emwd
EASTERN
MUNICIPAL
WATER
DISTRICT

May 17, 2023

Newcastle Partners
c/o Courtney Smith
4740 Green River Rd., Suite #110
Corona, CA 92878

Subject: Water Supply Assessment for the Ellis Logistics Center

Dear Ms. Smith:

As requested by the City of Perris, Eastern Municipal Water District (EMWD) has prepared a Water Supply Assessment (WSA) for the Ellis Logistics Center. This WSA was approved by EMWD's Board of Directors on May 17, 2023, and a copy of the final document is enclosed for your records.

If you should have any questions about this document, please contact me via e-mail at widemank@emwd.org or by calling (951) 928-3777 extension 4507.

Sincerely,

Kylee Wideman
Water Resources Specialist Associate

KW:sgc

Enclosure(s): Water Supply Assessment
CD containing Appendices

c: Patricia Brenes, City of Perris

2270 Trumble Road • P.O. Box 8300 • Perris, CA 92572-8300
T 951.928.3777 • F 951.928.6177 www.emwd.org

EASTERN MUNICIPAL WATER DISTRICT

Water Supply Assessment Report

Ellis Logistics Center - Newcastle

May 17, 2023

Section I: Introduction

I.1 Purpose

Water Code §10910 (a)(b)(c)

The purpose of this Water Supply Assessment (WSA) Report is to satisfy the requirements of Water Code §10910 et seq. and Government Code §66473.7 as amended by Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) in 2001. SB 610 focuses on the content of a water supply agency's Urban Water Management Plan (UWMP) and stipulates that when a project is subject to the California Environmental Quality Act (CEQA) and exceeds project size thresholds defined in the California Water Code, the appropriate water supply agency must provide an assessment on whether its total projected water supplies will meet the projected water demand associated with the proposed project. SB 610 applies to proposed residential developments of more than 500 dwelling units, or commercial, industrial, or mixed-use developments that exceed various thresholds for size. SB 221 requires water supply verification when a tentative map, parcel map, or development agreement for a project is submitted to a land use agency for approval. SB 221 applies to proposed residential developments of more than 500 dwelling units (with some exceptions). The need for an assessment or verification is determined by the lead agency for a project.

I.2 Project Description

The City of Perris is the lead agency for the preparation of an environmental document as required by CEQA for the proposed Ellis Logistics Center – Newcastle Project (Project). The Project proposes construction of a 643,419 square foot warehouse building on approximately 35 acres, located at the southwest corner of Ellis Avenue and Case Road. The developer for the Project is Newcastle Partners, and the location is shown in Figure 2.

I.3 Projected Water Demand

Water Code §10910 (c)(1)

In the Eastern Municipal Water District's (EMWD) 2020 UWMP, the demand projections for the parcels covering the project site were estimated based on light industrial land use, with a total demand of 84.94 acre-feet per year (AFY). The total water demand for this project is estimated to be 21.24 AFY, which falls within the limits of estimated demand considered in the 2020 UWMP. The specific facilities needed to serve the Project's water demands will be defined in the design conditions phase of EMWD's New Development Process.

I.4 Requirements

The City of Perris has requested that EMWD prepare a WSA for the Project. Based on information provided by the developer and lead agency, the projected demand from the Project is within the limits of demand accounted for in EMWD's 2020 UWMP, which was adopted in June 2021. As authorized by Water Code §10910 (c) (2) – (3), EMWD has elected to incorporate information from the 2020 UWMP in this WSA (attached as Appendix A).

In accordance with Water Code §10910 (d) – (f), the WSA shall:

1. Identify any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the Project, and provide a description of the quantities of water received in prior years by the public water system under existing water supply entitlements, water rights, water service contracts;
2. If no water has been received in prior years by the public water system, identify other public water systems of water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts to the same source of water as the public water system; and
3. If groundwater is included in the proposed supply, identify the groundwater basin or basins from which the Project will be supplied and include any applicable documentation of adjudicated rights to pump. If the basin is not adjudicated, regardless of whether the basin has been identified as over drafted, provide a detailed description and analysis of the amount and location of groundwater pumped by the public water system for the past five years from any groundwater basin from which the Project will be supplied; and provide a detailed description and analysis of the amount and location of groundwater from the basin or basins from which the Project will be supplied to meet the projected water demand associated with the Project.

If the proposed Project includes a "subdivision" of more than 500 residential dwelling units as defined by Government Code §66473.7 (a)(1), the public water system shall also provide verification as to whether the public water system is able or unable to provide a sufficient water supply based upon an analysis of whether water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection will meet the projected demand associated with the proposed subdivision which considers:

1. The historical record for at least 20 years;
2. The applicability of any urban water shortage contingency analysis;
3. The reduction in water supply for "specific water use sector" per an adopted resolution, ordinance, or contract; and
4. The amount of water that can be reasonably relied upon from specified supply projects.

This assessment is a technical, informational, and advisory opinion only. It is a supporting document for an environmental document and is not a commitment by EMWD to supply water for the Project. The information included is based on information available at the time of the report and changing circumstances could affect EMWD's water supply evaluation presented in this document.

This assessment does not specifically address funding of new or existing supplies. The cost of water supplies will increase over time and the developer of this Project may be required to fund the acquisition of new, supplemental supplies, treatment facilities, potable, wastewater, or recycled water infrastructure, and water efficiency measures for existing customers. The extent of additional funding will be determined by EMWD and may take the form of a new component of connection fees or a separate charge. New customers may also be required to pay a higher commodity rate for water used than existing customers to help offset the rising costs of new supplies.

Prior to project construction, the developer of the Project is required to meet with EMWD staff to establish development design conditions, which will detail water, wastewater, and recycled water requirements to serve the Project. If there is a change in the circumstances detailed in this assessment, EMWD will address the changes in the development design conditions for the Project. Modifications at the development design conditions stage could reduce the amount of water available to serve the Project.

I.5 Background

EMWD was formed in 1950 and annexed into the Metropolitan Water District of Southern California (MWD) in 1951, to deliver imported water. In 1971, EMWD assumed the additional role of a groundwater producer with the acquisition of the Fruitvale Mutual Water Company. Presently, EMWD's supply portfolio includes desalinated brackish groundwater, recycled water, potable groundwater and imported water.

EMWD provides both retail and wholesale water supplies to a service area encompassing approximately 558 square miles with an estimated population of over 888,000 people. Agencies through which EMWD provides water supplies indirectly via wholesale service include the following:

- City of Hemet Water Department
- City of Perris and the North Perris Water System
- City of San Jacinto Water Department
- Lake Hemet Municipal Water District (LHMWD)
- Murrieta Division of Western Municipal Water District (WMWD – Murrieta)
- Nuevo Water Company (NWC)
- Rancho California Water District (RCWD)

I.6 Urban Water Management Plan

The 2020 UWMP was adopted by the EMWD Board of Directors on June 30, 2021. This plan documents EMWD's projected supplies and demands in five-year increments through the year 2045, certifies EMWD's compliance with water use efficiency targets defined in the Water Conservation Act of 2009, and demonstrates EMWD's supply reliability, even under dry year hydrologic conditions lasting multiple years. Approximately half of EMWD's existing and future retail demand will be supplied through local sources such as groundwater, brackish groundwater desalination, and recycled water, with the balance coming from imported water delivered by MWD. Demands shown in the 2020 UWMP are not project specific, but rather, projected in aggregate using the best available current and planned land use information over EMWD's entire service area. The 2020 UWMP relies heavily on information and assurances contained within

MWD's 2020 Urban Water Management Plan (MWD UWMP) when evaluating service area supply reliability. The 2020 MWD UWMP is attached as Appendix B.

I.7 Population Projection

The population projections for EMWD's service area were updated in the 2020 UWMP using information obtained from the most recent regional transportation plan/sustainable communities strategy completed by the Southern California Association of Governments (SCAG). This study, known as Connect SoCal, forecasted regional growth through 2045, and was adopted by SCAG on September 3, 2020. The data available from Connect SoCal includes projections of population, households, and employment within each of SCAG's Traffic Analysis Zones, which closely resemble block groups in the United States Census.

Consistent with the significant percentage of undeveloped land within EMWD's service area, growth is anticipated to continue throughout the 2020 UWMP's 25-year planning horizon (as shown in Table 1). Currently, approximately 40 percent of the District's service area is built out. As population and the associated water demands increase, EMWD will continue to proactively manage its water supply portfolio through the development of local resources in conjunction with additional imported water purchases from MWD as outlined in the 2020 UWMP.

TABLE 1: PROJECTED POPULATION

Population Served	2020	2025	2030	2035	2040	2045
Retail	603,950	649,700	695,500	741,300	774,300	807,200
Wholesale	255,210	271,500	287,800	304,000	314,000	324,100
Total	**859,160**	**921,200**	**983,300**	**1,045,300**	**1,088,300**	**1,131,300**

Section II: Identification of Supplies and Description of Quantities

Water Code §10910 (d)(1)

II.1 Overview of Supplies

EMWD has four sources of water supply: imported water purchased from MWD, potable groundwater, desalinated brackish groundwater, and recycled water.

A. Retail Water Supply Portfolio

Approximately half of EMWD's retail demands are supplied through local water sources, which consists of potable groundwater, desalinated brackish groundwater, and recycled water. The remaining demands are supplied by a mix of raw and treated water purchased from MWD. EMWD treats most of its raw water for potable use at two water filtration plants, located in Perris and Hemet. A small quantity of raw water is supplied directly to agricultural customers.

Over the past five years, EMWD's retail water supply portfolio averaged approximately 49 percent imported water, 10 percent groundwater, 6 percent desalinated brackish groundwater, and 35 percent recycled water. An annual breakdown of EMWD's retail water supplies over this five-year period is shown in Table 2. The proportions of local to imported water supplies are impacted by EMWD's participation in MWD's cyclic storage program in 2019, where MWD offered an incentive for member agencies to voluntarily reduce local groundwater production and purchase additional imported water due to wet hydrologic conditions at the time.

TABLE 2: RETAIL WATER SUPPLY PORTFOLIO, PAST 5 YEARS (AFY)

Type	Source	2018	2019	2020	2021	2022
Imported – Treated(1)	Metropolitan Water District	42,419	41,167	44,726	44,870	37,208
Imported – EMWD Treated	Metropolitan Water District	18,288	18,969	17,584	18,028	24,380
Imported – Raw(2)	Metropolitan Water District	503	501	642	547	216
Groundwater(3),(4)	San Jacinto Groundwater Basin	13,605	8,044	14,410	14,945	12,369
Desalination	San Jacinto Groundwater Basin	7,544	7,433	7,310	7,653	10,850
Recycled Water(5)	Regional Water Reclamation Facilities	44,016	40,676	39,642	46,042	51,601
	Total	**126,375**	**116,790**	**124,314**	**132,085**	**136,624**

1. EMWD increased treated imported water purchases in 2019 to offset groundwater pumping reductions made as part of its participation in MWD's Cyclic Storage Program.
2. Raw water total does not include replenishment water recharged under the Soboba Settlement Agreement.
3. Groundwater totals may include raw, brackish groundwater used to augment recycled water system for agricultural use.
4. A portion of the San Jacinto Groundwater Basin is adjudicated under the Hemet-San Jacinto Watermaster. EMWD pumping in this portion is subject to an adjusted base production right. EMWD also receives pumping credits for a portion of any Soboba Settlement recharge water unused by the Soboba Tribe.
5. Recycled water total excludes discharge but includes system losses (such as storage pond evaporation and incidental recharge). Due to the interconnected nature of EMWD's recycled water system, it is difficult to split retail and wholesale losses, therefore all recycled water losses are reported with the retail portfolio.

B. Wholesale Water Supply Portfolio

EMWD imports raw and treated water from MWD to supplement the local water supplies of its wholesale agencies. In addition, EMWD has agreements to provide recycled water to some of its wholesale agencies. An annual breakdown of EMWD sales to wholesale agencies is shown in Table 3. Note that this table only documents sources of water sold by EMWD on a wholesale basis and does not include local supplies (such as groundwater) available and used by EMWD's wholesale agencies to meet customer demands.

TABLE 3: WHOLESALE WATER SUPPLY PORTFOLIO, PAST 5 YEARS (AFY)

Type	Source	2018	2019	2020	2021	2022
Imported – Treated	Metropolitan Water District	14,672	11,070	15,008	13,081	15,389
Imported – Raw	Metropolitan Water District	14,385	11,293	14,909	12,798	18,949
Imported – Recharge (Raw)	Metropolitan Water District	4,783	20,730	6,647	0	0
Recycled Water	Regional Water Reclamation Facilities	1,878	1,619	1,285	1,757	1,793
	Total	**35,718**	**44,712**	**37,849**	**27,636**	**36,131**

1. Table does not include local supply sources used by suppliers to which EMWD provides wholesale service.
2. Raw water is imported and recharged by EMWD, LHMWD, and the Cities of Hemet and San Jacinto for the Soboba Tribe under the Soboba Settlement Agreement, which requires a long-term average of 7,500 AFY to be recharged. MWD can pre-deliver recharge water. The annual volume of the 7,500 AFY requirement unused by the Soboba Tribe is credited to the agencies for use.
3. Due to the interconnected nature of EMWD's recycled water system, it is difficult to distinguish between retail and wholesale losses, therefore, all recycled water losses are reported in Table 2, which documents retail water supplies.

C. Projected Future Water Supply Portfolios

As development increases the water demands within EMWD's service area, it is anticipated that new demands will be met through a combination of additional imported water from MWD and the development of local supply projects including increased production of potable groundwater, desalination of brackish groundwater, and use of recycled water. EMWD also plans to continue its efforts to enhance water use efficiency within its service area. Table 4 and Table 5 show EMWD's projected water supplies for both retail and wholesale service throughout the planning horizon set within its UWMP. These estimates do not account for all potential new local supply projects that could potentially be developed by EMWD or by agencies to which EMWD provides wholesale service.

TABLE 4: PROJECTED RETAIL WATER SUPPLIES - AVERAGE YEAR HYDROLOGY

Type	Source	2025	2030	2035	2040	2045
Imported	Metropolitan Water District	66,447	72,147	70,247	74,747	78,847
Groundwater	San Jacinto Groundwater Basin	18,753	18,753	18,753	18,753	18,753
Desalination	San Jacinto Groundwater Basin	13,400	13,400	13,400	13,400	13,400
Other	Purified Water Replenishment	4,000	4,000	12,000	12,000	12,000
Recycled Water	Regional Water Reclamation Facilities	39,230	44,920	42,200	47,500	51,800
	Total	**141,830**	**153,220**	**156,600**	**166,400**	**174,800**

1. Imported water total represents planned EMWD purchases, not the maximum volume of water available from MWD.
2. Groundwater total includes only 7,303 AFY of pumping from the adjudicated Hemet/San Jacinto Management Plan Area, which is EMWD's long term adjusted base production right. EMWD is also able to pump a portion of water recharged under the Soboba Settlement Agreement that is not used by the Soboba Tribe. EMWD is also able to carry over production rights into future years. As of the end of calendar year 2021, EMWD has accrued a carry-over credit balance of over 26,000 acre-feet.
3. Purified Water Replenishment is a planned indirect potable reuse project.
4. Recycled water supply total excludes volumes to be recharged under Purified Water Replenishment to avoid double counting as well as projected losses due to evaporation and incidental storage pond percolation.

TABLE 5: PROJECTED WHOLESALE WATER SUPPLIES - AVERAGE YEAR HYDROLOGY

Type	Source	2025	2030	2035	2040	2045
Imported	Metropolitan Water District	50,700	44,900	46,900	49,200	51,300
Imported	Soboba Settlement Water	7,500	7,500	7,500	7,500	7,500
Recycled Water	Regional Water Reclamation Facilities	4,770	5,180	5,600	5,600	5,600
	Total	**62,970**	**57,580**	**60,000**	**62,300**	**64,400**

1. Imported water total represents planned EMWD purchases, not the maximum volume of water available from MWD.
2. Under the Soboba Settlement Agreement, MWD must provide an annual average of 7,500 AFY of recharge water, however, this water can be pre- or post-delivered based on supply availability and coordination between MWD and EMWD.
3. Due to the interconnected nature of EMWD's recycled water system, losses can be hard to allocate between retail and wholesale service – for simplicity, all recycled water losses are excluded from wholesale and shown in the retail table instead.

II.2 Wholesale Water Supplies

A. Written Contracts or Other Proof of Entitlement

Water Code §10910 (d)(2)(A)

EMWD is one of the 26 member agencies that make up MWD. The statutory relationship between MWD and its member agencies establishes the scope of EMWD's entitlements from MWD. Typically, MWD does not set limits on the quantity of supply available to member agencies and MWD has provided evidence in the 2020 MWD UWMP that its supplies will meet member agency demands during normal, single-dry, and multiple-dry years within a 20-year projection.

During shortage events, the MWD Water Supply Allocation Plan (WSAP) is implemented in order to promote a reduction in demand by member agencies. Member agencies are allocated a portion of their anticipated demand with the assurance that a member agency will not see a retail shortage greater than the regional shortage. The WSAP includes adjustments for member agency population growth and investments in local resources. Member agency purchases are not limited under the WSAP, but any amount purchased over a member agency's allocation is charged at a much higher rate.

B. MWD Water Supplies

EMWD relies on MWD to provide approximately half of its retail water supply. The northern portion of EMWD's service area is supplied by MWD's Mills Water Filtration Plant (WFP), while the southern portion of EMWD's service area is supplied by MWD's Skinner WFP. Untreated water from MWD is primarily treated at EMWD's Perris and Hemet WFPs with a small quantity that is delivered directly to agricultural customers. EMWD also imports water from MWD to supply wholesale customers.

EMWD plans to supply new water demands through a combination of additional imported water purchases from MWD, as well as ongoing projects and programs expanding EMWD's local water supply portfolio. The 2020 MWD UWMP provides information about MWD's supply reliability and projected demands. In this document, MWD states that it will be able to reliably supply projected member agency demands through 2045 even under historic single-dry and multiple-dry years. Unprecedented shortages are addressed in the Water Shortage Contingency Analysis and Catastrophic Supply Interruption Planning portions of the 2020 MWD UWMP.

EMWD actively coordinated with MWD staff during the development of the 2020 MWD UWMP, however, note that MWD does not provide supply projections for each member agency; instead, MWD uses a regional approach to developing projections. Demand for the entire Southern California region is calculated, and then, based on available information about existing and proposed local projects, MWD determines the amount of imported water needed during future years. The 2020 MWD UWMP is included as Appendix B of this WSA.

II.3 Local Water Supplies

Water Code §10910 (d)

EMWD has made extensive investments in local water supply sources to increase system resiliency and reduce dependence on imported water from MWD. These local resources include potable groundwater, desalinated brackish groundwater, and recycled water.

A. Groundwater

Water Code §10910 (f)

Groundwater information is included in this assessment to assist the lead agency in determining the adequacy of EMWD's total supply. While EMWD does not plan to develop new groundwater supplies specifically for this project, the advancement of new local supplies represents a major component of EMWD's planned water supply portfolio. Therefore, new developments, including the Project, may be supplied with a combination of additional imported water and/or projects and programs expanding EMWD's local supplies, including groundwater.

i. Urban Water Management Plan Review

Water Code §10910 (f)(1)

The 2020 UWMP discusses projected groundwater use by EMWD and explains assumptions made about groundwater. In the following sections, portions of the 2020 UWMP are summarized or excerpted below for informational purposes.

ii. Groundwater Basin Description

Water Code §10910 (f)(2)

EMWD's service area overlies the San Jacinto Groundwater Basin, which is primarily comprised of alluvium-filled valleys carved into the elevated bedrock plateau of the Perris Block. The San Jacinto Groundwater Basin is generally considered a closed basin surrounded by impermeable bedrock mountains and hills. For groundwater management plan and reporting purposes, the San Jacinto Groundwater Basin is further separated into the Hemet/San Jacinto Management Plan Area, where the San Jacinto Fault Zone strongly influences the groundwater hydrology and is adjudicated under the Hemet-San Jacinto Watermaster, and the West San Jacinto Management Plan Area, for which EMWD is the designated Groundwater Sustainability Agency (GSA).

The San Jacinto Groundwater Basin is delineated into eight groundwater management zones (GMZ) based on groundwater flow, groundwater divides, and changes in groundwater quality. The Hemet/San Jacinto Management Area is comprised of the Hemet South, Canyon, and San Jacinto Upper Pressure GMZs, as well as the Hemet North portion of the Lakeview/Hemet North GMZ. The West San Jacinto Basin covers the Perris North, Perris South, San Jacinto Lower Pressure, and Menifee GMZs, and the Lakeview portion of the Lakeview/Hemet North GMZ. EMWD produces water for potable use or blending in four of the GMZs: Perris North, Hemet South, San Jacinto Upper Pressure and Canyon. Desalter wells are located in the Perris South and Lakeview/Hemet North GMZs.

Detailed descriptions of each Management Zone and other additional information may be found in Chapter 6 of the 2020 UWMP attached as Appendix A of this WSA.

iii. Groundwater Management

Water Code §10910 (f)(2)

The San Jacinto Groundwater Basin is managed under two groundwater management plans. The Hemet/San Jacinto Groundwater Management Plan (HSJ Management Plan) covers the Hemet South, Canyon, San Jacinto Upper Pressure, and Hemet North portion of the Lakeview/Hemet North Groundwater Management Zones. The West San Jacinto Groundwater Basin Management Plan (WSJ Management Plan) covers the Perris North, Perris South, San Jacinto Lower Pressure, Menifee, and the Lakeview portion of the Lakeview/Hemet North Management Zones.

(1) Hemet/San Jacinto Groundwater Management Plan

In 2001, the Cities of Hemet and San Jacinto, LHMWD, EMWD, and representatives of the private groundwater producers, with the Department of Water Resources (DWR) acting as an impartial mediator, began working on a groundwater management plan for the Hemet/San Jacinto Basin. The group discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment and Decree, export of groundwater from the basins, and how to maximize the use of recycled water. As a result of their efforts, a final HSJ Management Plan was completed in 2007, and a Stipulated Judgment was entered with the Superior Court of the State of California for the County of Riverside in April of 2013.

The HSJ Management Plan:

- Limits the amount of water being extracted from the basin free of the replenishment charge to a sustainable yield
- Implements continued recharge of the basin using imported water through the Integrated Recharge and Recovery Program (IRRP)
- Ensures settlement claims by the Soboba Tribe are facilitated and accommodated
- Expands the existing water production and water services system to meet future urban growth through the use of imported water recharged into the basin
- Protects and/or enhances water quality in the Hemet/San Jacinto Basin
- Supports cost-effective water supplies and treatment by the public agencies
- Eliminates groundwater overdraft and enhances basin yield
- Continues the monitoring program to promote and provide for best management and engineering principles to protect water resources

Long-term groundwater management includes plans for artificial recharge using MWD replenishment water via permanent facilities through the IRRP Program. An agreement with the Soboba Tribe requires MWD to deliver, on average, 7,500 AFY of water for the next 30 years to EMWD, LHMWD, and the Cities of Hemet and San Jacinto to be recharged into Hemet/San Jacinto Basin, fulfilling the Soboba Tribe’s water rights, and addressing chronic groundwater overdraft. Since this agreement has gone into effect, MWD has fulfilled the average requirement of 7,500 AFY and in addition, has made pre-deliveries to buffer against dry periods where replenishment water may not be readily available.

EMWD’s has the right to a long-term adjusted base production right of 7,303 AFY of groundwater under the HSJ Management Plan. EMWD’s base production right was gradually adjusted downward on an annual basis until the long-term value was reached in 2019. EMWD also receives credits to pump a portion of any amount of water recharged under the Soboba Settlement Agreement that is not used by the Soboba Tribe. Volumes of EMWD’s adjusted base production right and unused recharge water can be carried over into future years. Any pumping above these amounts is subject to replenishment fees.

(2) San Jacinto Groundwater Basin Groundwater Sustainability Plan

In the West San Jacinto area, a cooperative groundwater management plan helps insure the reliability and quality of the water supply. In June 1995, EMWD adopted the WSJ Management Plan in accordance with the statutes in the California Water Code §10750 through §10755 resulting from the passage of AB 3030. The plan was adopted after extensive public outreach and meetings with interested individuals and agencies.

Implementation of the WSJ Management Plan began directly after its adoption. Initial efforts to implement the WSJ Management Plan included establishing an advisory committee; prioritizing the management zones; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. The West San Jacinto Groundwater Basin Management Plan Annual Report, which had been published annually since 1996, has been superseded by the San Jacinto Groundwater Basin GSP Annual Report.

The Sustainable Groundwater Management Act (SGMA) was passed into law in 2014 and required that medium and high priority groundwater basins designated by the DWR be managed by GSAs. The San Jacinto Groundwater Basin was deemed a high priority basin by the DWR. Subsequently, EMWD notified the DWR of its intent to become the GSA for the non-adjudicated portion of the San Jacinto Groundwater Basin in January 2017. EMWD performed an extensive public outreach effort to ensure that the interests of all beneficial uses and users of groundwater would be considered in the process of forming the GSA, and in the development and implementation of this GSP. After EMWD staff conducted public workshops, reached out to stakeholder agencies (e.g., cities, counties, water districts, watermasters, and state agencies), and circulated notices in the press, the EMWD Board of Directors approved Resolution No. 2016-135 in December 2016, which formalized EMWD's intention to be the GSA for the West San Jacinto GSA Area and, EMWD's Board of Directors became the exclusive GSA for the western portion of the San Jacinto Groundwater Basin on April 24, 2017.

EMWD, as the GSA, initiated the development of the San Jacinto Groundwater Basin GSP in February 2019 and adopted and submitted the GSP to the DWR in November 2021. The purpose of the GSP is to define the conditions under which the groundwater resources of the West San Jacinto GSA Plan Area, which support agricultural, domestic, municipal and industrial, and environmental uses, will be managed sustainably in the future. The adoption of the GSP represents the commitment of the West San Jacinto GSA to maintain long-term, sustainable use of groundwater resources within the West San Jacinto GSA Plan Area, as required by SGMA. Over the next 20 years, data will continue to be gathered, analyzed, and used to refine the estimated sustainable yield and understanding of the sources of and influences on degraded water quality. As the understanding of the West San Jacinto GSA Plan Area improves, the findings of this GSP will be evaluated and updated as necessary. The GSP documents a viable approach, determined by the GSA in collaboration with stakeholders and informed by the best available information, to maintaining the long-term sustainability of the groundwater resources within the West San Jacinto GSA Plan Area. The first San Jacinto Groundwater Basin Groundwater Sustainability Plan Annual Report was submitted to DWR and published in March 2022 and will continue to be completed annually.

iv. Groundwater Recharge

EMWD has undertaken groundwater recharge operations with imported surplus MWD water within the Hemet/San Jacinto area since 1990, initially through the use of temporary facilities constructed under various pilot programs. Long term facilities for recharge were placed in operation under the IRRP, which plays an integral role in both the HSJ Management Plan and the Soboba Settlement Agreement. Facilities for the first phase of the IRRP include approximately 35 acres of basins/ponds for recharge, three extraction wells, three monitoring wells, modifications to two existing pump stations and pipelines within and adjacent to the San Jacinto River. EMWD is currently expanding its groundwater recharge and banking capabilities through Phase 1 of the Enhanced Recharge and Recovery Program (ERRP), the Santa Ana Conservation and Conjunctive Use Program (SARCCUP). Planned future phases of the ERRP will further expand the groundwater recharge and banking capabilities.

EMWD also contributes to the replenishment of the basin by providing recycled water to customers for use in lieu of private groundwater production. This program can deliver up to 8,540 AF annually to local agricultural users and the costs are borne jointly by EMWD, LHMWD, and the Cities of Hemet and San Jacinto. Agreements that set limits on groundwater production and support portions of operational and maintenance costs have been in place since 2008.

v. Groundwater Pumping Rights

Water Code §10910 (f)

The Hemet/San Jacinto area forms the bulk of the eastern portion of EMWD's service area and is adjudicated through the Hemet-San Jacinto Watermaster and managed under the HSJ Management Plan. The groundwater native to this region is generally of high quality and is a major source of municipal as well as private production. EMWD's long term adjusted base groundwater production right in this area is 7,303 AF. Any pumping above this amount is subject to replenishment fees or must be offset by groundwater recharge. EMWD also receives the right to pump a portion of water recharged under the Soboba Settlement Agreement that is unused by the Soboba Tribe. Both EMWD's adjusted base production right and unused recharge water right can be carried over into future years. At the end of 2021, EMWD's balance of carry over credits exceeded 26,000 AF.

EMWD also operates potable wells in the Moreno Valley/North Perris area as well as brackish wells that feed EMWD's desalination facilities. These wells are located outside of the Hemet/San Jacinto area and will be managed by EMWD as the GSA under the San Jacinto Groundwater Basin GSP. Pumping in the GSA area is currently not subject to any restrictions.

(1) Past Groundwater Extraction

Water Code §10910 (f)(3)

Historic groundwater extractions by EMWD are documented in Table 2. The majority of EMWD's groundwater is extracted from the Hemet/San Jacinto area, with the remainder coming from the area covered by the WSJ Management Plan. The general location of wells and desalination facilities are shown in Figure 1.

(2) Projected Groundwater Extraction

Water Code §10910 (f)(4)

EMWD's projected groundwater supplies are shown in Table 4. Groundwater produced from the Hemet/San Jacinto area is adjudicated by the Hemet-San Jacinto Watermaster. For 2023, EMWD has an adjusted base production right of 7,303 AF, in addition to its balance of carry over credits. Any pumping above the adjusted base production right and carry over credits will be subject to replenishment fees or offset by groundwater recharge. Groundwater production outside the Hemet/San Jacinto area is not restricted and includes EMWD's wells located in Menifee and North Perris, as well as the wells feeding EMWD's desalter system. The general locations of the facilities shown in Figure 1 are anticipated to remain consistent for the foreseeable future.

vi. Analysis of the Sufficiency of Groundwater

Water Code 10910 (f)(5)

Protecting the groundwater supply available to EMWD is an important part of the District's planning efforts. EMWD is actively working with other agencies and groups to ensure that groundwater will continue to serve as a reliable water resource in the future. This effort includes the replacement of groundwater extracted beyond a given basin's safe yield.

EMWD extracts groundwater within its service area under the HSJ Management Plan and the San Jacinto Groundwater Basin GSP. Under the HSJ Management Plan, imported water will be recharged in the Hemet/San Jacinto area to support groundwater extractions, while pumping in the GSA area, where groundwater levels have been rising, is planned to increase in the future as EMWD constructs new wells as part of the Perris North Groundwater Contamination Prevention and Remediation Program.

B. Surface Diversion Rights

License Number 10667

EMWD holds a right to divert up to 5,760 AF of San Jacinto River flows for recharge and subsequent use. The diversion right applies annually from November 1 through June 30 each year. EMWD's diversion and recharge of San Jacinto River flows take place within the Canyon GMZ at EMWD's Grant Avenue Ponds located in the Valle Vista area. Diversions are recharged into the groundwater basin and are not sold or used directly. Flows in the San Jacinto River are ephemeral and in any given year, flows may not be sufficient for any amount of diversion at all.

Additional information about surface water diversions can be found in the Annual Report of the HSJ Management Plan.

C. Recycled Water

Water Code §10910 (d)(1)

Recycled water is used extensively in EMWD's service area in place of potable water. This offset to municipal demand comes from recycled water use to irrigate landscape and for industrial purposes. The majority of EMWD's agricultural customers also use recycled water, in some cases, in lieu of groundwater production.

EMWD's recycled water supply will expand as the population within EMWD's service area continues to grow. EMWD generally uses all its recycled water and is limited only by the amount available to serve during peak demands and by system losses. EMWD stores recycled water during low demand periods and does not typically discharge recycled water. The District anticipates that this will continue even as the recycled water supply grows via programs to retrofit additional landscape customers currently using potable water and future recharge for indirect potable reuse.

D. Water Use Efficiency Measures

Water Code §10631 (e)

The Water Conservation Act of 2009 (SBx7-7) set a requirement for water agencies to reduce their per capita water use by the year 2020. The overall goal is to reach a statewide reduction of per capita urban water use of 20 percent by December 31, 2020, with an intermediate 10 percent reduction by December 31, 2015. Demand reduction can be achieved through both conservation and the use of recycled water as a potable demand offset. EMWD's retail customers used approximately 125 gallons per capita per day (gpcd) in 2020, which exceeds the per capita use water use efficiency target set under SBx7-7 of 176 gpcd.

In 2018, California passed Assembly Bill 1668 (AB 1668) and Senate Bill 606 (SB 606), collectively known as the Making Conservation a California Way of Life legislation. AB 1668 and SB 606 will require additional increases in water use efficiency beyond the targets set under SBx7-7. Rulemaking for AB 1668 and SB 606 remains in progress and EMWD's new target has not been set.

EMWD's conservation effort primarily utilizes three methodologies:

1. Budget Based Tiered Rates – EMWD implemented a tiered rate billing structure for its residential and landscape customers in April of 2009. Customers are provided with an allocation for reasonable water use and are required to pay a higher rate for water use over their allocated limit. A study by the University of California, Riverside, showed that budget-based rates reduced demand from existing residential customers by 15 percent;
2. Water Use Efficiency Requirements for New Development – These requirements focus on the installation of lower water use landscape and interior fixtures. Water use efficiency

is mandated statewide through existing ordinances, plumbing codes, and legislation. To enforce water use efficiency, EMWD has lowered the water budget allocations for new developments. Any residential or dedicated landscape account installed after January 1, 2011, has an outdoor budget allocation based on only 70 percent of evapotranspiration (ET), and non-functional turf is prohibited. Similar accounts installed after April 2015 have an outdoor budget allocation that is reduced to 50 percent of ET. As of January 2018, accounts with an outdoor budget allocation of 100 percent of ET have been reduced to 80 percent of ET; and

3. Active Conservation Program – EMWD implements a variety of water use efficiency programs that encourage the replacement of inefficient devices and includes monetary rebates, distribution, and direct installation programs.

In addition to these outlined conservation efforts, EMWD continues to expand its recycled water system to offset potable demand.

E. Local Resources Documentation

i. Written Contracts or Other Proof

Water Code §10910 (d)(2)(A)

The following is a list of documents related to EMWD's local water supply:

- EMWD 2020 Urban Water Management Plan (June 2021): EMWD's 2020 Urban Water Management Plan is attached as Appendix A. This plan supplies additional information on EMWD, its service area, water management, and supply capabilities.
- Hemet/San Jacinto Groundwater Management Area – 2021 Annual Report (May 2022): This annual report contains detailed information on the history and progress of groundwater management and the groundwater monitoring program in the Hemet/San Jacinto area
- Hemet/San Jacinto Groundwater Management Area – Water Management Plan: This plan was developed by stakeholders in the Hemet/San Jacinto area to provide a foundation to guide and support responsible water management into the future. The plan was finalized in 2007.
- San Jacinto Groundwater Basin Groundwater Sustainability Plan – 2022 Annual Report (March 2022): This annual report contains detailed information on the history and progress of groundwater management and the groundwater monitoring program in the West San Jacinto area (including Perris and Menifee) for water years 2019 through 2021. This report can be found on SGMA's website (sgma.water.ca.gov).
- Groundwater Sustainability Plan for the San Jacinto Groundwater Basin (September 2021): As the GSA, EMWD developed the GSP to define the conditions under which the groundwater resources of the West San Jacinto GSA Plan Area will be managed sustainably in the future. This plan can be found on EMWD's website (www.emwd.org).

With respect to EMWD's ownership and use of reclaimed/recycled water, the California Water Code, §1210 states:

> *The owner of a wastewater treatment plant operated for the purpose of treating wastes from a sanitary sewer system shall hold the exclusive right to the treated wastewater as against anyone who has supplied the water discharged into the wastewater collection and treatment system, including a person using water under a water service contract, unless otherwise provided by agreement.*

With respect to the Water Use Efficiency Ordinance that will result in additional supplies through conservation:

- The County of Riverside Board of Supervisors approved an update to Ordinance Number 859 on October 20, 2009, requiring water efficient landscaping in any new development requiring a permit
- EMWD's Administrative Code requires water efficient landscaping in new developments and water efficiency by all customers. Efficiency is enforced through allocation based tiered rates. EMWD's Administrative Code can be found on EMWD's website (www.emwd.org).

ii. EMWD's Capital Improvement Plan

Water Code §10910 (d)(2)(B)

EMWD maintains and periodically updates a comprehensive Water Facilities Master Plan (WFMP). This working plan defines water supplies, transmission mains, and storage facilities required for the accommodation of projected growth within EMWD. On a yearly basis, a five-year Capital Improvement Plan (CIP) is prepared, which is based on a further refinement of the WFMP. The CIP outlines specific projects and their funding source. Each project is also submitted individually to the EMWD Board of Directors for authorization and approval. This allows EMWD to accurately match facility needs with development trends. Financing information for the desalter plant construction, expansion of the regional water reclamation facilities, and well replacement can also be found in the CIP.

iii. Federal, State, and Local Permits Needed for Construction

Water Code §10910 (d)(2)(c)

As part of EMWD's CIP, representatives from the Engineering, Water Resources and Facilities Planning, and Environmental and Regulatory Compliance Departments discuss each project and the steps needed to comply with regulatory requirements. EMWD works with various government agencies, including the United States Department of Fish and Wildlife, the United States Army Corps of Engineers, the California Department of Public Health, the California Division of Drinking Water, the California State Water Resources Board, the California Air Quality Management District, and the California Department of Fish and Game to obtain permits when necessary. The Engineering Department procures additional construction permits on a case-by-case basis. EMWD has already, or is in the process of, obtaining Environmental Impact Reports or other environmental documents necessary for desalter construction, expansion of regional water reclamation facilities, and well replacements. Any necessary permits secured by EMWD are kept on file at the District's headquarters facility.

iv. Regulatory Approvals

Water Code §10910 (d)(2)(D)

The California Division of Drinking Water (DDW) has issued a system-wide permit for EMWD's water supply system. EMWD's Environmental and Regulatory Compliance Department conforms to specific regulations and obtains any additional necessary approvals. As new facilities are constructed by EMWD, they are subject to inspection and testing by regulatory agencies and the DPH permit is amended.

Section III: Demands

III.1 Demand Projections

Water Code §10910 (c)(2)

EMWD's primary retail customers for potable and raw water can be divided into residential, commercial, industrial, institutional, landscape, and agricultural sectors. The residential sector is EMWD's largest customer segment; however, each sector plays a role in the growth and development of EMWD's service area. The historic and projected customer water use by the various potable/raw retail customer types are shown in Table 6.

TABLE 6: RETAIL POTABLE/RAW WATER USE BY CUSTOMER TYPE

	Actual Water Use - AFY				Projected Water Use - AFY				
Use Type	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Single Family	62,300	54,000	45,700	52,200	66,900	71,700	76,700	80,500	84,000
Multi-Family	5,500	6,100	5,800	6,500	8,500	9,100	9,700	10,200	10,600
Commercial	3,900	4,200	4,600	4,300	6,100	6,500	7,000	7,300	7,600
Industrial	400	400	300	600	600	600	700	700	700
Institutional	2,900	2,300	2,000	1,600	2,700	2,900	3,100	3,200	3,400
Landscape	7,500	8,900	7,700	8,200	8,400	7,600	6,800	6,200	5,500
Agricultural	2,500	2,300	2,800	1,600	2,000	2,000	2,000	2,000	2,000
Total	**85,000**	**78,200**	**68,900**	**75,000**	**95,200**	**100,400**	**106,000**	**110,100**	**113,800**

EMWD also provides wholesale water service to a number of sub-agencies, serves recycled water, and imports water for recharge purposes. These demands are shown in Table 7.

Table 7: Wholesale Deliveries to Other Agencies

	Actual Deliveries - AFY				Projected Deliveries - AFY				
Supplier	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
City of Hemet	100	0	0	0	0	0	0	0	0
City of Perris	1,900	1,700	1,500	1,685	1,800	1,900	2,100	2,200	2,300
City of San Jacinto	0	0	0	0	0	0	0	0	0
LHMWD	100	1,300	4,300	986	5,100	5,500	5,900	6,300	6,700
NWC	800	600	200	409	500	1,000	1,100	1,200	1,200
RCWD	26,300	21,900	15,000	25,028	42,300	35,200	36,200	37,500	38,800
WMWD (Murrieta)	100	1,600	700	1,809	1,000	1,300	1,600	2,000	2,300
Recharge (Soboba)	0	0	0	6,467	7,500	7,500	7,500	7,500	7,500
Total	**29,300**	**27,100**	**21,700**	**36,384**	**58,200**	**52,400**	**54,400**	**56,700**	**58,800**

1. The Cities of Hemet and San Jacinto plan to meet 100% of demands using local groundwater supplies, however, EMWD can deliver water to the cities during high demand periods or when city wells are undergoing maintenance.
2. Under the Soboba Settlement Agreement, MWD must provide an annual average of 7,500 AFY of water to be recharged in the Hemet/San Jacinto Management Plan Area by EMWD, LHMWD, and the Cities of Hemet and San Jacinto to fulfill the Soboba Tribe's water right. Actual deliveries will vary from year to year, and MWD has the option to pre-deliver water. Recharge water unused by the Soboba Tribe is proportioned between the four agencies.

Other water demands including recycled water use, recharge that occurred prior to or outside the scope of the Soboba Settlement Agreement, system losses, non-revenue water deliveries, and other, miscellaneous water usage are shown in Table 8.

Table 8: Other and Non-Potable Water Usage

	Actual Water Use - AFY				Projected Water Use - AFY				
Use Type	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Recycled(1),(2)	32,600	28,200	46,100	40,900	44,000	50,100	47,800	53,100	57,400
Recharge(3)	7,000	0	0	0	0	0	0	0	0
Other / Losses(4)	7,700	8,400	9,100	9,800	7,400	7,900	8,400	8,800	9,200
Total	**47,300**	**36,600**	**55,200**	**50,700**	**51,400**	**58,000**	**56,200**	**61,900**	**66,600**

1. Recycled water projections include recycled water that is delivered to sub-agencies but excludes the volume of recycled water that is planned to be recharged as part of EMWD's Purified Water Replenishment (indirect potable reuse) project to avoid double counting.
2. Recycled water supply may be supplemented by brackish groundwater or raw water during high demand months.
3. Volume of recharge water excludes water that is imported under the Soboba Settlement Agreement (shown in prior table).
4. Other/losses category includes unbilled, authorized consumption use as well as real and apparent losses in the potable system.

Total demands on EMWD's water system are summarized in Table 9.

TABLE 9: SUMMARY OF TOTAL SYSTEM WATER DEMANDS

	Actual Water Use - AFY				Projected Water Use - AFY				
Category	2005	2010	2015	2020	2025	2030	2035	2040	2045
Retail	85,000	78,200	68,900	75,000	95,200	100,400	106,000	110,100	113,800
Wholesale	29,300	27,100	21,700	36,384	58,200	52,400	54,400	56,700	58,800
Other	47,300	36,600	55,200	50,700	51,400	58,000	56,200	61,900	66,600
Total	**161,600**	**141,900**	**145,800**	**162,084**	**204,800**	**210,800**	**216,600**	**228,700**	**239,200**

III.2 Project Demands

The Project proposes construction of a 643,419 square foot warehouse building on approximately 35 acres, located at the southwest corner of Ellis Avenue and Case Road. In the 2020 UWMP, the demand projections for the parcels covering the project site were estimated based on Light Industrial land use, with a total demand of 84.94 AFY.

TABLE 10: 2020 UWMP LAND USE DEMAND ESTIMATE

Land Use Category	Average Day Demand (gpd)	Annual Demand (AFY)
Light Industrial	75,781	84.94
Total	**75,781**	**84.94**

Based on the land use information provided by the developer and the lead agency, the total water demand for this project is estimated to be 21.24 AFY, which is within the limits of estimated demand considered in the 2020 UWMP.

TABLE 11: PROJECT SPECIFIC DEMAND ESTIMATE

Land Use Category	Average Day Demand (gpd)	Annual Demand (AFY)
Business Park/Light Industrial/Warehouse	18,945	21.24
Total	**18,945**	**21.24**

All new developments are required to install water efficient devices and landscaping. The use of turf for non-functional purposes is prohibited. For reference, a document titled "Water Efficient Guidelines for New Development" is available on EMWD's website (www.emwd.org) to help increase water use efficiency for this Project.

III.3 Database of Proposed Projects

Water Code §10910 (c)(3)

To develop the projections used in this WSA, EMWD uses a development tracking database that assesses future water demands for specific projects. EMWD uses this database to help plan for future water supply and infrastructure needs by monitoring new projects through various stages of development. Subject to the Board of Director's approval of this WSA, information associated with this Project will be updated in the supply and demand projections EMWD uses for planning. Changes in density and land use are also tracked in this database for planning purposes. The developer is required to notify EMWD if any changes to project density or land use occur.

Section IV: Evaluation of Supply and Demand

Water Code §10910 (c)(2)

IV.1 Supply and Demand Evaluation under Historic Conditions

EMWD's 2020 UWMP includes an evaluation of EMWD's water supply reliability under a range of potential hydrologic conditions. The results for normal year conditions are shown in Table 12 and Table 13 for EMWD's retail and wholesale service respectively. The single dry year evaluation is documented in Table 14 and Table 15, and the results of the multiple dry year evaluation are shown in Table 16 and Table 17. The supply totals shown in the table reflect EMWD's planned production and not EMWD's supply capacity. Under drought conditions, EMWD may increase local supply production, pump from stored water supplies, or purchase additional imported water from MWD if necessary. More details on this analysis can be found in Chapter 7 of the 2020 UWMP.

A. Normal Year Supply and Demand Comparisons

TABLE 12: RETAIL SUPPLY AND DEMAND COMPARISON, NORMAL YEAR (AFY)

	2025	2030	2035	2040	2045
Supply Totals	145,930	157,320	168,900	178,700	187,100
Demand Totals	145,930	157,320	168,900	178,700	187,100
Difference	**0**	**0**	**0**	**0**	**0**

TABLE 13: WHOLESALE SUPPLY AND DEMAND COMPARISON, NORMAL YEAR (AFY)

	2025	2030	2035	2040	2045
Supply Totals	62,970	57,580	60,000	62,300	64,400
Demand Totals	62,970	57,580	60,000	62,300	64,400
Difference	**0**	**0**	**0**	**0**	**0**

B. Single Dry Year Supply and Demand Comparisons

Table 14: Retail Supply and Demand Comparison, Single Dry Year (AFY)

	2025	2030	2035	2040	2045
Supply Totals	151,130	162,820	174,700	184,700	193,300
Demand Totals	151,130	162,820	174,700	184,700	193,300
Difference	**0**	**0**	**0**	**0**	**0**

Table 15: Wholesale Supply and Demand Comparison, Single Dry Year (AFY)

	2025	2030	2035	2040	2045
Supply Totals	64,770	59,080	61,600	63,600	65,900
Demand Totals	64,770	59,080	61,600	63,600	65,900
Difference	**0**	**0**	**0**	**0**	**0**

C. Multiple Dry Years Supply and Demand Comparison

Table 16: Retail Supply and Demand Comparison, Multiple Dry Years (AFY)

		2025	2030	2035	2040	2045
First Year	Supply Totals	151,130	162,820	174,700	184,700	193,300
	Demand Totals	151,130	162,820	174,700	184,700	193,300
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	132,700	143,300	153,700	162,500	170,300
	Demand Totals	132,700	143,300	153,700	162,500	170,300
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	134,900	145,500	155,500	164,100	171,900
	Demand Totals	134,900	145,500	155,500	164,100	171,900
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	137,100	147,600	157,400	165,700	173,500
	Demand Totals	137,100	147,600	157,400	165,700	173,500
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	140,200	150,800	160,000	168,000	175,800
	Demand Totals	140,200	150,800	160,000	168,000	175,800
	Difference	**0**	**0**	**0**	**0**	**0**

TABLE 17: WHOLESALE SUPPLY AND DEMAND COMPARISON, MULTIPLE DRY YEARS (AFY)

		2025	2030	2035	2040	2045
First Year	Supply Totals	64,770	59,080	61,600	63,600	65,900
	Demand Totals	64,770	59,080	61,600	63,600	65,900
	Difference	**0**	**0**	**0**	**0**	**0**
Second Year	Supply Totals	63,200	59,100	61,400	63,400	65,600
	Demand Totals	63,200	59,100	61,400	63,400	65,600
	Difference	**0**	**0**	**0**	**0**	**0**
Third Year	Supply Totals	62,100	59,600	61,800	63,900	66,000
	Demand Totals	62,100	59,600	61,800	63,900	66,000
	Difference	**0**	**0**	**0**	**0**	**0**
Fourth Year	Supply Totals	61,000	60,100	62,200	64,300	66,400
	Demand Totals	61,000	60,100	62,200	64,300	66,400
	Difference	**0**	**0**	**0**	**0**	**0**
Fifth Year	Supply Totals	59,800	60,600	62,600	64,700	66,900
	Demand Totals	59,800	60,600	62,600	64,700	66,900
	Difference	**0**	**0**	**0**	**0**	**0**

EMWD’s 2020 UWMP discusses the supply reliability for EMWD during dry years. EMWD expects its local supplies to remain highly reliable and resilient, even under severe hydrologic conditions.

Similarly, MWD’s UWMP shows that MWD would have the ability to meet all its member agencies’ project supplemental demand through 2045, even under a repeat of historic drought scenarios.

IV.2 Contingency Planning

EMWD maintains a Water Shortage Contingency Plan (WSCP) that aims to reduce demand during water shortage using significant penalties for wasteful water use. EMWD’s WSCP details demand reductions for several stages of shortage through a 50 percent or greater reduction. Additional information about contingency planning is included in Chapter 8 of EMWD’s 2020 UWMP.

The WSCP was last updated on June 15, 2022, and is located in Title 5, Article 10 of the EMWD Administrative Code, which is available on EMWD’s website (www.emwd.org).

Section V: Water Supply Assessment

V.1 Potable Water

From a facilities perspective, the Project may be conditioned to construct off-site and on-site water facilities needed to distribute water throughout the project area. Prior to construction, the developer should contact EMWD staff to establish development design conditions and determine if any revisions are required to the master plan. Figure 2 shows existing water facilities in relation to the Project.

EMWD plans to supply new water demands in its service area, including the Project, through a combination of additional imported water purchases from MWD and the ongoing development of EMWD's local supply resources.

V.2 Recycled Water

EMWD policy recognizes recycled water as the preferred source of supply for all non-potable water demands, including irrigation of recreation areas, greenbelts, open space common areas, commercial landscaping, and supply for aesthetic impoundment or other water features.

According to the District's policies, the Project may be conditioned to construct a recycled water system separately from the potable water system. The system will need to be constructed to recycled water standards. The Project may also be conditioned to construct off-site recycled water facilities. EMWD will make a final determination on requirements for recycled water use and facilities during the development design conditions phase of the Project.

V.3 Duration of Approval

This assessment will be reviewed every three years until the Project begins construction. The Project applicant shall notify EMWD when construction has begun. The review will ensure that the information included in this assessment remains accurate and no significant changes to either the Project or EMWD's water supply have occurred. Furthermore, if the environmental document for the Project is not certified within three years after the adoption of this WSA, the WSA may be updated at such time if there are changed circumstances warranting updated analysis. If the environmental document is certified within three years of the adoption of the WSA, then the applicant shall provide updates to EMWD every three years on the status of the Project until construction commences; however, in such an instance, the WSA shall not be amended or invalidated by EMWD. If neither the Project applicant nor the lead agency contacts EMWD within three years of approval of this WSA, it is assumed that the Project no longer requires the estimated water demand calculated, and the demand for this project will not be considered in assessments for future projects. The assessment provided by this document will then become invalid.

V.4 Conclusion

EMWD relies on MWD and local resources to meet the needs of its growing population. MWD demonstrated in the 2020 MWD UWMP that with the addition of all water supplies, existing and planned, MWD has the ability to meet all of its member agencies' projected supplemental demand through 2045, even under a repeat of historic multiple-year drought scenarios.

Based on present information and the assurance that MWD is engaged in identifying solutions that, when combined with the rest of its supply portfolio, will ensure a reliable long-term water supply for its member agencies, EMWD has determined that it will be able to provide adequate water supplies to meet the potable water demand for this project as part of its existing and future demands.

In the event that the lead agency determines an adequate water supply exists for the Project, the developer of this project is required to meet with EMWD Development Services staff to establish development design conditions. The development design conditions will detail water, wastewater, and recycled water requirements to serve the Project. An agreement may be developed prior to construction if additional funding is determined to be required to reduce existing customer demand on imported supplies through the expansion of local resources or implementation of additional conservation programs. If required, this reduction of existing customer demand on imported water supplies would free up allocated imported water to be used to serve this Project during multiple dry year conditions. The amount of funding will be determined by EMWD (if required) and may take the form of a new component of connection fees or a separate charge.

If there is a change in the circumstances detailed in this assessment, EMWD will address the changes in the development design conditions for the Project. Modifications at the development design conditions stage could reduce the amount of water available to serve this Project.

Section VI: Conditions of Approval

This assessment is not a commitment to serve the project, but a review of EMWD supplies based on present information available. This assessment is conditioned on MWD's ability to continue to supply imported water to meet EMWD's requirements, including the requirements for the evaluated Project area. This project is subject to any special or additional requirements imposed by MWD or EMWD on such deliveries, including increased pricing or a different pricing structure.

All new developments are required to install water efficient devices and landscaping. The use of turf for non-functional purposes is prohibited. A document titled "Water Efficient Guidelines for New Development" is available on EMWD's website to help increase water efficiency for this Project.

The lead agency for the Project is responsible for evaluating the adequacy of the water supply assessment and making the ultimate decision of the sufficiency of the water supply. The developer for the Project is responsible for keeping EMWD informed about progress in the planning and development of the Project. The Project applicant will contact EMWD with Project status information and updates every three years until the Project begins construction. This will ensure that the information included in this assessment remains accurate and no significant changes to either the project or EMWD's water supply have occurred. Furthermore, if the environmental document for the Project is not certified within three years after the adoption of this WSA, the WSA may be updated at such time if there are changed circumstances warranting updated analysis. If the environmental document is certified within three years of the adoption of the WSA, then the applicant shall provide updates to EMWD every three years on the status of the Project until construction commences; however, in such instance, the WSA shall not be amended or invalidated by EMWD. If neither the Project applicant nor the lead agency contacts EMWD within three years of approval of this WSA, it is assumed that the Project no longer requires the estimated water demand calculated, and the demand for this Project will not be considered in assessments for future projects. The assessment provided by this document will then become invalid.

If the lead agency determines adequate water supply exists for this project, to the greatest extent possible, recycled water shall be used on the Project. Details about the feasibility of recycled water use shall be included in the development design conditions for the Project.

Section VII: Figures

FIGURE 1: EMWD SUPPLY SOURCES

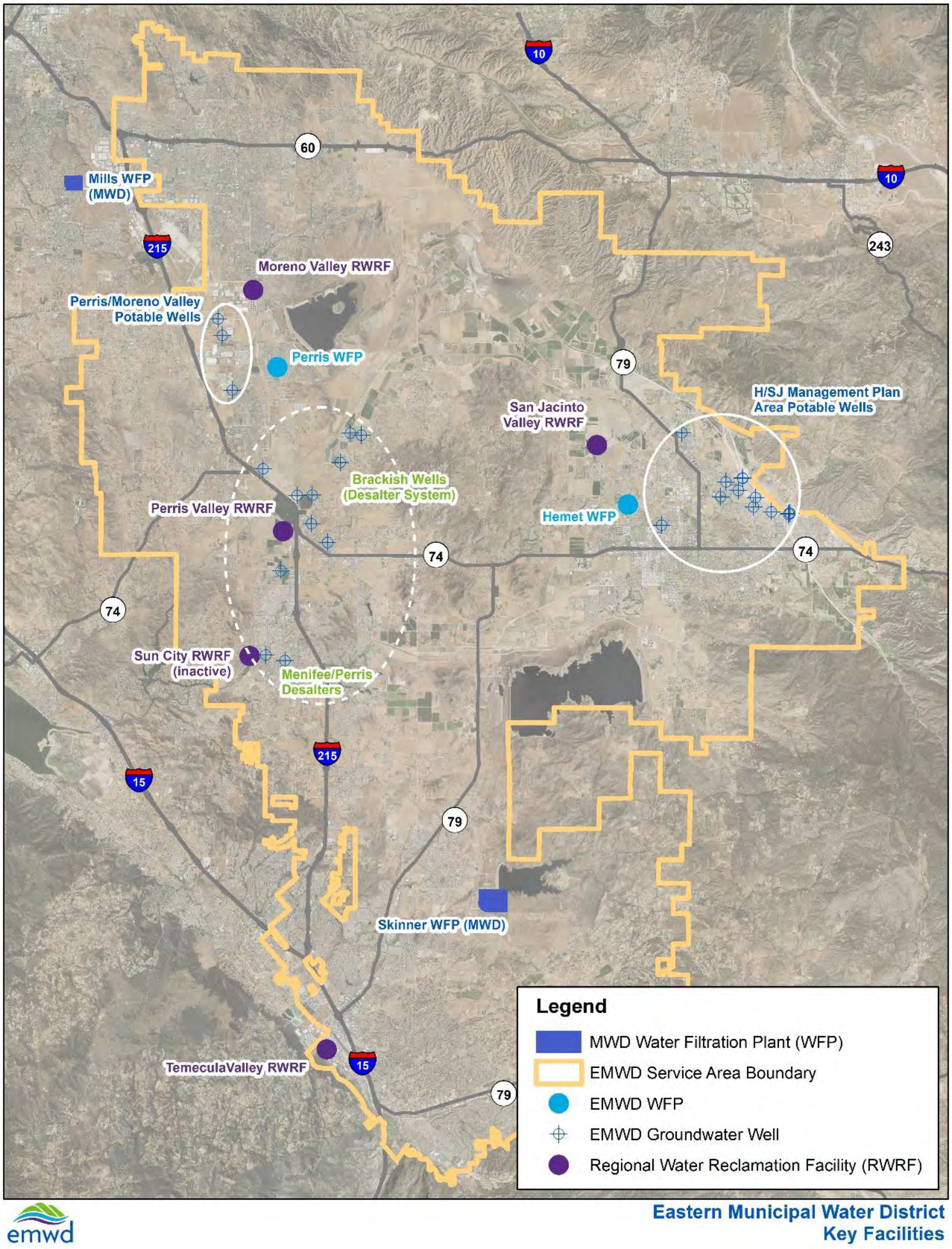
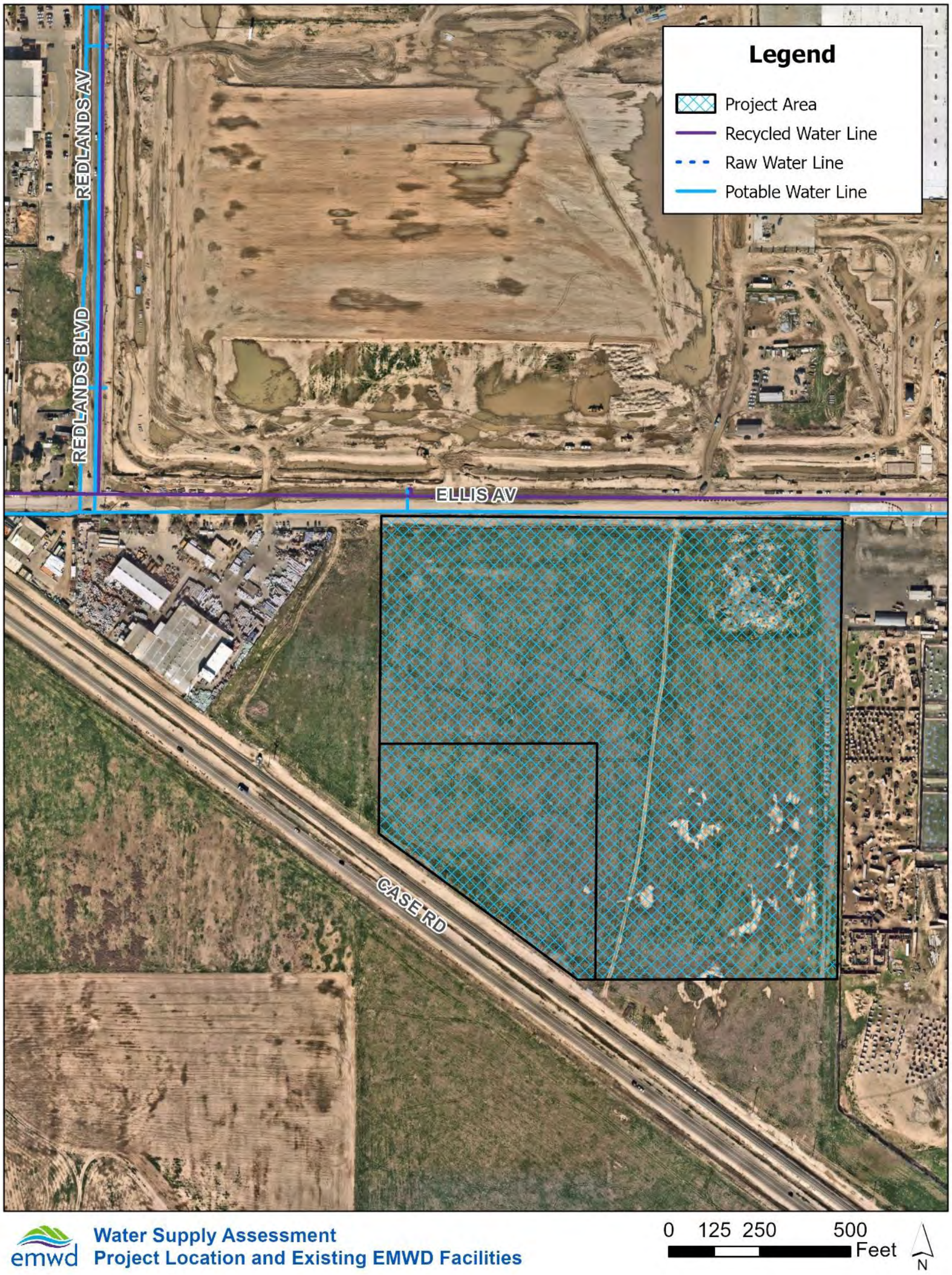


Figure 2: Project Location and Existing EMWD Water lines



Water Supply Assessment Report

Supplemental Information

Appendix A

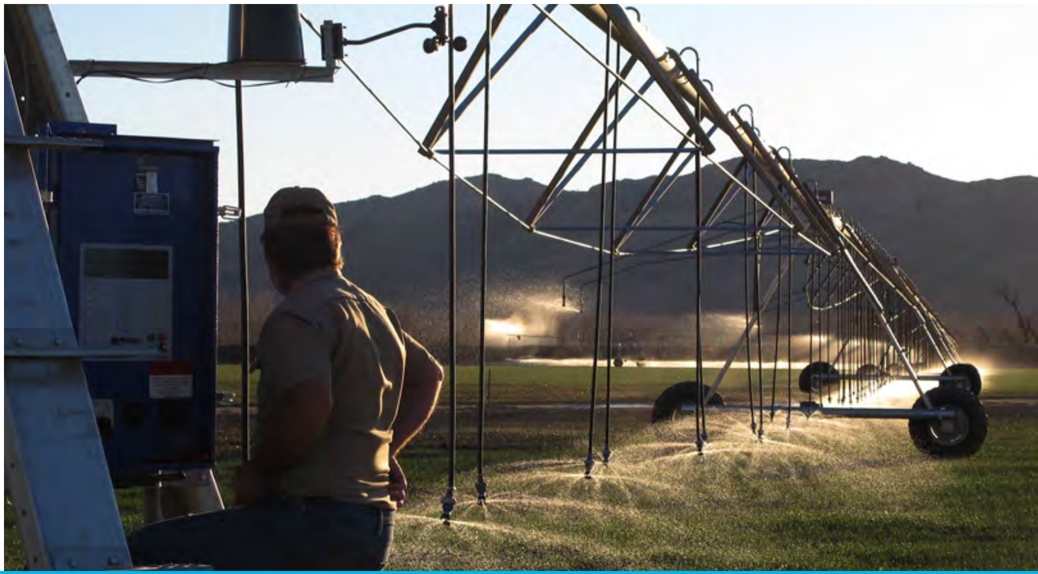
EMWD – 2020 Urban Water Management Plan

Appendix B

MWD – 2020 Urban Water Management Plan

Appendix C

EMWD CIP Budget



2020

EASTERN MUNICIPAL WATER DISTRICT

URBAN WATER MANAGEMENT PLAN

emwd
EASTERN
MUNICIPAL
WATER
DISTRICT

EASTERN MUNICIPAL WATER DISTRICT

Urban Water Management Plan

JULY 1, 2021

Prepared by Water Systems Consulting, Inc.

TABLE OF CONTENTS

List of Figures vi

List of Tables vii

Acronyms & Abbreviations ix

Lay Description 1

- Water Supplies 2
- Water Demands 2
- Drought Risk 2
- Contingency Planning 2
- Preparation and Outreach 2

1. Introduction 1-1
    - 1.1 The California Water Code 1-2
    - 1.2 UWMP Organization 1-4
    - 1.3 UWMPs in Relation to Other Efforts 1-5
    - 1.4 UWMPs and Grant or Loan Eligibility 1-6
    - 1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions 1-6
2. Plan Preparation 2-1
    - 2.1 Plan Preparation 2-2
    - 2.2 Basis for Preparing a Plan 2-2
    - 2.3 Coordination and Outreach 2-3
        - 2.3.1 Wholesale and Retail Coordination 2-3
        - 2.3.2 Coordination with Other Agencies and the Community 2-3
        - 2.3.3 Notice to Cities and Counties 2-4
3. System Description 3-1
    - 3.1 General Description 3-2
    - 3.2 Service Area Boundary Maps 3-3
    - 3.3 Service Area Climate 3-6
        - 3.3.1 Climate Change 3-7
    - 3.4 Service Area Population and Demographics 3-8
        - 3.4.1 Service Area Population 3-8
        - 3.4.2 Other Social, Economic, and Demographic Factors 3-9
    - 3.5 Land Uses within Service Area 3-10

3.6 Proposed Reorganization of Fallbrook Public Utility District and Rainbow Municipal Water District 3-10
4. Water Use Characterization 4-1
4.1 Past, Current, and Projected Water Use by Sector 4-2
4.1.1 Codes and Other Considerations Used in Projections 4-3
4.2 Distribution System Water Losses 4-7
4.3 Water Use for Lower Income Households 4-8
4.4 Climate Change Considerations 4-9
5. SB X7-7 Baseline, Targets and 2020 Compliance 5-1
5.1 SB X7-7 Forms and Tables 5-2
5.1.1 Baselines and Target Summary 5-2
5.2 Methods for Calculating Population and Gross Water Use 5-3
5.2.1 Service Area Population 5-3
5.2.2 Gross Water Use 5-3
5.3 2020 Compliance Daily Per-Capita Water Use (GPCD) 5-3
5.3.1 Adjustments Due to Factors Outside of a Supplier's Control 5-4
5.4 Regional Alliance 5-4
6. Water Supply Characterization 6-1
6.1 Water Supply Analysis Overview 6-2
6.2 UWMP Water Supply Characterization 6-4
6.2.1 Purchased or Imported Water 6-4
6.2.2 Groundwater 6-5
6.2.3 Surface Water 6-11
6.2.4 Stormwater 6-11
6.2.5 Wastewater and Recycled Water 6-12
6.2.6 Desalinated Water Opportunities 6-20
6.2.7 Water Exchanges and Transfers 6-20
6.2.8 Future Water Projects 6-21
6.2.9 Summary of Existing and Planned Sources of Water 6-23
6.2.10 Climate Change Effects 6-26
6.3 Energy Intensity 6-26
7. Water Service Reliability and Drought Risk Assessment 7-1
7.1 Water Service Reliability Assessment 7-2
7.1.1 Imported Water Reliability 7-2
7.1.2 Groundwater and Desalinated Groundwater Supply Reliability 7-3
7.1.3 Recycled Water Supply Reliability 7-3

7.1.4 Water Quality Constraints on Water Sources 7-3
7.1.5 Year Type Characterization 7-6
7.1.6 Water Service Reliability 7-7
7.2 Drought Risk Assessment 7-12
8. Water Shortage Contingency Plan 8-1
8.1 WSCP Overview 8-2
9. Demand Management Measures 9-1
9.1 Demand Management Measures for Wholesale Suppliers 9-2
9.1.1 Metering 9-2
9.1.2 Public Education and Outreach 9-3
9.1.3 Water Conservation Program Coordination and Staffing 9-4
9.1.4 Other Demand Management Measures 9-4
9.1.5 Asset Management 9-4
9.1.6 Wholesale Supplier Assistance Programs 9-3
9.2 Existing Demand Management Measures for Retail 9-4
9.2.1 Water Waste Prevention Ordinances 9-4
9.2.2 Metering 9-4
9.2.3 Conservation Pricing 9-5
9.2.4 Public Education and Outreach 9-7
9.2.5 Programs to Assess and Manage Distribution System Real 9-9
9.2.6 Water Conservation Program Coordination and Staffing Support 9-10
9.2.7 Other Demand Management Measures 9-10
9.3 Reporting Implementation 9-13
9.3.1 Implementation Over the Past Five Years 9-13
9.3.2 Implementation Achieve Water Use Targets 9-15
9.4 Water Use Objectives (Future Requirements) 9-15
10. Plan Adoption, Submittal, and Implementation 10-1
10.1 Inclusion of All 2020 Data 10-2
10.2 Notice of Public Hearing 10-2
10.2.1 Notice to Cities and Counties 10-2
10.2.2 Notice to the Public 10-3
10.3 Public Hearing and Adoption 10-3
10.3.1 Public Hearing 10-4
10.3.2 Adoption 10-4
10.4 Plan Submittal 10-4
10.4.1 Submittal of the UWMP and Water Shortage Contingency Plan to DWR 10-4

  - 10.4.2 Electronic Data Submittal 10-4
  - 10.4.3 Submittal of the UWMP to the California State Library 10-4
  - 10.4.4 Submittal of the UWMP to Cities and Counties 10-4
- 10.5 Public Availability 10-4
- 10.6 Notification to Public Utilities Commission 10-5
- 10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan 10-5
  - 10.7.1 Amending a UWMP 10-5
  - 10.7.2 Amending a Water Shortage Contingency Plan 10-5

APPENDICES

Appendix A	DWR UWMP Checklist
Appendix B	DWR Standard UWMP Tables
Appendix C	DWR Standard SB X7-7 Tables
Appendix D	AWWA Water Loss Audits
Appendix E	West San Jacinto Groundwater Basin Management Plan
Appendix F	Hemet/San Jacinto Groundwater Management Area Water Management Plan
Appendix G	Stipulated Judgment
Appendix H	Soboba Settlement Agreement
Appendix I	Water Shortage Contingency Plan
Appendix J	Notice of Public Hearing
Appendix K	Resolution for Adoption of the 2020 UWMP
Appendix L	Reduced Delta Reliance

LIST OF FIGURES

Figure 3-1. Water Agencies in and around EMWD Boundary 3-4
Figure 3-2. Cities in EMWD Boundary 3-5
Figure 3-3. Historical Climate Data at CIMIS Station 179 3-7
Figure 6-1. Agencies and Facilities 6-3
Figure 6-2. Groundwater Management Zones 6-8
Figure 6-3. EMWD Recycled Water System 6-15

LIST OF TABLES

Table 1-1. Related Planning Efforts 1-5
Table 2-1. DWR 2-1R Public Water Systems 2-2
Table 2-2. DWR 2-2 Plan Identification 2-2
Table 2-3. DWR 2-3 Agency Identification 2-2
Table 2-4. DWR 2-4 Water Supplier Information Exchange 2-3
Table 2-5. DWR 2-4W Water Supplier Information Exchange 2-3
Table 2-6. Outreach to Other Agencies and Entities 2-4
Table 3-1. EMWD Climate 3-6
Table 3-2. Historical Population within EMWD's Boundary - 1990 to 2010 3-8
Table 3-3. Projections of Population, Households, and Employment 3-8
Table 3-4. DWR 3-1R Current and Projected Population 3-9
Table 3-5. DWR 3-1W Current and Projected Population 3-9
Table 4-1. DWR 4-1R Actual Demands for Water 4-2
Table 4-2. DWR 4-1W Actual Demands for Water 4-3
Table 4-3. DWR 4-2R Projected Demands for Water 4-5
Table 4-4. DWR 4-2W Projected Demands for Water 4-5
Table 4-5. DWR 4-3R Total Gross Water Use 4-6
Table 4-6. DWR 4-3W Total Gross Water Use 4-6
Table 4-7. DWR 4-4R 12 Month Water Loss Audit Reporting 4-7
Table 4-8. Low Income Housing Unit Projection 4-8
Table 4-9. DWR 4-5R Inclusion in Water Use Projections 4-8
Table 5-1. DWR 5-1R Baselines and Targets Summary 5-2
Table 5-2. DWR 5-2R 2020 Compliance 5-3
Table 6-1. Groundwater Management Zones 6-7
Table 6-2. DWR 6-1R Groundwater Volume Pumped 6-11
Table 6-3. RWRF Treatment Capacity 6-12
Table 6-4. DWR 6-2R Wastewater Collected within Service Area in 2020 6-13
Table 6-5. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020 6-13
Table 6-6. Recycled Water Coordination Agencies 6-14
Table 6-7. DWR 6-4R Recycled Water within Service Area in 2020 6-17
Table 6-8. DWR 6-4W Recycled Water Within Service Area in 2020 6-17
Table 6-9. DWR 6-5R 2015 Recycled Water Use Projection Compared to 2020 Actual 6-18
Table 6-10. DWR 6-5W 2015 Recycled Water Use Projection Compared to 2020 Actual 6-18
Table 6-11. DWR 6-6R Methods to Expand Future Recycled Water Use 6-19
Table 6-12. DWR 6-7R Expected Future Water Supply Projects or Programs 6-22

Table 6-13. DWR 6-8R Actual Water Supplies 6-24
Table 6-14. DWR 6-8W Actual Water Supplies 6-24
Table 6-15. DWR 6-9R Projected Water Supplies 6-25
Table 6-16. DWR 6-9R Projected Water Supplies 6-25
Table 6-17. DWR Table O-1-1B Energy Intensity of Water Operations 6-27
Table 6-18. DWR Table O-2 Energy Intensity of Wastewater and Recycled Water Operations 6-28
Table 7-1. DWR 7-1R Basis for Water Year Data (Reliability Assessment) 7-6
Table 7-2. DWR 7-1W Basis for Water Year Data (Reliability Assessment) 7-7
Table 7-3. DWR 7-2R Normal Year Supply and Demand Comparison 7-8
Table 7-4. DWR 7-2W Normal Year Supply and Demand Comparison 7-8
Table 7-5. DWR 7-3R Single Dry Year Supply and Demand Comparison 7-8
Table 7-6. DWR 7-3W Single Dry Year Supply and Demand Comparison 7-9
Table 7-7. DWR 7-4R Multiple Dry Years Supply and Demand Comparison 7-10
Table 7-8. DWR 7-4W Multiple Dry Years Supply and Demand Comparison 7-11
Table 7-9. DWR 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) 7-13
Table 9-1. Meter Testing and Replacement Frequency 9-5
Table 9-2. DMM Implementation 9-14
Table 10-1. DWR 10-1R Notification to Cities and Counties 10-3
Table 10-2. DWR 10-1W Notification to Cities and Counties 10-3

ACRONYMS & ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
AB	Assembly Bill
AF	Acre Foot
AFY	Acre Feet per Year
AHHG	Area of Historic High Groundwater
AMR	Automatic Meter Reader
APA	Administrative Procedures Act
AWWA	American Water Works Association
BMP	Best Management Practice
CALWARN	California Water/Wastewater Agency Response Network
CAT	Climate Action Team
CCF	Hundred Cubic Feet
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFS	Cubic Feet per Second
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Irrigation System
CUWCC	California Urban Water Conservation Council
DCR	DWR SWP Delivery Capacity Report
DDW	SWRCB Division of Drinking Water
DFW	California Department of Fish and Wildlife
DIP	Ductile Iron Pipe
DMM	Demand Management Measure
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
EPA	United States Environmental Protection Agency
ERNIE	Emergency Response Network of the Inland Empire
ESA	Endangered Species Act
ET	Evapotranspiration

ETo	Reference Evapotranspiration
GAC	Granulated Activated Carbon
GIS	Geographic Information System
GPCD	Gallons per Capita per Day
GPM	Gallons per Minute
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet
IX	Ion Exchange
KAF	Thousand Acre Feet
KAFY	Thousand Acre Feet per Year
LAFCO	Local Agency Formation Commission
MAF	Million Acre-Feet
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
MF	Multi-family
MG	Million Gallons
MGD	Million Gallons per Day
MOU	Memorandum of Understanding
MSL	Mean Sea Level
MTBE	Methyl Tertiary Butyl Ether
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PCE	Perchloroethylene
PPCP	Pharmaceuticals and Personal Care Products
PVC	Polyvinyl Chloride
QWEZ	Qualified Water Efficient Landscaper
RIX	Rapid Infiltration and Extraction
RPA	Reasonable and Prudent Alternative
RUWMP	Regional Urban Water Management Plan
RWQCB	Regional Water Quality Control Board
SBX7-7	Senate Bill 7 of Special Extended Session 7
SF	Single Family
SOC	Synthetic Organic Chemicals
SOI	Sphere of Influence
SWRCB	State Water Resources Control Board

TDS	Total Dissolved Solids
TCE	Trichloroethylene
ULFT	Ultra-Low Flush Toilet
UV	Ultraviolet
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
VOC	Volatile Organic Compound
WBIC	Weather Based Irrigation Controller
WSCP	Water Shortage Contingency Plan
WFF	Water Filtration Facility
WSS	Water Sense Specification
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Lay Description

This Urban Water Management Plan (UWMP) presents a discussion of how Eastern Municipal Water District (EMWD) manages its water supplies to meet customer demands.

EMWD is required to prepare an UWMP and submit it to the California Department of Water Resources (DWR) every five years. DWR prepares guidance materials for water suppliers to help them prepare UWMPs that meet requirements of the California Water Code (CWC). EMWD has used these guidance materials to prepare its 2020 UWMP.

IN THIS SECTION

- Summary of fundamental determinations of the UWMP

Water Supplies

EMWD provides potable water, recycled water, and wastewater services to an area of approximately 555 square miles in western Riverside County. The service area includes seven incorporated cities in addition to unincorporated areas of Riverside County. EMWD has a diverse portfolio of local and imported supplies. Local supplies include recycled water, potable groundwater, and desalinated groundwater. EMWD is a leader in recycled water and generally uses 100 percent of its recycled water to irrigate landscape and agricultural fields and provide water for industrial customers. EMWD has groundwater wells in two groundwater management areas and works with other stakeholders to protect the quality and integrity of the groundwater basins. EMWD receives imported water from the Metropolitan Water District of Southern California (Metropolitan). About half of the water used in EMWD's service area is imported by Metropolitan. Through the implementation of local supply projects and increased water use efficiency, EMWD has been able to maintain a balance of local and imported water even as new connections have been added.

Water Demands

EMWD is both a retail supplier, selling to residential and commercial customers, and a wholesale supplier, selling to other water agencies. EMWD has a comprehensive conservation program to encourage customers to use water wisely and efficiently. Through the successful implementation of these programs, EMWD's average water use per person has dropped significantly since 2010. Looking forward, EMWD expects demands to increase as new residential and commercial development continues in the service area.

Drought Risk

EMWD's supply portfolio has a high degree of reliability. The local groundwater basins are managed to protect them from overdraft, and EMWD participates in programs to bank water in the groundwater basins in wet years so that it can be used in dry years. EMWD's imported water is provided by Metropolitan, which has made extensive investments in programs to increase the reliability of its supply. In its 2020 UWMP, Metropolitan has shown the ability to continue to meet demands through 2045, even during an extended drought. EMWD would benefit from Metropolitan's storage and supply programs and also expects that it can meet demands through 2045 during normal and dry conditions.

Contingency Planning

Even with highly reliable supplies, events such as statewide water use restrictions or a catastrophic natural disaster (such as an earthquake) that disrupts imported water supplies may require EMWD to temporarily reduce water demands. EMWD's Water Shortage Contingency Plan (WSCP) defines the actions that EMWD could take to conserve water during a shortage. The WSCP describes how EMWD would communicate these requirements to customers, and it describes how the restrictions on use (for example, limiting watering to certain days of the week) would be enforced.

Preparation and Outreach

EMWD coordinated with Metropolitan and EMWD's wholesale customers on the preparation of the 2020 UWMPs to present a clear and consistent picture of water supply management in the region. EMWD held a public hearing to receive feedback on the UWMP and the WSCP and used that feedback to help develop the plans. If a shortage occurs, EMWD will continue to monitor how the WSCP works and considering making changes where needed.

1 Introduction

The Urban Water Management Planning Act (Act), adopted in 1983, requires water suppliers in California to conduct long-term water resources planning. Prior to adoption of the Act, water agencies were more vulnerable to supply disruptions during periods of drought or supply shortages.

The Act sought to reduce susceptibility to supply shortages by requiring a minimum level of long-term resource assessment and planning by water suppliers. The planning requirements established by the Act and subsequent legislation encourage regional coordination and focus on water use efficiency as described in the sections below.

This 2020 Urban Water Management Plan (UWMP) addresses the water supply sources, projected demands, and supply reliability for Eastern Municipal Water District (EMWD).

IN THIS SECTION

- California Water Code
- UWMP Organization
- Related Efforts

1.1 The California Water Code

California Water Code (CWC) Section 10620 (a) of the Urban Water Management Act, states, “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)”. These plans are to be updated every five years and submitted to the California Department of Water Resources (DWR). Requirements for the UWMP include:

- Assessment of current and projected water supplies
- Evaluation of demand and customer types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan, in the event of a water shortage
- Comparison of demand and supply projections

In November of 2009, the California Legislature passed Senate Bill (SB) 7 as part of the Seventh Extraordinary Session, referred to as SBX7-7 or the Water Conservation Act of 2009. SBX7-7 set the goal of achieving a 20 percent reduction in urban per capita water use statewide by 2020. Retail water agencies were required to set targets and track progress toward decreasing daily per capita urban water use in their service areas, in order to assist the State in meeting its 20 percent reduction goal by 2020. This law required that every UWMP include:

- Baseline per capita water use
- Urban water use target for 2020
- Compliance daily per capita water use

This 2020 UWMP has been prepared to comply with the Urban Water Management Planning Act and SBX7-7. In addition to meeting the requirements of the Act, this report will be used to support water supply assessments and written verifications of water supply required by SB 610 and SB 221 of 2001. These bills require that water supply information be provided to counties and cities for projects of a certain size, prior to discretionary project approval. Both bills allow a UWMP to be used as a source document to fulfill these legislative requirements.

Since EMWD’s 2015 UWMP was completed and submitted to DWR, the Legislature has passed additional requirements that need to be incorporated in 2020 UWMPs. Major new requirements include:

- Water Reliability Assessment for five consecutive dry years, more than the three consecutive dry years previously required.
- Drought Risk Assessment to assess water supply reliability over a five-year period from 2021 to 2025 under a reasonable prediction for five consecutive dry years.
- Seismic risk assessment and mitigation plan for a supplier’s infrastructure.
- Water Shortage Contingency Plan with prescribed elements.
- Coordination on groundwater supply planning with plans being completed to address the Sustainable Groundwater Management Act (SGMA).
- Lay Description to describe the fundamental determinations of the UWMP in lay-person’s language.

This 2020 UWMP was developed to incorporate these new requirements, under the guidance of DWR's 2020 UWMPs Guidebook for Urban Water Suppliers. A checklist to document compliance of this UWMP with the Act and the CWC is provided in **Appendix A**.

This UWMP includes the required DWR standardized tables within relevant chapters, and they are compiled in **Appendix B**. Within the UWMP chapters, tables are numbered sequentially, and the standard DWR table number is also provided where applicable.

This UWMP also includes all required SB X7-7 tables in **Appendix C** to verify compliance with the SB X7-7 targets.

1.2 UWMP Organization

This report is structured with the layout recommended by the DWR Guidebook. The chapters include:

Chapter 1 – Introduction and Lay Description

- General legal requirements for UWMPs
- Lay description of fundamental determinations

Chapter 2 – Plan Preparation

- Plan preparation and agency identification
- Agency coordination and outreach

Chapter 3 – System Description

- General description of EMWD's retail and wholesale service areas
- Climate characteristics of EMWD's service area
- Current and projected population and demographic factors

Chapter 4 – Customer Water Use

- Overview of past, current, and projected water use
- System water losses
- Climate change impacts on water use

Chapter 5 – Baselines and Targets

- Information on the Water Conservation Act of 2009
- Water use targets for 2020 and confirmation of compliance

Chapter 6 – System Supplies

- Information about current and projected supplies
- Background on imported water supply, including the Metropolitan Water District of Southern California (Metropolitan)
- Description of groundwater basin management and supplies
- Description of EMWD's recycled water system and the beneficial uses of recycled water
- Description of planned water projects
- Climate change impacts to supplies

Chapter 7 – Water Supply Reliability Assessment

- Overview of the reliability of each of EMWD's supplies
- Water quality of supplies
- Projections for water supply and water demands under normal, single dry, and multiple dry year hydrologic conditions
- Regional supply reliability

Five-Year Drought Risk Assessment (DRA)

Chapter 8 – Water Shortage Contingency Planning

- EMWD's annual procedure for performing an assessment of supplies and demands to determine the potential need for implementing the WSCP in the coming year.
- Overview of EMWD's water shortage stages and associated response actions for each stage
- Potential fiscal impacts of implementing demand reduction actions
- The contents of this chapter were placed into a stand-alone Water Shortage Contingency Plan (WSCP) that can be adopted and amended separately from the UWMP.

Chapter 9 – Demand Management Measures

- Summary of EMWD's retail and wholesale demand management measures

Chapter 10 – Plan Adoption, Submittal, and Implementation

- Overview of the UWMP adoption process
- Implementation of the Plan

1.3 UWMPs in Relation to Other Efforts

UWMPs allow for integration of information from other planning documents, as well as regional planning efforts. EMWD has recently completed a number of planning documents that were used to inform estimates of water supplies and water use projections for the 2020 UWMP update. Additionally, regional planning efforts conducted by Metropolitan were used to assess the EMWD imported water supply reliability. A summary of related planning efforts is presented in **Table 1-1**.

Table 1-1. Related Planning Efforts

DOCUMENT	DESCRIPTION
Water Master Plan, EMWD 2016	This document analyzes EMWD's facilities needs to meet current and future customer demands.
Recycled Water Strategic and Master Plan, EMWD 2016	The document analyzes EMWD's recycled water opportunities and contains recycled water projections through the year 2045, including descriptions of planned recycled water projects and facilities.
Wastewater Collection Master Plan, EMWD 2016	This document analyzes EMWD's facilities needs to collect existing and future wastewater.
Regional Water Reclamation Facilities Master Plan	This document analyzes EMWD's reclamation facility needs for treating existing and future wastewater.
Metropolitan Water District Integrated Resources Plan	The document analyzes multiple supply and demand scenarios and describes Metropolitan's plan for providing adequate and reliable supplies to member agencies under the different scenarios. The detailed analyses of further local and imported water supplies; economic growth, demographics, and water demands; and changing hydrology are incorporated into Metropolitan's UWMP.
Metropolitan Water District Urban Water Management Plan	The document describes Metropolitan's demand and supply reliability and is used as the basis of EMWD's imported water supply reliability.

1.4 UWMPs and Grant or Loan Eligibility

Water suppliers are required to have a current UWMP on file with DWR in order to be eligible for any water grant or loan administered by DWR. DWR must also determine that the supplier's UWMP has addressed the requirements of the Water Code.

EMWD's 2015 UWMP was determined by DWR to address the requirements of the Water Code. This 2020 UWMP will be submitted to DWR for review and a similar determination.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

EMWD receives imported water supplies from the State Water Project (SWP) through Metropolitan. Agencies that receive water from the SWP are required to demonstrate consistency with the Delta Plan's policy to reduce reliance on the Sacramento-San Joaquin Delta (Delta).

EMWD has worked with Metropolitan to demonstrate this consistency. The documentation is included in **Appendix L**.

2 Plan Preparation

The Urban Water Management Planning Act (UWMP Act) requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections or supplies more than 3,000 acre-feet of water annually to adopt and submit an Urban Water Management Plan (UWMP) to the California Department of Water Resources (DWR) every five years.

The main purposes of developing and updating a UWMP are to forecast water demands and supplies under normal, single-dry, and multiple-dry year conditions; assess supply reliability; and describe methods of reducing demands under potential water shortages.

IN THIS SECTION

- Coordination and Outreach
- Cities and Counties Served by EMWD
- Basis for Plan

2.1 Plan Preparation

This UWMP satisfies the requirements of the UWMP Act and its amendments and provides an overview of Eastern Municipal Water District's (EMWD)'s long-term supplies and demands. The 2020 UWMP also demonstrates EMWD's compliance with the water use efficiency targets set by the Water Conservation Act of 2009 (SB X7-7).

EMWD operates a Public Water System that qualifies as an "Urban Water Supplier" under the CWC Section 10617, serving more than 3,000 customers and more than 3,000 acre-feet per year (AFY). The qualifying information about EMWD is shown in **Table 2-1**. The number of connections and volume of water supplied in **Table 2-1** reflect EMWD's potable water system only and do not include recycled water users or water supplied on a wholesale basis.

Table 2-1. DWR 2-1R Public Water Systems

PUBLIC WATER SYSTEM NUMBER	PUBLIC WATER SYSTEM NAME	NUMBER OF MUNICIPAL CONNECTIONS 2020	VOLUME OF WATER SUPPLIED 2020
CA3310009	Eastern Municipal Water District	155,561	84,673

2.2 Basis for Preparing a Plan

This plan is an individual plan to meet EMWD's reporting requirements as a wholesale supplier and a retail supplier. Although EMWD has coordinated with appropriate retail agencies and constituents, EMWD is not participating in a Regional UWMP or a Regional Alliance. The plan identification details are provided in **Table 2-2**.

Table 2-2. DWR 2-2 Plan Identification

TYPE OF PLAN	MEMBER OF RUWMP	MEMBER OF REGIONAL ALLIANCE
Individual UWMP	No	No

EMWD is both a retail and wholesale Urban Water Supplier and has selected to report UWMP data in calendar years and in units of acre-feet (AF). The agency identification details are provided in **Table 2-3**.

Table 2-3. DWR 2-3 Agency Identification

TYPE OF SUPPLIER	YEAR TYPE	UNIT TYPE
Wholesale and Retail	Calendar Years	Acre Feet (AF)

2.3 Coordination and Outreach

EMWD has coordinated with other agencies to prepare consistent evaluations of projected water demands and supplies. These coordination efforts are described in the following sections.

2.3.1 Wholesale and Retail Coordination

EMWD is both a retail and wholesale agency. As a retail agency, EMWD is required to provide its wholesaler, Metropolitan, with projected water demand in five-year increments for 20 years. As a wholesale agency, EMWD is required to provide information to its customer urban water suppliers identifying and quantifying water supplies available to those agencies in five-year increments.

The agencies affected are shown in **Table 2-4** and **Table 2-5**.

Table 2-4. DWR 2-4 Water Supplier Information Exchange

WHOLESALE WATER SUPPLIER NAME
Metropolitan Water District of Southern California

Table 2-5. DWR 2-4W Water Supplier Information Exchange

WHOLESALE WATER SUPPLIER NAME
City of Hemet
City of Perris
City of San Jacinto
Lake Hemet Municipal Water District
Nuevo Water Company
Rancho California Water District
Western Municipal Water District

2.3.2 Coordination with Other Agencies and the Community

Article 3, Section 10642 of the UWMP Act requires each urban water supplier to encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area. EMWD has encouraged the participation of sub agencies, cities, the County of Riverside, and other public groups. Public participation and coordination efforts included outreach to the entities shown in **Table 2-6**.

Table 2-6. Outreach to Other Agencies and Entities

ENTITY	ROLE
Metropolitan Water District of Southern California	Wholesaler supplier to EMWD
City of Beaumont	EMWD’s retail service area overlaps portion of City
City of Canyon Lake	EMWD’s retail service area overlaps portion of City
City of Hemet	EMWD is wholesale supplier to agency
City of Menifee	EMWD’s retail service area overlaps portion of City
City of Moreno Valley	EMWD’s retail service area overlaps portion of City
City of Murrieta	EMWD’s retail service area overlaps portion of City
City of Perris	EMWD is wholesale supplier to agency
City of Riverside	EMWD’s retail service area overlaps portion of City
City of San Jacinto	EMWD is wholesale supplier to agency
City of Temecula	EMWD’s retail service area overlaps portion of City
Elsinore Valley Municipal Water District	EMWD sells recycled water to agency
Lake Hemet Municipal Water District	EMWD is wholesale supplier to agency
Nuevo Water Company	EMWD is wholesale supplier to agency
Rancho California Water District	EMWD is wholesale supplier to agency
Western Municipal Water District	EMWD is wholesale supplier to agency
Fallbrook Public Utility District	Agency is a potential future wholesale customer of EMWD (pending the outcome of the reorganization proposal filed by Fallbrook PUD which is being processed by San Diego County Local Agency Formation Commission)
Rainbow Municipal Water District	Agency is a potential future wholesale customer of EMWD (pending the outcome of the reorganization proposal filed by Rainbow MWD which is being processed by San Diego County Local Agency Formation Commission)
County of Riverside	
Hemet – San Jacinto Watermaster	Oversee administration of Stipulated Judgement in the Management Area (Canyon Subbasin, the San Jacinto Upper Pressure Subbasin downstream to Bridge Street and the Hemet Subbasin)
Santa Ana Watershed Protection Authority	Integrated Regional Water Management Plan
Pechanga Band of Luiseño Indians	EMWD sells recycled water to Tribal Government
Soboba Band of Luiseño Indians	Party to Soboba Settlement Agreement
California Department of Water Resources	Administers Urban Water Management Planning Act
General Public	

2.3.3 Notice to Cities and Counties

EMWD provided notice to the cities and counties within its service area that the UWMP was being updated. These notices are included in Appendix J and were provided more than 60 days prior to the public hearing held to consider the draft plan.

3 System Description

EMWD is a public water agency formed in 1950 by popular vote. In 1951, it was annexed into Metropolitan and gained access to a supply of imported water from the Colorado River Aqueduct (CRA). Today, EMWD remains one of Metropolitan's 26 member agencies and receives water from Northern California through the State Water Project (SWP) in addition to deliveries through the CRA.

EMWD's initial mission was to deliver imported water to supplement local groundwater for a small, mostly agricultural, community. Over time, EMWD's list of services has evolved to include groundwater production, desalination, water filtration, wastewater collection and treatment, and regional water recycling.

IN THIS SECTION

- Service Area
- Land Uses

3.1 General Description

EMWD provides both retail and wholesale water service covering a total population of over 800,000. EMWD's mission is, "To deliver value to our diverse customers and the communities we serve by providing safe, reliable, economical and environmentally sustainable water, wastewater and recycled water services." A five-member Board of Directors governs EMWD. Each Director serves an area of equivalent population size within EMWD's boundaries and is elected to office every four years. As a member agency of Metropolitan, EMWD also has a member appointed to the Metropolitan Board.

EMWD provides potable water, recycled water, and wastewater services to an area of approximately 555 square miles in western Riverside County. EMWD is both a retail and wholesale agency. Approximately half of EMWD's retail demands are supplied using local sources, while the balance is served by imported water purchased from Metropolitan. EMWD also purchases imported water from Metropolitan to supplement the local supplies of its wholesale customers. Imported water is delivered to EMWD either as potable water treated by Metropolitan, or as raw water that EMWD can either treat at one of its two local filtration plants or deliver as raw water for non-potable uses.

EMWD's local supplies include groundwater, desalinated groundwater, and recycled water. Groundwater is pumped from the Hemet/San Jacinto and West San Jacinto areas of the San Jacinto Groundwater Basin. Groundwater in portions of the West San Jacinto Basin is high in salinity and requires desalination for potable use. EMWD owns and operates two desalination plants that convert brackish groundwater from the West San Jacinto Basin into potable water. EMWD also owns, operates, and maintains its own recycled water system that consists of four Regional Water Reclamation Facilities and several storage ponds spread throughout EMWD's service area that are all connected through the recycled water system. EMWD's goal is to beneficially use 100 percent of the recycled water it produces.

EMWD is located in western Riverside County, approximately 75 miles east of Los Angeles. The 555-square mile service area includes seven incorporated cities in addition to unincorporated areas in the County of Riverside. The cities and unincorporated areas within EMWD's boundary include:

- City of Beaumont
- City of Canyon Lake
- City of Hemet
- City of Menifee
- City of Moreno Valley
- City of Murrieta
- City of Perris
- City of Riverside
- City of San Jacinto
- City of Temecula
- Homeland
- Lakeview
- Nuevo
- Quail Valley
- Romoland
- Valle Vista
- Winchester

In most of the listed areas, EMWD provides both water and wastewater service. However, in some places EMWD provides only water or wastewater service or provides wholesale water to a purveyor agency. EMWD is a wholesale potable provider to the following agencies:

- City of Hemet Water Department
- City of Perris Water System
- City of San Jacinto Water Department
- Lake Hemet Municipal Water District (LHMWD)
- Murrieta Division of WMWD
- Nuevo Water Company
- Rancho California Water District (RCWD)

Additionally, EMWD sells recycled water to RCWD and Elsinore Valley Municipal Water District (EVMWD) and has an emergency connection with the City of Perris' North Perris Water System.

Several of these agencies are preparing their own UWMP. EMWD has discussed and reviewed the supplemental water demands required by each agency with representatives of those agencies. The demand and water supply requirements are incorporated in this UWMP.

EMWD has four sources of water supply: imported water from Metropolitan, local groundwater, desalinated groundwater, and recycled water. Delivery points for each source of water are located throughout the EMWD service area.

Potable imported water is treated and delivered to EMWD directly from Metropolitan's two large filtration plants. The Henry J. Mills (Mills) Water Treatment Plant treats water from Northern California and provides it to EMWD through two connection points located in the northeast portion of EMWD's service area. The Robert F. Skinner (Skinner) Water Treatment Plant treats a blend of Colorado River water and water from Northern California and provides it to EMWD through a connection point in the southwest portion of EMWD's service area.

EMWD owns and operates two microfiltration plants that filter raw imported water delivered through Metropolitan, removing particulate contaminants to achieve potable water standards. The two treatment plants, the Perris Water Filtration Plant and the Hemet Water Filtration Plant, are located in Perris and Hemet, respectively. Raw water from Metropolitan is also used for groundwater replenishment in the eastern part of EMWD. EMWD and others can extract this water at a later date for beneficial uses. Untreated water from Metropolitan used for agricultural purposes is delivered in the northeast for use by EMWD retail and wholesale accounts and in the south for RCWD agricultural accounts.

EMWD produces potable and brackish groundwater from the San Jacinto Groundwater Basin that underlies the EMWD service area. EMWD's groundwater wells pump primarily from the eastern portion of EMWD, with the largest amount of production taking place around the cities of Hemet and San Jacinto. EMWD owns and operates two desalination plants in Sun City, the Menifee Desalter and the Perris I Desalter, which treat brackish groundwater through reverse osmosis to achieve potable water standards.

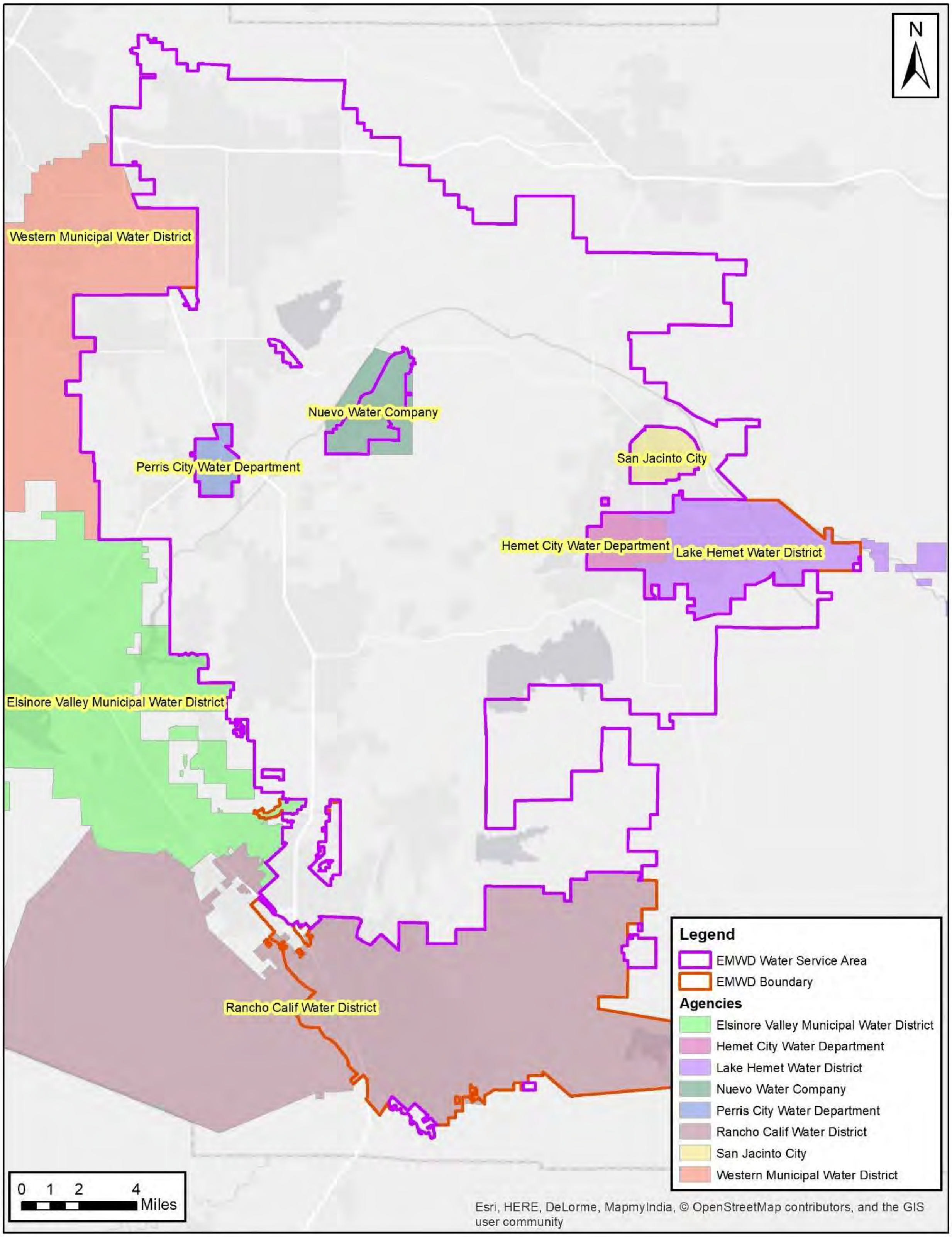
In addition to the potable water system, EMWD maintains a regional recycled water system that provides tertiary-treated recycled water to customers for agricultural, landscape irrigation, environmental, and industrial use. EMWD's recycled water system consists of four regional water reclamation facilities (RWRFs) that treat municipal sewage and produce water for recycling. The four RWRFs, the San Jacinto Valley RWRF, the Moreno Valley RWRF, the Temecula Valley RWRF, and the Perris Valley RWRF, are spread throughout EMWD's service area. A network of pipelines connects the four RWRFs, as well as several distribution storage ponds, to manage the delivery of recycled water.

EMWD's water supplies and facilities are described in more detail in **Chapter 6**.

3.2 Service Area Boundary Maps

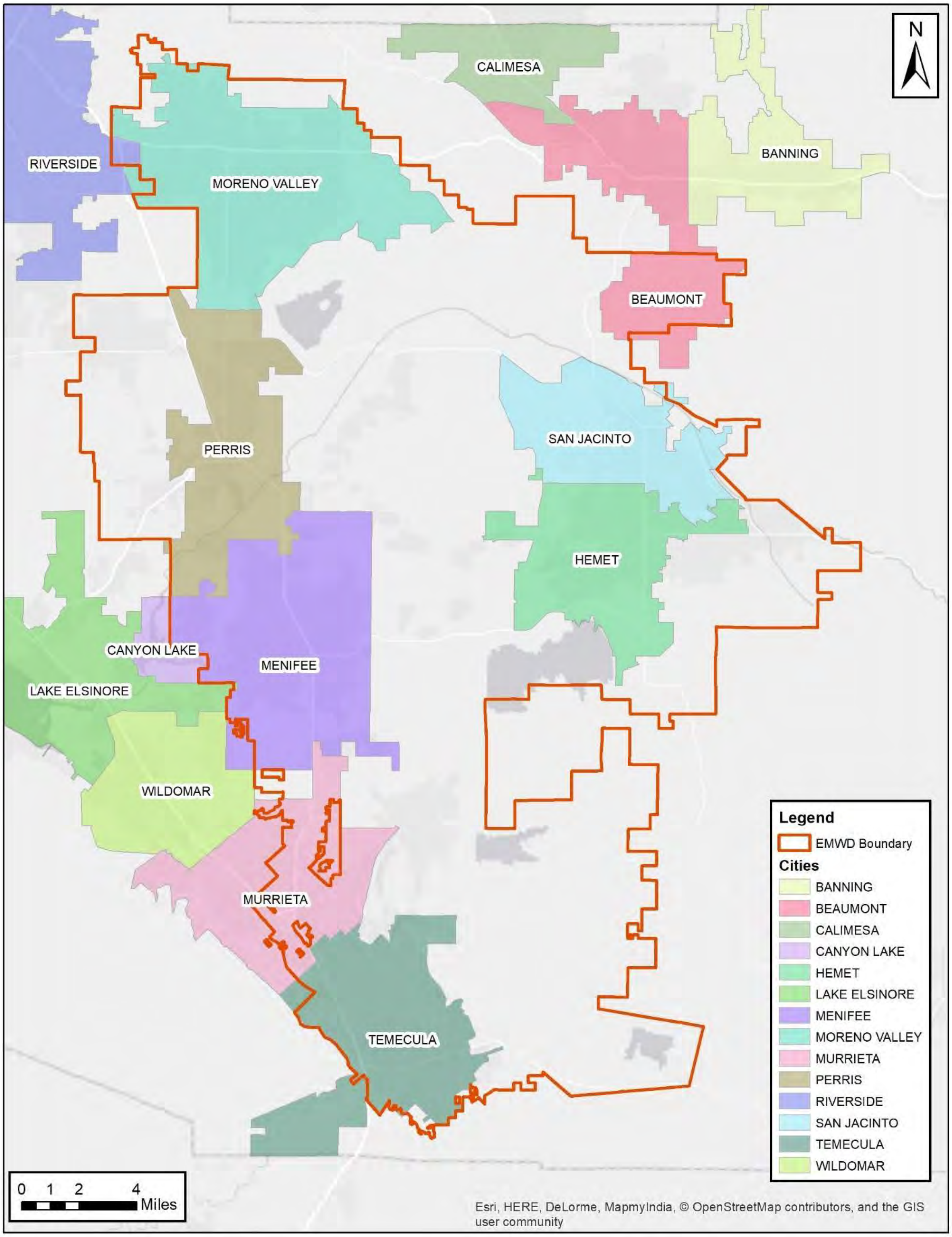
EMWD's service area boundary and the intersecting and adjacent water agencies within that boundary are shown in **Figure 3-1**. The cities in EMWD's service area are shown in **Figure 3-2**.

Figure 3-1. Water Agencies in and around EMWD Boundary



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Figure 3-2. Cities in EMWD Boundary



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

3.3 Service Area Climate

EMWD has a semi-arid climate characterized by hot, dry summers and cooler winters. The region experiences a wide variation in rainfall and periodic drought. The average total rainfall in the service area is approximately 7.6 inches, occurring mostly December through March. A summary of historical average climatological data is presented in **Table 3-5**, and the values are plotted in **Figure 3-3**.

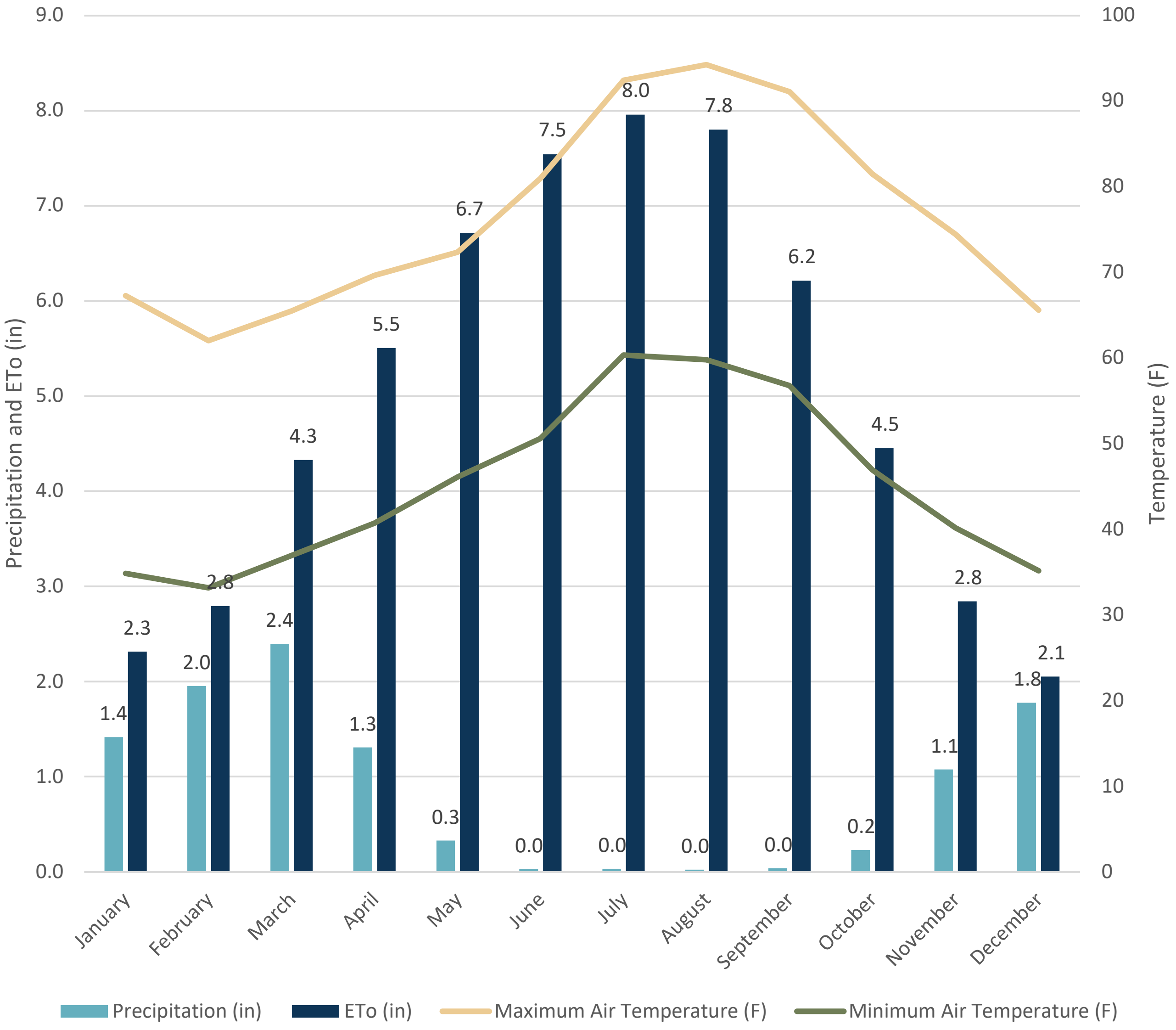
Table 3-1. EMWD Climate

	STANDARD MONTHLY AVERAGE ETO (INCHES)	AVERAGE RAINFALL (INCHES)	AVERAGE MAXIMUM TEMPERATURE (FAHRENHEIT)	AVERAGE MINIMUM TEMPERATURE (FAHRENHEIT)
JANUARY	2.3	1.4	67	35
FEBRUARY	2.8	2.0	62	33
MARCH	4.3	2.4	65	37
APRIL	5.5	1.3	70	41
MAY	6.7	0.3	72	46
JUNE	7.5	0.0	81	51
JULY	8.0	0.0	92	60
AUGUST	7.8	0.0	94	60
SEPTEMBER	6.2	0.0	91	57
OCTOBER	4.5	0.2	82	47
NOVEMBER	2.8	1.1	74	40
DECEMBER	2.1	1.8	66	35
TOTAL / AVERAGE	**60.5**	**10.6**	**76**	**45**

Data from California Irrigation Management Information System (CIMIS) Station Winchester 179

Data from 2002 through 2020

Figure 3-3. Historical Climate Data at CIMIS Station 179



3.3.1 Climate Change

EMWD has considered the potential impacts of climate change on its demands (described in **Chapter 4**) and its supplies (described in **Chapter 6**).

3.4 Service Area Population and Demographics

EMWD's service area has experienced population growth driven by cycles of economic expansion and conversion of agricultural land to urban development.

3.4.1 Service Area Population

EMWD used the DWR Population Tool to estimate the population in its service area for the census years of 1990, 2000, and 2010. The historic growth in population is shown in **Table 3-2**.

Table 3-2. Historical Population within EMWD's Boundary - 1990 to 2010

WATER SERVICE AREA	1990	2000	2010	2015
EMWD Retail Service Area	240,293	297,111	519,880	546,146
EMWD Wholesale Service Area	102,362	167,104	200,789	215,075
TOTAL	**342,655**	**464,215**	**720,669**	**761,221**

Service area population was estimated using Census data and DWR's Population Tool.

The DWR Population Tool was used to estimate the 2020 population based on the census data for 2010 and the change in the number of connections from 2010 to 2020.

For future population projections, EMWD evaluated projections prepared by the Southern California Association of Governments (SCAG). SCAG recently completed an updated regional growth forecast known as 2020 Connect SoCal. SCAG generated estimates of population, households, and employment in each Traffic Analysis Zone (TAZ). The results are summarized in **Table 3-3**.

Table 3-3. Projections of Population, Households, and Employment

		2025	2030	2035	2040	2045
POPULATION	EMWD Boundary	921,200	983,300	1,045,300	1,088,300	1,131,300
	EMWD Water Service Area	649,700	695,500	741,300	774,300	807,200
	EMWD Wholesale Service Area	271,500	287,800	304,000	314,000	324,100
HOUSEHOLDS	EMWD Boundary	290,800	317,000	343,200	360,800	378,400
	EMWD Water Service Area	199,600	218,700	237,700	251,000	264,200
	EMWD Wholesale Service Area	91,200	98,300	105,500	109,800	114,200
EMPLOYMENT	EMWD Boundary	231,400	250,100	268,800	282,500	296,300
	EMWD Water Service Area	123,600	132,300	141,000	149,000	157,000
	EMWD Wholesale Service Area	107,800	117,800	127,800	133,500	139,300

Estimates from SCAG forecast in 2020 Connect SoCal

The current and projected future population in the retail service area is shown in **Table 3-4**, and the estimates for the wholesale service area are shown in **Table 3-5**.

Table 3-4. DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
Retail	603,950	649,700	695,500	741,300	774,300	807,200

1) Retail population for 2020 was estimated using the DWR Population Tool and persons per connection.

2) Retail population projections for 2025-2045 were estimated using population projections prepared by the Southern California Association of Governments for 2020 Connect SoCal..

Table 3-5. DWR 3-1W Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
Wholesale	255,210	271,500	287,800	304,000	314,000	324,100

1) Wholesale population for 2020 was estimated using the data from the Southern California Association of Governments.

2) Wholesale population projections for 2025-2045 were estimated using population projections prepared by the Southern California Association of Governments for 2020 Connect SoCal.

3.4.2 Other Social, Economic, and Demographic Factors

As the population within EMWD's service area continues to grow, the characteristics of the service area are continually changing. Tract homes, commercial centers and new industrial warehouses are replacing areas of agriculture and vacant land.

EMWD has a history of development cycles with wide variations in the rate of growth. From the mid-1980's to 1990's, population growth in EMWD routinely exceeded 10 percent per year. In the early 1990's, growth slowed during an economic recession. During the late 1990's, growth began to steadily increase, and the first five years of the 2000's again brought accelerated population growth to the area. Growth within EMWD's service area reached its peak rate in 2005, but then there was a major decline in housing development and growth slowed again. Starting in 2006 EMWD saw a sharp decline in the number of new connections added, reaching a low point in 2010. Since 2010, new connections have slowly been increasing; but they remain well below the peak levels of new development seen in the early 2000's.

The cycle of booming growth followed by slower growth makes new development in EMWD's service area difficult to predict. On average, 6,700 new equivalent dwelling units (EDUs) per year were added to EMWD's service area from 2000 through 2015; but over that 15-year time period there were two years with more than 15,000 EDUs added and three years with less than 2,000 EDUs added. Because of the variability in demand cycles, EMWD has developed a comprehensive database of planned projects that tracks proposed new development and land use changes. This database is used in facility and supply planning to project future demands.

Ultimate demand estimates indicate that before EMWD reaches build out, the population will more than double compared to the current size. Land will continue to be developed in western Riverside County as more and more people move into the area. Just as it has in the past, EMWD will continue to meet the challenges of new development with innovation, efficiency, and responsibility.

3.5 Land Uses within Service Area

EMWD’s service area includes a number of cities and unincorporated communities within Riverside County. The regional growth projections prepared by SCAG included consultation with these agencies to reflect the current and planned land uses within their jurisdictions. As part of its planning process, EMWD has also reviewed general and specific plans available from Riverside County and the cities within the service area.

3.6 Proposed Reorganization of Fallbrook Public Utility District and Rainbow Municipal Water District

The San Diego Local Agency Formation Commission (LAFCO) is currently processing two related proposals separately filed by the Rainbow Municipal Water District (MWD) and Fallbrook Public Utility District (PUD). These proposals request LAFCO approval for each agency to separately and concurrently detach from the San Diego County Water Authority (SDCWA) and annex to EMWD for purposes of changing wholesale water suppliers. Fallbrook PUD and Rainbow MWD are currently being supplied with imported water from Metropolitan’s Robert A. Skinner (Skinner) Water Treatment Plant via the Metropolitan/San Diego Aqueduct, and if the proposal is approved, would continue to be supplied with the same water by EMWD.

As part of the LAFCO process, EMWD evaluated current and projected supplies and demands with and without the annexation of Fallbrook PUD and Rainbow MWD under various hydrologic conditions. Through the analysis, EMWD determined that EMWD’s current retail and wholesale customers would continue to recognize the same water supply reliability regardless of whether or not Fallbrook PUD and Rainbow MWD become wholesale customers of EMWD.

4 Water Use Characterization

When EMWD was formed in 1950 it was a small agency, primarily serving agricultural customers. Since then, potable water use in EMWD's service area has shifted from primarily agricultural to urban use. The reduction in agricultural demand has two major causes: rural farmland has been transformed to urban housing, and most remaining agricultural demands have been shifted to the recycled water system.

The development of new homes and the accompanying increase in population has led to the increasing demand for domestic water. EMWD has experienced increases in demand as the region has experienced dry weather patterns and a growing economy. Even with the warmer, drier weather, and improvements in the economy, demand has remained well below the peak seen in 2007. EMWD's proactive conservation program, including an allocation-based tiered rate billing structure, has reduced demand even as the agency has added new dwelling units.

IN THIS SECTION

- Water Use by Sector
- Projections of Future Demand

4.1 Past, Current, and Projected Water Use by Sector

In addition to retail potable water demand, EMWD delivers water to seven wholesale customer agencies and meets a significant portion of demand with recycled water. The sections below summarize the past and projected retail and wholesale water use within EMWD's service area.

EMWD's primary retail customers can be divided into residential, commercial, industrial, institutional, landscape and agricultural irrigation sectors. Although the residential sector is by far EMWD's largest customer segment, each market segment plays a role in the growth and development of EMWD's service area.

EMWD wholesales water to seven different agencies. The demand from each agency differs based on its need each year. These demands can be unstable at times as these agencies use water from EMWD to supplement their system when their local facilities are inadequate or fail. EMWD will also provide backup for the North Perris Water System if an emergency should occur.

Under the Hemet/San Jacinto Groundwater Management Area Water Management Plan (HSJ Management Plan), EMWD is responsible for providing water to recharge the groundwater basin. A portion of the water supplied will be SWP water imported through Metropolitan to meet the requirements of the Soboba Band of Luiseño Indians Water Settlement Agreement and to improve the reliability of groundwater in the area. Individual agencies, including EMWD, will be able to extract their allotted amount of the recharged water from the basin.

A portion of the water EMWD wholesales to Lake Hemet Municipal Water District (LHMWD) is raw water for agricultural uses. This water is needed especially when surface water is not available to LHMWD in dry years.

Water use for 2020 is shown in **Table 4-1** and **Table 4-2**.

Table 4-1. DWR 4-1R Actual Demands for Potable and Raw Water

USE TYPE	ADDITIONAL DESCRIPTION	LEVEL OF TREATMENT WHEN DELIVERED	2020 VOLUME
Single Family		Drinking Water	52,162
Multi-Family		Drinking Water	6,535
Commercial		Drinking Water	4,267
Industrial		Drinking Water	571
Institutional/Governmental		Drinking Water	1,629
Landscape		Drinking Water	8,155
Agricultural irrigation		Drinking Water	1,114
Agricultural irrigation		Raw Water	446
Other		Drinking Water	1,287
Non-Revenue	System losses & unbilled, authorized consumption	Drinking Water	8,507
		TOTAL:	**84,673**

1) Passive water savings due to the restrictions outlined in the Administrative Code are included in the demand projections for EMWD's retail service area.

2) Landscape demands remain constant/decrease over time as landscape accounts are offset by conversion to the recycled water system.

3) Projections for losses in the table include system losses (real and apparent) and unbilled, authorized consumption. EMWD's water loss audits are completed on a fiscal year basis (rather than calendar year) and report estimated system losses.

Table 4-2. DWR 4-1W Actual Demands for Potable and Raw Water

USE TYPE	ADDITIONAL DESCRIPTION	LEVEL OF TREATMENT WHEN DELIVERED	2020 VOLUME
Groundwater Recharge	Imported water recharge to the Hemet/San Jacinto Basin	Raw Water	6,467
Sales/Transfers/Exchanges to Other Agencies	City of Perris Water System	Drinking Water	1,685
Sales/Transfers/Exchanges to Other Agencies	Western Municipal Water District Murrieta Division	Drinking Water	1,809
Sales/Transfers/Exchanges to Other Agencies	Nuevo Water Company	Drinking Water	409
Sales/Transfers/Exchanges to Other Agencies	Rancho California Water District	Drinking Water	11,105
Sales/Transfers/Exchanges to Other Agencies	Rancho California Water District	Raw Water	13,923
Sales/Transfers/Exchanges to Other Agencies	City of Hemet	Drinking Water	0
Sales/Transfers/Exchanges to Other Agencies	City of San Jacinto	Drinking Water	0
Sales/Transfers/Exchanges to Other Agencies	Lake Hemet Municipal Water District	Raw Water	986
		TOTAL:	**36,384**

Projected demands for EMWD were developed using information about planned development and land use. To track new developments, EMWD updates a Geographic Information System (GIS) database that tracks proposed development quarterly. Currently, EMWD is tracking the status of over 800 proposed projects and over 125,000 equivalent dwelling units. Growth rates were based on a forecast of future population prepared by the Southern California Association of Governments (SCAG). EMWD's growth forecasts include both the retail and wholesale service areas.

EMWD's retail demand projections include the water savings needed to meet the Water Conservation Act of 2009, SB X7-7 requirements. Demand forecasts for wholesale customers are developed from growth projections and through collaboration with sub agencies.

Wholesale demand projections are based on communications with sub agencies and respective growth projections for those agencies.

4.1.1 Codes and Other Considerations Used in Projections

EMWD demand projections include water savings that result from a progressive conservation rate structure. EMWD uses an allocation-based tiered rate structure to encourage conservation by sending a strong price signal for water use over a budget allocation. Indoor budgets are based on an allocation of 55 gallons per capita per day. Outdoor budgets are based on the irrigated area and a percent of evapotranspiration. The percent of evapotranspiration is tied to the date the home was connected to EMWD's system. The rate structure is used to enforce codes and standards in place to promote efficiency.

As codes and standards increase efficiency over time, EMWD has the ability to adjust the allocations. The most recent update to EMWD's allocations occurred in May of 2015, when a fifty percent evapotranspiration standard was adopted for all new non-functional landscape installed after June 1, 2015. The details on EMWD's rate structure can be found in Section 5, Article 6 of EMWD's Administrative Code.

Senate Bill (SB) 606 and Assembly Bill (AB) 1668 because law in 2018. These laws establish guidelines for efficient water use and a framework for the implementation and oversight of new water use standards. The State will establish water use objectives and long-term standards for efficient water use applying to indoor use, outdoor use, and other use types including losses. Rulemaking is currently underway to implement this legislation and develop the standards for efficient water use. When the final standards are adopted, EMWD will evaluate the need to modify its water use budgets for customers.

Residential consumption is the dominant demand for EMWD, and this will continue in the future according to current general plans for the County of Riverside and local cities. Residential accounts are required to keep their demands below a budgeted allocation or pay a high rate for water use. Accounts dedicated to irrigating landscaped areas have the second highest consumption rate. Just as with residential accounts, landscape accounts are subject to a budgeted allocation or pay a higher rate for over budget use. New development in both of these account classes are provided with lower budget allocations to account for water use efficiency requirements for new development.

Section 5, Article 6 of EMWD's Administrative Code details EMWD's rate structure. Passive water savings due to the provisions outlined in the Administrative Code are included in the demand projections for EMWD's retail service area.

In 2019, EMWD began implementing water budgets and tiered rates for additional commercial, industrial, and institutional (CII) customers. Commercial developments will also continue to increase and will be focused along the major transportation corridors through EMWD's boundary (Interstate Highway 15, Interstate Highway 215, Highway 79, and Highway 74). Land use-based projections indicate that the ratio of commercial demand to retail demand will increase slightly over time.

EMWD has a very small industrial use sector, accounting for less than one percent of retail demand. Industrial developments are proposed around Interstate Highway 215 and other main transportation corridors. Much of the proposed growth consists of large warehouse projects with minimal water demand. As much as feasible, EMWD will meet the needs of high-water demand industrial customers with recycled water.

Currently, the demand from institutional accounts account for about two percent of retail demand for potable water. EMWD works closely with institutional and government accounts to help reduce their demand and promote the efficient use of water. Whenever possible, recycled water is used for landscape irrigation for schools and other government facilities. EMWD has also developed conservation programs designed to assist public sector accounts like schools to reduce demand through the retrofit of inefficient devices. These programs are discussed further in Chapter 9.

EMWD's service area has gone through a major transformation from a farming community to a residential community. Currently, agricultural demand accounts for less than four percent of EMWD's potable and raw water market, with a substantial portion of the agricultural community being served by the recycled water system. Agricultural demand for potable and raw water is expected to remain relatively stable for the next twenty years with some fluctuations from year to year due to changes in weather or crop rotations. It is also possible that a general decline over time may be observed both as a result of continued urbanization and increased recycled water usage.

Project demands for the retail and wholesale customers are shown in **Table 4-3** and **Table 4-4**.

Table 4-3. DWR 4-2R Projected Demands for Potable and Raw Water

-		PROJECTED WATER USE				
USE TYPE	ADDITIONAL DESCRIPTION	2025	2030	2035	2040	2045
Single Family		66,900	71,700	76,700	80,500	84,000
Multi-Family		8,500	9,100	9,700	10,200	10,600
Commercial		6,100	6,500	7,000	7,300	7,600
Industrial		600	600	700	700	700
Institutional/Governmental		2,700	2,900	3,100	3,200	3,400
Landscape		8,400	7,600	6,800	6,200	5,500
Agricultural irrigation	Potable Water	1,500	1,500	1,500	1,500	1,500
Agricultural irrigation	Raw Water	500	500	500	500	500
Other		0	0	0	0	0
Non-Revenue	System losses & unbilled, authorized consumption	7,400	7,900	8,400	8,800	9,200
	TOTAL:	**102,600**	**108,300**	**114,400**	**118,900**	**123,000**

1) Passive water savings due to the provisions outlined in the Administrative Code are included in the demand projections for EMWD's retail service area.

2) Landscape demands remain constant/decrease over time as landscape accounts are offset by conversion to the recycled water system.

3) Projections for losses in the table include system losses (real and apparent) and unbilled, authorized consumption.

Table 4-4. DWR 4-2W Projected Demands for Potable and Raw Water

-		PROJECTED WATER USE				
USE TYPE	ADDITIONAL DESCRIPTION	2025	2030	2035	2040	2045
Groundwater Recharge	Imported water recharge to the Hemet/San Jacinto Basin	7,500	7,500	7,500	7,500	7,500
Sales/Transfers/Exchanges to Other Agencies	City of Perris Water System	1,800	1,900	2,100	2,200	2,300
Sales/Transfers/Exchanges to Other Agencies	Western Municipal Water District Murrieta Division	1,000	1,300	1,600	2,000	2,300
Sales/Transfers/Exchanges to Other Agencies	Nuevo Water Company	500	1,000	1,100	1,200	1,200
Sales/Transfers/Exchanges to Other Agencies	Rancho California Water District (Potable)	27,100	20,000	21,000	15,200	16,500
Sales/Transfers/Exchanges to Other Agencies	Rancho California Water District (Raw)	15,200	15,200	15,200	22,300	22,300
Sales/Transfers/Exchanges to Other Agencies	City of Hemet	0	0	0	0	0
Sales/Transfers/Exchanges to Other Agencies	City of San Jacinto	0	0	0	0	0
Sales/Transfers/Exchanges to Other Agencies	Lake Hemet Municipal Water District	5,100	5,500	5,900	6,300	6,700
	TOTAL:	**58,200**	**52,400**	**54,400**	**56,700**	**58,800**

1) Lake Hemet Municipal Water District generally receives raw water, but may purchase some potable water in the future based on operational conditions

2) Groundwater recharge will occur under the Hemet/San Jacinto Water Management Plan.

In addition to potable and raw water demands, EMWD also uses recycled water for beneficial uses such as municipal, industrial, landscape, agricultural and environmental use. These uses are described in more detail in **Chapter 6**.

The gross water use including recycled water for the retail and wholesale systems is shown in **Table 4-5** and **Table 4-6**.

Table 4-5. DWR 4-3R Total Gross Water Use

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	84,673	102,600	108,300	114,400	118,900	123,000
Recycled Water Demand* From Table 6-4R	31,243	43,330	49,020	54,500	59,800	64,100
TOTAL WATER USE:	**115,916**	**145,930**	**157,320**	**168,900**	**178,700**	**187,100**

Table 4-6. DWR 4-3W Total Gross Water Use

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1W and 4-2W	36,384	58,200	52,400	54,400	56,700	58,800
Recycled Water Demand* From Table 6-4W	1,285	4,770	5,180	5,600	5,600	5,600
TOTAL WATER DEMAND:	**37,699**	**62,970**	**57,580**	**60,000**	**62,300**	**64,400**

4.2 Distribution System Water Losses

Water loss is a combination of apparent losses and real losses. Apparent losses are attributed to unauthorized consumption, customer metering inaccuracies and systematic data handling errors. Real losses are attributed to such physical water losses as leakage along the pipe system, at the storage tanks, or at the service connections. Real losses in EMWD's potable system are highest where pipelines are older and smaller in size, especially in the Hemet and San Jacinto areas that were once owned by the Fruitvale Mutual Water Company. EMWD tracks pipe leaks and identifies pipes for replacement as part of its capital improvement program. These efforts are described in more detail in **Chapter 9**.

EMWD used the American Water Works Association (AWWA) water system balance methodology to prepare water audits for the last five fiscal years. While EMWD provides both retail and wholesale service and generally reports these services separately throughout this UWMP, its physical facilities are shared. Therefore, losses cannot be easily attributed to one system or the other. For this reason, all of EMWD's water losses are reported in a single table.

The results of the water audits are summarized in **Table 4-7**. The completed audits are included in **Appendix D.**

Table 4-7. DWR 4-4R 12 Month Water Loss Audit Reporting

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS (AF)
7	2015	8,865
7	2016	6,221
7	2017	4,321
7	2018	7,360
7	2019	5,096

1) EMWD's retail and wholesale physical facilities are shared. Therefore, losses cannot be easily attributed to one system or the other. For this reason, all of EMWD's water losses are reported in the DWR Table 4-4 for retail.

2) Water Loss includes Real losses and Apparent losses

4.3 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections in an UWMP include the projected water use for single family and multi-family residential housing for lower income households as identified in the housing element of any city and county in the service area of the supplier. EMWD used the percent of low income and very low-income housing identified in the Regional Housing Needs Assessment (RHNA) for 2021 through 2029, approved by the Southern California Association of Governments, to estimate the number of new low-income housing units that may require service within EMWD's retail service area. The number of projected low-income housing units within each jurisdiction served by EMWD is shown in **Table 4-8**. The demands for these units are included in the total projected residential retail demands.

Table 4-8. Low Income Housing Unit Projection

	PROJECTED HOUSING UNITS			PERCENT VERY LOW INCOME OR LOW INCOME
JURISDICTION	TOTAL	VERY LOW INCOME	LOW INCOME	
Hemet	6,466	812	732	24%
Menifee	6,609	1,761	1,051	43%
Moreno Valley	13,627	3,779	2,051	43%
Murrieta	3,043	1,009	583	52%
Perris	7,805	2,030	1,127	40%
San Jacinto	3,392	800	465	37%
Temecula	4,193	1,359	801	52%
TOTAL	**45,135**	**11,550**	**6,810**	**41%**

The demand projections in this UWMP include future water savings and demand for lower income residential households as summarized in **Table 4-9**.

Table 4-9. DWR 4-5R Inclusion in Water Use Projections

ARE FUTURE WATER SAVINGS INCLUDED IN PROJECTIONS? REFER TO APPENDIX K OF UWMP GUIDEBOOK.	Yes
SECTION OR PAGE NUMBER WHERE THE CITATIONS UTILIZED IN THE DEMAND PROJECTS CAN IT BE FOUND:	Section 4.1.1
ARE LOWER INCOME RESIDENTIAL DEMANDS INCLUDED IN PROJECTIONS?	Yes

4.4 Climate Change Considerations

EMWD has considered the impacts of climate change on water demands as part of long-term strategic planning. Climate change is expected to cause a rise in temperatures in the region which will increase evapotranspiration and water demand. This is particularly true for EMWD's agricultural sector. Additionally, in urbanized areas with limited vegetation, climate change can exacerbate the heat island effect which may result in increased energy and cooling demands.

EMWD's service area lies within the Santa Ana River and Santa Margarita River Watersheds. The Santa Ana River Watershed is covered under the Santa Ana Watershed Planning Authority's (SAWPA)'s Integrated Regional Water Management (IRWM) Plan for the Santa Ana River Watershed. A climate change vulnerability assessment was completed for the region as part of the IRWM Plan update. Key demand vulnerabilities identified by the SAWPA Region that relate to EMWD's service area include:

- Increased temperature could lead to increases in industrial cooling water needs
- Seasonal outdoor water use is expected to increase
- Climate-sensitive crops will be impacted
- Continued education and increased employment of efficient use technologies will be required
- Changes in snowmelt patterns in the future may make it difficult to balance water demands

EMWD continues to work toward decreasing demands for potable water through water conservation programs and full utilization of recycled water. EMWD's conversion of agricultural, landscape and industrial uses to recycled water has helped EMWD mitigate climate change impacts on these demands.

EMWD is currently preparing a Climate Action Plan (CAP). EMWD has a two-pronged approach for investing in projects that address climate change. EMWD is committed to investing in climate resilient water supplies and landscapes as well as demand reduction efforts. EMWD is also committed to investing in projects that mitigate climate change by maximizing energy independence, reducing GHG emissions, and advancing policies and strategies that address climate adaptation.

5

SB X7-7 Baseline, Targets and 2020 Compliance

The Water Conservation Act of 2009, SB X7-7, set a requirement for water agencies to reduce their per capita water use by the year 2020. The overall goal was to reach a statewide reduction of per capita urban water use of 20 percent by December 31, 2020.

DWR, through a public process, developed and published Methodologies for Calculating Baseline and Compliance Urban Water Per Capita Use for consistent application of SB X7-7 throughout the state.

IN THIS SECTION

- Baselines & Targets
- 2020 Compliance

As a wholesaler, EMWD is required to provide an assessment of its present and proposed future measures, programs, and policies that will help its wholesale customers achieve their SB X7-7 water use reduction targets. As both a wholesaler and a retailer, EMWD currently participates in and supports programs developed and implemented by Metropolitan that benefit its entire service area, including wholesale customers. These programs include region-wide rebates for both commercial and residential customers, conservation messaging and outreach, and research and development of new conservation programs and devices. EMWD also actively promotes conservation throughout Riverside County through participation in organizations such as the Riverside County Water Task Force. EMWD will continue to support water reduction by wholesale customers through the use of outreach, technical support, and participation in regional programs. EMWD's wholesale water conservation efforts are described in more detail in Chapter 9.

Any one of four methods can be used to determine the per capita water use targets. Three methods were specified in the legislation, and the fourth was developed by DWR. The four methods are:

- Method 1: Use 80 percent of the baseline as the per capita water use target.
- Method 2: Use an efficiency standard with targets for indoor use, landscape use, and commercial, industrial, and institutional (CII) use and an optional target for agricultural use.
- Method 3: Use 95 percent of the applicable state hydrologic region target developed by DWR and published in the state's 20X2020 Water Conservation Plan.
- Method 4: Use an alternative method developed by DWR that accounts for water savings due to water metering and achieving water conservation measures in three water use sectors.

As documented in its 2015 UWMP, EMWD used Method 2 to calculate its target water use for 2020.

Water purveyors were required to define a continuous 10- to 15-year baseline period ending between December 31, 2004 and December 31, 2010 and calculate an average water use over this period. If the percentage of recycled water used in the year 2008 was at least 10 percent of the total water used, the agency could use up to a 15-year period. If the percentage of recycled water was less than 10 percent, a 10-year baseline period was required. Additionally, a continuous five-year period ending between December 31, 2007 and December 31, 2010 was used to confirm that the selected 2020 target meets the minimum water use reduction requirements.

EMWD selected a 10-year baseline period beginning 1999 and ending 2008 despite providing more than 10 percent recycled water in 2008. A 5-year baseline period was chosen between 2003 and 2007 for the target confirmation.

5.1 SB X7-7 Forms and Tables

EMWD has completed the required forms for compliance with SB X7-7 and included them in **Appendix C.**

5.1.1 Baselines and Target Summary

The baselines and targets calculated in EMWD's 2015 UWMP are summarized in **Table 5-1**. EMWD is not making any changes to its baselines or targets in the 2020 UWMP.

Table 5-1. DWR 5-1R Baselines and Targets Summary

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD*	CONFIRMED 2020 TARGET *
10-15 Year	1999	2008	197	176
5 Year	2003	2007	195	

*All values are in Gallons per Capita per Day (GPCD)

5.2 Methods for Calculating Population and Gross Water Use

EMWD used methods consistent with previous UWMPs and guidance from DWR to calculated service area population and gross water use for 2020.

5.2.1 Service Area Population

EMWD's retail baseline population was calculated using DWR's Population Tool. For 2020, EMWD used the Population Tool in combination with data from the Southern California Association of Governments and estimated persons per connection. The Population Tool uses preloaded Census data for the years 1990, 2000, and 2010 and uploaded service area boundary maps for the corresponding years to calculate service area population in Census years. The annual numbers of single family and multi-family connections in EMWD's retail service area were used to calculate a population-per-connection ratio for Census years. The Population Tool interpolated the population-per-connection ratio to estimate population for non-Census years.

5.2.2 Gross Water Use

Gross water use was calculated using the best available meter data for water entering and exiting EMWD's distribution system. The distribution system includes potable water service for both domestic and agricultural demand, and raw water service to a few agricultural customers.

Potable sources include potable groundwater wells, treated water from two desalination plants, imported water from Metropolitan and water wheeled from other agencies. Imported water from Metropolitan includes water delivered directly to the potable distribution system and raw water treated at EMWD facilities. Small amounts of water are also delivered from Western Municipal Water District and Rancho California Water District. Only water delivered to the distribution system is included in the gross water calculations. The single source for the raw water system is imported raw water from Metropolitan.

EMWD sells a portion of the water that enters its distribution system to wholesale customers. Some Metropolitan connections also have a portion of water that is diverted to other agencies without entering EMWD's distribution system. RCWD, EMWD's largest wholesale customer, has dedicated connections to Metropolitan's system and does not impact EMWD's distribution system.

5.3 2020 Compliance Daily Per-Capita Water Use (GPCD)

In the 2020 UWMP, agencies must demonstrate compliance with their confirmed 2020 Target GPCD. EMWD estimated its gross water use and service area populations using the methods described for previous years. EMWD did not make any optional adjustments to its 2020 gross water use.

A summary of EMWD's compliance is provided in Table 5 2.

Table 5-2. DWR 5-2R 2020 Compliance

ACTUAL 2020 GPCD*	OPTIONAL ADJUSTMENTS TO 2020 GPCD		2020 CONFIRMED TARGET GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020
	TOTAL ADJUSTMENTS*	ADJUSTED 2020 GPCD*		
125	0	0	176	Yes

*All values are in Gallons per Capita per Day (GPCD)

5.3.1 Adjustments Due to Factors Outside of a Supplier’s Control

EMWD has not made any special adjustments to its water use for 2020.

5.4 Regional Alliance

EMWD has elected to comply with SB X7-7 as an individual agency and is not participating in a Regional Alliance.

6 Water Supply Characterization

This chapter describes the sources of supply used by EMWD to meet demands.

EMWD's supply sources include local groundwater, imported water from Metropolitan, and recycled water. The discussion in this chapter is structured to follow the order recommended by DWR.

IN THIS SECTION

- Sources of Supply
- Recycled Water Program
- Projected Future Supply Portfolio

6.1 Water Supply Analysis Overview

EMWD has a diverse portfolio of local and imported supplies. Local supplies include recycled water, potable groundwater, and desalinated groundwater. EMWD is a leader in recycled water production and use. EMWD generally uses 100 percent of its recycled water to irrigate landscape and agricultural fields and provide water for industrial customers.

Groundwater is produced from two management areas within the service area. EMWD works diligently with other stakeholders to protect the quality and integrity of the groundwater basins. These efforts include recharging the basins with imported water and limiting native groundwater production when appropriate. EMWD has developed plans to expand groundwater recharge to improve reliability for its customers during normal and dry year demand periods. These plans include water banking which allows for imported water from northern California to be percolated into local aquifers for use during dry years and implementation of an advanced water purification facility for water to be used in aquifer recharge.

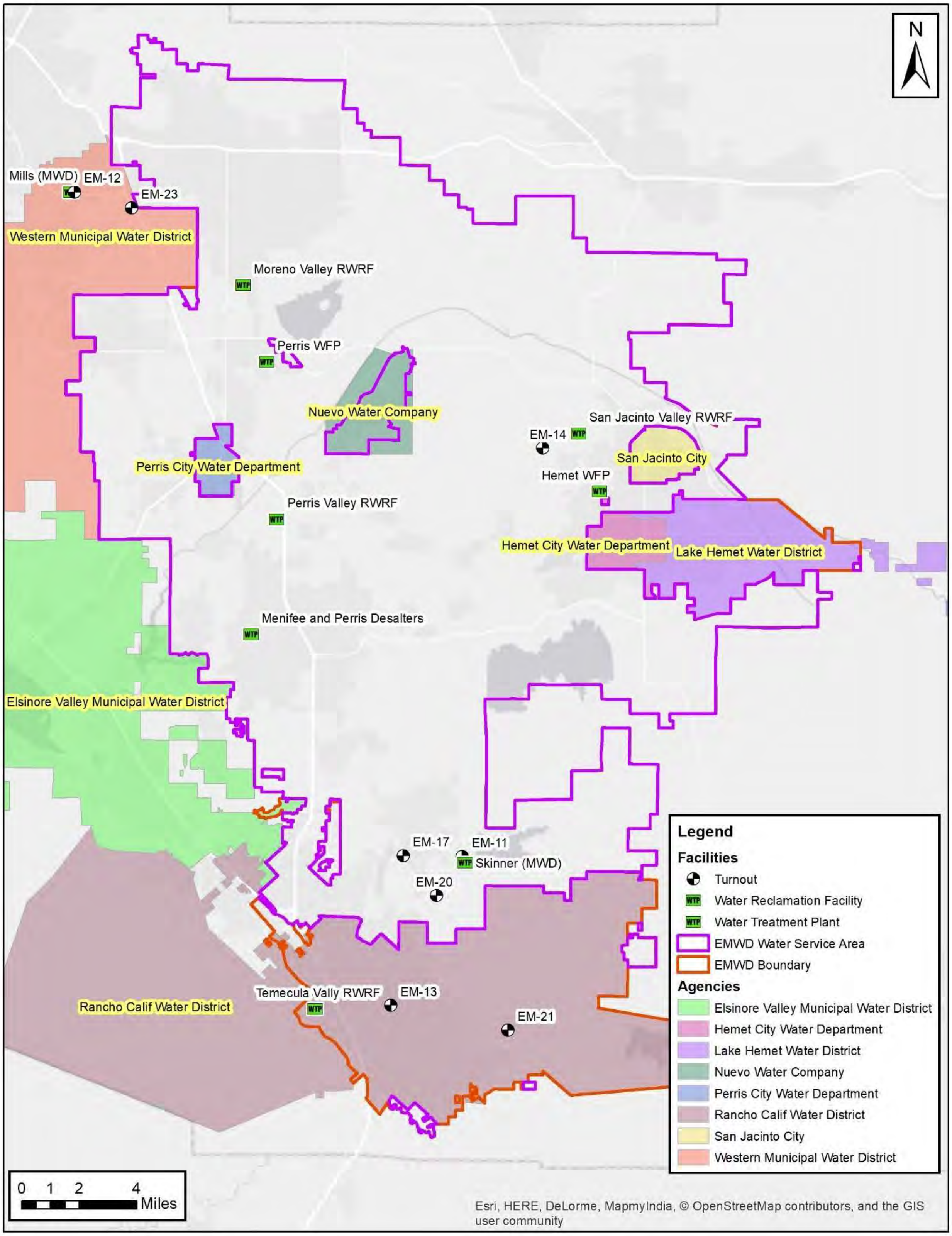
In addition to the production of potable groundwater, EMWD treats brackish groundwater at two locations, with a third desalter scheduled to come online during 2021. EMWD's groundwater desalination program has the benefit of not only providing a sustainable, reliable source of potable water for its customers, but also protecting higher quality groundwater from rising levels of brackish groundwater. These local supplies help EMWD meet regional goals for supply reliability and help limit the impact of imported water shortages.

In addition to local supplies, EMWD receives imported water from the Metropolitan Water District of Southern California (Metropolitan) in three forms: delivered directly as potable water, delivered to EMWD as raw water and then treated at EMWD's two local filtration plants, or delivered to EMWD as raw water for non-potable use and groundwater recharge.

Approximately half of the water used in the EMWD service area is imported by Metropolitan. EMWD has been able to maintain a balance of local and imported water even as new connections have been added. This has been accomplished through the implementation of local supply projects and increased water use efficiency.

These supplies are discussed in more detail in the sections that follow. Key facilities in EMWD's service area are shown in **Figure 6-1**.

Figure 6-1. Agencies and Facilities



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

6.2 UWMP Water Supply Characterization

6.2.1 Purchased or Imported Water

Metropolitan was formed in 1928 by thirteen Southern California cities to develop, store and distribute water for domestic and municipal purposes to the residents of Southern California. Today, the Metropolitan service area stretches across the Southern California coastal plain to 26 member agencies and includes portions of Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties.

Metropolitan is a wholesale water provider and has no retail customers. It provides treated and untreated water directly to its member agencies. Over the last ten years, Metropolitan has provided between 50 percent and 60 percent of the municipal, industrial, and agricultural water used in its nearly 5,200-square mile service area. The remaining water is provided through local resources and imported water from other sources.

EMWD is one of the 26 member agencies that make up Metropolitan, which include fourteen cities, ten other municipal water districts and one county water authority. The statutory relationship between Metropolitan and its member agencies establishes the scope of EMWD’s entitlements from Metropolitan. EMWD, like other member agencies, receives deliveries at different points in the system and pays for the service through a rate structure made up of multiple components. Each year member agencies advise Metropolitan how much water they anticipate they will need during the next five years. Metropolitan then works with member agencies to develop forecasts of long-term future water supply.

Metropolitan delivers supply to member agencies from two sources, the Colorado River Aqueduct (CRA), which it owns and operates, and the State Water Project (SWP), owned and operated by DWR. Additional information about Metropolitan is provided in Metropolitan’s 2020 UWMP.

EMWD and Metropolitan

The original mission of Metropolitan was to build the CRA, bringing Colorado River water to Southern California. As Metropolitan was constructing the San Jacinto Tunnel Portion of the project, a large amount of seepage was encountered in the pipeline. As the seepage began to affect local water resources within the region, residents began to organize to protect their water supply. Around the same time, the region experienced a period of dry weather conditions and the groundwater basin began to experience overdraft. It became clear that a source of imported water was necessary. EMWD was formed in 1950 to bring imported water into the area. In 1951, it was annexed into Metropolitan and the first major sale of Colorado River water within EMWD began in July of 1952.

In 1960, Metropolitan contracted for additional water supplies from the SWP, operated by DWR. In 1972, the SWP began conveying water from the wet climate of northern California to the dry climate of Southern California. Through the 1980s, EMWD built facilities to take advantage of the SWP water available, and today, EMWD continues to receive a portion of its imported water supply from Northern California. Treated potable water is available in the north from the Mills Water Treatment Plant and in the south through the Skinner Water Treatment Plant. EMWD also owns and operates two water filtration plants that treat raw imported water, in Perris and Hemet. Raw imported water is also used for recharge purposes and to meet agricultural demands.

Metropolitan does not provide supply projections for each member agency. Instead Metropolitan uses a regional approach to developing projections. Metropolitan calculates the demand for the entire region, as discussed in its UWMP. Using information about existing and proposed local projects, Metropolitan then determines the amount of imported water supply and demand. Throughout the preparation of the 2020 UWMP, EMWD has provided to Metropolitan information about local supply and projects, clarifications on boundary information, and population projections. Based on this information and information provided by other member agencies, Metropolitan has determined it is able to meet the demands of all member agencies through 2045.

6.2.2 Groundwater

EMWD produces potable groundwater from two management plan areas within the San Jacinto Groundwater Basin. Both management plan areas are part of the San Jacinto Groundwater Basin (DWR Bulletin 118 Groundwater Basin Number 8-05). The areas are the West San Jacinto Groundwater Sustainability Agency Plan Area (West San Jacinto Basin) and the Hemet/San Jacinto Water Management Plan area (Hemet/San Jacinto Basin). EMWD also owns and operates two desalination plants that convert brackish groundwater from the West San Jacinto Basin into potable water. These plants not only provide a reliable source of potable water, but they also protect potable sources of groundwater and support EMWD's groundwater salinity management program.

EMWD is a key player in three cooperative efforts to protect groundwater quality and reliability:

- The West San Jacinto Basin was formerly governed by the West San Jacinto Groundwater Basin Management Plan (WSJ Management Plan), developed in 1995 and included in Appendix E of this UWMP. Eastern Municipal Water District (EMWD), acting as the Groundwater Sustainability Agency (GSA) for the non-adjudicated portions of the San Jacinto Groundwater Basin, has developed a Groundwater Sustainability Plan (GSP) in compliance with the 2014 Sustainable Groundwater Management Act (SGMA), which is codified in California Water Code (CWC), Part 2.75 (Sustainable Groundwater Management), Section 10720 et seq. The West San Jacinto Basin will be governed by the GSP following its adoption by January 31, 2022.

- The Hemet / San Jacinto (HSJ) Management Plan is implemented by the Hemet-San Jacinto Watermaster (Watermaster). The Watermaster was appointed and is supervised by the Superior Court of the State of California for the County of Riverside, pursuant to the Stipulated Judgment entered in April 2013 (Appendix G).

- Additionally, a subset of participants (EMWD, LHMWD and the Soboba Band of Luiseño Indians [Soboba Tribe]) also actively manage water levels under a separate agreement under the Canyon Operating Plan.

Native potable groundwater production in the Hemet/San Jacinto Basin is limited according to HSJ Management Plan provisions to prevent continued overdraft. EMWD anticipated the limitations on native groundwater production it has experienced and has developed alternatives to assure reliability including an Integrated Recharge and Recovery Program (IRRP), filtration plants to treat and deliver imported water to areas dependent on groundwater, and recycled water use for irrigation of landscape and agriculture. In addition to the existing IRRP, EMWD is developing the Enhanced Recharge and Recovery Program (ERRP) to increase conjunctive use and facilitate groundwater banking. Phase 1 of the ERRP program is included in the Santa Ana River Conservation & Conjunctive Use Program (SARCCUP), a cooperative program between Metropolitan, EMWD, and other agencies in the Santa Ana Watershed to store imported water during wet years for use during dry years.

Portions of EMWD also overlay the Santa Margarita Valley Groundwater Basin. EMWD does not extract groundwater from the Santa Margarita Valley Groundwater Basin and has no plans to do so.

6.2.2.1 Basin Description

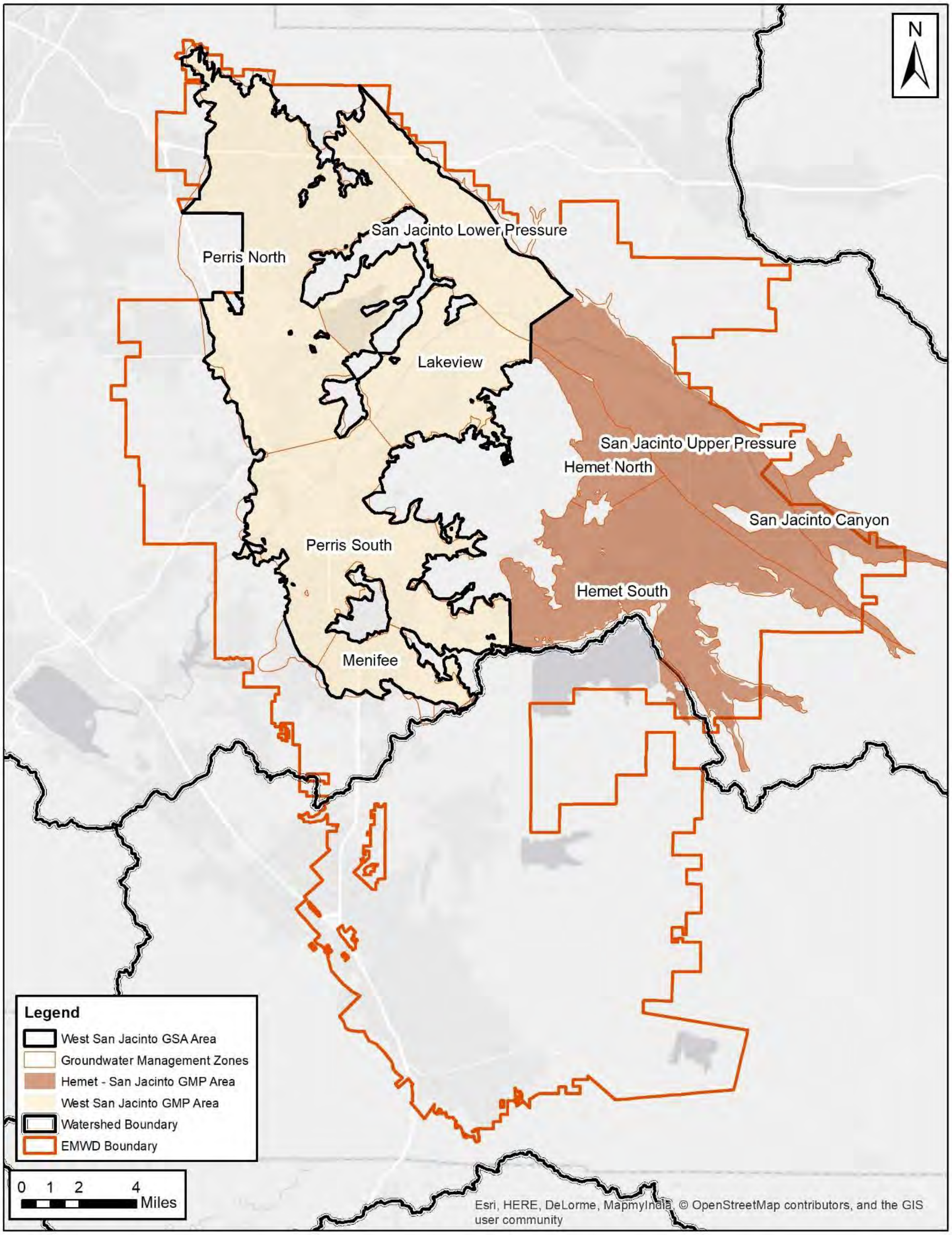
The West San Jacinto Basin and the Hemet/San Jacinto Basin are both located within the San Jacinto Groundwater Basin. Groundwater management zones within the San Jacinto Groundwater Basin were delineated based on areas of lower groundwater flow, groundwater divides, and changes in groundwater quality. The West San Jacinto Basin covers the Perris North, Perris South, San Jacinto Lower Pressure, and Menifee Groundwater Management Zones, and the Lakeview portion of the Lakeview/Hemet North Groundwater Management Zone. The Hemet/San Jacinto Basin is comprised of the Hemet South, Canyon, and San Jacinto Upper Pressure Groundwater Management Zones, as well as the Hemet North portion of the Lakeview/Hemet North Groundwater Management Zone.

EMWD produces water for potable use or blending in four of the groundwater management zones: Perris North, Hemet South, San Jacinto Upper Pressure and Canyon. Desalter production wells are located in the Perris South and Lakeview/Hemet North Groundwater Management Zones. The Groundwater Management Zones are summarized in **Table 6-1** and are shown in **Figure 6-2**.

Table 6-1. Groundwater Management Zones

BASIN	MANAGEMENT AREA	DESCRIPTION
WEST SAN JACINTO	Perris North	Boundaries include the Casa Loma fault to the northeast bordering the San Jacinto Lower Pressure Management Zone; a bedrock constriction to the south bordering the Perris South Groundwater Management Zone; the Bernasconi Hills and the Lakeview Mountains to the west; and the bedrock and surrounding hills the north and west. The Casa Loma fault zone is generally not a barrier to groundwater flow in this section of the fault. Therefore, groundwater leaks across the fault zone as underflow from the San Jacinto Lower Pressure Groundwater Management Zone. Lake Perris is located to the east of the Perris North Groundwater Management Zone and is surrounded by the Bernasconi Hills and Lakeview Mountains to the north, east, and south, and a dam on the west side. Seepage is known to occur under the dam through a subterranean channel into the Perris North Groundwater Management Zone.
	Perris South	Boundaries include a groundwater divide in the Winchester area; bedrock constrictions/saddles bordering the Menifee Groundwater Management Zone; a bedrock constriction/saddle bordering the Lakeview/Hemet North Groundwater Management Zone; a bedrock constriction bordering the Perris North Groundwater Management Zone; and the surrounding bedrock mountains and hills. A groundwater divide exists in the Winchester area near Highway 79. The divide is likely an artifact of natural and artificial recharge and groundwater production patterns. As such, the position (or the very existence) of this groundwater divide may vary with changing seasons, artificial recharge and/or production patterns. Southwest of EMWD's Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Groundwater Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Groundwater Management Zone; this is especially true during times of high groundwater levels. Southeast of Sun City, a bedrock constriction in the water-bearing alluvium is also a boundary between the Perris South and Menifee Groundwater Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Groundwater Management Zone. To the northeast, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview Groundwater Management Zones. Under historic flow conditions, groundwater flowed westward from Lakeview into Perris South. However, groundwater currently flows from Perris South eastward into Lakeview toward a "pumping depression" in the groundwater table.
	San Jacinto Lower Pressure	Boundaries include the Claremont fault to the northeast; the Casa Loma fault and its northwestward extension; various crystalline bedrock outcrops to the north and west; and the flow system boundary with the San Jacinto Upper Pressure Groundwater Management Zone to the southeast. The Casa Loma fault zone is a leaky barrier to groundwater flow to the Perris North Groundwater Management Zone in this section of the San Jacinto Groundwater Basin. Recharge rates along with water quality differences between San Jacinto Upper Pressure and San Jacinto Lower Pressure characterize the location of the barrier between the two zones.
	Menifee	Boundaries include the bedrock constrictions/saddles bordering the Perris South Groundwater Management Zone, a bedrock constriction to the east, and the surrounding bedrock mountains and hills. Southwest of the Winchester Ponds, a narrow constriction in the bedrock coincides with a buried bedrock saddle surface. This area of constriction in the water-bearing alluvium is a boundary between the Perris South and Menifee Groundwater Management Zones. Groundwater can flow through this bedrock gap from the Winchester area into the Menifee Groundwater Management Zone, especially during times of high groundwater levels. Southeast of Sun City, a bedrock constriction in the water-bearing alluvium is also a boundary between the Perris South and Menifee Groundwater Management Zones. Groundwater flows through this bedrock gap from the Sun City area into the Menifee Groundwater Management Zone.
WSJ AND HSJ	Lakeview / Hemet North	Boundaries of the Lakeview/Hemet North Groundwater Management Zone include the Casa Loma fault zone to the east; the groundwater divide near Esplanade Avenue to the south; the Lakeview Mountains to the west and south; the Bernasconi Hills to the north; and a bedrock constriction/saddle to the west. The Casa Loma fault zone is a partial barrier to groundwater flow. Generally, groundwater leaks across the fault zone as underflow from the San Jacinto Upper Pressure Groundwater Management Zone. Impermeable, crystalline bedrock outcrops that compose the Bernasconi Hills and the Lakeview Mountains to the north and south, respectively, are hard rock barriers to groundwater flow. To the west, the gap between the Bernasconi Hills and the Lakeview Mountains becomes narrow and the buried bedrock surface forms a saddle. This area of constriction in the water-bearing alluvium is the boundary between the Perris South and Lakeview/Hemet North Groundwater Management Zones.
HEMET/SAN JACINTO	Hemet South	Boundaries include the Casa Loma and Bautista Creek fault zones to the east; the groundwater divide near Esplanade Avenue to the north; the Lakeview Mountains to the northwest; the groundwater divide in the Winchester area to the west; and various crystalline bedrock outcrops to the south. The Casa Loma and Bautista Creek fault zones are generally known barriers to groundwater. However, groundwater leaks across portions of the Casa Loma Fault Zone as underflow into the San Jacinto Upper Pressure Groundwater Management Zone.
	San Jacinto Canyon	The boundaries include the San Jacinto Mountains to the east, north, and south, as well as the San Jacinto fault zone to the west. The San Jacinto Mountains are composed of consolidated crystalline bedrock and semi-consolidated sedimentary rocks. These rocks are relatively impermeable, providing limited groundwater seepage into the basin and bound the water-bearing, alluvium-filled canyons within this groundwater management zone. A branch of the San Jacinto fault zone extends southeast along the channel of Bautista Creek until it intersects the Park Hill fault and acts as an impermeable barrier at depth. The barrier effect of the fault forces groundwater upwards within the San Jacinto River upstream of the fault causing muddy areas at the surface. This area is known as the Cienega and is an area of significant municipal groundwater production.
	San Jacinto Upper Pressure	The San Jacinto Upper Pressure Groundwater Management Zone is bounded by the San Jacinto fault to the northeast, the Casa Loma and Bautista Creek fault zones to the southwest and the flow system boundary with the San Jacinto Lower Pressure Groundwater Management Zone to the northwest. The Claremont fault is a known barrier to groundwater flow and separates the San Jacinto Graben from both the San Timoteo Badlands and the San Jacinto Mountains. East of the City of San Jacinto, a branch of the San Jacinto fault zone cuts the alluvial fill by extending southeast across the San Jacinto River and along the channel of Bautista Creek until it intersects the Park Hill fault. This branch of the San Jacinto fault zone separates the San Jacinto Upper Pressure Groundwater Management Zone from the Canyon Groundwater Management Zone. The Casa Loma and Bautista Creek fault zones are generally known barriers to groundwater flow. However, studies show groundwater leaks across portions of the Casa Loma Fault zones as underflow along the Hemet South and Lakeview/Hemet North Groundwater Management Zones.

Figure 6-2. Groundwater Management Zones



6.2.2.2 WSJ Management

In the West San Jacinto Basin, a cooperative groundwater management plan is already in place to protect the reliability and quality of the water supply. In June 1995, EMWD adopted the WSJ Management Plan in accordance with the statutes in the California Water Code Sections 10750 through 10755 resulting from the passage of AB 3030. The plan was adopted after extensive public outreach and meetings with interested individuals and agencies. A copy of the Management Plan is included in **Appendix E**.

Implementation of the WSJ Management Plan began directly after its adoption. Initial efforts to implement the WSJ Management Plan included establishing an advisory committee; prioritizing the management zones; evaluating groundwater resources including establishing groundwater quality, level, and extraction monitoring programs; and conducting hydro-geophysical investigations. The West San Jacinto Groundwater Basin Management Plan Annual Report, documenting the implementation of the plan and activities in the groundwater management zones, has been published annually since 1996.

SGMA was passed into law in 2014 and required that medium and high priority groundwater basins designated by the DWR be managed by GSAs. The San Jacinto Groundwater Basin was deemed a high priority basin by the DWR. Subsequently, EMWD notified DWR of its intent to become the GSA for the non-adjudicated portion of the San Jacinto Groundwater Basin in January 2017. EMWD performed an extensive public outreach effort to ensure that the interests of all beneficial uses and users of groundwater would be considered in the process of forming the GSA, and in the development and implementation of this GSP. After EMWD staff conducted public workshops, reached out to stakeholder agencies (e.g., cities, counties, water districts, watermasters, and state agencies), and circulated notices in the press, the EMWD Board of Directors approved Resolution No. 2016-135 in December 2016, which formalized EMWD's intention to be the GSA for the West San Jacinto GSA Area and, EMWD's Board of Directors became the exclusive GSA for the western portion of the San Jacinto Groundwater Basin on April 24, 2017.

EMWD, as the GSA, initiated the development of the San Jacinto Groundwater Basin GSP in February 2019 and is anticipated to adopt and submit the GSP to the DWR by January 31, 2022. The purpose of the GSP is to define the conditions under which the groundwater resources of the West San Jacinto GSA Plan Area, which support agricultural, domestic, municipal and industrial, and environmental uses, will be managed sustainably in the future. The adoption of the GSP represents the commitment of the West San Jacinto GSA to maintain long-term, sustainable use of groundwater resources within the West San Jacinto GSA Plan Area, as required by SGMA. Over the next 20 years, data will continue to be gathered, analyzed, and used to refine the estimated sustainable yield and understanding of the sources of and influences on degraded water quality. As the understanding of the West San Jacinto GSA Plan Area improves, the findings of this GSP will be evaluated and updated as necessary. The GSP documents a viable approach, determined by the GSA in collaboration with stakeholders and informed by the best available information, to maintaining the long-term sustainability of the groundwater resources within the West San Jacinto GSA Plan Area.

6.2.2.3 HSJ Management

In 2001, the Cities of Hemet and San Jacinto, LHMWD, EMWD, and representatives of the private groundwater producers, with DWR acting as an impartial mediator, began working on a groundwater management plan for the Hemet/San Jacinto Basin. The group discussed and resolved several controversial issues, including San Jacinto Tunnel seepage water, the Fruitvale Judgment and Decree, export of groundwater from the basins, and how to maximize the use of recycled water. As a result of their efforts, a final HSJ Management Plan was completed in 2007, and a Stipulated Judgment was entered with the Superior Court of the State of California for the County of Riverside in April of 2013. These documents are included in **Appendix G**.

The HSJ Management Plan:

- Limits the amount of water being extracted from the basin free of the replenishment charge to a sustainable yield.
- Implements continued recharge of the basin using imported water through the IRRP.
- Ensures settlement claims by the Soboba Tribe are facilitated and accommodated.
- Expands the existing water production and water services system to meet future urban growth through the use of imported water recharged into the basin.
- Protects and/or enhances water quality in the Hemet/San Jacinto Basin.
- Supports cost-effective water supplies and treatment by the public agencies.
- Eliminates groundwater overdraft and enhances basin yield.
- Continues the monitoring program to promote and provide for best management and engineering principles to protect water resources.

Long-term groundwater management includes recharge using Metropolitan replenishment water via permanent facilities through the IRRP Program. An agreement with the Soboba Tribe (the Soboba Settlement Agreement) requires Metropolitan to deliver, on average, 7,500 AFY of water for the next 30 years to EMWD, LHMWD, and the Cities of Hemet and San Jacinto as part of an effort to recharge groundwater in the Hemet/San Jacinto Basin, fulfilling the Soboba Tribe's water rights and addressing chronic groundwater overdraft. A copy of the Agreement is included in **Appendix H**.

In 2015, the Canyon Operating Plan, an agreement between EMWD, LHMWD and the Soboba Tribe, was completed as a result of a Memorandum of Understanding (MOU) related to the Soboba Settlement Act. The Canyon Operating Plan provides a framework for operating the Canyon Management Zone in a manner to avoid significant impacts to the Soboba Tribe's wells and does not reduce the overall supply available in the Hemet/San Jacinto Basin.

The HSJ Management Plan recognizes that the Hemet/San Jacinto Basin is presently in a condition of groundwater overdraft. The Watermaster has implemented long-term base production rights that will eliminate overdraft conditions within the Hemet/San Jacinto Basin, with interim production rights that step down gradually. The long-term adjusted base production right for EMWD is 7,303 AF annually.

In addition to the recharge occurring under the Soboba Settlement Agreement and future recharge under ERRP, EMWD has historically also recharged groundwater in the Hemet/San Jacinto Basin with imported surplus water from Metropolitan since 1990 using temporary facilities constructed under various pilot programs. EMWD and the other three local HSJ agencies are also contributing to the replenishment of the basin by providing recycled water in lieu of groundwater production. The Recycled In-Lieu Program supplies recycled water for agricultural irrigation in-lieu of pumping native groundwater. The project costs are jointly funded by EMWD, LHMWD, and the Cities of Hemet and San Jacinto. Agreements that set limits on groundwater production and provide for a payment of a portion of the operation and maintenance costs have been in place since 2008.

6.2.2.4 Past Five Years

The volume of groundwater pumped by EMWD for the past five years is reported in **Table 6-2**. The volumes in the table include potable groundwater pumped from the Hemet/San Jacinto Basin and the West San Jacinto Basin as well as brackish groundwater pumped from the West San Jacinto Basin that is treated at EMWD's desalters before being used as a potable supply. Brackish groundwater volumes reported in **Table 6-2** are reported as a desalinated water supply in other supply tables of this UWMP. EMWD does not use groundwater to meet wholesale demands.

Table 6-2. DWR 6-1R Groundwater Volume Pumped

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	6,171	6,498	6,367	5,213	9,383
Alluvial Basin	Pumping of EMWD share of unused Soboba Settlement Water recharged in the Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	3,585	3,864	3,850	1,508	2,625
Alluvial Basin	West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	4,429	2,908	3,307	1,323	2,402
Alluvial Basin	Brackish Groundwater from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	10,254	8,585	8,547	9,801	9,565
	TOTAL:	**24,439**	**21,855**	**22,071**	**17,845**	**23,975**

1) Brackish groundwater pumped from the West San Jacinto Basin is not a direct supply – it is used to feed desalination facilities. The treated volume of this supply is shown in the other supply tables of this chapter as desalinated water instead of groundwater.

2) EMWD share of unused Soboba Settlement Water is pumped from wells in the Hemet/San Jacinto Basin. However, since this volume originates from water imported under the Soboba Settlement Agreement (and unused by the Soboba Tribe), this supply is shown in other supply tables of this chapter as imported water instead of groundwater.

3) In 2019 EMWD voluntarily reduced groundwater pumping through participation in Metropolitan's cyclic storage program.

6.2.3 Surface Water

EMWD holds a right to divert up to 5,760 AFY of San Jacinto River flows for recharge and subsequent use from September 1st through June 30th each year. EMWD's diversion and recharge of San Jacinto River surface water to the Canyon Management Zone takes place at EMWD's Grant Avenue Ponds in the Valle Vista area. EMWD's diverted water is recharged into the groundwater aquifer of the Canyon Groundwater Management Zone and is not used for direct use or sale. The San Jacinto River is an ephemeral river and, consequently, river flows may be insufficient for any diversion at all in some years. Water that is recharged helps the regional water balance and contributes to the safe yield of the basin.

6.2.4 Stormwater

The San Jacinto Water Harvesting Project allows EMWD to capture stormwater for the purposes of recharging the groundwater aquifers in the Hemet/San Jacinto Basin. The San Jacinto Water Harvesting Project uses the San Jacinto Reservoir as a retention basin for flows rerouted from Riverside County Flood Control and Water Conservation District storm drain Line E. The San Jacinto Water Harvesting Project is currently not monitored; however, at time of construction, the project was estimated to capture 300 to 320 AFY of storm water on a long-term average.

A potential stormwater capture component was considered during preliminary design of the Phase I Facilities, but it was not determined to be cost-effective. Later phases of the ERRP project may reevaluate the cost-effectiveness of a stormwater capture component.

6.2.5 Wastewater and Recycled Water

EMWD provides wastewater collection, treatment, and recycled water services throughout its service area. Recycled water is extensively used in EMWD's service area to meet non-potable demands. The supply of recycled water will continue to increase with EMWD's population size (though it is also impacted by conservation measures). The four RWRFs that EMWD operates have recently completed expansions. Recycled water is currently used for both municipal and agricultural purposes. Municipal customers use recycled water for landscape irrigation and industrial process water. Agricultural customers use recycled water for irrigation of crops. A portion of agricultural demand for recycled water is provided in-lieu of using groundwater. Due in part to drier conditions and higher demands, EMWD has been able to meet its goal of eliminating discharges and using almost all of the recycled water available within EMWD. Some of the recycled water use offsets demands of existing potable customers.

6.2.5.1 Wastewater Collection, Treatment, and Disposal

EMWD is responsible for all wastewater collection and treatment in its service area. It has four operational RWRFs located throughout EMWD. Inter-connections between the local collection systems serving each treatment plant allow for operational flexibility, improved reliability, and expanded deliveries of recycled water. All of EMWD's RWRFs produce tertiary effluent, suitable for all permitted uses, including irrigation of food crops and full-body contact. The four RWRFs have a combined capacity of 86,300 AFY as summarized in **Table 6-3**.

Table 6-3. RWRF Treatment Capacity

FACILITY	TREATMENT CAPACITY (AFY)
San Jacinto Valley	15,700
Moreno Valley	17,900
Temecula Valley	25,800
Perris Valley	26,900
TOTAL	**86,300**

Table 6-4. DWR 6-2R Wastewater Collected within Service Area in 2020

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020 (AFY)	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
Eastern Municipal Water District	Metered	8,194	Eastern Municipal Water District	San Jacinto Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	11,507	Eastern Municipal Water District	Moreno Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	16,090	Eastern Municipal Water District	Temecula Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	17,282	Eastern Municipal Water District	Perris Valley RWRF	Yes	No
	TOTAL:	**53,073**				

Table 6-5. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020

							2020 VOLUMES (AFY)				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	WASTEWATER DISCHARGE ID NUMBER	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
San Jacinto Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	7,441	436	6,319		
Moreno Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	10,451	1,600	8,874		
Temecula Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	14,612	1,600	12,407		
Perris Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	15,696	3,637	13,327		
						TOTAL:	**48,200**	**7,273**	**40,927**	**0**	**0**

1) Volumes recycled from each facility in the table were estimated based on the proportion of wastewater collected and treated at each plant compared to the total volume of wastewater treated

2) Recycled water sold to RCWD and EVMWD is included in the total volume recycled within EMWD's service area and not reported separately in DWR Table 6-3 for wholesale. Recycled water deliveries to wholesale customers are distinguished from retail sales in DWR Table 6-4.

6.2.5.2 Recycled Water Coordination

As a full-spectrum provider of water, wastewater collection, and treatment and recycled water services, EMWD has been active in developing local and regional plans for expanded water recycling in its service area. EMWD's first Recycled Water Facilities Master Plan was developed in 1990. In 2009, EMWD completed a Recycled Water System Strategic Plan that provides guidelines for moving forward with recycled water projects. Information from the strategic plan was incorporated into the EMWD Integrated Resource Plan (IRP) to evaluate potential recycled water projects. Both the Recycled Water Facilities Master Plan and the Recycled Water Strategic Plan were updated in 2016. EMWD's local water recycling plan is also incorporated into the IRWM Plan developed by SAWPA for the Santa Ana River Watershed.

EMWD has worked closely with the Santa Ana Regional Water Quality Control Board in updating local basin plans and developing a long-term salinity management plan to support and ensure compliance with local basin objectives for salinity and nitrogen. EMWD is involved with a variety of local agencies and public interest groups in recycled water planning efforts and has coordinated with these agencies as part of the development of this UWMP. **Table 6-6** lists agencies participating in recycled water planning.

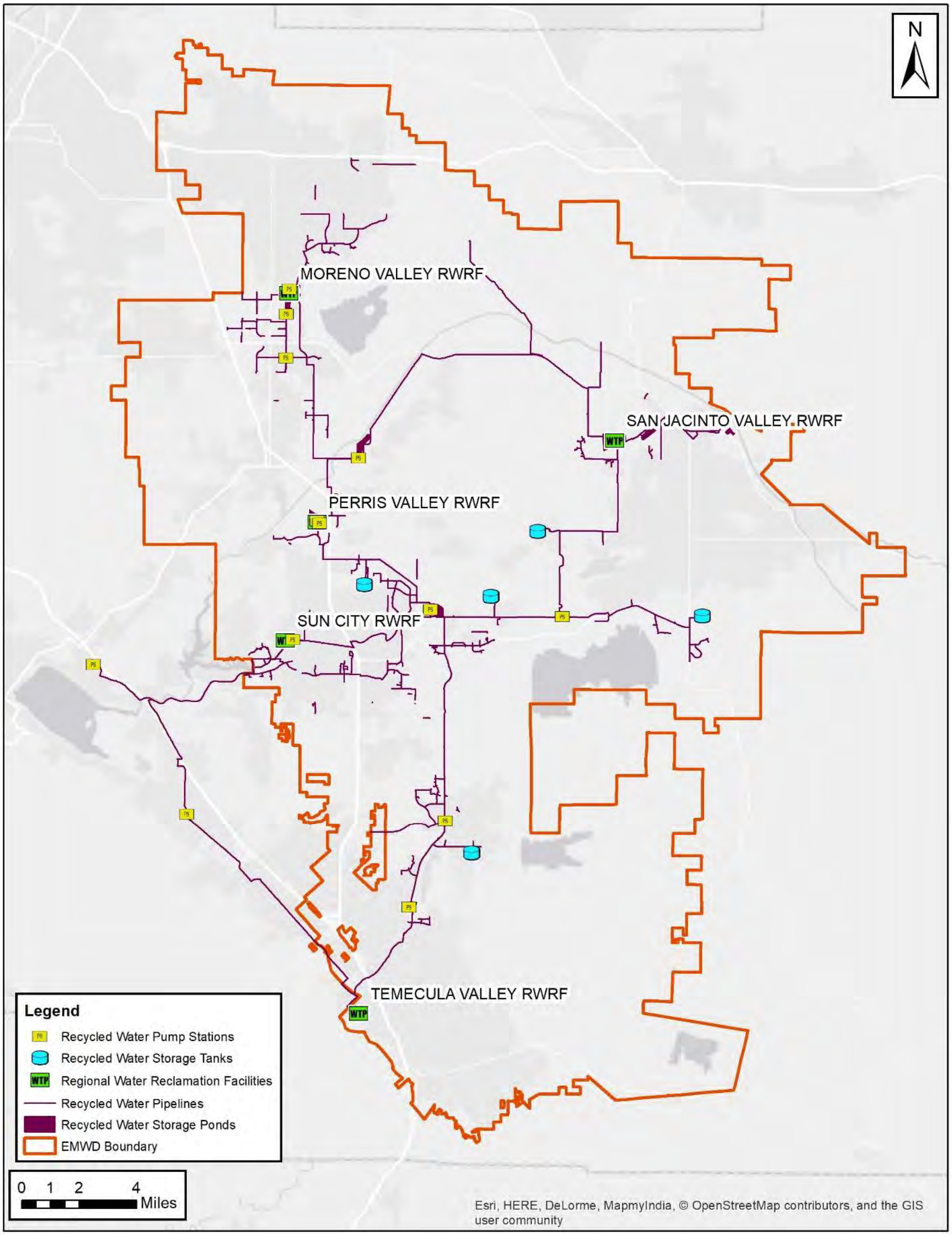
Table 6-6. Recycled Water Coordination Agencies

GROUP / AGENCY	ROLE
Santa Ana Watershed Project Authority	Regional Cooperative Planning
Santa Ana Regional Water Quality Control Board	Basin Planning / Salinity Management.
Rancho California Water District	Facility Planning / Market Development
West San Jacinto Groundwater Management Plan Advisory Board	Plan Review / Public Oversight
Hemet/San Jacinto Groundwater Management Plan Policy Committee (Cities of Hemet and San Jacinto, and Lake Hemet Municipal Water District)	Plan Review / Public Oversight
Elsinore Valley Municipal Water District	Facility Planning / Market Development
EMWD Recycled Water Advisory Committee	Plan Review / Public Oversight
San Jacinto Watershed Council	Plan Review / Public Oversight
Lake Elsinore/San Jacinto Watershed Authority	Plan Review / Water Quality
Metropolitan Water District of Southern California	Regional Urban Water Mgmt. Planning / Funding

6.2.5.3 Recycled Water System Description

The majority of recycled water sold is used for agricultural irrigation. A portion of the water sold for agriculture is used in lieu of groundwater, preserving the groundwater basin, and improving water supply reliability. In addition to meeting agricultural demand, recycled water is delivered to municipal customers for landscape irrigation. EMWD also sells recycled water to the California Department of Fish and Wildlife (CDFW) for environmental use within the San Jacinto Wildlife Area and to recreational customers that are comprised of private duck clubs and bird sanctuaries that use recycled water for ponds. EMWD uses existing storage facilities to store water during off peak periods for delivery in peak months and maximize the amount of recycled water sold. EMWD's recycled water production and distribution facilities are shown in **Figure 6-3**.

Figure 6-3. EMWD Recycled Water System



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

6.2.5.4 Potential, Current, and Projected Recycled Water Uses

EMWD’s current and projected retail recycled water sales are summarized in **Table 6-7**.

EMWD’s wholesale customer category consists of recycled water delivered to other agencies for use in their service areas. EMWD delivers recycled water to EVMWD and RCWD. EMWD’s wholesale current and projected recycled water use is shown in **Table 6-8**.

Table 6-7. DWR 6-4R Recycled Water within Service Area in 2020

Name of Supplier Producing (Treating) the Recycled Water:	Eastern Municipal Water District
Name of Supplier Operating the Recycled Water Distribution System:	Eastern Municipal Water District
Supplemental Volume of Water Added in 2020:	0
Source of 2020 Supplemental Water:	N/A

BENEFICIAL USE TYPE	POTENTIAL BENEFICIAL USES OF RECYCLED WATER	AMOUNT OF POTENTIAL USES OF RECYCLED WATER	GENERAL DESCRIPTION OF 2020 USES	LEVEL OF TREATMENT	2020	2025	2030	2035	2040	2045
AGRICULTURAL IRRIGATION				Tertiary	21,178	22,240	24,640	20,000	20,000	20,000
LANDSCAPE IRRIGATION (EXCLUDES GOLF COURSES)				Tertiary	4,275	7,600	10,080	10,600	11,100	11,100
GOLF COURSE IRRIGATION				Tertiary	1,457	2,750	3,130	3,500	3,500	3,500
INDUSTRIAL USE				Tertiary	0	440	870	1,310	1,310	1,310
RECREATIONAL IMPOUNDMENT				Tertiary	1,029	1,400	1,400	1,400	1,400	1,400
WETLANDS OR WILDLIFE HABITAT				Tertiary	3,231	4,500	4,500	4,500	4,500	4,500
GROUNDWATER RECHARGE (INDIRECT POTABLE REUSE)				Blend of Tertiary and Advanced Water Treatment		4,100	4,100	12,300	12,300	12,300
OTHER			Split between agricultural and landscape usage, proportion to be determined in future	Tertiary				590	5,390	9,690
OTHER			Construction	Tertiary	73	300	300	300	300	300
				TOTAL:	**31,243**	**43,330**	**49,020**	**54,500**	**59,800**	**64,100**

Note: Some recycled water in EMWD's storage ponds infiltrates into the ground or evaporates. DWR does not consider this water to be put to beneficial use, and therefore those volumes are not included in the table.

Table 6-8. DWR 6-4W Recycled Water Within Service Area in 2020

NAME OF RECEIVING SUPPLIER OR DIRECT USE BY WHOLESALER	LEVEL OF TREATMENT	2020	2025	2030	2035	2040	2045
Elsinore Valley Municipal Water District	Tertiary	533	1,120	1,120	1,120	1,120	1,120
Rancho California Water District	Tertiary	752	3,650	4,060	4,480	4,480	4,480
	TOTAL:	**1,285**	**4,770**	**5,180**	**5,600**	**5,600**	**5,600**

EMWD's board has a policy to reuse 100 percent of the recycled water produced. The actual 2020 use is compared to the projections from the 2015 UWMP in **Table 6-9** and **Table 6-10.**

Table 6-9. DWR 6-5R 2015 Recycled Water Use Projection Compared to 2020 Actual

BENEFICIAL USE TYPE	2015 PROJECTION FOR 2020	2020 ACTUAL USE
Agricultural Irrigation	18,784	21,178
Landscape Irrigation (excludes golf courses)	5,124	4,275
Golf Course Irrigation	2,375	1,457
Commercial Use	300	0
Industrial Use	2,912	0
Recreational Impoundment	1,250	1,029
Wetlands or Wildlife Habitat	4,500	3,231
Other (Construction)	0	73
TOTAL:	**35,245**	**31,243**

Note: Some recycled water in EMWD's storage ponds infiltrates into the ground or evaporates. DWR does not consider this water to be put to beneficial use, and therefore those volumes are not included in the table.

Table 6-10. DWR 6-5W 2015 Recycled Water Use Projection Compared to 2020 Actual

NAME OF RECEIVING SUPPLIER OR DIRECT USE BY WHOLESALER	2015 PROJECTION FOR 2020	2020 ACTUAL USE
Elsinore Valley Municipal Water District	289	533
Rancho California Water District	1,367	752
TOTAL:	**1,656**	**1,285**

6.2.5.5 Actions to Exchange and Optimize Future Recycled Water Use

EMWD is considering several options for the expansion of recycled water use in EMWD's service area. Historically, EMWD has used recycled water to meet the needs of agricultural and landscape demands. Water has also been used for environmental purposes at the CDFW's San Jacinto Wildlife Area. Other proposed special projects include Indirect Potable Reuse (IPR) using recycled water from the San Jacinto Valley RWRF for groundwater recharge.

IPR is included in EMWD's IRP and modeled under several hydraulic and supply conditions. EMWD's Recycled Water Strategic Plan and Recycled Water Facilities Master Plan also evaluate the storage and system improvements needed to offset peak demand. Additional storage is not required to fully utilize EMWD's recycled water supply.

To ensure that recycled water continues to be used to the fullest extent possible, EMWD uses five methods to expand the use of recycled water within its service area. These methods are:

1. **Mandatory Recycled Water Use Ordinance** – EMWD has adopted an ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available. This ordinance provides a basis for denying potable water service and providing recycled water for permitted uses.
2. **Rate Incentives** – Recycled water is currently priced below the cost of potable water for both municipal and agricultural use.

3. **Water Supply Assessments** – EMWD's Water Supply Assessments require all major new developments to use recycled water as a condition of service where it is available and permitted.
4. **Public Education** – EMWD actively promotes the use of recycled water with its water education program. EMWD also places prominent signage at public recycled water use sites promoting the benefits of water recycling.
5. **Facilities Financing** – EMWD will work with private parties to arrange or provide financing for construction of facilities needed to convert potable demands to recycled water.

EMWD does not have any data to support a projection of how much increased recycled water sales will result from each of the listed methods of encouraging recycled water use. Historically, the low cost of recycled water was the primary inducement for agricultural customers to use recycled water in-lieu of groundwater. However, as municipal customers continue to replace agriculture, it is reasonable to assume that the mandatory provisions of EMWD's Recycled Water Use Ordinance will play a major role in program expansion.

Table 6-11 summarizes EMWD's methods to expand future retail recycled water use.

Table 6-11. DWR 6-6R Methods to Expand Future Recycled Water Use

NAME OF ACTION	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	EXPECTED INCREASE OF RECYCLED WATER USE
Mandatory Recycled Water Use Ordinance	The ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available	Ongoing	
Rate Incentives	EMWD prices recycled water below the cost of potable water for both municipal and agricultural use	Ongoing	
Water Supply Assessments	Assessments condition all major new developments to use recycled water as a condition of service where it is available and permitted	Ongoing	
Public Education	EMWD has a recycled water public education campaign to promote the benefits of recycled water	Ongoing	
Facilities Financing	EMWD helps arrange or provide financing for the construction of facilities needed to convert potable demands to recycled water	Ongoing	
		TOTAL:	

EMWD does not have data to support a projection of how much increased recycled water sales will result from each of the listed methods of encouraging recycled water use. Historically, the low cost of recycled water was the primary inducement for agricultural customers to use recycled water in-lieu of groundwater. However, as municipal customers continue to replace agriculture, it is reasonable to assume that the mandatory provisions of EMWD's Recycled Water Use Ordinance will play a major role in program expansion.

6.2.6 Desalinated Water Opportunities

EMWD currently uses groundwater desalination to remove salts from basins in the West San Jacinto Basin. The 250 square mile area experiences increasing water levels due to the inward migration of high total dissolved solids (TDS) groundwater and decreased production. The high TDS groundwater is migrating into the Lakeview portion of the Lakeview/Hemet North Management Zone, which is an area of good quality groundwater. Lowering groundwater levels and removal of saline groundwater is an integral element of the WSJ Management Plan. To address these concerns, EMWD implemented a Groundwater Salinity Management Program. This program currently consists of two desalination facilities owned and operated by EMWD, with a third under construction. These facilities recover high TDS groundwater from the Menifee and Perris South Management Zones, and the Lakeview portion of the Lakeview/Hemet North Management Zone, for potable use. In addition to being a source of potable water, the main role of the desalters is to play a part in managing the groundwater management zones by addressing the migration of brackish groundwater into areas of good quality groundwater.

Desalter wells pump water to an integrated brackish water system that delivers water to the desalination plants where it is treated prior to entering the distribution system. The Menifee Desalter was the first desalter to be built. This facility began producing potable water in 2003. The second desalter, the Perris I Desalter, is located next to the Menifee Desalter in Sun City. This plant began production in 2006 and has a production capacity of approximately 7,500 AFY. Groundwater extraction for use in the desalter program has caused local declines in water levels to date; but the overall West San Jacinto Basin shows groundwater levels that continue to exhibit a stable or upward trend.

High iron and manganese concentrations along with silica irreversibly impact the desalter membranes and have resulted in several brackish groundwater extraction wells being offline. In 2004, an effort was initiated to evaluate alternative technologies for removal of iron and manganese prior to desalination. In late 2013, iron and manganese removal facilities were placed online and allowed EMWD to begin producing from four previously inactive wells.

6.2.7 Water Exchanges and Transfers

EMWD currently relies on Metropolitan for any transfers or exchanges. As a member agency, EMWD benefits from Metropolitan's efforts to improve supply reliability through transfers and exchanges, as detailed in Metropolitan's 2020 UWMP.

In addition to relying on Metropolitan, water transfers have been identified as a method of improving reliability, especially during periods of water shortage. The five regional water agencies in the Santa Ana River Watershed have identified a watershed scale project, the Santa Ana Conservation and Conjunctive Use Program (SARCCUP), to store imported water during wet years in order to help meet dry-year demands. The group includes representatives from the following regional water agencies:

- EMWD
- Inland Empire Utilities Agency
- Orange County Water District
- San Bernardino Valley Municipal Water District
- Western Municipal Water District

The program goals of SARCCUP include:

- Providing watershed wide benefits based upon regional collaboration
- Creating significant new dry year yield (about 70,000 AFY in Phase 1)
- Increasing resiliency and reliability of water supply

The SARCCUP includes four separate groundwater banks located in different groundwater basins within the Santa Ana Watershed. The total storage proposed for SARCCUP is about 137,000 AF. Each of the banks is expected to be able to recharge and extract one third of its storage capacity in any year. The combined extraction capacity is 45,667 AFY. Since the participants are sharing the benefits equally, each agency receives 25 percent (1/4) of the total capacity (IEUA does not currently have any storage capacity), resulting in each of the SARCCUP agencies receiving 11,417 AFY of new dry year yield. This may require transfers, in-lieu, or exchanges between the agencies in both wet and dry years. EMWD's SARCCUP facilities include recharge facilities, three production wells, eleven monitoring wells, and associated equipping and ancillary facilities.

In early 2016, SAWPA was formally notified that it had been awarded $64,268,000 by DWR for its Proposition 84 2015 IRWM grant proposal, which included the SARCCUP. From the grant, SAWPA governance designated $55 million for SARCCUP implementation. The SARCCUP Proposition 84 grant award includes the development of a Decision Support Model which was used to help refine the proposed facilities and identified additional facilities that could be included in future phases of the program. The total cost of Phase 1 of the SARCCUP program is approximately $150 million.

Construction of the SARCCUP facilities is on-going and estimated to be complete by 2023. The SARCCUP agencies will continue work to finalize all of the individual agreements needed for operations of the facilities and water purchases. This includes an agreement between the SARCCUP agencies and Metropolitan to allow purchase of water made available under the program and special conditions associated with use of the water during droughts and emergencies. Metropolitan recently authorized agreements associated with SARCCUP to be executed. All agreements associated with SARCCUP have been or will be presented to EMWD's Board for approval prior to completion of the SARCCUP facilities.

6.2.8 Future Water Projects

EMWD is in the process of updating planning efforts for wastewater, water and recycled water supplies and facilities. EMWD's expected future water supply projects and programs that have a quantifiable increase in supply and are reasonably expected to be implemented over the next 25 years are summarized in **Table 6-12**.

Table 6-12. DWR 6-7R Expected Future Water Supply Projects or Programs

NAME OF FUTURE PROJECTS OR PROGRAMS	JOINT PROJECT WITH OTHER SUPPLIERS	AGENCY NAME	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	PLANNED FOR USE IN YEAR TYPE	EXPECTED INCREASE IN WATER SUPPLY TO SUPPLIER
SARCCUP / San Jacinto Enhanced Recharge and Recovery Program (ERRP) Phase I	Yes	Inland Empire Utilities Agencies, Orange County Water District, San Bernardino Valley Municipal Water District, Western Municipal Water District, DWR	Project to be completed in phases and includes conjunctive use of groundwater recharge	2025	Multi-Dry Year	7,000 AFY
Perris North Basin Groundwater Contamination Prevention and Remediation Program	Yes	SWRCB (funding partner), WMWD	Combined MV and North Perris GW Development, and wells near MARB	2023	Average Year	6,450 AFY
Perris II Desalter	Yes	Army Corps of Engineers	Expected to be online mid-2021	2021	Average Year	5,400 AFY
Purified Water Replenishment, Phase I (IPR)	No	N/A	Advanced treated recycled water used to recharge the Hemet/San Jacinto Basin	2024	Average Year	4,000 AFY
Purified Water Replenishment, Phase II (IPR)	No	N/A	Advanced treated recycled water used to recharge the Hemet/San Jacinto Basin - could be increased to 11,000 AFY if brine issues are resolved	2035	Average Year	8,000 AFY
San Jacinto Enhanced Recharge and Recovery Program (ERRP) Phase II	No		Project to be completed in phases and includes conjunctive use of groundwater recharge	2030 - 2035	Multi-Dry Year	7,500 AFY
San Jacinto Enhanced Recharge and Recovery Program (ERRP) Phase III	No		Project to be completed in phases and includes conjunctive use of groundwater recharge	2040 - 2050	Multi-Dry Year	TBD

6.2.9 Summary of Existing and Planned Sources of Water

As described throughout this chapter, EMWD has developed a number of local supplies to offset imported water demand including recycled water, groundwater, and desalinated groundwater. EMWD's planned supply projects will increase supply reliability to mitigate against impacts to supply during dry and multi-dry years.

The following tables summarize EMWD's retail and wholesale current and projected supplies.

Table 6-13. DWR 6-8R Actual Water Supplies

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2020	
		ACTUAL VOLUME (AF)	WATER QUALITY
Purchased or Imported Water	Treated water purchased from Metropolitan	44,726	Drinking Water
Purchased or Imported Water	Untreated water purchased from Metropolitan, treated at EMWD Filtration Plants	17,584	Drinking Water
Purchased or Imported Water	EMWD share of unused Soboba Settlement Water	2,625	Drinking Water
Purchased or Imported Water	Raw Water for Agriculture	642	Other Non-Potable Water
Groundwater (not desalinated)	Potable water pumped from the Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	9,383	Drinking Water
Groundwater (not desalinated)	Potable water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	2,402	Drinking Water
Groundwater (not desalinated)	Brackish water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) used to supplement the recycled water system	0	Other Non-Potable Water
Desalinated Water - Groundwater	Desalinated water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	7,310	Drinking Water
Recycled Water	Includes Storage Pond Incidental Recharge / Evaporation	39,642	Other Non-Potable Water
	TOTAL:	**124,314**	

Table 6-14. DWR 6-8W Actual Water Supplies

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2020	
		ACTUAL VOLUME (AF)	WATER QUALITY
Purchased or Imported Water	Treated Water purchased from Metropolitan	15,008	Drinking Water
Purchased or Imported Water	Raw Water purchased from Metropolitan	14,909	Other Non-Potable Water
Purchased or Imported Water	Soboba Settlement Water	6,467	Other Non-Potable Water
Recycled Water		1,285	Recycled Water
	TOTAL:	**37,669**	

Table 6-15. DWR 6-9R Projected Water Supplies

		PROJECTED WATER SUPPLY (AFY)				
		REASONABLY AVAILABLE VOLUME				
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2025	2030	2035	2040	2045
Purchased or Imported Water	Metropolitan Treated/ Untreated	66,447	72,147	70,247	74,747	78,847
Groundwater (not desalinated)	Pumped from the Hemet/San Jacinto Basin	7,303	7,303	7,303	7,303	7,303
Groundwater (not desalinated)	Pumped from the West San Jacinto Basin	11,450	11,450	11,450	11,450	11,450
Desalinated Water - Groundwater	Desalinated water from the West San Jacinto Basin	13,400	13,400	13,400	13,400	13,400
Recycled Water	Excludes Storage Pond Incidental Recharge / Evaporation	43,330	49,020	54,500	59,800	64,100
Other	Purified Water Replenishment (IPR)	4,000	4,000	12,000	12,000	12,000
	TOTAL:	**145,930**	**157,320**	**168,900**	**178,700**	**187,100**

The projected recycled water supply total is inclusive of recycled water that is required to be recharged as part of EMWD's planning Purified Water Replenishment (PWR) Program – an Indirect Potable Reuse project with multiple phases. This recharge volume is reported under the groundwater recharge line item in Table 6-7 (DWR 6-4R) as a demand/beneficial use of EMWD's recycled water supply. The projected supply total under the "other" category reflects the volume of water produced by PWR that will be used to meet demands on EMWD's potable water system.

Table 6-16. DWR 6-9W Projected Water Supplies

		PROJECTED WATER SUPPLY (AFY)				
		REASONABLY AVAILABLE VOLUME				
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2025	2030	2035	2040	2045
Purchased or Imported Water	Metropolitan Treated / Untreated	50,700	44,900	46,900	49,200	51,300
Purchased or Imported Water	Soboba Settlement Water	7,500	7,500	7,500	7,500	7,500
Recycled Water		4,770	5,180	5,600	5,600	5,600
	TOTAL:	**62,970**	**57,580**	**60,000**	**62,300**	**64,400**

Soboba Settlement requires Metropolitan to provide a long term annual average recharge of 7,500 AFY - any portion unused by the Soboba Tribe is split for use by EMWD, LHMWD, City of Hemet, and the City of San Jacinto

6.2.10 Climate Change Effects

EMWD has considered the impact of climate change on water supplies as part of its long-term strategic planning. Climate change has the potential to affect not only local demand and supplies, but to reduce the amount of water available for import. Warmer temperatures will lead to higher demand for water within EMWD's service area and throughout California. An increase in intensity and frequency of extreme weather events can impact both local and imported supplies. EMWD gets approximately half of its retail supply from Metropolitan which imports water from the Bay-Delta system through the SWP and the Colorado River through the CRA. Potential impacts to these imported supplies are discussed in Metropolitan's UWMP.

In its climate change vulnerability assessment for the Santa Ana River Watershed, the SAWPA Region identified key supply vulnerabilities to climate change. The vulnerabilities identified in the assessment related to EMWD's supplies include:

- Reduction in the Sierra Nevada snowpack;
- Increased strain on imported supplies
- Inability to meet water demands during drought
- Shortage of long-term water storage

One of the outcomes of climate change could be more frequent limitations on imported supplies. To limit the impact of climate change, EMWD's long-term planning focuses on the development of reliable local resources and the implementation of water use efficiency. This includes the full utilization of recycled water, which is a highly resilient supply source, and the proactive management, monitoring, and recharge of local groundwater basins to ensure supply reliability even during potential periods of severe hydrologic conditions. EMWD is also focused on reducing demand for water supplies, especially outdoors. Increasing the use of local resources and reducing the need for imported water has the dual benefit of not only improving water supply reliability, but reducing the energy required to import water to EMWD's service area.

6.3 Energy Intensity

EMWD has calculated the energy intensity of its water management operations using the approach recommended by DWR. EMWD has self-regenerated renewable energy for both the potable and recycled water systems. This renewable energy is provided through solar generation and use of digester gas. The energy generated is used for the treatment processes and helps reduce the need for purchased power. The energy use for calendar year 2019 for the two systems are shown in **Table 6-17** and **Table 6-18**.

Table 6-17. DWR Table O-1-1B Energy Intensity of Water Operations

Urban Water Supplier: Eastern Municipal Water District

Water Delivery Product (If delivering more than one type of product use Table O-1C): Other

TABLE O-1B: RECOMMENDED ENERGY REPORTING - TOTAL UTILITY APPROACH

Start Date for Reporting Period: 1/1/2019 End Date for Reporting Period: 12/31/2019	URBAN WATER SUPPLIER OPERATIONAL CONTROL		
Is upstream embedded in the values reported?	SUM OF ALL WATER MANAGEMENT PROCESSES	NON-CONSEQUENTIAL HYDROPOWER	
Water Volume Units Used	**TOTAL UTILITY**	**HYDROPOWER**	**NET UTILITY**
Volume of Water Entering Process (volume unit)	119205	0	119205
Energy Consumed (kWh)	53763864	0	53763864
ENERGY INTENSITY (KWH/VOLUME)	**451.0**	**0.0**	**451.0**

QUANTITY OF SELF-GENERATED RENEWABLE ENERGY

0 kWh

DATA QUALITY (ESTIMATE, METERED DATA, COMBINATION OF ESTIMATES AND METERED DATA)

Combination of Estimates and Metered Data

DATA QUALITY NARRATIVE:

NARRATIVE:

Table 6-18. DWR Table O-2 Energy Intensity of Wastewater and Recycled Water Operations

TABLE O-2: RECOMMENDED ENERGY REPORTING - WASTEWATER & RECYCLED WATER				
Start Date for Reporting Period: 1/1/2019 End Date for Reporting Period: 12/31/2019	URBAN WATER SUPPLIER OPERATIONAL CONTROL WATER MANAGEMENT PROCESS			
Is upstream embedded in the values reported? Volume of Water Units Used AF	COLLECTION / CONVEYANCE	TREATMENT	DISCHARGE / DISTRIBUTION	TOTAL
Volume of Wastewater Entering Process (volume units selected above)	48,415	48,415	6,120	48,415
Wastewater Energy Consumed (kWh)	17,014,851	54,199,173	0	71,214,024
WASTEWATER ENERGY INTENSITY (KWH/VOLUME)	**351.4**	**1,119.5**	**0.0**	**1,470.9**
Volume of Recycled Water Entering Process (AF)	0	0	42,300	42,300
Recycled Water Energy Consumed (kWh)	0	0	7,415,833	7,415,833
RECYCLED WATER ENERGY INTENSITY (KWH/VOLUME)	**0.0**	**0.0**	**175.3**	**175.3**
QUANTITY OF SELF-GENERATED RENEWABLE ENERGY RELATED TO RECYCLED WATER AND WASTEWATER OPERATIONS				
Wastewater system: 8,756,363 kWh of self-generated solar (included in use above) Recycled water system: 2,213,990 kWh of self-generated solar (included in use above) Wastewater system: 21,486,638 kWh of digester gas generation (included in use above)				
DATA QUALITY (ESTIMATE, METERED DATA, COMBINATION OF ESTIMATES AND METERED DATA)				
Combination of Estimates and Metered Data				
DATA QUALITY NARRATIVE:				
NARRATIVE:				

7 Water Service Reliability and Drought Risk Assessment

This chapter presents a comparison of EMWD's expected supplies and demands during future conditions

Each of EMWD supply's sources has potential constraints that could affect future reliability. This section describes these potential constraints. EMWD's diverse supply portfolio is expected to allow it to maintain reliable water service for the next 25 years.

IN THIS SECTION

- Water Service Reliability Assessment
- Drought Risk Assessment

7.1 Water Service Reliability Assessment

This section presents an assessment of the expected reliability of EMWD's sources of supply.

7.1.1 Imported Water Reliability

Approximately half of EMWD's current and projected retail water supplies are imported through Metropolitan. EMWD also imports water from Metropolitan to augment the supplies of its wholesale customers. Metropolitan's resource management strategy depends on improving the reliability and availability of imported water supplies, increasing local storage and developing local resources. In Metropolitan's 2020 UWMP, it evaluated challenges to supply reliability, including drought conditions, environmental regulations, water quality concerns, infrastructure vulnerabilities to natural disaster, and responses to variations in water supply availability from year to year.

Flexible and adaptive regional planning strategies are required. Metropolitan's continued progress in developing a diverse resource portfolio will allow it to meet the region's water supply needs. Metropolitan's 2020 UWMP details its planning initiatives and based on these efforts concludes that with the storage and transfer programs developed, Metropolitan has sufficient supply capabilities to meet the expected demands of its member agencies from 2020 through 2045 under normal, historic single-dry and historic multiple-dry year conditions. EMWD is relying on Metropolitan's 2020 UWMP to evaluate the reliability of imported supplies and the amount of imported water which will be available in EMWD's service area during normal, single dry, and multiple dry water year periods.

In February 2008, Metropolitan adopted its Water Supply Allocation Plan (WSAP) to allocate water based on need during periods of mandatory imported water allocations throughout the region. The WSAP contains a specific formula and methodology to determine member agency supply allocations. Metropolitan works with member agencies to periodically review the WSAP formula and make adjustments as needed. The most recent revision to the WSAP was completed in December of 2014. The plan takes into consideration:

- The impact on retail customers and the economy
- Population and growth
- Changes and/or loss of local supply
- Reclamation and recycling
- Conservation
- Investment in local resources

In the event allocation is required, the WSAP establishes base period demands and then adjusts them for population growth and changes in local supply; it then calculates the water supply allocation for each member agency based on the calculated needs. Regional shortages are defined in 10 stages and credits are given for conservation and investment in local extraordinary supplies. These credits would potentially reduce a member agency's cutback under an allocation. EMWD currently expects that its contribution to SARCCUP would qualify for the extraordinary supply credit. It is Metropolitan's intent to prevent member agencies from experiencing retail shortages that are greater than corresponding regional shortages.

The probability of Metropolitan meeting dry year demands is dependent on the amount of water Metropolitan has in its reserves. Under some conditions, Metropolitan may choose to implement the WSAP proactively to preserve storage reserved for a future year. Accordingly, a Metropolitan allocation does not necessarily represent a Metropolitan shortage, and member agencies are not prohibiting from making purchases over their allocated volume. However, any purchases made over the allocation would be subject to a surcharge.

7.1.2 Groundwater and Desalinated Groundwater Supply Reliability

Protecting the available groundwater supply is an integral component of EMWD's planning efforts. EMWD is actively working with other agencies and groups to ensure that groundwater will be a reliable resource far into the future. To improve groundwater reliability EMWD and other groundwater producers are reducing production of native groundwater and using imported water to supplement natural recharge.

EMWD and the other participants in the Hemet/San Jacinto area have agreed to reduce production. The long-term adjusted base production right for EMWD is 7,303 AFY.

Production over the base production right requires basin replenishment. There is a long-term agreement in place for Metropolitan to provide an average of 7,500 AFY for replenishment in the Hemet/San Jacinto Basin. This water is to be used by the Soboba Tribe with any unused water available to the other municipal producers in the Hemet/San Jacinto Basin, as described in Chapter 6. The municipal producers are allowed to carry over quantities of both unused replenishment water and adjusted base production rights to future years. EMWD has also purchased carry over credits from other municipal producers in the basin. At the end of 2020, EMWD's carry over credit balance in the Hemet/San Jacinto Basin was over 25,000 acre-feet.

EMWD has plans to expand recharge through the ERRP.

Potable groundwater production from the West San Jacinto Basin will increase once the Perris North Basin Groundwater Contamination Prevention and Remediation Program is completed, and brackish groundwater production will increase as EMWD's desalter program comes online in 2021.

Desalination of groundwater from the West San Jacinto Basin increases groundwater supply reliability in the San Jacinto Basin by helping manage increasing groundwater levels that are due to decreased production. Desalination also prevents migration of brackish groundwater that could otherwise contaminate potable groundwater supplies.

7.1.3 Recycled Water Supply Reliability

EMWD has established a strategic goal of maximizing beneficial reuse of recycled water and frequently reuses 100 percent of the wastewater generated in its service area as recycled water. Because recycled water supply is dependent on wastewater generation and not precipitation, it is considered a nearly 100 percent reliable, drought-resistant supply. EMWD also has optimization efforts underway to improve operation of the recycled water system.

7.1.4 Water Quality Constraints on Water Sources

Promoting and protecting the quality of its water resources is a vital part of EMWD's planning and operations. Water quality constraints for imported water and groundwater are part of the criteria used to evaluate the value of a proposed project. EMWD does not anticipate a reduction in supply reliability due to water quality constraints. Contaminants of concern may require treatment or blending, but long-term supply planning indicates that the quantity of available water will not be diminished from projected levels due to quality.

7.1.4.1 Imported Water Quality

As part of the Metropolitan IRP and other planning efforts, Metropolitan has concentrated on maintaining the quality of source water and developing management programs that protect and enhance water quality. Metropolitan has two water sources: the CRA and the SWP. Metropolitan responds to water quality concerns by concentrating on protecting the quality of source water and developing water management programs that maintain and enhance water quality. Based on current knowledge, the only water quality threat to Metropolitan water supplies that may require future treatment is the potential for increased salinity levels.

To date, Metropolitan has not identified any other water quality issues that cannot be mitigated. Increased salinity may impact the amount of water available in the future. If additional treatment is required, Metropolitan could experience a loss of up to 15 percent of the water processed. Since only a small portion of the total water supply would be treated and blended with the remaining unprocessed water, there is no significant risk to Metropolitan's water supply availability.

Additional information and analysis of water quality is included in Metropolitan's 2020 UWMP.

7.1.4.2 Groundwater and Desalinated Groundwater Quality

EMWD has an extensive and proactive groundwater monitoring program that includes collecting, compiling and analyzing data related to groundwater quality. There are no known significant threats to EMWD's groundwater supply that cannot be mitigated by treatment or blending and EMWD does not anticipate a significant loss of supply due to water quality issues. EMWD may occasionally alter operational patterns to support treatment or blending.

EMWD protects groundwater supplies from potential water quality risks including contamination from salinity, nitrates, and chlorinated and other volatile organic compounds. Other contaminants have also been found in local groundwater sources at levels exceeding PHGs and may require additional treatment in the future.

Salinity and Nitrates

In partnership with other agencies, EMWD is responsible for the protection and preservation of local groundwater under the authority of the HSJ Management Plan and the WSJ Management Plan. Salinity and nitrate levels in groundwater increase due to agricultural activities, urban use, and recycled water use. EMWD monitors the salinity and nitrate levels in local basins as part of the groundwater management plan. EMWD also evaluates the ambient water quality for the basins and the data indicates that the basins are slowly increasing in concentrations of salinity and nutrients. Typically, the groundwater water quality meets the safe drinking water standards for salinity and nutrients and can be used directly. Where the salt and nutrients exceed the drinking water standards, EMWD addresses water quality through the efforts of the desalination program. Two operational desalination plants and one planned plant are part of EMWD's effort to remove salts and nutrients from the brackish water supply. In addition to supplying a source of drinking water, desalination also prevents the migration of brackish groundwater into other management zones.

Chlorinated Solvents and Other Volatile Organic Compounds

In the WSJ Management Plan, chlorinated solvents and other volatile organic compounds have been found in amounts that exceed PHGs. Chlorinated solvents are volatile organic compounds (VOCs) that contain chlorine. In general, they are used in aerospace and electronics industries, dry-cleaning, and degreasing industries. EMWD is vigilant in protecting groundwater basins from VOC contamination by closely monitoring the construction of new businesses such as gas stations and manufacturing within the vicinity of production wells. Through the review of proposed new development, EMWD works with local land agencies to ensure that groundwater quality is protected.

Arsenic

Arsenic is a naturally occurring compound found in rocks, soil, water and air. Arsenic has been found in several of EMWDs wells at levels that range from not detected to 12 µg/L (2015 data). In 2006, the MCL for arsenic in domestic water supplies was lowered to 10 µg/L by the USEPA. Currently, high arsenic concentration sources are blended with lower concentration sources to comply with the MCL. Should California lower the State's MCL below the federal level, some of EMWD's production wells could be impacted, requiring additional treatment facilities to utilize these wells.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and Personal Care Products (PPCPs) are constituents of emerging concern and EMWD has been and will continue to be proactive in addressing water quality concerns that arise. EMWD participates in the USEPA's Unregulated Contaminant Monitoring Rule program, which recently has included monitoring for PPCPs.

Per-and Polyfluoroalkyl Substances

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that includes PFOA, PFOS, GenX and many other chemicals. Historical activities at the former March Air Force Base have been identified as sources of PFOA and PFOS contamination in the groundwater. PFOA and PFOS have been detected at levels that exceed the current Division of Drinking Water notification levels in the Perris North and Perris South subbasins; however, groundwater extracted from these basins for drinking water that exceed the notification levels is treated to reduce PFOA and PFOS concentrations to below the notification levels. Should California lower notification levels, establish MCLs that are lower than current notification levels, or add notification levels/MCLs for additional PFAS compounds, some of EMWD's production wells could be impacted, requiring additional treatment facilities to utilize these wells.

7.1.4.3 Recycled Water Quality

EMWD has an extensive recycled water program and this supply is used for landscape, agricultural, and environmental uses. It significantly offsets non-potable water demands throughout the EMWD. Water quality issues with recycled water include high salinity, nutrients, and PPCPs.

Salinity and Nutrient Management

One of the challenges with the use of the recycled water is that it has salinity and nutrient concentrations that exceed the Santa Ana Region's basin plan objectives. EMWD has a Salinity and Nutrient Management Program (SNMP) specifically designed to evaluate and address the salinity and nutrient impacts that may be associated with the use of recycled water. The SNMP determines whether or not the recycled water complies with the basin plan water quality objectives. In the basins where the recycled water does not meet the water quality objectives, the SNMP determines the excess loading to the basin and describes EMWD's offset mitigation measure to address the added salt and nutrient load. Because recycled water offers a great benefit to the region and reduces the demand on the potable water system for non-potable water purposes, the basin plan allows the excess salt and nutrient load to be mitigated. The SNMP describes the approved offset mitigation measures utilized by EMWD. This offset program ensures that for every excess pound of salt or nutrient added to the basin, a corresponding pound is removed by desalinization wells or mitigated by replenishment with higher quality water.

Pharmaceuticals and Personal Care Products

PPCPs are a source of concern in EMWD's recycled water. In 2008, EMWD participated with SAWPA to form a Task Force to develop a plan to characterize emerging constituents (ECs) throughout the region. In 2009, the Task Force presented an acceptable monitoring plan to the Santa Ana Regional

Water Quality Control Board to monitor specific ECs. The plan included monitoring by SAWPA members to evaluate EC levels in wastewater effluent, local receiving streams and other raw water supplies imported into the area. Samples were collected in the spring of 2010 and a final report was prepared by SAWPA in late 2010. The results indicated the presence of some ECs at trace levels (parts per trillion) in the wastewater effluent that are consistent with the results from other wastewater agencies. EMWD tests for ECs in recycled water every three years, and monitors efforts towards the development of regulations.

7.1.5 Year Type Characterization

Since approximately half of EMWD's service area supplies are imported from Metropolitan, EMWD's normal, single-dry, and multi-dry year conditions are based on the same years used by Metropolitan in its 2020 UWMP. As described in Metropolitan's UWMP, these years are based on hydrological conditions impacting SWP supplies. EMWD's single-dry year condition is represented by 1977 hydrology and the multiple-dry year condition is represented by 1988-1992 hydrology. EMWD's average year is represented by the average of the 1922-2017 hydrologic conditions.

The base years for EMWD's retail and wholesale supplies are identified in Table 7-1 and Table 7-2.

Table 7-1. DWR 7-1R Basis for Water Year Data (Reliability Assessment)

-		AVAILABLE SUPPLY IF YEAR TYPE REPEATS	
YEAR TYPE	BASE YEAR	VOLUME AVAILABLE	PERCENT OF AVERAGE SUPPLY
AVERAGE YEAR	1922 - 2017		100%
SINGLE-DRY YEAR	1977		100%
CONSECUTIVE DRY YEARS 1ST YEAR	1988		100%
CONSECUTIVE DRY YEARS 2ND YEAR	1989		100%
CONSECUTIVE DRY YEARS 3RD YEAR	1990		100%
CONSECUTIVE DRY YEARS 4TH YEAR	1991		100%
CONSECUTIVE DRY YEARS 5TH YEAR	1992		100%

Note: Because EMWD is able to purchase additional water from Metropolitan to meet demands, percent of supply is 100% or greater.

Table 7-2. DWR 7-1W Basis for Water Year Data (Reliability Assessment)

-		AVAILABLE SUPPLY IF YEAR TYPE REPEATS	
YEAR TYPE	BASE YEAR	VOLUME AVAILABLE	PERCENT OF AVERAGE SUPPLY
AVERAGE YEAR	1922 - 2017		100%
SINGLE-DRY YEAR	1977		100%
CONSECUTIVE DRY YEARS 1ST YEAR	1988		100%
CONSECUTIVE DRY YEARS 2ND YEAR	1989		100%
CONSECUTIVE DRY YEARS 3RD YEAR	1990		100%
CONSECUTIVE DRY YEARS 4TH YEAR	1991		100%
CONSECUTIVE DRY YEARS 5TH YEAR	1992		100%

Note: Because EMWD is able to purchase additional water from Metropolitan to meet demands, percent of supply is 100% or greater.

7.1.6 Water Service Reliability

Based on the information provided in the Metropolitan UWMP, EMWD has the ability to meet current and projected water demands through 2045 during normal, historic single-dry and historic multiple-dry year periods using imported water from Metropolitan with existing supply resources. Planned local supplies will complement imported supplies and improve reliability for EMWD and the region.

EMWD will continue to rely on imported water from Metropolitan as the main source of supply for its retail and wholesale customers, yet recognizes the need to increase local supplies and water conservation to manage supply and demand. Metropolitan evaluated challenges to supply reliability in its UWMP, including drought conditions, environmental regulations, water quality concerns, and infrastructure vulnerability. Metropolitan has undertaken several planning initiatives to assess and prepare for vulnerabilities including its Integrated Resources Plan, its Water Surplus and Drought Management Plan, and its Water Supply Allocation Plan (WSAP). Additionally, Metropolitan has developed dry-year storage through groundwater and surface water reservoirs that help meet dry-year demands. Based on the information provided in Metropolitan's UWMP, Metropolitan has sufficient supply capabilities to meet the expected demands of its member agencies from 2020 through 2045 under normal, historic single-dry and historic multiple-dry year conditions.

If another multiple-dry year period were to occur over the next five years, Metropolitan could declare an allocation. EMWD is able to respond to a potential allocation through implementation of its WSCP and its balance of carry over credits in the Hemet/San Jacinto Management Plan Area. EMWD has the ability to meet current and projected water demands through 2045 under normal, historic single-dry and historic multiple-dry year conditions using a combination of imported water from Metropolitan and existing local supply resources.

7.1.6.1 Water Service Reliability – Normal Year

Table 7-3 and **Table 7-4** demonstrate that EMWD will have sufficient supplies to meet both retail and wholesale demands from 2020 to 2045 under average year conditions.

Table 7-3. DWR 7-2R Normal Year Supply and Demand Comparison

-	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	145,930	157,320	168,900	178,700	187,100
Demand Totals From Table 4-3R	145,930	157,320	168,900	178,700	187,100
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

Table 7-4. DWR 7-2W Normal Year Supply and Demand Comparison

-	2025	2030	2035	2040	2045
Supply Totals From Table 6-9W	62,970	57,580	60,000	62,300	64,400
Demand Totals From Table 4-3W	62,970	57,580	60,000	62,300	64,400
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

7.1.6.2 Water Service Reliability – Single Dry Year

The single-dry year represents the year with the lowest water supply available to the agency. EMWD's single-dry year is represented using 1977 hydrologic conditions. EMWD has developed programs to help accommodate increases in demand during dry years including the planned ERRP project which would allow EMWD to rely more heavily on groundwater supplies to meet demand in dry years. Additionally, EMWD could import more water from Metropolitan to meet increases in demand. **Table 7-5** and **Table 7-6** demonstrate that EMWD will have sufficient supplies to meet both retail and wholesale demands from 2020 to 2045 under single-dry year conditions.

Table 7-5. DWR 7-3R Single Dry Year Supply and Demand Comparison

-	2025	2030	2035	2040	2045
Supply Totals	151,130	162,820	174,700	184,700	193,300
Demand Totals	151,130	162,820	174,700	184,700	193,300
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

Table 7-6. DWR 7-3W Single Dry Year Supply and Demand Comparison

-	2025	2030	2035	2040	2045
Supply Totals	64,770	59,080	61,600	63,600	65,900
Demand Totals	64,770	59,080	61,600	63,600	65,900
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

7.1.6.3 Water Service Reliability – Five Consecutive Dry Years

The multiple-dry year period represents the lowest average water supply availability to the agency for a consecutive five-year period. EMWD's multiple-dry year period is represented using hydrologic conditions similar to the 1988-1992 period.

As demonstrated in **Table 7-7** and **Table 7-8**, EMWD will have sufficient supplies to meet both retail and wholesale demands from 2020 to 2045 under multiple-dry year conditions. During dry periods, EMWD would be able to utilize stored groundwater from the proposed ERRP project or import more water from Metropolitan to meet demands, if needed.

Table 7-7. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

-	-	2025	2030	2035	2040	2045
First	Supply Totals	151,130	162,820	174,700	184,700	193,300
Year	Demand Totals	151,130	162,820	174,700	184,700	193,300
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Second	Supply Totals	132,700	143,300	153,700	162,500	170,300
Year	Demand Totals	132,700	143,300	153,700	162,500	170,300
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Third	Supply Totals	134,900	145,500	155,500	164,100	171,900
Year	Demand Totals	134,900	145,500	155,500	164,100	171,900
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Fourth	Supply Totals	137,100	147,600	157,400	165,700	173,500
Year	Demand Totals	137,100	147,600	157,400	165,700	173,500
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Fifth	Supply Totals	140,200	150,800	160,000	168,000	175,800
Year	Demand Totals	140,200	150,800	160,000	168,000	175,800
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**

Table 7-8. DWR 7-4W Multiple Dry Years Supply and Demand Comparison

-	-	2025	2030	2035	2040	2045
First	Supply Totals	64,770	59,080	61,600	63,600	65,900
Year	Demand Totals	64,770	59,080	61,600	63,600	65,900
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Second	Supply Totals	63,200	59,100	61,400	63,400	65,600
Year	Demand Totals	63,200	59,100	61,400	63,400	65,600
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Third	Supply Totals	62,100	59,600	61,800	63,900	66,000
Year	Demand Totals	62,100	59,600	61,800	63,900	66,000
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Fourth	Supply Totals	61,000	60,100	62,200	64,300	66,400
Year	Demand Totals	61,000	60,100	62,200	64,300	66,400
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Fifth	Supply Totals	59,800	60,600	62,600	64,700	66,900
Year	Demand Totals	59,800	60,600	62,600	64,700	66,900
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**

Note: Includes 7,500 AFY of Soboba Settlement Recharge.

7.2 Drought Risk Assessment

EMWD anticipates it will have enough supplies to meet demands under all water year conditions from 2020 through 2045. To supplement Metropolitan imported sources and improve reliability, EMWD has several local resource programs. Production of local groundwater has been a source of supply for EMWD's service area for decades, but overproduction of groundwater has led to a need for groundwater management. Native production is limited and plans are in place to recharge local ground water basins to increase supply reliability. Desalination of high TDS groundwater also provides a reliable local supply of water.

Recycled water production and sales reduce the demand for imported water and provide a sustainable supply. EMWD's continued investment in improved facilities will continue to grow the market for recycled water, and innovative planning and recycled water management will allow EMWD's recycled water supply to bring an even greater benefit to the service area.

EMWD also has several planned projects that will increase regional supply reliability by increasing local supplies and decreasing demands for imported water from Metropolitan. These projects include increasing local groundwater banking through the ERRP, expanding the desalter program with the Perris II Desalter, and full utilization of recycled water through implementation of IPR.

In addition to the development of local resources, EMWD aggressively promotes the efficient use of water. Through the implementation of local ordinances, conservation programs and an innovative tiered pricing structure, EMWD is reducing demands on retail accounts. Reducing demands allows existing and proposed water supplies to stretch farther and reduces the potential for water supply shortages.

The California Water Code requires suppliers to prepare a Five-Year Drought Risk Assessment (DRA) to assess their ability to meet demands if the next five years are dry.

The results of the DRA are summarized in **Table 7-9**.

Table 7-9. DWR 7-5 Five-Year Drought Risk Assessment

2021	Gross Water Use	177,900
	Total Supplies	177,900
	Surplus/Shortfall without WSCP Action	0
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2022	Gross Water Use	185,400
	Total Supplies	185,400
	Surplus/Shortfall without WSCP Action	0
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	
	WSCP (Use Reduction Savings Benefit)	14,900
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	8%
2023	Gross Water Use	194,400
	Total Supplies	194,400
	Surplus/Shortfall without WSCP Action	0
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	15,400
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	8%
2024	Gross Water Use	209,400
	Total Supplies	209,400
	Surplus/Shortfall without WSCP Action	0
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	16,000
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	8%
2025	Gross Water Use	217,500
	Total Supplies	217,500
	Surplus/Shortfall without WSCP Action	0
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	16,500
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	8%

For each year: "revised surplus/shortfall" is still 0 AF because WSCP savings result in less purchases from Metropolitan.

8 Water Shortage Contingency Plan

For the 2020 UWMP reporting cycle, EMWD prepared a Water Shortage Contingency Plan (WSCP). The WSCP is an appendix to this document and is being adopted separately by the EMWD Board of Directors.

Adopting the UWMP as a separate document will allow EMWD to make adjustments as needed without triggering the need to amend and re-adopt the UWMP.

This chapter has been retained in the UWMP to maintain consistency with the chapter numbering defined in the DWR Guidebook.

IN THIS SECTION

- The WSCP is attached as Appendix I.

8.1 WSCP Overview

The WSCP includes a description of the shortage response actions that EMWD could implement to close a gap between supply and demand. It was developed and adopted as a separate document from the UWMP so that it can be modified if needed during the next five years.

9 Demand Management Measures

The CWC and UWMP Act require water agencies to describe the Demand Management Measures (DMMs) that an agency is implementing as part of its overall water conservation program. As both a retail and wholesale water agency, EMWD is responsible for fulfilling the requirements of both the retail and wholesale DMMs.

EMWD has established itself as a statewide leader in water use efficiency and continues to promote water conservation through investments in infrastructure, technology, education, and community outreach programs.

IN THIS SECTION

- Programs to Encourage and Incentivize Efficient Water Use

In 2009, EMWD first implemented the use of water budgets for its residential customers. The tiered water rate structure was designed to promote water conservation by encouraging efficient water use and discouraging wasteful water usage. All residential customers received a monthly water budget allocation customized to meet their specific household and landscape irrigation needs. The rate structure set budgets for indoor usage and usage in excess of the total budget. In 2017, the Board adopted a new water rate structure, adjusted to meet new State standards that call for making water efficiency a permanent way of life. The changes maintained the principles behind EMWD's rate structure, reflecting the cost of service while rewarding customers who use less and penalize those who are wasteful.

In 2019, EMWD launched its WaterWise Plus program, a comprehensive and forward-thinking program designed to assist customers and partner agencies with finding new and cost-effective ways to become more water efficient. The program integrates existing water use efficiency-based programs with long-term solutions that are promoted regardless of drought conditions. These programs help customers make lifestyle changes to their water use habits resulting in becoming more efficient with their water use, gaining a better understanding of their water usage, and making them better able to manage their monthly bills.

EMWD offers a wide range of programs for residential customers, including participation in the Metropolitan Water District of Southern California (Metropolitan) turf removal rebate program, EMWD offered water efficient devices and EMWD's Demonstration Garden which is available for customers to view to obtain ideas on various water efficient and sustainable landscape options.

EMWD is also working with government agencies and the business community to develop long-term sustainable approaches to see the benefits that the average residential customers may realize. It is partnering with the cities it serves in introducing a landscape transformation program, promoting investments in climate appropriate landscaping in commercial, industrial, and instructional areas through turf replacement programs. EMWD is also partnering with its local agricultural customers to better understand current irrigation practices and to incorporate programs that will further assist local farmers in managing their water use.

EMWD is an industry leader in recycled water, one of the largest by volume recyclers in the nation and one of the few agencies that achieves 100 percent beneficial reuse in most years. Its recycled water system receives and treats more than 45 million gallons of wastewater each day at its four operating regional treatment plants. About 75 percent of recycled water production is sold to agricultural irrigation, landscaping, and industrial customers. It also serves several schools, parks, cities and county streetscaping, HOA landscape areas, golf courses, wetlands habitat areas and industrial cooling towers. EMWD has the ability to store more than two billion gallons of recycled water. With significant urban development, it is prepared to manage the increase in recycled water production and is securing the regions' water future through water banking and its groundwater reliability efforts.

9.1 Demand Management Measures for Wholesale Suppliers

As a wholesale agency, EMWD is responsible for implementing DMMs for wholesale suppliers, as well as assisting its wholesale customers with their own DMM implementation. EMWD works closely with its wholesale customers to help fund, market, and implement a number of conservation programs.

9.1.1 Metering

All of EMWD's wholesale customers are fully metered and billed volumetrically each month.

9.1.2 Public Education and Outreach

As a wholesale agency, EMWD maintains extensive Public Information and School Education Programs for all of its wholesale customers.

Public Information Programs

As a wholesale agency, EMWD participates in a biennial landscaping competition with customers from EMWD, Western Municipal Water District (WMWD), and other water agencies throughout the Inland Empire as well as the respective sub agencies. EMWD initiated a long-term campaign to encourage all customers to use water wisely and offered materials with sub agencies. EMWD sponsors workshops and produces videos on California-friendly plants to promote landscaping using drought tolerant plants and the Water Waste Program to report/correct the wasteful use of water.

School Education Programs

EMWD implements an Education Program to foster understanding of water and wastewater issues and to promote wise water use among the future leaders of the community. EMWD's extensive education program is designed to provide a useful academic experience at all grade levels (K-12). Any school within EMWD's service area is eligible to benefit from the program. EMWD offers resources such as lesson plans, curriculum packets, and student materials.

As a wholesale agency, EMWD has created the language arts program "Write Off" for middle school students and is the lead agency in partnership with Rancho California Water District (RCWD), a sub agency of EMWD. Multiple presentations, which include complete curriculum packets, have resulted from this program, and agencies throughout California and other states have either duplicated the program or have requested materials to add to their current education programs.

9.1.3 Water Conservation Program Coordination and Staffing

EMWD maintains full-time staffing for water conservation programs.

EMWD's full time Conservation Staff include:

- One Executive Assistant
- One Conservation Program Assistant
- One Conservation Program Specialist
- One Water Resources Planning Manager
- One Principal Water Resources Specialist
- Two Water Resources Specialist Assistants
- One Water Resources Specialist Associate

9.1.4 Other Demand Management Measures

EMWD's wholesale agencies' customers are eligible to participate in the region-wide rebate program offered through Metropolitan. EMWD has also worked with wholesale customers to implement agency administered programs funded in part by Metropolitan. EMWD provides support and information about water use efficiency to sub agencies and offers training opportunities in landscape efficiency.

EMWD has a volume-based rate structure for wholesale customers.

9.1.5 Asset Management

EMWD's wholesale distribution system asset management program is the same as its retail asset management program.

The mission of EMWD is to deliver value to customers and the communities within EMWD's service area by providing safe, reliable, economical, and environmentally sustainable water, wastewater, and recycled water services. One of the ways this mission is carried out is through the EMWD's Asset Management program. This program was established to effectively manage assets throughout their lifecycle. The underpinnings of this program are rooted in research of other water agencies that have implemented Asset Management Plans.

One of the key components of the program is EMWD's Computerized Maintenance Management System. This system is a transactional database system that is used to capture physical attributes as well as work activities performed on assets. Asset technicians manage the asset records during new construction, refurbishment, and replacements. Two of the initial attributes captured for asset records are installation date and original purchase price. In addition, other important data is collected such as horsepower, revolutions per minute (rpm), and power requirements. Asset grouping is employed to compare histories of like assets. Further analysis may provide insight on premature failures and lead to the procurement of better performing assets.

The lifecycles of assets are determined by a number of factors. Due to the nature of business at EMWD, assets may be found in office, potable water, wastewater, and recycled water operating environments. Wastewater produces the harshest operating conditions and, therefore, decreases the life of an asset more than other EMWD environments. Another factor that impacts the life of an asset is its expected life. Empirical data is the best indicator for predicting an asset's expected life. This takes into account the operating conditions of the asset at a particular location using real-world parameters. However, this method takes time to build history from maintenance activities. An alternative method entails using industry standards from similar operations. Combining these factors allows for the remaining life of assets to be calculated.

An Asset Management model was produced to provide a framework for business decisions related to the replacement and refurbishment (R&R) of EMWD's assets. The inputs to the model include the physical location, remaining life expectancy, and the corrective maintenance costs. The health of an asset can be determined, in part, by the cost of maintenance relative to like assets. For example, if a potable pump historically costs more to maintain than another potable pump operating under similar conditions it should be further analyzed to understand the cause. Another input to the model includes EMWD's Capital Improvement Projects. By including Capital Improvement Project commitments into the model, assets that are likely candidates based on maintenance costs or end of life may be excluded from R&R consideration.

Output from the Asset Management model is provided to management for budget preparation. Assets may be grouped by site for a holistic review. Furthermore, the model allows for grouping of assets by maintenance responsibility whether electrical, mechanical, or other maintenance group. Management can easily review assets nearing end of life or with higher than usual maintenance costs. Assets are earmarked for budget inclusion or deferred to a future budget cycle. These decisions are recorded in the Asset Management model for future reference.

9.1.6 Wholesale Supplier Assistance Programs

EMWD has implemented these programs:

- Financial incentives provided for by Metropolitan for a variety of water efficient devices are administered through the SoCal Water$mart regional rebate program for residential and commercial customers. Both residential and commercial customers of EMWD's sub agencies are eligible to participate in the regional rebate programs.
- EMWD has hosted and/or conducted workshops for landscape professionals, including personnel and customers of EMWD's sub agencies, providing certification opportunities for smart irrigation controller technologies. EMWD's Board members hold Director Advisory Committee meetings with stakeholders throughout the year; and staff members attend/participate at local city councils and planning commissions. EMWD also provides assistance to sub agencies with various Geographic Information System (GIS) mapping requests.
- EMWD is the first water agency in Riverside County to offer the Qualified Water Efficient Landscaper (QWEL) professional certification program which provides landscape professionals with 24 hours of education on principles of proper plant selection for the local climate, irrigation system design and maintenance, and irrigation system programming and operation. In order to obtain the QWEL certification an individual must demonstrate their ability to perform an irrigation system audit as well as pass the QWEL exam.
- Staff meets with sub agencies to discuss conservation related topics. Regional incentive programs are administered though vendors assigned by Metropolitan and sub agencies are encouraged to participate in these programs. Metropolitan hosts monthly water use efficiency meetings to discuss the implementation of conservation programs; EMWD's sub agencies are encouraged to participate.
- During a shortage, supply to wholesale customers could be allocated using the formula and methodology based on Metropolitan's Water Supply Allocation Plan (WSAP). This plan takes into consideration: the impact on retail customers and the economy; population and growth; changes and/or loss of local supply; reclamation and recycling; conservation; and investment in local resources.
- EMWD will establish base period demands and then adjust them for growth and changes in local supply. Regional shortages will be phased in 10 stages. At each stage the wholesale customers will not experience shortages on the wholesale level that are greater than one-and-a-half times the percentage shortage of regional water supplies; nor will they face a retail shortage less than the regional shortage. Credits will be given for conservation and investment in local supplies.

9.2 Existing Demand Management Measures for Retail

EMWD has implemented programs to meet the requirements for DMMs as a retail agency.

9.2.1 Water Waste Prevention Ordinances

EMWD has implemented the following initiatives:

- **Ordinance 72.25** – Water Use Efficiency Ordinance, implemented January 1991. EMWD reviews ordinances on a regular basis with the most recent revision effective February 2016. This ordinance prohibits water waste, imposes penalties for runoff, and requires efficient design in new development. The ordinance is enforced in two ways, (1) through EMWD's allocation-based tiered rate structure for single family, multi-family and landscape accounts utilizing the domestic water system; and (2) through penalties for runoff.
- **Ordinance 117.2** – Water Shortage Contingency Plan, implemented July 2005. EMWD reviews the WSCP on a regular basis with the most recent modification adopted in 2017. This ordinance is designed for the purpose of protecting the integrity of water supply facilities (infrastructure), and implementing a contingency plan in times of drought, supply reductions, failure of water distribution systems or emergencies. The ordinance is included in Title 5, Article 10 of EMWD's administrative code (amended by Resolution No 2017-152 on December 20, 2017).
- EMWD supports legislation and local ordinances that prohibit water waste, and supports local ordinances that establish requirements for water efficient design in new development. As a member of the Riverside County Water Task Force, EMWD participated in updating Riverside County's Water Efficient Landscape Requirements Ordinance 859.
- In mid-2015, EMWD adopted new development standards to further promote conservation throughout its service area. Beginning in July 2015, all new developments are prohibited from having non-functional turf, including turf in the front yards of new homes. With more than 60 percent of water in EMWD's service area being used outdoors, this was designed to be a long-term strategy to minimize the impact of new development. EMWD's service area is currently 40 percent built out, making it one of the few regions in Southern California that will see significant population growth in the coming decades. EMWD also helped the County of Riverside adopt a similar ordinance prohibiting turf in the front yards of new homes in all unincorporated areas of Riverside County.
- EMWD has also prohibited the installation of non-functional turf in all new Commercial, Industrial, and Institutional (CII) developments. While turf is being allowed in functional areas of new development, including parks and schools, it is no longer permitted within common area landscaping that provides no functional community benefit. Non-functional turf can best be described as turf that is only ever walked on when it is being mowed.

9.2.2 Metering

A water meter is defined as a device that measures the actual volume of water delivered to an account in conformance with the guidelines of the American Water Works Association (AWWA).

EMWD has implemented this DMM through the following programs:

1. Meters are required on all new service connections
2. All service connections in EMWD's service area are metered
3. Meters are read on a monthly basis and billed monthly in hundred cubic feet
4. EMWD's program for meter testing and replacement is referenced in Table 9-1

5. EMWD has identified and measured all commercial customers with mixed use meters and completed creating water budgets for these customers in 2019
6. In an effort to reduce leaks, a continuous water use notification system was implemented in February 2016 which notifies customers of the presence of a constant water flow running through their meter (for every hour for several days), which is a strong indication of a possible leak
7. As part of the Water Loss Analysis that takes place every few years, EMWD now sends back approximately 30 small (5/8”-2”) meters each month for random testing to ensure accuracy
8. To better serve its customers in a more accurate and efficient manner, EMWD upgraded its meters to Advanced Metering Infrastructure (AMI) technology and Flex Net meters.

Table 9-1. Meter Testing and Replacement Frequency

METER TYPE	METER SIZE	MONTHLY CONSUMPTION (HUNDRED CUBIC FEET)	METER TESTING FREQUENCY	METER REPLACEMENT FREQUENCY
Residential	5/8” – 2”	Not Applicable	Customer Request	Upon Failure
Commercial	3” and Larger	1,001 – Above	6 Months	Upon Failure
Commercial	3” and Larger	401 – 1,000	12 Months	Upon Failure
Commercial	3” and Larger	201 – 400	24 Months	Upon Failure
Commercial	3” and Larger	0 – 200	36 Months	Upon Failure
Sample	Not Applicable	Not Applicable	Bi-Annually	Upon Failure

1) Meter testing frequency based on age segment (1960’s, 1961 – 1969, 1970 – 1979, etc.)

9.2.3 Conservation Pricing

Retail Water Rates

Conservation pricing provides economic incentives (a price signal) to customers to use waster efficiently. Because conservation pricing requires a volumetric rate, metered water service is a necessary condition of conservation pricing.

This DMM is intended to reinforce the need for water agencies to establish a strong nexus between volume-related systems costs and volumetric commodity rates. Conservation pricing requires volumetric rates. The goal of this DMM is to recover the maximum amount of water sales revenue from volumetric rates that is consistent with utility costs (which may include utility long-run marginal costs), financial stability, revenue sufficiency, and customer equity. In addition to volumetric rates, conservation pricing may also include service connection charges, meter service charges and/or special rates and charges for temporary service, fire protection service and other irregular services provided by the utility.

The following volumetric rate designs are potentially consistent with the above definition:

1. Uniform rate in which the volumetric rate is constant regardless of the quantity consumed
2. Seasonal rates in which the volumetric rate reflects seasonal variation in water delivery costs
3. Tiered rates in which the volumetric rate increases as the quantity used increases
4. Allocation-based rates in which the consumption tiers and respective volumetric rates are based on water use norms and water delivery costs established by the utility

In February 2009, EMWD implemented an allocation-based tiered rate structure for single family residential, multi-family residential and landscape accounts. The rate structure was instituted to promote the efficient use of water and is designed to provide customers a significant economic incentive to use the proper amount of water required to serve indoor and outdoor (landscape) demands. This is accomplished by setting a customized “allocation” for each customer account based on a variety of factors such as: irrigated area, daily weather characteristics, size of household, and other more unique characteristics such as the presence of a pool, livestock, or medical needs. Water is then sold to customers under a four-tier structure based upon their monthly allocation which varies for landscape use relating to daily weather patterns. Customers using water within their allocation purchase water in the lower two tiers. Customers using in excess of their allocation also purchase water in the remaining two tiers that generally will result in relatively high water bills which can send a strong price signal for excessive use. The tiered rate structure was also designed so that 70 percent of the rate is variable.

In January 2019, EMWD implemented water budgets and tiered rates for additional commercial, industrial, and institutional (CII) customers. The water budgets for these non-residential customers are based on industry-standard methodology, which considers factors such as business, historical average use, and amount of irrigated landscape. The structure for the CII customers includes a three-tier structure, in which Tier 1 represents the budgeted supply, and, similar to the residential and landscape structure, customers using water within their allocation purchase water in the lower tier. Customers using in excess of their allocation also purchase water in the remaining two tiers that generally will result in relatively high water bills which can send a strong price signal for excessive use.

Retail Wastewater Rates

Conservation pricing of sewer service provides incentives to reduce average or peak use, or both. Such pricing includes: (a) rates designed to recover the cost of providing service, and (b) billing for sewer service based on metered water use.

The following rate options are available for wastewater service:

1. Uniform rates in which the unit rate is the same across all units of service
2. Increasing block rates in which the unit rate increases as the quantity of units purchased increases
3. Rates in which the unit rate is based upon the long-run marginal cost or the cost of adding the next unit of capacity to the sewer system
4. Rates that charge customers a fixed amount per billing cycle for sewer service regardless of the unit of service consumed; and/or rates in which the typical bill is determined by high fixed charges and low commodity charges do not satisfy the definition of conservation pricing of sewer services.

EMWD complies with an at least as effective approach for this DMM. EMWD and RCWD, its largest sub agency, both have allocation-based tiered rate billing structures. The allocation-based tiered rate billing structure sends a strong price signal against using excessive water both indoors and outdoors. EMWD also uses the household size provided water budgets to tier sewer pricing. Finally, EMWD recycles all of its wastewater and reuses it within the service area. These methods are at least as effective as a conserving rate structure for wastewater.

9.2.4 Public Education and Outreach

California water agencies have played a major role in promoting water use efficiency through both public information and school education programs. EMWD's Public Information and Education Programs for its retail service area are described below.

Public Information Programs

Public information programs are an effective tool to educate customers about the need for water use efficiency and to influence customer behavior towards conservation. The following actions are necessary to implement a public information program to promote water conservation and related benefits:

- Public speakers to employees, community groups and the media
- Advertising using paid and public service
- Customer communication using bill inserts and on bill comparison charts for multi-year usage
- Coordination with government agencies, industry groups, public interest groups and media
- Marketing designed to change attitudes and influence behavior

EMWD has implemented this DMM in the following ways:

1. EMWD provides public speakers at new employee orientation which is conducted twice each year; provides information to employees via intranet updates on a regular basis; and occasionally provides employees with fact sheets or talking points on industry issues that may be topics of discussion with individuals outside of EMWD. Public speakers are also provided to community groups, in a variety of settings such as rotary clubs, homeowners associations, religious organizations, and mobile home parks. EMWD's active speakers' bureau provides multiple presentations each month. EMWD maintains an active relationship with reporters by phone, email and direct contact regarding topical issues relating the need to encourage water use efficiency throughout its service area. EMWD utilizes a number of means for paid advertising such as various Chambers of Commerce programs and newsletters and a variety of community publications. Monthly cable slides are used for public service advertising. Customer communication includes bill inserts, bill messaging, monthly usage comparisons on the water bills, monthly emails, and bi-monthly newsletters.
2. EMWD provides public information to promote water conservation measures. In an effort to effect changes in attitude and influence behavior, EMWD has active pages on common social media sites that are updated regularly, and dedicated water use efficiency web pages that are updated on a regular basis. Addressing the subject of training stakeholders, EMWD has hosted and/or conducted workshops for landscape professionals, providing certification opportunities for smart irrigation controller technologies. EMWD's Board members hold Director Advisory Committee meetings with stakeholders throughout the year; and staff members attend/participate at local city councils, planning commissions, and chambers of commerce events. Ongoing outreach efforts targeting new residential customers consists of a welcome letter and bi-monthly newsletters containing seasonal tips and ideas for water use efficiency. EMWD enforces local and state landscape ordinances through the use of budget based tiered rates.
3. EMWD's Education Program uses a variety of grade-appropriate curriculum to educate area students about the importance of water use efficiency. Through its wide range of programs, EMWD reaches more than 60,000 students per year. The long-term objective of the program is to establish positive water use efficiency habits at a young age in order to have a future generation of ratepayers who understand the importance of using water efficiently. Among the programs offered are: school assembly programs, field trips, classroom and virtual presentations, annual "Write-Off"

contests where students write and illustrate a water-themed book, and participation in regional poster contests.

EMWD participates in Metropolitan's regional rebate programs administered through SoCal Water$mart for residential and commercial customers.

School Education Programs

School education programs have been implemented to reach the youngest water users at an early age and reinforce the need to engage in water conservation as a life-long behavior. The following actions are necessary to implement school education programs to promote water conservation and related benefits:

1. Provide instructional assistance to school districts and private schools within the service area
2. Provide educational materials and classroom presentations that identify urban, agricultural and environmental issues and conditions in the local watershed
3. Develop and/or provide grade appropriate educational materials that meet the state education framework requirements

EMWD has implemented this DMM in the following ways:

1. EMWD has a very robust school education program that promotes water conservation and all aspects of environmental education. Additionally, EMWD works very closely with public and private schools within both its retail and wholesale service areas to provide educational materials which are in alignment with the California content standards for grades K-12.
2. EMWD provides classroom presentations covering water conservation, potable water treatment, desalination, wastewater treatment, purified water replenishment, and all aspects of environmental education. EMWD sponsors weekly field trips for students in eleven school districts throughout EMWD's service area to tour one of EMWD's wastewater treatment facilities and wetlands project and includes water education activities that are conducted in the education facility. EMWD provides materials developed by EMWD education staff and Metropolitan for K-12 students.
   EMWD has also developed a variety of curriculum for K-5 students including:
   - Wastewater Treatment for All Curious Beings – activity book
   - Dewie the Dragon – curriculum packet
   - Gobi's Adventure – curriculum packet
   - Otis the Turtle gets Water Wise – curriculum packet
   - Lily and the Seven Drops – curriculum packet
   - Bartholomew the Bird Investigates How to Use Water Wisely – curriculum packet and puppet show

   The following contests are also promoted by EMWD on an annual basis:
   - Grades K-5 Students – Poster contest "Water Use it Wisely"
   - Grades 6-8 Students – Language Arts contest "Write-Off" (results in a published book, written and illustrated by 6-8 grade students)
   - Grades 9-12 Students – Solar Cup event (MWD provides boat hull for students to assemble and EMWD provides financial support for students to outfit the boat with a motor and solar panels); and new video contest

EMWD participates in the following school and community activities:

- Environmental, science, health, and community fairs – provide activities and materials
- Annual environmental youth conference – provided in partnership with other agencies
- Sponsoring an environmental assembly program for schools in EMWD's service area

EMWD offers the following assistance for teachers in the service area:

- Training programs offered by EMWD and Metropolitan
- Training workshops offered by EMWD in partnership with other agencies to spotlight programs
- Training for Project WET offered

Conservation and Education have joined together to develop the Augmented Reality Sandbox Program (ARS) to help students learn about watersheds and topography by shaping and molding kinetic sand. Students will learn about the importance of watersheds, how we can protect them, and study elevation levels to create measurements. The ARS directly supports fourth and fifth grade common curriculum by concentrating on mathematics and science standards.

EMWD is one of Metropolitan's member agencies, as such Metropolitan has taken the lead as the wholesale agency in the Student Poster Contest Program and the Annual Solar Cup Event. Metropolitan has also provided curriculum for K-12 students.

9.2.5 Programs to Assess and Manage Distribution System Real

The goals of modern water loss control methods include both an increase in water use efficiency in the utility operations and proper economic valuation of water losses to support water loss control activities. In May 2009, the AWWA published the 3rd Edition M36 Manual "Water Audits and Loss Control Programs." This DMM incorporates these water loss management procedures and applies them in California. Agencies are expected to use the AWWA Free Water Audit Software to complete their standard water audit and water balance. For the 2020 UWMP, water agencies are required to calculate water loss using the AWWA software and report it with water use in Chapter 4.

EMWD has implemented this DMM in the following ways:

1. EMWD has compiled the standard water audit report for the past five years and included those results in Chapter 4.
2. The following methods are used to test source, import and production meters:

   Source Meters: Well meters are recalibrated or replaced annually. Filtration Plant and Desalter system supply meters are monitored against the raw water supply meters and calibrated annually.

   Import Meters: Metropolitan tests their connection meters bi-annually. EMWD's system meters are recalibrated annually and flows are monitored daily. Significant differences with Metropolitan deliveries are addressed jointly between EMWD and Metropolitan.

   Production Meters: Production meters are bench tested by a certified independent laboratory. Some large volume meters are calibrated twice a year.
3. EMWD has completed component analyses of real losses for fiscal years 2010 and 2014.
4. EMWD repairs reported leaks and breaks to the extent that are cost effective. A work order tracking system is used to track pipeline and service leaks by type and completed repairs.
5. In order to identify unreported leaks, EMWD monitors water use by customers and notifies them of anomalies that could indicate a possible leak.

9.2.6 Water Conservation Program Coordination and Staffing Support

EMWD has implemented this DMM.

EMWD's full time Conservation Staff include

- One Executive Assistant
- One Conservation Program Assistant
- One Conservation Program Specialist
- One Water Resources Planning Manager
- One Principal Water Resources Specialist
- Two Water Resources Specialist Assistants
- One Water Resources Specialist Associate

The Principal Water Resources Specialist and Water Resources Planning Manager serve as liaisons between EMWD and other public agencies, community and industry groups, and the media; recommends, develops and coordinates implementation of EMWD conservation programs; and assists in analyzing program goals, performance measures, and sources of funding. The Water Resources Specialist Associate participates in the implementation of conservation programs; develops and implements programs to inform, educate and assist with efficient water use and conservation; represents EMWD with customers in community events and meetings regarding conservation issues; and develops and implements methods to measure improvements in water use efficiency and customer satisfaction. The Conservation Program Specialist assists in the development and implementation of conservation programs; conduct water leak investigations; issue citations to enforce mandatory water conservation ordinances during times of water shortage; and represent EMWD with customers and community events and meetings on conservation issues. The Conservation Program and Water Resources Specialist Assistants perform a variety of customer service functions related to water conservation; assists with residential, landscape and CII water surveys; measures landscape area for water budgets; sends water waste notices; research problems; and conducts related duties assigned. The Executive Assistant provides administrative support for the Conservation Program.

9.2.7 Other Demand Management Measures

EMWD has implemented the following additional DMMs.

Residential Assistance Program

In 1997 EMWD's Conservation staff began performing residential surveys on a limited basis; during FY 2007/2008 and a portion of FY 2008/2009 these surveys were outsourced to a third party. In early 2009, the number of Conservation staff members increased, and in April 2009 the function of performing residential surveys was resumed by internal staff. With a dramatic increase in field and office work in August 2013, the residential surveys were outsourced to a new vendor "Water-Wise Consulting". In 2020 a new vendor was selected through a competitive process and awarded to "ConServe Inc. and to date the vendor continues to perform both residential and multi-family home surveys. Components of the indoor water survey include checking the water meter leak detector and testing the water meter for accuracy; testing flow rates for kitchen faucet, bathroom faucet(s) and showerhead(s) to determine gallons per minute (gpm); verify toilet(s) gallons per flush and perform a leak detection dye test on each toilet; verify use of dishwasher, hot water heater setting and clothes washer type. Upon completion of each survey, the customer is provided with a report that includes survey results and water efficient recommendations, along with information on incentives for eligible water saving devices when available. Showerheads, aerators and toilet flappers are distributed with surveys as needed.

In addition to surveys EMWD provides leak detection assistance to customers through the distribution of conservation packets. On average, staff members also distribute more than 250 conservation packets to residential customers each month. These packets are available in both English and Spanish to accommodate the needs of a majority of EMWD's residential retail customers. Conservation packets provide the customer with information on how to read their water meter, leak detection dye tablets for toilets, and instructions on how to identify leaks in the home.

In January 2010, EMWD began to distribute Outdoor Water Use Efficiency Kits to residential customers. The Outdoor Water Use Efficiency Kit is designed to help residential customers create a custom irrigation schedule, repair a leaky hose and eliminate water running from an unattended hose. Since 1990, EMWD has maintained a program to provide residential customers with water efficient showerheads and faucet aerators. These devices continue to be distributed when needed and are made available to customers at EMWD's office, as part of the residential survey program and at various outreach events.

EMWD was awarded a grant for the Spray-to-Drip Retrofit Kit Program (Kit Program) from the United States Bureau of Reclamation (USBR) in March 2019. Through this grant, 1,110 Spray-to-Drip conversion kits are offered to residential customers free of charge. The kits contain enough equipment to convert between 250 and 400 square-feet of planter beds from spray to drip irrigation, depending on planting density. As of February 2020, all 1,110 Spray-to-Drip conversion kits required for grant compliance have been distributed and installation verified. EMWD will look for opportunities to expand this program in the future.

EMWD was awarded a grant for the Residential Irrigation Efficiency Project (Project) from the USBR in September 2019. Through this grant, 50 single family homes will have their existing irrigation systems replaced with high efficiency irrigation equipment and manage the watering schedules for a one-year period. The equipment installation and watering schedule management will be conducted by a qualified contractor. Staff will monitor water consumption via EMWD's automated meter infrastructure system, and the homeowners will agree to keep their irrigation system in good working order for the duration of the project. The Project offers cost share funding for water use efficiency activities that result in water savings, improved water management and energy efficiency.

Landscape Water Survey

The landscape water survey requirement is being met through the implementation of tiered rates. A water budget for efficient landscape irrigation was developed for all residential customers. The water budget is enforced monthly through a tiered billing system. For those who exceed budget targets a residential survey may be performed to assist the customer in identifying where water can be saved. Staff members and/or the vendor perform on-site landscape surveys as part of the complete residential survey. Components of the outdoor water survey for single family residential accounts include checking the water meter leak detector and testing the water meter for accuracy; checking irrigation timer programming; running a one-minute test for each irrigation station to obtain gpm data and checking for system leaks; checking system pressure; obtaining plant and soil type(s) for reporting and measuring irrigated landscape area. Upon completion of each survey, the customer is provided with a report that includes survey results and a watering schedule, water efficient recommendations, and information on incentives for eligible water saving devices when available. EMWD has also developed a cost share program for the direct installation of residential smart irrigation controllers, high-efficiency precision nozzles, drip irrigation, and on-site landscape surveys as a component of this program.

High Efficiency Clothes Washers

EMWD has provided incentives for HECWs since 2001. In late 2010, EMWD established partnerships with the United States Bureau of Reclamation (USBR) through grant funding, and Southern California Gas Company, for the direct installation of HECWs with a water factor of 4.0 or less.

WaterSense Specification Toilets

EMWD began offering incentives for toilet retrofits in 1992, beginning with Ultra Low-Flush Toilets (ULFT). Incentives included customer rebates and free distribution events. Incentives for High Efficiency Toilets (HET) were added in 2005. HET incentive programs included customer rebates, free distribution events and a direct installation program which began in 2008. To continue to encourage the installation of water saving devices, the Replace and Save Multi-Family Toilet Program was implemented in 2014 and was targeted towards multi-family customers to help reduce or eliminate the cost associated with replacing older inefficient toilets with new efficient toilets.

Commercial, Industrial, and Institutional

CII water demands make up a large percentage of total demand for California. CII water use varies dramatically between business sectors as well as within a given water agency’s territory. The goal of this DMM is to implement comprehensive yet flexible measures, allowing each water agency to tailor the implementation of each practice to fit local needs and opportunities. The end result is a practice that is successful and will produce the greatest amount of cost-effective water savings.

EMWD continues to encourage efficiency by CII customers and in 2019 implemented budget-based tiered rates for these customers. Financial incentives provided for by Metropolitan for a variety of water efficient devices used in the CII sector are administered through the SoCal Water$mart regional rebate program. In 2008, EMWD implemented the Public School Retrofit program; providing surveys and direct installation of both indoor and outdoor devices for more than 40 school sites within EMWD’s retail service area. In 2009, conservation staff developed a program to identify CII accounts with mixed use meters, accounts with the highest water use are contacted first and offered CII water use surveys. Components of the CII water use survey include checking the water meter leak detector and testing the water meter for accuracy; checking irrigation timer programming; running a one-minute test for each irrigation station obtain gpm data and check for system leaks; checking system pressure; obtaining plant and soil type(s) for reporting and measuring irrigated landscape area. Upon completion of each survey, the customer is provided with a report that includes survey results and a watering schedule, water efficient recommendations, and information on incentives for eligible water saving devices when available.

Landscape

Irrigation accounts for a large portion of urban water use in California. Irrigation water use varies dramatically depending on water pricing and availability, plant choice, geographic locations, seasonal conditions, and the level of commitment to sound water efficiency practices. The goal of this DMM is that irrigators, with assistance from signatories, will achieve a higher level of water use efficiency consistent with the actual irrigation needs of the plant materials. Reaching this goal would reduce overall demands for water, reduce demands during the peak summer months, and still result in a healthy and vibrant landscape in California.

Accounts with Dedicated Irrigation Meters:

- Through the tiered rate process, EMWD has developed water budgets for 100 percent of dedicated landscape accounts.

- Water bills for these accounts include data that reflect the relationship between the water budget 70 percent ETo and actual usage.
- Each water bill for dedicated landscape meters provides a contact number with an offer for assistance. An audit program and technical assistance are made available to customers that make a request.
- EMWD has offered financial incentive programs for landscape since 1992, including large landscape audits, soil moisture sensors, weather-based irrigation controller (WBIC) rebates and distribution, large rotary nozzle rebates, and rotating nozzle and synthetic turf rebates. In 2006, EMWD implemented a program to supplement the cost of high efficiency nozzles, including labor for installation, for large landscape accounts. In 2008, EMWD also implemented a public school retrofit program that includes the direct installation of WBICs and high efficiency nozzles. In 2012, EMWD implemented the Large Landscape Assistance Program which provides large landscape customers with the option to have Toro precision nozzles directly installed or receive a voucher for high efficiency nozzles and smart controllers.

Commercial, Industrial, Institutional Accounts without Meters or with Mixed-Use Meters

- EMWD's retail service area includes an estimated 4,500 CII accounts.
- In July 2009, Conservation staff developed a program to identify CII accounts with mixed use meters and offer on-site surveys.
- EMWD has offered financial incentive programs for landscape since 1992, including large landscape audits, soil moisture sensors, WBIC rebate and distribution, large rotary nozzle rebates, rotating nozzle, and synthetic turf rebates.

9.3 Reporting Implementation

9.3.1 Implementation Over the Past Five Years

A summary of the extent to which these programs have been implemented is provided in **Table 9-2**.

Table 9-2. DMM Implementation

		2016			2017			2018			2019			2020		
PROGRAM	TYPE	DEVICES	COST	PARTICIPANTS	DEVICES	COST	PARTICIPANTS	DEVICES	COST	PARTICIPANTS	DEVICES	COST	PARTICIPANTS	DEVICES	COST	PARTICIPANTS
CII & Multi-Family Drip Rebate	Commercial	-	$-	-	221,706	$79,739	12	353,068	$176,501	17	97,151	$42,608	9	55,746	$27,873	2
Drip Retrofit Kit Voucher Program	Residential	-	$-	-	52	$5,564	36	6	$757	5	437	$66,895	231	319	$49,954	166
HECW Direct Install	Residential	161	$10,465	161	845	$54,015	831	332	$21,450	330	173	$11,245	173	232	$14,885	228
Large Landscape Controller Voucher Program	Commercial	1	$3,567	4	19	$8,969	17	3	$2,361	2	5	$32,184	2	7	$24,652	4
Large Landscape Nozzle Voucher Program	Commercial	3,994	$20,138	11	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Regional Rebates: Cistern	Residential	3	$950	3	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Regional Rebates: HECW	Residential	985	$102,105	986	326	$45,000	326	225	$33,685	225	150	$22,060	148	261	$39,150	261
Regional Rebates: HET	Residential	233	$19,153	133	35	$1,400	19	37	$1,480	18	27	$1,475	19	579	$23,160	9
Regional Rebates: HET	Commercial	2	$196	1	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Regional Rebates: Ice-Making Machine	Commercial	-	$-	-	-	$-	-	1	$1,000	1	-	$-	-	-	$-	-
Regional Rebates: NOZZLES	Residential	392	$1,110	10	291	$580	6	235	$470	5	144	$288	3	95	$190	3
Regional Rebates: NOZZLES	Commercial	-	$-	-	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Regional Rebates: RAIN BARREL	Residential	205	$15,413	82	19	$665	11	6	$210	4	6	$210	4	8	$280	5
Regional Rebates: Soil Moisture Sensor System	Residential	-	$-	-	-	$-	-	1	$145	1	-	$-	-	-	$-	-
Regional Rebates: Soil Moisture Sensor System	Commercial	-	$-	-	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Regional Rebates: Synthetic Turf	Residential	-	$-	-	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Regional Rebates: Urinal	Commercial	-	$-	-	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Regional Rebates: WBIC	Residential	146	$25,813	141	164	$21,921	159	326	$39,581	315	280	$30,060	273	361	$35,636	349
Regional Rebates: WBIC	Commercial	59	$95,239	20	12	$27,624	4	36	$80,987	13	9	$16,256	8	1	$1,680	1
Residential Water Survey	Residential	113	$14,125	113	94	$11,750	94	473	$59,125	473	252	$31,500	252	77	$9,625	77
Smart Controller Direct Install Program (Residential)	Residential	53	$6,669	48	2	$150	2	7	$675	9	2	$225	3	9	$2575	8
Toro Direct Install Program (Commercial)	Commercial	3,417	$10,319	6	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Toro Nozzle Direct Install Program (Residential)	Residential	1,194	$7,304	23	-	$-	-	-	$-	-	-	$-	-	-	$-	-
Turf Buy Back Program	Residential	696,153	$264,162	463	30,041	$58,468	19	9,789	$10,416	11	51,247	$95,358	46	76,076	$169,931	58
Turf Buy Back Program	Commercial	1,946,465	$3,219,438	58	1,023,072	$1,752,401	53	342,580	$1,113,855	10	333,457	$476,040	13	409,230	$855,944	12

9.3.2 Implementation Achieve Water Use Targets

EMWD estimates water saving have occurred due to ordinances in place, the implementation of tiered rates and active conservation. EMWD will continue to improve water efficiency through a budget based tiered rate, requirements for water efficiency in new construction and an active conservation program. Water use reduction will be focused on outdoor demand reduction by all customer types. Even after surpassing its water efficiency target for 2020, EMWD estimates that there is the potential for additional conservation savings through 2045.

EMWD will continue to reduce potable water demand in two ways: using recycled water to offset potable water demand and reducing demand for water through conservation. In December 2015, EMWD completed a Water Use Efficiency Master Plan which articulates the goals, strategies, and tactics required to deliver long-term solutions for secure and reliable water supplies. The Water Use Efficiency Master Plan helped to identify and update the targets for saving water through active conservation and provided a portfolio of projects and actions to meet the requirements of SB X7-7. EMWD anticipates continuing these programs to meet the requirements of future water use standards.

9.4 Water Use Objectives (Future Requirements)

EMWD’s final water use objectives have not yet been determined.

10 Plan Adoption, Submittal, and Implementation

This chapter describes the processes for adoption of this UWMP and WSCP, submittal of required information to DWR and other entities, and EMWD's implementation of the plan.

EMWD has coordinated with cities and counties within its service area to solicit input and feedback during preparation of this UWMP.

IN THIS SECTION

- Public Hearing Notices
- Adoption by EMWD Board of Directors
- Future Amendments

10.1 Inclusion of All 2020 Data

This UWMP and WSCP have been prepared on a calendar year basis and include data through the end of December 2020.

10.2 Notice of Public Hearing

EMWD encouraged public participation during the development of this UWMP and WSCP and provided opportunities for public review and comment. First, EMWD sent out notices via electronic mail on January 19, 2021 to cities within its retail and wholesale service area and the County of Riverside to inform these stakeholders that the UWMP was being reviewed, modified, and prepared in advance of the 60-day period leading up to the public hearing. Additional notices went out to these agencies announcing when the draft UWMP and WSCP would be available for public review and announcing the time and date of the public hearing. The agencies receiving these notices are shown in Table 10-1 and Table 10-2.

Notices of the public hearing were also published in the local newspaper and placed at the EMWD office. The notice included the time and date of the hearing and stated that the draft UWMP and WSCP were available for public review and comment until June 30, 2021 at the EMWD office or on EMWD's website. A copy of the public notice is provided in **Appendix J**.

EMWD conducted the public hearing on June 30, 2021 at the EMWD office to hear and discuss public comments on the draft UWMP and WSCP prior to EMWD Board adoption. No written comments were received on the draft documents.

10.2.1 Notice to Cities and Counties

Notices were provided to the cities and counties within the service area. Notice was provided more than 60 days before the public hearing, and subsequent notice was provided with information about the date and time of the public hearing.

10.2.1.1 60 Day Notification

EMWD provided notices to the agencies shown in **Table 10-1** and **Table 10-2** that this UWMP and WSCP was being updated and asking for input.

10.2.1.2 Notice of Public Hearing

EMWD provided notices to the agencies shown in **Table 10-1** and **Table 10-2** that a public hearing had been scheduled to review and consider adoption of the UWMP and WSCP.

Table 10-1. DWR 10-1R Notification to Cities and Counties

CITY	60 DAY NOTICE	NOTICE OF PUBLIC HEARING
City of Beaumont	Yes	Yes
City of Canyon Lake	Yes	Yes
City of Menifee	Yes	Yes
City of Moreno Valley	Yes	Yes
City of Murrieta	Yes	Yes
City of Riverside	Yes	Yes
City of Temecula	Yes	Yes
Pechanga Band of Luiseño Indians	Yes	Yes
Soboba Band of Luiseño Indians	Yes	Yes
COUNTY	60 DAY NOTICE	NOTICE OF PUBLIC HEARING
Riverside County	Yes	Yes

Table 10-2. DWR 10-1W Notification to Cities and Counties

CITY	60 DAY NOTICE	NOTICE OF PUBLIC HEARING
City of Perris	Yes	Yes
City of Hemet	Yes	Yes
City of San Jacinto	Yes	Yes
COUNTY	60 DAY NOTICE	NOTICE OF PUBLIC HEARING
Riverside County	Yes	Yes
OTHER	60 DAY NOTICE	NOTICE OF PUBLIC HEARING
Lake Hemet Municipal Water District	Yes	Yes
Nuevo Water Company	Yes	Yes
Rancho California Water District	Yes	Yes
Western Municipal Water District	Yes	Yes
Elsinore Valley Municipal Water District	Yes	Yes
Metropolitan Water District of Southern California	Yes	Yes
Fallbrook Public Utility District	Yes	Yes
Rainbow Municipal Water District	Yes	Yes

10.2.2 Notice to the Public

EMWD provided notice to the public through its web site that the UWMP and WSCP were being updated. Notice of the public hearing was published twice in the local newspaper in accordance with Section 6066 of the Government Code. Copies of these notices are included in **Appendix J**.

10.3 Public Hearing and Adoption

EMWD's Board of Directors held a public hearing to consider adoption of this UWMP and WSCP. The documents were adopted by the Board after the hearing.

10.3.1 Public Hearing

EMWD held a public hearing on June 30, 2021 at 8:00 a.m. The meeting was held at EMWD's headquarters, with an option to join virtually through an online collaboration platform. EMWD staff made a brief presentation of the contents of the UWMP and WSCP, and the public was given the opportunity to provide comments.

10.3.2 Adoption

The UWMP and WSCP were adopted by the EMWD Board of Directors on June 30, 2021 after the public hearing. Copies of the resolutions are provided in **Appendix K**.

10.4 Plan Submittal

EMWD plans to implement the adopted UWMP in accordance with the schedule described in the plan. Any amendments made to this UWMP will require completion of the same series of notification, public hearing, adoption, and submittals as required in submittal of this UWMP.

10.4.1 Submittal of the UWMP and Water Shortage Contingency Plan to DWR

The UWMP and WSCP will be submitted to DWR electronically on or prior to the CWC's deadline of July 1, 2021.

10.4.2 Electronic Data Submittal

The standardized UWMP data tables will be uploaded to the WUEData portal electronically on or prior to the CWC's deadline of July 1, 2021.

10.4.3 Submittal of the UWMP to the California State Library

No later than 30 days after adoption, EMWD will submit a copy of the UWMP and WSCP to the California State Library.

10.4.4 Submittal of the UWMP to Cities and Counties

The UWMP will be made available to Riverside County and the cities within EMWD's service area. Email notifications were sent to these entities to make them aware that the plan was available.

10.5 Public Availability

A hard copy of the UWMP and WSCP will be made publicly available at the EMWD office, and an electronic copy of the UWMP and WSCP will be available for public viewing on the EMWD website.

10.6 Notification to Public Utilities Commission

EMWD is not regulated by the California Public Utilities Commission (CPUC) and is therefore not required to notify the CPUC that this report has been updated.

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

If EMWD elects to make changes to the UWMP or WSCP, the required processes will be followed for notification and adoption.

10.7.1 Amending a UWMP

Amending this UWMP will require the same steps for notification, public hearing, adoption, and submittal as the original 2020 plan.

10.7.2 Amending a Water Shortage Contingency Plan

Amending the WSCP included in this UWMP will require the same steps for notification, public hearing, adoption, and submittal as the original 2020 plan.

A

Appendix A: DWR UWMP Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Section 1.1
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Lay Description
x	x	Section 2.2	10620(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.	Plan Preparation	Section 2.1
x	x	Section 2.6	10620(d)(2)	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.	Plan Preparation	Section 2.3
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged 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 and contingency plan.	Plan Preparation	Section 2.3
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.3.1
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.3.1
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.1
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4.1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4.2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.4.1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.1
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	Section 4.1.1
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.1.1
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.2
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.3
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 5.1
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.3
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.3.1
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.1
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 5.1
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 7.1
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Section 7.1
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.2.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.2.9
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.2
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.2
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2.9
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.2.7
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.2.5
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2.5
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.2.5
x	x	Section 6.2.5	10633(e)	Describe 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.	System Supplies (Recycled Water)	Section 6.2.5
x	x	Section 6.2.5	10633(f)	Describe the actions 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.	System Supplies (Recycled Water)	Section 6.2.5
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2.5
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.2.6
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.2.5
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.2.8
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.3
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1.4
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.1
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.1
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.2
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.1
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.2
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	WSCP
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	WSCP, Section 1
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	WSCP, Section 2
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	WSCP, Section 2
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	WSCP, Section 2
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	WSCP, Section 3
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	WSCP, Section 3
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	WSCP, Section 4
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	WSCP, Section 4
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	WSCP, Section 4
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	WSCP, Section 4
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	WSCP, Section 4
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	WSCP, Section 4.6
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	WSCP, Section 5
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	WSCP, Section 5
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	WSCP, Section 6
x		Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	WSCP, Section 7
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	WSCP, Section 7
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	WSCP, Section 7
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	WSCP, Section 8
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	WSCP, Section 8
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	WSCP, Section 8
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	WSCP, Section 8
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	WSCP, Section 11
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	WSCP, Section 12
x	x	Section 8.12	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	WSCP, Section 12

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Section 9.1
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9.2 and 9.3
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.2
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	Section 10.6
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.7

B

Appendix B: DWR Standard UWMP Tables

Submittal Table 2-1 Retail Only: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
Add additional rows as needed			
CA3310009	Eastern Municipal Water District	155,561	84,673
	TOTAL	155,561	84,673

**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 2-2: Plan Identification

<table>
<tr><th>Select Only One</th><th colspan="2">Type of Plan</th><th>Name of RUWMP or Regional Alliance
if applicable
(select from drop down list)</th></tr>
<tr><td>☑</td><td colspan="3">Individual UWMP</td></tr>
<tr><td rowspan="2"></td><td>☐</td><td>Water Supplier is also a member of a RUWMP</td><td></td></tr>
<tr><td>☐</td><td>Water Supplier is also a member of a Regional Alliance</td><td></td></tr>
<tr><td>☐</td><td colspan="2">Regional Urban Water Management Plan (RUWMP)</td><td></td></tr>
<tr><td colspan="4">NOTES:</td></tr>
</table>

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☑	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Add additional rows as needed
Metropolitan Water District of Southern California
NOTES:

Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one)	
☐	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed.
	Provide page number for location of the list.
☑	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.**

Water Supplier Name
Add additional rows as needed
City of Hemet
City of Perris
City of San Jacinto
Lake Hemet Municipal Water District
Nuevo Water Company
Rancho California Water District
Western Municipal Water District
NOTES:

Submittal Table 3-1 Retail: Population - Current and Projected

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	603,950	649,700	695,500	741,300	774,300	807,200

NOTES:

Submittal Table 3-1 Wholesale: Population - Current and Projected

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	255,210	271,500	287,800	304,000	314,000	324,100

NOTES:

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual

Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Single Family		Drinking Water	52,162
Multi-Family		Drinking Water	6,535
Commercial		Drinking Water	4,267
Industrial		Drinking Water	571
Institutional/Governmental		Drinking Water	1,629
Landscape		Drinking Water	8,155
Agricultural irrigation		Drinking Water	1,114
Agricultural irrigation		Raw Water	446
Other		Drinking Water	1,287
Other	Systems losses & unbilled, authorized consumption	Drinking Water	8,507
		TOTAL	84,673

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual

Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Groundwater recharge	Imported water recharge to the Hemet/San Jacinto Basin	Raw Water	6,467
Sales to other agencies	City of Perris Water System	Drinking Water	1,685
Sales to other agencies	Western Municipal Water District Murrieta Division	Drinking Water	1,809
Sales to other agencies	Nuevo Water Company	Drinking Water	409
Sales to other agencies	Rancho California Water District	Drinking Water	11,105
Sales to other agencies	Rancho California Water District	Raw Water	13,923
Sales to other agencies	City of Hemet	Drinking Water	0
Sales to other agencies	City of San Jacinto	Drinking Water	0
Sales to other agencies	Lake Hemet Municipal Water District	Raw Water	986
		TOTAL	36,384

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected

Use Type	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		66,900	71,700	76,700	80,500	84,000
Multi-Family		8,500	9,100	9,700	10,200	10,600
Commercial		6,100	6,500	7,000	7,300	7,600
Industrial		600	600	700	700	700
Institutional/Governmental		2,700	2,900	3,100	3,200	3,400
Landscape		8,400	7,600	6,800	6,200	5,500
Agricultural irrigation	Potable Water	1,500	1,500	1,500	1,500	1,500
Agricultural irrigation	Raw Water	500	500	500	500	500
Other		0	0	0	0	0
Other	System losses & unbilled, authorized consumption	7,400	7,900	8,400	8,800	9,200
	TOTAL	102,600	108,300	114,400	118,900	123,000

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-2 Wholesale: Use for Potable and Raw Water [1] - Projected

Use Type	Additional Description (as needed)	**Projected Water Use** [2] Report To the Extent that Records are Available				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool.		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Groundwater recharge	Imported water recharge to the Hemet/San Jacinto Basin	7,500	7,500	7,500	7,500	7,500
Sales to other agencies	City of Perris Water System	1,800	1,900	2,100	2,200	2,300
Sales to other agencies	Western Municipal Water District Murrieta Division	1,000	1,300	1,600	2,000	2,300
Sales to other agencies	Nuevo Water Company	500	1,000	1,100	1,200	1,200
Sales to other agencies	Rancho California Water District (Potable)	27,100	20,000	21,000	15,200	16,500
Sales to other agencies	Rancho California Water District (Raw)	15,200	15,200	15,200	22,300	22,300
Sales to other agencies	City of Hemet	0	0	0	0	0
Sales to other agencies	City of San Jacinto	0	0	0	0	0
Sales to other agencies	Lake Hemet Municipal Water District	5,100	5,500	5,900	6,300	6,700
	TOTAL	58,200	52,400	54,400	56,700	58,800

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)

	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	84,673	102,600	108,300	114,400	118,900	123,000
Recycled Water Demand[1] *From Table 6-4*	31,243	43,330	49,020	54,500	59,800	64,100
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	115,916	145,930	157,320	168,900	178,700	187,100

[1] Recycled water demand fields will be blank until Table 6-4 is complete

*[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES:

Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable)

	2020	2025	2030	2035	2040	2045 (opt)
Potable and Raw Water From Tables 4-1W and 4-2W	36,384	58,200	52,400	54,400	56,700	58,800
Recycled Water Demand* From Table 6-4W	1,285	4,770	5,180	5,600	5,600	5,600
TOTAL WATER DEMAND	37,669	62,970	57,580	60,000	62,300	64,400

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES:

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
07/2015	8,865
07/2016	6,221
07/2017	4,321
07/2018	7,360
07/2019	5,096

[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.

*[2] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Section 4.1.1
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES:	

Submittal Table 5-1 Baselines and Targets Summary From SB X7-7 Verification Form

Retail Supplier or Regional Alliance Only

Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*1999*	*2008*	*197*	*176*
5 Year	*2003*	*2007*	*195*	

**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:

Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form

Retail Supplier or Regional Alliance Only

2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
125	*0*	*0*	*176*	*Y*

**All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
Alluvial Basin	Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	6,171	6,498	6,367	5,213	9,383
Alluvial Basin	Pumping of EMWD share of unused Soboba Settlement Water recharged in the Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	3,585	3,864	3,850	1,508	2,625
Alluvial Basin	West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	4,429	2,908	3,307	1,323	2,402
Alluvial Basin	Brackish Groundwater from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	10,254	8,585	8,547	9,801	9,565
	TOTAL	24,439	21,855	22,071	17,845	23,975

**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020

☐	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Eastern Municipal Water District	Metered	8,194	Eastern Municipal Water District	San Jacinto Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	11,507	Eastern Municipal Water District	Moreno Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	16,090	Eastern Municipal Water District	Temecula Valley RWRF	Yes	No
Eastern Municipal Water District	Metered	17,282	Eastern Municipal Water District	Perris Valley RWRF	Yes	No
Total Wastewater Collected from Service Area in 2020:		53,073				

**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3* **.**

NOTES:

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

☐ **No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list*	Treatment Level *Drop down list*	2020 volumes [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
San Jacinto Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	7,441	436	6,319		
Moreno Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	10,451	1,600	8,874		
Temecula Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	14,612	1,600	12,407		
Perris Valley RWRF	Reach 4 Dissipater	Temescal Creek		River or creek outfall	No	Tertiary	15,696	3,637	13,327		
						Total	48,200	7,273	40,927	0	0

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.

[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area

☐ Recycled water is not used and is not planned for use within the service area of the supplier.
The supplier will not complete the table below.

Name of Supplier Producing (Treating) the Recycled Water:	Eastern Municipal Water District
Name of Supplier Operating the Recycled Water Distribution System:	Eastern Municipal Water District
Supplemental Water Added in 2020 (volume) *Include units*	0
Source of 2020 Supplemental Water	N/A

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020[1]	2025[1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Agricultural irrigation				Tertiary	21,178	22,240	24,640	20,000	20,000	20,000
Landscape irrigation (exc golf courses)				Tertiary	4,275	7,600	10,080	10,600	11,100	11,100
Golf course irrigation				Tertiary	1,457	2,750	3,130	3,500	3,500	3,500
Commercial use										
Industrial use				Tertiary	0	440	870	1,310	1,310	1,310
Geothermal and other energy production										
Seawater intrusion barrier										
Recreational impoundment				Tertiary	1,029	1,400	1,400	1,400	1,400	1,400
Wetlands or wildlife habitat				Tertiary	3,231	4,500	4,500	4,500	4,500	4,500
Groundwater recharge (IPR)				Advanced		4,100	4,100	12,300	12,300	12,300
Reservoir water augmentation (IPR)										
Direct potable reuse										
Other (Description Required)	Construction			Tertiary	73	300	300	300	300	300
Other (Description Required)	Split between agricultural and landscape usage, proportion to be determined in future			Tertiary				590	5,390	9,690
				Total:	31,243	43,330	49,020	54,500	59,800	64,100
				2020 Internal Reuse						

[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area							
☐	Recycled water is not directly treated or distributed by the Supplier. The Supplier will not complete the table below.						
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment *Drop down list*	2020*	2025*	2030*	2035*	2040*	2045* *(opt)*
Add additional rows as needed							
Elsinore Valley Municipal Water District	Tertiary	533	1,120	1,120	1,120	1,120	1,120
Rancho California Water District	Tertiary	752	3,650	4,060	4,480	4,480	4,480
Total		1,285	4,770	5,180	5,600	5,600	5,600
*** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.							
NOTES:							

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.

Beneficial Use Type	**2015 Projection for 2020** [1]	**2020 Actual Use**[1]
Insert additional rows as needed.		
Agricultural irrigation	18,784	21,178
Landscape irrigation (exc golf courses)	5,124	4,275
Golf course irrigation	2,375	1,457
Commercial use	300	0
Industrial use	2,912	0
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment	1,250	1,029
Wetlands or wildlife habitat	4,500	3,231
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required) (Construction)		73
Total	35,245	31,243

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.

NOTE:

Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

☐ Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020.
The wholesale supplier will not complete the table below.

Name of Receiving Supplier or Direct Use by Wholesaler	2015 Projection for 2020*	2020 Actual Use*
Add additional rows as needed		
Elsinore Valley Municipal Water District	289	533
Rancho California Water District	1,367	752
Total	1,656	1,285

Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use

☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.
	Provide page location of narrative in UWMP

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Add additional rows as needed			
Mandatory Recycled Water Use Ordinance	The ordinance requiring new and existing customers to use recycled water for appropriate permitted uses when it is available	Ongoing	
Rate Incentives	EMWD prices recycled water below the cost of potable water for both municipal and agricultural use	Ongoing	
Water Supply Assessments	Assessments condition all major new developments to use recycled water as a condition of service where it is available and permitted	Ongoing	
Public Education	EMWD has a recycled water public education campaign to promote the benefits of recycled water	Ongoing	
Facilities Financing	EMWD helps arrange or provide financing for the construction of facilities needed to convert potable demands to recycled water	Ongoing	
		Total	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: EMWD does not have data to support a projection of how much increased recycled water sales will result from each of the listed methods of encouraging recycled water use. Historically, the low cost of recycled water was the primary inducement for agricultural customers to use recycled water in-lieu of groundwater. However, as municipal customers continue to replace agriculture, it is reasonable to assume that the mandatory provisions of EMWD’s Recycled Water Use Ordinance will play a major role in program expansion.

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs

☐ No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.

☐ Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.

Provide page location of narrative in the UWMP

Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						
SARCCUP / San Jacinto Enhanced Recharge and Recovery Program (ERRP) Phase I	Yes	Inland Empire Utilities Agencies, Orange County Water District, San Bernardino Valley Municipal Water District, Western Municipal Water District, DWR	Project to be completed in phases and includes conjunctive use of groundwater recharge	2025	Multi-Dry Year	7,000
Perris North Basin Groundwater Contamination Prevention and Remediation Program	Yes	SWRCB (funding partner), WMWD	Combined MV and North Perris GW Development, and wells near MARB	2023	Average Year	6,450
Perris II Desalter	Yes	Army Corps of Engineers	Expected to be online mid-2021	2021	Average Year	5,400
Purified Water Replenishment, Phase I (IPR)	Yes	N/A	Advanced treated recycled water used to recharge the Hemet/San Jacinto Basin	2024	Average Year	4,000
Purified Water Replenishment, Phase II (IPR)	Yes	N/A	Advanced treated recycled water used to recharge the Hemet/San Jacinto Basin - could be increased to 11,000 AFY if brine issues are resolved	2035	Average Year	8,000
San Jacinto Enhanced Recharge and Recovery Program (ERRP) Phase II	Yes		Project to be completed in phases and includes conjunctive use of groundwater recharge	2030 - 2035	Multi-Dry Year	7,500
San Jacinto Enhanced Recharge and Recovery Program (ERRP) Phase III	No		Project to be completed in phases and includes conjunctive use of groundwater recharge	2040 - 2050	Multi-Dry Year	TBD

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water	Treated water purchased from Metropolitan	44,726	Drinking Water	
Purchased or Imported Water	Untreated water purchased from Metropolitan, treated at EMWD Filtration Plants	17,584	Drinking Water	
Purchased or Imported Water	EMWD share of unused Soboba Settlement Water	2,625	Drinking Water	
Purchased or Imported Water	Raw Water for Agriculture	642	Other Non-Potable Water	
Groundwater (not desalinated)	Potable water pumped from the Hemet/San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	9,383	Drinking Water	
Groundwater (not desalinated)	Potable water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	2,402	Drinking Water	
Groundwater (not desalinated)	Brackish water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05) used to supplement the recycled water system	0	Other Non-Potable Water	
Desalinated Water - Groundwater	Desalinated water pumped from the West San Jacinto Basin portion of the San Jacinto Groundwater Basin (DWR 8-05)	7,310	Drinking Water	
Recycled Water	Includes Storage Pond Incidental Recharge / Evaporation	39,642	Other Non-Potable Water	
	Total	124,314		0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-8 Wholesale: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Purchased or Imported Water	Treated Water purchased from Metropolitan	15,008	Drinking Water	
Purchased or Imported Water	Raw Water purchased from Metropolitan	14,909	Other Non-Potable Water	
Purchased or Imported Water	Soboba Settlement Water	6,467	Other Non-Potable Water	
Recycled Water		1,285	Recycled Water	
	Total	37,669		0

Units of measure (AF, CCF, MG) *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	**Projected Water Supply *** Report To the Extent Practicable									
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		**2025**		**2030**		**2035**		**2040**		**2045** (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Purchased or Imported Water	Metropolitan Treated/ Untreated	66,447		72,147		70,247		74,747		78,847	
Groundwater (not desalinated)	Pumped from the Hemet/San Jacinto Basin	7,303		7,303		7,303		7,303		7,303	
Groundwater (not desalinated)	Pumped from the West San Jacinto Basin	11,450		11,450		11,450		11,450		11,450	
Desalinated Water - Groundwater	Desalinated water from the West San Jacinto Basin	13,400		13,400		13,400		13,400		13,400	
Recycled Water	Excludes Storage Pond Incidental Recharge / Evaporation	43,330		49,020		54,500		59,800		64,100	
Other	Purified Water Replenishment (IPR)	4,000		4,000		12,000		12,000		12,000	
	Total	145,930	0	157,320	0	168,900	0	178,700	0	187,100	0

****Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES

Submittal Table 6-9 Wholesale: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply* Report To the Extent Practicable									
		2025		**2030**		**2035**		**2040**		**2045** (opt)	
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Purchased or Imported Water	Metropolitan Treated / Untreated	50,700		44,900		46,900		49,200		51,300	
Purchased or Imported Water	Soboba Settlement Water	7,500		7,500		7,500		7,500		7,500	
Recycled Water		4,770		5,180		5,600		5,600		5,600	
	Total	62,970	0	57,580	0	60,000	0	62,300	0	64,400	0

****Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ______________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1922-2017		100%
Single-Dry Year	1977		100%
Consecutive Dry Years 1st Year	1988		100%
Consecutive Dry Years 2nd Year	1989		100%
Consecutive Dry Years 3rd Year	1990		100%
Consecutive Dry Years 4th Year	1991		100%
Consecutive Dry Years 5th Year	1992		100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

Units of measure (AF, CCF, MG *) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)

Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ___________________________	
		☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	**% of Average Supply**
Average Year	1922-2017		100%
Single-Dry Year	1977		100%
Consecutive Dry Years 1st Year	1988		100%
Consecutive Dry Years 2nd Year	1989		100%
Consecutive Dry Years 3rd Year	1990		100%
Consecutive Dry Years 4th Year	1991		100%
Consecutive Dry Years 5th Year	1992		100%

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

****Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	145,930	157,320	168,900	178,700	187,100
Demand totals *(autofill from Table 4-3)*	145,930	157,320	168,900	178,700	187,100
Difference	0	0	0	0	0

NOTES:

Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	62,970	57,580	60,000	62,300	64,400
Demand totals *(autofill fm Table 4-3)*	62,970	57,580	60,000	62,300	64,400
Difference	0	0	0	0	0

NOTES:

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	151,130	162,820	174,700	184,700	193,300
Demand totals*	151,130	162,820	174,700	184,700	193,300
Difference	0	0	0	0	0
****Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*					
NOTES:					

Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045 (Opt)
Supply totals*	64,770	59,080	61,600	63,600	65,900
Demand totals*	64,770	59,080	61,600	63,600	65,900
Difference	0	0	0	0	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	151,130	162,820	174,700	184,700	193,300
	Demand totals	151,130	162,820	174,700	184,700	193,300
	Difference	0	0	0	0	0
Second year	Supply totals	132,700	143,300	153,700	162,500	170,300
	Demand totals	132,700	143,300	153,700	162,500	170,300
	Difference	0	0	0	0	0
Third year	Supply totals	134,900	145,500	155,500	164,100	171,900
	Demand totals	134,900	145,500	155,500	164,100	171,900
	Difference	0	0	0	0	0
Fourth year	Supply totals	137,100	147,600	157,400	165,700	173,500
	Demand totals	137,100	147,600	157,400	165,700	173,500
	Difference	0	0	0	0	0
Fifth year	Supply totals	140,200	150,800	160,000	168,000	175,800
	Demand totals	140,200	150,800	160,000	168,000	175,800
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison

		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	64,770	59,080	61,600	63,600	65,900
	Demand totals	64,770	59,080	61,600	63,600	65,900
	Difference	0	0	0	0	0
Second year	Supply totals	63,200	59,100	61,400	63,400	65,600
	Demand totals	63,200	59,100	61,400	63,400	65,600
	Difference	0	0	0	0	0
Third year	Supply totals	62,100	59,600	61,800	63,900	66,000
	Demand totals	62,100	59,600	61,800	63,900	66,000
	Difference	0	0	0	0	0
Fourth year	Supply totals	61,000	60,100	62,200	64,300	66,400
	Demand totals	61,000	60,100	62,200	64,300	66,400
	Difference	0	0	0	0	0
Fifth year	Supply totals	59,800	60,600	62,600	64,700	66,900
	Demand totals	59,800	60,600	62,600	64,700	66,900
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

***Units of measure (AF, CCF, MG) m** ust remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)

2021	Total
Total Water Use	177,900
Total Supplies	177,900
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2022	Total
Total Water Use	185,400
Total Supplies	185,400
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	14,900
Revised Surplus/(shortfall)	14,900
Resulting % Use Reduction from WSCP action	8%

2023	Total
Total Water Use	194,400
Total Supplies	194,400
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	15,400
Revised Surplus/(shortfall)	15,400
Resulting % Use Reduction from WSCP action	8%

2024	Total
Total Water Use	209,400
Total Supplies	209,400
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	16,000
Revised Surplus/(shortfall)	16,000
Resulting % Use Reduction from WSCP action	8%

2025	Total
Total Water Use	217,500
Total Supplies	217,500
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	16,500
Revised Surplus/(shortfall)	16,500
Resulting % Use Reduction from WSCP action	8%

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions (*Narrative description)*
1	Up to 10%	Supply watch. Customers will be asked to reduce up to 10% of demand voluntarily.
2	Up to 25%	Supply alert. Customers will be asked to reduce 25% of demand voluntarily.
3	Up to 25%	Mandatory Waste Reduction. At this stage efforts will be focused on a mandatory reduction of excessive water use.
4	Up to 50%	Mandatory Outdoor Reduction. At this stage efforts will be focused on mandatory reduction of outdoor water use.
5	>50%	Severe shortage or catastrophic incident Mandatory Indoor Reduction. At this stage efforts will be focused on mandatory reduction of indoor water use. This stage would only be implemented in response to a catastrophic loss of supplies requiring a 50 percent or more reduction in demand.

NOTES:

Submittal Table 8-2: Demand Reduction Actions

Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
Add additional rows as needed				
1 - 5	Expand Public Information Campaign	N/A		No
1	Other - Prohibit use of potable water for washing hard surfaces	N/A		Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	N/A		Yes
1	Landscape - Limit landscape irrigation to specific times	N/A		Yes
1	Landscape - Prohibit certain types of landscape irrigation	N/A		Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation	N/A		Yes
1	Other water feature or swimming pool restriction	N/A		Yes
1	Other	N/A		Yes
1	Other	N/A		Yes
1	Landscape - Other landscape restriction or prohibition	N/A		Yes
2	Landscape - Other landscape restriction or prohibition	Medium		Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Medium		Yes
2	Other water feature or swimming pool restriction	Low		Yes
2	Other	Medium		Yes
3	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
3a	Other	Medium		Yes
3b	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
3c	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
4	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
4	Landscape - Other landscape restriction or prohibition	Medium		Yes
4a	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
4b	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
4c	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
5	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
5a	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
5b	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
5c	Implement or Modify Drought Rate Structure or Surcharge	High		Yes
5	Implement or Modify Drought Rate Structure or Surcharge	High		Yes

NOTES:

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
NOTES:			

Submittal Table 10-1 Retail: Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
City of Beaumont	Yes	Yes
City of Canyon Lake	Yes	Yes
City of Menifee	Yes	Yes
City of Moreno Valley	Yes	Yes
City of Murrieta	Yes	Yes
City of Riverside	Yes	Yes
City of Temecula	Yes	Yes
Pechanga Band of Luiseño Indians	Yes	Yes
Soboba Band of Luiseño Indians	Yes	Yes

County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Riverside County	Yes	Yes

NOTES:

Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one)

☑	Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.**	
	Provide the page or location of this list in the UWMP.	
☐	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
City of Perris	Yes	Yes
City of Hemet	Yes	Yes
City of San Jacinto	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Riverside County	Yes	Yes
NOTES:		

C

Appendix C: DWR Standard SB X7-7 Tables

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*

(select one from the drop down list)

Acre Feet

***The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.**

NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☑	**2. Persons-per-Connection Method**
☑	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population

2020 Compliance Year Population	
2020	603,950

NOTES:

SB X7-7 Table 4: 2020 Gross Water Use

Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	84,672	-	-	-	-	-	**84,672**

* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source Treated water from Metropolitan

This water source is *(check one)* **:**

☐ The supplier's own water source

☑ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	44,726	-	44,726

*[1] **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

*[2] **Meter Error Adjustment** - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source Untreated water from Metropolitan

This water source is *(check one)* **:**

☐ The supplier's own water source

☑ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	17,584		17,584

*[1] **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

*[2] **Meter Error Adjustment** - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source EMWD share of unused Soboba Settlement Water

This water source is *(check one)* **:**

☐ The supplier's own water source

☑ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	2,625		2,625

*[1] **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

*[2] **Meter Error Adjustment** - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source Groundwater

This water source is *(check one)* **:**

☑ The supplier's own water source
☐ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	11,785		11,785

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source Desalinated groundwater

This water source is *(check one)* **:**

☑ The supplier's own water source
☐ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	7,310		7,310

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source Agriculture

This water source is *(check one)* **:**

☑ The supplier's own water source
☐ A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional* *(+/-)*	Corrected Volume Entering Distribution System
	642		642

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)

2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
84,672	603,950	**125**

NOTES:

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD					2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*		
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
125	-	-	-	-	125	176	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

D

Appendix D: AWWA Water Audits

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: Eastern Municipal Water District (3310009 SRO)
Reporting Year: 2015-2016 | 7/2015 - 6/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the

<----------- Enter grading in column 'E' and 'J' ---------->

WATER SUPPLIED

Master Meter and Supply Error Adjustments

	Grade	Value	Unit	Grade	Pcnt:		Value:	Unit
Volume from own sources:	5	39,038.703	acre-ft/yr	5		● ○		acre-ft/yr
Water imported:	5	47,433.023	acre-ft/yr	2		● ○		acre-ft/yr
Water exported:	5	12,382.642	acre-ft/yr	3		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 74,089.084 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

	Grade	Value	Unit	Pcnt:		Value:	Unit
Billed metered:	8	65,197.120	acre-ft/yr				
Billed unmetered:	n/a	0.000	acre-ft/yr				
Unbilled metered:	n/a	0.000	acre-ft/yr				
Unbilled unmetered:	6	27.360	acre-ft/yr		○ ●	27.360	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: 65,224.480 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

8,864.604 acre-ft/yr

Apparent Losses

	Grade	Value	Unit	Pcnt:		Value:	Unit
Unauthorized consumption:		185.223	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

	Grade	Value	Unit	Pcnt:		Value:	Unit
Customer metering inaccuracies:	8	658.557	acre-ft/yr	1.00%	● ○		acre-ft/yr
Systematic data handling errors:		162.993	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,006.772 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 7,857.832 acre-ft/yr

WATER LOSSES: 8,864.604 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 8,891.964 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

	Grade	Value	Unit
Length of mains:	9	2,576.0	miles
Number of active AND inactive service connections:	8	154,989	
Service connection density:		60	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 5 | 74.0 psi

COST DATA

	Grade	Value	Unit
Total annual cost of operating water system:	10	$111,535,107	$/Year
Customer retail unit cost (applied to Apparent Losses):	4	$3.75	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	4	$872.75	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 61 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Volume from own sources
3: Customer retail unit cost (applied to Apparent Losses)

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: Eastern Municipal Water District (3310009 SRO)
Reporting Year: 2017 7/2016 - 6/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the

<----------- Enter grading in column 'E' and 'J' ---------->

WATER SUPPLIED

Master Meter and Supply Error Adjustments

		Grading	Value	Unit		Grading	Pcnt:		Value:	
Volume from own sources:	+ ?	6	36,847.860	acre-ft/yr	+ ?	3		● ○		acre-ft/yr
Water imported:	+ ?	6	54,030.710	acre-ft/yr	+ ?	2		● ○		acre-ft/yr
Water exported:	+ ?	6	14,032.420	acre-ft/yr	+ ?	3		● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: **76,846.150** acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

		Grading	Value	Unit	Pcnt:		Value:	
Billed metered:	+ ?	7	70,593.100	acre-ft/yr				
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr				
Unbilled metered:	+ ?	n/a	0.000	acre-ft/yr				
Unbilled unmetered:	+ ?	5	32.040	acre-ft/yr		○ ●	32.040	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: ? **70,625.140** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

6,221.010 acre-ft/yr

Apparent Losses

		Grading	Value	Unit	Pcnt:		Value:	
Unauthorized consumption:	+ ?		192.115	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

		Grading	Value	Unit	Pcnt:		Value:	
Customer metering inaccuracies:	+ ?	7	354.739	acre-ft/yr	0.50%	● ○		acre-ft/yr
Systematic data handling errors:	+ ?		176.483	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? **723.337** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? **5,497.673** acre-ft/yr

WATER LOSSES: **6,221.010** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? **6,253.050** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

		Grading	Value	Unit
Length of mains:	+ ?	9	2,576.0	miles
Number of active AND inactive service connections:	+ ?	8	157,519	
Service connection density:	?		61	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

		Grading	Value	Unit
Average operating pressure:	+ ?	4	74.0	psi

COST DATA

		Grading	Value	Unit
Total annual cost of operating water system:	+ ?	10	$121,089,214	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	4	$3.71	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	6	$885.55	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 63 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported

2: Customer retail unit cost (applied to Apparent Losses)

3: Volume from own sources

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: Eastern Municipal Water District (3310009 SRO)
Reporting Year: 2018 7/2017 - 6/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where

<----------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED

		Grade	Value	Unit		Grade	Pcnt:		Value:	
Volume from own sources:	+ ?	7	34,988.040	acre-ft/yr	+ ?	4		○ ●	29.920	acre-ft/yr
Water imported:	+ ?	7	65,369.400	acre-ft/yr	+ ?	4	-0.28%	● ○		acre-ft/yr
Water exported:	+ ?	7	17,592.890	acre-ft/yr	+ ?	3	-0.60%	● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 82,811.984 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

		Grade	Value	Unit	Pcnt:		Value:	
Billed metered:	+ ?	7	78,470.600	acre-ft/yr				
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr				
Unbilled metered:	+ ?	n/a	0.000	acre-ft/yr				
Unbilled unmetered:	+ ?	4	20.050	acre-ft/yr		○ ●	20.050	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: ? 78,490.650 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

4,321.334 acre-ft/yr

Apparent Losses

		Grade	Value	Unit	Pcnt:		Value:	
Unauthorized consumption:	+ ?		207.030	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

		Grade	Value	Unit	Pcnt:		Value:	
Customer metering inaccuracies:	+ ?	7	473.666	acre-ft/yr	0.60%	● ○		acre-ft/yr
Systematic data handling errors:	+ ?		196.177	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? 876.872 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 3,444.462 acre-ft/yr

WATER LOSSES: 4,321.334 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 4,341.384 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

		Grade	Value	Unit
Length of mains:	+ ?	9	2,281.1	miles
Number of active AND inactive service connections:	+ ?	8	160,017	
Service connection density:	?		70	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 4 74.0 psi

COST DATA

		Grade	Value	Unit
Total annual cost of operating water system:	+ ?	10	$129,977,810	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	5	$3.73	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	6	$886.17	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 68 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported

2: Customer retail unit cost (applied to Apparent Losses)

3: Billed metered

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access
+ Click to add a comment

Water Audit Report for: Eastern Municipal Water District (3310009 SRO)
Reporting Year: 2019 | 7/2018 - 6/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<----------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:		Value:	
Volume from own sources:	7	40,545.710	acre-ft/yr	5		○ ●	-24.000	acre-ft/yr
Water imported:	7	53,578.970	acre-ft/yr	4	-0.18%	● ○		acre-ft/yr
Water exported:	7	18,362.290	acre-ft/yr	3	-1.20%	● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 75,659.982 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option

				Pcnt:		Value:	
Billed metered:	9	68,282.700	acre-ft/yr				
Billed unmetered:	n/a	0.000	acre-ft/yr				
Unbilled metered:	n/a	0.000	acre-ft/yr				
Unbilled unmetered:	4	17.740	acre-ft/yr		○ ●	17.740	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: 68,300.440 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

7,359.542 acre-ft/yr

Apparent Losses

				Pcnt:		Value:	
Unauthorized consumption:		189.150	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	7	829.345	acre-ft/yr	1.20%	● ○		acre-ft/yr
Systematic data handling errors:	5	170.707	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,189.201 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 6,170.341 acre-ft/yr

WATER LOSSES: 7,359.542 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 7,377.282 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	2,314.0	miles
Number of active AND inactive service connections:	8	162,904	
Service connection density:		70	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 4 | 76.0 psi

COST DATA

Total annual cost of operating water system:	10	$129,435,936	$/Year
Customer retail unit cost (applied to Apparent Losses):	7	$4.21	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	7	$841.65	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 73 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported
2: Volume from own sources
3: Unauthorized consumption

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
\+ Click to add a comment

Water Audit Report for: Eastern Municipal Water District (3310009 SRO)
Reporting Year: 2020 | 7/2019 - 6/2020

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<----------- Enter grading in column 'E' and 'J' ---------->

WATER SUPPLIED

Master Meter and Supply Error Adjustments

							Pcnt:		Value:	
Volume from own sources:	+ ?	7	36,583.280	acre-ft/yr	+ ?	5		○ ●	5.130	acre-ft/yr
Water imported:	+ ?	7	58,985.230	acre-ft/yr	+ ?	4	-0.22%	● ○		acre-ft/yr
Water exported:	+ ?	7	15,786.150	acre-ft/yr	+ ?	3	-3.00%	● ○		acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: **79,419.052** acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option

					Pcnt:		Value:	
Billed metered:	+ ?	9	74,299.500	acre-ft/yr				
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr				
Unbilled metered:	+ ?	n/a	0.000	acre-ft/yr				
Unbilled unmetered:	+ ?	4	24.050	acre-ft/yr		○ ●	24.050	acre-ft/yr

Use buttons to select percentage of water supplied
OR
value

AUTHORIZED CONSUMPTION: ? **74,323.550** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

5,095.502 acre-ft/yr

Apparent Losses

					Pcnt:		Value:	
Unauthorized consumption:	+ ?		198.548	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	7	2,297.923	acre-ft/yr	3.00%	● ○		acre-ft/yr
Systematic data handling errors:	+ ?	5	185.749	acre-ft/yr	0.25%	● ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? **2,682.219** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? **2,413.283** acre-ft/yr

WATER LOSSES: **5,095.502** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? **5,119.552** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	9	2,338.6	miles
Number of active AND inactive service connections:	+ ?	8	165,627	
Service connection density:	?		71	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 4 74.1 psi

COST DATA

Total annual cost of operating water system:	+ ?	10	$140,926,497	$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	7	$4.26	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	7	$1,014.17	$/acre-ft

☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 73 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported

2: Volume from own sources

3: Unauthorized consumption

E

Appendix E: West San Jacinto Groundwater Basin Management Plan

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.)

Table of Contents

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

TABLE OF CONTENTS

Section - Description | Page

SECTION 1 EXECUTIVE SUMMARY 1 - 1

SECTION 2 INTRODUCTION 2 - 1

THE NEED FOR GROUNDWATER MANAGEMENT 2 - 1
APPROACH TO DEVELOPMENT OF GROUNDWATER MANAGEMENT PLAN 2 - 2
PURPOSE OF THIS REPORT 2 - 3
ORGANIZATION OF THIS REPORT 2 - 4
ACKNOWLEDGMENTS 2 - 4

SECTION 3 EXISTING WATER RESOURCES MANAGEMENT FRAMEWORK 3 - 1

WATER SUPPLY AND WASTEWATER AGENCIES 3 - 1
Eastern Municipal Water District 3 - 1
Metropolitan Water District of Southern California 3 - 3

REGULATION OF WASTEWATER 3 - 5
Federal Environmental Protection Agency 3 - 5
State Water Resources Control Board 3 - 6
California Regional Water Quality Control Board, Santa Ana Region 3 - 7
California Department of Health Services 3 - 8

REGULATION OF DRINKING WATER 3 - 10
Summary of Water Quality Standards 3 - 10

LOCAL PLANNING AND REGULATORY AGENCIES 3 - 10

SECTION 4 GROUNDWATER RESOURCES IN THE WEST SAN JACINTO BASIN 4 - 1

PHYSICAL FEATURES 4 - 1
The Perris Subbasins 4 - 1
The Menifee Subbasins 4 - 3
The Winchester Subbasin 4 - 3
Lakeview Subbasin 4 - 4
San Jacinto Lower Pressure Subbasin 4 - 5

TABLE OF CONTENTS
(Continued)

Section - Description	Page
GROUNDWATER HYDROLOGY OF THE WEST SAN JACINTO BASIN	4 - 5
Groundwater Levels and Movement	4 - 5
Groundwater Hydrology	4 - 6
GROUNDWATER QUALITY	4 - 10
Perris North Subbasin	4 - 12
Perris South Subbasins	4 - 12
Menifee Subbasins	4 - 13
Lakeview Subbasin	4 - 14
Winchester Subbasin	4 - 15
San Jacinto Lower Pressure Subbasin	4 - 15
FUTURE GROUNDWATER QUALITY	4 - 16
SECTION 5 FUTURE WATER DEMANDS AND WASTEWATER FLOWS	5 - 1
WATER DEMANDS AND SOURCES OF SUPPLY	5 - 1
Projected Demands	5 - 1
Imported Water from Metropolitan	5 - 1
Groundwater	5 - 3
Reclaimed Water	5 - 4
WATER SUPPLY PLAN WITHOUT GROUNDWATER MANAGEMENT PLAN	5 - 5
SECTION 6 GROUNDWATER MANAGEMENT GOALS	6 - 1
SECTION 7 ELEMENTS OF GROUNDWATER MANAGEMENT PLAN	7 - 1
MANAGEMENT POLICY ELEMENTS	7 - 1
Monitoring of Groundwater Production, Groundwater Levels and Groundwater Quality	7 - 1
Administration and Monitoring of Well Construction	7 - 2
Administration of Well Abandonment and Destruction Program	7 - 3
Groundwater Quality Protection	7 - 3

TABLE OF CONTENTS
(Continued)

Section - Description	Page
YIELD ENHANCEMENT ELEMENTS	7 - 4
Artificial Recharge	7 - 4
Recovery of Contaminated Groundwater	7 - 9
CONJUNCTIVE USE	7 - 13
TRANSFER OF AGRICULTURAL AND OTHER NON-POTABLE WATER USERS FROM GROUNDWATER TO RECLAIMED WATER	7 - 15
SECTION 8 GROUNDWATER MANAGEMENT PLAN	8 - 1
CONTENTS OF THE MANAGEMENT PLAN	8 - 1
MANAGEMENT PLAN CRITERIA	8 - 1
ULTIMATE PLAN DESCRIPTION	8 - 3
Establishment of a Groundwater Manager	8 - 3
Monitoring of Groundwater Production	8 - 4
Monitoring of Groundwater Level and Quality	8 - 4
Development of Well Construction Policies	8 - 4
Development of a Well Abandonment and Destruction Program	8 - 4
Monitoring of Well Construction, Abandonment and Destruction	8 - 5
Groundwater Quality Protection	8 - 5
Exchange of Agricultural and Other Non-Potable Groundwater Production to Municipal Use	8 - 5
Maximize Yield Augmentation with Local Resources-Local Runoff and Reclaimed Water	8 - 6
Maximize Conjunctive Use	8 - 7
Groundwater Treatment	8 - 7
Groundwater Management Plan Alternatives	8 - 7
FINANCING THE GROUNDWATER MANAGEMENT PLAN	8 - 11
IMPLEMENTATION OF THE GROUNDWATER MANAGEMENT PLAN	8 - 12
Phase 1 Short Term Implementation	8 - 13
Phase 2 Refine the Ultimate Groundwater Management Plan	8 - 15
Phase 3 Ultimate Groundwater Management Plan Implementation	8 - 17

TABLE OF CONTENTS
(Continued)

Section - Description	Page
MANAGEMENT AND MONITORING	8 - 18
SCHEDULE AND COST	8 - 18
REFERENCES	
APPENDIX A	
A-1 AB 3030 with AB 1152 Amendments	
A-2 Proposed Regulation: Title 22, California Code of Regulations Div. 4. Environmental Health, Chapter 3 Reclamation Criteria	
A-3 Drinking Water Standards and Health Advisories Table	
APPENDIX B	
Table B-1 Availability of Groundwater Quality Data for Wells in the West San Jacinto Area	

LIST OF TABLES

Table Number	Description	Follows Page
1 - 1	Availability of Groundwater in the West San Jacinto Basin	1 - 5
1 - 2	Projections of Municipal and Agricultural Demands West San Jacinto Groundwater Basin	1 - 6
1 - 3	Water Supply Plan in the Absence of a Groundwater Management Plan	1 - 9
1 - 4	Comparison of Groundwater Management Plan Alternatives	1 - 18
3 - 1	Beneficial Uses of Surface Waters	3 - 8
3 - 2	Groundwater Beneficial Uses	3 - 8
3 - 3	Surface Water Quality Objectives	3 - 8
3 - 4	Groundwater Quality Objectives	3 - 8
3 - 5	Maximum Allowable TOC After Organics Removal in Reclaimed Water	3 - 9
3 - 6	Key Criteria for Reclaimed Water Recharge Project	3 - 9
4 - 1	Available Pump Test Data Well Characteristics and Aquifer Properties	4 - 2
4 - 2	Hydrologic Components of the West San Jacinto Basins Year 2000 Conditions Per Basin Plan	4 - 7
4 - 3	Historical Groundwater Production	4 - 9
5 - 1	Projections of Municipal and Agricultural Demands West San Jacinto Groundwater Basin	5 - 1
5 - 2	Metropolitan Water Rate Projections	5 - 2
5 - 3	Availability of Groundwater in the West San Jacinto Basin	5 - 3
5 - 4	Projected Reclaimed Water Flows	5 - 4
5 - 5	Water Supply Plan in the Absence of a Groundwater Management Plan	5 - 5
5 - 6	Cost of Water Supply for the West San Jacinto Groundwater Basin Management Area Without a Groundwater Management Plan	5 - 5
7 - 1	Blending Water Requirements to Meet Title 22 Drinking Water Regulations and Waste Discharge Requirements at Reclamation Plants	7 - 9
7 - 2	Considerations for Blending and Demineralization Elements	7 - 11
7 - 3	Menifee Desalter Costs and Metropolitan's Groundwater Recover Program	7 - 12
7 - 4	Considerations for Conjunctive Use Projects	7 - 13

LIST OF TABLES
(continued)

Table Number	Description	Follows Page
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	8 - 8
8 - 2	Preliminary Estimate of Cost of Water Supply Plan for the West San Jacinto Groundwater Basin Management Area Alternative 2 - Agricultural Exchange and Blending and Demineralization	8 - 8
8 - 3	Preliminary Estimate of Cost of Water Supply Plan for the West San Jacinto Groundwater Basin Management Area Alternative 3 - Agricultural Exchange, Blending and 30,000 Acre-Ft. Conjunctive Use	8 - 8
8 - 4	Preliminary Estimate of Cost of Water Supply Plan for the West San Jacinto Groundwater Basin Management Area Alternative 4 - Agricultural Exchange, Blending and 58,000 Acre-Ft. Conjunctive Use	8 - 8
8 - 5	Comparison of Groundwater Management Plan Alternatives	8 - 9

LIST OF FIGURES

Figure Number	Description	Follows Page
1 - 1	Location Map	1 - 2
1 - 2	District Boundary Map	1 - 3
1 - 3	Subagencies	1 - 4
1 - 4	Imported Water Facilities	1 - 4
1 - 5	Major Physical Features	1 - 5
1 - 6	Groundwater Subbasins	1 - 5
1 - 7	Water Demand Projections For the West San Jacinto Groundwater Management Area	1 - 6
1 - 8	Cost of Imported Water	1 - 7
2 - 1	Location Map	2 - 1
3 - 1	District Boundary Map	3 - 1
3 - 2	Subagencies	3 - 1
3 - 3	Imported Water Facilities	3 - 3
4 - 1	Major Physical Features	4 - 1
4 - 2	Groundwater Subbasins	4 - 1
4 - 3	Groundwater Elevation Map 1974	4 - 5
4 - 4	Groundwater Elevation Map 1993	4 - 5
4 - 5	Groundwater Elevation Time History for Perris, Lakeview and Menifee Subbasins	4 - 6
4 - 6	Groundwater Elevation Time History for Winchester, and San Jacinto Lower Pressure Subbasins	4 - 6
4 - 7	Average Annual Precipitation in Groundwater Management Area	4 - 7
4 - 8	General TDS Map	4 - 12
4 - 9	TDS, Nitrate, & General Inorganic Chemistry Perris North Subbasin	4 - 12
4 - 10	TDS in Perris North and Perris South Subbasins	4 - 12
4 - 11	Nitrate in Perris North and Perris South Subbasins	4 - 12
4 - 12	Chloride in Perris North and Perris South Subbasins	4 - 12
4 - 13	TDS, Nitrate & General Inorganic Chemistry Perris South and Lakeview Subbasins	4 - 12
4 - 14	TDS, Nitrate & General Inorganic Chemistry Perris South II and Perris South III Subbasins	4 - 12
4 - 15	TDS, Nitrate & General Inorganic Chemistry Menifee I and II Subbasins	4 - 13
4 - 16	TDS in Menifee I, Winchester and Lakeview Subbasins	4 - 14
4 - 17	Nitrate in Menifee I, Winchester and Lakeview Subbasins	4 - 14
4 - 18	Chloride in Menifee I, Winchester and Lakeview Subbasins	4 - 14

LIST OF FIGURES

Figure Number	Description	Follows Page
4 - 19	TDS, Nitrate & General Inorganic Chemistry in Winchester Subbasin	4 - 15
4 - 20	TDS, Nitrate & General Inorganic Chemistry in San Jacinto Lower Pressure Subbasin	4 - 15
5 - 1	Water Demand Projections for the West San Jacinto Groundwater Management Area	5 - 1
5 - 2	TDS Concentration in Imported Water	5 - 2
5 - 3	Projected Cost of Imported Water	5 - 2
5 - 4	Ultimate Reclaimed Water System	5 - 4

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.

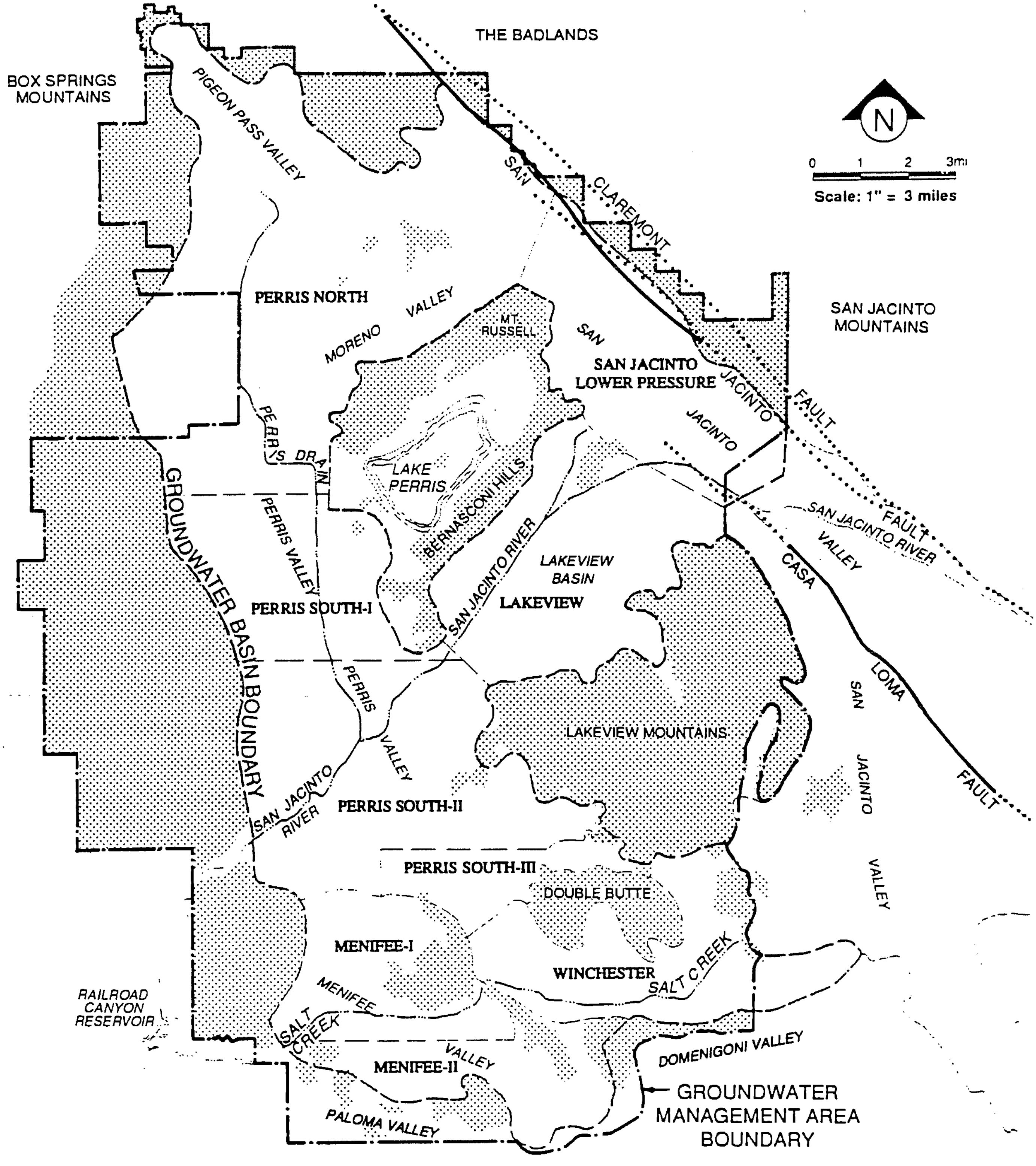
The West San Jacinto Groundwater Basin underlies a large portion of the Eastern Municipal Water District (EMWD). The West San Jacinto Groundwater Basin includes the Perris North, Perris South, Menifee, Winchester, Lakeview and the San Jacinto Lower Pressure subbasins. The location of these subbasins 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.

Mark J. Wildermu
Water Resources Engin

> "§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.

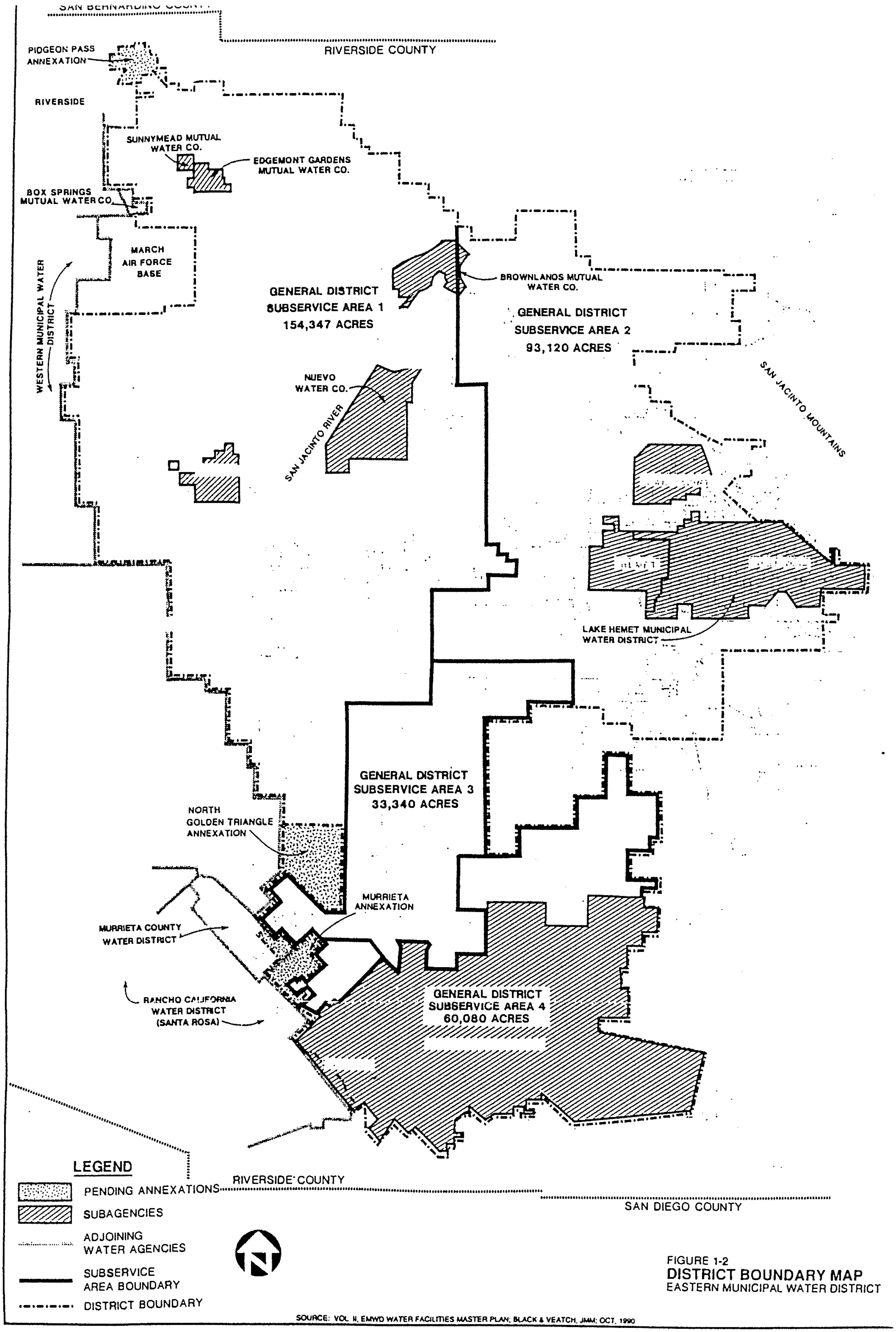


FIGURE 1-2
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

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.

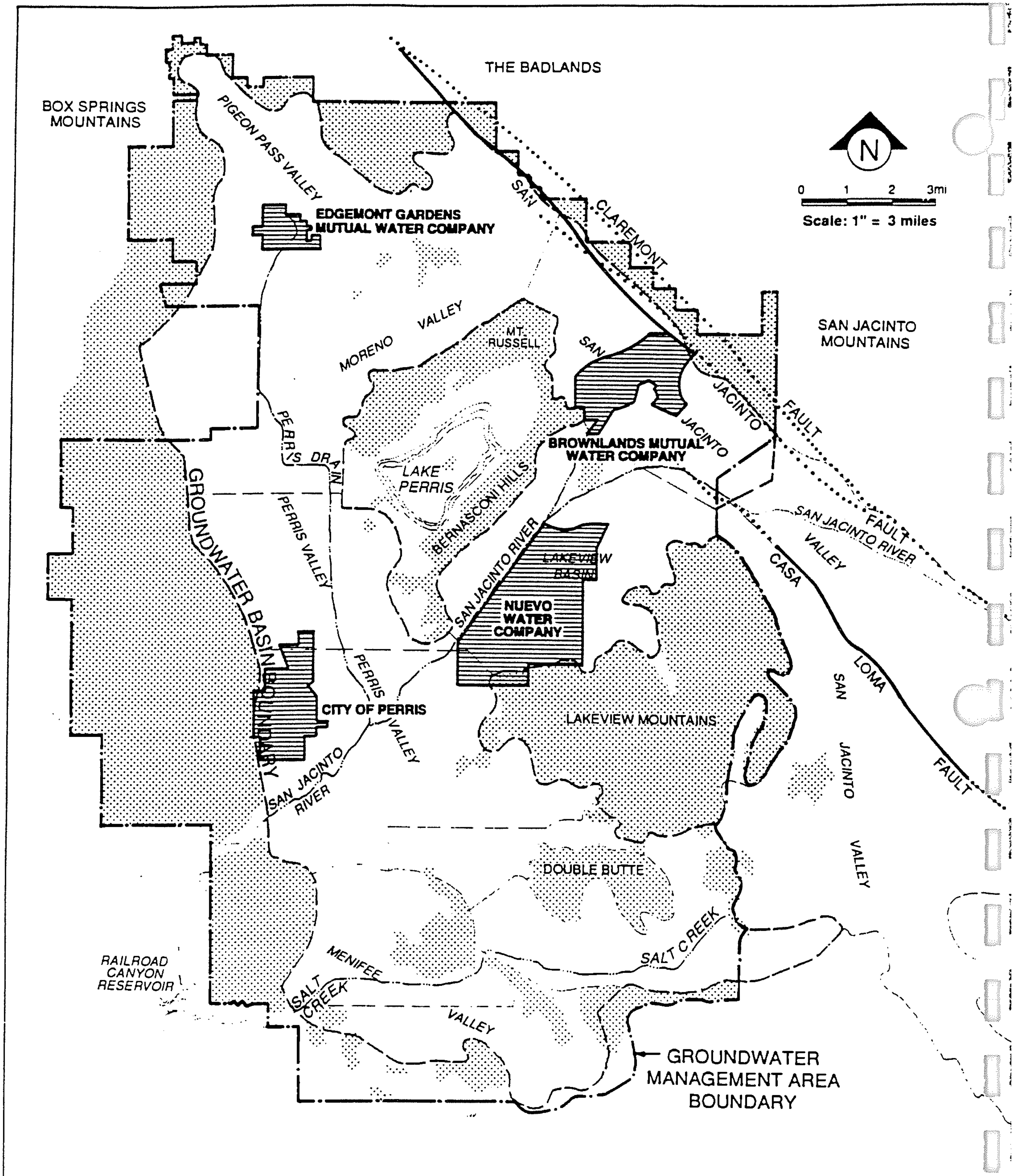
EMWD has agreed to supply water on a wholesale basis to eight public entities and companies, four of which are in the West San Jacinto Groundwater Management area. Water requirements by these subagencies varies depending on development and the availability of local supplies. These entities and public 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.

Mark J. Wilderm h
Water Resources Eng

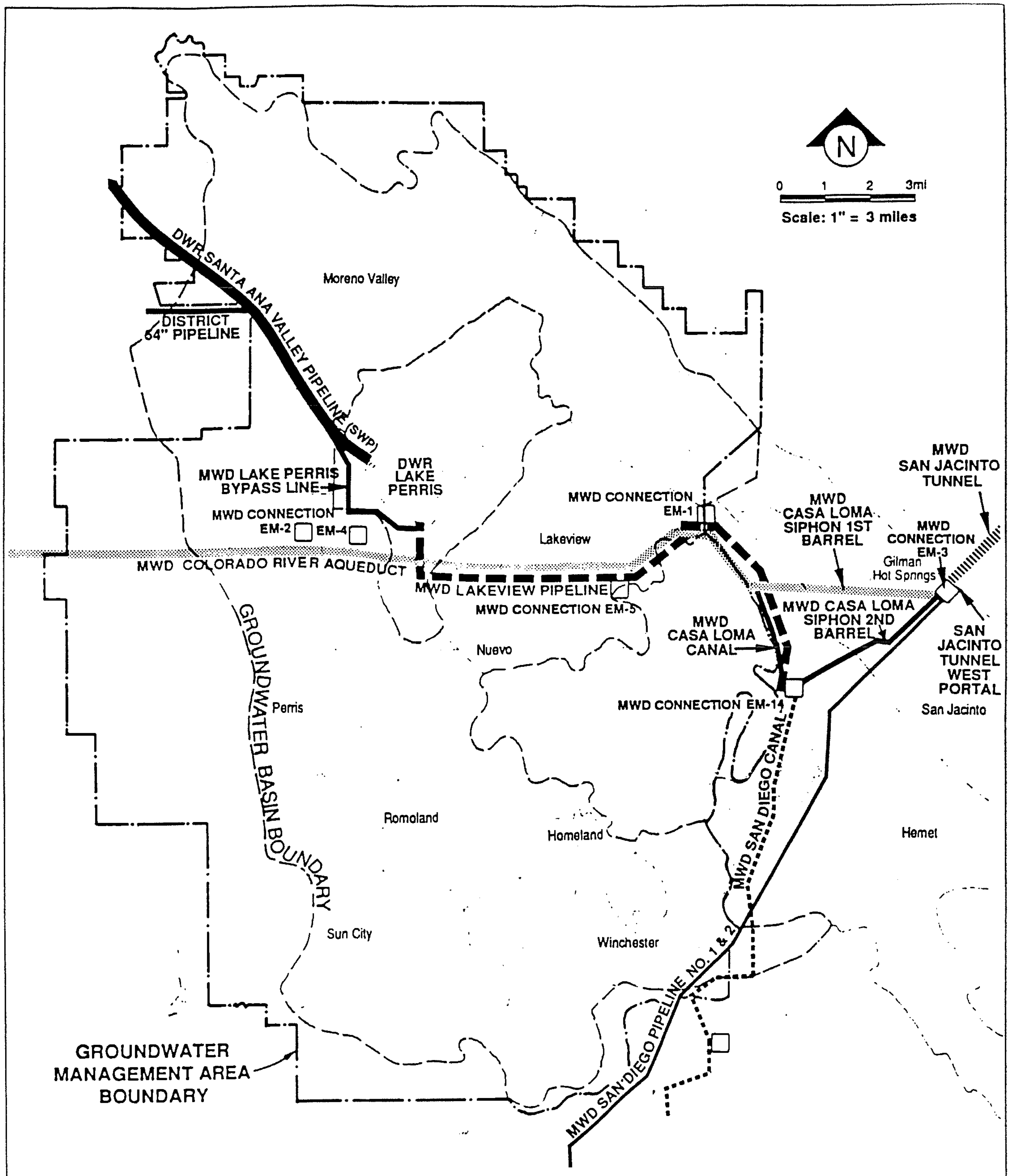


Figure 1-4

IMPORTED WATER FACILITIES

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

Mark J. Wildermuth
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

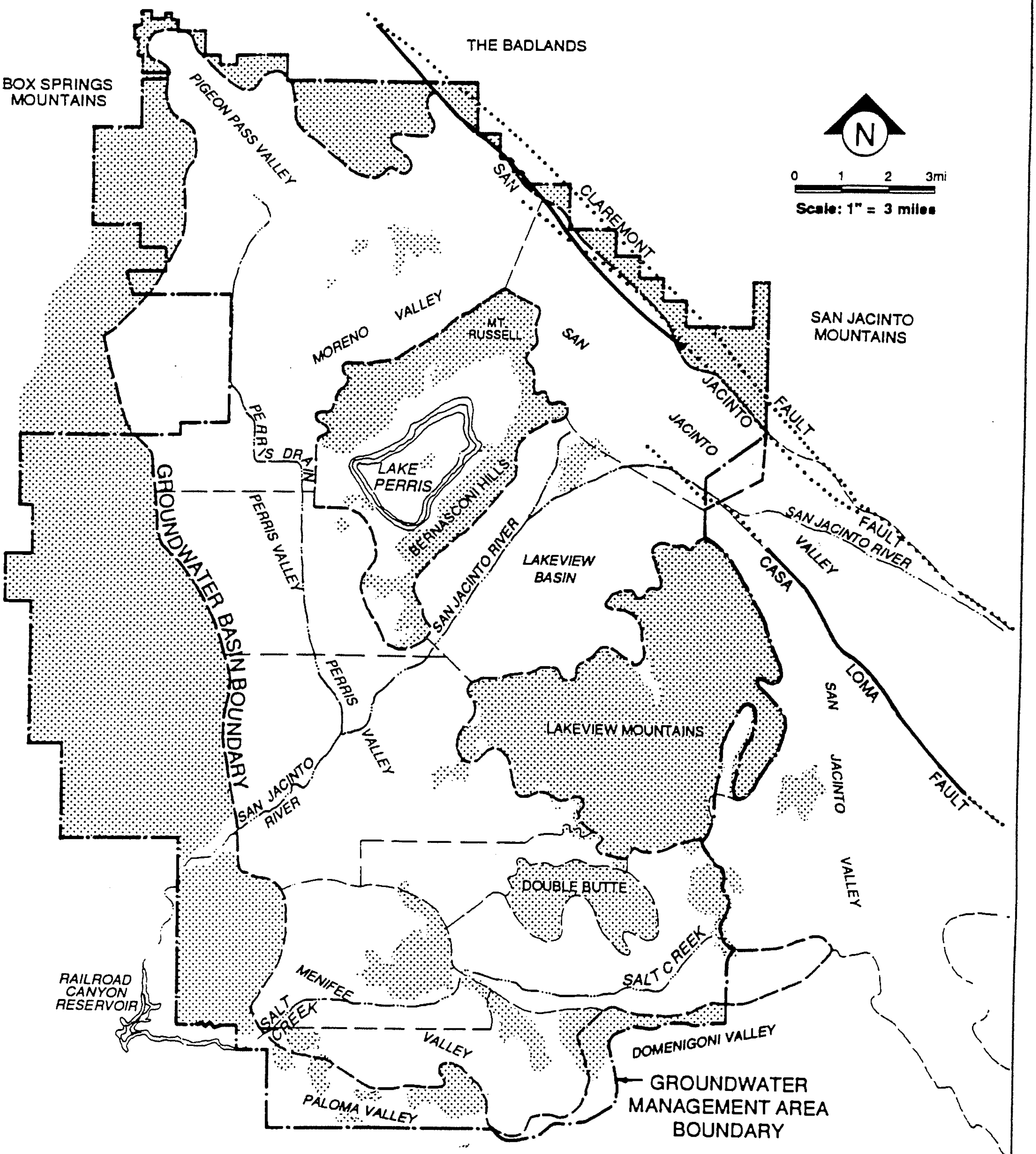
Other local agencies that may have a significant influence on groundwater management include:

> 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.

Mark J. Wildermuth
Water Resources Engineer

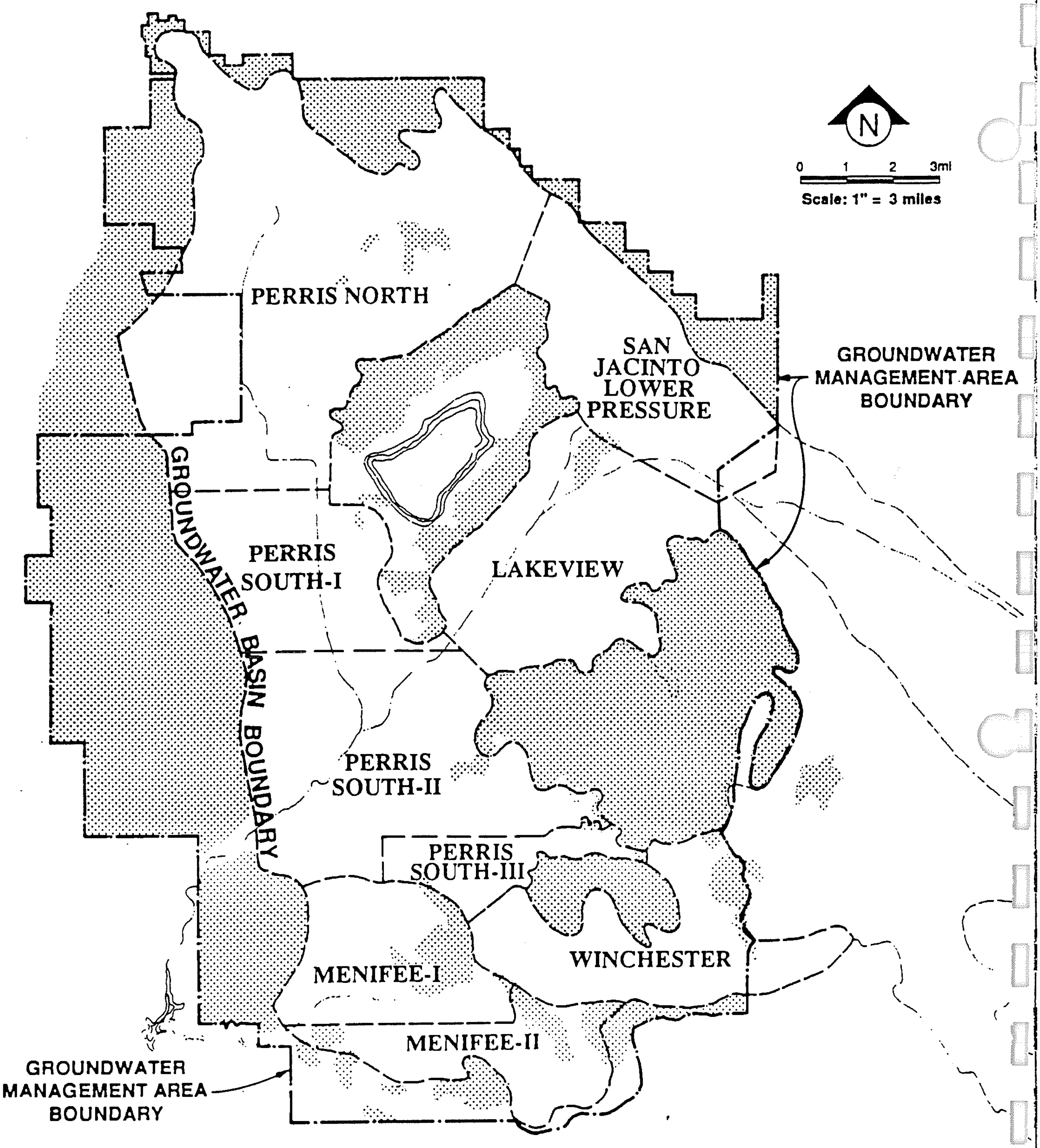


Figure 1-6
GROUNDWATER SUBBASINS

Mark J. Wildermuth
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

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

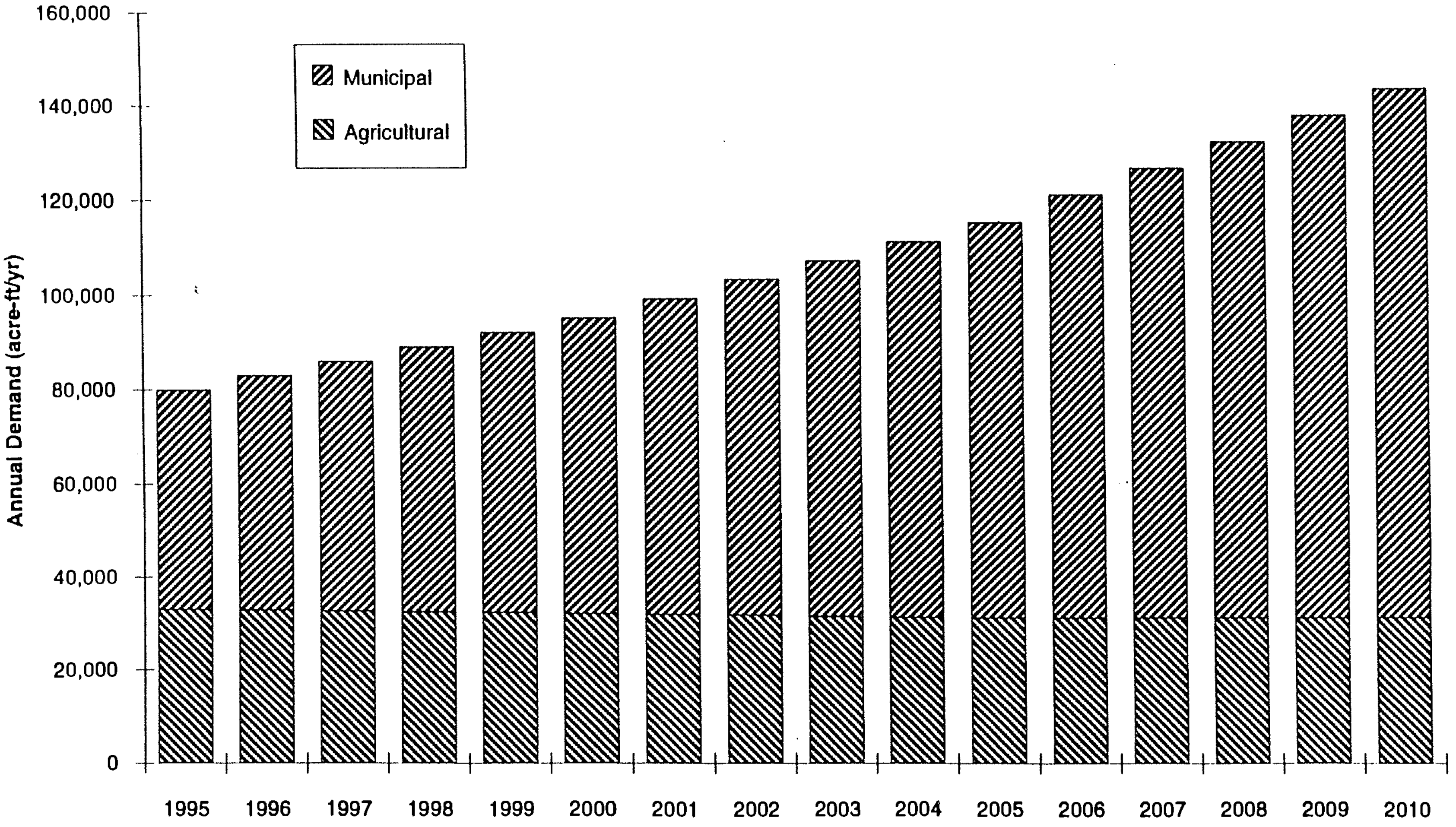
Projected Municipal Water demands for the West San Jacinto Groundwater Management area are listed in Table 1-2 and shown graphically in Figure 1-7. These estimates are based on land use and population projections and projected water use rates. Municipal demands in the West

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

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



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:

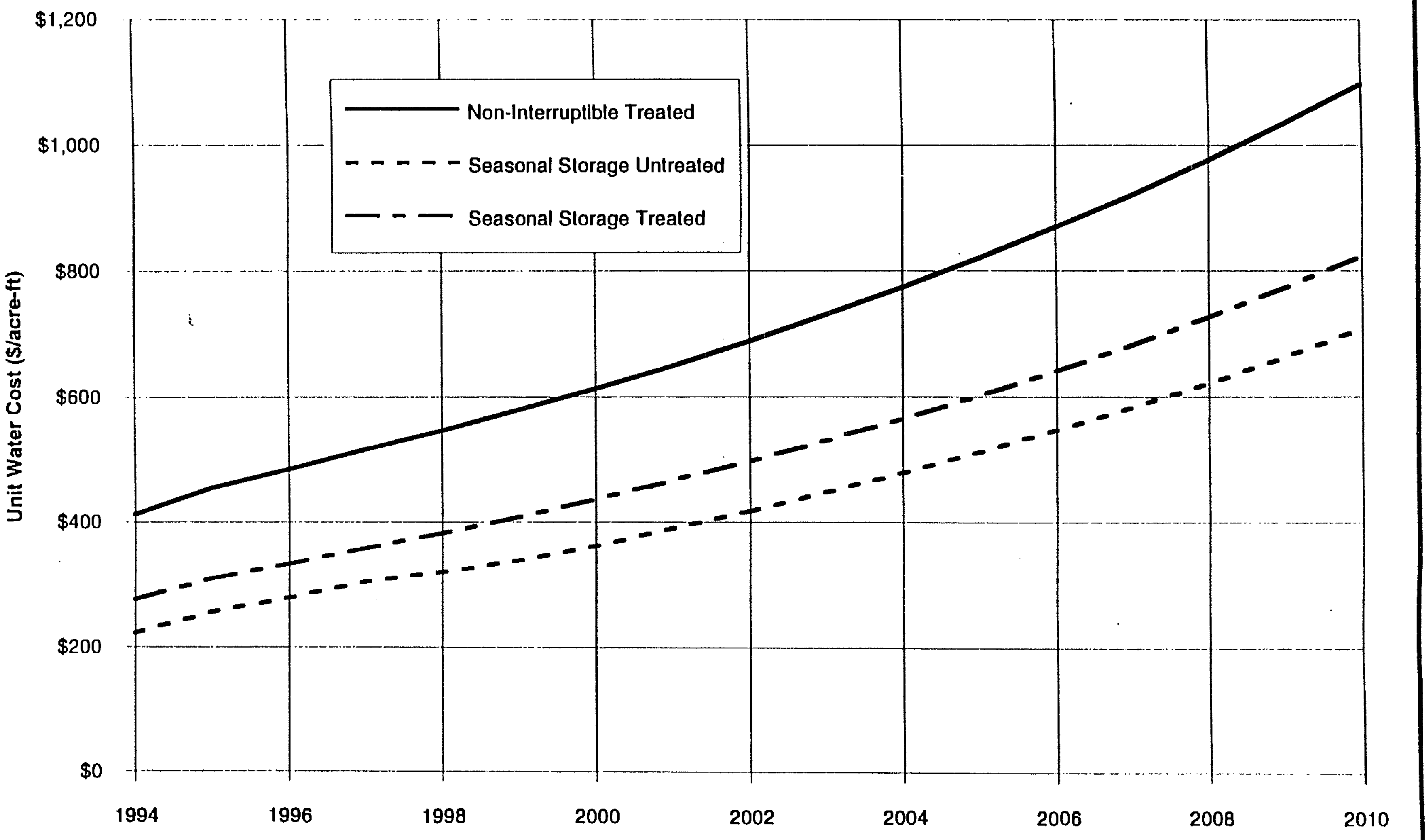
- ☐ a base (non-interruptible) rate;
- ☐ a treatment surcharge to be added to the base rate for purchases of treated water; and
- ☐ a seasonal discount for water produced from October 1 through April 30, to be subtracted from the base rate.

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%

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 <u>total</u> water supply for <u>all water users in the West San Jacinto Groundwater Basin Management area</u>.***

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

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 <u>could be reduced by half</u>. 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 <u>must</u> 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

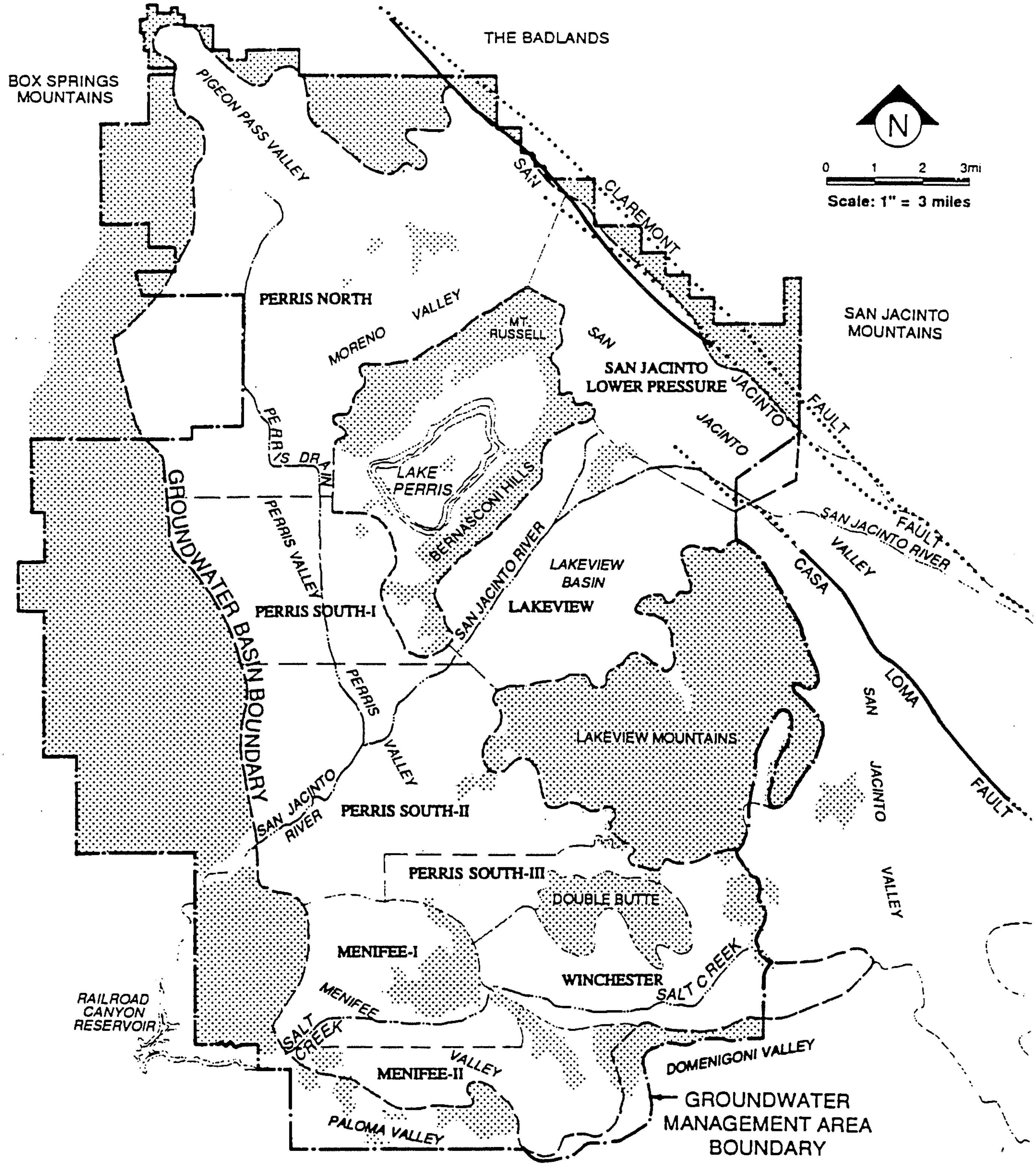
Section 6 Groundwater Management Goals

Section 7 Elements of the Groundwater Management Plan

Section 8 Description of the Groundwater Management Plan

ACKNOWLEDGMENTS

A great deal of research and data gathering went into the preparation of this study and report. Assistance in research, data gathering and plan formulation was provided by the staff of EMWD, in particular Dr. Behrooz Mortazavi and Dr. P. Ravishanker. Their help was greatly appreciated.



LEGEND:

▨ NONWATER-BEARING PORTION

— KNOWN FAULTS

········· INFERRED OR CONCEALED FAULTS

Figure 2-1
LOCATION MAP

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

Mark J. Wilderm
Water Resources Eng

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

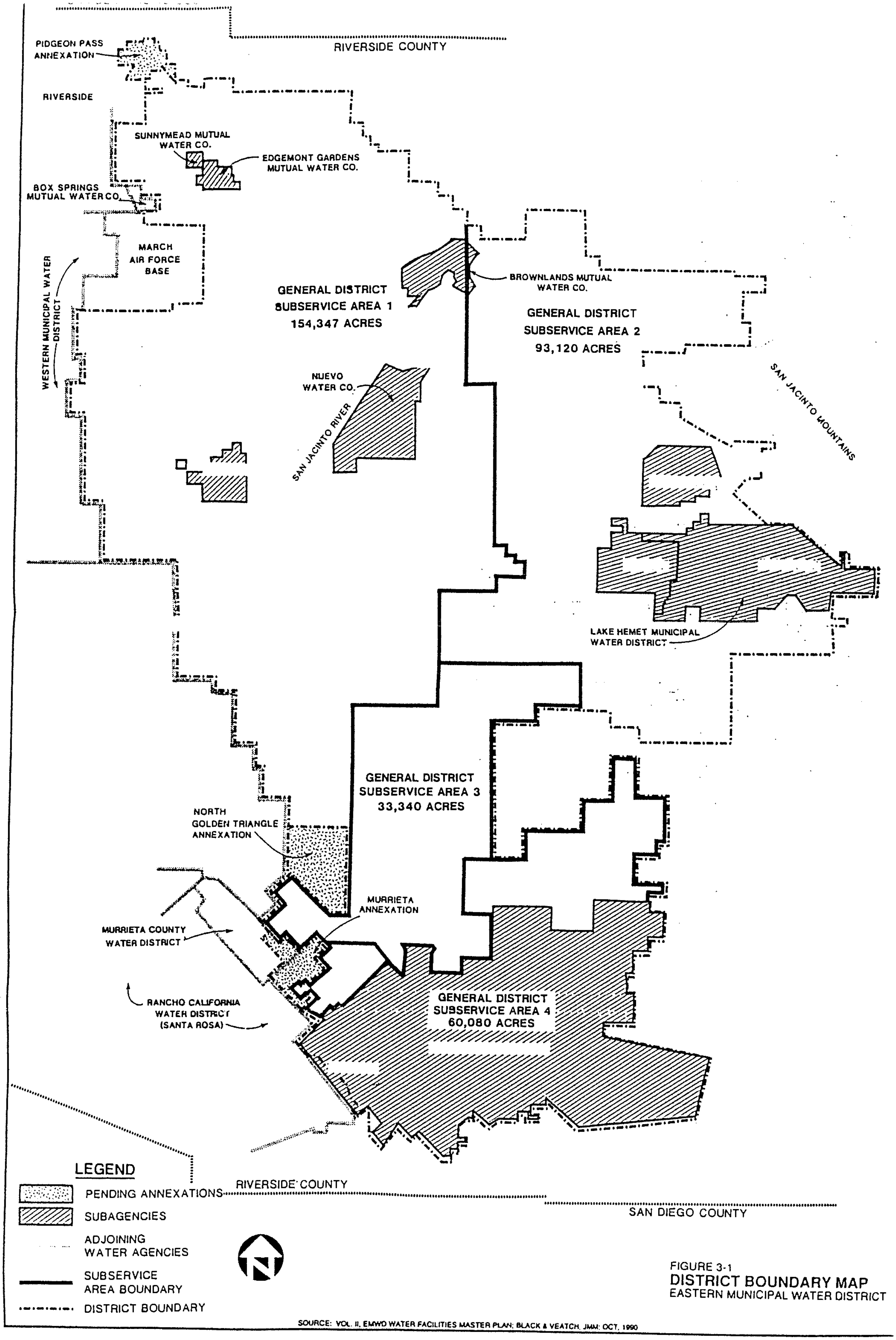


FIGURE 3-1
DISTRICT BOUNDARY MAP
EASTERN MUNICIPAL WATER DISTRICT

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

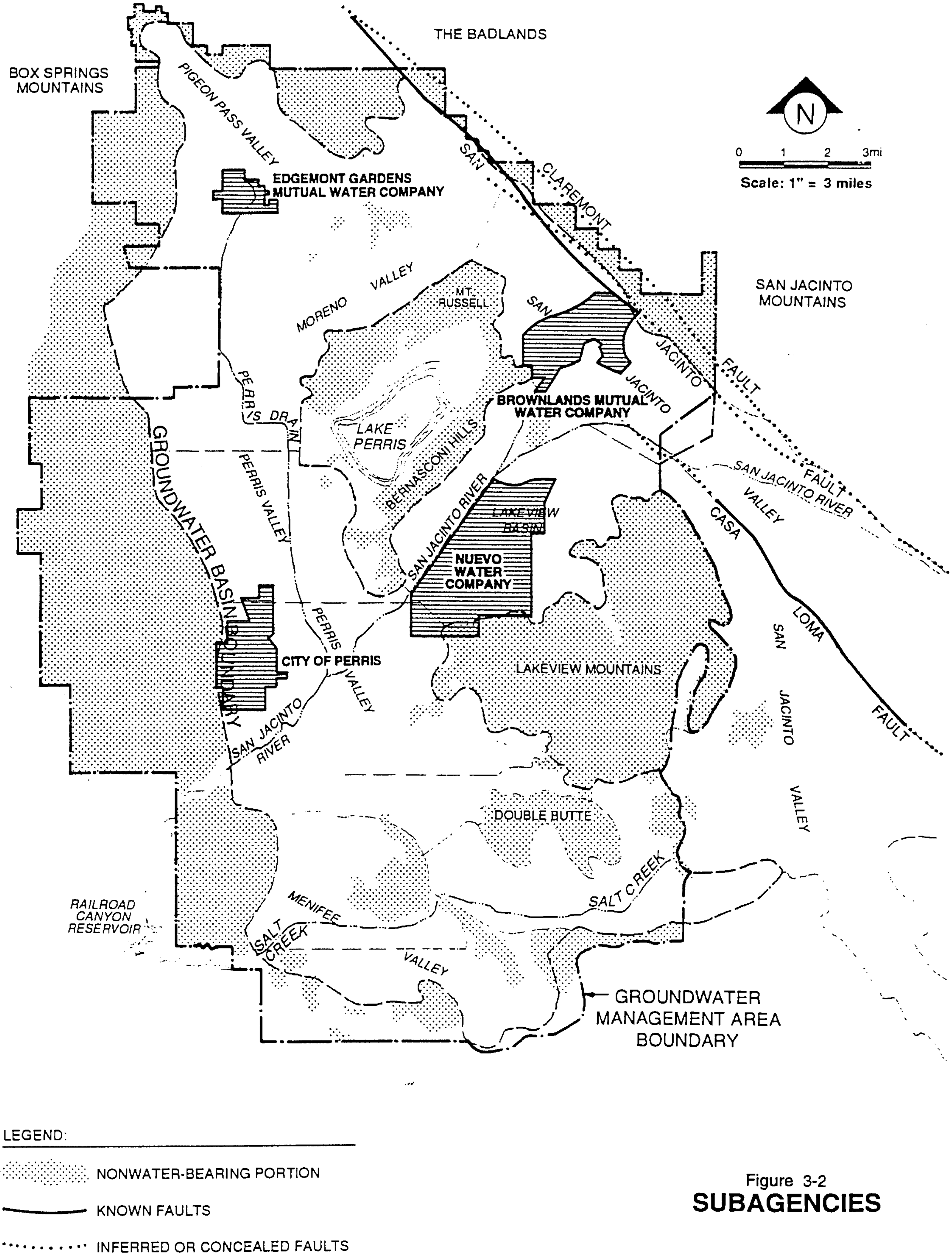


Figure 3-2
SUBAGENCIES

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

Mark J. Wildermuth
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.

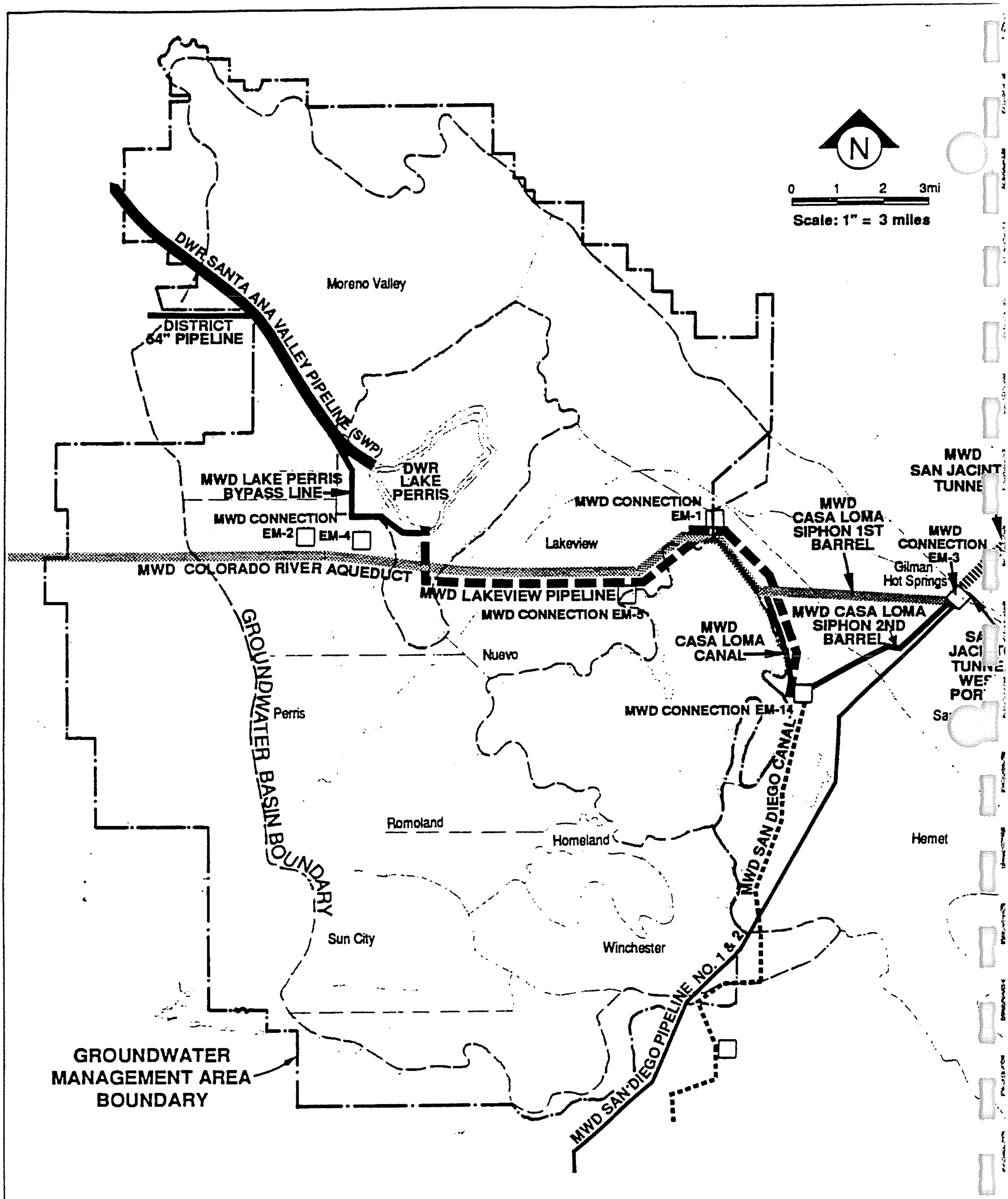


Figure 3-3

IMPORTED WATER FACILITIES

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

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 Sa cin Water Reclamation Program include:

Nondegradation Policy (1968). This is the single most important statewide water qual 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". T 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 su 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 a 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 pl 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 tho objectives. For the Santa Ana Region, the original basin plan was adopted in 1975 and amended 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.

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

<u>Water Quality Objectives.</u> 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.

<u>Trace constituents.</u> 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

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

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					

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

	Maximum TOC Concentration (mg/L)	
Reclaimed water Contribution (%)	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

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

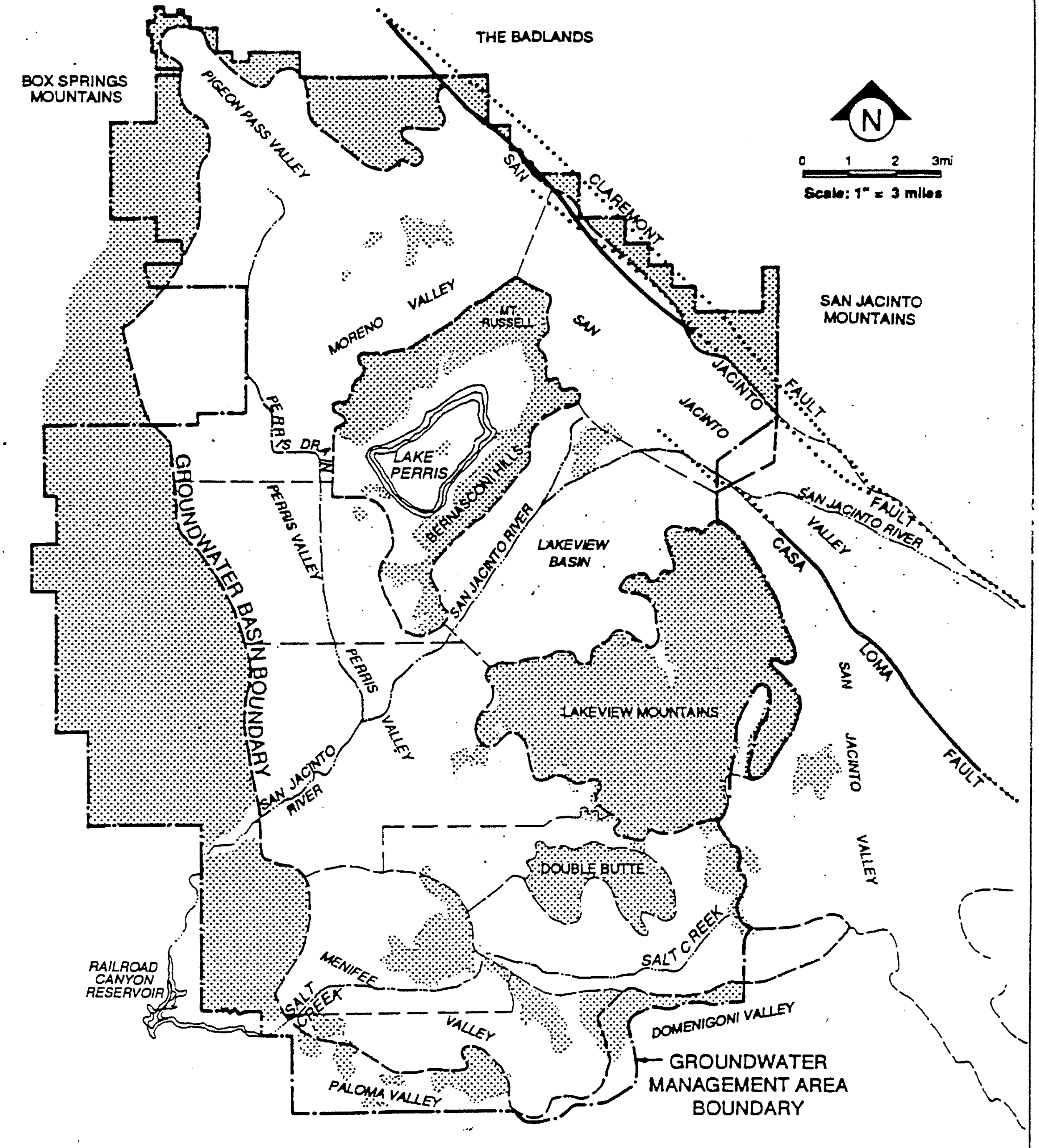
PHYSICAL FEATURES

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



LEGEND:

▨ NONWATER-BEARING PORTION

—— KNOWN FAULTS

·········· INFERRED OR CONCEALED FAULTS

Figure 4-1

MAJOR PHYSICAL FEATURES

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

Mark J. Wildermuth
Water Resources Engineer

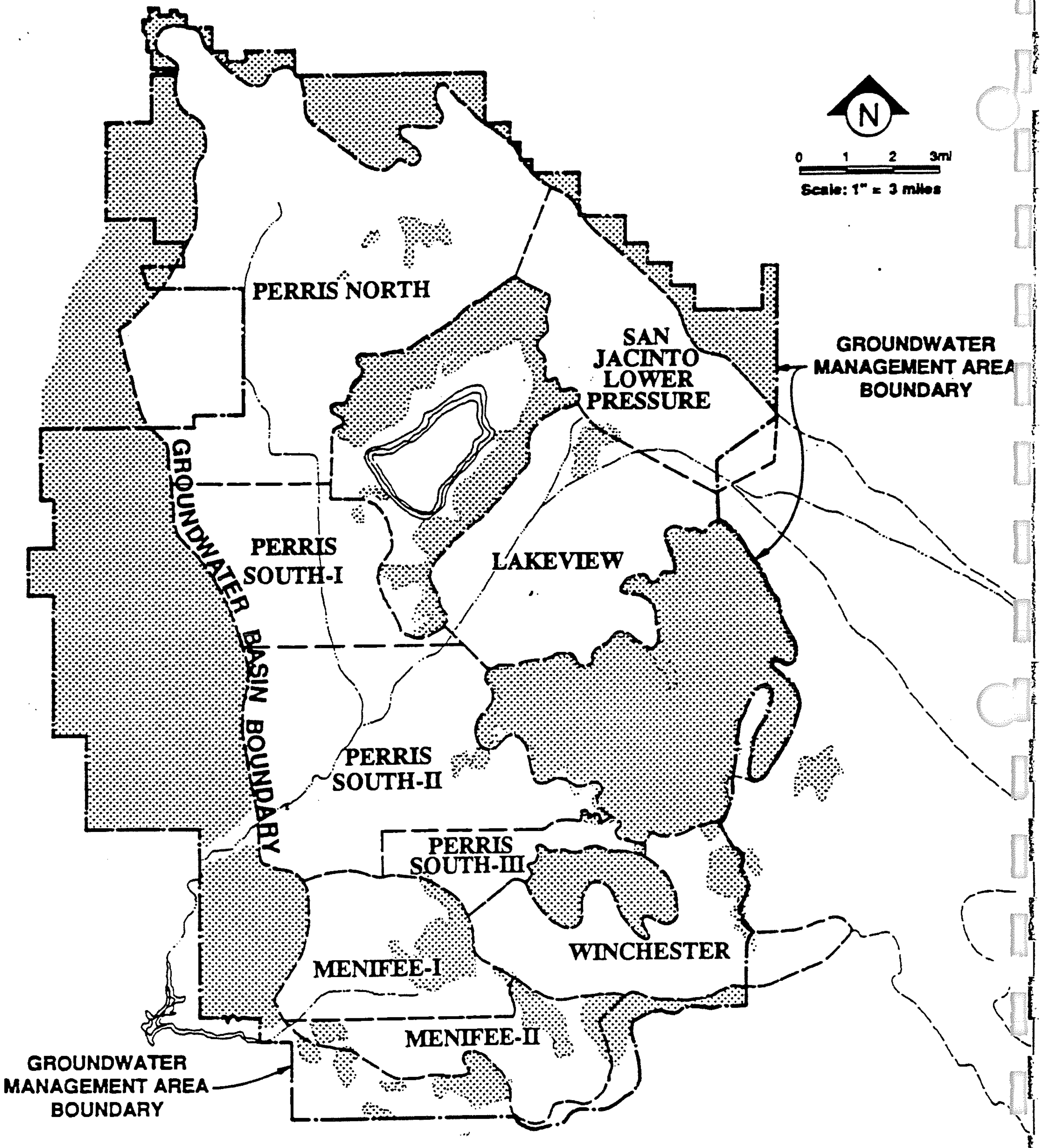


Figure 4-2
GROUNDWATER SUBBASINS

Mark J. Wilderm
Water Resources Engi

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

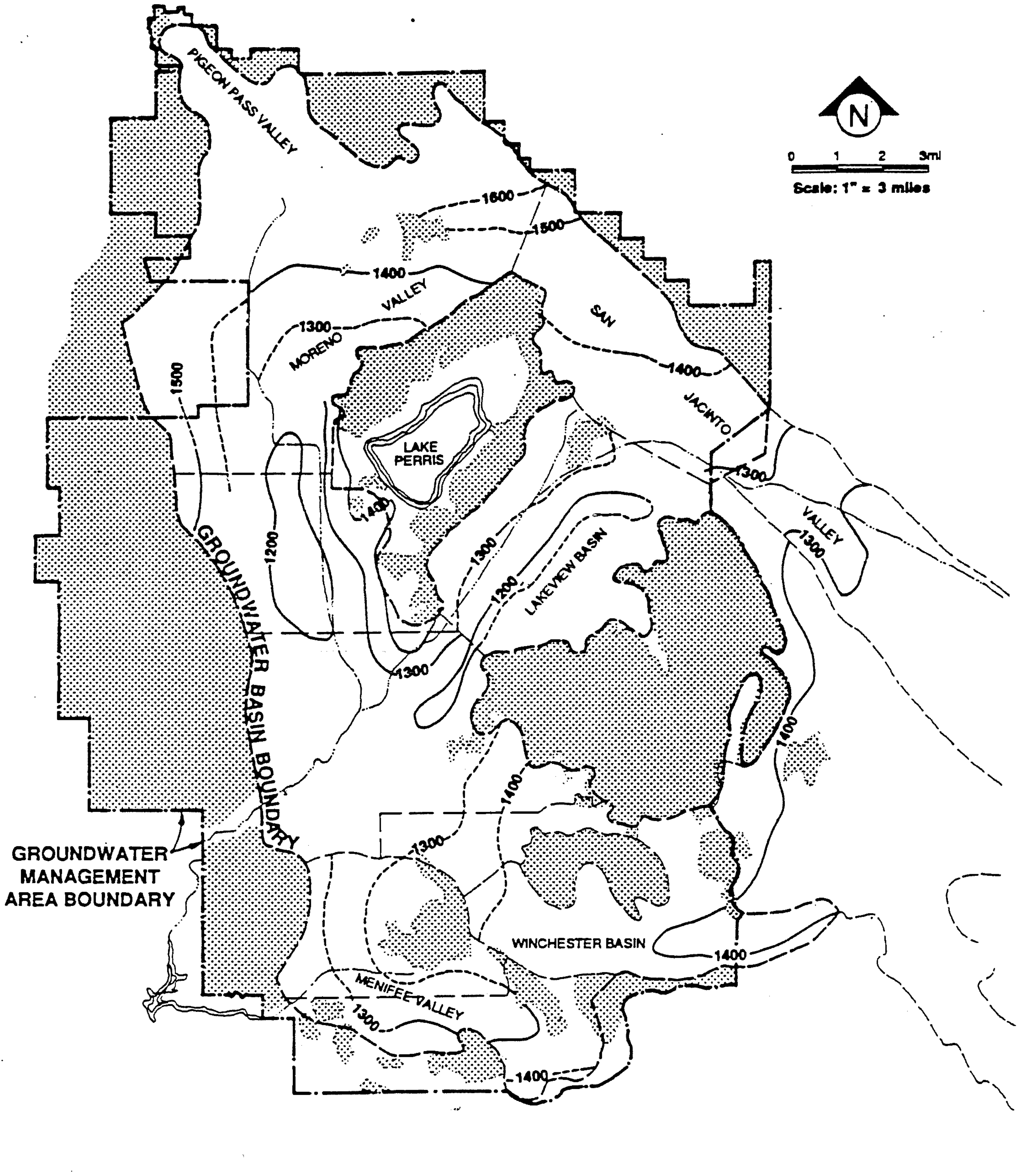
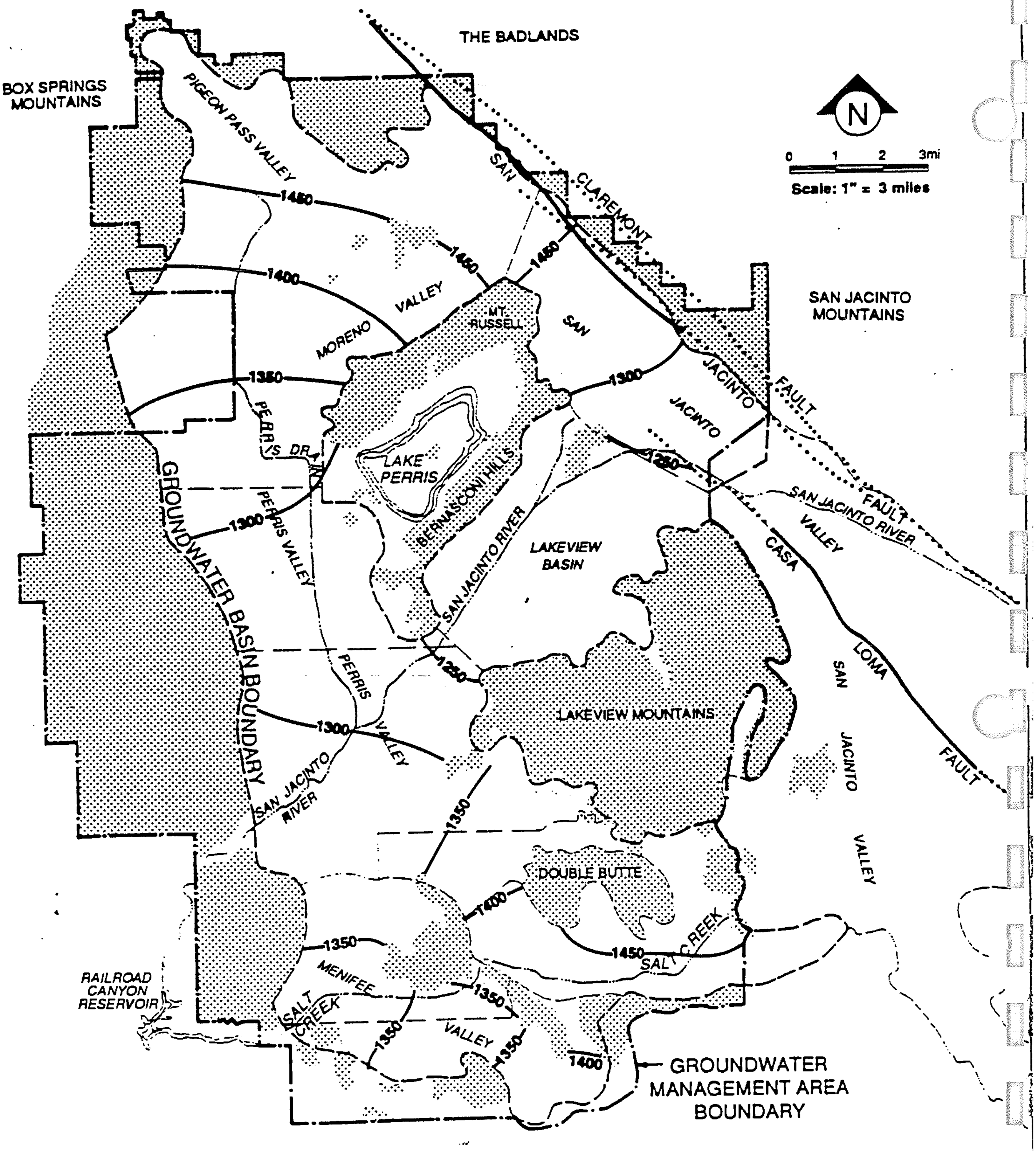


Figure 4-3

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 Eng

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

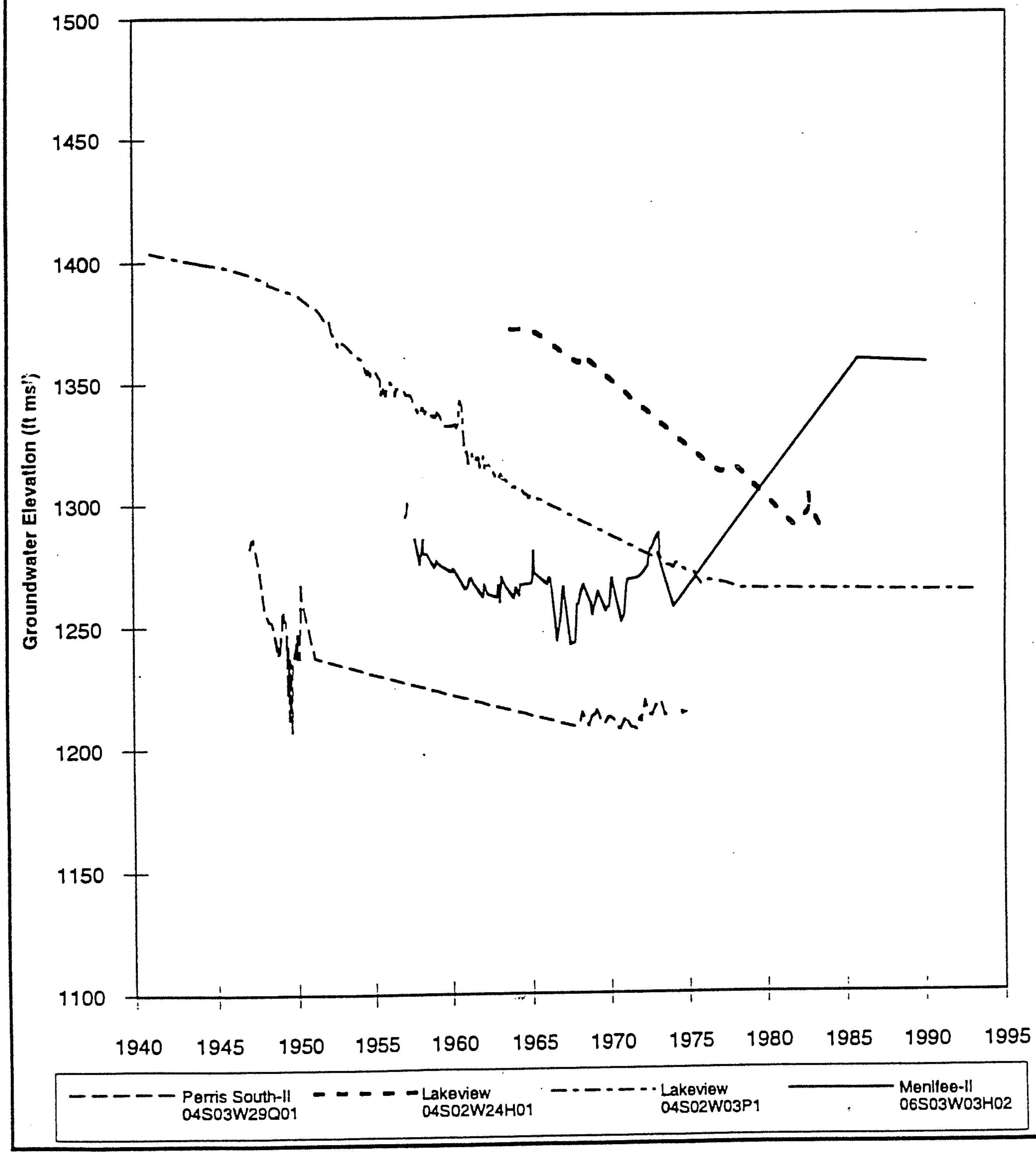
Generally, water levels will fluctuate both seasonally and on a long-term basis. Records of water levels in wells for the last 45 years generally indicate that the water table declined during the period of 1945 to the mid-seventies and recovered somewhat from the mid-1970's to the present. This long 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.

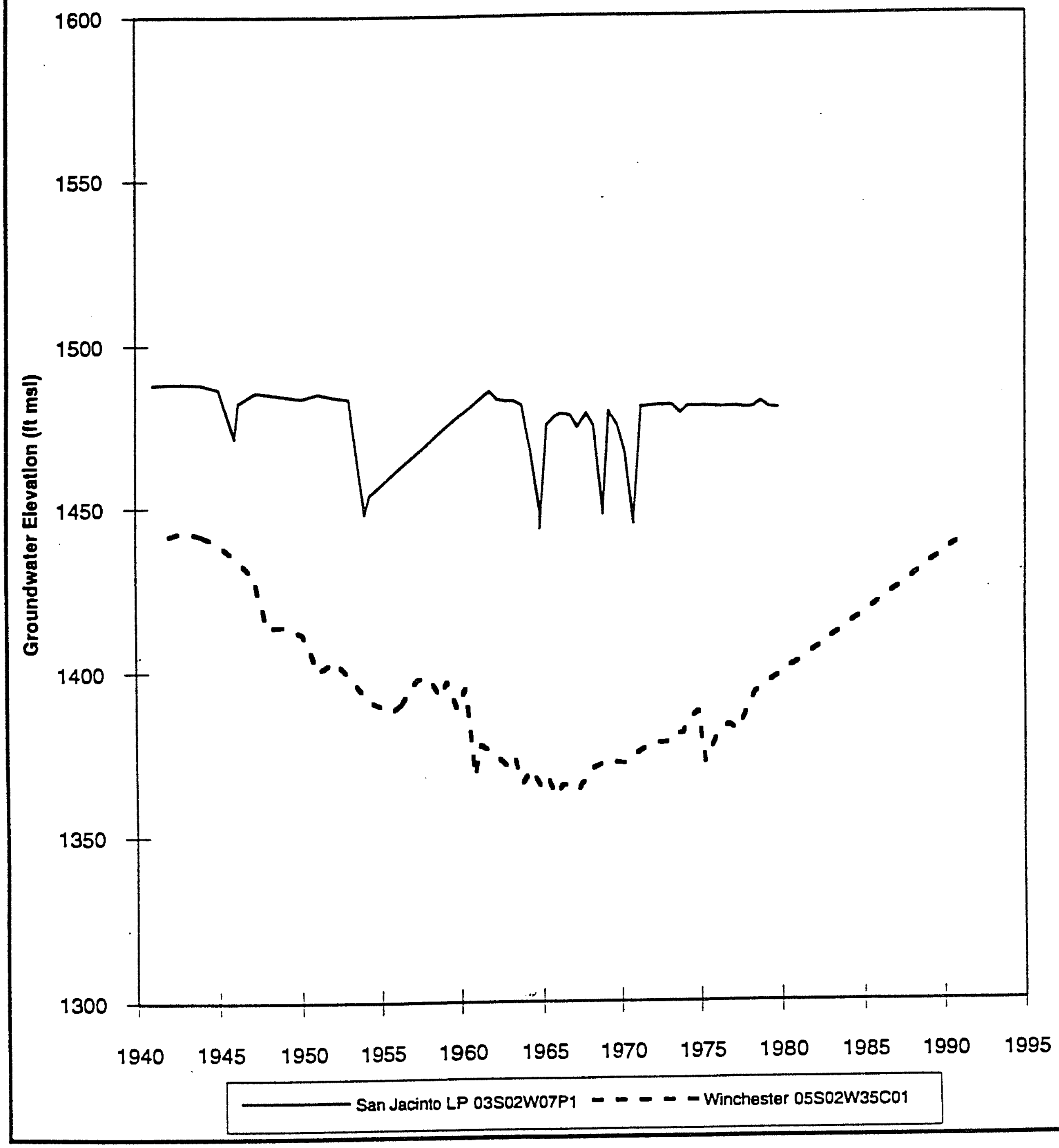
FIGURE 4-5 GROUNDWATER ELEVATION IN PERRIS, LAKEVIEW AND MENIFEE SUBBASINS



B&W Chart A
7/27/94
9:15 AM

Mark J. Wildermuth
Water Resources Engineer

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



B&W Chart B
7/27/94
9:40 AM

Mark J. Wildermuth
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.

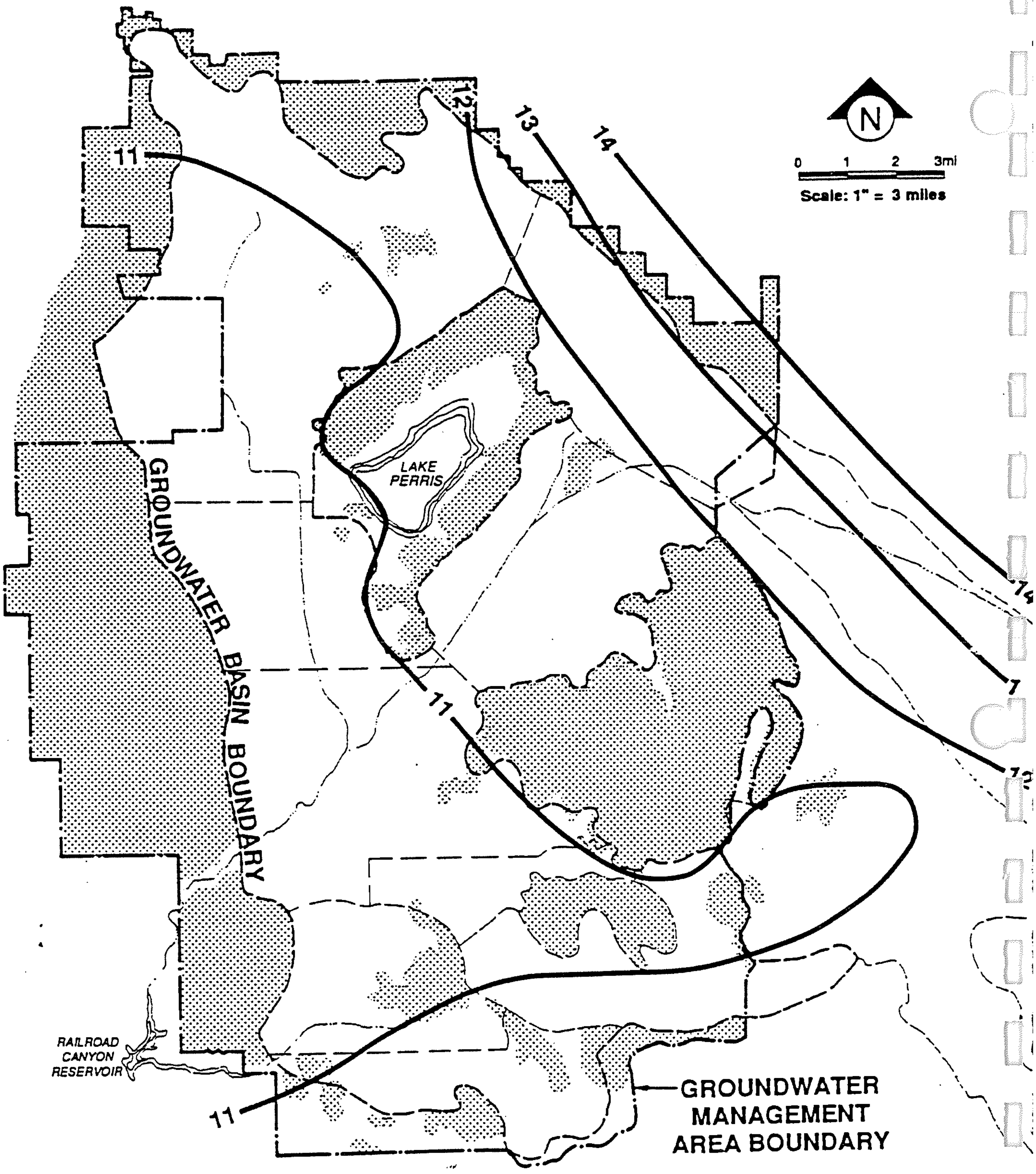


Figure 4-7

AVERAGE ANNUAL PRECIPITATION
GROUNDWATER MANAGEMENT AR

LEGEND:

▨ NONWATER-BEARING PORTION

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

Mark J. Wilde
Water Resources E

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

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		
Mone	4S/2W 10C		600.3	792	653.4	428.1
Mone	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
Nutrilite	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				
Mone	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

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

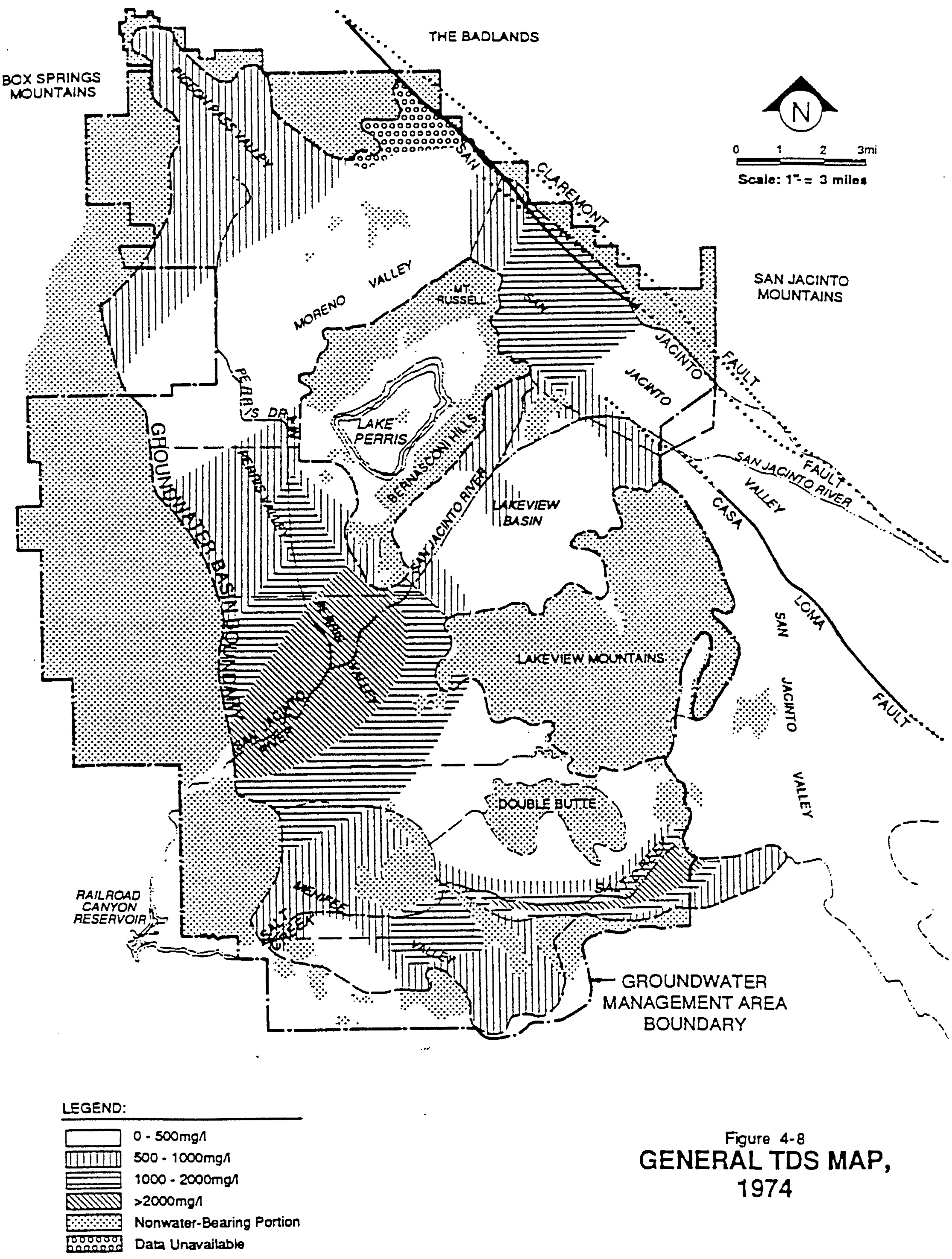


Figure 4-8

GENERAL TDS MAP, 1974

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

Mark J. Wildermut
Water Resources Engine

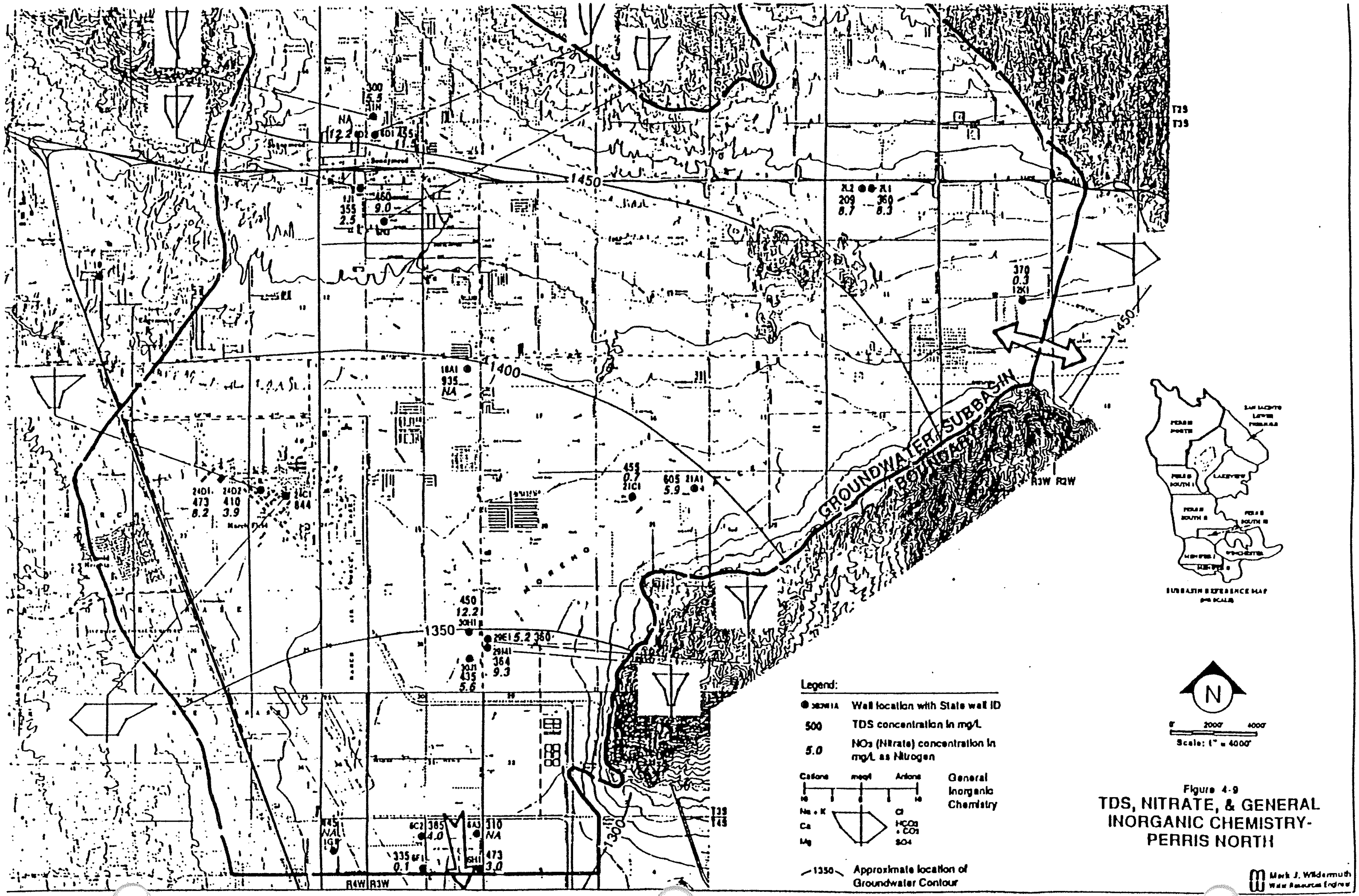
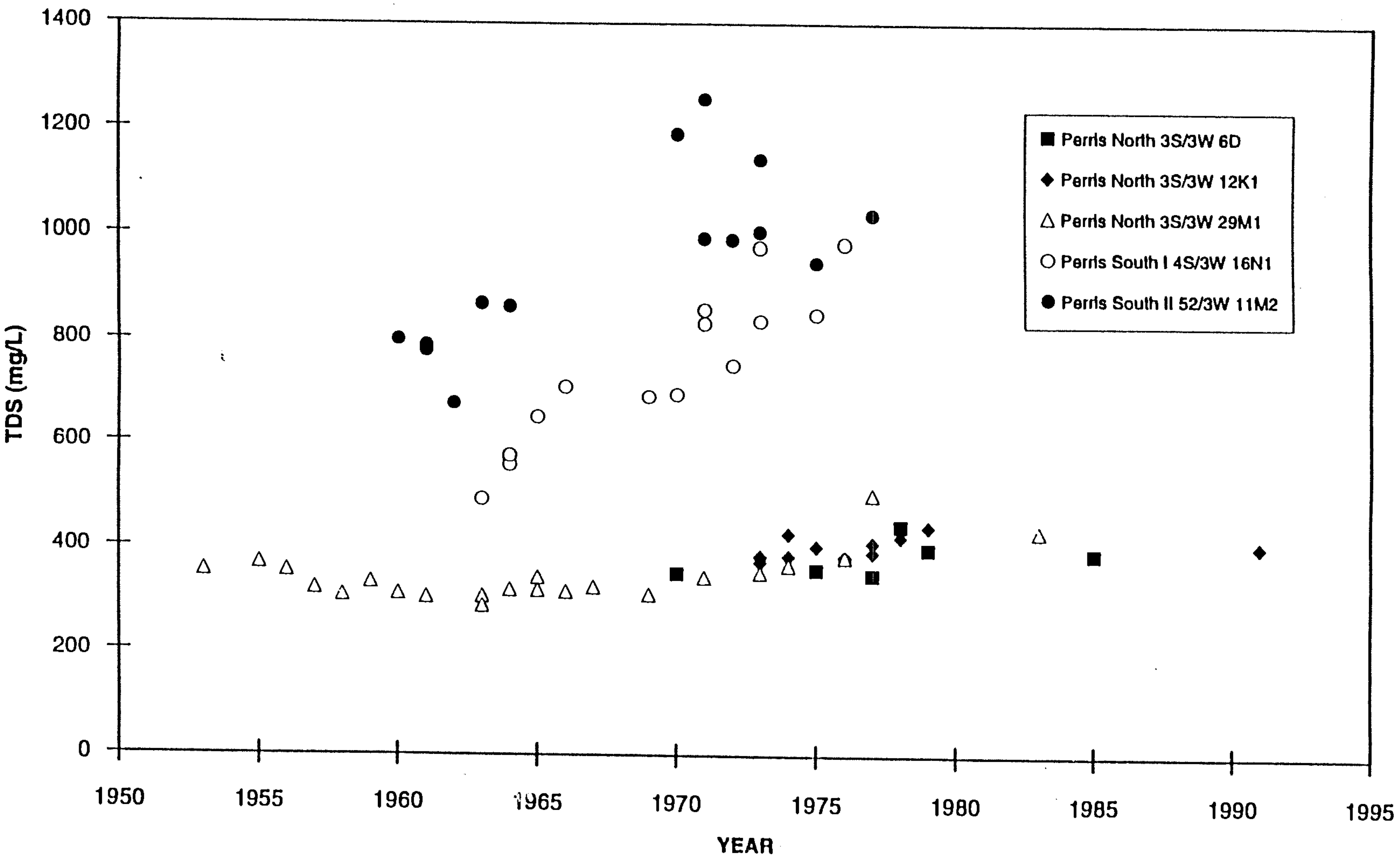


Figure 4-9

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-PERRIS NORTH

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



TDS Plot Perris N&S
9/2/94
7:45 AM

Mark J. Wildermuth
Water Resources Engineer

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

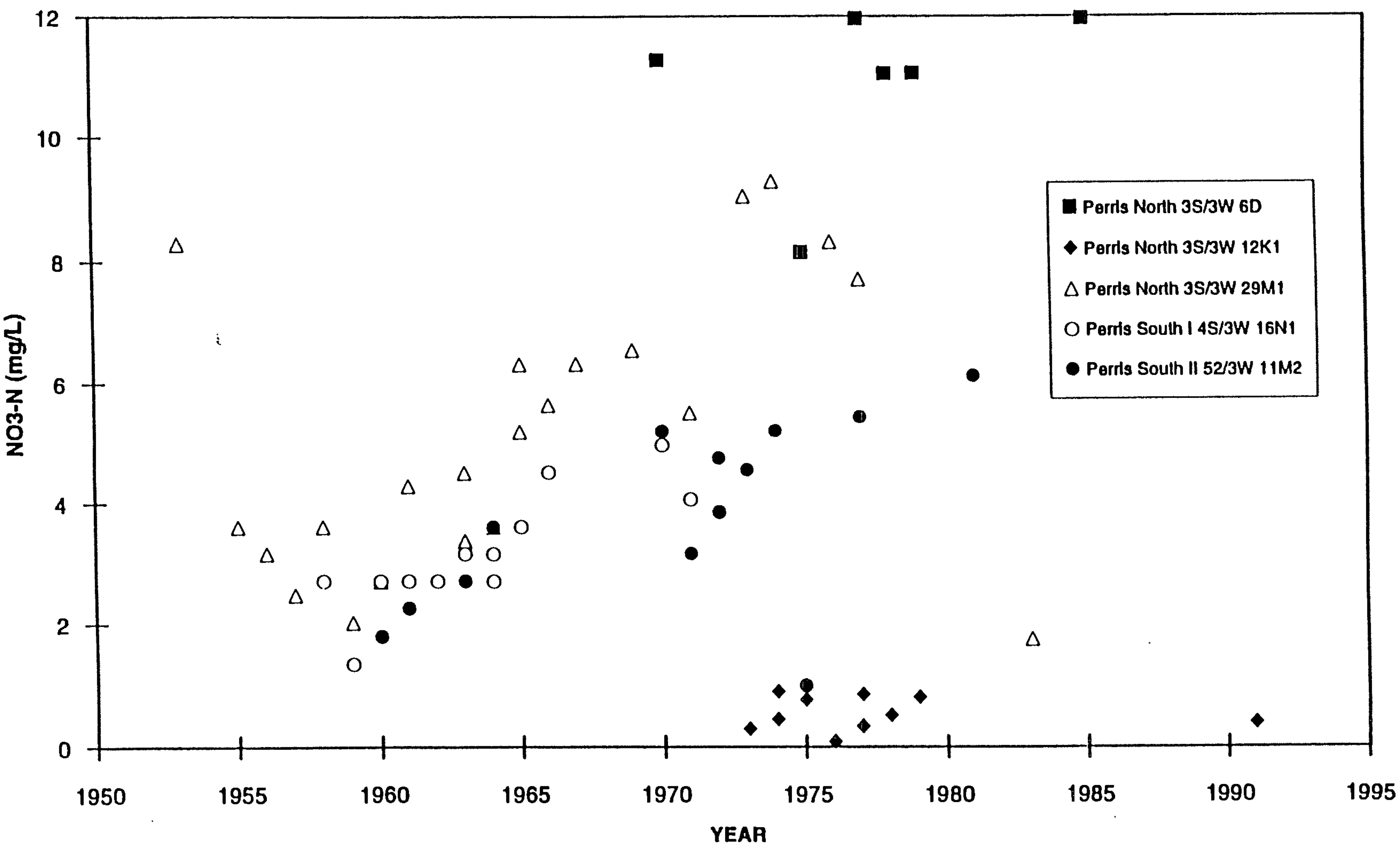
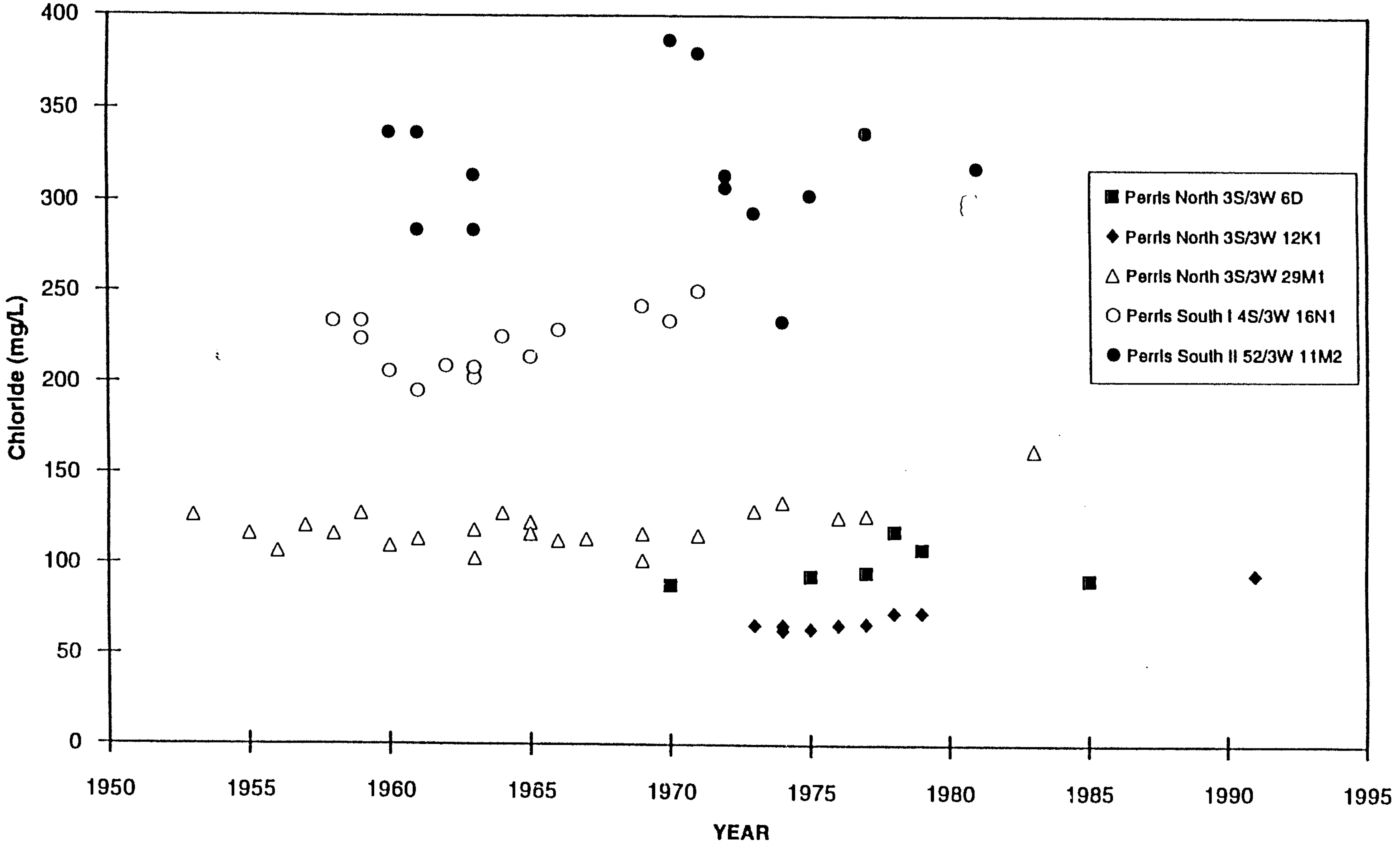


FIGURE 4-12 CHLORIDE CONCENTRATION PERRIS NORTH AND SOUTH BASINS



Chloride Plot Perris N&S
9/2/94
7:55 AM

Mark J. Wildermuth
Water Resources Engineer

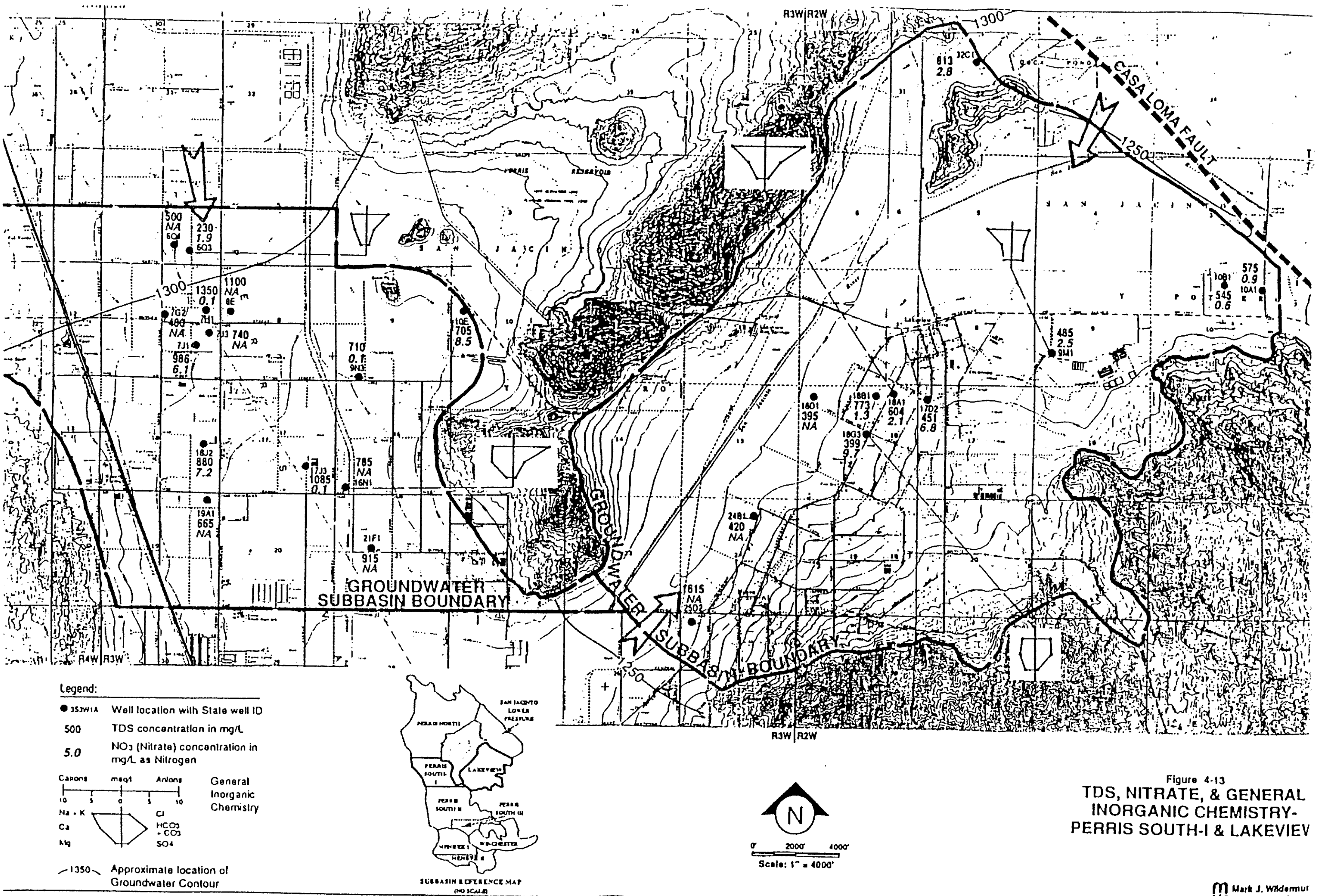
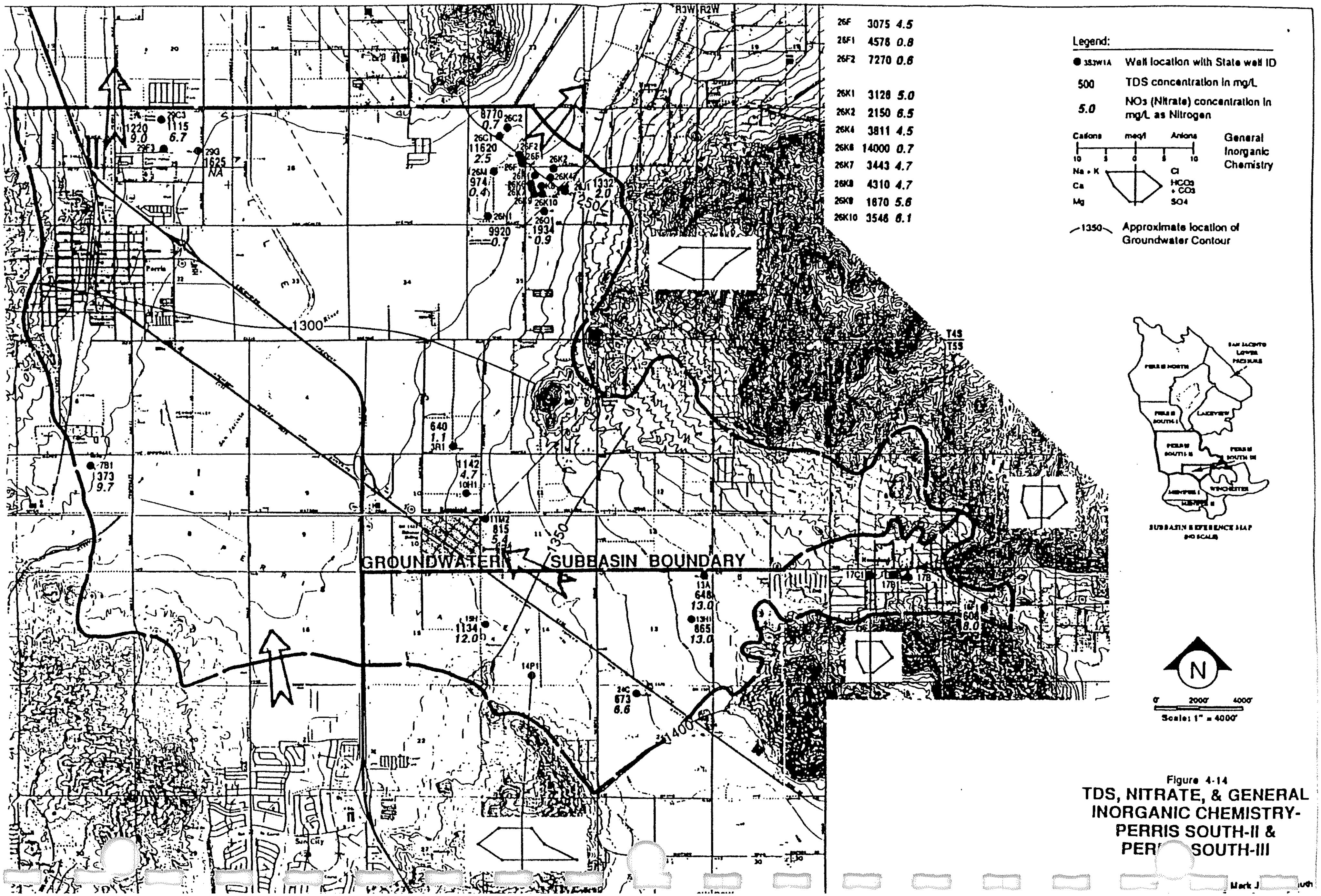


Figure 4-13
TDS, NITRATE, & GENERAL
INORGANIC CHEMISTRY-
PERRIS SOUTH-I & LAKEVIEV

Mark J. Wildermut
Water Resources Engine



26F	3075	*4.5*
26F1	4578	*0.8*
26F2	7270	*0.6*
26K1	3128	*5.0*
26K2	2150	*6.5*
26K4	3811	*4.5*
26K6	14000	*0.7*
26K7	3443	*4.7*
26K8	4310	*4.7*
26K9	1670	*5.6*
26K10	3546	*6.1*

Figure 4-14

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

Mark J uth

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.

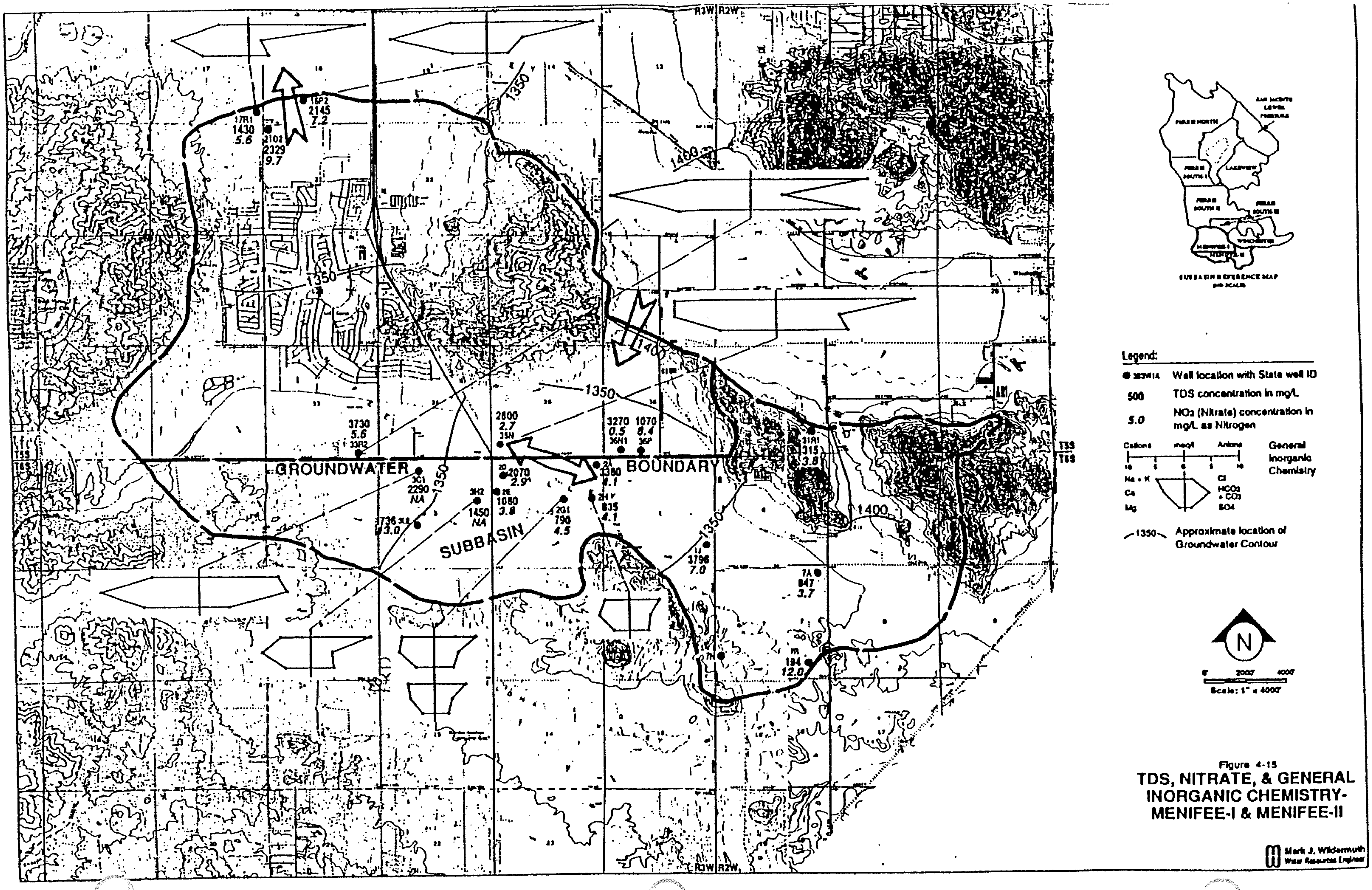


Figure 4-15

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

Mark J. Wildermuth
Water Resources Engineer

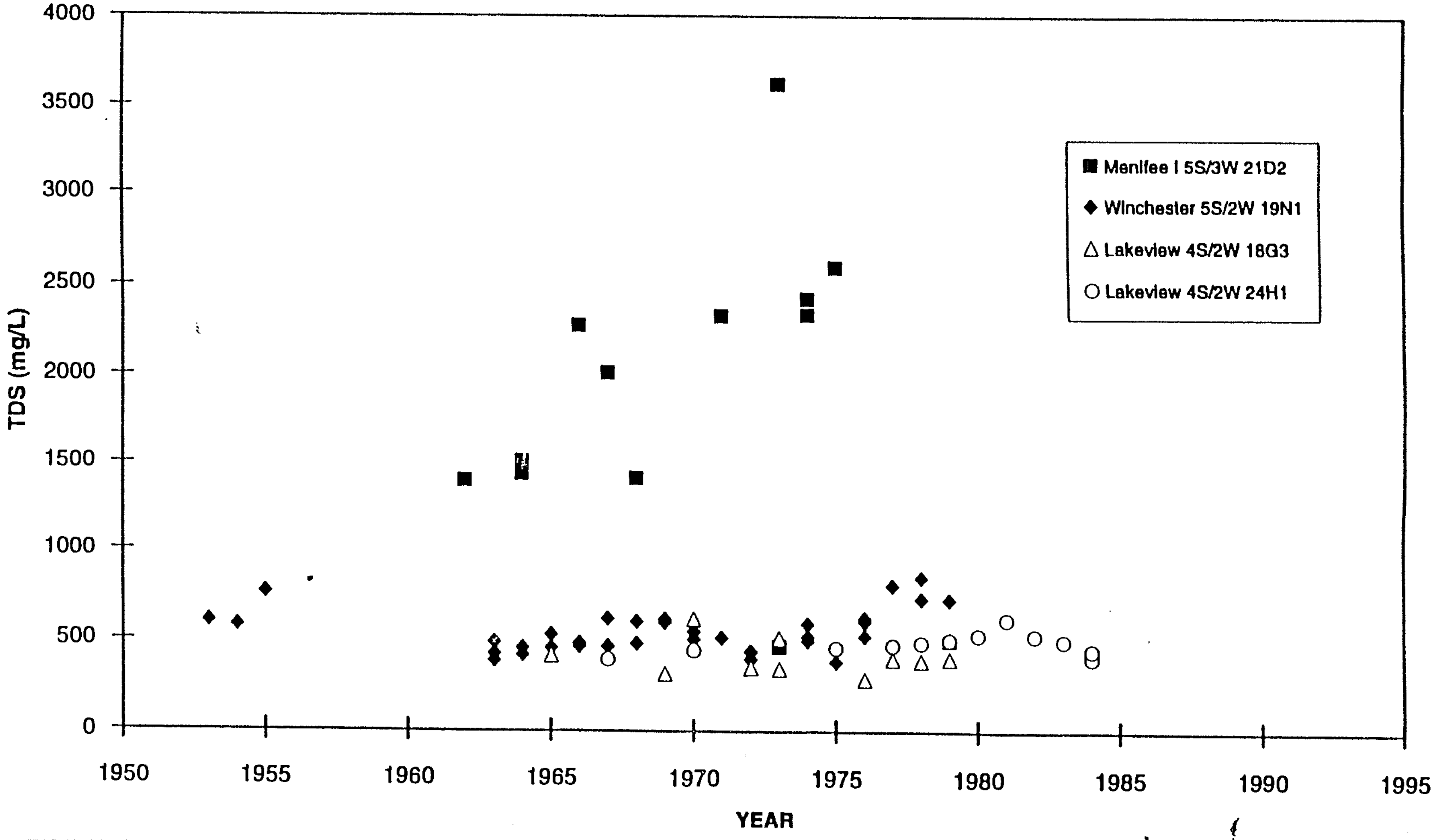
Lakeview Subbasin

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
9/2/94
8:01 AM

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

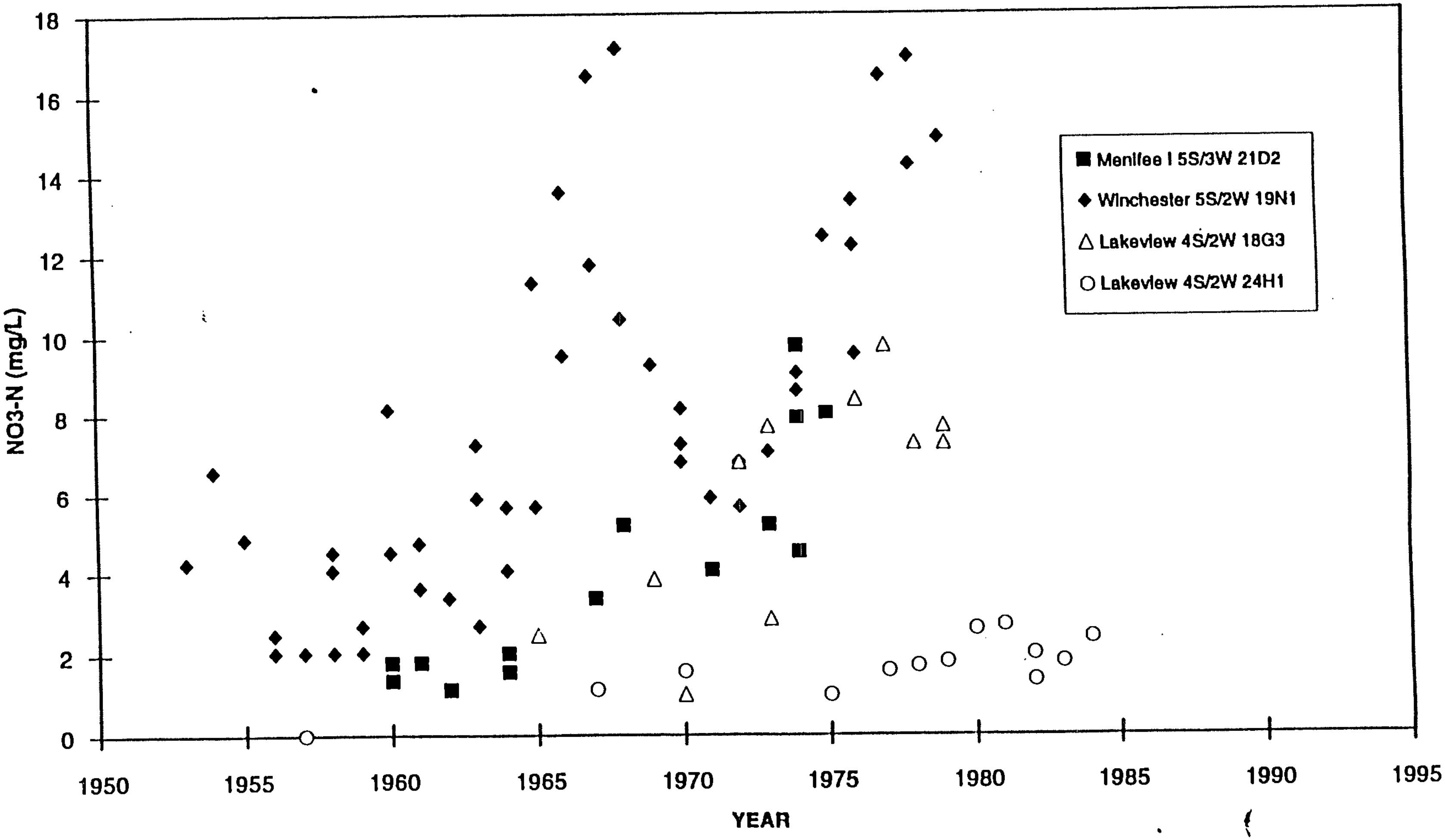
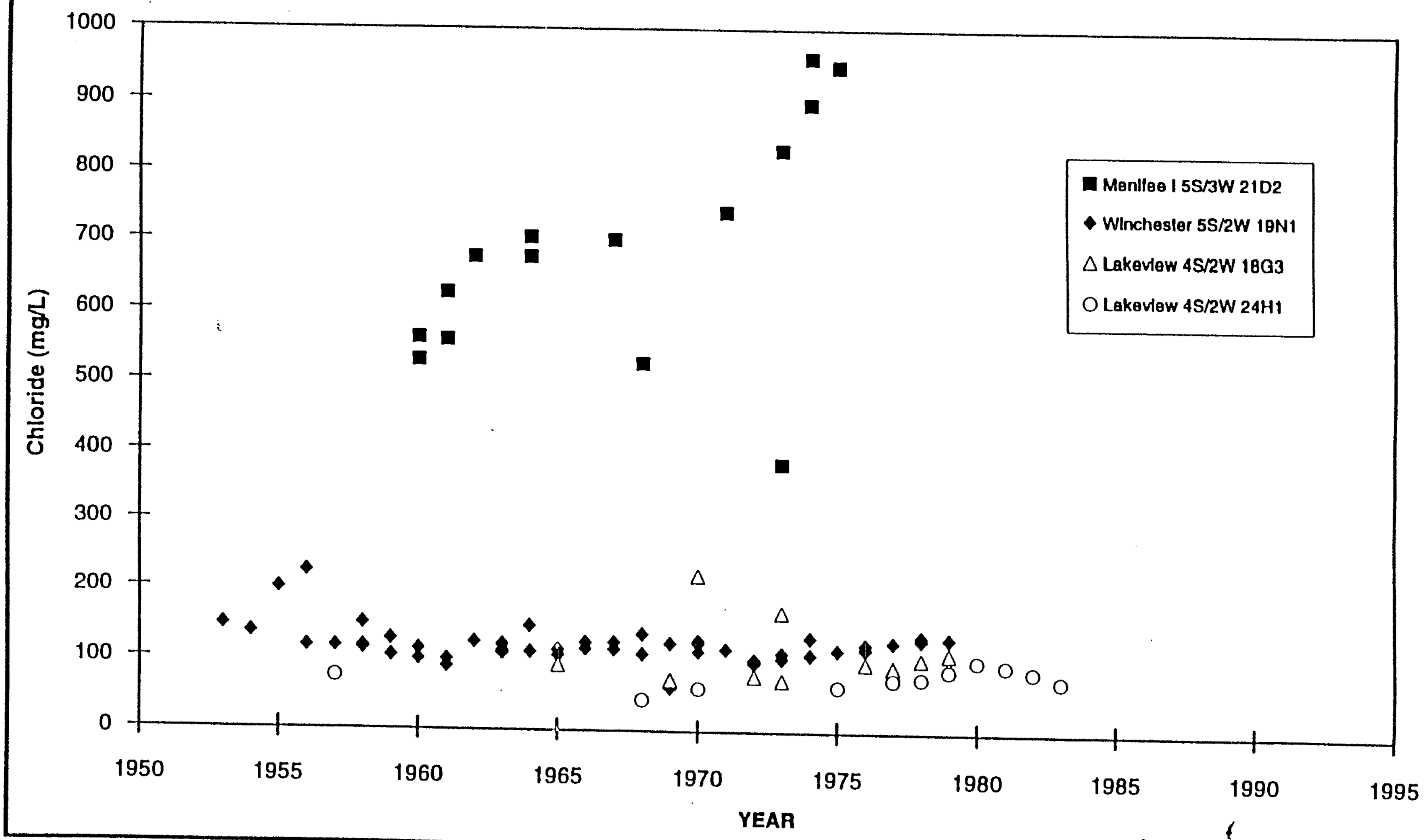


FIGURE 4-18 CHLORIDE CONCENTRATION IN MENIFEE, WINCHESTER, AND LAKEVIEW BASINS



Chloride Plot Men-Win-Lak
9/2/94
8:04 AM

Mark J. Wildermuth
Water Resource gineer

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.

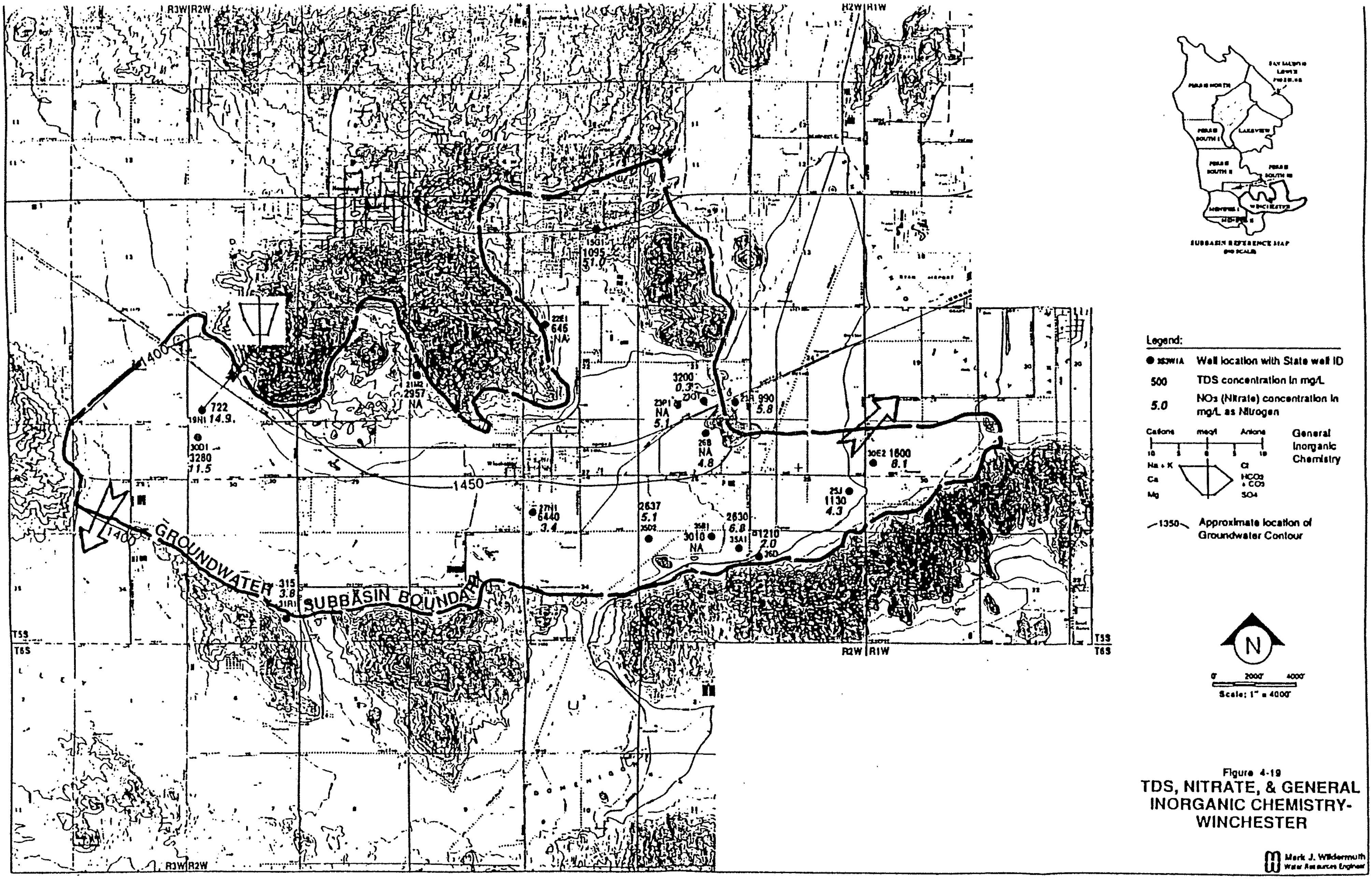


Figure 4-19

TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-WINCHESTER

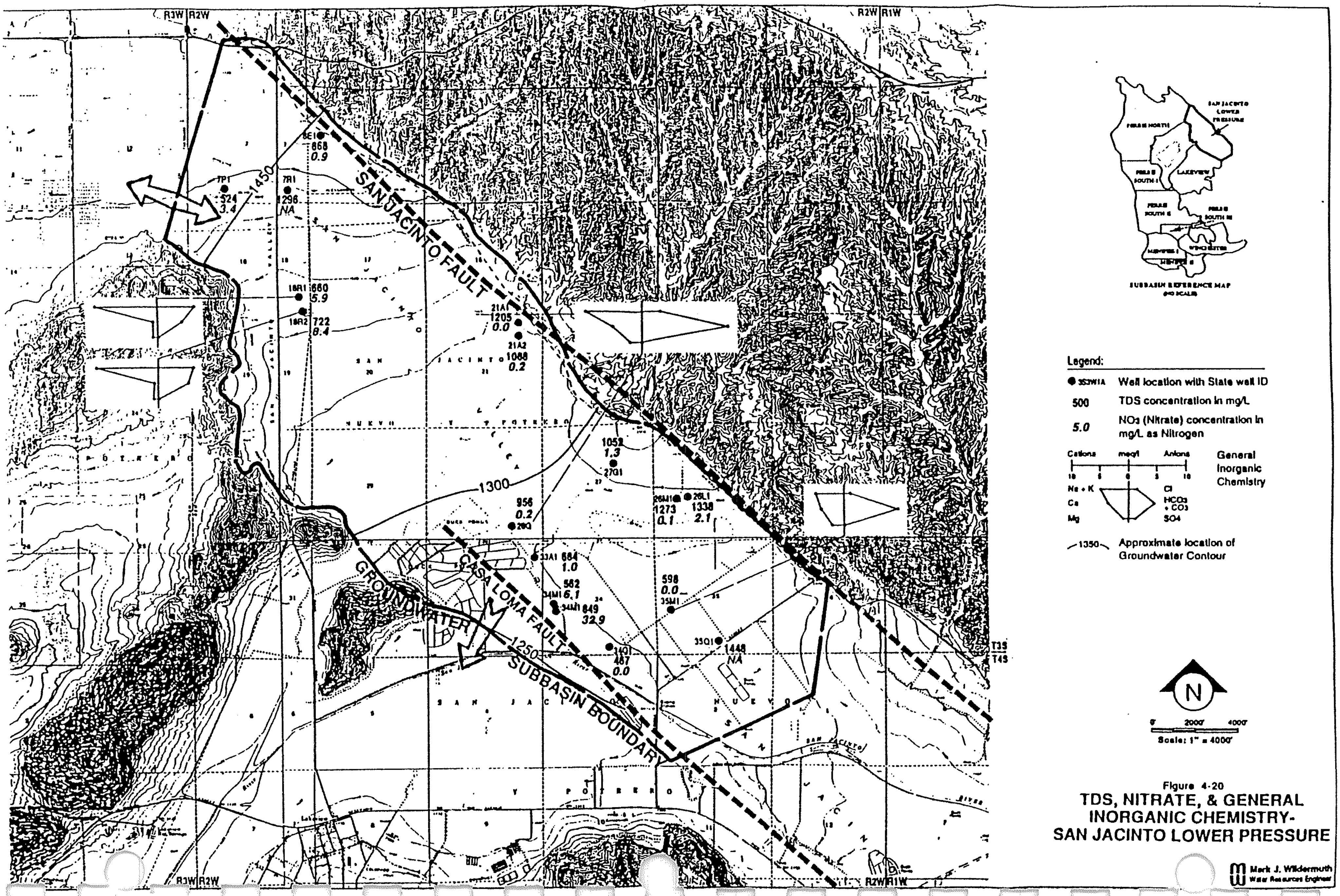


Figure 4-20
TDS, NITRATE, & GENERAL INORGANIC CHEMISTRY-
SAN JACINTO LOWER PRESSURE

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

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

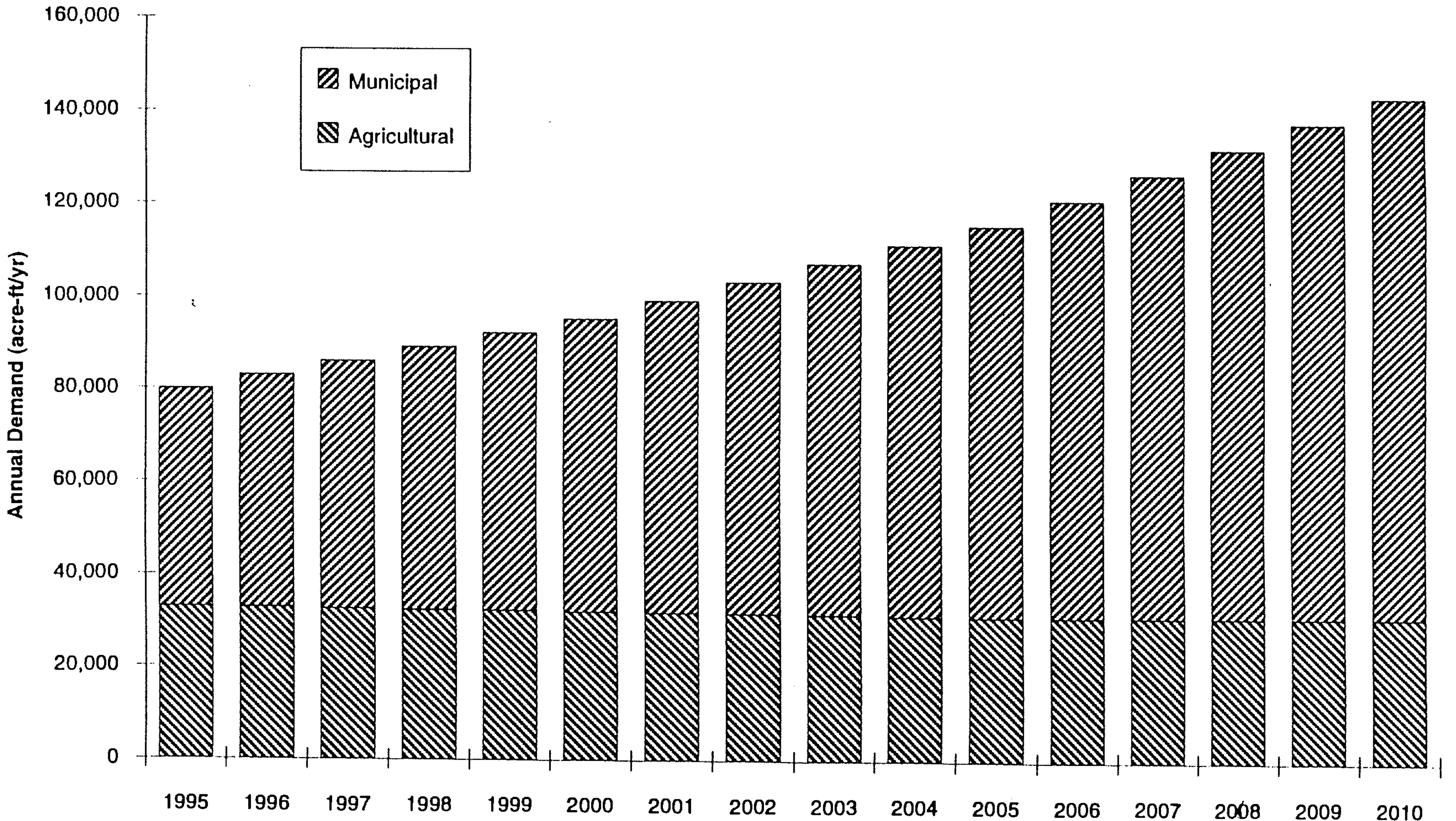


fig 5-1 Water Demands
9/2/94

Mark J. Wildermuth
Water Resources Engineer

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.

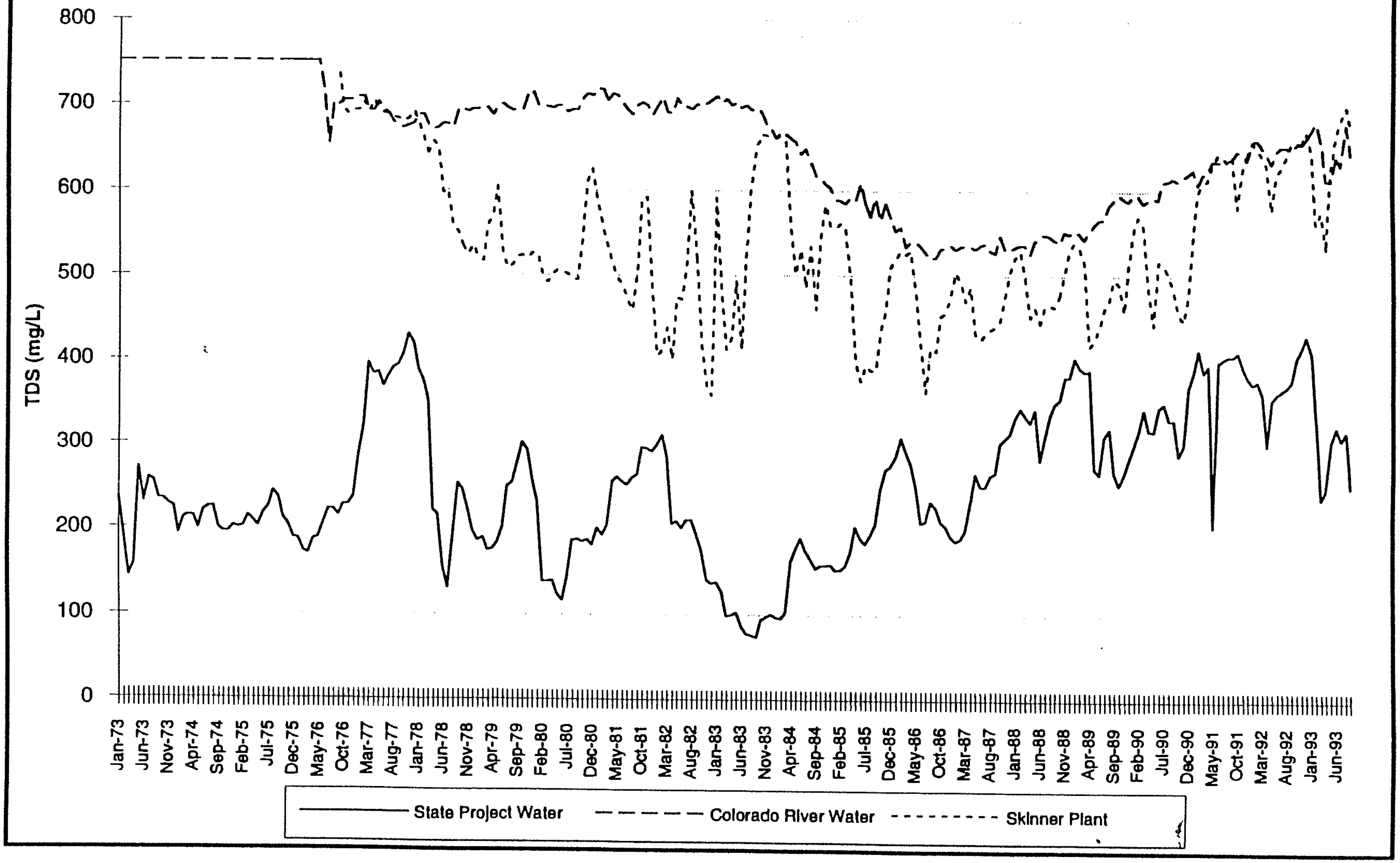


FIGURE 5-2 TDS OF IMPORTED SUPPLIES

Figure 5-2 MWD
9/2/94
9:38 AM

Mark J. Wildermuth
Water Resources Engineer

TABLE 5-2
METROPOLITAN WATER RATE PROJECTIONS

4/2/94

Year	Treatment Surcharge	Base Rate	Base Treated	Seasonal Storage (1)	
				Untreated	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

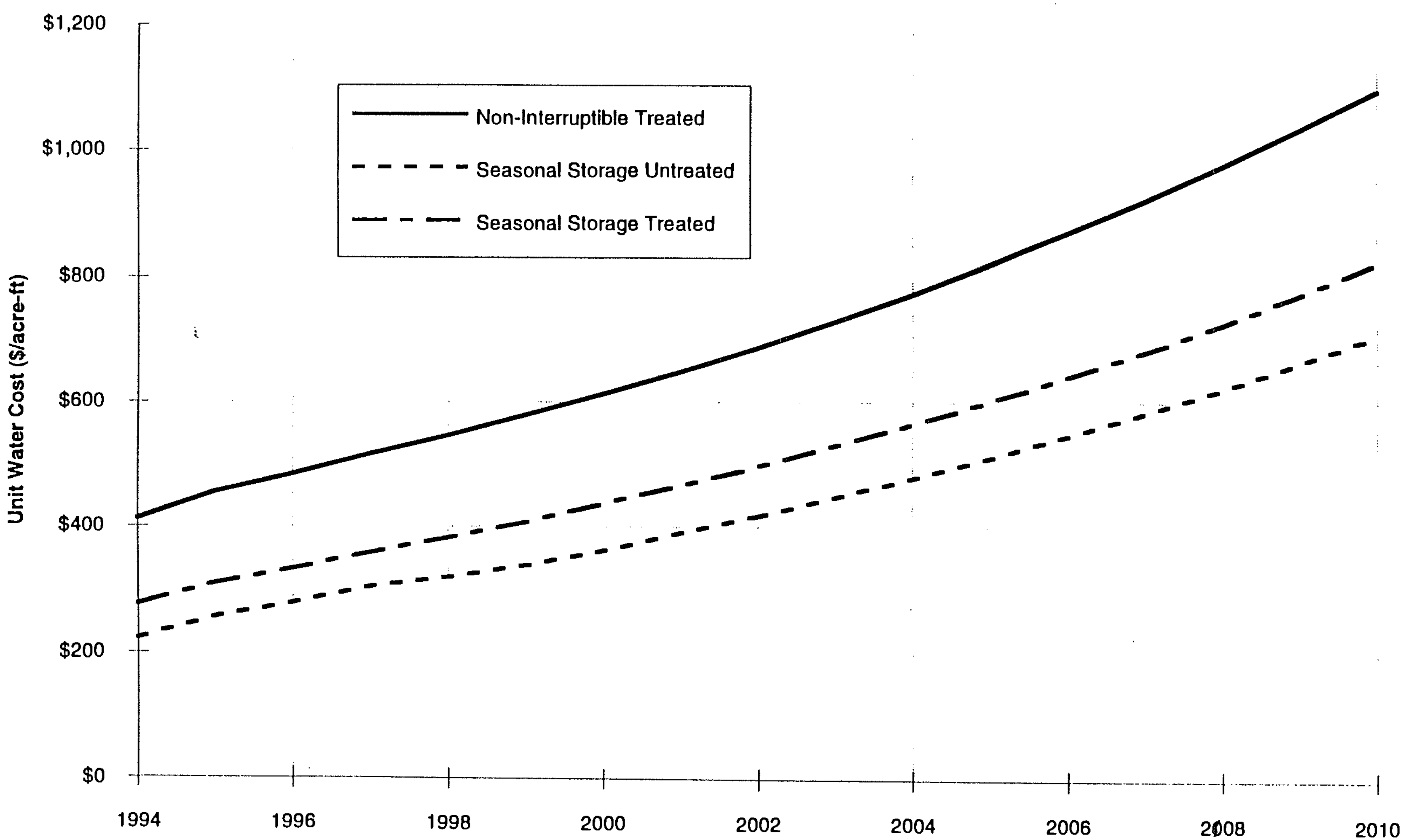


FIGURE 5-3 COST OF IMPORTED WATER

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

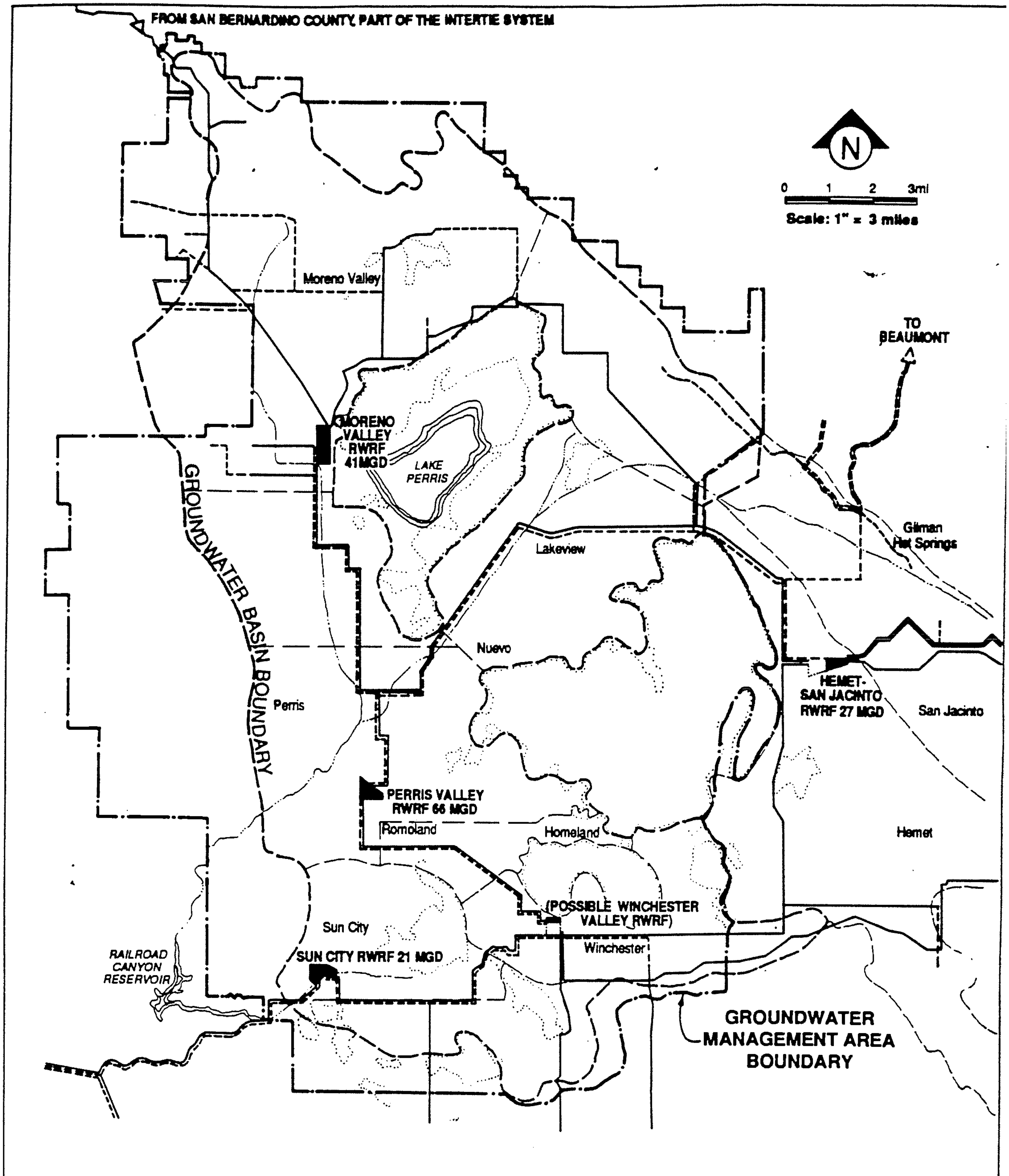
if blended with SWP water. Groundwater from the Menifee-I, Menifee-II, Winchester and parts of the Perris South-II subbasins will require treatment if groundwater from these subbasins is to be used as a municipal drinking water supply. The treatment processes that would make these basins useful as a 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. 8/93)

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.

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.

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	Composite Unit Cost of Supply
								Menifee Desalter			Agricultural Use			Municipal Use					
		Volume	Rate	Cost	Volume	Rate	Cost	Volume	Rate	Cost	Volume	Rate	Cost	Volume	Rate	Cost	Total Cost of Groundwater Production		
	(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)
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
9/8/94
3:53 PM

Mark J. Wildern
Water Resources Engir

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 <u>total</u> water supply for <u>all water users in the West San Jacinto Groundwater Basin Management area</u>.***

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	Estimated Average TDS in Subbasin (2)	Required Water Supply TDS	Blending Ratio of SWP Water to Groundwater for SWP Water TDS (in mg/L) of	
		(mg/L)	(mg/L)	(mg/L)	250	300
Perris North	Morreno 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).

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

Use This Table 7-3
9/1/94
12:48 AM

Mark J. Wildermuth
Water Resources 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

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 C' ST OF WATER SUPPLY PLAN FOR THE WEST SAN JACINTO GROUNDWATER BASIN MANAGEMENT AREA
ALTERNATIVE 1 - AGRICULTURAL EXCHANGE AND BLENDING

Year	Demand	Imported Water					Reclaimed Water				Agricultural Groundwater			Municipal Use of Groundwater								Total Groundwater Usage	Total Cost	Composite Unit Cost
		Treated Base Water			Total									Demineralization		Direct Municipal Use		Blending						
	(acre-ft/yr)	Direct Use (acre-ft/yr)	Blending (acre-ft/yr)	Rate ($/acre-ft)	Imported Volume	Imported Cost ($)	Direct Use (acre-ft/yr)	Rate ($/acre-ft)	Total Recl. Water Use (acre-ft/yr)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost	Total Mun. Use of Groundwater (acre-ft/yr)	(acre-ft/yr)	($)	($/acre-ft)
1995	80,000	44,500	0	$454	44,500	$20,303,000	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
1999	92,000	33,604	5,500	$578	39,104	$22,602,112	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
2000	95,000	34,655	5,500	$613	40,155	$24,615,015	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
2001	99,000	36,706	5,500	$649	42,206	$27,391,694	20,594	$80	20,594	$1,641,653	13,606	$80	$1,084,604	3,360	$649	12,154	$86	7,100	$86	$3,835,566	22,594	36,200	$33,953,516	$343
2002	103,000	38,757	5,500	$688	44,257	$30,448,816	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
2003	107,000	40,808	5,500	$730	46,308	$33,804,840	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
2004	111,000	42,859	5,500	$773	48,359	$37,381,507	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
2005	115,000	44,910	5,500	$820	50,410	$41,336,200	28,390	$93	28,390	$2,647,521	6,610	$93	$616,418	3,360	$820	19,130	$101	7,100	$101	$5,395,422	29,590	36,200	$49,995,362	$435
2006	120,600	50,310	5,500	$869	55,810	$48,498,890	28,590	$97	28,590	$2,772,818	6,610	$97	$641,075	3,360	$869	19,130	$105	7,100	$105	$5,665,672	29,590	36,200	$57,578,455	$477
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	$921	19,130	$109	7,100	$109	$5,950,225	29,590	36,200	$65,895,257	$522
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	29,390	36,200	$74,995,039	$569
2009	137,400	66,310	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	$6,566,287	29,590	36,200	$85,002,260	$619
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	$95,861,145	$670
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		
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	

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

		Imported Water																						
Year	Demand	Treated Base Water			Total		Reclaimed Water				Agricultural Groundwater			Municipal Use of Groundwater								Total Groundwater Usage	Total Cost	Composite Unit Cost
														Demineralization		Direct Municipal Use		Blending						
		Direct Use	Blending	Rate	Imported Volume	Imported Cost	Direct Use	Rate	Total Recl. Water Use	Cost	Volume	Rate	Cost	Volume	Rate	Volume	Rate	Volume	Rate	Municipal Cost	Total Mun. Use of Groundwater			
	(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	$1,318,300	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	23,622	$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
1999	92,000	31,924	5,500	$578	37,424	$21,631,072	18,376	$74	18,376	$1,354,331	15,424	$74	$1,136,766	7,540	$609	6,136	$80	7,100	$80	$5,644,789	20,776	36,200	$29,766,958	$324
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	$83	$6,002,073	22,945	36,200	$31,935,858	$336
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	$729,252	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	$95,791,494	$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		42%	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	

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							Reclaimed Water						Agricultural Groundwater			Municipal Use of Groundwater								Total	Total Cost	Composite
		Treated Base Water			Unit. Seasonal Water		Total											Demineralization		Direct + Conj. Use		Blending						
	(acre-ft/yr)	Direct Use (acre-ft/yr)	Blending (acre-ft/yr)	Rate ($/acre-ft)	Conj Use (acre-ft/yr)	Rate ($/acre-ft)	Imported Volume	Imported Cost ($)	Direct Use (acre-ft/yr)	Rate ($/acre-ft)	Conj. Use (acre-ft/yr)	Rate ($/acre-ft)	Total Recl. Water Use (acre-ft/yr)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost ($)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Volume (acre-ft/yr)	Rate ($/acre-ft)	Cost	Total Mun. Use of Groundwater (acre-ft/yr)	Groundwater Usage (acre-ft/yr)	($)	Unit Cost ($/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	$176,400	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	$1,246,753	3,360	$592	2,500	$76	0	$76	$2,180,347	5,860	23,453	$31,845,239	$358
1999	92,000	2,724	5,500	$578	20,000	$338	28,224	$11,513,472	17,576	$74	10,000	$0	27,576	$1,295,370	15,424	$74	$1,136,766	7,540	$609	36,136	$80	7,100	$80	$4,031,300	50,776	66,200	$21,976,908	$239
2000	95,000	3,555	5,500	$613	20,000	$361	29,055	$12,774,715	19,745	$77	10,000	$0	29,745	$1,513,437	13,255	$77	$1,015,984	7,540	$627	38,305	$83	7,100	$83	$8,484,045	52,945	66,200	$23,788,181	$250
2001	99,000	5,386	5,500	$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	$649	40,474	$86	7,100	$86	$8,966,804	55,114	66,200	$26,466,420	$267
2002	103,000	7,217	5,500	$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	$688	42,643	$89	7,100	$89	$9,638,691	57,283	66,200	$29,467,809	$286
2003	107,000	9,048	5,500	$730	20,000	$447	34,548	$19,537,320	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	5,500	$773	20,000	$477	36,379	$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	5,500	$820	20,000	$511	38,210	$25,142,468	30,590	$93	10,000	$0	40,590	$2,852,642	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	5,500	$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	23,510	5,500	$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	5,500	$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	5,500	$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	$82,645,156	$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	

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)

		Imported Water																												
Year	Demand	Treated Base Water			Untr. Seasonal Water		Treated Seasonal Water		Total		Reclaimed Water						Agricultural Groundwater			Municipal Use of Groundwater								Total Groundwater Usage	Total Cost	Composite Unit Cost
		Direct Use	Blending	Rate	Conj. Use	Rate	Conj. Use	Rate	Imported Volume	Imported Cost	Direct Use	Rate	Conj. Use	Rate	Total Recl Water Use	Cost	Volume	Rate	Cost	Demineralization Volume	Rate	Direct + Conj. Use Volume	Rate	Blending Volume	Rate	Cost	Total Mun. Use of Groundwater			
	(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	$234		$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	$68	0	$68	$170,000	2,500	26,600	$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	21,931	$66	$1,436,919	0	$0	2,500	$71	0	$71	$176,800	2,500	24,431	$23,281,460	$305
1997	86,000	47,140	0	$515	0	$304		$357	47,140	$24,277,100	13,238	$68	0	$0	13,238	$901,048	19,762	$68	$1,348,398	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		$381	50,140	$27,326,300	15,407	$71	0	$0	15,407	$1,091,838	17,593	$71	$1,244,733	3,360	$592	2,500	$76	0	$76	$2,180,547	5,860	23,453	$31,845,239	$358
1999	92,000	0	5,500	$578	21,362	$338	1,362	$408	28,224	$10,954,780	17,576	$74	10,000	$0	27,576	$1,293,370	15,424	$74	$1,136,766	7,540	$609	38,860	$80	7,100	$80	$8,247,996	53,500	68,924	$21,634,911	$235
2000	95,000	0	5,500	$613	21,777	$361	1,778	$436	29,055	$12,012,205	19,745	$77	10,000	$0	29,745	$1,513,437	13,255	$77	$1,015,984	7,540	$627	41,860	$83	7,100	$83	$8,778,158	56,500	69,755	$23,319,784	$245
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	$9,430,228	60,500	71,586	$25,733,610	$260
2002	103,000	0	5,500	$688	23,609	$417	3,609	$496	32,717	$15,422,341	24,083	$83	10,000	$0	34,083	$1,996,570	8,917	$83	$739,251	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	$581,812	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	$477	5,440	$564	36,379	$19,457,514	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	$12,115,587	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	30,590	$93	10,000	$0	40,590	$2,852,641	2,410	$93	$224,745	7,540	$820	61,860	$101	7,100	$101	$13,124,080	76,500	78,910	$37,967,965	$330
2006	120,600	0	5,500	$869	29,055	$545	9,055	$641	43,610	$26,423,415	30,790	$97	10,000	$0	40,790	$2,986,187	2,410	$97	$233,735	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	$3,125,807	2,410	$101	$243,083	7,540	$921	69,150	$109	7,100	$109	$15,245,692	83,790	86,200	$51,203,235	$404
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	$252,804	7,540	$976	69,150	$113	7,100	$113	$15,992,444	83,790	86,200	$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	$3,424,311	2,410	$109	$262,970	7,540	$1,035	69,150	$118	7,100	$118	$16,782,642	83,790	86,200	$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	$1,045	69,150	$122	7,100	$122	$17,518,792	83,790	86,200	$78,505,767	$549
Total Volume	1,719,000	235,720	66,000		314,814		74,816		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						$33,849,189			$11,807,430							$157,700,273			$613,041,887	
Fraction of Total										67%						6%			2%							26%				
Present Value																													$371,114,059	

Mark J Wilder
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					
		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)	Present Value Cost of Supply	Reduction in Present Value Cost of Supply from Groundwater Management Plan
	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.