This assumes zero non-residential use. Under emergency power outages or a catastrophic earthquake conditions, the existing storage is expected to provide a minimum supply of 3.5 days of average day demand or 1.7 days under maximum summer demand.

The District is planning to construct an additional 12.5 million gallons of storage within the next few years for a total of 78.11 million gallons which would give the District 4.2 days of average day demand. The District also has interconnections with three other agencies for emergency supplies.

The District has portable back-up generators that can be used in the event of an area wide power outage. These generators can be located on both wells and booster stations to continue water production. These generators will be located in the northern part of the distribution system. Water can then be boosted to higher zones or gravity fed to the lower zones. In addition to the portable generators, the District is constructing back-up generators at the Zone 5 and 6 booster stations.

4.4 Prohibitions, Penalties, and Consumption Reduction Methods
(California Water Code 10632 (d-f))

Consumption limits in the progressively restrictive stages are imposed on different uses. These are based on percentage reductions in water allotments, and restrictions on specific uses. The specific percentage reductions at each stage and for each user class are listed in Table 4-4 and include watering on even or odd numbered days, watering time frames and limitations on irrigation and construction water. The individual customer allotments will be based on the previous year's use. This provides the District a basis for reviewing appeals.

Mandatory provisions to reduce water use during the different stages of water shortage are also summarized in the table. Provisions of Ordinance No.68, Article 24 - Water Conservation, adopted May 1, 2003 was adopted pursuant to Sections 375 and 376 of the California Water Code. Any second or subsequent violation of this policy after notice as specified in Section 2411 1(a) is a misdemeanor. (California Water Code Section 377)

Violations - In addition to criminal prosecution available to the District as described above, violation of this Ordinance may result in the imposition of surcharges and restriction and/or termination of water service as set forth below:

First Violation - written warning accompanied by a copy of the Ordinance.

Second Violation (within one year) - a surcharge of $100 or 100% of the current water billing cycle, whichever is higher.

Third Violation (within one year of the first violation) - a surcharge of $300 or 200% of current water billing cycle, whichever is higher, and installation of flow restricting device in the meter for a minimum of 96 hours.

Fourth Violation (within one year of the first violation) - a surcharge of $500 or 300% of the current water billing cycle, whichever is higher, and termination of service for such period as the Board of Directors determines to be appropriate under the circumstances, following a hearing regarding said issue. Written notice of the hearing shall be mailed to the customer at least ten days before the hearing.

Surcharges, Additional Charges - Any surcharge assessed shall be in addition to the basic water rates and other charges of the District for the account and shall appear on and be payable with the billing statement for the period during which the violation occurred; non-payment shall be subject to the same remedies available to the District as for non-payment of basic water rates.

In addition to any surcharge, a customer violating this Ordinance shall be responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the District's Schedule of Charges at that time in effect. Such charges shall be paid prior to the removal of the flow restrictor or reconnection of service, whichever the case may be.

4.5 Analysis of Revenue Impacts on Reduced Sales During Shortages
(California Water Code Section 10632 (g))

The District has a uniform price per unit rate structure (100 cubic feet) where all users within a user classification pay the same rate along with associated monthly service charges. Beyond providing more dependable water supply for domestic and fire service, the construction of additional water storage facilities allows the District to utilize one of the lowest power rates offered by Southern California Edison in turn allows the District to operate with one of the lowest water rates in the area.

An analysis of the impact of rationing was performed on the revenues and expenditures of the District. During a Stage 2, 3, or 4 water supply shortage the following reduction in consumption will occur based on the voluntary and mandatory provisions of the plan.

Table 4-6
Estimated Annual Reduction of Water Consumption
During Water Stages (Stage 2, 3 and 4)
(per 100 cu.ft.)

	Water Consumption Year June 30, 2004 [1] (per 100 Cu. Ft.)	Reduction	Stage 2 Estimated Water Reduction	Reduction	Stage 3 Estimated Water Reduction	Reduction	Stage 4 Estimated Water Reduction
Domestic	8,376,527	15%	1,256,480	20%	1,675,305	50%	4,188,264
Irrigation	274,513	25%	68,628	50%	137,257	100%	274,513
Total	8,651,040		1,325,107		1,812,562		4,462,777

[1] Based on Fiscal Year 2003/2004 annual consumption of domestic and irrigation of 8,651,040 cu. ft.

The following decrease in revenue is expected during the implementation of the appropriate rationing stage.

Table 4-7
Estimated Annual Revenue Reduction of Water Sales
During Water Stages (Stage 2, 3 and 4)

	Stage 2	Stage 3	Stage 4
Reduced Annual Water Sales	$1,044,301	$1,418,481	$3,507,083

[1] Based on Commodity Rates adopted September 2, 2004 and includes reduction in domestic and irrigation sales.

The projected reduction in consumption as tabulated in Table 4-6, calculates that the reduction of water usage on a voluntary and mandatory basis would result in a revenue reduction as shown in Table 4-7. This table shows the estimated reduction in revenue for a 12 month period during a Stage 2, 3, and 4 water supply shortage. Reduced annual revenue from domestic and irrigation water sales is estimated to be $1,044,301 during Stage 2, $1,418,481 during Stage 3, and as high as $3,507,083 during Stage 4 of a water supply shortage.

As described in Table 4-4, a Stage 2 shortage calls for a reduction in water consumption, in Stages 3 and 4, mandatory conservation measures and prohibition are called for. When a Water Shortage Emergency is declared, the supply shortage will trigger the appropriate rationing stage and appropriate charges and penalties. Proposed measures to overcome those impacts, such as the development of reserves and rate adjustments were formulated as outlined below.

The District does not currently encourage conservation through water pricing. The District has adopted a tiered rate structure to be instigated during Stages 2 through 4 drought conditions only. The monthly commodity charge for water usage for a 3/4" meter during Stages 2 through 4 are as follows:

Table 4-8
Tiered Water Rate During Stage 2, 3 and 4 Water Supply Shortage

0 to 20 units [1]	@ Base Rate [2]
21 to 30 units	@ 1.5 times Base Rate
31 to 40 units	@ 2.25 times Base Rate
41+ units	@ 3.375 times Base Rate

[1] Based on 500 gpd/equivalent 3/4" meter for 20 units per month. 1 unit equals 100 cubic feet or 748 gallons.
[2] District's existing base rate for its commodity charge is $0.80 per unit.

In order to mitigate the financial impacts of a water shortage, the District maintains sufficient funds within their account. The Department of Water Resources suggests maintaining funds in excess of 75 percent of normal water revenue. The District's funds currently have a balance in excess of that goal. Surplus revenues are currently used to fund the District's General O & M Fund which pays for all of the District's operating and nonoperating expenses. This fund can be used to stabilize water rates during periods of water shortage or disasters affecting the water supply. It can also fund Capital Improvement or recycled water projects.

A drought as seen in 2003/2004 resulted in increased water demand and, in return, increased water sales above non drought years. Groundwater levels within the District declined, prompting elevated pumping costs and required the District to buy additional supplies of SPW which is a more expensive water source. The District incurred further expenses by having to treat the SPW at the Oliver P. Roemer Water Filtration Facility. Expenses for treating SPW in 2003/2004 was almost double that of the previous fiscal year.

4.5.1 Revenue Projections During Water Shortages

In order to project the possible effect of conservation on revenues from water sales, an analysis of the water records was completed. Active water connections were as follows:

Table 4-9
Fixed Water Service Usage Charge Revenue

Meter Size	Number of Meters as of Jan. 1, 2003 [1]	Number of Meters as of June 30, 2004	Monthly Service Charge	Yearly Fixed Water Service Usage Charge
Domestic				
5/8"	3,478	3,692[1]	$7.96	$352,660
3/4"	9,983	9,983	$7.96	$953,576
1"	2,705	2,705	$11.87	$385,300
1-1/2"	123	123	$17.51	$25,845
2"	142	142	$24.12	$41,100
3"	9	9	$35.02	$3,782
4"	17	17	$46.17	$9,419
6"	7	7	$70.05	$5,884
8"	5	5	$93.92	$5,635
	16,469	16,683		$1,783,202
Fire				
2"	26	26	$10.00	$3,120
4"	13	13	$20.00	$3,120
6"	44	44	$30.00	$15,840
8"	44	44	$40.00	$21,120
10"	3	3	$50.00	$1,800
	130	130		$45,000
Irrigation				
All meters	19	19	$31.50	$7,182
Total	16,618	16,832		$1,835,384

[1] Sizes and quantities of meters for January 1, 2003 was obtained from the Water Master Plan. The sizes of the additional meters since that time where not available and were calculated using a 3/4" meter rate.

Based on the monthly fixed water service usage charges assigned by the rate schedule the fixed annual revenue was calculated to be $1,835,384.

Even with these reserves, rate increases may be necessary during a prolonged water shortage. The District may wish to increase the fixed monthly meter service charge to cover the shortfall in revenue resulting from the decrease in water sales during a water shortage. The additional revenues would also help to cover the increased operating and water expenses that occur. The current fixed monthly meter charge within the District's service area is below that of several local water providers.

Table 4-10
Water Sales by Month - Fiscal Year Ending June 30, 2004

Month	Domestic	Irrigation	Wholesale	Bulk	Monthly Total [1]
	$814,927	$11,017	$6,034	$15,391	**$847,369**
August	$858,150	$11,028	$7,425	$45,720	**$922,323**
September	$864,447	$10,018	$7,917	$36,283	**$918,665**
October	$772,045	$10,278	$10,688	$38,545	**$831,556**
November	$672,058	$6,868	$11,245	$38,874	**$729,045**
December	$550,797	$4,125	$8,605	$36,375	**$599,902**
January	$560,533	$5,057	$8,919	$17,795	**$592,304**
February	$530,137	$4,946	$8,665	$21,683	**$565,431**
March	$484,021	$2,842	$8,314	$1,220	**$496,397**
April	$647,587	$7,351	$3,648	$25,418	**$684,004**
May	$715,235	$9,246	$7,713	$18,769	**$750,963**
June	$878,511	$4,986	$8,777	$19,687	**$911,961**
Total	**$8,348,448**	**$87,762**	**$97,950**	**$315,760**	**$8,849,920**

[1] Totals include fixed water service charges.

After an extended water shortage, water revenues are expected to fall below pre-shortage levels. The water use is projected at 90% of the pre-shortage use, which would result in a reduction of revenue during the twelve month period after the end of a water supply shortage.

4.6 Draft Ordinance and Use Monitoring Procedure
(California Water Code Section 10632 (h-I))

The mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency plan will be the review of the daily production figures and the monthly water meter readings.

The General Manager of the District, or his designee, shall access all available water supply data and shall make a report of his findings to the Board of Directors at the next regular meeting or at a special meeting called for that purpose. The Board of Directors at that time determine and declare which of the four previously discussed conditions the District's water supply is in and the extent of water conservation required to prudently plan for and supply water to the District's customers.

Stage 1 - Normal Conditions
In normal water supply conditions, production figures are recorded daily. Totals are reported daily on a continuous computerized monitoring system and reviewed by the Superintendent. Totals are reported monthly to the Watermaster and incorporated into the water supply report.

Stage 2 - Water Alert
During a Stage 2 water shortage, daily production figures are reported to the Superintendent who compares the daily production to the target daily production to verify that the reduction goal is being met. Reports are forwarded to the General Manager on an as-needed basis, continuously if appropriate.

Stage 3 - Water Warning
During a Stage 3 water shortage, the procedure listed above will be followed.

Stage 4 - Water Emergency
During a disaster shortage, the General Manager or his designee will report continuously to the Board of Directors and inform the San Bernardino County Office of Emergency Services. Special Board meetings can be convened should authorization for special action be needed.

A coordinated response to water supply shortages is necessary for uniformity in developing, implementing and enforcing Drought Contingency Plans. The District's primary source of water is groundwater wells within the Bunker Hill Basin. SBVMWD's primary function is to plan and develop a long-range water supply for water agencies within this Basin.

SBVMWD is a member agency of the California State Water Project, which imports water from Northern California. SBVMWD imports SPW to water agencies within SBVMWD's boundary and to artificially recharge the groundwater basin. SBVMWD has a maximum entitlement of 102,600 acre-feet per year of SPW, and has developed approximately $70 million of regional facilities to transport both local and SPW within their District.

SECTION FIVE

RECYCLED WATER PLAN

5.1 Coordination

All of the wastewater collection and treatment within the District is handled by the City of Rialto. The City has a 12.0 mgd tertiary treatment plant with a current flow of 8 mgd. All of the City's treatment plant effluent meets Title 22 for recycled water usage in restricted irrigation. Reclaimed water not currently being used for irrigation is discharged into the Santa Ana River.

5.2 Wastewater Quantity, Quality, and Current Uses
(California Water Code Section 10633 (a-c))

The City of Rialto has constructed a hydropneumatic booster station and approximately 7,000 feet of 10-inch diameter transmission water line to provide Caltrans with recycled water for irrigation of landscape for the I-10 Freeway from Pepper Avenue to Cherry Avenue. This is approximately 42,000 feet of landscape irrigation corridor within the right-of-way for the I-10 Freeway. Caltrans has been using 1.0 mgd of recycled water during the summer months and 0.5 mgd during the winter. Currently there are no other users of the recycled water.

Table 5-1
Recycled Water Uses - Actual (AF/Yr)

Type of Use	Treatment Level	2005
Irrigation - Caltrans I-10 Freeway	Title 22	850

Other Recycle Water Projects - The District is utilizing non-potable raw SPW and decanted backwash water from the Oliver P. Roemer Water Filtration Facility to supply the El Rancho Verde Golf Course (its largest user). Records show that the golf course consumed 1,357 acre-feet in 2003.

5.3 Potential and Projected Use, Optimization Plan
(California Water Code Section 10633 (d-g))

The District is studying the use of reclaimed water from perchlorate contamination in the Rialto Basin to supply other irrigation and industrial users. The sources would be wells that would extract water from the Rialto Basin which has high concentrations of the contaminate perchlorate and remove the perchlorate with biological treatment. The non-potable effluent from the biological treatment plant could then be used to supply existing non-potable customers that currently must use potable water including the Mid-Valley Landfill (134 AF/Yr) and the adjacent Robertson Ready Mix (510 AF/Yr) sand and gravel operations. In the future, there may be industrial users that may utilize recycled water.

Table 5-2
Recycled Water Uses - Potential (AF/Yr)

Type of Use	Treatment Level	2010	2015	2020	2025
Other - Mid Valley Landfill (Dust Control)	Title 22	130	130	130	130
Industrial - Robertson's Ready Mix (Sand and Gravel)	Title 22	500	500	500	500
Industrial - Sun West Materials (Sand and Gravel)	Title 22	800	800	800	800
Industrial - Vulcan (Sand and Gravel)	Title 22	800	800	800	800
Landscape - Schools and Parks	Title 22	100	100	100	100
Landscape - Golf Course	Title 22	1,360	1,360	1,360	1,360
	Total	3,690	3,690	3,690	3,690

Water being used at the Vulcan Sand and Gravel site is being supplied from a groundwater well located on the premises. The Sun West Materials Sand and Gravel company uses surface flow from Lytle Creek in addition to raw SPW. The remaining potential recycle water users are currently using potable water from the District's domestic system to supply demand.

The City of Rialto is investigating the expansion of their existing tertiary treatment plant and reclaimed water system as a way to supplement the City's water supply. The City prepared a Wastewater Master Plan that investigated recycled water systems as a way to supplement the City's water supply and reduce the need to purchase water. The plan analyzed the feasibility of converting a currently unused water main that extends several miles up Riverside Avenue and identified potential landscape irrigation customers. A preliminary design and cost estimate for the first phase of the recycled water system was also prepared.

The City is also investigating the use of package plants in the north end of the City. If the City were able to extend non-potable water service in the north end of the city, then the District could utilize this recycled source and in so doing reduce the demand on their potable water system.

The last Urban Water Management Plan prepared for the District projected the use of 400 AF/Yr for landscape irrigation at the El Rancho Verde Golf Course. In actuality, the golf course is using more than three times as much.

Table 5-3
Recycled Water Uses - 2000 Projection compared with 2005 Actual (AF/Yr)

Type of Use	2000 Projection for 2005	Actual Use
Landscape Irrigation - Rancho El Verde Golf Course	400	1,300

5.3.1 Financial Incentives to Promote the Use of Recycled Water

The District currently has several rates for water (Article 21). Hydrant water is $566/AF, domestic use is $348/AF, and irrigation use is $248/AF. If all recycled water was charged at $218/AF, there would be a definite financial incentive to use recycled water. Unfortunately, most of the potential large users for recycled water are six to eight miles from the City of Rialto's wastewater treatment plant and would require an approximate 700 to 900-foot lift. The cost associated with the construction of the recycled water line and the booster pumps required do not make this project economially feasible at this time.

If the City of Rialto were able to provide recycled water to the District in the north end of the City at a rate equal to or less then what the District's large landscape users are currently paying, then the District would consider using this water source. It is not known at this time what price the City of Rialto would charge to provided recycled water to the District.

SECTION SIX

WATER QUALITY IMPACTS ON RELIABILITY

6.0 Water Quality

(California Water Code Section 10634)

The District's water sources are of medium to good quality at this time. The District is studying using reclaimed water from perchlorate contamination in the Rialto Basin to supply irrigation and industrial users. The sources would be wells (capacity of 3,000 gpm) to extract water supply from the Rialto Basin that has high concentrations of the contaminate perchlorate and remove the perchlorate with biological treatment. The non-potable effluent from the biological treatment plant would then be used to supply existing non-potable customers that currently use potable water for water supply. The Rialto Basin's perchlorate contamination is expected to be remediated for ultimate supply.

The Bunker Hill Basin, one of the District's projected main sources has some areas of potential contamination problems. The City of San Bernardino, in cooperation with the Environmental Protection Agency, has a Proposition 65 clean-up site in the Bunker Hill Basin. The District is presently negotiating with the City for additional groundwater. This project could provide the District with up to 5,000 AF/Yr of supply for ten years.

The District is a member of the Chino Basin Watermaster. The Chino Basin purveyors are presently negotiating with Metropolitan Water District of Southern California to start a conjunctive use and storage program in the Chino Basin. This Basin has some contaminate problems and with conjunctive use and storage with Metropolitan Water District, the contaminate could be reduced, increasing the storage in this Basin. This will allow the District to better utilize the Chino Basin water supply.

Geologic hazards within Lytle Creek have the potential to disrupt the water supply system by restricting the flow and/or introducing large quantities of suspended solids to the runoff, thereby increasing turbidity levels. The District is expanding the treatment process capability of the Oliver P. Roemer Water Filtration Facility to achieve both turbidity removal and total organic carbon (TOC) reduction by providing pretreatment facilities.

Water quality within the District will not change their management strategy or the reliability of the water supply. The District is planning to construct treatment facilities to remove the volatile organics (TCE and PCE) on existing and future proposed wells when needed. All water provided by the District, meets or exceeds all Federal and State Requirements.

SECTION SEVEN

WATER SERVICE RELIABILITY

7.1 Projected Normal Water Year Supply and Demand
(California Water Code Section 10635 (a))

An assessment on the reliability to provide water service to the customers within the District during normal, single dry, and multiple dry water years was performed and is reflected in the following tables. The assessment compares the water supply sources available to the District with the projected water use over the next 20 years, in five-year increments and is based on the information compiled in Section Two.

Although all of the water sources listed below in Table 7-1 are available to the District, should they be required, the District may use more or less from a particular source. Factors that affect the District's production vary and may include pumping costs associated with certain basins, replenishment costs, treatment costs, agreements with other agencies, basin water levels, judgments, adjudications, SPW allotments, system demands, and the District's ability to utilize the source.

Table 7-1
Projected Normal Water Year Supply and Demand Comparison
Period 2010-2025 (AF/Yr)

Source	2010	2015	2020	2025
Lytle Creek Basin	10,000	10,000	10,000	10,000
North Riverside Basin [1]	6,000	8,000	6,000	5,000
Rialto Basin	10,000	10,000	10,000	10,000
Bunker Hill Basin	10,000	12,000	15,000	25,000
Chino Basin	3,000	3,000	3,000	3,000
Lytle Creek Surface Water	5,500	5,500	5,500	5,500
State Project Water	15,000	15,000	17,000	23,000
SUPPLY	**59,500**	**63,500**	**66,500**	**81,500**
DEMAND	**30,000**	**33,700**	**39,000**	**45,000**
SURPLUS	**29,500**	**29,800**	**27,500**	**36,500**

[1] The well capacity projected for the District in the North Riverside Basin as shown in Table 2-9 reflects a range of production of 5,000 AF/Yr to 3,000 AF/Yr. These numbers are based on future extraction limitations. In the interim from 2010 through 2020 it is assumed that the District will have the ability to pump up to 8,000 AF/Yr during a normal water supply year. The District's production within this basin is projected to decrease after 2020 when it is thought that the City of Riverside will exercise their adjudicated rights in the basin.

The normal water year supply is based on an average water supply year and the annual production range as shown in Table 2-9. Information used in Table 2-9 was obtained from the District's 2004 Water Master Plan Table 7.10 and from SPW projections. The future demands which include residential, commercial, agricultural, and unaccounted for water are based on the demand projections from Table 2-14.

The projected water supply facilities include existing and planned capital improvement projects through the year 2010 as well as future supply projects. The exact date of the implementation of future supply projects is not known at this time, but have been added to these tables to include their supply capacity for future demands. The supply includes future wells in the Lytle Creek Basin constructed for the Lytle Creek North Planned Development, future wells in the Bunker Hill Basin, and contracted allotment from SBVMWD through the Baseline Feeder and from State Project Water projections from Table 2-17. During a drought in Southern California, it is highly unlikely that there will be a simultaneous drought in Northern California. For this reason full SPW projections have been utilized in all of the reliability assessment tables.

The well capacity projected for the District in the North Riverside Basin as shown in Table 2-9 reflects a range of production of 5,000 AF/Yr to 3,000 AF/Yr. These numbers are based on future extraction limitations. In the interim from 2010 through 2020 it is assumed that the District will have the ability to pump up to 8,000 AF/Yr during a normal water supply year. The District's production within this basin is projected to decrease after 2020 when it is thought that the City of Riverside will exercise their adjudicated rights in the basin.

The District plans to develop adequate water supplies to meet demands during both normal and drought conditions. During a normal water year, the projected water supply for the District far exceeds the anticipated demand even without SPW projections.

7.2 Projected Single Dry Year Supply and Demand Comparison

Water use patterns during a dry year will differ from those in a normal water year. Irrigation demands will increase and reduction in demands resulting from implemented rationing may occur. There are no substantial agricultural demands within the District that will affect demand.

Table 7-2
Projected Single Dry Year Supply and Demand Comparison
Period 2010-2025 (AF/Yr)

Source	2010	2015	2020	2025
Lytle Creek Basin	9,500	9,500	9,500	9,500
North Riverside Basin	6,000	8,000	6,000 [(1)]	5,000 [(1)]
Rialto Basin	9,500	9,500	9,500	9,500
Bunker Hill Basin	9,500	11,000	14,000	23,000
Chino Basin [(2)]	3,000	3,000	3,000	3,000
Lytle Creek Surface Water	3,000	3,000	3,000	3,000
State Project Water	15,000	15,000	17,000	23,000
SUPPLY	**55,500**	**59,000**	**62,000**	**76,000**
DEMAND	**30,000**	**33,700**	**39,000**	**45,000**
SURPLUS	**25,500**	**25,300**	**23,000**	**31,000**

[(1)] Anticipating that the City of Riverside will exercise their adjudicated rights in the basin which will affect water levels and production capacity for the District.
[(2)] The District is planning to install well head treatment on well W-39 in the future which will increase production capacity. Should the District require additional supply, they have the option of purchasing additional Chino Basin water.

The well capacity production range as shown in Table 2-9 for the North Riverside Basin is based on future extraction limitations. In the interim, the District will have the ability to pump additional supply from this basin until such time when the City of Riverside will exercise their adjudicated rights in the basin.

The demand as shown in Table 7-2 reflects consumption without rationing. Future planned facilities and additional purchased water are expected to supply the projected demand through the year 2025 during a single dry water year.

7.3 Projected Multiple Dry Year Supply and Demand Comparison for 2006-2010

The annual production for all of the water sources available to the District during multiple dry years is based on historical usage where available and from the production potential of each source as outlined in Table 2-9 and Table 7.10 from the District's 2004 Water Master Plan. Within the next five years, changes in production capacity will be affected by several of the capital improvement projects and pumping limitations.

The projected supply shown in Table 7-3 reflects the production capacity of the five-year capital improvement projects of the District. The demand is based on information outlined in the District's Water Master Plan and known developments that will occur during this time frame as discussed earlier in this report.

Table 7-3
Projected Supply and Demand Comparison
During Multiple Dry Years 2006-2010 (AF/Yr)

Source	2006	2007	2008	2009	2010
Lytle Creek Basin	10,000	8,200	7,500	6,200	5,000
North Riverside Basin [1]	6,000	5,500	5,000	4,500	4,000
Rialto Basin [2]	6,134	5,400	4,600	3,800	3,067
Bunker Hill Basin [3]	5,500	5,500	9,000 [4]	9,000	9,000
Chino Basin	2,000	2,000	2,000	3,000 [5]	3,000
Lytle Creek Surface Water	5,000	4,500	4,000	3,500	3,000
State Project Water [6]	8,800	9,300	9,800	14,500 [7]	15,000
Projected Supply	**43,434**	**40,400**	**41,900**	**44,500**	**42,067**
% of Projected Normal	---	---	---	---	74%
Projected Demand	**25,200**	**26,400**	**27,600**	**28,800**	**30,000**
% of Projected Normal	100%	100%	100%	100%	100%
Surplus	**18,234**	**14,000**	**14,300**	**15,700**	**12,067**
Surplus as a %	42%	35%	34%	35%	29%

[1] The District's Water Master Plan projects a range of annual production from the North Riverside Basin of 5,000 to 3,000 AF/Yr. This number is based on ultimate supply when the City of Riverside will have exercised their rights in the Basin.
[2] Due to the groundwater depletion 6,134 AF/Yr is thought to be the safe yield under adjudication.
[3] Includes existing wells and contracted allotment from SBVMWD through the Baseline Feeder. The District has agreed to limit their extraction in the basin for the next few years with the City of San Bernardino.
[4] Production in the Bunker Hill basin is expected to increase by 2008. This is due to the replacement of the Etiwanda Avenue pipeline and the drilling of 3 new wells in the Newmark Plume per agreement with the City of San Bernardino.
[5] Production in the Chino Basin (which does not appear to be affected during drought periods) is expected to increase in 2009 when well head treatment is put on well W-39 adding extra capacity.
[6] With the completion of the Oliver P. Roemer Water Filtration Facility upgrades, the District will be able to utilize additional SPW.
[7] Construction of the 4.0 mgd Lytle Creek North Planned Development Water Filtration Facility.

Due to the groundwater depletion in the Rialto Basin, 6,134 AF/Yr is thought to be the safe yield of the Basin under adjudication. During a multiple dry year scenario, the annual production range for the Basin could decline to the minimum potential supply of 3,067 AF/Yr. Future extractions from the Rialto Basin for the District are projected to be within these ranges.

The well production range as shown in Table 2-9 for the North Riverside Basin is based on future extraction limitations. In the interim, the District will have the ability to pump additional supply from this Basin until such time when the City of Riverside will exercise their adjudicated rights in the Basin.

Production in the Chino Basin, which does not appear to be affected during drought periods is expected to increase in 2009 when well head treatment is installed on Well W-39 adding extra capacity.

With the completion of the Oliver P. Roemer WFF upgrades and the Lytle Creek North Planned Development WFF, the District will be able to utilize additional SPW. The amount of purchased SPW depends on the availability of Lytle Creek Water and the combined treatment capacity of the existing Oliver P. Roemer WFF, the proposed expansion and the Lytle Creek North Planned Development WFF. By the year 2010 the combined total WFF treatment capacity is projected to be 18.4 mgd. Of the 18.4 mgd, the City of Rialto owns 1.5 mgd capacity in the Oliver P. Roemer WFF.

The projected supply for the Bunker Hill Basin includes the existing wells and the contracted allotment from SBVMWD through the Baseline Feeder. The District has agreed to limit their extraction in the basin for the next few years with the City of San Bernardino. Production in the Bunker Hill basin is expected to increase by 2008. This is due to the replacement of the Etiwanda Avenue pipeline and the drilling of three new wells in the Newmark Plume per an agreement with the City of San Bernardino.

The projected demand is based on normal usage and does not take into account rationing implemented during a Stage 2, 3, or 4 water shortage. The supply assumes all proposed sources will be available but in reduced quantities. In the event water supplies decrease beyond predicted levels, due to declining water tables, low surface flows, reduction in SPW allotments or water quality, the District may initiate the appropriate rationing stage. Rationing of the available supplies will alleviate the strain placed upon the system.

In the years 2010 and 2015 during the fifth year of a multiple dry year cycle, the District is projected to have 74% and 76% of its projected supply respectively. Even with this reduction in supply capacity, the District is projected to be able to provide the demand without rationing.

Table 7-4
Projected Supply and Demand Comparison
During Multiple Dry Years 2011-2015 (AF/Yr)

Source	2011	2012	2013	2014	2015
Lytle Creek Basin	10,000	9,200	8,500	7,700	7,000 [1]
North Riverside Basin	8,000 [2]	7,200	6,500	5,700	5,000
Rialto Basin [3]	6,134	5,400	4,600	3,800	3,067
Bunker Hill Basin	10,000	9,000	12,000 [4]	11,000	10,000
Chino Basin	3,000	3,000	3,000	3,000 [5]	3,000
Lytle Creek Surface Water	5,000	4,500	4,000	3,500	3,000
State Project Water [6]	13,000	13,500	14,000	14,500	15,000
Projected Supply	**55,134**	**51,800**	**52,600**	**49,200**	**46,067**
% of Projected Normal	---	---	---	---	76%
Projected Demand	**30,740**	**31,480**	**32,220**	**32,960**	**33,700**
% of Projected Normal	100%	100%	100%	100%	100%
Surplus	**24,394**	**20,320**	**20,380**	**16,240**	**12,367**
Surplus as a %	44%	39%	39%	33%	27%

[1] The projected maximum range for this Basin as shown in the District's Water Master Plan is 5,000 AF/Yr. The production is projected to increase to 7,000 AF/Yr due to the recent annexation of the Lytle Creek North Planned Development into the District which will allow them to pump additional supply from this Basin.

[2] Production in the North Riverside Basin is expected to increase in year 2011 due to the construction of Wells W-19, W-29 and W-38.

[3] Due to the groundwater depletion 6,134 AF/Yr is thought to be the safe yield under adjudication.

[4] Production in the Bunker Hill Basin is expected to increase in 2013 with the construction of additional wells and modification to the management agreement with the City of San Bernardino.

[5] Addition well head treatment is expected to be installed on Well W-39 which will increase production of this well.

[6] During a drought in Southern California, it is highly unlikely that there will be a simultaneous drought in Northern California. For that reason, we have projected full State Project Water projections.

Production in several of the Basins is expected to increase between 2011 and 2015. The projected minimum range for the Lytle Basin as shown in the District's Water Master Plan and Table 2-9 is 5,000 AF/Yr. That minimum production range will increase to 7,000 AF/Yr due to the recent annexation of the Lytle Creek North Planned Development into the District which will allow them to pump additional supply from this Basin. Production in the Bunker Hill Basin will increase in 2013 with the construction of additional wells and modification to the management agreement with the City of San Bernardino. Production in the Chino Basin will also increase when additional well head treatment is installed on Well W-39, boosting its production.

The well capacity production range as shown in Table 2-9 for the North Riverside Basin is based on future extraction limitations. In the interim, the District will have the ability to pump additional supply from this basin until such time when the City of Riverside will exercise their adjudicated rights in the basin. Production in the North Riverside Basin will increase in the year 2011 due to the construction of Wells W-19, W-29 and W-38.

The amount of purchased SPW depends on the availability of Lytle Creek Water and the combined treatment capacity of the water filtration facilities. By the year 2015 the combined total WFF treatment capacity is still 18.4 mgd. Of the 18.4 mgd, the City of Rialto owns 1.5 mgd capacity in the Oliver P. Roemer WFF.

The projected demand for 2011 through 2015 is based on normal usage and does not take into account rationing implemented during a water shortage. The supply assumes all proposed sources will be available but in reduced quantities. In the event water supplies decrease beyond predicted levels, the District may choose to purchase additional supply through the Baseline Feeder or pump more from the Chino Basin and pay replenishment costs.

In the years 2016 through 2020, water supply projects as shown in Table 7-5 will affect the projected supply for the District. Water supply is expected to increase in 2016 with the construction of additional wells in the Bunker Hill Basin and the expansion of the Lytle Creek North Planned Development WFF from 4.0 to 6.0 mgd. This will allow the District to utilize additional State Project Water. During a drought in Southern California, it is highly unlikely that there will be a simultaneous drought in Northern California. For that reason, we have utilized full State Project Water projections.

The amount of purchased SPW required depends on the availability of Lytle Creek Water and the combined treatment capacity of the water filtration facilities. By the year 2016 the combined total WFF treatment capacity is projected to be 20.4 mgd. Of the 20.4 mgd, the City of Rialto owns 1.5 mgd capacity in the Oliver P. Roemer WFF.

In 2019, when additional well head treatment is installed on Well W-39, the District is expected to increase production capability in the Chino Basin. Table 2-9 projects a potential production range of 1,000 AF/Yr to 3,000 AF/Yr from the Chino Basin but also shows that the District has no limit on extraction. The District may increase their production within this basin but will be required to pay replenishment costs.

Anticipating that the City of Riverside will exercise their adjudicated rights in the North Riverside Basin, water supply for the District is expected to decrease.

The projected demand from 2016 through 2020 is based on normal usage as shown in Table 2-14 and does not take into account rationing implemented during a water shortage. The supply assumes all proposed sources will be available but in reduced quantities. In the event water supplies decrease beyond predicted levels, the District may choose to purchase additional supply.

Table 7-5
Projected Supply and Demand Comparison
During Multiple Dry Years 2016-2020 (AF/Yr)

Source	2016	2017	2018	2019	2020
Lytle Creek Basin	10,000	9,200	8,500	7,700	7,000
North Riverside Basin	6,000 [(1)]	5,500	5,000	4,500	4,000
Rialto Basin [(2)]	6,134	5,400	4,600	3,800	3,067
Bunker Hill Basin	15,000 [(3)]	14,200	13,500	12,700	12,000
Chino Basin	3,000	3,000	3,000	3,000 [(4)]	3,000
Lytle Creek Surface Water	5,000	4,500	4,000	3,500	3,000
State Project Water	15,000	15,500	16,000	16,500	17,000
Projected Supply	**60,134**	**57,300**	**54,600**	**51,700**	**49,067**
% of Projected Normal	---	---	---	---	77%
Projected Demand [(7)]	**34,760**	**35,820**	**36,880**	**37,940**	**39,000**
% of Projected Normal	100%	100%	100%	100%	100%
Surplus	**25,374**	**21,480**	**17,720**	**13,760**	**10,067**
Surplus as a %	42%	37%	32%	27%	21%

[(1)] The City of Riverside is expected to exercise their adjudicated rights in the Basin which will affect water levels and production capacity for the District.
[(2)] Due to the groundwater depletion 6,134 AF/Yr is thought to be the safe yield under adjudication.
[(3)] Production is expected to increase in the Bunker Hill Basin in 2016 with the construction of additional wells.
[(4)] Addition well head treatment is expected to be installed on Well W-39 which will increase production of this well.

The District's Water Master Plan projects a range of annual production from the North Riverside Basin of 5,000 to 3,000 AF/Yr. It is thought that by 2021 the City of Riverside will exercise their rights in the Basin and that the District may receive 3,000 AF/Yr during a multiple dry water year cycle.

Water supply is expected to increase in 2021 as shown in Table 7-6 with the construction of additional wells in the Bunker Hill Basin and the 6.0 mgd expansion of the Oliver P. Roemer Water Filtration Facility. This will allow the District to utilize additional State Project Water.

The amount of purchased SPW required depends on the availability of Lytle Creek Water and the combined treatment capacity of the water filtration facilities. By the year 2021 the combined total WFF treatment capacity is projected to be 26.4 mgd. Of the 26.4 mgd, the City of Rialto owns 1.5 mgd capacity in the Oliver P. Roemer WFF.

Table 7-6
Projected Supply and Demand Comparison
During Multiple Dry Years 2021-2025 (AF/Yr)

Source	2021	2022	2023	2024	2025
Lytle Creek Basin	10,000	9,200	8,500	7,700	7,000
North Riverside Basin [1]	5,000	4,500	4,000	3,500	3,000
Rialto Basin [2]	6,134	5,400	4,600	3,800	3,067
Bunker Hill Basin	25,000 [3]	22,500	20,000	17,500	15,000
Chino Basin [4]	3,000	3,000	3,000	3,000	3,000
Lytle Creek Surface Water	5,000	4,500	4,000	3,500	3,000
State Project Water	21,000 [5]	21,500	22,000	22,500	23,000
Projected Supply	**75,134**	**70,600**	**66,100**	**61,500**	**57,067**
% of Projected Normal	---	---	---	---	73%
Projected Demand	**40,200**	**41,400**	**42,600**	**43,800**	**45,000**
% of Projected Normal	100%	100%	100%	100%	100%
Surplus	**34,934**	**29,200**	**23,500**	**17,700**	**12,067**
Surplus as a %	46%	41%	36%	29%	21%

[1] The District's Water Master Plan projects a range of annual production from the North Riverside Basin of 5,000 to 3,000 AF/Yr. It is thought that by 2021 the City of Riverside will exercise their rights in the Basin, limiting the District's extraction.
[2] Due to the groundwater depletion 6,134 AF/Yr is thought to be the safe yield under adjudication.
[3] Production in the Bunker Hill Basin is expected to increase with the construction of additional wells.
[4] Should the District require additional supply, they have the option of purchasing additional Chino Basin water.
[5] Expansion of the Oliver P. Roemer Water Filtration Facility will allow the District to utilize additional State Project Water. The exact time frame for this expansion is not known at this time.

The projected demand from 2021 through 2025 is based on normal usage as shown in Table 2-14 and does not take into account rationing implemented during a water shortage. The supply assumes all proposed sources will be available but in reduced quantities. In the event water supplies decrease beyond predicted levels, the District will assess all available water supply data and at that time determine whether to purchase additional supply or declare a water supply shortage.

The schedule for the District's future water supply projects is estimated and can change should unforeseen events occur that affect the projected supply availability. The District has several water sources available to it and can tailor future supply projects to meet their needs.

In order to minimize the social and economic impact of water shortages, the District manages its water supplies prudently. Existing and future supply projects are designed to provide a supply during a severe or extended water shortage as nearly normal as possible. The District is expected to be able to provide sufficient supply to meet all of its future demands during normal, single dry, or multiple dry water years.

SECTION EIGHT

ADOPTION AND IMPLEMENTATION OF THE URBAN WATER MANAGEMENT PLAN

RESOLUTION NO. 758

A RESOLUTION OF THE BOARD OF DIRECTORS OF
THE WEST VALLEY WATER DISTRICT
ADOPTING THE URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Legislature has enacted the Urban Water Management Planning Act, California Water Code Sections 10610 through 10657 requiring every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water: and

WHEREAS, Section 10621 (a) of the California Water Code requires an update of the Urban Water Management Plan at least once every five years on or before December 31, in years ending in five and zero; and

WHEREAS, Section 10632 of the California Water Code requires preparation of an urban water shortage contingency analysis as part of the Urban Water Management Plan; and

WHEREAS, the West Valley Water District is an urban supplier of water providing water to more than 3,000 customers, and has, therefore prepared and circulated for public review its Draft Urban Water Management Plan in compliance with Chapter 3, Article 3 of the Urban Water Management Planning Act and a properly noticed public hearing on said draft plan was held by the District on January 5, 2006 and a final plan prepared;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the West Valley Water District as follows:

1. The final 2005 Urban Water Management Plan, dated November , 2005, is hereby approved and adopted;

2. The Urban Water Management Plan is ordered to be filed with the Cities of Rialto, Fontana, Colton and the County of San Bernardino no later than 30 days after adoption;

3. The General Manager is hereby authorized and directed to file this Plan with the State Department of Water Resources and the California State Library no later than 30 days after adoption;

4. The General Manager is further directed to periodically review the 2005 Urban Water Management Plan in accordance with applicable law and recommend to the Board of Directors amendments to the plan as may be appropriate as a result of such review.

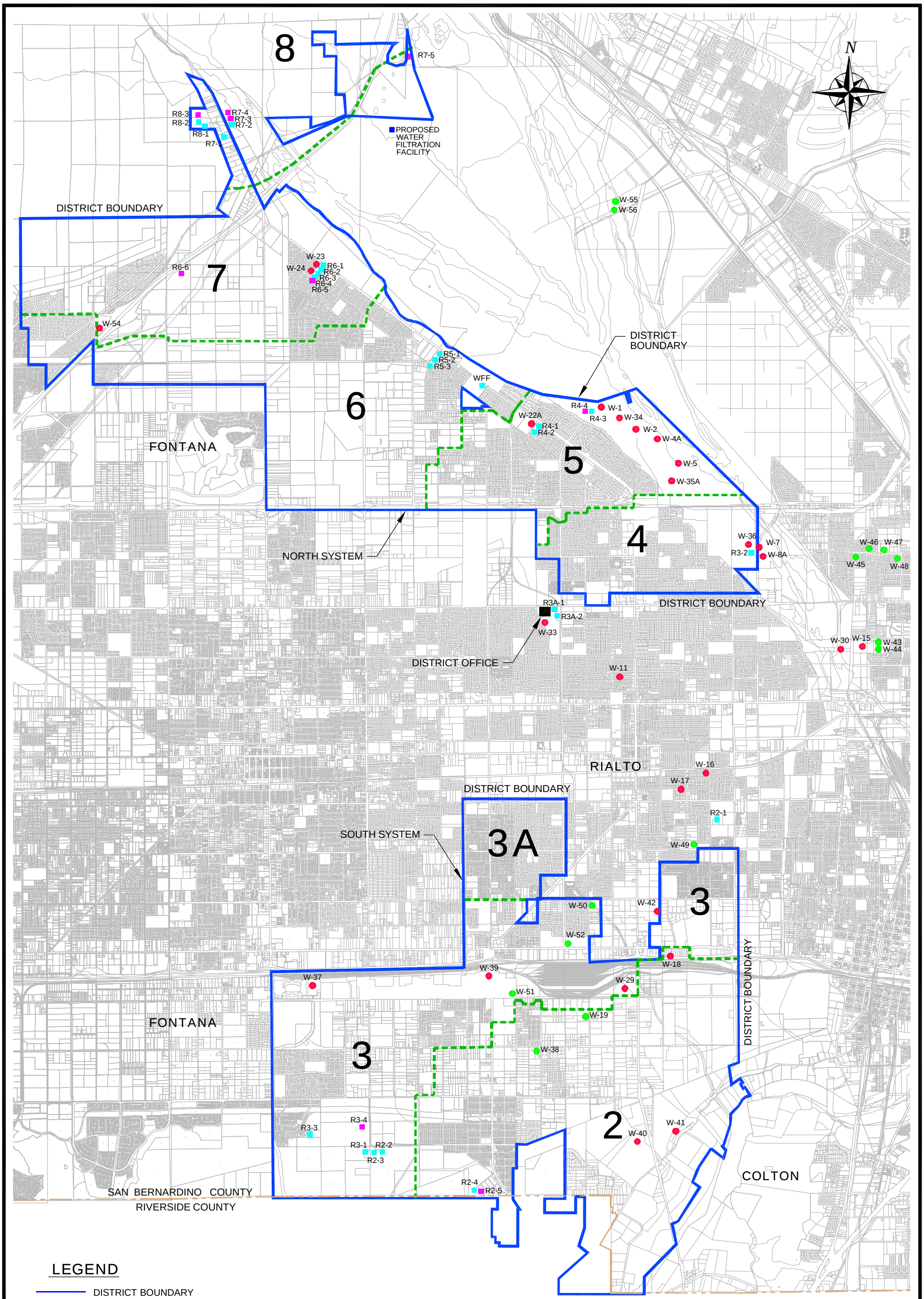
ADOPTED, SIGNED, AND APPROVED THIS 5th DAY OF JANUARY 2006.

Earl Tillman, Jr., President

ATTEST:

Anthony W. Araiza, Secretary

Figures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PROPOSED FUTURE WELLS
PROPOSED FUTURE RESERVOIRS
WEST VALLEY WATER DISTRICT
DISTRICT BOUNDARY MAP,
PRESSURE ZONES AND FACILITIES

Figure -1

Appendix

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384 Costa, 2002
SB 1518 Torlakson, 2002
AB 105, Wiggins, 2003
SB 318, Alpert, 2004

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING
CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:
(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.
10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS

Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:
(A) Water survey programs for single-family residential and multifamily residential customers.
(B) Residential plumbing retrofit.
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.

(2) A single dry water year.

(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water , shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department

shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657. (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

Appendix

B

AGREEMENT BETWEEN THE WEST SAN BERNARDINO COUNTY WATER DISTRICT AND THE CITY OF RIALTO FOR JOINT USE OF A ONE MILLION GALLON STILLING RESERVOIR AND PUMPING STATION

This Agreement is made as of September 3, 1991, by and between the **WEST SAN BERNARDINO COUNTY WATER DISTRICT** (District) and the **CITY OF RIALTO** (City).

RECITALS

A. District owns two wells known as Well No. 15 and Well No. 30 located in Lytle Creek in the area of 9th Street and Base Line Road, as shown on attached Exhibit "A".

B. City owns a parcel of land upon which City proposes to drill a new well as described in Exhibit "B" and shown on Exhibit "A".

C. District and City have a common interest along with the San Bernardino Valley Municipal Water District (SBVMWD) in a project known as "The Baseline Feeder" which transports water from the so called pressure zone in the City of San Bernardino to the service areas of District and City.

D. The water produced from the groundwater from District's Wells No. 15 and 30 contains a substantial amount of air. This air will also be produced by City's new well.

E. It is of mutual benefit to District and City to construct a stilling reservoir to remove the air, a pumping station and a pipeline to transport water produced by District's Wells No. 15 and 30 and the proposed City well to the Baseline Feeder so that facility may be used to transport the water to the District and City service areas.

F. Both District and City provide domestic water service to the citizens of Rialto. Therefore, it has been determined that it would be to the best interest of the citizens to jointly participate in the construction and operation of said stilling reservoir, pumping station and pipeline to the Baseline Feeder.

G. It has been determined that each well will produce approximately three thousand five hundred (3,500) gallons per minute. The District and the City are willing to contribute to the construction cost and maintenance of said facilities on the basis of two-thirds (2/3) by District (two wells) and one-third (1/3) by the City (one well).

THEREFORE, IT IS AGREED:

1. District and City shall jointly participate in the construction of a one million (1,000,000) gallon storage reservoir to be used as a still well, a pumping station and a twenty-four (24) inch pipeline from the pumping station to the Baseline Feeder, all shown on Exhibit "A".

2. The stilling reservoir and pumping station shall be constructed on City's property and shall be owned jointly by the District and City on the basis of two-thirds (2/3) by District and one-third (1/3) by City. The District shall obtain an easement for the pipeline, all as shown on Exhibit "A". District and City shall provide each other with all necessary easements for ingress and egress, construction, operation and maintenance of the facilities.

3. District has previously prepared and adopted a Negative Declaration for said project, therefore, it shall act as lead agency for construction and operation of the facilities.

4. District shall not approve any construction drawings or contracts without approval of the City's Engineer or his designee.

5. District shall pay two-thirds of the construction costs of the facilities and City shall pay one-third of the costs. If, in the future, District or City utilizes more of the facilities then the two-thirds/one-third as shown above, then the District or the City, whatever the case may be, shall reimburse the other for the additional capacity of the facilities.

6. Each agency shall pay to the District funds required for the operation and maintenance, depreciation and power costs based upon an agreed price per acre foot transported through the facilities.

7. The District shall operate and maintain the facilities and from funds described in above Section 6, shall set aside operation and maintenance income and depreciation income in appropriate accounts to finance the operation, maintenance and replacement costs.

   If additional funds are required to meet costs associated with the operation, maintenance and/or depreciation of the facilities, the price per acre foot shall be adjusted accordingly.

8. This Agreement may be modified only upon the mutual written agreement of the parties hereto. Any request for modification of this Agreement shall be made at least ninety (90) days prior to the proposed effective date of any such requested modification or termination. This Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective successors, legal representatives, and assigns. This Agreement shall be reviewed by the parties ninety (90) days prior to the end of each five-year anniversary date of this Agreement.

9. District agrees to indemnify and hold City and its officers, employees, successors and assigns, and each of them, harmless from and against all liability or claims thereof for loss of or damage to property or injury to or death of any person proximately caused in whole or in part by the negligence of District or its contractors, or by any acts for which District or its contractors are liable without fault, in the operation and maintenance of the facilities hereunder, save and except in those instances where such loss, damage, injury, or death is caused in whole or in part by the negligence of City or its contractors or by any acts for which City or its contractors are liable without fault.

10. City agrees to indemnify and hold District and its officers, employees, successors, and assigns, and each of them, harmless from and against all liability or claims thereof for loss of or damage to property or injury to or death of any person proximately caused in whole or in part by the negligence of City or its contractors, or by any acts for which City or its contractors are liable without fault, in the operation and maintenance of the facilities hereunder, save and except in those instances where such loss, damage, injury, or death is caused in whole or in part by the neglience of District or its contractors or by any acts for which District or its contractors are liable without fault.

11. Written notice to be given to either party shall be given by personal delivery or by registered or certified mail; other correspondence and invoices may be sent by first class mail, addressed and delivered as set forth below:

CITY

City Administrator
City of Rialto
150 South Palm Avenue
Rialto, CA 92376

DISTRICT

General Manager
West San Bernardino County
Water District
855 West Base Line Rd.
Rialto, CA 92376

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed by its respective duly authorized officers. The effective date of this Agreement shall be the date first above written.

CITY OF RIALTO

By _____
JOHN LONGVILLE
Title Mayor

Attest:

_____
Joseph H. Sampson, City Clerk

Approved as to form and content:

_____
Robert G. Koch, Jr., City Attorney

WEST SAN BERNARDINO COUNTY WATER DISTRICT

By _____
IRA B. PACE
Title General Manager

Approved as to Form & Content

_____
Gerald D. Shoaf, Legal Counsel

Appendix

C

CONTRACT BETWEEN THE SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT AND WEST SAN BERNARDINO COUNTY WATER DISTRICT FOR A WATER SUPPLY FROM FACILITIES TO BE CONSTRUCTED KNOWN AS THE "BASELINE FEEDER"

This agreement is made by and between the San Bernardino Valley Municipal Water District, a municipal water district organized and existing under the Municipal Water District Law of 1911, hereinafter "SBVMWD," and West San Bernardino County Water District, a county water district organized and existing under the County Water District Law, hereinafter "West District," on the date written at the end hereof.

RECITALS

The SBVMWD proposes to construct water facilities known as the "Baseline Feeder" consisting of a pipeline and associated facilities to convey water from the southern and central part of the San Bernardino Basin to users on the west side of the SBVMWD. It is anticipated that the SBVMWD will finance the cost of such facilities through arrangements with a lender or lenders. The parties desire to provide assurance through this agreement and related agreements that the additional water supply required by West District will be available to it, and that the cost of the facilities to be constructed pursuant to this agreement will be

amortized by the parties contracting for such supply.

NOW THEREFORE, IT IS AGREED as follows:

1. The SBVMWD shall construct the Baseline Feeder facilities for delivery of water into West District's distribution system as shown on Plate 1. In performing such construction the wells shall be drilled and tested prior to construction of the other facilities. Upon completion of the facilities SBVMWD shall deliver water to West District's system in quantities as required to meet the delivery schedule of West District arranged pursuant to this agreement. Except as otherwise specifically agreed by SBVMWD, the facilities constructed by the SBVMWD shall be its property, and it shall be responsible for their operation, maintenance and replacement.

2. West District shall be entitled to delivery of water from the Baseline Feeder in the flow rates and amounts and upon the schedule attached hereto as Exhibit "A". During the period this agreement is in effect or any extension thereof, SBVMWD shall reserve capacity in the Baseline Feeder facilities to make such deliveries to West District. West District shall periodically submit a schedule of actual deliveries desired so that reasonable operation requirements for such deliveries may be met. The water delivered shall comply with public health standards for domestic use. Deliveries shall be made in accordance with the SBVMWD Rules and Regulations for the Sale and Delivery of Water as they may from time to time be in effect.

3. West District shall pay for its rights to the delivery of water provided herein in accordance with the schedule set forth on Exhibit "B" attached hereto. Failure or refusal to accept delivery of project water to which it is entitled shall in no way relieve it of its obligation to make payments to the SBVMWD as provided for herein. West District shall make such payments as they become due, notwithstanding any individual default by its customers or users, or any change in its requirements.

4. The water made available for delivery hereunder shall be delivered for use only within the boundaries of the SBVMWD, and West District agrees that neither such water nor any other water available to West District which may be surplus to its needs as a result of the supply available from the Baseline Feeder, shall be delivered or exchanged for use outside the SBVMWD.

5. This agreement shall be in effect for a period of 20 years commencing January 1, 1990 and ending December 31, 2009; provided that it shall not terminate until the debt incurred by the SBVMWD for the Baseline Feeder Facilities is paid in full. At any time during the last year (2009) if West District is not then in default under the terms herein, West District may extend this agreement for an additional 10 years by written notice given to SBVMWD. West District shall have options to extend this agreement for two additional 10 year periods, each to be exercisable during the last year to which this agreement has theretofore been extended, if West District is not then in

default.

6. This agreement shall be contingent upon the occurrence of all the following events on or before February 1, 1990.

a. Execution of sufficient purchase agreements with the City of Rialto and other users for the Baseline Feeder project to guarantee the SBVMWD that it will receive payments sufficient to cover the capital cost of the facilities.

b. Execution of an agreement with the City of San Bernardino providing for the right of way for the pipeline.

c. Execution of an agreement with the San Bernardino County Flood Control District providing for the Baseline Feeder to cross San Bernardino County Flood Control District property and facilities.

On or about said date, SBVMWD shall notify West District whether or not such contingencies have occurred. If such contingencies have not occurred, this agreement shall be of no further force and effect; if such contingencies have occurred the parties hereto shall proceed with the fulfillment of the terms hereof.

7. West District shall have access to all the accounting records and meter readings taken by SBVMWD upon reasonable notice to SBVMWD.

8. Neither this Agreement nor any duties or obligations hereunder shall be assigned by West District without the prior written consent of the SBVMWD, and any such assignment without the consent of the SBVMWD shall at its option be void. Subject to the foregoing, this agreement and all of its provisions shall apply to and bind the successors and assigns of the parties.

9. Each party to this Agreement agrees to execute and deliver all documents and perform all further acts that may be reasonably necessary to carry out the provisions of this Agreement.

10. This Agreement may be amended in writing by unanimous action of the Parties.

11. If a dispute arises as to the interpretation or implementation of any provision of this Agreement, the issue or issues in dispute or matter requiring action shall be submitted to binding arbitration. For such purposes, an arbitrator shall be selected by agreement of the Parties. The agreed-upon arbitrator shall proceed to arbitrate the matter in accordance with the provisions of Title 9, Part 3, of the California Code of Civil Procedure (Section 1280 et seq.).

12. In the event of legal action or arbitration to enforce or interpret this Agreement or any of its provisions, the prevailing Party shall be entitled, in addition to any other form of relief, to recover its reasonable attorney's fees and costs of suit.

13. The SBVMWD may temporarily discontinue or reduce the delivery of water to the West District hereunder for the purposes of necessary investigation, inspection, maintenance, repair, or replacement of any facilities necessary for the delivery of water to West District. The SBVMWD shall notify West District as far in advance as possible of any such discontinuance or reduction, except in cases of emergency, in which case advance notice need not be given. As nearly as possible any discontinuance or reduction in service shall be scheduled between October 1 and May 1. No such temporary discontinuance or reduction in deliveries shall excuse payment of the minimum monthly installment as set forth in Exhibit "B".

14. (a) Neither SBVMWD nor any of its officers, agents, or employees shall be liable for the control, carriage, handling, use, disposal, or distribution of Baseline Feeder project water supplied to West District after such water has been delivered into West District facilities; nor for claim of damage of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal or distribution of such water beyond said point; and West District shall indemnify and hold harmless SBVMWD and its officers, agents, and employees from any such damages or claims of damages.

(b) Neither West District nor any of its officers, agents, or employees shall be liable for the control, carriage,

handling, use, disposal, or distribution of Baseline Feeder project water before such water has passed out of the facilities constructed and owned by SBVMWD; nor for claim of damage of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water before it has passed beyond said point; and the SBVMWD shall indemnify and hold harmless West District and its officers, agents, and employees from any such damages or claims of damages.

15. It is recognized that from time to time additional facilities, pipelines, wells and/or booster stations may be constructed in addition to the Baseline Feeder facilities. West District and SBVMWD agree to negotiate in good faith additional capacity, terms of operation, and costs for these new facilities and to reach agreement upon the costs and operating criteria for these new facilities before changing the then current operating and payment provisions for the Baseline Feeder facilities as provided in this agreement.

16. West District and SBVMWD foresee the desirability of providing for potential future participation in the Baseline Feeder Facilities for agencies which do not currently need a supply of water therefrom. Any agreement made by SBVMWD reserving capacity for future use shall require payment of a proportionate share of the capital cost component of the pricing formula, including provisions for any prior capital costs.

17. Except as may be otherwise agreed by the parties

hereto, after West District has commenced making payments under this contract and until the debt incurred to finance the Baseline Feeder facilities has been paid off, any contract entered into by the SBVMWD with any other entity which entitles such entity to delivery of water from the Baseline Feeder facilities and reserves capacity in the Baseline Feeder facilities to make such deliveries shall require such entity to make payment at not less than the terms and rates specified in this contract, including provision for prior capital costs.

18. SBVMWD may, at its option, waive satisfaction of the contingencies specified in section 6.

Dated: November 29, 1989

San Bernardino Valley
Municipal Water District

by _____
President

ATTEST:

_____
Secretary

Dated: December 7, 1989

West San Bernardino County
Water District

by _____
President

ATTEST:

_____
Secretary

EXHIBIT "A"

Schedule of Deliveries Available

	Maximum Flow Rate
First Year	2,000 gpm
Subsequent Years	4,000 gpm

EXHIBIT "B"

Payment Schedule

Price per acre foot

Price per acre foot shall be determined as follows:

Fiscal Year	Pricing formula
1st	$80.00
2nd through 20th	The higher of (a) $80.00; or (b) $30.00 capital recovery charge (adjusted as provided below), plus actual pumping and maintenance cost, plus actual treatment cost, if any, as determined by the SBVMWD board.
after 20th	As set by the SBVMWD board

The first fiscal year shall commence the first day of the first month in which deliveries are made, or the first day of the sixth month prior to the first month in which SBVMWD has an obligation to make payments on principal or interest of debt incurred to construct the Baseline Feeder Facilities, whichever is earlier. The $30 capital recovery charge shall be adjusted annually to reflect the actual capital payments for the Baseline Feeder facilities.

Minimum Annual Payment

The minimum annual payment shall be an amount computed at the above price per acre foot for 2,500 acre feet for the first year and for 5,000 acre feet for subsequent years.

Payment Schedule

The minimum annual payment shall be made in 12 equal monthly installments ("minimum monthly installment") due on the first day

of each month. Payment for quantities delivered in excess of the quantity covered by the minimum monthly installment shall be made by the 15th day of the following month, and may be deducted from the minimum monthly installment in any subsequent month in such fiscal year in which the minimum monthly installment exceeds a charge based on the price per acre foot, to the extent of such excess.

Appendix

D

DONALD D. STARK
A Professional Corporation
Suite 201 Airport Plaza
2061 Business Center Drive
Irvine, California 92715
Telephone: (714) 752-8971

CLAYSON, ROTHROCK & MANN
601 South Main Street
Corona, California 91720
Telephone: (714) 737-1910

Attorneys for Plaintiff

ORIGINAL FILED

JAN 30 1978

V. DENNIS WARDLE
COUNTY CLERK

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

CHINO BASIN MUNICIPAL WATER DISTRICT,

Plaintiff,

v.

CITY OF CHINO, et al.

Defendants.

No. 164327

JUDGMENT

District.

(z) State Water -- Supplemental Water imported through the State Water Resources Development System, pursuant to Chapter 8, Division 6, Part 6 of the Water Code.

(aa) Stored Water -- Supplemental water held in storage, as a result of direct spreading, in lieu delivery, or otherwise, for subsequent withdrawal and use pursuant to agreement with Watermaster.

(bb) Supplemental Water -- Includes both water imported to Chino Basin from outside Chino Basin Watershed, and reclaimed water.

(cc) WMWD -- Defendant Western Municipal Water District of Riverside County.

5. List of Exhibits. The following exhibits are attached to this Judgment and made a part hereof:

"A" -- "Location Map of Chino Basin" showing boundaries of Chino Basin Municipal Water District, and other geographic and political features.

"B" -- "Hydrologic Map of Chino Basin" showing hydrologic features of Chino Basin.

"C" -- Table Showing Parties in Overlying (Agricultural) Pool.

"D" -- Table Showing Parties in Overlying (Non-agricultural Pool and Their Rights.

"E" -- Table Showing Appropriators and Their Rights.

"F" -- Overlying (Agricultural) Pool Pooling Plan.

"G" -- Overlying (Non-agricultural) Pool Pooling Plan.

"H" -- Appropriative Pool Pooling Plan.

"I" -- Engineering Appendix.

"J" -- Map of In Lieu Area No. 1.

"K" -- Legal Description of Chino Basin.

II. DECLARATION OF RIGHTS

A. HYDROLOGY

6. Safe Yield. The Safe Yield of Chino Basin is 140,000 acre feet per year.

7. Overdraft and Prescriptive Circumstances. In each year for a period in excess of five years prior to filing of the First Amended Complaint herein, the Safe Yield of the Basin has been exceeded by the annual production therefrom, and Chino Basin is and has been for more than five years in a continuous state of overdraft. The production constituting said overdraft has been open, notorious, continuous, adverse, hostile and under claim of right. The circumstances of said overdraft have given notice to all parties of the adverse nature of such aggregate over-production.

B. WATER RIGHTS IN SAFE YIELD

8. Overlying Rights. The parties listed in Exhibits "C" and "D" are the owners or in possession of lands which overlie Chino Basin. As such, said parties have exercised overlying water rights in Chino Basin. All overlying rights owned or exercised by parties listed in Exhibits "C" and "D" have, in the aggregate, been limited by prescription except to the extent such rights have been preserved by self-help by said parties. Aggregate preserved overlying rights in the Safe Yield for agricultural pool use, including the rights of the State of California, total 82,800 acre feet per year. Overlying rights for non-agricultural pool use

total 7,366 acre feet per year and are individually decreed for each affected party in Exhibit "D". No portion of the Safe Yield of Chino Basin exists to satisfy unexercised overlying rights, and such rights have all been lost by prescription. However, uses may be made of Basin Water on overlying lands which have no preserved overlying rights pursuant to the Physical Solution herein. All overlying rights are appurtenant to the land and cannot be assigned or conveyed separate or apart therefrom.

9. Appropriative Rights. The parties listed in Exhibit "E" are the owners of appropriative rights, including rights by prescription, in the unadjusted amounts therein set forth, and by reason thereof are entitled under the Physical Solution to share in the remaining Safe Yield, after satisfaction of overlying rights and rights of the State of California, and in the Operating Safe Yield in Chino Basin, in the annual shares set forth in Exhibit "E".

(a) Loss of Priorities. By reason of the long continued overdraft in Chino Basin, and in light of the complexity of determining appropriative priorities and the need for conserving and making maximum beneficial use of the water resources of the State, each and all of the parties listed in Exhibit "E" are estopped and barred from asserting special priorities or preferences, inter se. All of said appropriative rights are accordingly deemed and considered of equal priority.

(b) Nature and Quantity. All rights listed in Exhibit "E" are appropriative and prescriptive in nature. By reason of the status of the parties, and the provisions of Section

1007 of the Civil Code, said rights are immune from reduction or limitation by prescription.

10. Rights of the State of California. The State of California, by and through its Department of Corrections, Youth Authority and Department of Fish and Game, is a significant producer of ground water from and the State is the largest owner of land overlying Chino Basin. The precise nature and scope of the claims and rights of the State need not be, and are not, defined herein. The State, through said departments, has accepted the Physical Solution herein decreed, in the interests of implementing the mandate of Section 2 of Article X of the California Constitution. For all purposes of this Judgment, all future production by the State or its departments or agencies for overlying use on State-owned lands shall be considered as agricultural pool use.

C. RIGHTS TO AVAILABLE GROUND WATER STORAGE CAPACITY

11. Available Ground Water Storage Capacity. There exists in Chino Basin a substantial amount of available ground water storage capacity which is not utilized for storage or regulation of Basin Waters. Said reservoir capacity can appropriately be utilized for storage and conjunctive use of supplemental water with Basin Waters. It is essential that said reservoir capacity utilization for storage and conjunctive use of supplemental water be undertaken only under Watermaster control and regulation, in order to protect the integrity of both such Stored Water and Basin Water in storage and the Safe Yield of Chino Basin.

12. Utilization of Available Ground Water Capacity. Any person or public entity, whether a party to this action or not, may make reasonable beneficial use of the available ground water

storage capacity of Chino Basin for storage of supplemental water; provided that no such use shall be made except pursuant to written agreement with Watermaster, as authorized by Paragraph 28. In the allocation of such storage capacity, the needs and requirements of lands overlying Chino Basin and the owners of rights in the Safe Yield or Operating Safe Yield of the Basin shall have priority and preference over storage for export.

III. INJUNCTION

13. Injunction Against Unauthorized Production of Basin Water. Each party in each of the respective pools is enjoined, as follows:

(a) Overlying (Agricultural) Pool. Each party in the Overlying (Agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water from Chino Basin in any year hereafter in excess of such party's correlative share of the aggregate of 82,800 acre feet allocated to said Pool, except pursuant to the Physical Solution or a storage water agreement.

(b) Overlying (Non-Agricultural) Pool. Each party in the Overlying (Non-agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed rights in the Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

(c) Appropriative Pool. Each party in the

Appropriative Pool, its officers, agents, employees, successors and assigns, is and they are each ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed share of Operating Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

14. Injunction Against Unauthorized Storage or Withdrawal of Stored Water. Each party, its officers, agents, employees, successors and assigns is and they each are ENJOINED AND RESTRAINED from storing supplemental water in Chino Basin for withdrawal, or causing withdrawal of, water stored by that party, except pursuant to the terms of a written agreement with Watermaster and in accordance with Watermaster regulations. Any supplemental water stored or recharged in the Basin, except pursuant to such a Watermaster agreement, shall be deemed abandoned and not classified as Stored Water. This paragraph has no application, as such, to supplemental water spread or provided in lieu by Watermaster pursuant to the Physical Solution.

IV. CONTINUING JURISDICTION

15. Continuing Jurisdiction. Full jurisdiction, power and authority are retained and reserved to the Court as to all matters contained in this judgment, except:

(a) The redetermination of Safe Yield, as set forth in Paragraph 6, during the first ten (10) years of operation of the Physical Solution;

(b) The allocation of Safe Yield as between the several pools as set forth in Paragraph 44 of the Physical Solution;

(c) The determination of specific quantitative rights and shares in the declared Safe Yield or Operating Safe Yield herein declared in Exhibits "D" and "E"; and

(d) The amendment or modification of Paragraphs 7(a) and (b) of Exhibit "H", during the first ten (10) years of operation of the Physical Solution, and thereafter only upon affirmative recommendation of at least 67% of the voting power (determined pursuant to the formula described in Paragraph 3 of Exhibit "H"), but not less than one-third of the members of the Appropriative Pool Committee representatives of parties who produce water within CBMWD or WMWD; after said tenth year the formula set forth in said Paragraph 7(a) and 7(b) of Exhibit "H" for payment of the costs of replenishment water may be changed to 100% gross or net, or any percentage split thereof, but only in response to recommendation to the Court by affirmative vote of at least 67% of said voting power of the Appropriative Pool representatives of parties who produce ground water within CBMWD or WMWD, but not less than one-third of their number. In such event, the Court shall act in conformance with such recommendation unless there are compelling reasons to the contrary; and provided, further, that the fact that the allocation of Safe Yield or Operating Safe Yield shares may be rendered moot by a recommended change in the formula for replenishment assessments shall not be deemed to be such a "compelling reason."

Said continuing jurisdiction is provided for the purpose of enabling the Court, upon application of any party, the Watermaster, the Advisory Committee or any Pool Committee, by motion and, upon

at least 30 days' notice thereof, and after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate for interpretation, enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment.

V. WATERMASTER

A. APPOINTMENT

16. Watermaster Appointment. CBMWD, acting by and through a majority of its board of directors, is hereby appointed Watermaster, to administer and enforce the provisions of this Judgment and any subsequent instructions or orders of the Court hereunder. The term of appointment of Watermaster shall be for five (5) years. The Court will by subsequent orders provide for successive terms or for a successor Watermaster. Watermaster may be changed at any time by subsequent order of the Court, on its own motion, or on the motion of any party after notice and hearing. Unless there are compelling reasons to the contrary, the Court shall act in conformance with a motion requesting the Watermaster be changed if such motion is supported by a majority of the voting power of the Advisory Committee.

B. POWERS AND DUTIES

17. Powers and Duties. Subject to the continuing supervision and control of the Court, Watermaster shall have and may exercise the express powers, and shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction.

18. Rules and Regulations. Upon recommendation by the

Advisory Committee, Watermaster shall make and adopt, after public hearing, appropriate rules and regulations for conduct of Watermaster affairs, including meeting schedules and procedures, and compensation of members of Watermaster at not to exceed $25 per member per meeting, or $300 per member per year, whichever is less, plus reasonable expenses related to activities within the Basin. Thereafter, Watermaster may amend said rules from time to time upon recommendation, or with approval of the Advisory Committee after hearing noticed to all active parties. A copy of said rules and regulations, and of any amendments thereof, shall be mailed to each active party.

19. Acquisition of Facilities. Watermaster may purchase, lease, acquire and hold all necessary facilities and equipment; provided, that it is not the intent of the Court that Watermaster acquire any interest in real property or substantial capital assets.

20. Employment of Experts and Agents. Watermaster may employ or retain such administrative, engineering, geologic, accounting, legal or other specialized personnel and consultants as may be deemed appropriate in the carrying out of its powers and shall require appropriate bonds from all officers and employees handling Watermaster funds. Watermaster shall maintain records for purposes of allocation of costs of such services as well as of all other expenses of Watermaster administration as between the several pools established by the Physical Solution.

21. Measuring Devices. Watermaster shall cause parties, pursuant to uniform rules, to install and maintain in good operating condition, at the cost of each party, such necessary measuring

devices or meters as Watermaster may deem appropriate. Such measuring devices shall be inspected and tested as deemed necessary by Watermaster, and the cost thereof shall constitute an expense of Watermaster.

22. Assessments. Watermaster is empowered to levy and collect all assessments provided for in the pooling plans and Physical Solution.

23. Investment of Funds. Watermaster may hold and invest any and all Watermaster funds in investments authorized from time to time for public agencies of the State of California.

24. Borrowing. Watermaster may borrow from time to time amounts not exceeding the annual anticipated receipts of Watermaster during such year.

25. Contracts. Watermaster may enter into contracts for the performance of any powers herein granted; provided, however, that Watermaster may not contract with or purchase materials, supplies or services from CBMWD, except upon the prior recommendation and approval of the Advisory Committee and pursuant to written order of the Court.

26. Cooperation With Other Agencies. Subject to prior recommendation or approval of the Advisory Committee, Watermaster may act jointly or cooperate with agencies of the United States and the State of California or any political subdivisions, municipalities or districts or any person to the end that the purpose of the Physical Solution may be fully and economically carried out.

27. Studies. Watermaster may, with concurrence of the Advisory Committee or affected Pool Committee and in accordance with Paragraph 54(b), undertake relevant studies of hydrologic

conditions, both quantitative and qualitative, and operating aspects of implementation of the management program for Chino Basin.

28. Ground Water Storage Agreements. Watermaster shall adopt, with the approval of the Advisory Committee, uniformly applicable rules and a standard form of agreement for storage of supplemental water, pursuant to criteria therefor set forth in Exhibit "I". Upon appropriate application by any person, Watermaster shall enter into such a storage agreement; provided that all such storage agreements shall first be approved by written order of the Court, and shall by their terms preclude operations which will have a substantial adverse impact on other producers.

29. Accounting for Stored Water. Watermaster shall calculate additions, extractions and losses and maintain an annual account of all Stored Water in Chino Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water.

30. Annual Administrative Budget. Watermaster shall submit to Advisory Committee an administrative budget and recommendation for each fiscal year on or before March 1. The Advisory Committee shall review and submit said budget and their recommendations to Watermaster on or before April 1, following. Watermaster shall hold a public hearing on said budget at its April quarterly meeting and adopt the annual administrative budget which shall include the administrative items for each pool committee. The administrative budget shall set forth budgeted items in sufficient detail as necessary to make a proper allocation of the expense among the several pools, together with Watermaster's proposed allocation. The budget shall contain such additional comparative information

or explanation as the Advisory Committee may recommend from time to time. Expenditures within budgeted items may thereafter be made by Watermaster in the exercise of powers herein granted, as a matter of course. Any budget transfer in excess of 20% of a budget category during any budget year or modification of such administrative budget during any year shall be first submitted to the Advisory Committee for review and recommendation.

31. Review Procedures. All actions, decisions or rules of Watermaster shall be subject to review by the Court on its own motion or on timely motion by any party, the Watermaster (in the case of a mandated action), the Advisory Committee, or any Pool Committee, as follows:

(a) Effective Date of Watermaster Action. Any action, decision or rule of Watermaster shall be deemed to have occurred or been enacted on the date on which written notice thereof is mailed. Mailing of copies of approved Watermaster minutes to the active parties shall constitute such notice to all parties.

(b) Noticed Motion. Any party, the Watermaster (as to any mandated action), the Advisory Committee, or any Pool Committee may, by a regularly noticed motion, apply to the Court for review of any Watermaster's action, decision or rule. Notice of such motion shall be served personally or mailed to Watermaster and to all active parties. Unless otherwise ordered by the Court, such motion shall not operate to stay the effect of such Watermaster action, decision or rule.

- - - - - - - - - - - - - - -

EXHIBIT "D"

OVERLYING NON-AGRICULTURAL RIGHTS

Party	Total Overlying Non-Agricultural Rights (Acre Feet)	Share of Safe Yield (Acre Feet)
Ameron Steel Producers, Inc.	125	97.858
County of San Bernardino	171	133.870
Conrock Company	406	317.844
Kaiser Steel Corporation	3,743	2,930.274
Red Star Fertilizer	20	15.657
Southern California Edison Co.	1,255	982.499
Space Center, Mira Loma	133	104.121
Southern Service Co., dba Blue Seal Linen	24	18.789
Sunkist, Orange Products Division	2,393	1,873.402
Carlsberg Mobile Home Properties, Ltd. '73	593	464.240
Union Carbide Corporation	546	427.446
Quaker Chemical Co.	0	0
Totals	9,409	7,366.000

EXHIBIT "E"
APPROPRIATIVE RIGHTS

Party	Appropriative Right (Acre Feet)	Share of Initial Operating Safe Yield (Acre Feet)	Share of Operating Safe Yield (Percent)
City of Chino	5,271.7	3,670.067	6.693
City of Norco	289.5	201.545	0.368
City of Ontario	16,337.4	11,373.816	20.742
City of Pomona	16,110.5	11,215.852	20.454
City of Upland	4,097.2	2,852.401	5.202
Cucamonga County Water District	4,431.0	3,084.786	5.626
Jurupa Community Services District	1,104.1	768.655	1.402
Monte Vista County Water District	5,958.7	4,148.344	7.565
West San Bernardino County Water District	925.5	644.317	1.175
Etiwanda Water Company	768.0	534.668	0.975
Felspar Gardens Mutual Water Company	68.3	47.549	0.087
Fontana Union Water Co.	9,188.3	6,396.736	11.666
Marygold Mutual Water Co.	941.3	655.317	1.195
Mira Loma Water Co.	1,116.0	776.940	1.417
Monta Vista Irr. Co.	972.1	676.759	1.234
Mutual Water Company of Glen Avon Heights	672.2	467.974	0.853
Park Water Company	236.1	164.369	0.300
Pomona Valley Water Co.	3,106.3	2,162.553	3.944
San Antonio Water Co.	2,164.5	1,506.888	2.748
Santa Ana River Water Company	1,869.3	1,301.374	2.373
Southern California Water Company	1,774.5	1,235.376	2.253
West End Consolidated Water Company	1,361.3	947.714	1.728
TOTAL	78,763.8	54,834.000	100.000

3150 Acres

EXHIBIT "I"

ENGINEERING APPENDIX

1. Basin Management Parameters. In the process of implementing the physical solution for Chino Basin, Watermaster shall consider the following parameters:

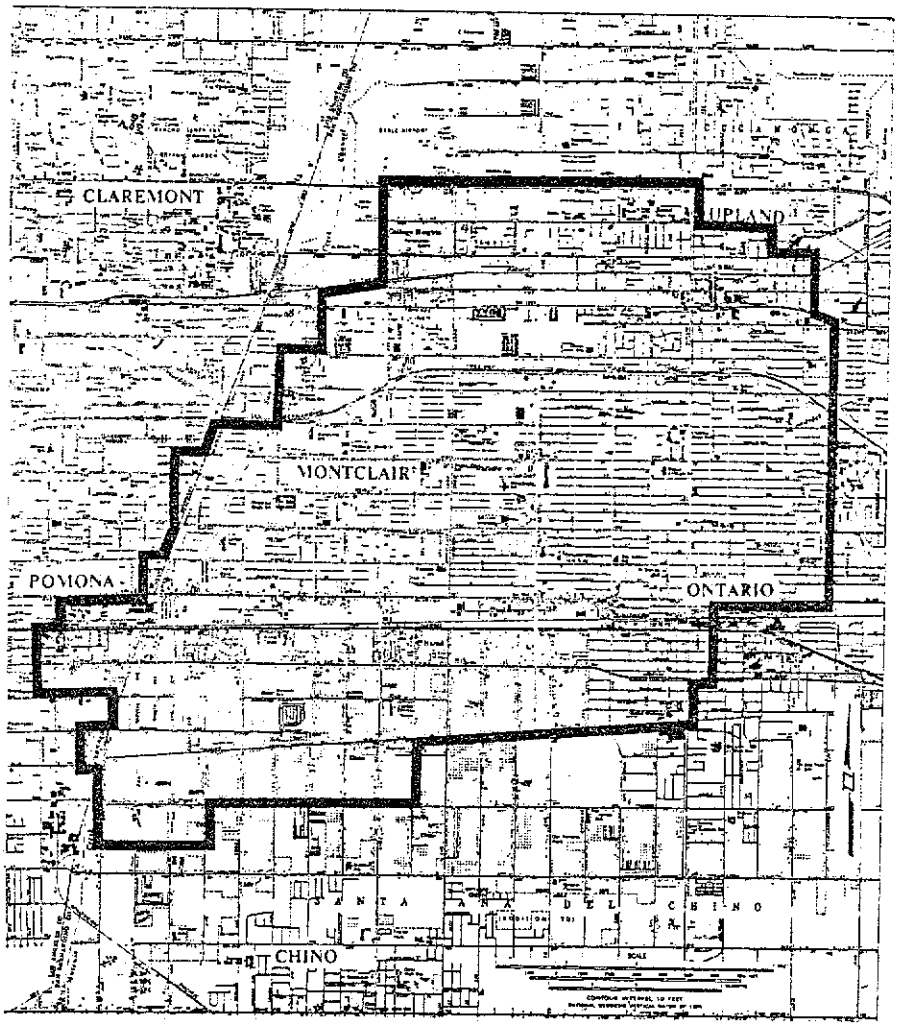
(a) Pumping Patterns. Chino Basin is a common supply for all persons and agencies utilizing its waters. It is an objective in management of the Basin's waters that no producer be deprived of access to said waters by reason of unreasonable pumping patterns, nor by regional or localized recharge of replenishment water, insofar as such result may be practically avoided.

(b) Water Quality. Maintenance and improvement of water quality is a prime consideration and function of management decisions by Watermaster.

(c) Economic Considerations. Financial feasibility, ecnomic impact and the cost and optimum utilization of the Basin's resources and the physical facilities of the parties are objectives and concerns equal in importance to water quantity and quality parameters.

2. Operating Safe Yield. Operating Safe Yield in any year shall consist of the Appropriative Pool's share of Safe Yield of the Basin, plus any controlled overdraft of the Basin which Watermaster may authorize. In adopting the Operating Safe Yield for any year, Watermaster shall be limited as follows:

(a) Accumulated Overdraft. During the operation of this Judgment and Physical Solution, the overdraft accumulated from and after the effective date of the Physical



CHINO BASIN

IN LIEU AREA NO. 1

EXHIBIT "J"

Appendix

E

Superior Court of the State of California

For the County of Orange

ORANGE COUNTY WATER DISTRICT

Plaintiff

vs.

CITY OF CHINO, et al.,

Defendants

NO. 117628

SETTLEMENT DOCUMENTS

STIPULATIONS
- RE DISMISSAL OF CERTAIN DEFENDANTS
- RE DISMISSAL OF CERTAIN CROSS-DEFENDANTS
- FOR JUDGMENT

JUDGMENT
- MAP OF SANTA ANA RIVER WATERSHED
- ENGINEERING APPENDIX

ORDER APPOINTING WATERMASTER

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT DOCUMENTS

AGREEMENTS
- CITY OF SAN BERNARDINO — 1969
- CITY OF COLTON — 1969

WESTERN MUNICIPAL DOCUMENTS

AGREEMENTS
- CHINO BASIN MWD
- RIVERSIDE FLOOD CONTROL
- CITY OF RIVERSIDE
- CITY OF CORONA

WMWD & ESBCWD SETTLEMENT
- STIPULATION FOR JUDGMENT
- JUDGMENT
- ORDER APPOINTING WATERMASTER
- ESBCWD STIPULATION AS TO ACCEPTANCE OF JUDGMENT
- ORDER AMENDING THE JUDGMENT TO CLARIFY THE REPLENISHMENT OBLIGATIONS OF THE PARTIES

Reprinted March 1997

(l) TDS -- Total dissolved solids determined as set forth in Exhibit B.

(m) Water Year -- The period from October 1 to the following September 30. Where reference is made herein to "year" or "annual", such terms shall be construed as referring to Water Year, unless the context indicates otherwise.

(n) Adjusted Base Flow -- Actual Base Flow in each year adjusted for quality as provided hereinbelow. Compliance with the respective obligations under Paragraph 5 shall be measured by the Adjusted Base Flow.

4. Declaration of Rights. Substantially all of the parties to this action, whether situate in Upper Area or Lower Area have or claim rights to the use of a portion of the water supply of the Santa Ana River system. In the aggregate, water users and other entities in Lower Area have rights, as against all Upper Area claimants, to receive an average annual supply of 42,000 acre feet of Base Flow at Prado, together with the right to all Storm Flow reaching Prado Reservoir. Water users and other entities in Upper Area have rights in the aggregate, as against all Lower Area claimants, to divert, pump, extract, conserve, store and use all surface and ground water supplies originating within Upper Area without interference or restraint by Lower Area claimants, so long as Lower Area receives the water to which it is entitled under this Judgment and there is compliance with all of its provisions.

5. Physical Solution. The Court hereby declares the following physical solution to be a fair and equitable basis for satisfaction of all said rights in the aggregate between Lower Area and Upper Area. The parties are hereby ordered and directed to comply with this Physical Solution and such compliance shall constitute full and complete satisfaction of the rights declared in

Paragraph 4 hereof.

(a) General Format. In general outline, SBVMWD shall be responsible for the delivery of an average annual amount of Base Flow at Riverside Narrows. CBMWD and WMWD shall jointly be responsible for an average annual amount of Base Flow at Prado. Insofar as Lower Area claimants are concerned, Upper Area water users and other entities may engage in unlimited water conservation activities, including spreading, impounding and other methods, in the area above Prado Reservoir, so long as Lower Area receives the water to which it is entitled under the Judgment and there is compliance with all of its provisions. Lower Area water users and other entities may make full conservation use of Prado Dam and reservoir, subject only to flood control use.

(b) Obligation of SBVMWD. SBVMWD shall be responsible for an average annual Adjusted Base Flow of 15,250 acre feet at Riverside Narrows. A continuing account, as described in Exhibit B, shall be maintained of actual Base Flow at Riverside Narrows, with all adjustments thereof and any cumulative debit or credit. Each year the obligation to provide Base Flow shall be subject to the following:

(1) Minimum Annual Quantities. Without regard to any cumulative credits, or any adjustment for quality for the current Water Year under subparagraph (2) hereof, SBVMWD each year shall be responsible at Riverside Narrows for not less than 13,420 acre feet of Base Flow plus one-third of any cumulative debit; provided, however, that for any year

commencing on or after October 1, 1986, when there is no cumulative debit, or for any year prior to 1986 whenever the cumulative credit exceeds 10,000 acre feet, said minimum shall be 12,420 acre feet.

(2) Adjustment for Quality. The amount of Base Flow at Riverside Narrows received during any year shall be subject to adjustment based upon the weighted average annual TDS in such Base Flow, as follows:

If the Weighted Average TDS in Base Flow at Riverside Narrows is:	Then the Adjusted Base Flow shall be determined by the formula:
Greater than 700 ppm	$Q - \frac{11}{15,250} Q (TDS-700)$
600 ppm - 700 ppm	Q
Less than 600 ppm	$Q + \frac{11}{15,250} Q (600-TDS)$

Where: Q = Base Flow actually received.

(3) Periodic Reduction of Cumulative Debit. At least once in any ten (10) consecutive years subsequent to October 1, 1976, SBVMWD shall provide sufficient quantities of Base Flow at Riverside Narrows to discharge completely any cumulative debits. Any cumulative credits shall remain on the books of account until used to offset any subsequent debits, or until otherwise disposed of by SBVMWD.

(c) Obligation of CBMWD and WMWD. CBMWD and WMWD shall be responsible for an average annual Adjusted Base Flow of 42,000 acre feet at Prado. A continuing account, as described in Exhibit B, shall

be maintained of actual Base Flow at Prado, with all adjustments thereof and any cumulative debit or credit. Each year the obligation to provide Base Flow shall be subject to the following:

(1) Minimum Annual Quantities. Without regard to any cumulative credits, or any adjustments for quality for the current Water Year under subparagraph (2) hereof, CBMWD and WMWD each year shall be responsible for not less than 37,000 acre feet of Base Flow at Prado, plus one-third of any cumulative debit; provided, however, that for any year commencing on or after October 1, 1986, when there is no cumulative debit, or for any year prior to 1986 whenever the cumulative credit exceeds 30,000 acre feet, said minimum shall be 34,000 acre feet.

(2) Adjustment for Quality. The amount of Base Flow at Prado received during any year shall be subject to adjustment based upon the weighted average annual TDS in Base Flow and Storm Flow at Prado as follows:

If the Weighted Average TDS in Base Flow and Storm Flow at Prado is:	Then the Adjusted Base Flow shall be determined by the formula:
Greater than 800 ppm	$Q - \frac{35}{42,000} Q\ (TDS-800)$
700 ppm - 800 ppm	Q
Less than 700 ppm	$Q + \frac{35}{42,000} Q\ (700-TDS)$

Where: Q = Base Flow actually received.

(3) Periodic Reduction of Cumulative Debit. At least once in ten (10) consecutive years subsequent to October 1, 1976, CBMWD and WMWD shall

RUTAN & TUCKER
MILFORD W. DAHL
JAMES E. ERICKSON
401 West 8th Street
Santa Ana, California
Telephone: 835-2200

PILLSBURY, MADISON & SUTRO
JAMES MICHAEL
WILLIAM C. MILLER
ROBERT M. WESTBERG
225 Bush Street
San Francisco, California 94104

Attorneys for Plaintiff and
Cross-Defendant, Orange County
Water District.

FILED
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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF ORANGE

ORANGE COUNTY WATER DISTRICT, Plaintiff, vs. CITY OF CHINO, et al., Defendants.	NO. 117628 ORDER APPOINTING WATERMASTER
CITY OF CHINO, et al., Cross-Complainants, vs. CITY OF ANAHEIM, et al., Cross-Defendants.	

Section 7 of the Judgment herein providing for the appointment of a Watermaster, consisting of a committee composed of five persons, one of which to be nominated each by Chino Basin Municipal Water District, Western Municipal Water District, San Bernardino Valley Municipal Water District, and two by the Orange County Water District; and

Such districts having made the following nominations in accordance with such provision:

Chino Basin Municipal Water District	WILLIAM J. CARROLL,
Western Municipal Water District	ALBERT A. WEBB,
San Bernardino Valley Municipal Water District	CLINTON HENNING,
Orange County Water District	JOHN M. TOUPS,
	MAX BOOKMAN,

and GOOD CAUSE APPEARING THEREFOR;

IT HEREBY IS ORDERED that the following representatives to the Watermaster Committee are appointed and will serve at the pleasure of and until further order of this court, for the purpose of exercising the powers and duties of the Watermaster provided in Section 7 of such Judgment:

WILLIAM J. CARROLL

ALBERT A. WEBB

CLINTON HENNING

JOHN M. TOUPS

MAX BOOKMAN

DATED: April 23, 1969

JOHN P. McMURRAY
JUDGE OF THE SUPERIOR COURT

3. In any five year period, each Plaintiff shall have the right to extract from the San Bernardino Basin Area for use in each service area designated in Table B-1 an amount of water equal to five times its adjusted right for such service area; provided, however, that extractions by each Plaintiff in any year in any service area shall not exceed such Plaintiff's adjusted right for that service area by more than 30 percent.

4. If the natural safe yield of the San Bernardino Basin Area has not been determined by January 1, 1972, the initial determination thereof shall be retroactive to that date and the rights of the Plaintiffs, and the replenishment obligation of San Bernardino Valley as hereinafter set forth, shall be adjusted as of such date. Any excess extractions by Plaintiffs shall be charged against their respective adjusted rights over the next five year period, or in the alternative, Plaintiffs may pay to San Bernardino Valley the full cost of any replenishment which it has provided as replenishment for such excess extractions. Any obligation upon San Bernardino Valley to provide additional replenishment, by virtue of such retroactive determination of natural safe yield, may also be discharged over such next five year period.

5. Plaintiffs and each of them and their agents and assigns are enjoined from extracting any more water from the San Bernardino Basin Area than is permitted under this Judgment. Changes in place

of use of any such water from one service area to another shall not be made without the prior approval of Court upon a finding of compliance with Paragraph XV(b) of this Judgment. So long as San Bernardino Valley is in compliance with all its obligations hereunder, and Plaintiffs are allowed to extract the water provided for in this Judgment, Plaintiffs are further enjoined from bringing any action to limit the water extracted from the San Bernardino Basin Area for use within San Bernardino Valley.

6. Nothing in this Judgment shall prevent future agreements between San Bernardino Valley and Western under which additional extractions may be made from the San Bernardino Basin Area, subject to the availability of imported water not required by San Bernardino Valley, and subject to payment satisfactory to San Bernardino Valley for replenishment required to compensate for such additional extractions.

(c) San Bernardino Valley Replenishment. San Bernardino Valley shall provide imported water for replenishment of the San Bernardino Basin Area at least equal to the amount by which extractions therefrom for use within San Bernardino County exceed during any five year period the sum of: (a) five times the total average annual extractions determined under Paragraph V(b) hereof, adjusted as may be required by the natural safe yield of the San Bernardino Basin Area; and (b) any new conservation to which users within San Bernardino Valley are entitled. Such replenishment shall be

supplied in the year following any five year period; provided that during the first five year period, San Bernardino Valley shall supply annual amounts on account of its obligations hereunder, and such amounts shall be not less than fifty percent of the gross amount of excess extractions in the previous year.

1. Against its replenishment obligation over any five year period San Bernardino Valley shall receive credit for that portion of such excess extractions that returns to the ground water of the San Bernardino Basin Area.

2. San Bernardino Valley shall also receive credit against any future replenishment obligations for all replenishment which it provides in excess of that required herein, and for any amounts which may be extracted without replenishment obligation, which in fact are not extracted.

(d) In this subparagraph (d), "person" and "entity" mean only those persons and entities, and their successors in interest, which have stipulated with the parties to this Judgment within six months after its entry to accept this Judgment.

San Bernardino Valley agrees that the base rights of persons or entities other than Plaintiffs to extract water from the San Bernardino Basin Area for use within San Bernardino Valley will be determined by the average annual quantity extracted by such person or entity during the five year period ending with 1963. After the natural safe yield of the San Bernardino Basin Area is determined hereunder, such

base rights will be adjusted to such natural safe yield; the adjusted right of each such person or entity shall be that percentage of natural safe yield as determined hereunder from time to time which the unadjusted right of such person or entity is of the amount determined under Paragraph V(b).

San Bernardino Valley further agrees that in the event the right to extract water of any of such persons or entities in the San Bernardino Basin Area is adjudicated and legal restrictions placed on such extractions which prevent extracting of water by said persons or entities in an amount equal to their base rights, or after natural safe yield is determined, their adjusted rights, San Bernardino Valley will furnish to such persons or entities or recharge the ground water resources in the area of extraction for their benefit with imported water, without direct charge to such persons or entities therefor, so that the base rights, or adjusted rights, as the case may be, may be taken by the person or entity.

Under the provisions hereof relating to furnishing of such water by San Bernardino Valley, such persons or entities shall be entitled to extract in addition to their base rights or adjusted rights any quantities of water spread for repumping in their area of extractions, which has been delivered to them by a mutual water company under base rights or adjusted base rights included by the Watermaster under the provisions of Paragraph V (b) hereof. Extractions must be made within three years of spreading to so qualify.

VII

WATER DISCHARGED ACROSS THE BUNKER HILL DIKE

San Bernardino Valley shall keep in force an agreement with the City of San Bernardino that the present annual quantity of municipal sewage effluent discharged across Bunker Hill Dike, assumed for all purposes herein to be 16,000 acre feet annually, shall be committed to the discharge of the downstream obligations imposed on San Bernardino Valley under this Judgment or under the Orange County Judgment, and that such effluent shall comply with the requirements of the Santa Ana River Basin Regional Water Quality Control Board in effect December 31, 1968.

VIII

EXTRACTIONS FROM COLTON BASIN AREA AND RIVERSIDE BASIN AREA IN SAN BERNARDINO COUNTY.

(a) The average annual extractions from the Colton Basin Area and that portion of the Riverside Basin Area within San Bernardino County, for use outside San Bernardino Valley, for the five year period ending with 1963 are assumed to be 3,349 acre feet and 20,191 acre feet, respectively; the correct figures shall be determined by the Watermaster as herein provided.

(b) Over any five year period, there may be extracted from each such Basin Area for use outside San Bernardino Valley, without replenishment obligation, an amount equal to five times such annual average for the Basin Area; provided, however, that if extractions in any year exceed such average by more than 20 percent, Western shall provide replenishment in the following year equal to the excess

extractions over such 20 percent peaking allowance.

(c) To the extent that extractions from each such Basin Area for use outside San Bernardino Valley exceed the amounts specified in the next preceding Paragraph (b), Western shall provide replenishment. Except for any extractions in excess of the 20 percent peaking allowance, such replenishment shall be supplied in the year following any five year period, and shall not be from reclaimed water produced within San Bernardino Valley. Such replenishment shall also be of a quality at least equal to the water extracted from the Basin Area being recharged; provided, that water from the State Water Project shall be deemed to be of acceptable quality. Replenishment shall be supplied to the Basin Area from which any excess extractions have occurred and in the vicinity of the place of the excess extractions to the extent required to preclude influence on the water level in the three wells below designated; provided that discharge of imported water into the Santa Ana River or Warm Creek from a connection on the State Aqueduct near the confluence thereof, if released in accordance with a schedule approved by the Watermaster to achieve compliance with the objectives of this Judgment, shall satisfy any obligation of Western to provide replenishment in the Colton Basin Area, or that portion of the Riverside Basin Area in San Bernardino County, or the Riverside Basin Area in Riverside County.

(d) Extractions from the Colton Basin Area and that portion of the Riverside Basin Area within San Bernardino County, for use within San Bernardino Valley, shall not be limited. However, except for any required replenishment by Western, San Bernardino Valley shall provide the water to maintain the static water levels in the area, as determined by wells numbered

1S 4W 21 Q3, 1S 4W 29 H1, and 1S 4W 29 Q1 at an average level no lower than that which existed in the Fall season of 1963. Such 1963 average water level is hereby determined to be 822.04 feet above sea level. In future years, the level shall be computed by averaging the lowest static water levels in each of the three wells occurring at or about the same time of the year, provided that no measurements will be used which reflect the undue influence of pumping in nearby wells, or in the three wells, or pumping from the Riverside Basin in Riverside County in excess of that determined pursuant to Paragraph IX(a) hereof.

(e) Extractions by Plaintiffs from the Colton Basin Area and the portion of the Riverside Basin Area in San Bernardino County may be transferred to the San Bernardino Basin Area if the level specified in Paragraph (d) above is not maintained, but only to the extent necessary to restore such 1963 average water level, provided that Western is not in default in any of its replenishment obligations. San Bernardino Valley shall be required to replenish the San Bernardino Basin Area in an amount equal to any extractions so transferred. San Bernardino Valley shall be relieved of responsibility toward the maintenance of such 1963 average water level to the extent that Plaintiffs have physical facilities available to accommodate such transfers of extractions, and insofar as such transfers can be legally accomplished.

(f) The Colton Basin Area and the portion of the Riverside Basin Area in San Bernardino County constitute a major source of water supply for lands and inhabitants in both San Bernardino Valley and Western, and the parties hereto have a mutual interest in the maintenance of water quality in these Basin Areas and in the preservation of such supply. If

the water quality in such Areas, as monitored by the City of Riverside wells along the river, falls below the Objectives set therefor by the Santa Ana River Basin Regional Water Quality Control Board, the Court shall have jurisdiction to modify the obligations of San Bernardino Valley to include, in addition to its obligation to maintain the average 1963 water level, reasonable provisions for the maintenance of such water quality.

(g) The primary objectives of Paragraph VIII and related provisions are to allow maximum flexibility to San Bernardino Valley in the operation of a coordinated replenishment and management program, both above and below Bunker Hill Dike; to protect San Bernardino Valley against increased extractions in the area between Bunker Hill Dike and Riverside Narrows, which without adequate provision for replenishment might adversely affect base flow at Riverside Narrows, for which it is responsible under the Orange County Judgment; and to protect the area as a major source of ground water supply available to satisfy the historic extractions therefrom for use within Western, without regard to the method of operation which may be adopted by San Bernardino Valley for the San Bernardino Basin Area, and without regard to the effect of such operation upon the historic supply to the area below Bunker Hill Dike.

If these provisions should prove either inequitable or unworkable, the Court upon the application of any party hereto shall retain jurisdiction to modify this Judgment so as to regulate the area between Bunker Hill Dike and Riverside Narrows on a safe yield basis; provided that under such method of operation, (1) base rights shall be determined on the basis of total average annual extractions for use within San Bernardino Valley and Western, respectively, for the five year period ending

with 1963; (2) such base rights for use in both Districts shall be subject to whatever adjustment may be required by the safe yield of the area, and in the aggregate shall not be exceeded unless replenishment therefor is provided; (3) in calculating safe yield, the outflow from the area at Riverside Narrows shall be determined insofar as practical by the base flow obligations imposed on San Bernardino Valley under the Orange County Judgment; and (4) San Bernardino Valley shall be required to provide replenishment for any deficiency between the actual outflow and the outflow obligation across Bunker Hill Dike as established by safe yield analysis using the base period of 1934 through 1960.

IX

EXTRACTIONS FROM THE PORTION OF RIVERSIDE BASIN AREA IN RIVERSIDE COUNTY WHICH IS TRIBUTARY TO RIVERSIDE NARROWS.

(a) The average annual extractions from the portion of the Riverside Basin Area in Riverside County which is tributary to Riverside Narrows, for use in Riverside County, for the five year period ending with 1963 are assumed to be 30,044 acre feet; the correct figures shall be determined by the Watermaster as herein provided.

(b) Over any five year period, there may be extracted from such Basin Area, without replenishment obligation, an amount equal to five times such annual average for the Basin Area; provided, however, that if extractions in any year exceed such average by more than 20 percent, Western shall provide replenishment in the following year equal to the excess extractions over such 20 percent peaking allowance.

(c) To the extent that extractions from such Basin Area exceed the amounts specified in the next preceding

Paragraph (b), Western shall provide replenishment. Except for any extractions in excess of the 20 percent peaking allowance, such replenishment shall be supplied in the year following any five year period, and shall be provided at or above Riverside Narrows.

(d) Western shall also provide such replenishment to offset any reduction in return flow now contributing to the base flow at Riverside Narrows, which reduction in return flow results from the conversion of agricultural uses of water within Western to domestic or other uses connected to sewage or waste disposal systems, the effluent from which is not tributary to the rising water at Riverside Narrows.

X

REPLENISHMENT TO OFFSET NEW EXPORTS OF WATER TO AREAS NOT TRIBUTARY TO RIVERSIDE NARROWS.

Certain average annual amounts of water extracted from the San Bernardino Basin Area and the area downstream therefrom to Riverside Narrows during the five year period ending in 1963 have been exported for use outside of the area tributary to Riverside Narrows and are assumed to be 50,667 acre feet annually as set forth in Table C-1 of Appendix "C"; the correct amount shall be determined by the Watermaster as herein provided. Western shall be obligated to provide replenishment at or above Riverside Narrows for any increase over such exports by Western or entities within it from such areas for use within areas not tributary to Riverside Narrows. San Bernardino Valley shall be obligated to provide replenishment for any increase over the exports from San Bernardino Valley for use in any area not within Western nor tributary to Riverside Narrows as set forth in Table C-2 of

Appendix "C", such amounts being subject to correction by the Watermaster, or for any exports from the San Bernardino Basin Area for use in the Yucaipa, San Timoteo, Oak Glen and Beaumont Basins.

XI

REPLENISHMENT CREDITS AND ADJUSTMENT FOR QUALITY

(a) All replenishment provided by Western under Paragraph IX and all credits received against such replenishment obligation shall be subject to the same adjustments for water quality applicable to base flow at Riverside Narrows, as set forth in the Orange County Judgment.

(b) Western shall receive credit against its replenishment obligations incurred under this Judgment for the following:

1. As against its replenishment obligation under Paragraph VIII, any return flow to the Colton Basin Area or the portion of the Riverside Basin Area within San Bernardino County, respectively, resulting from any excess extractions therefrom; and as against its replenishment obligation under Paragraph IX, any return flow to the portion of the Riverside Basin Area in Riverside County, which contributes to the base flow at Riverside Narrows, resulting from any excess extractions therefrom, or from the Riverside Basin Area in San Bernardino County, or from the Colton Basin Area.

2. Subject to adjustment under Paragraph (a) hereof, any increase over the present amounts of sewage effluent discharged from

treatment plants within Riverside County which are tributary to Riverside Narrows, and which results from the use of imported water.

3. Any replenishment which may be provided in excess of that required; any amounts which hereunder are allowed to be extracted from the Colton and Riverside Basin Areas without replenishment obligation by Western, and which in fact are not extracted; any storm flows conserved between Bunker Hill Dike and Riverside Narrows by works financed solely by Western, or entities within it, which would not otherwise contribute to base flow at Riverside Narrows; and any return flow from imported water used in Riverside County which contributes to base flow at Riverside Narrows; provided, however, that such use of the underground storage capacity in each of the above situations does not adversely affect San Bernardino Valley in the discharge of its obligations at Riverside Narrows under the Orange County Judgment, nor interfere with the accomplishment by San Bernardino Valley of the primary objectives of Paragraph VIII, as stated in Subdivision (g).

(c) The replenishment obligations of Western under this Judgment shall not apply during such times as amounts of base flow at Riverside Narrows and the amounts of water stored in the ground water resources below Bunker Hill Dike and tributary to the maintenance of such flow are found by Order of the Court to be sufficient to satisfy any obligation which San Bernardino Valley may have under this Judgment, or under the

Orange County Judgment, and if the Court further finds by Order that during such times any such increase in pumping, changes in use or exports would not adversely affect San Bernardino Valley in the future.

(d) The replenishment obligations of San Bernardino Valley under Paragraph X of this Judgment for increase in exports from the Colton and Riverside Basin Areas within San Bernardino Valley below the Bunker Hill Dike shall not apply during such times as the amounts of water in the ground water resources of such area are found by Order of the Court to be sufficient to satisfy the obligations which San Bernardino Valley may have to Plaintiffs under this Judgment, and if the Court further finds by Order that during such times any such increases in exports would not adversely affect Plaintiffs in the future.

XII

CONVEYANCE OF WATER BY SAN BERNARDINO VALLEY TO RIVERSIDE NARROWS.

If San Bernardino Valley determines that it will convey reclaimed sewage effluent, or other water, to or near Riverside Narrows, to meet its obligations under this or the Orange County Judgment, the City of Riverside shall make available to San Bernardino Valley for that purpose any unused capacity in the former Riverside Water Company canal, and the Washington and Monroe Street storm drains, without cost except for any alterations or capital improvements which may be required, or any additional maintenance and operation costs which may result. The use of those facilities shall be subject to the requirements of the Santa Ana River Basin Regional Water Quality Control Board and of the State Health Department, and compliance

therewith shall be San Bernardino Valley's responsibility.

XIII

WATERMASTER

(a) This Judgment and the instructions and subsequent orders of this Court shall be administered and enforced by a Watermaster. The parties hereto shall make such measurements and furnish such information as the Watermaster may reasonably require, and the Watermaster may verify such measurements and information and obtain additional measurements and information as the Watermaster may deem appropriate.

(b) The Watermaster shall consist of a committee of two persons. San Bernardino Valley and Western shall each have the right to nominate one of such persons. Each such nomination shall be made in writing, served upon the other parties to this Judgment, and filed in Court. Such person shall be appointed by and serve at the pleasure of and until further order of this Court. If either Western or San Bernardino Valley shall at any time nominate a substitute appointee in place of the last appointee to represent it, such appointee shall be appointed by the Court in place of such last appointee.

(c) Appendix "D" to this Judgment contains some of the data which have been used in preparation of this Judgment, and shall be utilized by the Watermaster in connection with any questions of interpretation.

(d) Each and every finding and determination of the Watermaster shall be made in writing certified to be by unanimous action of both members of the Watermaster committee. In the event of failure or inability of such Watermaster Committee to reach agreement, the Watermaster committee may determine to submit the dispute to a third person to be selected

APPENDIX C
TABLE C-1

EXTRACTIONS FOR USE WITHIN WESTERN
FROM
THE SAN BERNARDINO BASIN AREA, COLTON BASIN AREA,
AND THE RIVERSIDE BASIN AREA
FOR USE ON LANDS THAT ARE NOT TRIBUTARY
TO THE RIVERSIDE NARROWS FOR
AVERAGE OF FIVE-YEAR PERIOD ENDING IN 1963

Extractor	Five-Year Average Ac. Ft.
City of Riverside, including Irrigation Division water extracted by Gage Canal Co. and former Riverside Water Co.	30,657
Meeks & Daley Water Co., Agua Mansa Water Co., and Temescal Water Co., including water received from City of Riverside	13,731
Extractions delivered by West Riverside Canal received from Twin Buttes Water Co., La Sierra Water Co., Agua Mansa Water Co., Salazar Water Co., West Riverside 350" Water Co., and Jurupa Water Co.	5,712
Rubidoux Community Services District	531
Jurupa Hills Water Co.	36
TOTAL	50,667

APPENDIX C
TABLE C-2

EXTRACTIONS FOR USE WITHIN SAN BERNARDINO COUNTY
FROM
SAN BERNARDINO BASIN AREA AND COLTON BASIN AREA
FOR USE ON LANDS NOT TRIBUTARY TO
RIVERSIDE NARROWS FOR AVERAGE OF
FIVE-YEAR PERIOD ENDING WITH 1953

(ALL VALUES IN ACRE FEET)

Entity	San Bernardino Basin Area	Colton Basin Area	Total
Fontana Union Water Co.	14,272	365	14,637
West San Bernardino County Water District	2,961	947	3,908
City of Rialto			700
TOTAL			19,245

APPENDIX D
TABLE D-1

EXTRACTIONS FROM SAN BERNARDINO BASIN AREA
FOR THE AVERAGE OF FIVE-YEAR PERIOD ENDING WITH 1963
FOR USE WITHIN SAN BERNARDINO COUNTY

(ALL VALUES IN ACRE FEET)

Basin	Five Year Avg. 1959-63
Beaumont	10,064
Big Bear	1,171
Borea Canyon	91
Bunker Hill	181,600
City Creek	337
Cook Canyon	197
Devil Canyon	3,326
Devil Creek	42
Lower Cajon	2,090
Little San Creek	15
Lytle	29,364
Mill Creek	11,084
Oak Glen	935
Plunge Creek	1,265
Santa Ana	1,790
Strawberry Creek	291
San Timoteo	2,272
Waterman Canyon	367
Yucaipa	13,837
Upper Basin Total	260,139
Less: Beaumont	
Oak Glen	
San Timoteo	27,107
Yucaipa	
Subtotal	233,032
Less Big Bear	1,171
Subtotal	231,861
Less extractions for use outside San Bernardino County	60,897
Extractions from San Bernardino for use in San Bernardino County	170,964

APPENDIX D
TABLE D-2

EXTRACTIONS FROM
COLTON BASIN AREA FOR AVERAGE OF
FIVE-YEAR PERIOD ENDING WITH 1963
BY SAN BERNARDINO AND RIVERSIDE COUNTY ENTITIES
FOR USE WITHIN EACH COUNTY

(VALUES IN ACRE FEET)

Extractor	Place of Use		Total
	San Bernardino Co.	Riverside Co.	
San Bernardino County Entities	8,480	0	8,480
Riverside County Entities	147	3,349	3,496
TOTAL EXTRACTIONS	8,627	3,349	11,976

APPENDIX D
TABLE D-3

EXTRACTIONS FROM
RIVERSIDE BASIN AREA IN SAN BERNARDINO COUNTY
FOR AVERAGE FIVE-YEAR PERIOD ENDING WITH 1963
BY SAN BERNARDINO AND RIVERSIDE COUNTY ENTITIES
FOR USE WITHIN EACH COUNTY

(VALUES IN ACRE FEET)

Extractor	Place of Use		Total
	San Bernardino Co.	Riverside Co.	
San Bernardino County Entities	9,582	0	9,582
Riverside County Entities	3,929	20,191	24,120
TOTAL EXTRACTIONS	13,511	20,191	33,702

APPENDIX D
TABLE D-4

EXTRACTIONS FROM
SAN BERNARDINO BASIN AREA, COLTON BASIN AREA
AND RIVERSIDE BASIN AREA USED WITHIN
RIVERSIDE COUNTY FOR THE AVERAGE
FIVE-YEAR PERIOD ENDING WITH 1963

(ALL VALUES IN ACRE FEET)

Basin	Five-Year Average
San Bernardino Basin Area	60,897
Colton Basin Area	3,349
Riverside Basin Area in San Bernardino County	20,191
Riverside Basin Area in Riverside County	30,044
TOTAL	114,481

Appendix

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SURR & HELLYER
Attorneys at Law
599 Arrowhead Avenue
San Bernardino, California
Telephone: TUrner 4-4704

Attorneys for Lytle Creek Water and Improvement Company and Citizens Land and Water Company of Bloomington

James A. Stone
Entered Dec 22 1961
B. 167 22
V. DENNIS WARDLE Clerk
By [illegible]
DEPUTY

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

THE LYTLE CREEK WATER AND IMPROVEMENT COMPANY, a corporation, Plaintiff, vs. FONTANA RANCHOS WATER COMPANY, a corporation; HIGHLAND AVENUE WATER COMPANY, a corporation; CITIZENS LAND AND WATER COMPANY OF BLOOMINGTON, a corporation; CITY OF RIALTO, a municipal corporation; and CITY OF COLTON, a municipal corporation; et al., Defendants.	No. 81264 - DECREE

WHEREAS, there has been filed in the above-entitled action a Stipulation for Judgment duly executed by and on the part of each and all of the following named parties to said action (who are collectively hereinafter referred to as "stipulating parties"), to-wit: The Lytle Creek Water and Improvement Company, a corporation (hereinafter referred to as "Lytle Creek"); Citizens Land and Water Company of Bloomington, a corporation (hereinafter referred to as "Citizens"); Fontana Union Water Company, a corporation (hereinafter referred to as "Fontana Union"); City of Colton, a municipal corporation (hereinafter referred to as "Colton"); City of Rialto, a municipal corporation (hereinafter referred to as "Rialto"); and Semi-Tropic County Water District, a county water district organized and existing under the California County Water District Law (hereinafter referred to as "Semi-Tropic"); and

WHEREAS, the Fontana Union was sued herein as John Doe

SURR & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

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Company No. 1 a corporation, and the Complaint herein should be amended accordingly; and

WHEREAS it appears that Semi-Tropic should be joined as a defendant in this action; and

WHEREAS, the action has been dismissed as to each of the defendants Fontana Ranchos Water Company, a corporation, and Highland Avenue Water Company, a corporation; and

WHEREAS, the Court has heard and considered evidence on the part of the various stipulating parties; and

WHEREAS the parties have in said Stipulation for Judgment waived Findings of Fact and Conclusions of Law;

NOW, THEREFORE, IT IS HEREBY ORDERED, ADJUDGED, AND DECREED as follows:

1. The Complaint herein is hereby amended to set forth the true name of the defendant John Doe Company No. 1, a corporation, which is Fontana Union Water Company, a corporation.

2. Semi-Tropic County Water District is hereby joined as a defendant in this action.

3. As used herein the terms listed below shall have the respective meanings next following them, viz:

(a) "Rialto Basin" or "Basin" shall mean that certain territory in the County of San Bernardino, State of California, which is more particularly described on Exhibit "1".

(b) "Year" shall mean a twelve month period commencing on October 1 and ending on the next following September 30.

(c) "Acre Foot" of water shall mean that quantity of water which will cover one acre to a depth of one foot, also being 43,560 cubic feet, and which also is equal to a flow of 25.208 miner's inches of water for 24 hours.

4. Except as provided herein no stipulating party shall have any priority to take water from the Basin, and the rights of the parties to take

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water from the Basin as between themselves are set forth herein.

5. Subject to the pro rata reductions hereinafter set forth, the amount of water in acre feet to which the stipulating parties are respectively entitled to extract from the Basin in each year are as follows:

Colton	3,010 acre feet
Rialto	1,580 acre feet
Citizens	3,260 acre feet
Fontana Union	550 acre feet
Lytle Creek	3,600 acre feet
Semi-Tropic (WVWD)	-0- acre feet

6. The following described wells in the Basin are designated and referred to herein as index wells for the purpose of determining the elevation above sea level of the ground waters within the Basin. These wells are as follows:

(a) "Duncan Well" - presently owned by Rialto, having State Location No. 1S/5W-3A1, State Serial No. D-1084, located 109 feet South of the center line of Baseline and 233 feet West of the center line of Cactus Avenue.

(b) "Willow Street Well" - presently owned by Lytle Creek, having State Location No. 1S/5W-2K1, State Serial No. D-1085, located 202 feet East of the center line of Willow Street and 133 feet North of the center line of Victoria Avenue.

(c) "Boyd Well" - presently owned by Citizens, having State Location No. 1S/5W-12L1, State Serial No. D-1095, located 109 feet West of the center line of Eucalyptus Street and 155 feet North of the center line of Wilson Street.

For the purpose of determination of the elevation of water above sea level in the said index wells, the elevation above sea level of each of the index wells is established as follows:

(a)	"Duncan Well"	1352.79
(b)	"Willow Street Well"	1287.00
(c)	"Boyd Well"	1177.19

If for any reason any or all of said wells shall not be available

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for measurement the identity and location of a substitute index well or wells may be determined by a written stipulation executed by at least three-fourths in number of the stipulating parties (or their successor(s) in interest) and filed in this action, or in default of said stipulation, by order of this Court.

The elevation of the water level above sea level of each of the index wells shall be measured in each of the months of March, April, and May in each year. Each stipulating party shall be entitled from time to time to designate one individual to be present and observe such measurements. Measurements shall be made by the owners of the respective wells or such other person, firm or corporation which three-fourths in number of the stipulating parties shall designate to do so. Such measurements shall be made at such times as the index well measured is not being pumped and has not been pumped within the preceding twenty-four hours.

7. As used herein the term "spring-high water level" for a year at each of the index wells shall mean the highest elevation in feet above sea level of the surface of the water table which shall be measured in each respective index well at any one of the monthly measurements during either March, April, or May.

In any year in which the average of the elevation of the spring-high water level in the three index wells is above elevation 1002.3 feet above mean sea level, no stipulating party shall be limited in the amount of water which may be pumped from the Basin. However, no stipulating party shall acquire any additional right to extract water from the Basin by reason of extracting more than such party is entitled under paragraph 5 above.

In any year in which the average of the elevations of the spring-high water level in the three index wells is between 1002.3 feet above mean sea level and 969.7 feet above mean sea level, each party shall be entitled to pump from the Basin in such year only the amount of water to which such party is entitled as specified in paragraph 5 above.

In any year in which the average of the elevations of the spring-high water level in the three index wells is below 969.7 feet above mean sea level, then the amount of water which the stipulating parties shall

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AGREEMENT

THIS AGREEMENT is made this 1st day of August, 1961, by and between LYTLE CREEK WATER AND IMPROVEMENT COMPANY, a corporation (hereinafter referred to as "Lytle Creek"), CITIZENS LAND AND WATER COMPANY OF BLOOMINGTON, a corporation (hereinafter referred to as "Citizens"), CITY OF RIALTO, a municipal corporation (hereinafter referred to as "City"), and SEMI-TROPIC COUNTY WATER DISTRICT, a county water district organized and existing under the County Water District Law of the State of California (hereinafter referred to as "District").

Recitals

1. Citizens, City and District concurrently herewith are entering into a stipulation for judgment (hereinafter referred to as "Citizens stipulation") embracing some, but not all, of the matters set forth in this agreement, in Case No. 101528 in the Superior Court of the State of California, in and for the County of San Bernardino, a copy of which is attached hereto marked Exhibit "A" and hereby incorporated herein.

2. Lytle Creek, City, and District concurrently herewith are entering into a stipulation for judgment (hereinafter referred to as "Lytle Creek stipulation") embracing some, but not all, of the matters set forth in this agreement, in Case No. 101512 in the Superior Court of the State of California, in and for the County of San Bernardino, a copy of which is attached hereto, marked Exhibit "B" and hereby incorporated herein.

3. Lytle Creek, District, Citizens, and City, together with certain other parties named therein, are concurrently herewith entering into a stipulation for judgment (hereinafter referred to as "Rialto Basin stipulation") embracing the matters raised by the pleadings in Case No. 81264 in the Superior Court of the State of California, in and for the County of San Bernardino, a copy of which stipulation is attached hereto, marked Exhibit "C" and hereby incorporated herein.

4. As used herein the term "water supply and distribution assets" shall refer to and mean real and personal property used in the production, treatment,

storage, and distribution of water, including but not limited to wells, reservoirs, water treatment facilities, pumping plants, pipelines, and appurtenances.

5. It is the contemplation of the parties in entering into this agreement that at a date prior to December 31, 1963, District will acquire all of the water rights and substantially all of the water supply and distribution assets of Lytle Creek and Citizens except those being reserved and set over to the City by this agreement and the exhibits hereto.

6. The parties desire to enter into various supplemental agreements which become necessary by reason of the judgments to be entered pursuant to said stipulations and the potential acquisition of said assets of Citizens and Lytle Creek by the District to become effective upon the date that the aforesaid assets shall be acquired by District, said date hereinafter called the "~~effective~~ Feb 28th date". The various terms defined in the various stipulations for judgment shall have the same meanings herein unless the context shall otherwise clearly require.

7. City presently owns 711 shares out of a total of 3,237 shares of the issued and outstanding shares of stock of Lytle Creek.

8. City presently owns 687-1/2 shares out of a total of 4,716 shares of the issued and outstanding shares of stock of Citizens.

Operative Provisions

NOW, THEREFORE, in consideration of the premises and the hereinafter mentioned agreements and conditions, the parties agree as follows:

FIRST: Pending the effective date, neither the Lytle Creek nor the Citizens stipulation for judgment shall be filed with the Court, and said stipulations shall be of no force or effect until the effective date. Thereafter, the stipulations may be filed with the Court by any party thereto, and judgment entered thereon without necessity of further proceedings.

SECOND: The Rialto Basin stipulation may be filed with the Court, and said stipulation shall be immediately effective as a stipulation for judgment, and judgment may be entered thereon at the instance of any party thereto without necessity of further proceedings.

THIRD: Notwithstanding any of the foregoing, if the District

Appendix

G

S. 62026.05
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Judgment

In the Superior Court of the State of California
in and for the County of San Bernardino

CITY OF SAN BERNARDINO,
a municipal corporation,

Plaintiff.

vs.

FONTANA WATER COMPANY, a corporation, FONTANA UNION WATER COMPANY, a corporation, FONTANA POWER COMPANY, a corporation, FONTANA FARMS COMPANY, a corporation, FONTANA COMPANY, a corporation, LYTLE CREEK WATER AND IMPROVEMENT COMPANY, a corporation, CITIZENS LAND AND WATER COMPANY OF BLOOMINGTON, a corporation, RIVERSIDE HIGHLAND WATER COMPANY, a corporation, RANCHERIA WATER COMPANY, a corporation, MUTUAL LAND AND WATER COMPANY OF RIALTO, a corporation, TERRACE WATER COMPANY, a corporation, THE GAGE CANAL COMPANY, a corporation, RIVERSIDE TRUST COMPANY, LIMITED, a corporation, RIVERSIDE

No. 17030

ORANGE COMPANY, LIMITED, a corporation, CITY OF COLTON, a municipal corporation, GATE CITY ICE AND PRECOOLING COMPANY, a corporation, COLTON CITY WATER COMPANY, a corporation, MEEKS AND DALEY WATER COMPANY, a corporation, FONTANA LAND COMPANY, a corporation, JOHNHUB WATER COMPANY, a corporation, FONTANA DEVELOPMENT COMPANY, a corporation, NORTH COLTON WATER COMPANY, a corporation, LAWSON WELL COMPANY, a corporation, ALTA VISTA WATER COMPANY, a corporation, CLARA VISTA WATER COMPANY, a corporation, ORCHARD MUTUAL WATER COMPANY, a corporation, EAST RIVERSIDE WATER COMPANY, a corporation, JAMES BARNHILL, JOHN DOE, RICHARD ROE, SAM BLACK, JOE WHITE, SAM WHITE, CHARLES WHITE, TOM BROWN, SARAH BROWN, CHARLES BROWN, MARY BROWN, CHARLES LOW and JOHN LOW, and RIALTO DOMESTIC WATER COMPANY, a corporation,

Defendants.

WHEREAS there has been filed in this action a stipulation for judgment, duly executed by and on the part of the plaintiff above named and by and on the part of each and all of the following named defendants in this action, to-wit: Fontana Water Company, a corporation;

aggregate, (inclusive of said Lytle Creek Water) to 325 inches of water, and said plaintiff shall not be entitled to divert, at any time, from said Region, an amount of water in excess of said 325 inches. Of said quantity of water, 225 inches and no more may be pumped or diverted from that certain tract of land in said Region, comprising 10.09 acres, and forming a part of tract known as the "McKenzie Tract" (said tract of 10.09 acres being more particularly described in that certain deed running from William L. McKenzie, and others, to said plaintiff, and recorded in Book 109 of Deeds, at page 303 thereof, in the office of the County Recorder of said San Bernardino County), and none of said 225 inches shall ever be diverted by plaintiff from any other portion of said Region.

Said plaintiff is also the owner of the right to take, divert and use water from that portion of the San Bernardino Valley, lying east of the easterly boundary line of said Lytle Creek Region and east of a line beginning at the point of intersection of the State Highway with the south boundary line of Section 34, Township 2 North, Range 5 West, S. B. B. & M., and running thence to the northwest corner of said Section 34, and north of the center line of Mill Street, extended east to Sterling Avenue, and from streams tributary to said portion of said valley, situate in said portion of said valley, either from the surface flow of such streams, or from wells bored or to be bored in said portion of said valley, to such extent as may be reasonably necessary to supply the needs of said city and its inhabitants with water for supplying needs and purposes within said City. The right of said plaintiff to take water from the surface flow of Lytle Creek, to the extent of 100 inches, shall

not be affected or diminished by any claims of the Fontana Companies, or any of them to salvage water, by reason of any water of Lytle Creek being conducted or conveyed in or through pipe lines, or conduits of any kind.

X.

That, subject to the provisions of this paragraph, the maximum quantity of water which said Rialto Domestic Water Company shall be, and is entitled to take from said Region and use beyond the confines thereof, is such quantity of water which, when added to the water said Company is entitled to have delivered to it from said Lytle Creek, will amount in the aggregate (inclusive of said Lytle Creek Water) to 143.22 inches of water, and said Company shall not be entitled to divert, at any time from said Region, an amount of water in excess of said quantity hereinbefore in this paragraph specified. Of said quantity of water, 100 inches and no more may be pumped from said Region by said Company, provided that:

(a) None of said 100 inches of water shall be taken from any well or water development situate south of a line located parallel to, and situate three-fourths of a mile north of, Highland Avenue.

(b) The right of said Company to so pump and take said one hundred inches of water, shall be exercised only to such extent as shall be necessary to supply the City of Rialto, and the inhabitants thereof, with water for municipal and domestic uses and purposes, and for the irrigation of flowers, trees and lawns, within said City, and then only during such times as the 43.22 inches of water (now supplied by said Company to the

inhabitants of said City) is inadequate, or unsuitable for such purposes or uses.

(c) None of said 100 inches of water shall, at any time, be used outside of the now, or hereafter existing corporate limits of said City of Rialto, except to the extent that said 43.22 inches is now being used outside said City.

(d) Nothing in this Paragraph X contained shall be construed as vesting in said Company the right to take any portion of said 100 inches of water from any well or water development, without the consent of the owner of the land on which such well or water development is situated.

(e) The right to pump and take said 100 inches of water from said region shall be exercised only in the event such right shall be transferred to the City of Rialto.

(f) The water derived from said 100 inches water right, other than water supplied for fire hydrants, sewers, stores and buildings, not used for dwellings, shall not be furnished to the inhabitants of said City of Rialto, except through meters and when charged for at meter rates.

XI.

That the maximum quantity of water which said Improvement Company shall be, and is entitled to take from said Region, and use beyond the confines thereof, is, such quantity of water, which when added to the water said Company is entitled to have delivered to it from said Lytle Creek, will amount in the aggregate (inclusive of said Lytle Creek Water), to 1026.23 inches, and said Improvement Company shall not be en-

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titled to divert at any time, from said Region, an amount of water in excess of said quantity in this paragraph hereinbefore specified. Of said quantity of water, only 700 inches may be pumped and diverted from said Region, by said Improvement Company, except during such periods when the quantity of water said Company is deriving from said Lytle Creek, is temporarily reduced to a quantity of less than 326.23 inches, during which periods additional water may be pumped and diverted from said Region by said Company, but only to an extent sufficient to supply such deficiency of said Lytle Creek Water, and only so long as such deficiency continues. Said pumping of said 700 inches of water by said Improvement Company shall be confined to the Ferguson Ranch (said Ranch being the real property described in that certain deed, dated November 20th, 1908, and executed by Fontana Development Company, and recorded in the office of the County Recorder of said San Bernardino County, in Book 429 of Deeds, page 103 thereof), and said Company is not entitled to pump any water from any other part of said Region.

XII.

That the maximum quantity of water, which said Mutual Company shall be, and is entitled to take and conduct from said Region, and use beyond the confines thereof, is 125 inches of water, and said Mutual Company shall not be entitled to divert at any time, from said Region, an amount of water in excess of said 125 inches, all of which said quantity of water may be pumped by said Company from said Region, but all of said water shall be taken from wells, or water de-

velopments situate south of Highland Avenue, and north of Base Line.

XIII.

That the maximum quantity of water which said Riverside Company shall be, and is entitled to take from said Region, and use beyond the confines thereof, is 450 inches of water, and said Riverside Company shall not be entitled to divert at any time, from said Region, an amount of water in excess of said 450 inches, all of which said quantity of water may be pumped or diverted by said Company from said Region, but all of said water shall be taken from wells or water developments situate south of Highland Avenue, and north of Base Line.

5.82 mgd

XIV.

That the maximum quantity of water which said Rancheria Water Company shall be, and is entitled to take from said Region, and use beyond the confines thereof, is 120 inches of water, and said Company shall not be entitled to divert at any time from said Region, an amount of water in excess of 120 inches, all of which said quantity of water may be pumped or diverted by said Company from said Region, but all of said water shall be taken from wells or water developments, situate south of Highland Avenue, and north of said Fourth Street.

Rancheria
120"
1.55 mgd

XV.

That the maximum quantity of water which said Citizens Company shall be, and is entitled to take from

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said Region, and use beyond the confines thereof, is 1300 inches of water, and said Citizens Company shall not be entitled to divert, at any time, from said Region, an amount of water in excess of said 1300 inches, all of which said quantity of water may be pumped or diverted by said Company from said Region, provided that:

(a) No more than 200 inches shall ever be diverted or pumped by said Citizens Company, from that part of said Ferguson Ranch specified in that certain deed, executed by the Semi-Tropic Land and Water Company, to the Rialto Irrigation District, and recorded in the office of the County Recorder of said San Bernardino County, in Book 187 of Deeds, at page 213 thereof, and

(b) No more than 585 inches shall ever be diverted from said Region by said Citizens Company, from the northeast quarter of Section 36, Township 1 North, Range 5 West, S. B. B. & M., and

(c) No more than 150 inches shall ever be diverted or pumped by said Citizens Company, from that certain tract of land, situate in said Region, described as follows, to-wit:

Commencing at a point on the Base Line two thousand and fifty feet east of the southwest corner of Township 1 North, Range 4 West, San Bernardino Base and Meridian, and running thence due east 250 feet; thence north 14 degrees west, 344 feet; thence north 24 degrees 10 minutes West, 839.7 feet; thence north 39 degrees, 56 minutes west, 1096 feet; thence due west 674 feet; thence south 8 degrees, 20 minutes east, 500 feet; thence south 34 degrees, 15 minutes east, 1119 feet; thence south 58 degrees, 35 minutes east, 998-7/10 feet, to the place of beginning.

Appendix

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S62-026-00
4/98

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

IN AND FOR THE COUNTY OF LOS ANGELES.

LYTLE CREEK WATER AND IMPROVEMENT

COMPANY (a corporation),

Plaintiff,

vs

GRAPELAND IRRIGATION DISTRICT, Lytle Creek Water Company (a corporation), A.B. Hotchkiss, W.G. Daniels, Eliza Osterhout, J.D.Osterhout, W.D.Nevin, Marie Nevin, J.R. Nevin, R.J. Brannaugh, William H. Weston (sued by the name of William Westor) Theodore Williams, R.H.Gillespie, John O. Williams (sued by the name of John C. Williams), Irwin Fayette Carles (sued by the name of Carter), John Doe Ensign, Richard Roe Foley, Nelson R. Benson (sued as Peter Doe Nelson), C.B. Hughes, John H. Morgan (sued as John Morgan) James A Byrne (sued as J.H.Bryne) John Ramsbottom, W.D.Hunt, John H. Paine, J.O.Turley, John N. Miller, (sued as J.N.Miller), S.N.Johnston (sued as J.N.Johnston), Dr. G.A. Rene, Harvey Bradshaw (sued as H. Bradshaw) Joseph A. Scott, E.T.Meyers, John Doe, Peter Doe, Samuel Doe, Henry Doe, James Doe, John L. Campbell, John L. Adams, A.G.Pier, Levi N. Breed, (sued as L.N.Breed), Charles B. McClure (sued as John Doe McClure) T.H.Stewart, (sued as William Roe Stewart) Edward F. Phelan (sued as John Doe Phelan) Tom O. Carter,

Defendants.

No.20,790

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FINDINGS OF FACT AND CONCLUSIONS OF LAW.

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This cause came on regularly to be tried, before the Court, without a jury, upon the Complaint of the Plaintiff, the Answers thereto of the defendants C.B.Hughes, The Grapeland Irrigation District, C.H.Vosburgh, H.N.Milligan,

J.A. Scott, A.G. Pier, Olive Byrne and P.J. Stockman, Executors of the Estate of M. Byrne, deceased, Lytle Creek Water Company, Eliza Osterhout, J. Osterhout, J.L. Campbell and the amendments thereto, and the supplemental answer of A.B. Hotchkiss; and the cross complaint of C.H. Vosburgh, and the answers of the Lytle Creek Water Company thereto, and the answer of the Lytle Creek Water and Improvement Company, of the Grapeland Irrigation District, of J.S. Milligan, J.L. Campbell, and the amended answer of Tom O. Carter (substituted in the place of H.N. Milligan); and the cross complaint of the Lytle Creek Water Company and the answer thereto of the Grapeland Irrigation District, C.H. Vosburgh and C.H. Hughes, and of the plaintiff, the Lytle Creek Water and Improvement Company and of J.L. Campbell and J.N. Miller and A.B. Hotchkiss; and also the cross complaint of J.L. Campbell, and the answer thereto of the Lytle Creek Water Company and of the Grapeland Irrigation District and of the plaintiff, the Lytle Creek Water and Improvement Company and of Eliza A. and J.D. Osterhout, Olive A. Byrne, and P.J. Stockman Executors of Estate of M. Byrne, deceased, J.A. Scott, A.G. Pier, E.T. Myers, J.L. Adams, and Tom O. Carter; and also upon the amendment to the answer of Campbell and Amendment to the answer of the Lytle Creek Water Company to the complaint of plaintiff herein; and also the complaint in intervention of John N. Miller, and the answer of the plaintiff thereto.

And the cause having been submitted to the Court upon the pleadings and the evidence taken in the case, and the

Fork, or the waters flowing undergrough, or in any underground springs in the said Middle Fork, or in any of the waters that may be developed along said Fork, or in the Canyon through which the same flows, to the extent of two thousand inches - measured under a four inche pressure, or to any other extent or any other right whatever except as herd nafter specifical ly found.

-LXVIII-

The Court now finds the rights of the parties to this action in the waters of Lytle Creek to be as follows:

The plaintiff is the owner of, and entitled to divert and use, ninety-two inches of water, constant flow, measured under a four inch pressure, as successor to that pro portion of the ninety-six inches, commonly known as the "Lord Right; and in order to obtain the said ninety-six inches, delivered at the Lord Gate,(the place at which the water was formerly delivered), it would require one hundred and twenty-eight (128) inches constant flow, measured under a four inch pressure to pass the intake of the plaintiff's cement ditch, at the mouth o the canyon, to furnish said ninety-six inches at the Lord Gate; that the right to said constant flow of one hundred and twenty-eight inches of water, measured under a four inch pressure, at plaintiff's intake is, superior and paramount to the rights of all other parties in this action to any of the waters of said Creek;-

And that of said one hundred and twenty-eight inches, the plaintiff is the owner of, and entitled to, one hundred and twentythree (123) inches ther of constant flow, measured under a four inch pressure, of the flow of Lytle Creek at the

said intake of plaintiff's cement ditch; and is also entitled to one (1) inch further thereof for the delivery through said cement ditch of said other four (4) inches to the owners thereof, which delivery plaintiff may make.

2. The plaintiff is entitled to divert and use out of the waters of said Lytle Creek flowing at the said intake two twenty (20) inches, constant flow, measured under a four inch pressure in addition to the one hundred and twenty-three (123) inches above mentioned, which twenty (20) inches, constant flow, the said plaintiff is entitled to as a riparian owner, the said twenty (20) inches, being the amount found by the Court to be reasonably pertaining to the said riparian lands which lie above the point where the Lytle Creek Water Company and its predecessors diverted the water of said Lytle Creek to the amount next hereinafter found, and as against this riparian right, which the plaintiff has succeeded to, to-wit, the twenty(20) inches of water constant flow, measured under a four inch pressure, the said Lytle Creek Water Company its stockholders and their ancestors, predecessors, and grantors, have not acquired any right by prescription or otherwise and the plaintiff's right to the said twenty(20) inches of water by reason of the said riparian right, is next in order after the said one hundred and twenty-eight (128) inches of the Lord right, and is paramount and superior to the rights of all other parties in this action.

3. The next right in order of priorities, is the right of John L. Campbell; and the Court now finds that the said defendant, John L. Campbell, is the owner of and entitled to divert and use one hundred and fifty (150) inches of water, constant flow, delivered at the Lord Gate; and the Court now

further finds that in order to supply this right at that point, it would be necessary to permit a much greater number of inches , the precise quantity of which the Court is unable to determine, to flow across the intake of the plaintiff's cement ditch but not less than two hundred (200 inches when the said one hundred and fifty are so taken from the natural course of the stream; and the Court finds ,that the said John L. Campbell is entitled to the said amount of water,to-wit, one hundred and fifty (150) inches, constant flow, measured under a four inch pressure at the Lord Gate, and which amount shall be delivered by the plaintiff and its successors without charge through said cement ditch or the other conduit hereinafter mentioned at said point; but in the event the plaintiff or its successor shall at any time fail or refuse to so deliver the said amount through said cement ditch or other conduit at said Lord Gate, than the plaintiff shall permit to flow down past its said intake, such an amount of water not exceeding six hundred and fifty inches as that the same will be amply sufficient (but without diminishing the two aforesaid prior and paramount rights hereinbefore found to be vested in plaintiff), to furnish to said Campbell or his successors the said full flow of one hundred and fifty inches of water delivered and measured under a four inch pressure at said Lord Gate.

4. That The right of the Lytle Creek Water Company and its grantors and its predecessors, so acquired by prescription, as aforesaid, and including what is known as the "Lord water" and the Milligan and Russcott water rights, was seven hundred and twenty-five (725) inches, measured at the head of the Old Zanja. From this foregoing amount of seven hundred and twenty-five inches, one hundred and twenty-

(120) inches, (the amount which is hereby found necessary to supply the Lord water at the head of the said Old Zanja), is to be deducted, and leaving six hundred and five (605) inch inches, measured and taken under the four inch pressure, if t taken at the intake of said Old Zanja, to which the Lytle Creek Water Company and the owners of said Milligan and Musoott water rights, had so acquired a title by prescription and adverse use;-

But the Court finds that there is a loss between plaintiff's intake and the points along the Old Zanja through which the same was formerly delivered by the Lytle Creek Water Company in delivery by the Lytle Creek Water Company of the four hundred and fifty inches at plaintiff's intake measured under a four inch pressure hereinafter found in it, including the Milligan and Musoott water rights, of forty-five (45) inches also measured under the four inch pressure;- and that in order to deliver said six hundred and five (605) inches above mentioned it will require a constant flow of six hundred and fifty (650 inches measured under a four inch pressure to flow past the plaintiff's intake.out.

Out of this last named amount of six hundred and fifty (650) inches measured under a four inch pressure, at the plaintiff's intake two hundred (200) inches being the equivalent at plaintiff's intake of the Campbell right described in paragraph 2 of this finding, and taken at the last named intake, is to be deducted thereby leaving to the Lytle Creek Water Company (and including the Milligane and Musoott water rights,) four hundred and fifty (450) ~~see~~ inches, constant, at plaintiff's intake, and measured under a four inch pressure, at that point, if the same be by plaintiff allowed to flow down past the said intake but if the plaintiff chooses to deliver the same through its

cement ditch to said Lytle Creek Water Company in the manner, and at the same ~~time~~ points thereon, where the said waters of said creek have been heretofore delivered, then in that event the plaintiff may divert at its said intake the said entire amount of four hundred and fifty (450) inches, and keep use, anjoy, own and have for its own benefit, all thereof, over and above the said amount of four hundred and five (405) on delivering to said Lytle Creek Water Company, (for the benefit of said Company, and its stockholders and including the owners and holders of said Milligan and Muscott water rights) through its cement ditch, at the existing turnouts thereon, or the other points on the same, where said waters have heretofore been accustomed to be delivered to sail Lytle Creek Water Company or its stockholders or the owners of said Milligan and Muscott water rights in such amounts and at such of the above points as may be designated by the Lytle Creek Water Company;-

But if said plaintiff shall not choose ~~said~~ to deliver said water amounting of said four hundred and five inches to said Lytle Creek Water Company, through its cement ditch, as aforesaid, then and in that event, said Lytle Creek Water Company shall be entitled to have said full flow of four hundred and fifty (450) inches measured under a four inch pressure, flow down past the plaintiff's said intake, in order to supply to it said amount of four hundred and five (405) inches at the intake of its said Old Zanja.

And the Court further finds, that those certain rights hereinbefore described as the Milligan Water Right, and the Muscott Water Right, are included in the amount of water

hereby awarded to the said Lytle Creek Water Company, and that said Milligan Water Right, is vested in Tom O. Carter, as the successor and grantee of said H.H.Milligan(Tom O. Carter having been substituted herein, as a party in lieu of said H.H.Milligan) and that said Muscott water right is vested in some party or its assigns, neither of whom is a party to this action.

5. The next right in order of priority is the right of the plaintiff, as the grantee of the riparian rights pertaining to the said Muscupiabe Rancho, granted to it with the tract of land, part of the Muscupiabe Rancho, hereinbefore described; and the Court finds that the plaintiff is not entitled to any riparian rights, except those which pertain to the said portion of the Muscupiabe Rancho, and that over and above the twenty inches constant flow, hereinbefore referred to, said plaintiff is; next after the prescriptive right acquired by the Lytle Creek Water Company, (including said Milligan and Muscott rights) as next hereinbefore found, as the successor of the riparian rights of the said lands, part of the Muscupiabe Rancho entitled to six hundred inches of water measured under a four inch pressure, at, and to be diverted at plaintiff's said intake.

6. The next right in order of priority, is the right of the plaintiff as an appropriator, and the Court finds, that prior to any other appropriation or acquisition of any right in or to the waters of Lytle Creek, or by or in any of the other defendants except as in above determined, this plaintiff and its grantors and predecessors entered upon said

Each note being the for the amount of six thousand dollars and said notes to bear interest at the rate of six per cent per annum, payable semi-annually, and it seeming to be the best interest of this Company to accept said offer, said offer was accordingly accepted and the transfer of such right duly made and the notes for the purchase price for said right duly accepted and are now held by this Company.

Respectfully submitted, Feb. 20/92.

Joseph L. Merrill, :
H.M.Van Frank, :
W.D.Humphrey, : Trustees.
A.L.Wright, :
J.F.Harmon, :

That thereupon the following resolution was offered, seconded and unanimously adopted by the vote of all the stockholders present, and represented at said meeting, which resolution was in words and figures, as follows, to-wit:

"Resolved that all the acts of the Board of Trustees of this Corporation adopted since the annual meeting of this Corporation held February 14th 1891, be and the same are hereby approved, ratified and declared the acts of this Corporation."

-LXXV-

That the defendant, the Grapelam Irrigation District, since a time prior to the 17th day of February 1892, has been and at the time of the commencement of this action, it was and now is, and irrigation district organized and existing under and in pursuance of the Acts of Legislature of the State of California, entitled. "An Act to provide for the organization and Government of Irrigation Districts, and to provide for the acquisition of water and other property, and for the distribution of water thereby, for irrigation purposes". Approved March 7th and Amendments thereto.

The defendant the Lytle Creek Water Company and the defendant John L. Campbell are the owners of the several ditches and rights of way alleged in their respective answers to belong to them.

As

C O N C L U S I O N S O F L A W.

from the foregoing Facts, the Court finds, that a Decree be made in this cause, adjudging,

1. That the plaintiff is entitled to divert the waters of Lytle Creek, first and prior to all other parties, the said one hundred and twenty-three (123) inches, constant flow measured under a four inch ~~flow~~ pressure, taken at the intake of its cement ditch; and if it diverts the entire one hundred and twenty-eight (128) inches of the Lord Right, it is entitled to the full flow and use of one hundred and twenty-four (124) inches thereof, on delivering four (4) inches thereof to the owners of same at the Lord Gate, which four inches is vested as stated in Finding XIV hereof.

2. That the plaintiff is entitled, next, after the said one hundred and twenty-eight inches, to twenty (20) inches of water constant flow, measured under a four inch pressure at plaintiff's intake, as the grantee of the riparian right to the portion of the Muscupiabe Rancho lying above the head of the Old Zanja, the point of the Lytle Creek Water Company's diversion, not affected by the adverse use of the Lytle Creek Water Company, or its stockholders, or the owners

of said Milligan or Wiscott Water Rights or their predecessors or assigns.

3. That the defendant John L. Campbell, is entitled to one hundred and fifty (150) inches of water, constant flow, measured under a four inch pressure, delivered at the Lord Gate, unless the same be delivered by the plaintiff through its said cement ditch or other conduit at said Lord Gate; but in the event the plaintiff or its successor shall at any time fail or refuse to so deliver the said amount through said cement ditch or other conduit at said Lord Gate, then the plaintiff shall permit to flow down past its said intake, such an amount of water, not exceeding six hundred and fifty (650) inches, as that the same will be amply sufficient (but without diminishing the two aforesaid prior and paramount rights hereinbefore found to be vested in plaintiff) to furnish to said Campbell or his successors, the said full flow of one hundred and fifty inches of water, delivered and measured under a four inch pressure at said Lord Gate.

4. That the defendant, Lytle Creek Water Company is entitled to take for its own benefit and that of its stockholders (and including the Milligan and Wiscott water rights) four hundred and five (405) inches, measured under a four inch pressure, at the head of the Old Zanja, and in the event said waters are taken at the latter point, is further entitled to have four hundred and fifty (450) inches, measured under a four inch pressure flow past the plaintiff's intake as a constant flow, to supply such amount of four hundred and five (405) inches of water.

But in the event the plaintiff delivers the same through its cement ditch or other conduit, to said Lytle Creek Water

Company is entitled to receive said four hundred and five (405) inches of water measured under a four inch pressure, measured at plaintiff's said intake, from the plaintiff and through said cement ditch or other conduit as stated in Finding LXVIII to be distributed among its stockholders and to the others claiming under the same water right acquired by the same use as the right held by said Lytle Creek Water Company as hereinbefore found in said Finding last named, or in Findings XVI and XXV.

And that the Milligan Water right described in Finding XVI and XXV hereof, and elsewhere mentioned in these Findings is vested in said Tom C. Carter as the successor of said H.H. Milligan.

5. That it be decreed that after the said foregoing rights have been supplied, the plaintiff is then entitled as next in order to six hundred inches of water, constant flow, measured under a four inch pressure, at its plaintiff's said intake, under the riparian rights granted to it.

6. That it be further decreed that the plaintiff is then next entitled to the remainder of the waters of the said Lytle Creek up to two thousand inches, measured under a four inch pressure at its said intake, a constant flow, by it prior appropriation and use of the said waters.

And that it be further decreed that the waters herein decreed to the various parties in the order above stated, may be diverted from the said Lytle Creek by the plaintiff, by means of the plaintiff's said cement ditch or other proper and sufficient conduit that may be hereafter constructed in lieu of this said cement ditch and delivered by plaintiff, from in such conduit, to the said parties the water to which they

WATER RIGHTS AND THEIR OWNERSHIP

IN LYTLE CREEK

SAN BERNARDINO COUNTY, CALIF.

The rights above mentioned, as they now exist, are determined by and based upon the judgment and findings entered in the motion heretofore pending in the Superior Court of the County of Los Angeles, State of California, No. 20,790 therein, and the Entitled, ---"The Lytle Creek Water and Improvement Company, Plaintiff, versus, the Grapeland Irrigation District, et al., defendants.

The rights as defined under the above mentioned judgment are, in their order of priority -

-I-
WATER RIGHTS

	INCHES
(a) The "Lord Water Right", amounting to -	96.00
(b) The "Lord Salvage Water Right, amounting to -	32.00

-II-

The right commonly known as the "Riparian Water Rights No. 1", amounting to - 20.00

-III-

(a) The right commonly known as the "Muscott Water Right" amounting to - 20.79

(b) The right commonly known as the "Milligan Water Right", amounting to - 2.439

(c) The right commonly known as the "Campbell Water Right", amounting to - 150.00

(d) The right commonly known as the "Campbell Salvage Water Right", amounting to - 50.00

(e) The right awarded to the Lytle Creek Water Company, amounting to - 381.771

(f) The right commonly known as the "Lytle Creek Water Company Salvage Water Right", amounting to - 45.00

-IV-

The right commonly known as "Riparian Water Right No. 1", amounting to - 600.00

-V-

The right commonly known as "Appropriation Water Right, amounting to - 602.00

TOTAL - 2000.00

(Note: There were several other rights adjudicated in and to the waters of Lytle Creek, but all were held to be subsequent and subordinate to the rights hereinabove mentioned, - there being more than 1000 inches flowing in said Creek, during the irrigation season, I have felt it unnecessary to set forth in this paper the rights defined above the first 2000 inches.)

OWNERSHIP

I

(a) Lord Water Right of 96 Inches:

Improvement Company water so-called of 90.64 inches, is owner by -

L.C.W.& I. CO., -	58.69		
Fontana Dev. Co. -	31.95	- Rialto City	
Rene, Roe and King rights are owned by Fontana Dev. Co.			
Jacobs water is owned by L.N. Breed	2.98	- F. Union W.C	
	2.38		96.00

(b) Lord Salvage Water Right of 32 Inches

Owned by -

L.C.W.&I. Co			
Fontana Dev. Co.	20.724		
	11.276	- Rialto City	32.00

(Note: Rights mentioned under this paragraph I are on a parity with each other.)

II

Riparian Water Right No. 1 of 20 Inches

Owned by -

L.C.W.& I. Co.		
Fontana Dev. Co.	12.952	
	7.048	- F.Union & Co.
		20.00

III

(a) The Muscott Water Right of 20.79 Inches

Owned by:

Fontana Dev. Co.	20.79	- F.Union W.C.

(b) The Milligan Water Right of 2.439 Inches

Owned by:

Fontana Dev. Co.	2.439	-F.Union

(c) Campbell Water Right of 150 Inches

Owned by:

A.B. Hubbard	100.00	
Mt. Vernon Owners	50.00	

(d) Campbell Salvage Water Right of 50 Inches

Owned by:

L.C.W.&I. Co.	32.38	
Fontana Dev. Co. Fontana Dev. Co.	17.62	50.00

(e) Lytle Creek Water Company Right of 381.771 Inches

This letter amount is arrived at in the following manner: The L.C. W&I Co. Under the judgment first herein mentioned, was awarded 450.00

Less salvage	45.00	
Less Muscott right	20.79	
Less Milligan right	2.439	68.229
		381.771 In.

The 381.771 inches, so owned by L.C. Water Co. is divided into 714-2/60 shares. Each share, therefore, is the equivalent of 5344/100000 of an inch, or roughly .534 of an inch.

L.C.W.&I. Co. owns 328 shares, equal to inches	175.283	
Fontana Dev. Co. 376-260	201.144)	
V. Yeatte owns 4 shares	2.137)	F. Water Co.
Crestes Pierce owns 6 shares	3.207)	
		381.771

(f) Lytle Creek Enter Co. Salvage Water Right of 45 inches

Owned by:

Fontana Dev. Co.		
L.C.W.& I. Co. (the part necessary to make up its interest as stated herein)	16.806	
	28.194	45.00

TOTAL OF RIGHT III - 650.00

(Note: All rights set forth in subdivisions (a) to (f) of the preceding paragraph III are co-equal, each with the other; and neither is entitled to any precedence or priority as against the other, except that when the water actually flowing in said Creek, measured at the weir located at the intake of the cement canal, is less in amount than 798 inches (being the amount necessary to fully supply the said two prior rights of 148 inches and the rights set forth in said paragraph III), then as between the said "Campbell Water Right and "Campbell Salvage Water Right," and the said Lytle Creek Water Company Water Right of 381.771 inches, said "Campbell Water Right" and "Campbell Salvage Water Right" take precedence of and are a prior claim to that of said Lytle Creek Water Company to the waters then actually flowing in said Creek".

IV

Riparian Water Right No. 2 of 600 inches

Owned by Fontana Development Co. 600.00

(300 F. Water Co.)
(300 F. Union W. Co.)

V

Appropriation Water Right of 602 inches

Owned by Fontana Development Co. (Fontana Union Water Co.) 602.00

2000.00

The use of the letters "L.C.W.&I" seems and intends to refer to the Lytle Creek Water and Improvement Co.

The use of the letters "L.C. Water Co." seems and intends to refer to the Lytle Creek Water Co.

The use of the letters "Fontana Dev. Co." seems and intends to refer to the Fontana Development Co.

The word "Inches" means miners' inches, under a four inch pressure and as defined by law.

(Note by Major Hasbreack - Out of first 2000 inches in creek, F. Union Water Co. owns 871.553 inches and F. Water Co. owns 603.400 inches.)

Under the terms of the agreement of date, March 2nd, 1896, executed between the San Francisco Savings Union and the said Lytle Creek Water and Improvement Company and the deed which was executed and delivered in pursuance of said agreement, the latter Company reserved to itself (as between it and said Savings Union) the first 300 inches of water of stock in the Lytle Creek Water Company (mentioned in said agreement).

So that said L.C.W.& I. Co. owned after the delivery of the papers last mentioned -

500.00 inches

Plus water equivalent of 7 shares of L.C. Water Co. 3.741

Total number of inches -

503.741

As the result of the segregation deal of July, 1900, the L.C.W.& I. Co. granted R.W. Waloh, Trustee, the predecessor of the Fontana Development Co., 881/2500 part of all its water, or the equivalent of -

177.518

Which amount deducted from the above leaves the L.C.W.& I. Co. now entitled to -

326.223 in.

- - - - - - - - - -

Of the rights hereinbefore defined, the said L.C.W.& I. Co. now owns the following portions -

Lord Water Right -	58.69
Lord Salvage Water Right -	20.724
Riparian Water right No. 1	12.952
Campbell Salvage Water Right	32.38
328 shares L.C.W. Co.	175.283
L.C. Water Co. Salvage Water Right	26.194

- - - - - - - - - -

The public records show that the -

RENE water right consisted of the right to the flow of the creek for 12 hours, of a fifty inch stream, commencing on the first Friday in January of each year at 6 a.m. and ending at 6 p.m. of that day and continuing during and between said hours every alternate Friday.

ROE and KING rights consisted of a right to 50 inches of water from the L.C. Water Company ditch, so-called, taken and used through the Lord ditch connecting there-with, for four hours in every seven days.

MILLIGAN right consisted of the right to the flow of the creek one hour and thirty minutes once in each 15-1/2 days, except the Lord Water Right of 83 inches.

MUSCOTT right consisted of the right to the flow of the creek (less the Lord Water of 96 inches) for 12 hours and 47 minutes in each 15-1/2 days, throughout the year.

TOTALS

		INCHES
Water owned by the Lytle Creek Water and Improvement Co:		
As per statement on preceding page --		326.223
Water owned by the Fontana Development Company:		
Lord Water Right	31.95	
Lord Salvage Water Right	11.276	
Rena, Roe & King Water Rights	2.98	
Riparian No. 1	7.048	
Musoott Water Right	20.79	
Milligan Water Right	2.439	
Campbell Salvage Water Right	17.62	
376-2/60 shs. L.C. Water Co.	201.144	
Lytle Creek Water Co. Salvage Water Right	18.806	
Riparian Water Right No. 2	600.	
Appropriation Water Right	602.	
		1516.053
Water owned by L.H. Bread, "Jacobs Water" portion of Lord Water Right		2.38
Water owned by A.G. Hubbard (leased to City of San Bernardino) Campbell Water Right		100.00
Water owned by the Mt. Vernon settlers: Campbell Water Right		50.00
Water owned by Crest. Pierce: 6 shares of L.C. Water Co.		3.207
Water owned by V. Vezetta: 2 shares of L.C. Water Co.		2.137
TOTAL		2000.00

(Signed) THOS. F. KEEFE

Dated February 21, 1903

Appendix

I

OVERVIEW OF
GROUNDWATER AND SURFACE WATER MANAGEMENT
IN THE EAST SAN BERNARDINO VALLEY

DRAFT

October 2005

San Bernardino Valley Municipal Water District

SUMMARY

The San Bernardino Valley Municipal Water District (District) covers a service area of about 325 square miles and contains a population of approximately 600,000 located in southwestern San Bernardino County with a very small portion of its service area in Riverside County. The District spans the eastern two-thirds of the San Bernardino Valley, the Crafton Hills, and a portion of the Yucaipa Valley, and includes the cities and communities of San Bernardino, Colton, Loma Linda, Redlands, Rialto, Bloomington, Highland, Grand Terrace, and Yucaipa. The District is a State Water Contractor (SWC) with an annual entitlement to State Water Project Water of 102,600 acre-feet. In addition to being a SWC, the District has also been given the responsibility of overall groundwater management within its boundary. The District, in conjunction with many of the retail water agencies within its boundary, recently received a grant through Proposition 50 to create an Integrated Regional Groundwater Management Plan (IRGMP). Development of this plan will likely start near the end of 2005. The IRGMP will provide coordination between all of the existing planning documents and legal documents within the District which govern the management of groundwater and surface water. A listing of the *regional* documents is provided below and summarized in Table 1:

Western Judgment

Provisions of the physical solution set forth in the Judgment in Case No. 78426, Western Municipal Water District of Riverside County et al., vs. East San Bernardino County Water District et al., entered April 17, 1969, in the superior Court of the State of California in and for the County of Riverside, established the entitlements and obligations of the San Bernardino Valley Municipal Water District (District) and the Western Municipal Water District (WMWD) with regard to the San Bernardino, Riverside and Colton groundwater basins. The judgment establishes the safe yield of the San Bernardino Basin Area to be 232,100 acre-feet per year. The adjusted right for use within District is 167,238 acre-feet per year. The adjusted right for use within WMWD is 64,862 acre-feet per year. Should the extraction, or withdrawal, of groundwater from the San Bernardino Basin Area exceed the safe yield, the District is obligated recharge an amount equal to the amount the safe yield has been exceeded from an outside source of water. The outside source of water is typically the State Water Project. This judgment is administered by a Watermaster who prepares an annual report that is submitted to the court.

Rialto Basin Decree

On December 22, 1961, a decree, a stipulated judgment, was entered for the Lytle Creek Water and Improvement Company, a corporation, vs. Fontana Ranchos Water Company, a corporation, et al., San Bernardino County Superior Court Case Number 81264. Several of the stipulating parties requested San Bernardino Valley Municipal Water District to monitor the compliance with the decree. The decree specifies the maximum extractions from the basin and establishes three index wells which are to be used to determine the average water surface elevation of the Rialto basin. If the average water surface elevation is below certain levels, then pumping amounts for all parties are reduced. The average water surface elevation is calculated annually.

Consent Decree

This Consent Decree (CD) - among the U.S. EPA, the U.S. Department of the Army, the City of San Bernardino, and the California Department of Toxic Substances Control - resolves claims by the City of San Bernardino and the California Department of Toxic

Substances Control against the U.S. Army over alleged groundwater contamination, and provides funds for the cleanup of the contamination.

Under the settlement, the City of San Bernardino is required to use most of the funds to operate and maintain EPA's groundwater extraction and treatment remedies at the Newmark Groundwater Contamination Superfund Site for up to fifty years. The City of San Bernardino may use some of the funds to build additional treatment plants to expand its water delivery capacity. [1]

The CD provides for development of a groundwater management program, and implementation of institutional controls (IC) to ensure the effectiveness and integrity of the groundwater Interim Remedial Action (IRA) facilities for the Newmark Operable Unit (OU) and Muscoy OU.

On January 1, 2005, an agreement amongst water agencies in the area was adopted for purposes of developing and adopting an Institutional Controls Groundwater Management Program (ICSA). Under the institutional controls groundwater management program (ICGMP), proposed projects planned within the associated Management Zone (the City of San Bernardino) will be assessed, either through the ICSA group or through an ordinance to be adopted by the San Bernardino Municipal Water Department.[2]

Orange County Judgment

The complaint in the case was filed by Orange County Water District on October 18, 1963, seeking an adjudication of water rights against substantially all water users in the area tributary to Prado Dam within the Santa Ana River Watershed, but excluding the area tributary to Lake Elsinore. The judgment obligates the San Bernardino Valley Municipal Water District to assure an average annual Adjusted Base Flow of 15,250 acre-feet in the Santa Ana River at Riverside Narrows. Under a provision in the judgment, this amount was reduced to 12,420 acre-feet in 1986. The judgment also obligates the Inland Empire Utilities Agency and the Western Municipal Water District to assure and average annual Adjusted Base Flow of 42,000 acre-feet at Prado Dam. Under a provision in the judgment, this amount was reduced to 34,000 acre-feet in 1986. Currently, the District is able to meet this obligation entirely with tertiary treated wastewater.

San Bernardino Valley Municipal Water District and Western Municipal Water District Water Rights Applications for "New Conservation" behind Seven Oaks Dam

Congress authorized the Santa Ana River Mainstem [Flood Control] Project for construction in 1986 under new guidelines for cost sharing of water resources projects between Federal and local governments. The Seven Oaks Dam is a major feature of this project. The District and Western Municipal Water District (Western) recognized that the Dam could also be used to conserve water. A study showed that the Dam would provide a minimum average of about 10,000 acre-feet of water per year, which is worth about $1 million. The District and Western have already spent approximately $4 million on design elements for the Seven Oaks Dam to ensure that it can be used for water conservation.

[1] Environmental News Link, http://www.caprep.com/0804047.htm.
[2] SECOR International Incorporated, DRAFT WORK PLAN GROUNDWATER FLOW MODELING Newmark Groundwater Contamination Superfund Site, San Bernardino, California, April 2005.

The District also worked with the Corps of Engineers through the San Bernardino County Flood Control District and the Riverside and Orange County Flood Control Districts to study the feasibility of water conservation at Seven Oaks. That study concluded that water conservation is feasible. The District and Western have also filed water right applications with the State Water Resources Control board to divert up to a maximum of 200,000 acre-feet per year of water from the Santa Ana River. A draft EIR has been completed which evaluates the potential environmental impacts of the project along with groundwater management concepts and the facilities necessary to utilize the water. On July 21, 2004, a settlement agreement ("Seven Oaks Accord") was reached between the San Bernardino Valley Municipal Water District and Western Municipal Water District and a number of water users related to the potential diversion of water from the Santa Ana River. The agreement calls for District/WMWD to develop and manage a groundwater spreading program that is intended to maintain groundwater levels at a number of specified monitoring wells. This integrated water resources management program will be adopted within five years of the State Water Resources Control Board approving the District/WMWD Santa Ana River water right applications.

San Bernardino Valley Municipal Water District Regional Water Facilities Master Plan

The Master Plan provides the regional facilities to allow coordinated management of available water resources to meet the ultimate quantity and quality requirements of all water purveyors and increase the reliability of supplies, by maximizing the use of local water resources and optimizing the use of imported water. The Plan also proposes water conservation measures; generalized groundwater management concepts for the San Bernardino Basin, Yucaipa Basin and Rialto-Colton Basin; as well as general surface water management concepts for groundwater recharge, management of imported supplies, reclaimed water, and spreading operations.

Santa Ana River Watershed Project Authority (SAWPA) Integrated Regional Water Management Plan

Water users in the Santa Ana River Watershed have worked together for years to develop an integrated and regional approach to water management for the entire Santa Ana River watershed. SAWPA has developed an Integrated Regional Water Management Plan (IRWMP) that covers the entire watershed. This broad planning document is the framework for water management in the watershed. The SAWPA Plan is a macro-level planning process that is consistent with the Department of Water Resources' California Water Plan Update (Bulletin 160) and the State Water Resources Control Board's Strategic Plan, its Watershed Management Initiative, and the basin planning process. The SAWPA Plan builds upon local agencies' initiatives and programs and emphasizes integrated regional water management.

Upper Santa Ana Watershed Integrated Regional Groundwater Management Plan

The San Bernardino Valley Municipal Water District (District) and other members of the Upper Santa Ana Water Resources Association (Association) are planning to develop an Integrated Regional Groundwater Management Plan (IRGWMP) for the Upper Santa Ana River. In recent years, the cities and communities within the Association have experienced significant population growth. The Southern California Association of Governments indicates that population within the District service area is projected to

increase by almost 63 percent over the next 25 years. As the population increases, the demand for water will also increase and, therefore, the local agencies need to work together to cooperatively manage their water resources to ensure their future water needs are met. The water interests in the region are working together to ensure that local water in the region is put to reasonable and beneficial use in a manner that reduces reliance on imported water supply and will achieve the regional water management objectives.

The initial planning objectives for the IRGWMP include the following:

- Increase local water supply reliability by reducing projected water demand.
- Conjunctive management of surface and groundwater resources.
- Increase long-term water supply reliability by developing new supplies of high quality water from local sources.
- Address groundwater issues of the region.
- Protect and enhance quality of groundwater and surface water resources.
- Examine environmental and recreational enhancement opportunities.
- Maintain water levels in the area of historic high groundwater that help reduce the possibility of liquefaction.
- Maintain water levels on the outer edges of the basin that are as high as possible to reduce pumping costs.
- Implementation of salinity management strategies in the Yucaipa Management Zone and San Timoteo Management Zone consistent with the 2004 RWQCB Basin Plan.

Table 1. Documents defining water management within the District's boundary.

RESOURCE(S)	DOCUMENT	MANAGEMENT ISSUE(S)
Groundwater: Bunker Hill Basin Lytle Creek Basin	Western Judgment	1. Establishes the safe yield of the San Bernardino Basin Area (Bunker Hill Basin and Lytle Creek Basin) to be 232,100 acre-feet per year. 2. Requires the District to replenish the basin for any extractions above the safe yield. Water for replenishment must come from a source outside of the San Bernardino Basin Area (currently comes from the State Water Project). 3. Requires an annual accounting of extractions as compared to the safe yield.
Groundwater: Rialto Basin	Rialto Basin Decree	1. Specifies maximum extractions from the Rialto basin. 2. Designates the District as the party to monitor compliance with the Decree. 3. Establishes the average water level of three index wells to be used to monitor the amount of water in the basin. 4. If the average water level of the three index wells is below certain levels, then extractions in the basin are systematically reduced a maximum of 50%. 5. The average water level is calculated three (3) times annually.
Groundwater: Bunker Hill Basin (within the City limits of the City of San Bernardino) Newmark and Muscoy Groundwater Cleanup Project	Consent Decree	1. Develops a groundwater management program within the City of San Bernardino. 2. Develops institutional controls to ensure the effectiveness of the cleanup project. 3. Requires new water projects within the City of San Bernardino to be evaluated as to their potential impact on the cleanup project.
Surface Water: Santa Ana River	Orange County Judgment	1. Obligates the District to assure an average annual Adjusted Base Flow in the Santa Ana River of 12,420 acre-feet. 2. Requires an annual accounting of the base flow. 3. Obligation is met entirely with treated wastewater.
Surface Water: Santa Ana River	District and Western Municipal Water District (WMWD) Water Right applications Draft EIR for said water	1. Requests an annual water right of up to 200,000 acre-feet per year for the District and WMWD for the "new conservation" generated by the construction of the Seven Oaks Dam. 2. Provides the environmental documentation in support of the water right applications. 3. If approved, will increase the safe yield of the basin. 4. Requires the District and WMWD to develop and manage a groundwater spreading program intended to maintain

	right applications Seven Oaks Accord	water levels at a number of specified monitoring wells. 5. Said groundwater spreading program is to be completed within 5 years of receiving a water right on the Santa Ana River (see item above).
Surface Water and Groundwater	District Water Facilities Master Plan	Provides facilities to manage water within the District. Proposes water conservation measures; generalized groundwater management concepts for the San Bernardino Basin, Yucaipa Basin and Rialto-Colton Basin; as well as general surface water management concepts for groundwater recharge, management of imported supplies, reclaimed water, and spreading operations.
Surface Water and Groundwater	Santa Ana Watershed Project Authority (SAWPA) Integrated Regional Water Management Plan	1. Broad planning document for the entire Santa Ana River Watershed. 2. This plan incorporates all of the above mentioned documents.
Surface Water and Groundwater	Upper Santa Ana Watershed Integrated Regional Groundwater Management Plan (in process)	Once complete, this document is intended to provide the surface water and groundwater plan and accompanying facilities within the District. This collaborative process will address the requirements of the various legal documents listed above as well as some long-term water management strategies. This planning process is a part of overall Santa Ana River water management planning and is in agreement with SAWPA's current, regional planning initiatives. Each of the retail water agencies within the District will also adopt this plan as their own. This document is to be completed by December 2006.

Appendix

J

STATE OF CALIFORNIA • RESOURCES AGENCY • DEPARTMENT OF WATER RESOURCES

NOTICE TO
STATE WATER PROJECT CONTRACTORS

NUMBER: 05-08

DATE: MAY 25 2005

SUBJECT: SWP Delivery Reliability Data From the Draft 2005 SWP Delivery Reliability Report

FROM: Gerald E. Johns
DEPUTY DIRECTOR, DEPARTMENT OF WATER RESOURCES

The Department of Water Resources (DWR) is preparing an update to the State Water Project (SWP) Delivery Reliability Report issued in 2003. Many SWP Contractors have already begun or will soon begin preparation of their 2005 Urban Water Management Plans (UWMP), which must be completed by December 2005. Contractors have indicated they would like to use updated information on the delivery reliability of the SWP as the basis for the SWP supplies included in their UWMP's. However, the 2005 Delivery Reliability Report is not expected to be publicly available, as a draft, until September 2005.

Given this time gap between the immediate need of the Contractors for updated data for use in their UWMP preparation and the availability of an updated Reliability Report, DWR is providing relevant sections from the working draft of the 2005 Delivery Reliability Report. Attachment 1 contains these sections, namely, Chapter 4 and excerpts from Chapter 6 and Appendix B.

The working draft includes seven studies. Studies 1, 2, and 3 are from the 2003 report. Studies 4 and 5 are similar to the studies for the CVP/SWP Operations Criteria and Plan. Studies 6 and 7 are similar to studies 4 and 5 but contain updated assumptions for Contractor demands. The updated assumptions for demand in studies 6 and 7 were developed with representatives of the State Water Contractors as part of the study preparation for the Environmental Impact Report for the Monterey Amendment. Because studies 6 and 7 contain the most current information for assumed demands, DWR recommends the results of these studies for use in the development of the UWMPs.

DWR was also asked to include estimates of SWP delivery reliability with the increased Delta export limit (8500 cfs) proposed in the South Delta Improvement Program (SDIP). The environmental and public review required by CEQA and NEPA has not been completed for the SDIP. It is possible the proposed export operation will be modified in response to this review. The potential delivery increases associated with the proposed project are, therefore, not contained in this notice.

For additional information regarding these results, you may contact Sushil Arora, Chief of the Hydrology and Operations Unit, Bay-Delta Office, at (916) 653-7921 or sushil@water.ca.gov.

Attachment

Attachment 1

Excerpts from Working Draft of 2005 State Water Project Delivery Reliability Report

May 2005

Chapter 4
Model Study Assumptions

The selection of the assumptions and the factors that go into the estimation of future water delivery reliability is very important and must be tailored to the particular water supplier. Assumptions and factors for the State Water Project concern, in particular, Sacramento and San Joaquin river basin precipitation; water rights and uses; SWP storage and conveyance facilities, including diversion facilities in the Delta; SWP service area demand; and the statutes, regulations, and contractual provisions that govern and regulate the SWP, including coordinating operations with the federal Central Valley Project (CVP).

The assumptions for the seven studies in this report differ in three main categories: the projected water use in the source areas, assumed SWP demands, and base model assumptions. These categories are summarized in Table 4-1. Water use in the areas supplying water to the SWP (source areas) is represented at the current level of use (2005) and at a level of use projected to occur in 2025. For this report, the existing water use estimates for the source areas for 2001 and 2020 are assumed to be representative of 2005 and 2025 conditions, respectively.

Table 4-1 Key study assumptions

Study	Use of water in source areas	SWP Table A demand (maf/year)	SWP Article 21 demand (taf/month)	Model version
1	2001 level of development	3.0–4.1	0–84, Apr–Nov 50–134, Dec–Mar	May 2002 benchmark
2	2020 level of development	3.3–4.1	0–84, Apr–Nov 50–134, Dec–Mar	May 2002 benchmark
3	2020 level of development	4.1	0–84, Apr–Nov 50–134, Dec–Mar	May 2002 benchmark
4	2001 level of development	3.0–4.1	0–84, Apr–Nov 50–134, Dec–Mar	2004 OCAP
5	2020 level of development	3.3–4.1	0–84, Apr–Nov 50–134, Dec–Mar	2004 OCAP
6	2001 level of development	2.3–3.9	0–84, Apr–Nov 100–184, Dec–Mar	2004 OCAP
7	2020 level of development	3.9–4.1	0–84, Apr–Nov 100–184, Dec–Mar	2004 OCAP

maf = million acre-feet
OCAP = 2004 Long-Term Central Valley Project Operations Criteria and Plan
taf = thousand acre-feet

The SWP contractors' Table A and Article 21 demands from the Delta for the seven studies are shown in Table 4-1. For six of the studies, a range in Table A demands is shown because the demand is assumed to vary each year with the weather in the delivery areas. In study 3, the SWP Table A demand is assumed to be maximized each year, regardless of weather. Article 21 deliveries are available on an unscheduled and interruptible basis and are not counted as part of the Table A amount.

There are two versions of the model that are used for these studies as shown in Table 4-1. The three studies from *The SWP Delivery Reliability Report 2002* (DWR 2003) are based on the May 2002 benchmark study version, and subsequent studies are based on the 2004 Long-Term Central Valley Project Operations Criteria and Plan (OCAP) study version. The key modeling assumption differences between the May 2002 benchmark version and the 2004 OCAP version as used in this report are as follows:

1 Temperature flow below Keswick changed from a fixed time series flow to a dynamic storage dependent flow.
2 Relaxation of flow below Nimbus criteria when Folsom storage drops below 300 thousand acre-feet.
3 Navigation control point flow criteria modified from being dependent on water year type to being dependent on CVP agricultural allocation levels. Criteria were also relaxed for very low allocation years.
4 Clear Creek Tunnel target flows modified to match the latest Trinity EIR analysis.
5 Addition of a minimum pumping level at Banks of 300 cubic feet per second.
6 Addition of a minimum pumping level at Tracy of 600 cubic feet per second.
7 Addition of flow requirements on the Feather River at the mouth for Settlement Contractors.
8 Delivery-carryover relationship was adjusted to reduce delivery targets and increase carryover in critically dry years.
9 Addition of Lake Oroville end-of-September carryover target storage rule.
10 Five-step study setup modified to isolate B2 accounting from "with Project" conditions.
11 Modification of American River demands.
12 Modification of Contra Costa Water District demands.
13 The minimum flow of the Trinity River below Lewiston Dam in studies 4 and 6 ranges from 369 to 453 thousand acre-feet per year depending on water year type. All other studies used in this report assume the Trinity River minimum flow has a higher range from 369 to 815 thousand acre-feet per year. This higher range of Trinity River minimum flows represents the Trinity Environmental Impact Statement Preferred Alternative.
14 Studies 5 and 7 assume implementation of Freeport Regional Water Project including modified East Bay Municipal Utility District operations on the Mokelumne River.
15 Implementation of May 2003 CVPIA 3406 (b)(2) decision and other changes:
    a Streamlining of actions for simplified analyses of the results.
    b Anadromous Fish Restoration Program table updates to better represent management of (b)(2) water under the May 2003 (b)(2) decision.
    c Action triggering modifications to attempt to meet 200 thousand-acre feet target during October through January period.
16 Environmental Water Account changes including:
    a Streamlining of actions and coordination with (b)(2) actions.
    b Environmental Water Account (EWA) purchase amount increase to a maximum of 250 thousand acre-feet per year.
    c Addition of storage debt carryover accounting including debt spill at San Luis.
    d Addition of EWA asset takeover by SWP and CVP at San Luis when reservoir space utilized by EWA is needed for project operations.
    e Eliminates the need to pay off end-of-year debt from unidentified sources of water in order to keep the projects whole.

Chapter 6 (excerpt)
Study Results

SWP Water Deliveries under Different Hydrologic Scenarios

The assumed demands and results of the studies estimating SWP water deliveries under current conditions (2005) and 2025 conditions are summarized in tables 6-1 through 6-8.

Average, Maximum, and Minimum

The average, maximum, and minimum Table A demands from the Delta for the seven studies are shown in Table 6-1. Studies 4 and 5 have the same demands as studies 1 and 2, respectively. Study 6 has lower demands than studies 1 and 4. The average demand for study 6 is 80 percent of full Table A compared to 90 percent of full Table A for studies 1 and 4. The primary reason for the lower demand in study 6 is that it includes a new set of annual Table A demands for the Metropolitan Water District of Southern California prepared specifically for 2003 conditions by MWDSC. The average demand for study 7 is 99.4 percent of full Table A and is less than full Table A in only seven wet years based on local Kern River water supply conditions.

Table 6-1 SWP Table A demand from Delta

Study	Full Table A (taf per year)	Average demand (taf per year)	Average demand (percent of full Table A)	Maximum demand (taf per year)	Maximum demand (percent of full Table A)	Minimum demand (taf per year)	Minimum demand (percent of full Table A)
SWP Delivery Reliability Report (2003):							
1. 2001 Study	4,114	3,712	90%	4,114	100%	3,007	73%
2. 2021A Study	4,133	4,026	97%	4,133	100%	3,343	81%
3. 2021B Study	4,133	4,133	100%	4,133	100%	4,133	100%
OCAP (2004):							
4. OCAP Today	4,114	3,712	90%	4,114	100%	3,007	73%
5. OCAP Future	4,133	4,026	97%	4,133	100%	3,343	81%
Revised-Demand:							
6. Revised-Demand Today	4,112	3,290	80%	3,862	94%	2,321	56%
7. Revised-Demand Future	4,133	4,110	99%	4,133	100%	3,898	94%

Table 6-2 contains the average, maximum, and minimum Table A deliveries from the Delta for the seven studies. Comparing the results for studies 1 and 2 (weather variable demand) shows the average Table A delivery value is projected to increase by only 3 percentage points, from 72 percent to 75 percent over 20 years. This increase is due to the projected increase in Table A demand in 2025. When it is assumed that future demand will not vary with the weather and will be constant at 4.13 maf (study 3), the average Table A delivery value is 76 percent, only 1 percentage point above study 2. These relatively small differences indicate that the SWP Table A demand is very near the full Table A amount. Recall that the demand levels range from 3.0 maf per year to 4.1 maf per year for study 1; from 3.3 maf per year to 4.1 maf per year for study 2; and is constant at 4.1 maf per year for study 3.

Table 6-2 SWP Table A delivery from Delta

Study	Full Table A (taf per year)	Average delivery (taf per year)	Average delivery (percent of full Table A)	Maximum delivery (taf per year)	Maximum delivery (percent of full Table A)	Minimum delivery (taf per year)	Minimum delivery (percent of full Table A)
SWP Delivery Reliability Report (2003):							
1. 2001 Study	4,114	2,962	72%	3,845	93%	804	20%
2. 2021A Study	4,133	3,083	75%	4,128	100%	830	20%
3. 2021B Study	4,133	3,130	76%	4,133	100%	830	20%
OCAP (2004):							
4. OCAP Today	4,114	2,973	72%	3,850	94%	165	4%
5. OCAP Future	4,133	3,156	76%	4,133	100%	187	5%
Revised-Demand:							
6. Revised-Demand Today	4,112	2,818	69%	3,848	94%	159	4%
7. Revised-Demand Future	4,133	3,178	77%	4,133	100%	187	5%

Studies 4 and 5 indicate a slightly higher increase in average delivery in the future, 72 percent to 76 percent of full Table A, respectively (see Table 6-2). This slightly higher increase of 4 percent is due to differences in modeling assumptions as listed in Appendix A. Studies 6 and 7 have the highest increase (8 percent) with an average delivery of 69 percent of full Table A under current conditions (study 6) and 77 percent under future conditions (study 7). The lower delivery of 69 percent under current conditions is due to the lower level of demand assumed for study 6. The slightly higher average delivery of 77 percent for study 7 compared to 76 percent for study 5 is due to the assumed higher demand in study 7.

The more recent studies have a minimum delivery of 4 percent to 5 percent of full Table A compared to 20 percent for the studies in the *SWP Delivery Reliability Report 2002* (DWR 2003). The lower minimum delivery is primarily due to modification of the delivery-carryover storage rule. This modification was developed during the project-simulation effort associated with the application for license renewal with the Federal Energy Regulatory Commission. Compared to the rule used for the *SWP Delivery Reliability Report 2002* studies (studies 1, 2, and 3), the modified rule reduces delivery by about 80 percent whenever carryover storage (sum of the end-of-September storages of Oroville Reservoir and the SWP share of San Luis Reservoir) is projected to be less than about 860 thousand acre-feet (taf). Potential adjustment of 1977 CalSim-II Table A deliveries is discussed in a later section of this chapter.

Average Article 21 demands and average, maximum, and minimum Article 21 deliveries for the seven studies are shown in Table 6-3. All studies have the same Article 21 demand in April through November. Studies 6 and 7 both assume a 200 taf increase in Article 21 demand in December through March compared to the other studies.

Table 6-3 SWP Article 21 demand and delivery from Delta (taf per year except as noted)

Study	Average Article 21 demand			Annual delivery from Delta		
	Dec-Mar	Apr-Nov	Total	Average	Maximum	Minimum
SWP Delivery Reliability Report (2003):						
1. 2001 Study	504	607	1,111	130	510	0
2. 2021A Study	504	607	1,111	80	400	0
3. 2021B Study	504	607	1,111	70	400	0
OCAP (2004):						
4. OCAP Today	504	607	1,111	170	620	0
5. OCAP Future	504	607	1,111	90	500	0
Revised-Demand:						
6. Revised-Demand Today	704	607	1,311	260	1,110	0
7. Revised-Demand Future	704	607	1,311	120	550	0

Delivery numbers rounded to the nearest 10,000 acre-feet.

The average amount of water supply per year under Article 21 decreases from 130 taf in study 1 to 80 taf in study 2. Water pumped from the Delta will go toward meeting Table A demands prior to being made available under Article 21. The 50 taf decrease is a direct result of the assumed increase in Table A demand for study 2. Study 3 reflects this same relationship with an average Article 21 delivery of 70 taf, slightly less than study 2.

Studies 4 and 5 show an increase in Article 21 delivery compared to studies 1 and 2 even though Article 21 demands are the same and studies 4 and 5 have the same Table A demands as studies 1 and 2, respectively. The average delivery for study 4 is 170 taf per year, 40 taf per year more than study 1; study 5 has an average delivery of 90 taf per year, 10 taf per year more than study 2. These increases are primarily due to implementation of a Lake Oroville end-of-September carryover target storage rule in studies 4 and 5 to better simulate actual reservoir operations. The effect of this rule is to lower Lake Oroville storage and increase SWP San Luis Reservoir storage in the fall and winter of some years as compared to studies 1 and 2. As a result, the rule increases the probability that SWP San Luis Reservoir will fill, a condition that must be met before Article 21 water can be delivered.

The average Article 21 delivery for study 6 is 260 taf per year, an increase of 90 taf per year from the study 4 average delivery of 170 taf per year. This increase in delivery is a result of the increase in Article 21 demand of 200 taf per year in studies 6 and 7 and also due to the decrease in Table A demand in study 6 compared to study 4. Study 7 has an average Article 21 delivery of 120 taf per year, 30 taf per year more than study 5, which is the result of increased Article 21 demand.

Drought Years

Table 6-4 includes estimates of water deliveries under an assumed repetition of historical drought periods for the seven studies. The years are identified as dry by the Eight River Index, a good indicator of the relative amount of water supply available to the SWP. The Eight River Index is the sum of the unimpaired

runoff from the four rivers in the Sacramento Basin used to define water conditions in the basin plus the four rivers in the San Joaquin Basin, which correspondingly define water conditions in that basin. The eight rivers are the Sacramento, Feather, Yuba, American, Stanislaus, Tuolumne, Merced, and San Joaquin. Table 6-4 also includes the average deliveries for comparison purposes.

Table 6-4 SWP average and dry year Table A delivery from Delta for seven studies

Study	Full Table A (taf per year)	SWP Table A delivery from Delta (in percent of full Table A)					
		Average 1922-1994	Single dry year 1977	2-year drought 1976-1977	4-year drought 1931-1934	6-year drought 1987-1992	6-year drought 1929-1934
SWP Delivery Reliability Report (2003):							
1. 2001 Study	4,114	72%	20%	48%	37%	41%	40%
2. 2021A Study	4,133	75%	20%	44%	39%	40%	41%
3. 2021B Study	4,133	76%	20%	44%	39%	40%	41%
OCAP (2004):							
4. OCAP Today	4,114	72%	4%	41%	31%	40%	36%
5. OCAP Future	4,133	76%	5%	42%	35%	43%	39%
Revised-Demand:							
6. Revised-Demand Today	4,112	69%	4%	42%	32%	43%	38%
7. Revised-Demand Future	4,133	77%	5%	40%	33%	42%	38%

As shown in Table 6-5, studies 6 and 7 are selected to represent the estimated 2005 and 2025 deliveries, respectively, and to show Table A delivery in 5-year intervals as required by SB 610. The intermediate estimates shown in Table 6-5 for the years 2010, 2015, and 2020 are simply linearly interpolated from the study results for 2005 and 2025.

Table 6-5 SWP average and dry year Table A delivery from Delta in five-year intervals for studies 6 and 7

Year	Full Table A (taf per year)	SWP Table A delivery from Delta (in percent of full Table A)					
		Average 1922-1994	Single dry year 1977	2-year drought 1976-1977	4-year drought 1931-1934	6-year drought 1987-1992	6-year drought 1929-1934
2005	4,112	69%	4%	42%	32%	43%	38%
2010	4,117	71%	4%	41%	32%	42%	38%
2015	4,123	73%	4%	41%	33%	42%	38%
2020	4,128	75%	4%	41%	33%	42%	38%
2025	4,133	77%	5%	40%	33%	42%	38%

Even though the demands are projected to increase from 2005 to 2025 and the resulting amount of reservoir carryover storage is less, the drought deliveries are estimated to remain about the same (see Table 6-5). This result is attributable to the operation rules governing the amount of water that must be retained for carryover storage, the fact that SWP demand between 2005 and 2025 increases relatively slightly, and because less water is made available under Article 21.

Table 6-6 summarizes the estimates of dry year deliveries under Article 21 for the seven studies. Notice the reductions in delivery for studies 2 and 3 compared to study 1 in the years 1930, 1932, 1933, and

1976. These reductions are due to the increase in Table A deliveries. Study 5 has similar reductions compared to study 4 for the same reason. As previously mentioned, Article 21 deliveries for studies 4 and 5 tend to be higher than studies 1 and 2, respectively, due to implementation of a Lake Oroville end-of-September carryover target storage rule to better simulate actual reservoir operations. Study 7 does not always show a decrease in Article 21 delivery compared to study 6, illustrating how differences in Table A and Article 21 demands can alter dry period operations. For example, SWP San Luis fills in March 1989 of study 7 thereby allowing an Article 21 delivery of 90 taf, but SWP San Luis does not fill in 1989 in study 6, which has lower demands. Differences in Article 21 delivery between studies are also affected by differences in the transfer of EWA assets to the CVP and SWP at San Luis Reservoir when reservoir space used by EWA is needed for project operations.

Table 6-6 Average and dry year delivery under Article 21 (taf per year)

Study:	1	2	3	4	5	6	7
Year	Study 2001	Study 2021A	Study 2021B	OCAP Today	OCAP Future	Revised-Demand Today	Revised-Demand Future
1929	0	0	0	0	0	0	0
1930	90	30	30	130	70	120	140
1931	0	0	0	0	0	0	0
1932	200	40	40	270	70	240	110
1933	130	10	10	400	400	510	550
1934	0	0	0	210	130	210	240
1976	110	0	0	140	0	190	0
1977	0	0	0	0	0	0	0
1987	0	0	0	400	140	550	180
1988	0	0	0	0	0	0	0
1989	0	0	0	80	70	0	90
1990	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0
1992	0	0	0	30	0	0	100
1922-1994 average	130	80	70	170	90	260	120

Numbers rounded to the nearest 10,000 acre-feet.

Wet Years

Tables 6-7 and 6-8 below summarize the model run results for historical wet years. As with drought years, the Eight River Index is used to identify the wet years.

Table 6-7 SWP average and wet year Table A delivery from Delta

Study	Full Table A (taf per year)	SWP Table A delivery from Delta (in percent of full Table A)					
		Average 1922-1994	Single wet year 1983	2-year wet 1982-1983	4-year wet 1980-1983	6-year wet 1978-1983	10-year wet 1978-1987
SWP Delivery Reliability Report (2003):							
1. 2001 Study	4,114	72%	74%	79%	80%	80%	80%
2. 2021A Study	4,133	75%	62%	89%	86%	87%	84%
3. 2021B Study	4,133	76%	100%	100%	91%	91%	87%
OCAP (2004):							
4. OCAP Today	4,114	72%	73%	79%	80%	80%	80%
5. OCAP Future	4,133	76%	81%	89%	89%	90%	85%
Revised-Demand:							
6. Revised-Demand Today	4,112	69%	61%	66%	70%	75%	72%
7. Revised-Demand Future	4,133	77%	95%	97%	93%	93%	89%

Table 6-8 contains information about Article 21 deliveries for the wet period 1978–1987. The information illustrates a significant decrease in the availability of Article 21 supply between study 1 and studies 2 and 3. This is primarily due to the increase in Table A demand. Studies 5 and 7 have similar decreases in Article 21 delivery compared to studies 4 and 6, respectively.

The generally higher Article 21 deliveries for studies 6 and 7 compared to studies 4 and 5 are attributed to the 200 taf per year increase in Article 21 demand assumed for studies 6 and 7. In addition, the increase in Article 21 deliveries for study 6 compared to the study 4 is partially due to the decrease in Table A demand assumed for study 6.

Table 6-8 Average and wet year delivery under Article 21 (taf per year)

Study:	1	2	3	4	5	6	7
Year	Study 2001	Study 2021A	Study 2021B	OCAP Today	OCAP Future	Revised-Demand Today	Revised-Demand Future
1978	100	100	100	150	150	300	300
1979	140	90	100	260	80	160	140
1980	100	70	80	100	40	140	90
1981	120	0	0	280	50	550	70
1982	390	100	60	450	120	800	170
1983	200	200	160	200	200	400	360
1984	410	380	370	400	400	550	490
1985	0	0	0	0	0	0	0
1986	50	50	60	60	30	120	80
1987	0	0	0	400	140	550	180
1922-1994 average	130	80	70	170	90	260	120

Numbers rounded to the nearest 10,000 acre-feet.

SWP Table A Delivery Probability

The probability that a given level of SWP Table A amount will be delivered from the Delta is shown for the three current-condition studies in Figure 6-1 and for the four future-condition studies in Figure 6-2. The plot lines in the figures are derived from the study results listed in tables B-3 through B-9. Each line is constructed by ranking the 73 annual Table A delivery values of the relevant study from lowest to highest and calculating the percentage of values equal to or greater than the delivery value of interest. For example, for study 7 in Figure 6-2, the value of 3.50 maf is in the middle of the ranking; therefore, it is equaled or exceeded by half of the 73 delivery values. The delivery value of 0.20 maf, the minimum value for study 7, is equaled or exceeded by all of the delivery values.

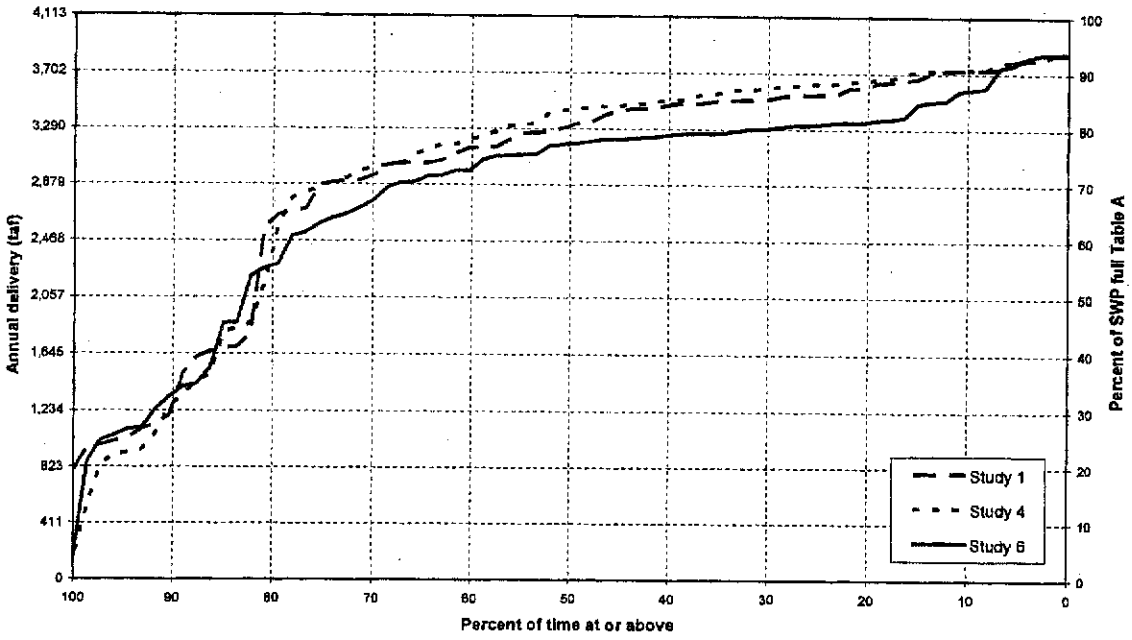


Figure 6-1 SWP Delta Table A delivery probability for year 2005

The curves for studies 1 and 4 in Figure 6-1 are very similar except at the lowest portion of the ranking (delivery values equaled or exceeded by 90 percent of the values). The divergence between 90 and 100 percent is due to modification of the delivery-carryover storage rule. The curve for study 6 is generally lower than the other two studies due to assumed lower demand.

The curves for studies 2 and 3 in Figure 6-2 are very similar for the lower portion of the ranking (that is, delivery values equaled or exceeded by 50 percent to 100 percent of the values). These lower values are similar because deliveries are limited by the amount of water available to the SWP for export from the Delta. The curves diverge within the upper range of the delivery values due to differences in assumed demand.

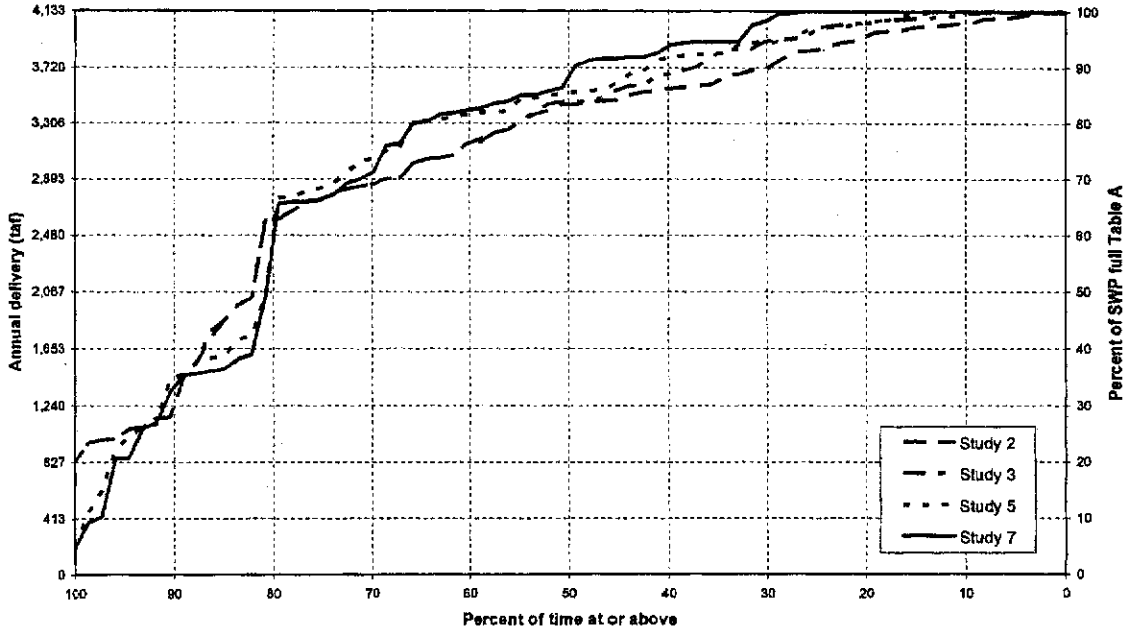


Figure 6-2 SWP Delta Table A delivery probability for year 2025

Study 5 shows higher deliveries than study 2 for delivery values exceeded by up to 80 percent of the values, and mostly lower deliveries for values exceeded by 80 to 100 percent of the values. Because the assumed demands are the same for these two studies, the higher deliveries in study 5 are due to modeling assumption differences other than demand. The curve for study 7 diverges from the study 5 curve for delivery values equaled or exceeded by up to 50 percent of the values. This divergence is attributed to the higher assumed demands in study 7.

A comparison of the upper range of studies 2 and 3 illustrates the effect the projected demand has upon SWP deliveries. The deliveries in study 3 reach 100 percent more frequently than in study 2 (weather variable demand) because the demand for 100 percent of Table A deliveries is assumed for each year of study 3. In study 2, the demand for 100 percent of Table A occurs in significantly fewer years and is rarely met because when 100 percent is assumed to be needed, the water year often cannot provide it. The delivery values for the three current-condition studies never reach 100 percent Table A for the same reason (Figure 6-1).

Study 7 deliveries reach 100 percent 26 percent of the time, the highest percentage for the seven studies. This is primarily a result of the assumed demands (only seven years less than full Table A).

The amount of SWP Table A delivery per year, either in percent of full Table A or in thousand acre-feet, associated with a specific degree of reliability can be estimated from Figures 6-1 and 6-2 for 2005 and 2025 conditions, respectively. The study 6 curve in Figure 6-1 is recommended to be used to represent 2005 conditions, and the study 7 curve in Figure 6-2 is recommended to be used to represent 2025 conditions. By referencing the curve for study 7 in Figure 6-2, the following can be deduced:

- In 75 percent of the years, the annual water delivery of the SWP is estimated to be at or above 2.70 maf per year (65 percent of 4.13 maf).
- In 50 percent of the years, it is estimated to be at or above 3.50 maf per year (85 percent of 4.13 maf).
- In 25 percent of the years, it is at 4.13 maf per year (100 percent).

Figures 6-1 and 6-2 depict the estimated reliability for the total of SWP deliveries. Under conditions when almost all contractors are requesting their maximum Table A, like in study 7, this information can be directly applied to individual long-term water supply contracts for the SWP. For example, if a water agency has a full SWP Table A amount of 400 taf, it can expect to receive at least 260 taf per year (65 percent of 400 taf) 75 percent of the time.

Potential Adjustments to 1977 CalSim-II Table A Deliveries

The CalSim-II model, a planning model, is not the best tool for analyzing SWP performance and operations for a shorter period, like a single year; nevertheless, there is a tendency to compare and contrast shorter-period operations with actual historical operations. Studies 4 through 7, discussed earlier, show that operations criteria changes result in much lower 1977 Table A deliveries. These deliveries are lower than historical as well as what is shown in *SWP Delivery Reliability Report 2002* (DWR 2003). The discussion below presents some adjustments contractors may consider in estimating 1977 Table A deliveries.

In order to understand what led to lower deliveries in 1977, it is prudent to start with 1975, a wet year, followed by 1976 and 1977, two critically dry years (1977 being the driest year on record during the last 80 years of historical hydrology). For the Revised-Demand Today study (study 6), SWP Table A deliveries during 1975, 1976, and 1977 are 3.23 maf, 3.27 maf, and 159 taf, respectively. For the Revised-Demand Future study (study 7) the respective deliveries are 4.13 maf. 3.14 maf, and 187 taf. Pursuant to the long-term water supply contracts as practiced in recent years, many of the contractors would carry over a portion of their allocated Table A deliveries during 1975 and 1976 to succeeding years. In the case of 1977, one can assume that up to 500 taf of 1976 Table A deliveries could be carried over to 1977. In addition, due to the slightly conservative delivery-carryover rule curve used in these studies, the minimum SWP storage in San Luis Reservoir for 1977, which occurs during the June-August period, averages about 190 taf for both studies 6 and 7. The minimum pool for the SWP share of San Luis Reservoir is just over 40 taf. In a year as critically dry as 1977, it is reasonable to assume an additional 150 taf would be made available for deliveries bringing the SWP storage in San Luis Reservoir to minimum pool. After August, the SWP storage in San Luis Reservoir begins to rise. It is reasonable to expect additional deliveries to also be made in the September-December period.

In summary, under the hydrologic conditions similar to a critically dry year like 1977, project deliveries can be expected to range from 4 or 5 to 20 percent of Table A, depending upon such factors as the delivery-carryover risk curve applied by SWP operators and Article 56 (carryover) deliveries.

Additional Analysis of Tables B-3 through B-9

Information on the average deliveries over the entire study period (1922-1994) and specific wet and dry periods is helpful in analyzing the delivery reliability of a specific water system receiving a portion of its water supply from the SWP. The series of data contained in tables B-3 through B-9 are also very helpful in analyzing longer periods of time that contain not only dry periods but wetter periods, which can replenish local water supplies if there is a place to store the supply. Analysis of this information can help determine if a local agency has adequate storage for capturing these supplies or if more storage could be utilized in the local water system.

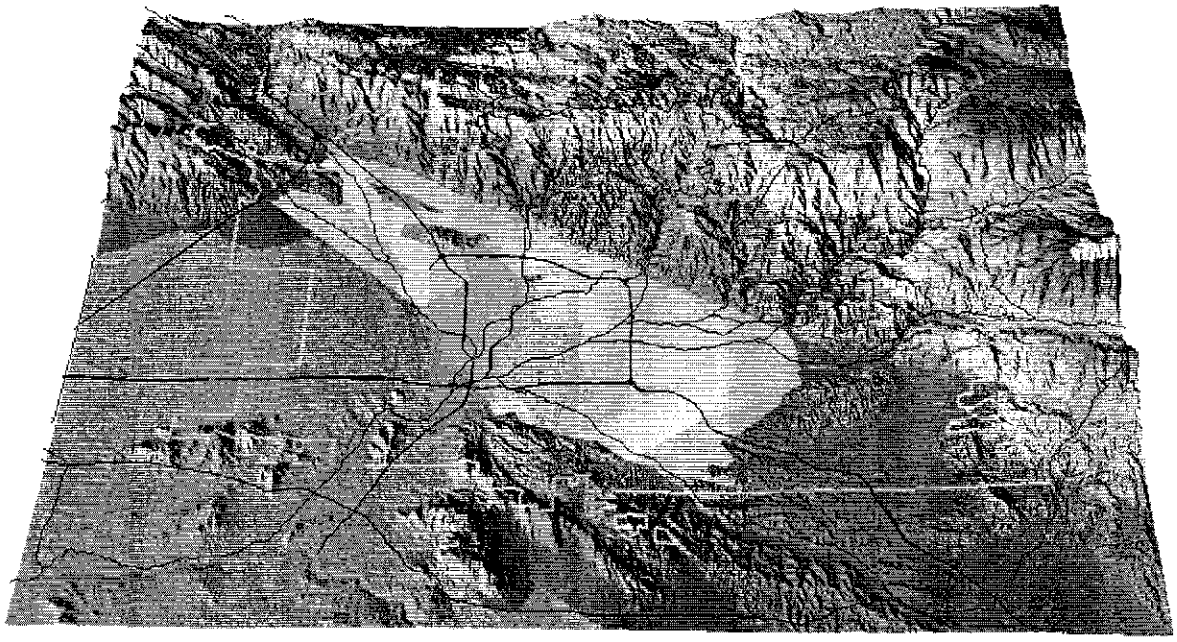
Cited Reference

[DWR] California Department of Water Resources, Bay-Delta Office. 2003. The State Water Project Delivery Reliability Report 2002. Final.

Appendix

K

Change in Groundwater Storage for the San Bernardino Basin Area Calendar Years 1934 to 2004



September 2005

San Bernardino Valley Municipal Water District

Robert M. Tincher
Manager of Engineering and Planning

Richard Peterson - Raymond Brown
GIS Technician - GIS Coordinator

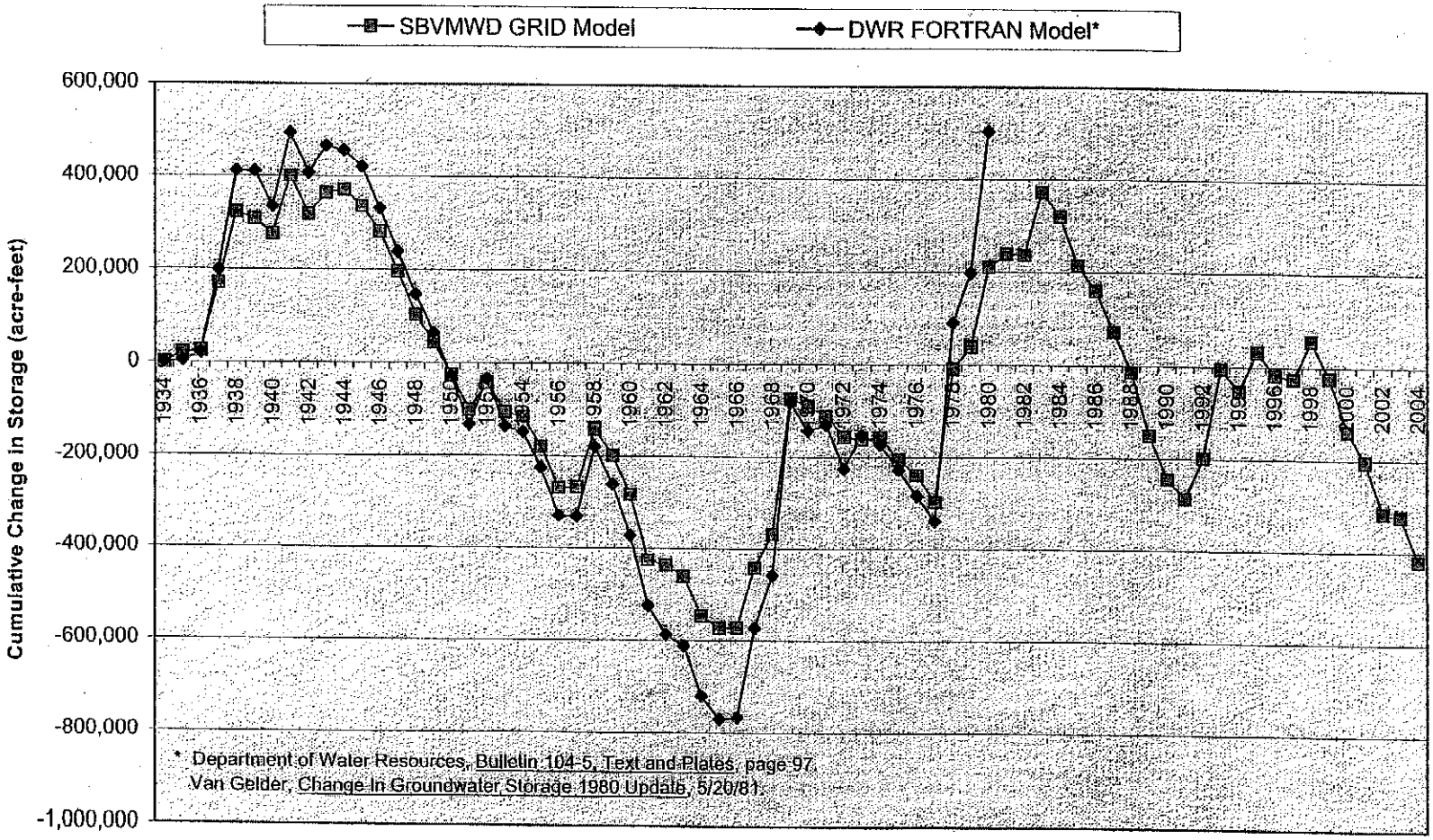
1. EXECUTIVE SUMMARY

The San Bernardino Valley Municipal Water District (SBVMWD) has been calculating the change in groundwater storage for the San Bernardino Basin area since 1970. The first calculation was completed for the years 1934 – 1960 by the State of California Department of Water Resources (DWR) and the results were summarized in Bulletin 104-5, Meeting Water Demands in the Bunker Hill-San Timoteo Area, Geology, Hydrology, and Operation-Economics Studies, Text and Plates (Olson, pp. 90 – 92). The DWR change in storage values were calculated using the Specific Yield Method (Olson, pp. 85 – 98) and a mathematical model developed by TRW, Incorporated, Redondo Beach, California (TRW). In 1980, SBVMWD updated the change in storage calculation to include the years 1961 – 1980 (Van Gelder). In the early 1990's, SBVMWD created a new change in storage model (SBVMWD Model) using software developed by Environmental Systems Research Institute (ESRI), Redlands, California. Results from the SBVMWD Model are presented to the SBVMWD Board of Directors and may be released in a report format. The last "complete" Change in Storage report was released in August 2000. The complete report provides a detailed explanation of the model and is planned to be released every five (5) years. Between complete releases of the report, the data is planned to be released on an annual basis with a brief Executive Summary.

Like the earlier DWR model, the SBVMWD Model calculates the change in groundwater storage (volume) for the San Bernardino Basin area using the Specific Yield Method. Although the two models use slightly different data sets and calculate the change in storage using different computer programs, their results are similar (see Figure 1.1).

The cumulative change in groundwater storage is a measure of the volume of water lost or gained in the San Bernardino Basin Area as compared to the base year of 1934. The year 1934 was selected as the base year to correspond with the first year of the DWR base period, 1934-35 through 1959-60 (Motokane, pp. 123 – 129). The annual change in storage (ACIS) is simply a measure of the volume of water lost or gained in the basin during a year. This report presents the results from the SBVMWD Model for calendar years 1934 to 2004. The SBVMWD Model uses the calendar year instead of the water year (October through September) to correspond with the United States Geological Survey MODFLOW groundwater model, which is dependent upon local pumping records kept by calendar year.

Figure 1.1. Comparison of DWR FORTRAN Model and SBVMWD GRID Model Results



The annual change in storage for calendar year 2004 was calculated to be -97,648 acre-feet. Table 1.1 below summarizes the distribution of the 2004 annual and cumulative change in storage among the various sub-basins, as defined in Bulletin 104-5 (DWR, Plate 14) (Basin Groundwater Storage Data). For 2004, the Devil Canyon and City Creek sub-basins accounted for approximately 58% of the total decrease in annual change in storage for the San Bernardino Basin Area. This large decrease can likely be attributed to the increase in well production and reduction of natural recharge due to below average precipitation over the past few years. The dry conditions caused the annual change in storage for the Devil Canyon sub-basin to reach a historic low.

The cumulative change in storage for calendar year 2004 was calculated to be -420,624 acre-feet which is a 30% decrease from the previous year. Review of Figure 1.1 shows that the cumulative change in storage has been declining since 1998. Over that period of time, the volume of water in storage has changed by -493,089 acre-feet. This decrease in the cumulative change in storage since 1998 is due to the increase in groundwater production associated with the below average precipitation over the past few years. These dry conditions have caused water agencies to rely more heavily on the basin during the winter months. The winter production has caused water levels in the Pressure Zone (United States Geological Survey "Backyard" monitoring well) to remain low. In 2004, the Pressure Zone sub-basin experienced its lowest cumulative change in storage on record and the Lytle Creek sub-basin approached its historic low. However, since the Pressure Zone is under pressure, water levels will immediately rise closer to land surface once the dry period ends and well production in the area decreases.

Although the amount of water in storage continues to decrease since 1998, Figure 1.1 shows that past conditions have been worse in the basin. For example, the cumulative change in storage for 2004 is 152,006 acre-feet higher than the lowest cumulative change in storage recorded in 1965.

Table 1.1. Annual and cumulative change in storage for 2004 by sub-basin.

	Sub-basin	Wells (qty)	Area (acres)	2004 Annual Change in Storage	2004 Cumulative Change in Storage	Basin Index (ft)
1	Cajon	6	9,833	-14,766	-57,619	-14
2	Devil Canyon	14	7,105	-36,530	-52,151	-9
3	Lytle Creek	11	5,899	-9,519	-74,087	-18
4	Pressure Zone	16	15,965	-6,717	-119,023	-9
5	City Creek	21	21,284	-19,861	-158,159	-15
6	Redlands	10	5,113	-3,369	1,037	--7
7	Mill Creek	7	7,299	-1,436	19,004	4
8	Reservoir	6	2,177	-2,775	7,957	-8
9	Divide	1	2,634	-2,675	12,417	-14
		92	**77,309**	**-97,648**	**-420,624**	

Table 1.1 provides a "basin index" for each sub-basin. The basin index is simply the average, annual water level change for the sub-basin for the particular year. For example, a basin index of 5.0 indicates that the average water level for the named sub-basin increased 5.0 feet for that particular year. For 2004, the Lytle Creek subbasin saw the largest change in water level as it decreased 18 feet. This decrease is likely due to the increased production due to the dry conditions over the past few years and to the relatively small size of the basin.

Since the release of the last full report in August 2000, SBVMWD has made some minor changes to the model data. Please see the Appendix for a list of these changes.

Appendix

L

RESOLUTION NO. 390.2
A RESOLUTION OF THE BOARD OF DIRECTORS OF
THE WEST VALLEY WATER DISTRICT
AMENDING ARTICLE 20. SCHEDULE OF CHARGES
AND ARTICLE 21. SCHEDULE OF RATES
OF RESOLUTION NO. 390

WHEREAS, the Board of Directors of the West Valley Water District deem it proper and necessary to amend Article 20, Schedule of Charges and Article 21, Schedule of Rates, of the Water Service Regulations.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors hereby amend Article 20, Schedule of Charges and Article 21, Schedule of Rates, of the Water Service Regulations as indicated on the attached draft in bold print.

BE IT FURTHER RESOLVED that said amendments be supplemented to and made a part of said Resolution No. 390 on file in the District records, and by this reference made a part thereof.

BE IT FURTHER RESOLVED that this resolution is effective August 19, 2004.

ADOPTED, SIGNED, AND APPROVED THIS 19TH DAY OF AUGUST 2004.

Betty J. Gosney, Vice President

ATTEST:

Anthony W. Araiza, Secretary

CERTIFICATION

STATE OF CALIFORNIA)
) ss
COUNTY OF SAN BERNARDINO)

I, **ANTHONY W. ARAIZA**, Secretary of the Board of Directors of the **WEST VALLEY WATER DISTRICT**, DOES HEREBY CERTIFY that the foregoing Resolution No. 390.2 was duly adopted by the Board of Directors of said District at a Regular meeting thereof, held the 19th day of August 2004, a quorum present and acting throughout, by the following vote to wit:

AYES:	**DIRECTORS:**	**GOSNEY, DYER, OLINGER, COX**
NOES:	**DIRECTORS:**	**NONE**
ABSENT:	**DIRECTORS:**	**TILLMAN**

Anthony W. Araiza, Secretary

ARTICLE 20. SCHEDULE OF CHARGES

2001. **APPLICABILITY**. Applicable to all new or transferred accounts for water service.

2002. **TERRITORY.** Within the boundaries of the West Valley Water District.

2003. **SERVICE DEPOSITS** - Residential and Commercial - Minimum deposit of $65.00 shall be required for domestic service.

Construction

(a) Minimum Water Use deposit of $350.00 shall be required for fire hydrant meters, plus "a cash deposit of $900.00 shall be required of all applicants for a 3" fire hydrant meter".

(b) Cash deposit of $1,750.00 for a 4" fire hydrant meter.

(c) Developer Refundable Deposit. Developers are to make an advance, refundable deposit as follows:

3/4" & 1" meters	$100/meter
1 1/2" & 2" meters	$300/meter
3" meters & larger	Bill at actual cost plus 20% for repairs
Temporary jumpers	200.00/lot

Said deposit shall be refunded to developer at time of final inspection, less any charges for necessary repairs to water meter or service. (See Article 7, Section 716)

(d) Valve Box Recovery Fee is $80.00 per valve. (See Article 7, Section 713)

(e) Developer $60.00 per lot refundable water deposit. Said deposit shall be refunded to Developer at time of transfer to new account, less any water use charges.

(f) Irrigation. (See Article 11, Section 1111)

(g) Temporary Service. (See Article 16, Section 1602)

If temporary service is required from a fire hydrant meter, a deposit equal to Section (a) above is required.

If temporary service requires installation of a service and meter, a minimum deposit per Article 20, Section 2006 shall be required or a deposit based on the estimated cost for installation, plus overhead.

ARTICLE 20. SCHEDULE OF CHARGES

2004. FRONTAGE CHARGE. The water main construction charge, as prescribed in Article 5, Section 512 hereof, shall be fixed in the amount of $12.00 per front foot for the street frontage for which water service has been requested, except in areas where a charge has been previously established.

2005. FACILITY CHARGES. Charges are hereby established as follows and effective 9/2/04 and payable prior to installation of meters.

On the first day of January of each year, all facility charges and development fees shall be adjusted according to the Engineering News Record (ENR), Construction Cost Index for the Los Angeles area, but shall not exceed the Consumer Price Index (CPI), or as determined by the Board of Directors.

Type of Development

Apartment, Business, Commercial (light use), Condominium, Mobile Home Units, irrigation services and single-family residences.

Those single family dwellings being constructed on lots of less than 10,000 sq. ft. and being required to install a one (1") inch meter and service to meet fire requirements shall pay a facility charge equal to a 3/4 inch single family residence meter and a one (1") inch fire line service.

Those single-family dwellings being constructed on lots consisting of 10,000 sq. ft. or more shall install a minimum of one (1") inch meter and service.

Meter Size	Safe Maximum Operating Flow	System Demand Factor	Facility Charge
3/4"	30 gpm	1.0	$ 4,855
1"	50 gpm	1.7	8,255
1 1/2"	100 gpm	3.3	16,020
2"	160 gpm	5.3	25,730
3"	350 gpm	11.7	56,805
4"	600 gpm	20.0	97,100
6"	1250 gpm	41.7	202,455
8"	1800 gpm	60.0	291,300

(Flows are based on safe maximum operating per AWWA Standards C701-88)

ARTICLE 20. SCHEDULE OF CHARGES

Industrial and Commercial (other than light use)

Industrial and Commercial (other than light use) users shall pay based on the demand of the development (calculated and approved by the District) prorated with the District's demand for an equivalent dwelling unit (EDU) of the various components of the Facility Charge times the dollar amount of the various components of the Facility charge for a 3/4-inch meter size, added together, but not less than the Facility Charges listed above for Commercial (light use) for the various meter sizes.

Fire Line Services Facility Charges

Meter Size	Safe Maximum Operating Flow	System Demand Factor	Facility Charge
1"	50 gpm	1.0	475
1 1/2"	100 gpm	2.0	950
2"	160 gpm	3.2	1,510
3"	350 gpm	7.0	3,300
4"	600 gpm	12.0	5,665
6"	1,400 gpm	28.0	13,225
8"	2,400 gpm	48.0	22,660
10"	3,800 gpm	76.0	35,885
12"	5,000 gpm	100.0	47,220

(Flows through fire services shall not exceed 16 F.P.S. in velocity.)

2006. SERVICE INSTALLATION CHARGE.

Meters

Where new meters are installed for the first time, the following charges or deposits shall be payable prior to installation:

Size	Meter Only	Meter and Service
3/4"	$376	$1448.00
1"	$425	$1750.00
1 1/2"	$694	Time & Materials
2"	$848	Time & Materials

ARTICLE 20. SCHEDULE OF CHARGES

Backflow Prevention Devices: (See Article 8, Sections 807 and 808, 810 and 811)

Optional fees for installation of devices when required and when the customer requests the District to do the installation.

	Double Check	R. P. Device
1"	$181.00	$245.00
1 1/2"	$321.00	$432.00
2"	$392.00	$485.00

All other sizes shall be for cost of all labor, materials, and street repairs, plus twenty percent (20%). Only duly authorized employees or agents of the District will be authorized to install service connections.

2007. INSPECTION FEES. Inspection fees are hereby established as follows:

(a) For pipelines, service and fire hydrant laterals the inspection fee shall be seventy cents (70¢) per foot.

(b) For single service laterals such as fire services and fire hydrants a minimum fee of $300 shall be paid by developer/owner.

(c) For inspection of meters and facilities after installation, an additional fee of $10.00 per lot shall be paid by developer/owner.

2008. CONSTRUCTION CHARGES. A construction water charge is hereby established at the rate of twenty-five dollars ($25) per month per service connection during construction period in new housing tracts with Board approval in lieu of setting meters. Developer shall furnish and install jumpers equivalent to meter size. (See Article 20, Section 2003(b).)

2009. COMBINATION BACKFLOW/DETECTOR CHECK. Full recorded costs of installation plus twenty percent (20%).

2010. SAME DAY, NEXT WORKING DAY & AFTER HOURS SERVICE. Any customer who desires same-day, next working day or after hours service, for other than emergencies, shall pay the following charges:

Same Day	Next Working Day	After hours (4 p.m. - 8 a.m. daily) & 24 hour weekends/holidays
$12.75	No Charge	$80.00

ARTICLE 20. SCHEDULE OF CHARGES

New Customers Only

Same Day	Next Working Day	After hours (4 p.m. - 8 a.m. daily) & 24 hour weekends/holidays
Before 12:00 noon No Charge	No Charge	$80.00
After 12:00 noon $12.75		

2011. TESTING. (Optional) (See Article 10, Section 1005)

Meters

1" and smaller	$55.00
Over 1"	Recorded cost, plus 20%

Backflow Devices

3/4" to 2"	$55.00
3" to 8"	$66.00
Complete Fire Service	$77.00

2012. DELINQUENT CHARGE. $10.00 (See Article 11, Sections 1105 and 1106)

2013. TURN OFF CHARGE. Turn off for non-payment $12.75. Turn on from non-payment $12.75.

2013.1 PULLED METER CHARGE. If meter needs to be pulled from setting due to customer tampering, there will be a charge of $60.00. Fee includes reinstallation of water meter.

2014. RETURNED CHECKS. There will be a $25.00 charge for all returned checks.

2015. PLAN CHECK AND INVESTIGATION FEE. A fee shall be charged for plan check and investigation of pipeline extensions and subdivisions as outlined in Article 6, Section 601(b) and Article 7, Section 707.

A minimum fee of $500 shall be charged for all pipeline extensions. Pipeline extensions exceeding 1,700 feet in length shall be charged thirty cents (30¢) per foot.

ARTICLE 20. SCHEDULE OF CHARGES

At the request of developers for phased projects, the charges, as stated above, shall be collected for the entire project and as the phases progress, a fee of $300 per phase shall be collected for investigation and updating.

In cases where the District can contract small jobs with approved contractors for the installation of single services, fire hydrants, fire services, etc., an investigation fee of $300 shall be applied.

2016. MANUAL CHARGE. A charge for reproduction of this Water Service Regulation is hereby established at $16.50 per copy.

2017. OVERHEAD CHARGE. Overhead charges for projects as described in Article 2, Section 235, shall be as follows:

(a) 20% of all recorded costs

(b) Construction contracts in an amount up to:

1.	$ 75,000	-	10%
2.	124,000	-	$7,500 + 7.5% over $75,000
3.	200,000	-	$11,175 + 5.0% over $124,000
4. Over $200,000			$13,100 + 3.5% over $200,000

(c) The appropriate charges set forth above shall be applied.

2018. CONSTRUCTION CONTINGENCY DEPOSIT. Owner/Developer shall deposit with the District an amount equal to ten (10%) percent of the construction cost estimate, for contingency during construction, said construction contingency deposit shall be refunded to the Owner/Developer at time of final inspection, less any necessary charges due to unexpected change orders.

2019. RELEASE OF OVERLYING RIGHT-OF-WAYS AND EASEMENTS. Release of overlying right-of-ways and easements shall be $50.00 per acre or any portion thereof with a minimum fee of $250.00.

2020. HOURLY LABOR RATE. Hourly labor rates are adjusted on an annual basis by averaging employees' salaries and benefits. (See Exhibit "A" in back of the Manual.)

2021. VEHICLE/EQUIPMENT HOURLY RATE. The hourly rate is established utilizing the State of California Labor Surcharge and Equipment Rental Rate on an annual basis, prior to the beginning of the fiscal year. (See Exhibit "B" in back of the manual.)

ARTICLE 20. SCHEDULE OF CHARGES

2022. FINES FOR VIOLATION OF DISTRICT'S SERVICE REGULATIONS.

1.	Unauthorized use of public fire hydrants (See Article 16, Section 1606)	$275.00
2.	Unauthorized use of fire hydrants on private fire systems	$275.00
3.	Contamination of District's water system through backflow	-$550.00 Plus recorded costs

Appendix

M

ARTICLE 21. SCHEDULE OF RATES

2101. RATE SCHEDULE. Rates for water service, other than irrigation water, used within the District's boundaries shall hereby be established as follows:

(a) Monthly Service Charge *

Meter Size	Charge	Meter Size	Charge
5/8" & 3/4*	$ 7.96	3"	$35.02
1"	11.87	4"	46.17
1½"	17.51	6"	70.05
2"	24.12	8"	93.92

(b) Monthly Consumption Commodity Charge

$.80 per 100 cubic foot

(c) Out-of-District rates and charges shall be one and one-half (1 1/2) times regular In-District rates.

2102. IRRIGATION RATE SCHEDULE (MONTHLY) (See Article 11, Section 1110 an Article 17, Section 1706)

(a) Irrigation Water (includes gravity)

Commodity Charge	.40/100 cu.ft.
Service Charge per month	$ 31.50

(b) Pressure Irrigation

Commodity Charge	.57/100 cu.ft.
Service Charge per month	$ 31.50

(c) Golf Courses

Service Charge per month	$ 31.50
plus commodity charge @	$ .50/100 cu. ft.

* The Service Charge is a "ready-to-serve" charge applicable to all metered services, which shall be added to the water consumption charge computed at the monthly rates.

(d) Fine for Violation of Article 17, Section 1705.

2103. OUT-OF-DISTRICT IRRIGATION RATES (MONTHLY). Out-of-District irrigation rates shall be two (2) times the regular In-District rates.

2104. HYDRANT WATER

(a)	Monthly service charge per meter	$34.75
(b)	Meter water for commercial and industrial use	1.30/100 cu.ft.
	Minimum charge	$55.00

2105. FIRE SERVICE (MONTHLY SERVICE CHARGE)

(a)	Private Fire Service, per diameter inch of service, monthly flat rate	$5.00
	Examples:	
	4"	$20.00
	6"	30.00
	8"	40.00
(b)	Fire hydrants, monthly flat rate	$5.00

2106. GENERAL. All water service not covered by the foregoing classifications shall be furnished on a metered basis and priced as approved by the General Manager. Meters shall be installed at the option of the District.

2107. TESTING FOR FIRE FLOW. A request for testing of a non-certified fire flow shall have a charge of $85.00 per test. For a certification test, the District shall determine the cost and a cash deposit will be required.

2108. BACKFLOW PREVENTION DEVICES. Monthly service charge to cover the District's Backflow Prevention Program administration costs - $1.40 per device.

2109. INDUSTRIAL PROCESS WATER. (Non-potable)

(a)	Service charge per meter, per month	$33.00

ARTICLE 21. SCHEDULE OF RATES

(b) Commodity charge:

Project Water	$ .57/100 cu.ft.
Domestic Water	.80/100 cu.ft.

Appendix

N

ORDINANCE NO. 68

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE WEST SAN BERNARDINO COUNTY WATER DISTRICT COUNTIES OF SAN BERNARDINO AND RIVERSIDE, STATE OF CALIFORNIA, RESCINDING ORDINANCE NO. 67 AND AMENDING RESOLUTION NO. 387, WATER SERVICE REGULATIONS, BY ADDING ARTICLE NO. 24 - WATER CONSERVATION

WHEREAS, the water resources of the District are limited and of finite supply, and

WHEREAS, we are in the fourth year of drought and a groundwater overdraft condition prevails throughout the service area of the District; and

WHEREAS, the elimination of wasteful and inefficient uses of our precious limited and finite water resources is essential to help protect the public health, safety, and welfare of the citizens served by the District and to help assure an adequate water supply to meet the domestic, sanitation, and fire protection needs of our growing population and economy of the communities we serve; and

WHEREAS, the Board of Directors of this District, as the Trustees of this precious, limited and finite water supply, recognize its responsibility to provide a mandatory water conservation plan to minimize the effect of a shortage of water to consumers of the District's service area and to adopt provisions that will significantly reduce the consumption of water, thereby extending the available water and minimizing the hardship on the general public.

NOW, THEREFORE, be it ordained that this Board of Directors hereby determines that a water conservation program must be adopted and enforced to help protect our said precious, limited and finite water supply,

BE IT FURTHER ORDAINED that Resolution No. 387 is hereby amended to add Article 24 as follows:

ARTICLE 24. WATER CONSERVATION

1. Purpose. The purpose of this Article is to provide water conservation measures in order to minimize the effect(s) of a water shortage on the citizens of, visitors to, and the economic well-being of the communities we serve and, by means of this

ARTICLE 24. WATER CONSERVATION

1. **Purpose.** The purpose of this Article is to provide water conservation measures in order to minimize the effect(s) of a water shortage on the citizens of, visitors to, and the economic well-being of the communities we serve and, by means of this Article, to adopt provisions that will significantly reduce the wasteful and inefficient consumption of water, thereby extending the available water resources required for the domestic, sanitation, and fire protection needs of the citizens of, and visitors to, the communities we serve while reducing the hardship on the District and the general public to the greatest extent possible.

2. **Application.** The provisions of this Article shall apply to all customers and property within the service area of the District and shall also apply to all property and facilities owned, maintained, operated, or otherwise under the jurisdiction of the West Valley Water District.

a) Exception. The prohibited uses of water provided for by this Ordinance are not applicable to that use of water necessary for public health and safety or for essential government services such as police, fire, and similar emergency services.

3. **Policy.** Due to the fact that we are located in a semi-arid region and our groundwater is of limited supply and in an overdraft condition and because of these conditions prevailing in the District and areas elsewhere from which the District obtains its water supplies, the general welfare requires that the water resources available to the District be put to the maximum beneficial use to the extent to which they are capable and that the wasteful, inefficient, or unreasonable use, or method of use of our previous, limited, and finite water resources be prevented.

As such, the conservation of such waters is to be exercised with a view to the reasonable and beneficial and efficient use thereof in the interests of the people of the District and for the public welfare.

Therefore, the West Valley Water District establishes the following goals, objectives, policies, and four-stage water conservation plan pertaining to the conservation and use of water:

2401. GOALS

- The conservation of water.
- The efficient use and distribution of available water supplies.
- Adequate and sufficient potable water supply and availability for the greatest public benefit, with particular regard to human consumption, sanitation, and fire protection.

ARTICLE 24. WATER CONSERVATION

- Maintain high quality customer service.
- Ensure fiscal soundness.
- Protect environmental quality.
- Meet growing water quality regulations.

2402. OBJECTIVES

- To conserve all available water supplies.
- To achieve an overall water use reduction.
- To reduce the volume of wastewater.
- To continuously increase consumer awareness about the need for and benefits of water conservation.
- To reduce or eliminate wasteful and inefficient uses of water.
- To assure an adequate supply of potable water sufficient to meet the essential private and public needs of the District's growing population and economy of those communities in which we serve.
- To assure that all new developments and existing dwellings which are remodeled or added to are equipped with water-conserving devices, fixtures, and appliances.
- To increase the use of native or water-conserving plant species for landscaping purposes.

2403. POLICIES

- As a condition of water service, all new structures shall be equipped with ultra low-flush toilets (1.6 gallons per flush max) as per Section 17921.3 of the California Health and Safety Code, and with low-flow showers and faucets as per Title 24, Part 6, Article 1, T20-1406F of the California Administrative Code, in addition to the insulating of all hot water lines according to California Energy Commission Rules.
- As a condition of continued water service, existing structures not so equipped, which require building permits to remodel or expand, shall be retrofitted with toilet tank dams resulting in

  1.6 gallon flushes unless the toilets are to be replaced, in which case the new toilets shall be

ultra low-flush (1.6 gpf), as stated above, and low-flow showers and faucets. Certification of compliance with this Ordinance shall be forwarded to the District.

- The use of lawns shall be minimized in new commercial, hotel, condominium, and high-density housing and shall be subject to District review and conditioning of projects. The use of native or water-conserving trees, shrubs, lawns, grass, ground cover, vines, and other plant species for landscape planting or replanting purposes is required and shall be approved by the District. (A list of such plants can be obtained at the District office.)

- Large water users, as determined by the District, shall submit a water conservation plan to the District and promote implementation of same as a condition to continued service.

- Water demand, use, and mitigation shall be address in every Environmental Impact Report.

- The District shall:

  a) Cooperate with other local water purveyors, appropriate state and other responsible agencies in facilitating a continuous program to increase consumer awareness about the need for and benefits of water conservation.

  b) Encourage large water users to implement water recycling and reuse processes.

  c) Make water conservation as reliable a method of reducing water demands as water supply projects are in meeting such demands.

2404. STAGE I - NORMAL CONDITION

Normal supply and distribution capacity is available. All policies shown in Section 2403 and the following water conservation measures shall apply.

1. Recommendations for use of water.

(a) Watering with sprinklers should be done at night between 11:00 p.m. and 8:00 a.m. Hand watering should be done between 6:00 p.m. and 8:00 a.m. Drip irrigation and hand watering while gardening is exempt from this recommendation. Water being used during repair or maintenance of watering system is exempt from this section.

b) Water conservation should be practiced within the home or business.

c) All restaurants are requested not to serve water to their customers unless specifically requested by the customer.

2. The following uses of water are hereafter considered non-essential to the public health, safety and welfare and, if allowed, would constitute the wasting of water and is hereby prohibited, pursuant to Water Code Section 350 et seq., Water Code Section 71640 et. Seq., and the common law:

a) There shall be no hose washing of sidewalks, walkways, driveways, parking areas, patios, porches, verandas, tennis courts, or other paved, concrete, or other hard surface areas, unless done with hand-held hose equipped with a trigger nozzle, except that flammable or other similarly dangerous or unhealthy substances may be washed from said areas by direct hose flushing for the benefit of public health or safety.

b) No water shall be used to clean, fill, operate, or maintain levels in decorative fountains unless such water is part of a recycling system.

c) No person shall permit water to leak from any facility or plumbing fixture on his/her premises; said leak shall be repaired in a timely manner.

d) Washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment are prohibited unless done with a hand-held bucket or hand-held hose equipped with an automatic positive shut off trigger nozzle for quick rinses. The nozzle shall be removed when the hose is not in use. This section does not apply to the washing of the above-listed vehicles or mobile equipment when conducted at a commercial car wash utilizing recycling systems.

1. Such washings are exempted from these regulations when the health, safety, and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

e) Use of water for any purpose, which results in flooding or run-off in gutters, driveways or streets, should be prevented and controlled.

f) The use of sprinklers for any type of irrigation during high winds is prohibited.

2405. STAGE II - WATER ALERT

The District may not be able to meet all water demands of all customers, unless the following water conservation measures are applied:

a) All policies and prohibitions listed in Sections 2403 and 2404.

b) All customers are asked for a voluntary minimum 10% reduction of their water consumption

over their last year's consumption, unless otherwise stated.

(c) Washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment is prohibited unless done with a hand-held bucket or hand-held hose equipped with a positive shut off nozzle for quick rinses. This section does not apply to the washing of the above-listed vehicles or mobile equipment when conducted at a commercial car wash utilizing recycling systems.

1. Such washings are exempted from these regulations when the health, safety, and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

d) All restaurants are prohibited from serving water to their customers except when specifically requested by the customer.

e) District will screen all new applications for water service installations and will limit water use before occupancy to that essential use for construction and testing of landscape plumbing. Limited landscaping for new development shall be allowed as approved by the District.

f) Irrigators will be notified that water delivery will be limited to those crops, which are presently planted. Water will not be delivered to crops planted after date of notice.

g) Commercial nurseries shall curtail all non-essential water use and shall irrigate between the hours of 11:00 p.m. to 6:00 a.m. and consumption shall be reduced to 25% less than the customer's last year's comparable billing period unless they are using reclaimed water.

h) All publicly owned lawns, landscapes, parks, school grounds, and freeways shall be irrigated between the hours of 11:00 p.m. and 6:00 a.m. and consumption shall be reduced to 25% less than the customer's last year's comparable billing period unless they are using reclaimed water.

i) All golf courses and other large landscaped areas shall be irrigated between the hours of 11:00 p.m. to 6:00 a.m. and consumption shall be reduced to 25% less than the customer's last year's comparable billing period unless they are using raw creek water or reclaimed water.

j) All other lawn watering and landscape irrigation shall be done between the hours of 8:00 p.m. and 6:00 a.m. Drip irrigation, hand-watering while gardening and water being used during repair and maintenance of watering system is exempt from this section.

k) Water use for compaction, dust control, and other types of construction shall be by permit

only and will be limited to conditions of the permit or may be prohibited as determined by the General Manager or his designee.

2406. STAGE III - WATER WARNING

District is not able to meet all water demands of all customers; therefore, the following water conservation measures shall apply.

a) All policies and prohibitions listed in Sections 2403, 2404 and 2405.

b) All customers are asked for voluntary minimum of 15% reduction in their water consumption over their last year's consumption, unless otherwise stated.

c) Washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment are prohibited. Washing of the above-listed vehicles or mobile equipment shall be allowed only at a commercial car wash where recycled water is being utilized.

1. Such washings are exempt from these regulations when the health, safety, and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

d) New water services shall be installed but water shall be used before occupancy for essential construction only and for testing of landscape irrigation systems. The installation of new landscaping for all new development/projects must be approved by the District.

e) Commercial nurseries shall use water only between the hours of 11:00 p.m. and 6:00 p.m., and only with hand-held devices or with drip irrigation, and consumption shall be reduced to 50% less than the customer's last year's comparable billing period unless they are using reclaimed water.

f) School grounds shall be watered only on odd numbered days except where they are equipped with electronic moisture sensor control systems and/or drip irrigation systems. All watering shall be done between the hours of 11:00 p.m. and 6:00 a.m. and consumption shall be reduced to 40% less than the customer's last year's comparable billing period, unless they are using reclaimed water.

g) All other publicly owned lawns, landscape, parks, and freeways shall be watered on even numbered days unless equipped with electronic moisture sensor control systems and/or drip irrigation systems. All watering shall be done only between the hours of 11:00 p.m. and 6:00 a.m. and consumption shall be reduced to 50% less than the customer's last year's comparable billing period, unless they are using reclaimed water. Water being used during repair or maintenance of watering system is exempt from this section.

h) All other lawn and landscape irrigation shall be done as follows: users with house numbers ending in an even number shall water on even numbered days only and users with house numbers ending in an odd number shall water on odd numbered days only, except where equipped with electronic moisture sensor control system and/or drip irrigation systems. All watering shall be done between the hours of 8:00 p.m. and 6:00 a.m.

i) All agricultural water users shall irrigate only at times approved by the District.

j) Swimming pools, ornamental pools, fountains and artificial lakes shall not be filled or refilled after being drained.

k) Water used for compaction, dust control, and other types of construction shall be by permit only and will be limited to conditions of the permit or may be prohibited as determined by the General Manager, or his designee.

2407. STAGE IV - WATER EMERGENCY

District is experiencing a major failure of supply or distribution; therefore, the following water conservation measures shall apply:

a) All policies and prohibitions shown in Sections 2403, 2404, 2405 and 2406.

b) All customers are asked for voluntary minimum 20% reduction in their water consumption over their last year's consumption, unless otherwise stated.

c) No water shall be used for construction purposes. All construction meters shall be locked off or removed.

d) Commercial nurseries shall water only between the hours of 11:00 p.m. and 6:00 a.m. and only with hand-held devices or with drip irrigation systems.

e) There shall be no watering of any lawn or landscaped area.

f) The use of water shall be limited to essential household, commercial, manufacturing, or processing uses only, except where other uses may be allowed by permit.

g) All agricultural water users shall irrigate only at times approved by the District.

2408. DETERMINATION AND DECLARATION OF WATER CONDITIONS

ARTICLE 24. WATER CONSERVATION

The General Manager of the District, or his designee, shall access all available water supply data and shall make a report of his/her findings to the Board of Directors at the next Regular meeting or at a Special meeting called for that purpose. The Board of Directors may at that time determine and declare which of the four (4) previously discussed conditions the District's water supply is in and the extent of water conservation required to prudently plan for and supply water to the District's customers.

Thereafter, the Board of Directors may order that the appropriate stage of water conservation be implemented or terminated in accordance with the applicable provision of this Ordinance. The declaration of any stage shall be made by public announcement and notice shall be published once in a local newspaper of general circulation. The stage designated shall become effective immediately upon announcement.

2409. DURATION OF DECLARATION

The declaration of any stage of water supply conditions shall remain in effect until such time as another stage is declared.

2410. AUTHORITY - MISDEMEANOR

This Article is adopted pursuant to Sections 375 and 376 of the California Water Code. Any second or subsequent violation of this policy after notice as specified in Section 2411 1(a) is a misdemeanor. (California Water Code Section 377).

2411. ENFORCEMENT

1. **Violations**. In addition to the remedy of criminal prosecution available to the District as described above, violation of this Ordinance may result in the imposition of surcharges and restriction and/or termination of water service as set forth below:

a) First Violation - written warning accompanied by a copy of this Ordinance, delivered by U.S. Mail and/or hung on customer's door.

b) Second Violation (within one year) - a surcharge of $100.00 or 100% of the current water billing cycle, whichever is higher.

c) Third Violation (within one year of the first violation) – a surcharge of $300.00 or 200% of current water billing cycle, whichever is higher, and installation of flow restricting device in the meter for a minimum of ninety-six (96) hours. Said restricted flow shall meet minimum

County Health Department's standards, if any have been established. If said ninety-six (96) hour period ends on a weekend or holiday, full service will be restored during the next

business day.

d) Fourth Violation (within one year of the first violation) – a surcharge of $500.00 or 300% of the current water billing cycle, whichever is higher, and termination of service for such period as the Board of Directors determines to be appropriate under the circumstances, following a hearing regarding said issue. Written notice of the hearing shall be mailed to the customer at lest ten days before the hearing.

2. **Surcharges, Additional Charges**. Any surcharge hereunder shall be in addition to the basic water rates and other charges of the District for the account and shall appear on and be payable with the billing statement for the period during which the violation occurred; non-payment shall be subject to the same remedies available to the District as for non-payment of basic water rates.

In addition to any surcharge, a customer violating this Ordinance shall be responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the District's Schedule of Charges then in effect. Such charges shall be paid prior to the removal of the flow restrictor or reconnection of service, whichever the case may be.

3. **Nonliability for Damage**. The customer or resident who violates this Ordinance thereby assumes responsibility for injury to the customer and/or other residents/occupants receiving service, including emotional distress and/or damage to the customer's private water system and/or to other real or personal property owned by the customer or by a third party resulting from the installation and operation of a flow restricting device or from termination of service; said customer shall thereby be deemed to have: (a) waived any claim for injury or for damage to the customer's property which the customer may otherwise have against the District; and (b) agreed to indemnify, defend, and hold the District harmless from claims by third parties for injury or property damage arising or claimed to arise out of the District's installation and/or operation of a flow restricting device or termination of water service.

4. **Exemptions**. No exemption shall be granted to any person for any reason in the absence of a showing by said person that he/she has achieved the maximum practical reduction in water consumption in his/her residential, commercial, industrial, or governmental water consumption as the case may be.

The General Manager, or his designee, may grant exemptions ("exceptions" to this Ordinance) for uses of water otherwise prohibited by the regulations. Water customers who feel that they need an adjustment in the prohibitions as they relate to him/her will fill out a simple application form for an exemption stating the justification and circumstances. If the exemption is not granted, customer may

appeal in writing as stated in Section 2412.1.

a) Inconvenience or the potential for damage to landscaping shall not be considered for exemption from any section of this Ordinance.

2412. APPEALS

1. **Procedures.** The General Manager, or his designated Enforcement Officer, shall determine when violations have occurred and shall issue to the customer a Notice of Violation by mailing same and/or hanging same on the customer's door at least ten (10) days before taking enforcement action. Said notice shall describe the action to be taken (notice of first violation shall simply be accompanied by a copy of this Ordinance) and shall be mailed or delivered at least ten (10) days before the proposed action is scheduled to be taken.

A customer may appeal the Notice of Violation by filing a written notice of appeal with the District no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed shall be final. Upon receipt of a timely appeal, a hearing on the appeal by the Board of Directors shall be scheduled at the Board's next Regular meeting or at a Special meeting scheduled for that hearing; in either, the hearing shall be at least ten (10) days following receipt of the appeal, and the District shall mail written notice of the hearing to the customer at least ten (10) days before the date of said hearing.

2. **Interim Measures**. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the General Manager or the Enforcement Officer, if one has been designated, may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violation and the current declared water condition.

2413. CEQA EXEMPTION

The adoption of this Ordinance, and the actions taken hereunder, are exempt from the provisions of the California Environmental Quality Act of 1970 in that they constitute a project undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Section 15071 of the State EIR Guidelines.

2414. DURATION OF ORDINANCE

This Ordinance shall remain in effect until the Board of Directors finds that the threatened emergency and threatened water shortage no longer exists. The provisions of this Ordinance shall prevail and control in the event of any inconsistency with any other rules and regulations of the District.

2415. SEVERABILITY

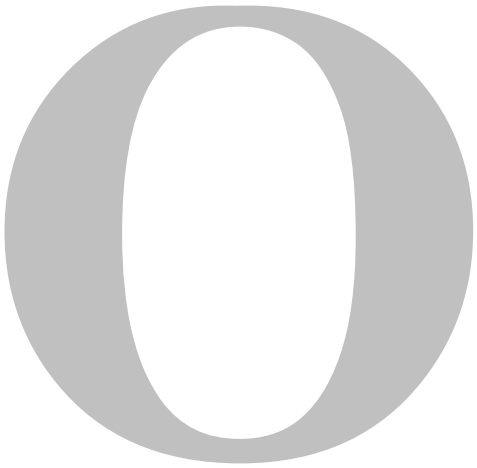
ARTICLE 24. WATER CONSERVATION

If any section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this Ordinance. The Board of Directors hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause, or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases may be unconstitutional or invalid.

2416. EFFECTIVE DATE, PUBLISHING, AND POSTING

This Ordinance shall be effective immediately upon adoption. Within ten (10) days of adoption, a copy of this Ordinance shall be published one time in a local newspaper and posted in the lobby of the District Office.

Appendix



ARTICLE 17. AGRICULTURAL, IRRIGATION, AND GOLF COURSE WATER SERVICE

1701. AGRICULTURAL OR IRRIGATION WATER

(a) Shall be that water delivered from the District's pressurized pipelines into the applicant's irrigation system, and shall be used in the commercial production of agricultural crops. (See Article 2, Section 205)

It shall be the policy of the District that no agricultural water be served for irrigation purposes on parcels of land totaling fifteen (15) acres or more, except at domestic rate.

(b) All irrigation water will be delivered through a meter connection.

(c) The District reserves the right to adjust schedules of irrigation runs on the water system. Irrigator affected shall be notified of any such change.

(d) The District reserves the right to terminate irrigation service in the event of a drought or natural disaster. (See Article 24)

(e) If a commercial crop is not being produced for a period of six months, irrigation service is subject to termination.

1702. TERMINOLOGY.

(a) An irrigation head shall normally be fifty (50) miners inches unless otherwise arranged.

(b) Length of irrigation run shall be the number of continuous hours arranged for at time application is made.

1703. GOLF COURSE WATER. Shall be that water delivered from the District's concrete gravity flow pipelines or the district's pressured pipelines into the applicant's irrigation system, and shall be used solely for irrigation purposes.

(a) Water Rate. See Article 21, Section 2102 (c).

(b) Domestic Use. Any domestic use of water delivered to a golf course shall comply with those Sections of this Resolution pertaining thereto.

ARTICLE 17. AGRICULTURAL, IRRIGATION, AND GOLF COURSE WATER SERVICE

(c) Water Quality. The irrigation water delivered for golf course use is considered non-potable and the District accepts no responsibility or liability for water deliveries.

Appendix

P

West Valley Water District

855 West Base Line, P.O. Box 920
Rialto, California 92377-0920
Phone (909) 875-1804

Board of Directors
Earl Tillman, Jr.
President
Betty J. Gosney
Vice President
Alan G. Dyer
Donald D. Olinger
Jackie Cox

Administrative Staff
Anthony W. Araiza
General Manager-Secretary
Leon Long
Assistant General Manager
Deborah L. Sousa
Treasurer
Peggy S. Asche
Administrative Secretary

Fax (909) 875-7284 Administration
Fax (909) 875-1361 Engineering
Fax (909) 875-1849 Customer Service

November 18, 2005

Mr. Robert Reiter
General Manager
San Bernardino Valley Municipal Water District
1350 S. E Street
San Bernardino, CA 92408

RE: Long Term Request for State Project Water

Mr. Reiter,

West Valley Water District (WVWD), in conjunction with the requirements of the Urban Water Master Plan by the Department of Water Resources, requests a commitment from the San Bernardino Valley Municipal Water District for direct delivery of State Project Water to WVWD's water filtration facilities. WVWD's estimated amount of State Project Water is projected to be 15,000 acre-feet per year for the years 2010 through 2015; increasing to 17,000 af/yr by the year 2020; and increasing to 23,000 af/yr by the year 2025.

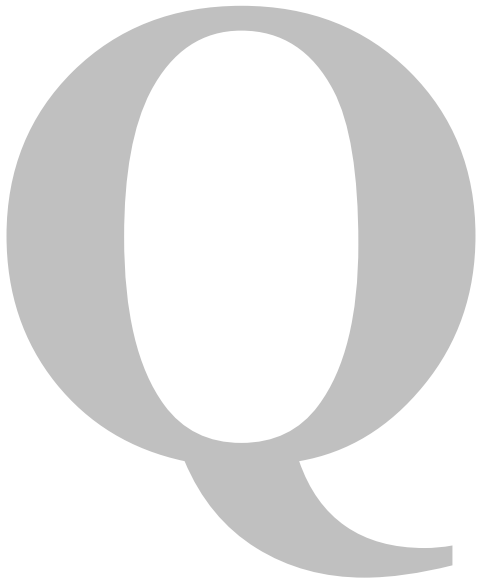
I look forward to you r response and want to thank you for your assistance. If you have any questions please call my office at (909) 875-1804.

Sincerely,

Leon Long

Leon Long
Assistant General Manager

Appendix



ORDINANCE NO. 69

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE WEST SAN BERNARDINO COUNTY WATER DISTRICT, AMENDING THE "URBAN WATER MANAGEMENT PLAN UPDATE" BY ADDING THE "WATER SHORTAGE CONTINGENCY PLAN"

WHEREAS, due to the passing of recent legislation, the District was required to amend the "Urban Water Management Plan Update" by preparing and adding a "Water Shortage Contingency Plan"; and

WHEREAS, Staff has prepared and presented the proposed "Water Shortage Contingency Plan", as shown in the attached "Exhibit A".

NOW, THEREFORE, BE IT RESOLVED, that said Board of Directors of the West San Bernardino County Water District, after reviewing the proposed "Water Shortage Contingency Plan", hereby authorize the amendment to the "Urban Water Management Plan Update", a copy of said Plan being attached hereto.

BE IT FURTHER RESOLVED, that said "Water Shortage Contingency Plan" be supplemented to and made a part of said "Urban Water Management Plan Update" on file in the District records, and by this reference made a part thereof as Exhibit No. 2, and forward copies of said Plan to all appropriate governmental offices.

Adopted, signed and approved the 6th day of February, 1992.

Robert A. Scherer, President

ATTEST

Ira B. Pace, Secretary

CERTIFICATION

STATE OF CALIFORNIA)
)ss
COUNTY OF SAN BERNARDINO)

I, **IRA B. PACE,** Secretary of the Board of Directors of **THE WEST SAN BERNARDINO COUNTY WATER DISTRICT, DO HEREBY CERTIFY** that the foregoing **Ordinance No. 69** was duly adopted by the Board of Directors of said District at a regular meeting thereof, held the 6th day of February, 1992, a full quorum present and acting through, by the following vote to wit:

AYES: DIRECTORS: **SCHERER, ROEMER, DYER, ROTOLO, FERGUSSON**
NOES: DIRECTORS: **NONE**
ABSENT: DIRECTORS: **NONE**

By:_____
Ira B. Pace, Secretary, West San Bernardino County Water District, and the Board of Directors thereof.

2005 Urban Water Management Plan
West Valley Water District

Coordination with Appropriate Agencies (Water Code § 10620 (d)(1)(2))

All of West Valley Water District's groundwater sources are shared with other water purveyors in the area. Prior to the public hearing, the District provided copies of the draft Urban Water Management Plan to these purveyors including, the City of Rialto, the City of Colton, the City of Fontana and the San Bernardino County Planning Department for review and comment along with a notice specifying the time and place of the public hearing.

Resource Maximization / Import Minimization Plan (Water Code § 10620 (f))

In 2005, the District and other members of the Upper Santa Ana Water Resources Association met to develop an Integrated Regional Water Management Plan (IRWMP) that would address the water supply and quality issues of the communities within the Upper Santa Ana River Watershed. This IRWMP focuses on several of the groundwater basins from which the District receives water, including the Bunker Hill Basin, Lytle Creek Basin, Rialto Basin and the North Riverside Basin. The goal of the IRWMP is to improve groundwater management and water supply reliability, especially during times of drought, by maximizing the use of local surface water runoff and groundwater storage.

The IRWMP proposes to increase reliability by implementing programs to recycle and conserve water and by improving surface water and groundwater management. This will be achieved by expanding water conservation programs, by encouraging land use planning that requires native plant life in landscaping, by constructing facilities that will capture newly conserved surface waters, by enhancing groundwater storage in preparation for drought years and during catastrophic events and by improving system redundancy by constructing additional transmission pipelines.

To improve surface water and groundwater management in the watershed, the plan outlines projects that will capture additional storm water runoff by enhancing spreading grounds and recharging basins. The IRWMP also addresses measures to ensure water quality by monitoring surface and groundwater supplies and by entering into joint projects that will clean up contaminated groundwater plumes. Implementation of these programs and projects will maximize the utilization of local groundwater and surface water supplies and thus minimize the need for imported water.

Plan Update and Adoption (Water Code § 10621 (a) and 10642)

No written responses or comments from the floor at the public hearing were received. The Urban Water Management Plan was then adopted on January 5, 2006 by Resolution No. 758 by the Board of Directors of the West Valley Water District. (See Appendix A1 for the Public Notice and Proof of Publication, Appendix B1 for the Minutes of the regular Board Meeting of the West Valley Water District dated January 5, 2006 approving Resolution No. 758 and Appendix C1 for Resolution No. 758 of the Board of Directors of the West Valley Water District adopting the 2005 Urban Water Management Plan.)

City and County Notification and Participation (Water Code § 10621 (b) and 10645)

A notice dated November 26, 2005 informing the public that the District is in the process of reviewing their Urban Water Management Plan and is considering amendments or changes to the plan was advertised in the local newspaper, mailed and posted at the District's office. The notification welcomed comments on the plan from public agencies and the general public. The date and time of the hearing was posted along with the location where a copy of the plan would be made available for public viewing.

Water Sources (Water Code § 10631 (b))

West Valley Water District does not currently provide recycled water as a supply. All of the wastewater collected and treated from the District's service area is handled by the City of Rialto. The District provides decanted backwash water from the Oliver P. Roemer Water Filtration Facility and non-potable raw State Project Water to supply the irrigation demand of the El Rancho Verde Golf Course. The Golf Course consumed a total of 1,357 acre feet in 2003 from both sources which would have otherwise been supplied from the District's potable water supplies. By providing this customer with decanted backwash water for its irrigation demand, the District was able to conserve potable water supplies.

This water supply has been included in the supply from the Lytle Creek Surface Water in Table 2-11 (page 21) of the 2005 Urban Water Management Plan. Table 5-2 (page 51) outlines the potential recycled water users in the future and includes the current El Rancho Verde Golf Course supply.

Reliability of Supply (Water Code § 10631 (c)(1-3))

The quantities of water supplied for the "Basis of Water Year Data for Local Supply" in Table 2-12 of the District's 2005 Urban Water Management Plan are shown in Table 2-13.

Table 2-13
Supply Reliability (af/yr)

Average/Normal Water Year	Single Dry Water Year	Multiple Dry Years		
		Year 1	Year 2	Year 3
17,149	20,248	20,655	21,558	22,734

Water Use Provisions (Water Code § 10631 (e)(1)(2))

The information used to compile the "Water Use by Customer - Past, Current and Future" Table 2-14 in the Urban Water Management Plan was taken from the District's "Public Water System Statistics" reporting document. The single family and multi-family residential active service connections and metered water deliveries shown on these documents have been combined. The future residential accounts and water deliveries shown in the table below show the projected single family and multi-family usage.

Table 2-14
Water Use by Customer - Past, Current and Future (AF/Yr)

	2000		2004		2010	
Water Use Sector	# of accounts	Deliveries (af/yr)	# of accounts	Deliveries (af/yr)	# of accounts	Deliveries (af/yr)
Single Family	15,487	14,542	16,742	15,199	22,674	20,763
Multi-Family					226	237
	2015		2020		2025	
Water Use Sector	# of accounts	Deliveries (af/yr)	# of accounts	Deliveries (af/yr)	# of accounts	Deliveries (af/yr)
Single Family	26,211	24,723	30,324	28,586	35,090	33,121
Multi-Family	289	277	476	414	610	479

Demand Management Measures (Water Code § 10631)

(A) Water Survey Programs for Single-Family and Multi-Family Residential Customers (Water Code § 10631 (f)(1)(a))

The District does not perform water use surveys for their customers at this time. In 2004 the average residential connection in the District had a demand of 840 gallons per day or 0.9 acre feet per year. The following Cost Effectiveness Summary is based on this usage with a projected 5% reduction in demand achieved per connection. This summary was calculated on 200 residential units surveyed.

Cost Effectiveness Summary	
Total Costs	$43,200
Total Benefits	$22,430
Discount Rate	5%
Time Horizon	20 years
Cost of Water ($ per AF)	$200
Water Savings (AFY)	9.0

(B) Residential Plumbing Retrofit (Water Code § 10631 (f)(1)(b))

Implementation: In its efforts to promote water conservation, the District is studying programs that will provide the greatest savings for their investment. Two of the programs under review are a Low-Flow Showerhead Exchange Program and a Faucet Aerator Kit Give-A-Way. Low-Flow Showerheads equipped with a built-in control valve will allow the user to manually stop the water flow and then return the flow back without changing the water temperature and pressure. The Faucet Aerator Kit would include one dual spray aerator for the kitchen and two bathroom faucet aerators per household. Implementation of this plan could commence as early as 2008.

Methods Used to Evaluate Effectiveness: The effectiveness of this program will depend on the number of Low-Flow Showerheads and Faucet Aerator Kit that are distributed and are installed. A showerhead using 3.0 gpm when replaced with a Low-Flow Showerhead that uses 2.5 gpm could save a family of four 7,300 gallons per year. If 3,000 showerheads were replaced, 67.2 af/yr could be conserved.

New Faucet Aerators are projected to provide a 13% reduction in water faucet usage per day per person. The savings per household could be as high as 1,700 gallons per year. If 5,000 kits are installed, 26.1 af/yr could be conserved.

	Quantity	Cost Per Item	Estimated Water Savings (af/yr)	Total Cost
Low-Flow Showerhead	3,000	$3.50	67.2	$10,500
Faucet Aerator Kit	5,000	$1.97	26.1	$9,850
Total	8,000		93.3	$20,350

(C) System Water Audits, Leak Detection, and Repair (Water Code § 10631 (f)(1)(c))

Implementation: A water audit is performed once a year by the District's Superintendent where he compares demands from meter readings against well production meters. Audits from 2001 through 2005 show an average annual unaccounted for water loss of 7.9 percent. The unaccounted for water loss is attributed to line flushing, fire fighting, meter efficiency and street cleaning. In addition to the Superintendent's annual review, the District receives calls from the general public reporting leaks. The District's field personnel also report any visible signs of water leakage within the system during day to day operations.

Methods Used to Evaluate Effectiveness: These forms of evaluation prove to be fairly effective for the District. The 7.9 percent unaccounted for water loss is below the average system loss of 10 percent as reported by the Department of Water Resources in a water audit and leak detection program of 47 California water utilities. The 2.1 percent below average unaccounted for water represents an average annual water savings of 444 acre feet per year for years 2001 through 2005.

(D) Metering with Commodity Rates (Water Code § 10631 (f)(1)(d))

Implementation: District records show that all connections within the District since 1999 (16,046 connections) are metered and are charged a monthly consumption commodity charge. The District will continue to install meters on all new accounts.

Methods Used to Evaluate Effectiveness: Typically metering accounts encourages the efficient use of water and may result in a 15-20% reduction in demand compared to an unmetered connection.

(E) Large Landscape Conservation Programs and Incentives (Water Code § 10631 (f)(1)(e))

Implementation: Article No. 24 - Water Conservation amended Resolution No. 387 through Ordinance No. 68 on May 1, 2003. It states that large water users, as determined by the District, are required to submit a water conservation plan to the District and implement it as a condition of continued service.

Urban development has replaced agricultural crops in the District's service area. The District has 18 irrigation meters within its service area according to the District's 2004 Water Master Plan. These irrigation meters supply local schools and parks. None of the landscape accounts have water budgets.

Commercial/Institutional/Industrial meters within the District in 2004 totaled 474. None of these accounts have had landscape surveys prepared for them.

The District, the City of Rialto and San Bernardino Valley Municipal Water District are reviewing a plan to install ET controllers at local parks within the District's service area and within the City of Rialto to reduce landscape irrigation demands.

Methods Used to Evaluate Effectiveness: When this plan is implemented, and the ET controllers have been installed, customer usage will be compared with past water use to determine the effectiveness of this DMM. The projected time frame for such a plan is 2008-2010.

(F) High-Efficiency Washing Machine Rebate Program (Water Code § 10631 (f)(1)(f))

Implementation: The Board of Directors has authorized funds to implement a Residential Water Conservation Incentive Program. The adopted Program recommends a High-Efficiency Washing Machine Rebate Program to be implemented in 2010. The District plans to issue 200 rebates at $100 per rebate.

Methods Used to Evaluate Effectiveness: If 200 high efficiency washing machines are purchased through this rebate program, with an average savings of 8,000 gallon per year per machine, then a total of 1,600,000 gallons per year is estimated to be saved at a cost of $20,000 to the District.

(G) Public Information Programs (Water Code § 10631 (f)(1)(g))

Implementation: To promote voluntary conservation, the District has initiated a public awareness and education plan.

The District sponsors an annual poster coloring contest at local elementary schools where the students are required to draw a poster with a water conservation theme.

Tours of the Oliver P. Roemer Water Filtration Facility are conducted with the local schools to educate today's youths on water conservation and awareness. Tours have been conducted since 1999.

Pamphlets, brochures, and stickers are distributed stressing the reasonable utilization of resources and explain that the quality of life need not suffer from the use of conservation techniques. These forms of public awareness were initiated prior to 1999.

The District provides each service customer with data on water use during the similar period from the previous year. Customers will use the data to informally evaluate the results of their conservation efforts taking into consideration climatic difference, exact billing period length, and any changes they have made to their households which could affect water consumption. This data has been provided to customers since 2004.

A yearly Consumer Confidence Report which illustrates the quality of water provided by the District is posted on the District's web site and is distributed to customers.

Methods Used to Evaluate Effectiveness: The District does not have a method to determine the effectiveness of this program or to quantify the water savings realized by this DMM. The District feels that this program is beneficial in educating the public and that some level of water conservation is achieved.

(H) School Educational Programs (Water Code § 10631 (f)(1)(h))

Implementation: As previously mentioned, the District has provided tours of the Oliver P. Roemer Water Filtration Facility for the local schools to educate today's youths on water conservation and awareness since 1999. In addition to the tours, the District conducts Water Conservation Presentations in classrooms at local schools. These presentations cover why water conservation is important and provides examples on how the students can conserve water at school and home. The District also participates at the local State College Cal State Expo.

Methods Used to Evaluate Effectiveness: The District does not have a method to determine the effectiveness of this program or to quantify the water savings realized by this DMM. The District feels that this program is beneficial in educating the public and that some level of water conservation is achieved.

(I) Conservation Programs for Commercial, Industrial, and Institutional (Water Code § 10631 (f)(1)(I))

In 2003 there were 479 commercial/institutional metered connections within the District. The total demand recorded for those connections was 2,454 acre feet per year or 5.12 acre feet per connection. The following Cost Effectiveness Summary is based on this usage and a survey of 40 average commercial connections per year with a 5% reduction in demand.

Cost Effectiveness Summary	
Total Costs	$43,200
Total Benefits	$25,520
Discount Rate	5%
Time Horizon	20 years
Cost of Water ($ per AF)	$200
Water Savings (AFY)	10.24

(J) Wholesale Agency Programs (Water Code § 10631 (f)(1)(j))

Implementation: The District began supplying Marygold Mutual Water Company (MMWC) with supplemental water in July of 2003. This water supply was provided in response to a request for water from MMWC due to one of their wells being out of service. The District is not a wholesale agency and only supplies water on an emergency basis.

(K) Conservation Pricing (Water Code § 10631 (f)(1)(k))

Implementation: The District does not currently encourage conservation through a tiered rate or seasonal water pricing system. The District is evaluating the impacts on the District's finances to implement such a program.

All connections within the District since 1999 are metered and are assessed a monthly consumption commodity charge based on the quantity of water used. The District currently charges $1.00 per 100 cubic feet of water used. Out-of-District rates are one and a half times the regular In-District rate. The commodity charge for irrigation water is $0.50 per 100 cubic feet, for pressure irrigation the charge is $0.70 per 100 cubic feet and for Golf Courses $0.63 per 100 cubic feet. Out-of -District irrigation rates are twice the regular In-District rate. Hydrant Water - Metered water for commercial and industrial uses is $1.63 per 100 cubic feet. The District does not provide sewer service. This is provided by the City of Rialto.

Methods Used to Evaluate Effectiveness: Typically metering accounts encourages the efficient use of water and may result in a 15-20% reduction in demand compared to an unmetered connection.

(L) Water Conservation Coordinator (Water Code § 10631 (f)(1)(l))

Implementation: Water Conservation Programs are coordinated by the District's Assistant General Manager. Approximately 5% of his time is allocated to overseeing water conservation programs and activities. Another member of the staff has 15% of their time allocated to conservation efforts, including the presentations on water conservation at local schools, distributing conservation kits and providing guided tours of the District's Waterwise Demonstration Garden.

Methods Used to Evaluate Effectiveness: The District has been able to utilize existing staff for various conservation activities. The District does not have a method to quantify savings of this DMM but feels that all efforts to encourage water conservation and initiate water conservation programs and incentives are beneficial.

(M) Water Waste Prohibition (Water Code § 10631 (f)(1)(m))

Implementation: The District through Ordinance 68, Article 24, 2404. Stage 1 - Normal Condition, lists uses of water considered non-essential to the public health, safety and welfare and, if allowed, would constitute the wasting of water which is prohibited, pursuant to Water Code Section 350 et seq., Water Code Section 71640 et. Seq., and the common law. This Ordinance was adopted May 1, 2003.

Methods Used to Evaluate Effectiveness: The District does not have a method at this time to evaluate the effectiveness of this DMM.

(N) Residential Ultra-Low-Flush Toilet Replacement Program (Water Code § 10631 (f)(1)(n))

Implementation: The District is studying options for implementing a Water Conservation Incentive Program, including rebates for ultra low-flow (ULF) toilets and high efficiency (HE) toilets. Implementation of a residential ultra-low flush toilet rebate program is scheduled for implementation in 2009.

There were approximately 13,300 single family and 90 multi-family accounts within the District prior to 1992. Existing structures which required building permits to remodel or expand are required to be retrofitted with ultra low-flush toilets. There is no ordinance in the City requiring a retrofit on resale.

Methods Used to Evaluate Effectiveness: If the District were to implement a program that provides a $40.00 rebate on ULF toilets and $60.00 on HE toilets the following summary of costs and savings is estimated based on 200 and 250 rebates respectively. These rebate costs are a onetime investment to the District which will benefit from the annual water savings over the life of the toilet.

	Quantity	Amount Per Rebate	Estimated Water Savings (af/yr)	Cost of Rebates
ULF Toilets	200	$40	8.6	$8,000
HE toilets	250	$60	13	$15,000
Total	450		21.6	$23,000

Planned Water Supply Projects and Programs (Water Code § 10631 (g))

The District realizes that their water supply is indispensable and is committed to improving the reliability of its water supply. Several conservation programs and projects are under review by the District to achieve this goal. They include a water conservation incentive program that will provide rebates for both indoor and outdoor water saving devices and the installation of ET controllers at local parks to reduce their landscape irrigation demand. Initial projects will focus on the programs that provide the greatest water savings to the customer for the investment. These include high efficiency clothes washer rebates, high efficiency and low-flow flush toilets rebates, low-flow showerhead and faucet aerator kit distribution and soil moisture sensors for residential landscape conservation. Examples of the cost-benefit analysis associated with these programs are shown with the applicable DMM. The District made recommendations for the implementation of a Residential Water Conservation Program that was adopted by their Board of Directors in March 2008.

Wholesale Water Supplier (Water Code § 10631 (k))

The District's wholesale water supplier has provided information regarding the anticipated availability and reliability of State Water Project Water (see Wholesale provider letter Appendix E1). During an average or single dry year, production from local groundwater basins and surface water supplies will be sufficient to meet projected demands within the District. In a multiple year drought when deliveries of SWP water would be curtailed, the District would rely more heavily upon their groundwater and local surface water supplies and/or reduce consumption by enacting one of the stages of water conservation as set forth in Ordinance No. 68, Article 24.

Consumption Reduction Methods (Water Code § 10632 (e))

The Consumption Reduction Methods that the District will use to reduce water use in the most restrictive stages with up to 50% reduction are listed in Table 4-4 of the Urban Water Management Plan (page 41). The reduction methods include minimum customer allocations over last year's consumption, restrictions on commercial nursery water usage, irrigation limited to certain days, construction water allowed by permit only, limitations on swimming pool and decorative fountain refilling, restrictions on watering of public areas such as parks, school grounds, freeways and the stage when each method takes effect. Article 24 of Ordinance 68, in appendix N, outlines the consumption reduction methods, the rationing stages, mandatory prohibitions, and the penalties and charges for excessive use.

Consumption Reduction Methods

Consumption Reduction Method	Stage When the Method Takes Effect	Projected Reduction (%)
Reduction in Consumption Over Last Year's Usage	2, 3, 4	10, 15, 20
Commercial Nursery Watering	2, 3, 4	25, 50, 50
Residential Lawn Watering Reduction	3, 4	50, 100
Watering of Public Areas, Parks, Freeways	2, 3, 4	25, 50, 100

Water Shortage Contingency Ordinance/Resolution (Water Code § 10632 (h))

Ordinance No. 69 Amending the "Urban Water Management Plan Update" by adding the "Water Shortage Contingency Plan" is located in Appendix Q in the Urban Water Management Plan. Included in Appendix D1 is the District's 1995 Water Shortage Contingency Plan.

Wastewater System Description (Water Code § 10633 (a))

The wastewater collection and treatment within West Valley Water District's service area is provided by the City of Rialto. The City of Rialto has a 12.0 mgd tertiary treatment plant with a current flow of 8 mgd or approximately 8,900 af/yr. The estimates of the wastewater generated from West Valley Water District's service area are shown in the following table. The City's treatment plant effluent meets Title 22 for recycled water usage in restricted irrigation.

Estimated Wastewater Collection and Treatment
Within West Valley Water District's Service Area (af/yr)

Type of Wastewater	2000	2005	2010	2015	2020	2025
Wastewater collected in service area	6,000	6,600	8,900	10,400	12,000	14,000
Volume that meets recycled water standard	6,000	6,600	8,900	10,400	12,000	14,000

The use of recycled water from the City of Rialto's Wastewater Treatment Plant to offset potable water demands within West Valley Water District's service is not feasible at this time. The treatment plant is located at an elevation and location that would require extensive pipeline construction and substantial boosting to elevations and locations that could utilize this supply.

Wastewater Disposal and Recycled Water Uses (Water Code § 10633 (a-d))

The City of Rialto used approximately 850 acre feet of Title 22 recycled water from the Wastewater Treatment Plant in 2005 to supply the Caltrans I-10 freeway irrigation demands. The remaining 8,050 acre feet were discharged into the Santa Ana River.

Provision of Water Service Reliability within Service Area (Water Code § 10635 (b))

An assessment of the water reliability within the Districts service area during normal, dry and multiple dry water years was prepared and is outlined in Section 7 of the UWMP. Section 7 was provided in the copies of the UWMP submitted to the cities and counties that the District services (see Appendix F1).

Provision of 2005 UWMP to Local Governments (Water Code § 10644 (a))

Upon adoption of the UWMP, copies of the plan were sent to the Department of Water Resources and to the cities and counties within the Districts service area.

Appendix

A1

PUBLIC NOTICE

Preparations of an Urban Water Management Plan for West Valley Water District. Pursuant to the California Urban Water Management Planning Act, under Section 10610 of the Water Code, West Valley Water District is to prepare an Urban Water Management Plan (U.W.M.P.). After completion of the first U.W.M.P., the U.W.M.P. is to be updated every five (5) years by December 31st on years ending in 0 or 5. The Act states that the agency preparing the plan is to notify all public agencies within the areas the agency supplies water to. West Valley Water District is in the process of reviewing the plan and is considering amendments or changes to the plan. The District welcomes comments on the plan from public agencies and the general public. The District plans to hold a Public Hearing at the place and time as specified below. A copy of the U.W.M.P. will be made available for viewing at the address listed below.

Public Hearing location -

Place: West Valley Water District
855 W. Baseline
Rialto, CA 92376

Phone: (909) 875-1804

Time: The District intends to adopt the new U.W.M.P. at the Board Meeting of January 5, 2006 at 3:00 p.m.

Contact: Leon Long, Assistant General Manager

SAN BERNARDINO COUNTY SUN

This space for filing stamp only

399 D ST, SAN BERNARDINO, CA 92401
Telephone (909) 386-3960 / Fax (909) 381-3976

PEGGY ASCHE
WEST VALLEY WATER DISTRICT
855 WEST BASE LINE
RIALTO, CA - 92377

SBS#: 896756

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of SAN BERNARDINO) ss

Notice Type: GPNSB - GOVERNMENT PUBLIC NOTICE-SB

Ad Description: PREPERATION OF AN URBAN WATER MANAGEMENT

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the SAN BERNARDINO COUNTY SUN, a newspaper published in the English language in the city of SAN BERNARDINO, county of SAN BERNARDINO, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SAN BERNARDINO, State of California, under date 06/20/1952, Case No. 73084. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

11/26/2005

Executed on: 11/26/2005
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Helen Tang

Signature

PUBLIC NOTICE

Preparations of an Urban Water Management Plan for West Valley Water District, Pursuant to the California Urban Water Management Planning Act, under Section 10610 of the Water Code, West Valley Water District is to prepare an Urban Water Management Plan (U.W.M.P.) After completion of the first U.W.M.P. is to be updated every five (5) years by December 31st on years ending in 0 or 5. The Act states that the agency preparing the plan is to notify all public agencies within the areas the agency supplies water to. West Valley Water District is in the process of reviewing the plan and is considering amendments or changes to the plan. The District welcomes comments on the plan from public agencies and the general public. The District plans to hold a Public Hearing at the Place and time as specified below. A copy of the U.W.M.P. will be made available for viewing at the address listed below.
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855 W. Baseline, Rialto, CA 92376
Phone: (909) 875-1804
Time: The District intends to adopt the new U.W.M.P. at the Board Meeting of January 5, 2006 at 3:00 p.m.
Contact: Leon Long, Assistant General Manager
11/26/2005

SBS-896756#

Appendix

B1

MINUTES
REGULAR BOARD MEETING
of the
WEST VALLEY WATER DISTRICT
January 5, 2006

PRESENT	ABSENT	DIRECTORS
✓		**Earl Tillman, Jr., President**
✓		**Betty Gosney, Vice President**
✓		**Alan Dyer, Director**
✓		**Don Olinger, Director**
✓		**Jackie Cox, Director**
		STAFF
✓		**Anthony W. Araiza, General Manager/Secretary**
✓		**Leon Long, Assistant General Manager**
✓		**Debbie Sousa, Treasurer/Office Manager**
✓		**Lon Tsai, Chief Engineer**
✓		**Ken Sikorski, Superintendent**
✓		**Peggy Asche, Administrative Secretary**
✓		**Amanda Kasten, Executive Secretary**

VISITORS: **None**

The regular meeting of the Board of Directors was called to order by President Tillman at 3:00 p.m. at the District office, 855 W. Base Line Road, Rialto, CA.

ROLL CALL

The roll call was made noting a quorum present.

ADOPT AGENDA

Motion was made by Director Dyer, seconded by Director Cox, duly carried and ordered to adopt the Agenda.

CONSENT CALENDAR

Motion was made by Director Dyer, seconded by Director Gosney, duly carried and ordered to approve the Consent Calendar.

1. Minutes of the Regular Meeting of December 15, 2005.

2. Write Off List.

3. Approval of Liens on Delinquent List.

4. Payment to ECORP Consulting, Inc. for professional services rendered through September 30, 2005; Invoice #46478.

5. Payment to Tom Dodson & Associates for CEQA and Regulatory Support for the Lytle Creek Turnout Model dated 12/16/05; Invoice #WV 035 10.

6. Progress Payment No. 1 to McKinney Construction Co., Inc., for the installation of Zone 6 & 7 waterlines in Sierra Ave. from Casa Grande Ave. to Riverside Ave.

7. Payment to GTS Associates, Inc., for providing professional Engineering Services for the design and construction management of District Headquarters Expansion.

8. Payment to Black & Veatch for providing professional Engineering Services for the preliminary design of Oliver P. Roemer Water Filtration Facility Expansion Phase 3 – Membrane.

9. Payment to PCR for services rendered through November 30, 2005 for the Construction Monitoring for the San Bernardino Kangaroo Rat on the Duncan Canyon Pipeline Project.

PUBLIC PARTICIPATION

President Tillman invited anyone who so desired to address the Board. There was no participation.

PUBLIC HEARING

President Tillman opened the Public Hearing at 3:02 p.m. stating this was the time and place as specified in the Notice dated November 26, 2005, to hold a Public Hearing concerning the adoption of the 2005 Urban Water Management Plan of the West Valley Water District.

Secretary Araiza certified that all notices for the above hearing have been advertised, mailed and posted as required. No written responses have been received.

President Tillman requested comments from the floor. Hearing none, motion was made by Director Dyer, seconded by Director Cox to close the public hearing at 3:03 p.m.

BUSINESS MATTERS

1. **Approval of Engineering Consultant's Agreement for 2006** – Following Staff presentation and discussion, motion was made by Director Dyer, seconded by Director

Gosney, duly carried and ordered to approve Jerry Dunlap, the Engineering Consultant's Agreement for the year 2006.

2. **Authorization to Purchase one (1) Backhoe** – Following Staff presentation and discussion, motion was made by Director Dyer, seconded by Director Cox, duly carried and ordered to approve the purchase of one (1) 2006 Caterpillar 420 D Backhoe Loader in the amount of $88,067.00.

3. **Approval of Resolution No. 758 adopting the Urban Water Management Plan** – Following Staff presentation, motion was made by Director Olinger, seconded by Director Dyer, duly carried and ordered to adopt Resolution No. 758, as follows:

RESOLUTION NO. 758

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE WEST VALLEY WATER DISTRICT ADOPTING THE URBAN WATER MANAGEMENT PLAN (for full text, see Resolution on file)

AYES:	**DIRECTORS:**	**TILLMAN, GOSNEY, DYER, OLINGER, COX**
NOES:	**DIRECTORS:**	**NONE**
ABSENT:	**DIRECTORS:**	**NONE**

4. **Approval of Resolution No. 759 adopting Negative Declaration for the Lytle Creek Turnout Project** – Following Staff presentation, motion was made by Director Dyer, seconded by Director Cox, duly carried and ordered to adopt Resolution No. 759, as follows:

RESOLUTION NO. 759

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE WEST VALLEY WATER DISTRICT FORMERLY WEST SAN BERNARDINO COUNTY WATER DISTRICT ADOPTING A NEGATIVE DECLARATION ON DISTRICT PROJECT KNOWN AS THE LYTLE CREEK TURNOUT PROJECT (for full text, see Resolution on file)

AYES:	**DIRECTORS:**	**TILLMAN, GOSNEY, DYER, OLINGER, COX**
NOES:	**DIRECTORS:**	**NONE**
ABSENT:	**DIRECTORS:**	**NONE**

REPORTS – LIMITED TO 5 MINUTES MAXIMUM (Presentations or handouts must be provided to Board Members in advance of Board Meeting.)

1. Committees

Director Dyer reported on the following:

- Jan. 4th – Attended San Bernardino Valley Municipal Water District's Board meeting.

- Jan. 16th – Plans on attending the Rialto Black History "Martin Luther King" luncheon at the San Bernardino Hilton Hotel from 11:00 a.m. to 3:00 p.m.

Director Cox reported on the following:

- Dec. 19th - Attended the Special District's Dinner meeting. Enjoyed the Christmas program.

Director Olinger reported on the following:

- Dec. 19th – Also, attended the Special District's Dinner meeting. Enjoyed the Choir.

Director Gosney reported on the following:

- Dec. 19th – Also, attended the Special District's dinner meeting and thanked Peggy Asche for making the arrangements for the Christmas program.

President Tillman reported on the following:

- Dec. 19th – Also, attended the Special District's dinner meeting and thanked Peggy Asche for the Choir and their performance.

2. Consultants

3. Safety

Celebrating 285 days without "Lost time" claims.

"Safety Pays" Celebration will be held on January 12, 2006.

4. IT Administrator

5. General Manager

Mr. Araiza reported on the following:

(a) Reported that Mitch Curtis, District's Human Resources Administrator, had to leave early on Wednesday as he received a call that his home had caught on fire. Mr. Curtis lost most of his upper rooms to the fire damage and is now dealing with insurance.

(b) Dec. 19th – Meeting with Kennedy/Jenks regarding the District's rate study.

(c) Dec. 19th – Also, attended the Special District's Dinner meeting and enjoyed the Christmas program as well.

(d) Dec. 20th – Meeting with Tetra Tech regarding a proposal they are working on for the District's Well 22 site.

6. Assistant General Manager

Mr. Long reported on the following:

(a) Dec.19th – Also, attended the meeting with Kennedy/Jenks. I will be working on water consumptions for the next five years.

(b) Dec. 19th – Also, attended the Special District's Dinner meeting and enjoyed the program.

(c) Reported that the District received a Christmas card from Mr. John Taylor, a former Board member. He stated that he had turned 100 years old last June.

7. Chief Engineer

Mr. Tsai reported on the following:

(a) Developer's Projects:

1. Lytle Creek North Villages – The contractor is continuing to install the pipelines in Lytle Creek Road. Also, continuing to work on the two reservoirs.

2. El-Co Contractors, Inc. is installing the 12" waterline in Duncan Canyon Road, approx. ½ mile is completed.

3. McKinney Construction is working on the Sierra Ave. pipeline and is approx. 90% complete.

(b) District's Projects:

1. Treatment Plant Expansion – There are approx. 4 items from the punch list to complete.

2. District Headquarters Expansion – The Architect is still talking to City of Rialto's Consultant regarding the permit.

8. Treasurer

Mrs. Sousa is on vacation. The October 2005 Treasurer's Report is in your Board packets.

9. Superintendent

Mr. Sikorski reported on the following:

(a) Treatment Plant Operations – As of today, the Plant is off line due to the recent storm activity. Since the Plant is off line, we plan on conducting maintenance work on some of the equipment and hopefully back on line on Monday.

(b) District Reservoirs and Wells – During the height of the rain storm, one of the motors on Well #2 burned. Now is a good time to complete the annual maintenance.

(c) Baseline Feeder – There is still only one well running into the feeder. No reports from Muni regarding the progress and/or prognosis.

(d) Water Production and Level Reports – Well measurements are coming up.

(d) Rainfall – 1.63 inches to date.

10. Administrative Secretary

(a) Informed the Board of the Water Education Special Tour in Yuma, Arizona on March 1-3, 2006.

(b) Requested reservations for the Association of the San Bernardino County Special Districts Membership Meeting on January 23, 2006, hosted by Cucamonga Valley Water District at the Panda Inn in Ontario.

CLOSED SESSION

There was no closed session for this meeting.

FUTURE AGENDA ITEMS

INFORMATION

THERE BEING NO FURTHER BUSINESS, MOTION WAS MADE BY DIRECTOR DYER, SECONDED BY DIRECTOR COX, DULY CARRIED AND ORDERED, TO ADJOURN THE MEETING AT 4:00 P.M.

_____

Earl Tillman, Jr., President

ATTEST:

_____

Anthony W. Araiza, District Secretary

Appendix

C1

RESOLUTION NO. 758

A RESOLUTION OF THE BOARD OF DIRECTORS OF
THE WEST VALLEY WATER DISTRICT
ADOPTING THE URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Legislature has enacted the Urban Water Management Planning Act, California Water Code Sections 10610 through 10657 requiring every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objective of which is to plan for the conservation and efficient use of water: and

WHEREAS, Section 10621 (a) of the California Water Code requires an update of the Urban Water Management Plan at least once every five years on or before December 31, in years ending in five and zero; and

WHEREAS, Section 10632 of the California Water Code requires preparation of an urban water shortage contingency analysis as part of the Urban Water Management Plan; and

WHEREAS, the West Valley Water District is an urban supplier of water providing water to more than 3,000 customers, and has, therefore prepared and circulated for public review its Draft Urban Water Management Plan in compliance with Chapter 3, Article 3 of the Urban Water Management Planning Act and a properly noticed public hearing on said draft plan was held by the District on January 5, 2006 and a final plan prepared;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the West Valley Water District as follows:

1. The final 2005 Urban Water Management Plan, dated November , 2005, is hereby approved and adopted;

2. The Urban Water Management Plan is ordered to be filed with the Cities of Rialto, Fontana, Colton and the County of San Bernardino no later than 30 days after adoption;

3. The General Manager is hereby authorized and directed to file this Plan with the State Department of Water Resources and the California State Library no later than 30 days after adoption;

4. The General Manager is further directed to periodically review the 2005 Urban Water Management Plan in accordance with applicable law and recommend to the Board of Directors amendments to the plan as may be appropriate as a result of such review.

ADOPTED, SIGNED, AND APPROVED THIS 5th DAY OF JANUARY 2006.

Earl Tillman, Jr., President

ATTEST:

Anthony W. Araiza, Secretary

Appendix

D1

WATER SHORTAGE CONTINGENCY PLAN

PAST, CURRENT AND PROJECTED WATER USE

A. California Water Code Section 10631.(e)(1), Past, Current and Projected Water Use

1. The District serves about 42,000 residents within its 26 square miles. The distribution of water deliveries is about 84% residential, 14% commercial/industrial and 2% agricultural. The current demand is about 14,200 AF/yr with about 7.7% (1,200 AF/yr) unaccounted for water.

Type	1994/95 Connections	1994/95 (AF/yr)	Projected 95/96 (AF/yr)	Projected 96/97 (AF/yr)	Projected 97/98 (AF/yr)
Residential	14,466	11,420	11,600	11,800	12,100
Comm/Indust	605	1,970	2,000	2,100	2,200
Agriculture	41	310	300	300	300
Bulk	---	480	400	0	0
Subtotal	15,112	14,180	14,300	14,200	14,600
Unaccounted		1,190	1,200	1,100	1,000
TOTAL		15,370	15,500	15,300	15,600

WORST CASE WATER SUPPLY AVAILABILITY FOR 12, 24 AND 36 MONTHS

A. California Water Code Section 10631(e)(2).

The District's water supply sources are listed as follows:

Supply Sources and Worst Case Supply Projections						
Source	No. Wells	91-95 Avg. Use (AF/yr)	Actual 1994 (AF/yr)	Projected 1995 (AF/yr)	Projected 1996 (AF/yr)	Projected 1997 (AF/yr)
Lytle Creek Basin	9	5,500	8,300	9,300	8,700	8,100
Bunker Hill Basin	3	4,700	4,000	2,600	3,300	4,000
Colton-Rialto Basin	7	2,800	2,800	3,400	2,800	2,500
North Riverside Basin	1	300	300	200	500	1,000
Chino Basin	2	0	0	0	0	0
TOTAL	22	13,300	15,400	15,500	15,300	15,600

In the previous reporting period (1986-1990), because of the drought, the District had shifted its main source of supply from the Lytle Creek Basin to the Bunker Hill and Colton-Rialto Basins. The District's existing nine wells in the Lytle Creek Basin had water levels decline an average of over 300 feet from 1985 to 1990. Levels in the Bunker Hill and Colton-Rialto Basins had only declined 30 to 60 feet, in the same time period. The Bunker Hill Groundwater Basin has an estimated 5 million AF groundwater storage capacity, but has some areas of contamination problems and may require water treatment for volatile organics in the future. WSBCWD, in a joint venture with the City of Rialto and SBVMWD, constructed 25,000 feet of 48-inch transmission line, two booster stations, and two additional wells in the Bunker Hill Basin. These improvements provide up to 5,000 AF/yr of supply for WSBCWD's portion.

In 1993-94, the area was relieved from the drought by above normal rainfall and the Lytle Basin was replenished reducing the dependency on the Bunker Hill Basin. This provides the District the option to pump from the Lytle or Bunker Hill Basin.

B. Water Quality and Emergency Supplies

The District's water sources are of medium to good quality at this time. One of the District's projected main source (Bunker Hill Basin) has some areas of potential contamination problems. The District is planning to construct treatment facilities to remove the volatile organics (TCE and PCE) when needed. The District has 48 million gallons of existing storage. The 48 million gallons of storage will provide two days of storage under maximum summer demand. The District also has inter-ties with three other agencies for emergency supplies.

DISTRICT'S WATER SHORTAGE RESPONSE

The District adopted a Water Conservation Plan with Ordinance No. 68 on July 5, 1990 by adding Article No. 24 entitled "Water Conservation" to its Water Service Regulations and a Water Shortage Contingency Plan with Ordinance No. 69 on February 6, 1992, which amended portions of the Water Conservation Plan (see Exhibit No. 1).

RATIONING STAGES AND REDUCTION GOALS

As part of the above-referenced Water Conservation and Water Shortage Contingency Plan, the District developed a four stage rationing plan to put into effect for a declared water shortage as shown below:

Shortage	Stage	Demand Reduction Goal	Type Program
Normal	Stage 1	10%	Voluntary
10% to 25%	Stage 2	25%	Voluntary/Mandatory
25% to 35%	Stage 3	35%	Mandatory
35% to 50%	Stage 4	50% +	Mandatory

PRIORITIES BY USE

Priorities for the use of available water, based on California Water Code Chapter 3 and community input are:

- Health and Safety - interior residential and fire fighting
- Commercial, Industrial and Governmental - maintain jobs and economic base
- Crops - project jobs
- Existing Landscaping - especially trees and shrubs
- New Demand - new development and construction

WATER SUPPLY ALLOCATED BY PRIORITY

1. Stage 1 - Normal Conditions (Projected 1995/96)

Priority	Residential (AF/yr)	Comm/Indust (AF/yr)	Agriculture (AF/yr)	Total (AF/yr)
Health & Safety	5,650	---	---	5,650
Commercial	---	1,700	---	1,700
Agriculture	---	---	300	300
Landscape	5,950	300	100	6,350
New Connections	200	100	---	300
TOTAL	11,800	2,100	400	14,300

2. Stage 2

Priority	Residential (AF/yr)	Comm/Indust (AF/yr)	Agriculture (AF/yr)	Total (AF/yr)
Health & Safety	5,000	---	---	5,000
Commercial	---	1,500	---	1,500
Agriculture	---	---	300	300
Landscape	3,900	---	---	3,900
New Connections	200	100	---	300
TOTAL	9,100	1,600	300	11,000

23% Reduction

3. Stage 3

Priority	Residential (AF/yr)	Comm/Indust (AF/yr)	Agriculture (AF/yr)	Total (AF/yr)
Health & Safety	4,800	---	---	4,800
Commercial	---	1,400	---	1,400
Agriculture	---	---	300	300
Landscape	2,900	---	---	2,900
New Connections	---	---	---	0
TOTAL	7,700	1,400	300	9,400

34% Reduction

4. Stage 4

Priority	Residential (AF/yr)	Comm/Indust (AF/yr)	Agriculture (AF/yr)	Total (AF/yr)
Health & Safety	4,500	---	---	4,500
Commercial	---	1,400	---	1,400
Agriculture	---	---	200	200
Landscape	1,000	---	---	1,000
New Connections	---	---	---	0
TOTAL	5,500	1,400	200	7,100

50% Reduction

SUPPLY SHORTAGE TRIGGERING LEVELS

Section 2408 of Ordinance No. 68 for the WSBCWD (see Exhibit No. 1) declares that the District's General Manager shall determine what level of shortage exists and informs the Board of Directors who then determines what level to adopt.

MANDATORY PROHIBITIONS ON WATER USE

California Water Code Section 10631(e)(4)

The District adopted restrictions on water use in Sections 2404 through 2411 in their Ordinance No. 68, July 5, 1990 and Ordinance No. 69, February 6, 1992 (see Exhibit No. 1).

CONSUMPTION LIMITS

California Water Code Section 10631(e)(5)

The District established the following allocation for each customer type for its Stage IV Water Emergency Conditions:

Type	Restrictions
Residential	20% reduction inside use, no outside use
Commercial	20% reduction inside use, no outside use
Governmental	20% reduction inside use, no outside use
New Demand	No usage

PENALTIES ON CHARGES FOR EXCESSIVE USE

California Water Code Section 10631(e)(6)

The District's penalties and charges in Section 2411 of Ordinance No. 68 (see Exhibit No. 1) were adopted 7/5/90.

ANALYSIS OF REVENUE AND EXPENDITURES IMPACTS

California Water Code Section 10631(e)(7)

A. Impacts

The District's normal projected revenues from water sales is expected to be $4,011,700 in FY 1995/96. Revenue from meter service charges is expected to be $1,295,800 in FY 95/96, and other revenues are expected to be $892,300 in FY 95/96 from taxes and fees. Water sales represent 64.7% of the $6,199,800 in total expected revenues. Expenditures not related to water production, storage, or transmission is expected to be $3,630,800 or 62.9%, water production costs represent $2,139,300 or 37.1% of expenditures. The following is a projection of water usage by stages.

Water Sales	Stage 1 (Normal) (AF/yr)	Stage 2 (AF/yr)	Stage 3 (AF/yr)	Stage 4 (AF/yr)
Urban	14,000	10,700	9,100	6,900
Agriculture	300	300	300	200
Total	14,300	11,000	9,400	7,100

The financial impacts of these reductions is shown on the following table:

Revenues	Stage 1 (Normal)	Stage 2	Stage 3	Stage 4
Urban	$3,959,700	$3,026,300	$2,573,800	$1,951,600
Agriculture	52,000	52,000	52,000	34,700
Total Water Sales	$4,011,700	$3,078,300	$2,625,800	$1,986,300
Meter Service	$1,295,800	$1,295,800	$1,295,800	$1,295,800
Other	892,300	892,300	892,300	892,300
Total Revenues	$6,199,800	$5,266,400	$4,813,900	$4,174,400
Expenses				
Water Production	$2,139,300	$2,030,000	$1,976,800	$1,900,800
All Other	3,630,800	3,630,800	3,630,800	3,630,800
Total Expenses	$5,770,100	$5,660,800	$5,607,600	$5,531,600
Surplus or (Deficiency)	$429,700	($394,400)	($793,700)	($1,357,200)

B. Establishment of a Rate Stabilization Fund

If required by a drought creating a water shortage and in order to maintain a balanced budget, the District would have to adopt a surcharge to its basic rates under the four stages as shown in the following three alternatives:

Alternative A - Monthly Service Charge Surcharge

Stage	Surcharge Addition	Monthly Service Charge (3/4" Meter)	Estimated Additional Revenue
1 (Normal)	0%	$6.65	0
2	30%	$8.66	$394,900
3	61%	$10.69	$793,800
4	104%	$13.56	$1,357,600

Alternative B - Graduated Water Rate Surcharge

Each Connection would be given a lifeline rate based on meter equivalents of a 3/4" meter. The lifeline rate will be 10 units per month (one unit equals 100 cu. ft.). The surcharge will be added to usage over the lifeline rate each month.

Stage	Surcharge	Charge per Unit over 10 units/month	Estimated Additional Revenue
1 (Normal)	0%	$0.70	0
2	21%	$0.85	$404,400
3	57%	$1.10	$799,700
4	186%	$2.00	$1,353,100

Alternative C - Combination Service Charge and Water Rate Surcharge

The monthly service charge would be increased $1.00 per month for each additional stage and the lifeline rate of $0.70/unit (1 unit = 100 cu. ft.) for the first 10 units/month for an equivalent 3/4" meter would be allocated for each connection as in Alternative B.

Stage	Monthly Service Charge 3/4" Meter	Unit Charge over Lifeline	Additional Revenues
1 (Normal)	$6.65	$0.70	0
2	$7.65	$0.78	$412,200
3	$8.65	$0.90	$792,800
4	$9.65	$1.44	$1,359,700

The surcharge rates would remain in effect until water supply conditions return to satisfactory levels and water consumption returns to normal.

IMPLEMENTATION OF THE PLAN

California Water Code Section 10631 (e)(8)

The District adopted Ordinance No. 69 on February 6, 1992, which implemented the plan.

WATER MONITORING PROCEDURES

California Water Code Section 10631 (e)(9)

A. Normal Monitoring Procedure

In normal water supply conditions, production figures are recorded daily. Totals are reported weekly to the Operations Superintendent. Totals are reported monthly to the Assistant General Manager and incorporated into the Water Supply Report.

B. Stage 1 and 2 Water Shortages

During a Stage 1 and 2 water shortage, weekly production figures are reported to the Assistant General Manager. The Assistant General Manager compares the monthly production to the target production to verify the reduction goal is being met. If goals are not met, the General Manager will advise the Board of Directors, so that corrective action may be taken.

C. Stage 3 and 4 Water Shortages

The same actions as Stage 1 and 2 except reports are weekly to the Assistant General Manager.

D. Disaster Shortages

During a disaster shortage, production will be reported hourly to the Superintendent, and daily to the Assistant General Manager and General Manager.

Appendix

E1

SAN BERNARDINO Valley MUNICIPAL WATER DISTRICT

380 East Vanderbilt Way
San Bernardino, CA 92408
phone: 909.387.9200
fax: 909.387.9247
www.sbvmwd.com

October 15, 2010

Tom Crowley
Assistant General Manager
West Valley Water District
P.O. Box 920
Rialto, CA 92377

Subject: Availability of State Water Project Water from the San Bernardino Valley Municipal Water District

Dear Tom,

Per your request, the San Bernardino Valley Municipal Water District (District) submits this letter providing the anticipated reliability of State Water Project Water for use in the West Valley Water District (WVWD) 2005 Urban Water Management Plan.

As you are aware, Valley District was the lead agency for the preparation of the *Upper Santa Ana River Watershed Integrated Regional Water Management Plan* (IRWMP). The IRWMP estimates the total direct delivery demand for SWP water for all of Valley District's service area to be 34,200 acre-feet in the year 2025 which includes 7,000 acre-feet for WVWD. Future reliability for SWP water is provided by *The State Water Project Delivery Reliability Report*, 2009 (latest edition). Table 1 below provides the amount of SWP water that Valley District would receive from the SWP during average and dry periods based upon the 2009 report.

Table 1. Summary of estimated amount of State Water Project Water San Bernardino Valley Municipal Water District would receive during average and dry periods (acre-feet).

Scenario	Long-term Average	Single dry year 1977	2-year drought 1976-77	4-year drought 1931-34	6-year drought 1987-92	6-year drought 1929-34
Current Conditions	61,560	7,182	36,936	34,884	35,910	34,884
Future Conditions	61,560	11,286	38,988	35,910	32,832	36,936

The only scenario that would result in less SWP water than Valley District's 2025 direct delivery demands (34,200 acre-feet) is the "Single Dry Year, 1977" scenario. In all of the other scenarios, Valley District is expected to be able to meet its 2025 direct delivery demands. Valley District assumes that in a single dry year, each of the four (4) water treatment plants within its service area would share

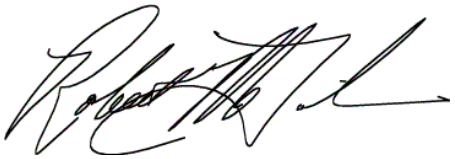
Board of Directors and Officers

MARK ALVAREZ Division 1 | GEORGE A. AGUILAR Division 2 | C.PATRICK MILLIGAN Division 3 | MARK BULOT Division 4 | STEVE COPELAN Division 5 | DOUGLAS D. HEADRICK General Manager

equally in the shortage with the goal to provide each treatment plant enough water to remain operational.

One of the foundational water management strategies in the IRWMP involves using local groundwater basins as a place to store SWP and local stormwater in wet years for use during drought periods. Using this strategy, the IRWMP estimates that the amount of water available from the SWP will be adequate to meet the needs of the Valley District service area. The "wet year" water stored in local groundwater basins is available to WVWD and could be used to offset lower SWP direct deliveries during the single dry year scenario.

Sincerely,



Robert M. Tincher, P.E.
Manager of Engineering and Planning

cc: Doug Headrick

Appendix

F1

West Valley Water District

855 West Base Line, P.O. Box 920
Rialto, California 92377-0920
Phone (909) 875-1804

Board of Directors
Earl Tillman, Jr.
President
Betty J. Gosney
Vice President
Alan G. Dyer
Donald D. Olinger
Jackie Cox

Administrative Staff
Anthony W. Araiza
General Manager-Secretary
Leon Long
Assistant General Manager
Deborah L. Sousa
Treasurer
Peggy S. Asche
Administrative Secretary

Fax (909) 875-7284 Administration
Fax (909) 875-1361 Engineering
Fax (909) 875-1849 Customer Service

January 10, 2006

City of Rialto
150 S. Palm Ave.
Rialto, CA 92376

City of Fontana
8353 Sierra Ave.
Fontana, CA 92335

City of Colton
650 N. La Cadena Dr.
Colton, CA 92324

County of San Bernardino
385 N. Arrowhead Ave.
San Bernardino, CA 92415

RE: West Valley Water District's 2005 Urban Water Management Plan

To Whom It May Concern:

Please find enclosed the District's adopted 2005 Urban Water Management Plan. This document was approved by Resolution No. 758 at the regularly scheduled Board Meeting on January 5, 2006. If you have any questions or need any further information please do not hesitate to contact Leon Long at (909) 875-1804.

Sincerely,

Amanda Kasten
Executive Secretary

259

SURR & HELLYER
Attorneys at Law
599 Arrowhead Avenue
San Bernardino, California
Telephone: TUrner 4-4704

Attorneys for Lytle Creek Water and Improvement Company and Citizens Land and Water Company of Bloomington

James A. Stone
Entered [illegible] 1961
B. 167 [illegible]
V. DENNIS [illegible] Clerk
By [illegible]
DEPUTY

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

THE LYTLE CREEK WATER AND IMPROVEMENT COMPANY, a corporation, Plaintiff, vs. FONTANA RANCHOS WATER COMPANY, a corporation; HIGHLAND AVENUE WATER COMPANY, a corporation; CITIZENS LAND AND WATER COMPANY OF BLOOMINGTON, a corporation; CITY OF RIALTO, a municipal corporation; and CITY OF COLTON, a municipal corporation; et al., Defendants.	No. 81264 - DECREE

WHEREAS, there has been filed in the above-entitled action a Stipulation for Judgment duly executed by and on the part of each and all of the following named parties to said action (who are collectively hereinafter referred to as "stipulating parties"), to-wit: The Lytle Creek Water and Improvement Company, a corporation (hereinafter referred to as "Lytle Creek"); Citizens Land and Water Company of Bloomington, a corporation (hereinafter referred to as "Citizens"); Fontana Union Water Company, a corporation (hereinafter referred to as "Fontana Union"); City of Colton, a municipal corporation (hereinafter referred to as "Colton"); City of Rialto, a municipal corporation (hereinafter referred to as "Rialto"); and Semi-Tropic County Water District, a county water district organized and existing under the California County Water District Law (hereinafter referred to as "Semi-Tropic"); and

WHEREAS, the Fontana Union was sued herein as John Doe

Company No. 1, a corporation, and the Complaint herein should be amended accordingly; and

WHEREAS, it appears that Semi-Tropic should be joined as a defendant in this action; and

WHEREAS, the action has been dismissed as to each of the defendants Fontana Ranchos Water Company, a corporation, and Highland Avenue Water Company, a corporation; and

WHEREAS, the Court has heard and considered evidence on the part of the various stipulating parties; and

WHEREAS, the parties have in said Stipulation for Judgment waived Findings of Fact and Conclusions of Law;

NOW, THEREFORE, IT IS HEREBY ORDERED, ADJUDGED, AND DECREED as follows:

1. The Complaint herein is hereby amended to set forth the true name of the defendant John Doe Company No. 1, a corporation, which is Fontana Union Water Company, a corporation.

2. Semi-Tropic County Water District is hereby joined as a defendant in this action.

3. As used herein the terms listed below shall have the respective meanings next following them, viz:

(a) "Rialto Basin" or "Basin" shall mean that certain territory in the County of San Bernardino, State of California, which is more particularly described on Exhibit "1".

(b) "Year" shall mean a twelve month period commencing on October 1 and ending on the next following September 30.

(c) "Acre Foot" of water shall mean that quantity of water which will cover one acre to a depth of one foot, also being 43,560 cubic feet, and which also is equal to a flow of 25.208 miner's inches of water for 24 hours.

4. Except as provided herein no stipulating party shall have any priority to take water from the Basin, and the rights of the parties to take

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water from the Basin as between themselves are set forth herein.

5. Subject to the pro rata reductions hereinafter set forth, the amount of water in acre feet to which the stipulating parties are respectively entitled to extract from the Basin in each year are as follows:

Colton	3,010 acre feet
Rialto	1,580 acre feet
Citizens	3,260 acre feet
Fontana Union	550 acre feet
Lytle Creek	3,600 acre feet
Semi-Tropic	-0- acre feet

6. The following described wells in the Basin are designated and referred to herein as index wells for the purpose of determining the elevation above sea level of the ground waters within the Basin. These wells are as follows:

(a) "Duncan Well" - presently owned by Rialto, having State Location No. 1S/5W-3A1, State Serial No. D-1084, located 109 feet South of the center line of Baseline and 233 feet West of the center line of Cactus Avenue.

(b) "Willow Street Well" - presently owned by Lytle Creek, having State Location No. 1S/5W-2K1, State Serial No. D-1085, located 202 feet East of the center line of Willow Street and 133 feet North of the center line of Victoria Avenue.

(c) "Boyd Well" - presently owned by Citizens, having State Location No. 1S/5W-12L1, State Serial No. D-1095, located 109 feet West of the center line of Eucalyptus Street and 155 feet North of the center line of Wilson Street.

For the purpose of determination of the elevation of water above sea level in the said index wells, the elevation above sea level of each of the index wells is established as follows:

(a) "Duncan Well"	1352.79
(b) "Willow Street Well"	1287.00
(c) "Boyd Well"	1177.19

If for any reason any or all of said wells shall not be available

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for measurement the identity and location of a substitute index well or wells may be determined by a written stipulation executed by at least three-fourths in number of the stipulating parties (or their successor(s) in interest) and filed in this action or in default of said stipulation, by order of this Court.

The elevation of the water level above sea level of each of the index wells shall be measured in each of the months of March, April, and May in each year. Each stipulating party shall be entitled from time to time to designate one individual to be present and observe such measurements. Measurements shall be made by the owners of the respective wells or such other person, firm or corporation which three-fourths in number of the stipulating parties shall designate to do so. Such measurements shall be made at such times as the index well measured is not being pumped and has not been pumped within the preceding twenty-four hours.

7 As used herein the term "spring-high water level" for a year at each of the index wells shall mean the highest elevation in feet above sea level of the surface of the water table which shall be measured in each respective index well at any one of the monthly measurements during either March, April, or May.

In any year in which the average of the elevation of the spring-high water level in the three index wells is above elevation 1002.3 feet above mean sea level, no stipulating party shall be limited in the amount of water which may be pumped from the Basin. However, no stipulating party shall acquire any additional right to extract water from the Basin by reason of extracting more than such party is entitled under paragraph 5 above.

In any year in which the average of the elevations of the spring-high water level in the three index wells is between 1002.3 feet above mean sea level and 969.7 feet above mean sea level, each party shall be entitled to pump from the Basin in such year only the amount of water to which such party is entitled as specified in paragraph 5 above.

In any year in which the average of the elevations of the spring-high water level in the three index wells is below 969.7 feet above mean sea level, then the amount of water which the stipulating parties shall

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be entitled to pump from the Basin during such year shall be reduced one per cent (1%) for each one (1) foot that the said average is below 969.7 feet above mean sea level, and not cumulatively to be reduced more than fifty per cent (50%).

9 If any stipulating party acquires any of the wells located within the Basin which are described on Exhibit "2", which is attached hereto and hereby incorporated herein, such party shall have the additional right to extract water from the Rialto Basin annually in the amount set forth on said Exhibit "2" opposite the description of the respective wells.

10. Each stipulating party shall maintain records of all its extractions of water from the Basin so that it can be determined therefrom what extraction of water was taken from each well or combination of wells or other water sources in the Basin from which such party received water in each year. Each stipulating party shall equip each of its wells with a water metering device which shall accurately measure the entire quantity of water pumped from the well. Each stipulating party shall allow the other stipulating parties access upon reasonable notice to the wells of such party to permit of inspection and testing the metering equipment.

Upon written demand of any stipulating party, the party keeping such records shall within thirty (30) days after receipt of such demand supply to the party making such demand or other person designated by such party in such demand a written statement of the amount of water (in acre feet) so taken from each such well or combination of wells or other sources for each year after 1961 with respect to which no such statement has previously been supplied.

11. Every provision of this judgment in favor of all applies to any party hereto and also applies to and inures to the benefit of and shall also bind all of the heirs, legal representatives successors and assigns of such party.

12. Nothing in this judgment contained shall prevent any stipulating party from selling or otherwise disposing of or purchasing or otherwise acquiring any rights to extract water from the Basin which may be adjudged to belong to any other stipulating party; but any such right to acquire or to dispose of shall remain subject to any limitation or restrictions herein expressed.

13. The stipulating parties will unite in opposing any new taking

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of water from the Basin by other than a stipulating party or parties and will prorate the expenses in making such opposition, including litigation or engineering expenses, provided that:

(a) The term "new taking" shall not include any water development in the Basin hereafter made for the sole purpose of maintaining but not increasing any quantity of water now being taken from the Basin by the person who may hereafter make such development; or in the exercise by any person of an overlying right who is not a stipulating party.

(b) If any stipulating party does not join in prosecuting any future suit to prevent, enjoin or limit any such new or unlawful taking, such stipulating party not so joining shall bear proratably the expenses of such suit, including attorneys' fees and engineering fees, only if final judgment is rendered in such suit preventing enjoining or limiting such taking.

14. No stipulating party shall be entitled to recover court costs from any other stipulating party in this proceeding.

15. The court will retain jurisdiction to enter modifications of this decree upon a finding of changed circumstances.

16. In the event through litigation of the supply of water in the Basin, or by reason of adjudication in any subsequent action, the stipulating parties in the aggregate shall be unable to pump and extract from the Basin a quantity of water so great as the aggregate water is set forth herein, the stipulating parties shall prorate the aggregate quantity of water available in the Basin as long as such inability shall continue.

17. The listing herein of any number of acre feet for any party to this action other than a stipulating party shall not be deemed an admission by any stipulating party that a non-stipulating party is entitled to any water whatsoever from the Basin, nor as to the quantity which such non-stipulating party may take from the Basin, but each such figure for any non-stipulating party is listed in order that the stipulating parties may between themselves agree as to their rights to extract water on account of acquisition of the wells of non-stipulating parties.

18. As between stipulating parties only no extraction of water

from the Basin by any stipulating party in excess of the amount herein provided to be taken by such party shall be deemed adverse to any other stipulating party, and each stipulating party hereby waives as against each other stipulating party the right to plead any statute of limitation or latches with respect to water extracted by such party in excess of such amount.

19. No objection shall ever be made by any party to this judgment as to the interest or right of any such party as herein defined or as to the validity of this judgment not so defining such interest or right on the ground that such interest or right as so defined is not consistent with or warranted by the pleadings in this action relative thereto, and if in any case it shall appear that any such interest or right as so defined is in fact not consistent with or warranted by such pleadings then such pleadings shall be deemed and treated as amended to conform to and sustain such interest and right as herein defined, and said pleadings shall be deemed sufficient to support this judgment.

Each of the parties to this judgment waives all right of appeal therefrom and no appeal shall be taken by any party hereto from this judgment or any part thereof and the same shall constitute a final judgment.

DONE IN OPEN COURT this 24th day of November, 1964.

Judge of the Superior Court

BURR & MELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

DESCRIPTION OF BOUNDARIES OF RIALTO BASIN

BEGINNING at a point on the centerline of Meridian Avenue, as shown on plat of Town of Rialto and Adjoining Subdivisions, as recorded in Map Book 4, page 11, records of the County Recorder of said County, said point being 950 feet North of the intersection of said Meridian Avenue and San Bernardino Avenue, thence Northwesterly to a point on the centerline of Rialto Avenue (Arrow Route) as shown on said subdivision plat, said point being 400 feet East of the intersection of West Rialto Avenue and Cactus Avenue; thence Northwesterly to a point on the center line of Foothill Boulevard (State Highway Route No. 9), said point being 1,050 feet East of the intersection of said Foothill Boulevard and Linden Avenue, said intersection being the Southwest corner of Section 3, T1S, R5W, SBB&M; thence Northwesterly to a point in said Linden Avenue, said point being 700 feet North of said Foothill Boulevard; thence Northwesterly to a point in the centerline of Laurel Avenue as shown on said subdivision plat, said point being 3,600 feet North of said Foothill Boulevard; thence Northwesterly to the intersection of Alder Avenue and Baseline Road, said intersection being the Southeast corner of Section 32, T1N, R5W, SB9&M; thence Northwesterly to a point at the base of the San Gabriel Mountains, said point being 1,100 feet North and 1,400 feet West of the Southeast corner of Section 15, T1N, R6W, SBE&M; thence Northeasterly along the base of the San Gabriel Mountains in a direct line to a point in the East line of Section 13, T1N, R6W said point being 3,700 feet North of the Southeast corner of said Section 13; thence Northeasterly along the base of the San Gabriel Mountains in a direct line to a point in fractional Section 7, T1N, R5W, said point being 2,200 feet North and 3,700 feet East of the Southwest corner of said Section 7; thence Southeasterly to a point in Muscupiabe Rancho, said point being 2,500 feet North and 950 feet East of the Southwest corner of fractional Section 22, T1N, R5W, SBB&M; thence Southeasterly to a point in said Muscupiabe Rancho, said point being 700 feet North and 3,700 feet East of the Southwest corner of said fractional Section 22, thence Southeasterly to a point in said Muscupiabe Rancho, said point being 4,000 feet North and 2,500 feet East of the Southwest corner of fractional Section 26, T1N, R5W, SBB&M; thence Southeasterly to a point in fractional Section 6, T1S, R4W, SBB&M, said point being 1,500 feet North and 4,300 feet East of the Southwest corner of said fractional Section 6; thence Southeasterly to a point on the centerline of Mill Street, as shown on plat The Martin Tract, as recorded in Map Book 3, page 27, Records of the County Recorder of said County, said point being 1,050 feet West of the intersection of said Mill Street and Mt. Vernon Avenue; thence Southwesterly to the point of beginning.

Exhibit 1

STATE WELL NUMBER		LOCATION	STIPULATED RIGHT ACRE FEET
Location Number	Serial Number		
1S/5W-3B1	D-1083	680 feet South of center line Base Line, 2,183 feet West of Cactus Avenue	490
1S/5W-3J1	D-1083a	1,371 feet North of Foothill Blvd. 703 feet West of Cactus Avenue	490
1S/5W-3N1	D-1083b	404 feet North of Foothill Blvd. 1,241 feet East of center line Linden Avenue	540
1S/4W-7C1	E-8a	92 feet South of center line Foothill Blvd., 1,484 feet East of center line Meridian Avenue	290
1S/4W-18B2	E-70c	705 feet South of center line Mill Street, 1,085 feet West of Rancho Avenue	370
1S/4W-18E1	E-70a	416 feet East of center line Meridian Avenue, 608 feet North of center line Randall Avenue	160
1S/4W-18K1	E-70e	47 feet South of center line Citrus Avenue, 87 feet East of West line of Northeast 1/4 of Section 18	360
1N/5W-17K1	D-1170b	3,937 feet measured Southeasterly along the center line of Riverside Avenue from its intersection with the North line of Section 17, and 352 feet Southwest of the center line of Riverside Avenue measured at right angles	90
1N/5W-17G1	D-1170d	3,625 feet measured Southeasterly along the center line of Riverside Avenue from its intersection with the North line of Section 17, and 161 feet Southwest of the center line of Riverside Avenue measured at right angles	90
1N/5W-28J1	D-1177a	63 feet West of Linden Avenue, 45 feet South of Vineyard 0.36 miles North of Highland Avenue	40
1N/5W-31A1	D-1166	66 feet South of center line of Highland Avenue 361 feet East of center line of Juniper	370

Exhibit "2"

SURR & HELLYER
Attorneys at Law
599 Arrowhead Avenue
San Bernardino, California
Telephone: TUrner 4-4704

Attorneys for Lytle Creek Water and Improvement Company and Citizens Land and Water Company of Bloomington

SURR & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

THE LYTLE CREEK WATER AND IMPROVEMENT COMPANY, a corporation, Plaintiff, vs. FONTANA RANCHOS WATER COMPANY, a corporation; HIGHLAND AVENUE WATER COMPANY, a corporation; CITIZENS LAND AND WATER COMPANY OF BLOOMINGTON, a corporation; CITY OF RIALTO, a municipal corporation; and CITY OF COLTON, a municipal corporation; et al., Defendants.	No. 81264 DECREE

WHEREAS, there has been filed in the above-entitled action a Stipulation for Judgment duly executed by and on the part of each and all of the following named parties to said action (who are collectively hereinafter referred to as "stipulating parties"), to-wit: The Lytle Creek Water and Improvement Company, a corporation (hereinafter referred to as "Lytle Creek"); Citizens Land and Water Company of Bloomington, a corporation (hereinafter referred to as "Citizens"); Fontana Union Water Company, a corporation (hereinafter referred to as "Fontana Union"); City of Colton, a municipal corporation (hereinafter referred to as "Colton"); City of Rialto, a municipal corporation (hereinafter referred to as "Rialto"); and Semi-Tropic County Water District, a county water district organized and existing under the California County Water District Law (hereinafter referred to as "Semi-Tropic"); and

WHEREAS, the Fontana Union was sued herein as John Doe

Company No. 1, a corporation, and the Complaint herein should be amended accordingly; and

WHEREAS, it appears that Semi-Tropic should be joined as a defendant in this action; and

WHEREAS, the action has been dismissed as to each of the defendants Fontana Ranchos Water Company, a corporation, and Highland Avenue Water Company, a corporation; and

WHEREAS, the Court has heard and considered evidence on the part of the various stipulating parties; and

WHEREAS, the parties have in said Stipulation for Judgment waived Findings of Fact and Conclusions of Law;

NOW, THEREFORE, IT IS HEREBY ORDERED, ADJUDGED, AND DECREED as follows:

1. The Complaint herein is hereby amended to set forth the true name of the defendant John Doe Company No. 1, a corporation, which is Fontana Union Water Company, a corporation.

2. Semi-Tropic County Water District is hereby joined as a defendant in this action.

3. As used herein the terms listed below shall have the respective meanings next following them, viz:

(a) "Rialto Basin" or "Basin" shall mean that certain territory in the County of San Bernardino, State of California, which is more particularly described upon Exhibit "1", and which also includes all percolating water and underground water and water sources underlying said territory.

(b) "Year" shall mean a twelve month period commencing on October 1 and ending on the next following September 30.

(c) "Acre Foot" of water shall mean that quantity of water which will cover one acre to a depth of one foot, also being 43,560 cubic feet, and which also is equal to a flow of 25.208 miner's inches of water for 24 hours.

4. Except as provided herein no stipulating party shall have any priority to take water from the Basin, and the rights of the parties to take

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water from the Basin as between themselves are set forth herein.

5. Subject to the pro rata reductions hereinafter set forth, the amount of water in acre feet to which the stipulating parties are respectively entitled to extract from the Basin in each year are as follows:

Colton	3,010 acre feet - 3400
Rialto	1,580 acre feet - 3100
Citizens	3,260 acre feet
Fontana Union	550 acre feet — 970 - 1420
Lytle Creek	3,600 acre feet

6. The following described wells in the Basin are designated and referred to herein as index wells for the purpose of determining the elevation above sea level of the ground waters within the Basin. These wells are as follows:

(a) "Duncan Well" - presently owned by Rialto, having State Location No. 1S/5W-3A1, State Serial No. D-1084, located 109 feet South of the center line of Baseline and 233 feet West of the center line of Cactus Avenue.

(b) "Willow Street Well" - presently owned by Lytle Creek, having State Location No. 1S/5W-2K1, State Serial No. D-1085, located 202 feet East of the center line of Willow Street and 133 feet North of the center line of Victoria Avenue.

(c) "Boyd Well" - presently owned by Citizens, having State Location No. 1S/5W-12L1, State Serial No. D-1095, located 109 feet West of the center line of Eucalyptus Street and 155 feet North of the center line of Wilson Street.

For the purpose of determination of the elevation of water above sea level in the said index wells, the elevation above sea level of each of the index wells is established as follows:

(a) "Duncan Well"

(b) "Willow Street Well"

(c) "Boyd Well"

If for any reason any or all of said wells shall not be available

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for measurement, the identity and location of a substitute index well or wells may be determined by a written stipulation executed by at least three-fourths in number of the stipulating parties (or their successor(s) in interest) and filed in this action, or in default of said stipulation, by order of this Court.

The elevation of the water level above sea level of each of the index wells shall be measured in each of the months of March, April, and May in each year. Each stipulating party shall be entitled from time to time to designate one individual to be present and observe such measurements. Measurements shall be made by the owners of the respective wells or such other person, firm or corporation which three-fourths in number of the stipulating parties shall designate to do so. Such measurements shall be made at such times as the index well measured is not being pumped and has not been pumped within the preceding twenty-four hours.

7. As used herein the term "spring-high water level" for a year at each of the index wells shall mean the highest elevation in feet above sea level of the surface of the water table which shall be measured in each respective index well at any one of the monthly measurements during either March, April, or May.

In any year in which the average of the elevation of the spring-high water level in the three index wells is above elevation 1002.3 feet above mean sea level, no stipulating party shall be limited in the amount of water which may be pumped from the Basin. However, no stipulating party shall acquire any additional right to extract water from the Basin by reason of extracting more than such party is entitled under paragraph 5 above.

In any year in which the average of the elevations of the spring-high water level in the three index wells is between 1002.3 feet above mean sea level and 969.7 feet above mean sea level, each party shall be entitled to pump from the Basin in such year only the amount of water to which such party is entitled as specified in paragraph 5 above.

In any year in which the average of the elevations of the spring-high water level in the three index wells is below 969.7 feet above mean sea level, then the amount of water which the stipulating parties shall

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be entitled to pump from the Basin during such year shall be reduced ten per cent (10%) for each one (1) foot that the said average is below 969.7 feet above mean sea level.

9. If any stipulating party acquires any of the wells located within the Basin which are described on Exhibit "2", which is attached hereto and hereby incorporated herein, such party shall have the additional right to extract water from the Rialto Basin annually in the amount set forth on said Exhibit "2" opposite the description of the respective wells.

10. Each stipulating party shall maintain records of all extractions of water from the Basin so that it can be determined therefrom what extraction of water was taken from each well or combination of wells or other water sources in the Basin from which such party received water in each year.

Upon written demand of any stipulating party, the party keeping such records shall within thirty (30) days after receipt of such demand supply to the party making such demand, or other person designated by such party in such demand, a written statement of the amount of water (in acre feet) so taken from each such well or combination of wells or other sources for each year after 1961 with respect to which no such statement has previously been supplied.

11. Every provision of this judgment in favor of all applies to any party hereto and also applies to and inures to the benefit of and shall also bind all of the heirs, legal representatives, successors and assigns of such party.

12. Nothing in this judgment contained shall prevent any stipulating party from selling or otherwise disposing of or purchasing or otherwise acquiring any rights to extract water from the Basin which may be adjudged to belong to any other stipulating party; but any such right to acquire or so dispose of shall remain subject to any limitation or restrictions herein expressed.

13. The stipulating parties will unite in opposing any new taking of water from the Basin other than a stipulating party or parties and will prorate the expenses in making such opposition, including litigation or engineer-

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ing expenses, provided that:

(a) The term "new taking" shall not include any water development in the Basin hereafter made for the sole purpose of maintaining but not increasing any quantity of water now being taken from the Basin by the person who may hereafter make such development.

(b) If any stipulating party does not join in prosecuting any future suit to prevent, enjoin or limit any such new or unlawful taking, such stipulating party not so joining shall bear proratably the expenses of such suit, including attorneys' fees and engineering fees, only if final judgment is rendered in such suit preventing enjoining or limiting such taking.

14. No stipulating party shall be entitled to recover court costs from any other stipulating party in this proceeding.

15. The Court will render jurisdiction to enter modifications of this decree.

16. In the event through litigation of the supply of water in the Basin, or by reason of adjudiciation in any subsequent action, the stipulating parties in the aggregate shall be unable to pump and extract from the Basin a quantity of water so great as the aggregate water is set forth herein, the stipulating parties shall prorate the aggregate quantity of water available in the Basin as long as such inability shall continue.

17. The listing herein of any number of acre feet for any party to this action other than a stipulating party shall not be deemed an admission by any stipulating party that a non-stipulating party is entitled to any water whatsoever from the Basin, nor as to the quantity which such non-stipulating party may take from the Basin, but each such figure for any non-stipulating party is listed in order that the stipulating parties may between themselves agree as to their rights to extract water on account of acquisition of the wells of non-stipulating parties.

18. As between stipulating parties only no extraction of water from the Basin by any stipulating party in excess of the amount herein provided to be taken by such party shall be deemed adverse to any other stipulating party, and each stipulating party hereby waives as against each other stipulating

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party the right to plead any statute of limitation or latches with respect to water extracted by such party in excess of such amount.

19. No objection shall ever be made by any party to this judgment as to the interest or right of any such party as herein defined or as to the validity of this judgment not so defining such interest or right on the ground that such interest or right as so defined is not consistent with or warranted by the pleadings in this action relative thereto, and if in any case it shall appear that any such interest or right as so defined is in fact not consistent with or warranted by such pleadings then such pleadings shall be deemed and treated as amended to conform to and sustain such interest and right as herein defined, and said pleadings shall be deemed sufficient to support this judgment.

Each of the parties to this judgment waives all right of appeal therefrom and no appeal shall be taken by any party hereto from this judgment or any part thereof and the same shall constitute a final judgment.

DONE IN OPEN COURT this _____ day of _____, 1961.

_____
Judge of the Superior Court

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DESCRIPTION OF BOUNDARIES OF RIALTO BASIN

BEGINNING at a point on the centerline of Meridian Avenue, as shown on plat of Town of Rialto and Adjoining Subdivisions, as recorded in Map Book 4, page 11, records of the County Recorder of said County, said point being 950 feet North of the intersection of said Meridian Avenue and San Bernardino Avenue; thence Northwesterly to a point on the centerline of Rialto Avenue (Arrow Route) as shown on said subdivision plat, said point being 400 feet East of the intersection of West Rialto Avenue and Cactus Avenue; thence Northwesterly to a point on the center line of Foothill Boulevard (State Highway Route No. 9), said point being 1,050 feet East of the intersection of said Foothill Boulevard and Linden Avenue, said intersection being the Southwest corner of Section 3, T1S, R5W, SBB&M; thence Northwesterly to a point in said Linden Avenue, said point being 700 feet North of said Foothill Boulevard; thence Northwesterly to a point in the centerline of Laurel Avenue as shown on said subdivision plat, said point being 3,600 feet North of said Foothill Boulevard; thence Northwesterly to the intersection of Alder Avenue and Baseline Road, said intersection being the Southeast corner of Section 32, T1N, R5W, SBB&M; thence Northwesterly to a point at the base of the San Gabriel Mountains, said point being 1,100 feet North and 1,400 feet West of the Southeast corner of Section 15, T1N, R6W, SBB&M; thence Northeasterly along the base of the San Gabriel Mountains in a direct line to a point in the East line of Section 13, T1N, R6W, said point being 3,700 feet North of the Southeast corner of said Section 13; thence Northeasterly along the base of the San Gabriel Mountains in a direct line to a point in fractional Section 7, T1N, R5W, said point being 2,200 feet North and 3,700 feet East of the Southwest corner of said Section 7; thence Southeasterly to a point in Muscupiabe Rancho, said point being 2,500 feet North and 950 feet East of the Southwest corner of fractional Section 22, T1N, R5W, SBB&M; thence Southeasterly to a point in said Muscupiabe Rancho, said point being 700 feet North and 3,700 feet East of the Southwest corner of said fractional Section 22, thence Southeasterly to a point in said Muscupiabe Rancho, said point being 4,000 feet North and 2,500 feet East of the Southwest corner of fractional Section 26, T1N, R5W, SBB&M; thence Southeasterly to a point in fractional Section 6, T1S, R4W, SBB&M, said point being 1,500 feet North and 4,300 feet East of the Southwest corner of said fractional Section 6; thence Southeasterly to a point on the centerline of Mill Street, as shown on plat The Martin Tract, as recorded in Map Book 3, page 27, Records of the County Recorder of said County, said point being 1,050 feet West of the intersection of said Mill Street and Mt. Vernon Avenue; thence Southwesterly to the point of beginning.

Exhibit 1

STATE WELL NUMBER		LOCATION	STIPULATED RIGHT ACRE FEET
Location Number	Serial Number		
1S/5W-3B1	D-1083	680 feet South of center line Base Line, 2,183 feet West of Cactus Avenue	490
1S/5W-3J1	D-1083a	1,371 feet North of Foothill Blvd. 703 feet West of Cactus Avenue	490
1S/5W-3N1	D-1083b	404 feet North of Foothill Blvd. 1,241 feet East of center line Linden Avenue	540
1S/4W-7C1	E-8a	92 feet South of center line Foothill Blvd., 1,484 feet East of center line Meridian Avenue	290
1S/4W-18B2	E-70c	705 feet South of center line Mill Street, 1,085 feet West of Rancho Avenue	370
1S/4W-18E1	E-70a	416 feet East of center line Meridian Avenue, 608 feet North of center line Randall Avenue	160
1S/4W-18K1	E-70e	47 feet South of center line Citrus Avenue, 87 feet East of West line of Northeast 1/4 of Section 18	360
1N/5W-17K1	1170-B	3,937 feet measured Southeasterly along the center line of Riverside Avenue from its intersection with the North line of Section 17, and 352 feet Southwest of the center line of Riverside Avenue measured at right angles	90
1N/5W-17G1	D-1170	3,625 feet measured Southeasterly along the center line of Riverside Avenue from its intersection with the North line of Section 17, and 161 feet Southwest of the center line of Riverside Avenue measured at right angles	90
1N/5W-28J1	D-1177a	63 feet West of Linden Avenue, 45 feet South of Vineyard .036 miles North of Highland Avenue	70
1N/5W-31A1	D-1176	66 feet South of center line of Highland Avenue 361 feet East of center line of Juniper	370

Exhibit "2"