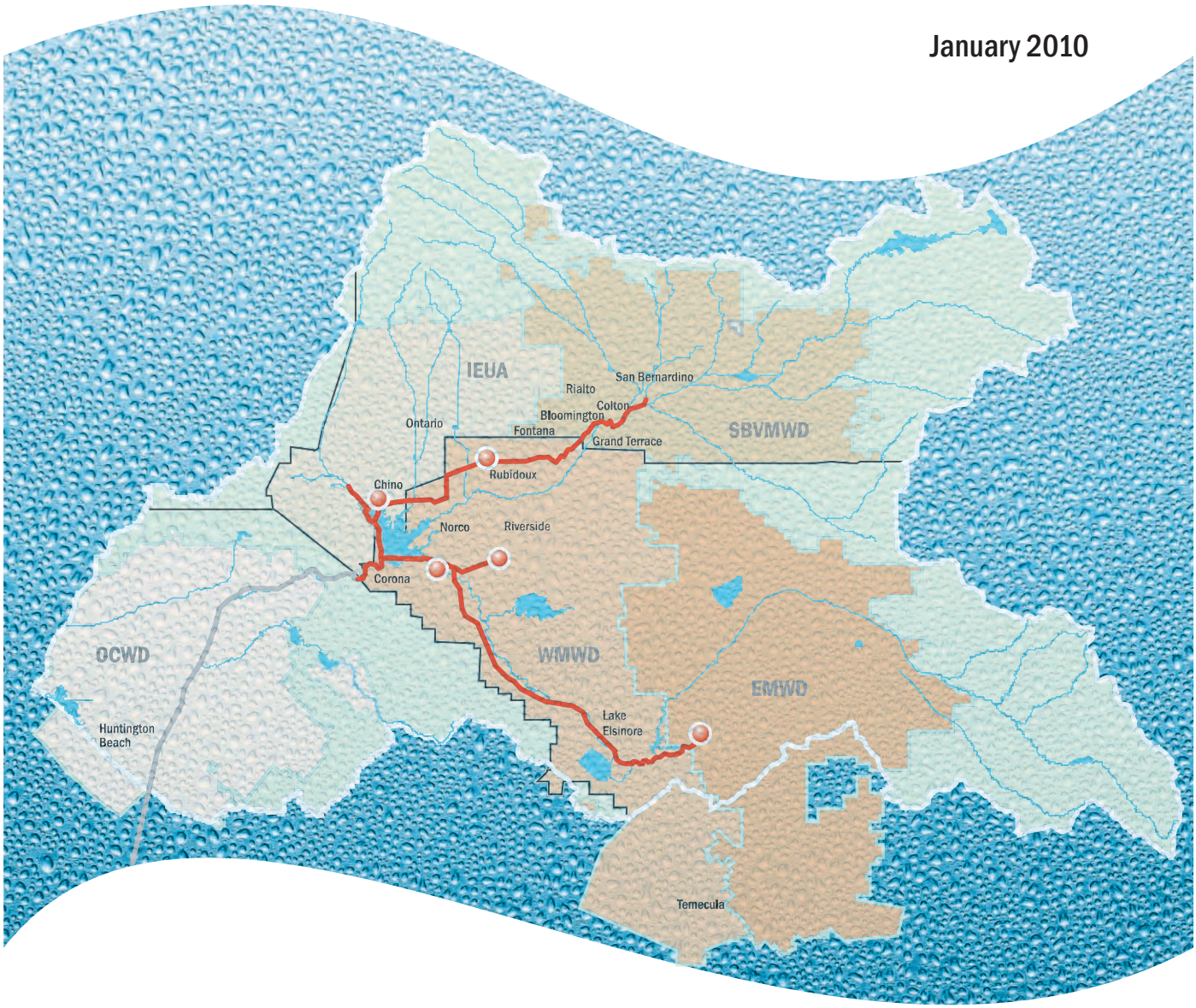
SANTA ANA WATERSHED PROJECT AUTHORITY

Santa Ana Watershed Salinity Management Program

Phase 1 Salinity Management Plan Technical Memorandum

January 2010



CDM

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January 11, 2010

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Subject: Santa Ana Watershed Salinity Management Program
Phase 1 Salinity Management Program Final Technical Memorandum

Dear Rich:

The enclosed document presents the information and findings resulting from the CDM team's work on Phase 1 of the subject program. The document incorporates comments received on the draft Technical Memorandum.

We look forward to completing subsequent phases of the study.

Very truly yours,

Donald J. Schroeder, P.E.
Vice President
Camp Dresser & McKee Inc.

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Acronyms

AF – acre-foot
AFY – acre-foot per year
BMP – best management practices
BOD – biochemical oxygen demand
BPM – basin planning models
CDA – Chino Desalter Authority
CRA – Colorado River Aqueduct
CSRM – constantly stirred reactor models
EMWD – Eastern Municipal Water District
EPA – U.S. Environmental Protection Agency
GIS – geographical information system
IEUA – Inland Empire Utility Authority
IRWMP – integrated regional water management plan
ISFM – integrated salt flux model
IX – ion exchange
LACSD – Los Angeles County Sanitation District
lb/d – pounds per day
MCL – maximum contaminant level
mg/L – milligrams per liter
mgd – million gallons per day
NRWL – Non-Reclaimable Waste Line
OCSD – Orange County Sanitation District
OCWD – Orange County Water District
POTW – publically-owned treatment works
RO – reverse osmosis
SARI – Santa Ana Regional Interceptor
SAWPA – Santa Ana Watershed Project Authority
SBVMWD – San Bernardino Valley Municipal Water District
SCE – Southern California Edison
SWP – State Water Project
TDS – total dissolved solids
TSS – total suspended solids
USACE – U.S. Army Corp of Engineers
WMWD – Western Municipal Water District
WSA – water service area
WSDP – water supply/disposal plans
WWTP – wastewater treatment plant
ZLD – zero liquid discharge

Section 1
Introduction

1.1 Background

From its original inception as the Santa Ana Watershed Planning Agency (now the Santa Ana Watershed Project Authority- SAWPA) in 1968, through over 40 years of growth and leadership on a wide variety of water quality and resource management issues currently expressed in the "One Water One Watershed" theme, facilitating salt management has remained one of SAWPA's most important objectives. Significant progress has been made over the years through implementation and operation of the SARI line, groundwater desalters and other projects and activities with salt reduction as a primary goal. Nonetheless, it is still apparent that there is a significant long-term salt imbalance in the watershed. Not only is the magnitude of the challenge still large, dynamic changes in local and statewide issues have, if anything, increased the challenge. The original underlying assumption in basin planning that there would be substantial quantities of low TDS imported State Project Water available to the watershed for direct use and groundwater recharge is no longer valid. Expansive urban growth, while expected, has been even faster than anticipated. Water reuse is now a large part of local agencies plans.

The SARI system, the fundamental link for exporting salts from the basin has been subject to various physical, institutional and economic challenges. While much has been accomplished, much more can and should be done. This Salinity Management Program study is intended to assist the SAWPA staff and Commission and other stakeholders to envision additional actions that can be taken on a watershed basis to achieve the desired salt balance in an effective and cost-efficient manner.

Camp Dresser & McKee Inc., in conjunction with Wildermuth Environmental Inc. and Carollo Engineers is performing this Salinity Management Program Study under a Task Order issued by SAWPA. The Study is divided into three phases:

- Phase 1 – Salt Management Program
- Phase 2 – SARI Planning
- Phase 3 – SARI Operations

At the end of each phase of the study, the consultant team will prepare a draft Technical Memorandum, assist SAWPA staff in a briefing to the SAWPA Commission, and prepare a final Technical Memorandum based on comments received. In Phase 3, a final Executive Summary report will also be prepared based on the three completed Technical Memoranda.

This Technical Memorandum presents the results of Phase 1 of the study.

1.2 Scope of Work

The scope of Work for this first phase of the Salt Management Program is summarized as follows:

Task 1-1 Current Setting

- Summarize current conditions related to salinity management within the watershed including "inputs" and "outputs".
- Summarize current SARI data including contribution to salt output/export, facilities, permits/dischargers including fail safe connections, operations, management, and finances.
- Summarize ongoing projects to modify/extend the SARI such as YVWD's 14 mile extension.
- Summarize current contractual agreements between SAWPA and OCSD, SAWPA and the Member Agencies, and the Member Agencies and Sub-Agencies.

Task 1-2 Planning

- Summarize current water supply, recycling and quality planning affecting salinity management such as:
  - use of higher TDS water sources,
  - additional use of desalters for potable water supply,
  - water use efficiency,
  - recycled water use, nitrate removal plants, etc.
- Confirm/update watershed salt balance assumptions/calculations over the near, intermediate, and long term planning horizons.
- Evaluate SARI's role based upon current plans including an estimate of salt exported and flows.
- Prepare salt export and flow projections broken down into estimates from each member agency and sub-agency area, if applicable.
- Summarize ongoing planning efforts that will change discharges/physical configuration to the system such as EMWD's Brine Management System evaluations (reference Brine Management System Basis of Design Report, CDM, March 2009), WMWD's Arlington Desalter expansion, CDA's expansion of the

Chino II Desalter and other possible desalters, and YVWD's reverse osmosis plant at the Wochholz Regional Water Recycling Facility.

- Summarize the ability to technically and contractually accommodate the planned uses.
- Evaluate additional objectives and steps required to achieve "salt balance" in the watershed and the SARI's potential to support additional salt export beyond what is planned. Identify measures (or "Best Management Practices") to control salt sources and maximize salt removal. Planning horizons shall be: near term (2015), intermediate (2025) and long term (beyond 2025).
- Results address the following items:
  - Validate watershed salt balance assumptions/calculations.
  - Identify additional activities/facilities that can be implemented to achieve salt balance in the watershed. Determine their effectiveness and importance.
  - Develop near, intermediate, and long term needs for salt removal from the watershed.
  - Develop scenarios to maximize SARI's use as an effective salt management tool. For each scenario quantify the range of expected use in terms of volume of brine to be removed and pounds of salts to be removed.

Summarize existing salinity management practices and near, intermediate and long term goals to achieve salt balance in the watershed. Identify SARI's role in current plans and in a salt balanced watershed. Provide recommendations for maximizing SARI's role. Present flow and salt export projections by sub-agency, member agency and SAWPA overall as a range based upon current plans and maximum use.

Task 1-3 Technical Memorandum and meetings

Summarize data, information, and results in a Technical Memorandum. Conduct one workshop with a stakeholder group and aid SAWPA staff in presenting a summary to the Commission. Prepare a final technical memorandum incorporating comments received from the stakeholder group and Commission as part of the Final Report prepared under Task 4.

This Technical Memorandum presents the findings of Phase 1 activities.

1.3 Report Organization

This Phase 1 Technical Memorandum is organized in six sections as follows:

Section 1 – Introduction

Section 2 –Current Setting

Section 3 – Water Demand Projections and Water Supply/Disposal Plans

Section 4 – TDS Projections in Groundwater

Section 5 – Salt Budget and Salt Removal Needs for the Santa Ana Watershed

Section 6 – Future Scenarios to Maximize SARI as a Salt Management Tool

Section 2
Current Setting

The purpose of this section is to establish the current setting for salt management in the watershed including a brief background on the SARI system. Section 2.1 describes the SARI system background, including existing SARI facilities, existing permits, an overview of SARI operations, management and finances, planned SARI system improvements, and agency contractual agreements. Section 2.2 describes existing desalter, recycling, nitrogen removal, and wastewater projects currently in the watershed that discharge to the SARI line. Section 3 presents the current setting in the watershed with respect to existing water supply and waste disposal plans among the member agencies and/or sub-agencies.

2.1 SARI System Background

This section summarizes the background information on the SARI line relevant to the salinity management study. SARI facilities, permits, operations, management and finances are briefly discussed below. In addition, this section will list ongoing projects to modify/extend the SARI line. Current contractual agreements between SAWPA and OCSD, SAWPA and the Member Agencies, and the Member Agencies and Sub-Agencies are discussed as well.

2.1.1 Summary of Existing Facilities

SAWPA owns and operates a pipeline system within San Bernardino and Riverside Counties of California, referred to as the Santa Ana Regional Interceptor (SARI). The SARI line accepts brine and other wastewater discharges within the Santa Ana Watershed. The interceptor was initially constructed to provide export and ultimately ocean disposal of highly saline discharges from groundwater desalination facilities, power plants, and industrial users, in order to protect the inland water quality in the upper Santa Ana River Watershed. Due to the initially low flows of these higher salinity wastewaters, the SARI line has temporarily accommodated lower salinity domestic wastewaters to provide revenue and maintain system flows closer to design capacities. This also has provided a service to member agencies to allow time for planning for future wastewater conveyance and treatment facilities

The SARI pipeline conveys the wastewater to the Orange County Sanitation District (OCSD) system, where the water is treated and ultimately discharged through an ocean outfall. OCSD charges SAWPA for treatment and disposal, based on the flow, biochemical oxygen demand (BOD), and total suspended solids (TSS) of the wastewater measured at the Orange County Meter at the Riverside-Orange county line where the SAWPA-owned pipeline ends. Below this point, SAWPA owns partial capacity on an OCSD-owned interceptor which also receives domestic wastewater from local agency collection systems in Orange County. SAWPA then charges agencies discharging to the SARI line based on the same parameters, with predetermined rates established to cover the charges from OCSD, pipeline maintenance, and other related costs incurred by SAWPA.

The SARI line consists of approximately 93 miles of 16-inch to 84-inch pipeline. This includes 72 miles in the Santa Ana River Watershed (the upper watershed) and 21 miles in the lower watershed. There are also 9 miles that connect Lake Elsinore to the Menifee area, owned by EMWD. See Figure 2-1 for an overview of the SARI line. The current capacity of the SARI line is nominally 30 mgd, while the current average utilization is approximately 11.4 mgd (as of August 2009). The SARI line exports over 75,000 tons of salt per year from the Upper Santa Ana River Watershed. The SARI line is entirely a gravity pipeline. No pump stations are required on the line.

2.1.2 Existing Permits/Dischargers

SAWPA owns and operates the SARI line in the upper watershed. The lower watershed interceptor sewer that the SARI line connects to is owned and operated by OCSD. SAWPA owns pipeline capacity rights in the SARI line west of Prado Dam (in Orange County) and owns the SARI line upstream of the Riverside and San Bernardino Counties line. In addition, SAWPA member agencies have added pipelines to facilitate connections to the SARI line.

Table 2-1 lists the current pipeline capacity, as well as the treatment and disposal capacity of the SARI line owned by member agencies. Note that the pipeline capacity rights have been negotiated between the member agencies and SAWPA, while the disposal capacity has been purchased by SAWPA from OCSD.

2.1.3 Ownership and Contractual Agreements

There are five member agencies in SAWPA, summarized below. Four of these agencies in the Upper Basin own and use capacity in the SARI system. OCWD does not own capacity.

Eastern Municipal Water District (EMWD)

The Eastern Municipal Water District (EMWD) covers an area of 555 square miles and serves a population of over 650,000 people in the Inland Empire region of Southern California. Groundwater wells provide approximately 30 percent of EMWD's potable water supply. EMWD retails water to more than 82,000 homes and business, including 200 agricultural customers. About half of the water used within the EMWD service area originates from EMWD; the rest is produced by individual groundwater pumps, local water agencies and municipalities. EMWD also produces and sells recycled water. This recycled water is currently used on 22,350 acres, which includes golf courses and several Riverside County schools.

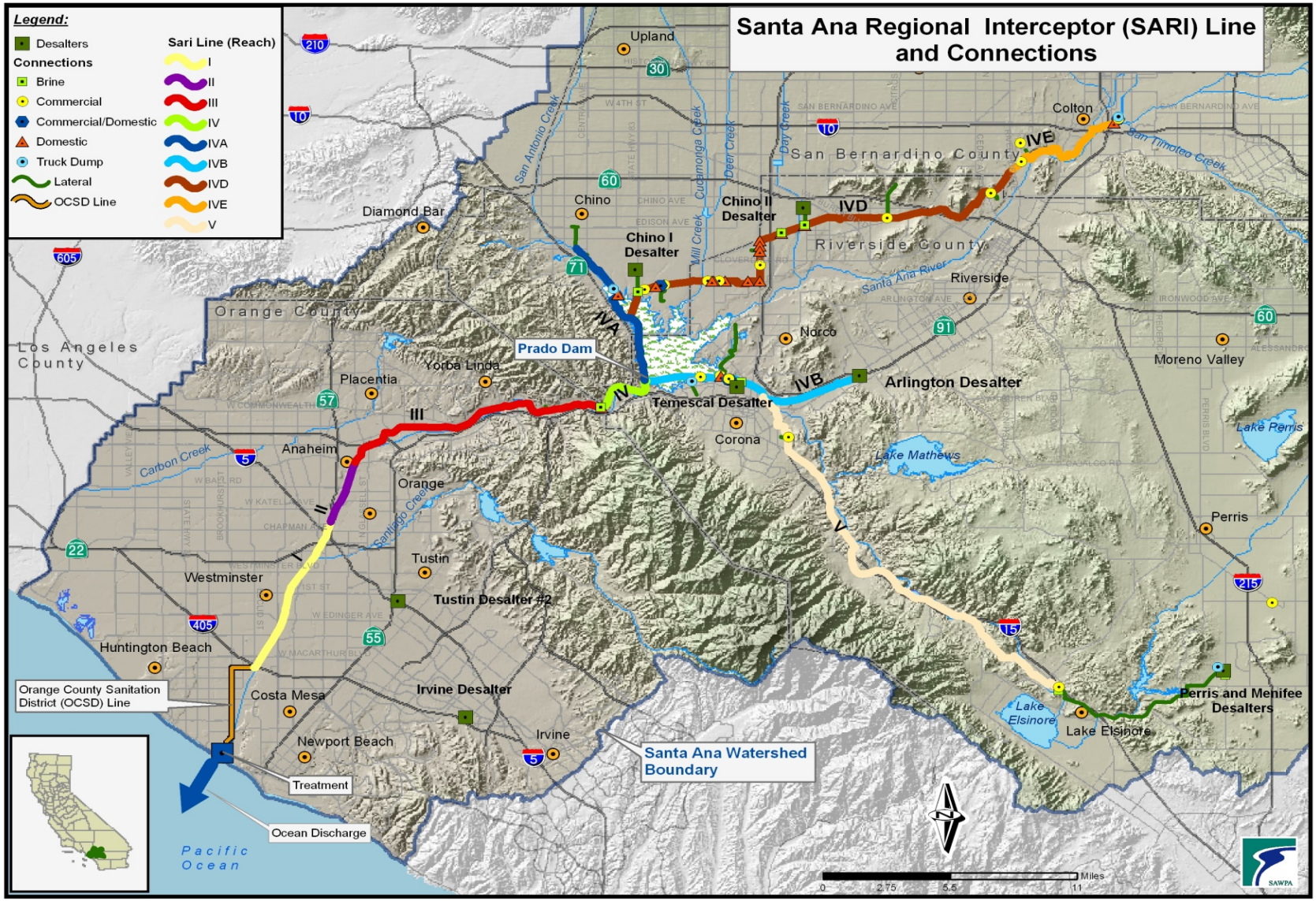

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Figure 2-1
SARI System Map

Table 2-1
Permit Capacity

Date	Organization	Pipeline Capacity (MGD)[2]	Treatment & Disposal Capacity (MGD)	Notes
2/1/2002	CDA	0.266	0	Purchased capacity from IEUA
4/21/2004	CDA	1.3	1.3	
4/21/2004	CDA	2.104	2.05	
SAWPA Unassigned Capacity			0.295	
	TOTAL SAWPA	**3.67**	**3.645**	
12/31/1982	SBVMWD	0.08	0.08	SCE
12/31/1982	SBVMWD	0.01	0.01	BELK
6/22/1993	SBVMWD	2.5		City of San Bernardino
6/22/1993	SBVMWD	2		City of Colton
6/22/1993	SBVMWD	1.5		City of Rialto (1.0 MGD transferred to SBVMWD and then to YVWD)
6/22/1993	SBVMWD	1.108		YVWD
4/8/2003	SBVMWD		0.062	City of Colton
9/14/2006	SBVMWD		0.432	Mountain View Power Plant
7/17/2007	SBVMWD		0.22	Enertech
	TOTAL SBVMWD	**7.198**	**0.804**	
12/8/1992	EMWD	2		
1/12/1999	EMWD	2.378		
9/11/2001	EMWD		1.2	Menifee Desalter Treatment
9/14/2006	EMWD	1.568	1.568	
7/17/2007	EMWD		0.78	
	TOTAL EMWD	**5.946**	**3.548**	
6/10/1981	IEUA	2.5	2.5	
5/31/1989	IEUA	1.5	1.5	
6/18/1998	IEUA	1.5	0.3	
7/1/1999	IEUA	1		
2/1/2002	IEUA	-0.266		Sold to CDA for Chino I
4/21/2004	IEUA	-0.484	-0.75	Sold to CDA for Chino I
4/21/2004	IEUA	-1.62	-1.3	Sold to CDA for Chino II
	TOTAL IEUA	**4.13**	**2.25**	
12/31/1981	WMWD	0.35	0.035	Green River
12/31/1981	WMWD	0.67	0.067	IPT
12/31/1981	WMWD	0.1	0.1	CEP
12/31/1981	WMWD	0.03	0.03	WMWD
6/30/1989	WMWD	4.493	0.32	Jurupa CSD
6/16/1982	WMWD	0.01	0.01	Alcoa
2/6/1985	WMWD	0.75	0.75	CRC
7/11/4995	WMWD	0.03	0.03	Roubidoux CSD
7/11/1995	WMWD	0.004	0.004	Riverside Cement
2/8/1992	WMWD	1		
7/18/1997	WMWD		0.02	Jurupa CSD
10/15/1998	WMWD		0.03	Jurupa CSD
9/8/1998	WMWD	0.187	0.187	St. of CA - Stringfellow
1/12/1999	WMWD	0.5		
1/12/1999	WMWD	1.5	1.2	Corona Plant
5/18/1999	WMWD		0.03	Jurupa CSD
8/1/2000	WMWD		0.072	St. of CA - Stringfellow
11/21/2000	WMWD		0.03	Jurupa CSD
9/11/2001	WMWD		0.33	Golden Cheese
9/11/2001	WMWD		0.03	
9/11/2001	WMWD		0.02	International Food Solutions
4/17/2002	WMWD		0.06	JCSD
10/7/2002	WMWD		0.02	Dart Containers
10/11/2002	WMWD		0.2	JCSD
8/12/2003	WMWD		0.01	Dart Containers
9/30/2003	WMWD		0.25	JCSD
9/14/2006	WMWD	1	1	WMWD
6/29/1989	WMWD	1	1	Transfer from SAWPA
	TOTAL WMWD	**11.624**	**6.753**	
	GRAND TOTAL	**32.568**	**17**	

Notes: 1) This table is based on information which is current as of June 26, 2009 in the SARI Market Analysis.
2) MGD = million gallons per day

San Bernardino Valley Municipal Water District (SBVMWD)

The San Bernardino Valley Municipal Water District (SBVMWD) covers an area of 325 square miles and serves a population of about 600,000 people in Southwestern San Bernardino County, in Southern California. SBVMWD includes the cities and communities of San Bernardino, Colton, Loma Linda, Redlands, Rialto, Bloomington, Highland, East Highland, Mentone, Grand Terrace, and Yucaipa. SBVMWD imports water into its service area through the State Water Project and manages groundwater storage within its boundaries; the State Water Project is used for direct delivery and groundwater recharge.

Western Municipal Water District (WMWD)

The Western Municipal Water District (WMWD) covers an area of 527 square miles and serves a population of more than 853,000 people in Western Riverside County, in Southern California. WMWD acquires its water from the Colorado River, the State Water Project, and groundwater to provide supplemental water to the cities of Corona, Riverside, and Norco and the water agencies of Box Springs Mutual, Eagle Valley Mutual, Lee Lake, Elsinore Valley, and Rancho California. WMWD also serves customers in unincorporated areas of El Sobrante, Eagle Valley, Temescal Creek, Lake Mathews, Woodcrest, and March Air Reserve Base.

Inland Empire Utility Agency (IEUA)

The Inland Empire Utility Agency (IEUA) covers an area of 242 square miles in the Southwest corner of San Bernardino County, in Southern California. IEUA provides regional wastewater service and imported water deliveries to 8 contracting agencies, which include the water districts of Monte Vista and Cucamonga Valley and the cities of Chino, Chino Hills, Fontana, Ontario, Upland, and Montclair. IEUA was original founded to provide supplemental water to the Chino Basin region; however, over time, it has also become a recycled water supplier, biosolids and fertilizer treatment provider and a leader in water supply salt management, for the purpose of protecting the regions groundwater supplies.

Orange County Water District (OCWD)

The Orange County Water District (OCWD) covers an area of 350 square miles in the large groundwater basin under northern and central Orange County. The groundwater basin provides water to 23 cities and water agencies, serving a population of more than 2,300,000 with more than half of their water demand. Since its foundation, OCWD has been maintaining and replenishing the groundwater basin at safe levels, while doubling the basin's annual yield. OCWD owns 1,100 acres in and near the Santa Ana River and Santiago Creek in the Cities of Anaheim and Orange, which it uses to capture flows and recharge the groundwater basin; in addition, OCWD owns 2,400 acres above Prado Dam, in Riverside County, which it uses for conservation and water quality improvements. Agencies within OCWD's boundaries include the cities of Anaheim, Buena Park, Fountain Valley, Fullerton, Garden grove, Huntington Beach, La Palma, Orange, Newport Beach, Santa Ana, Seal Beach, Tustin, Westminster and the water districts of Yorba Linda, Serrano, Orange Park Acres

Mutual, East Orange County, Golden State, Irvine Ranch, and Mesa Consolidated. The OCWD is a SAWPA member agency but does not own any capacity in the SARI line.

Ownership and Capacity Agreements

In general, the SARI pipeline is owned by SAWPA and the capacity use rights are owned by four of the five SAWPA member agencies. As noted above, SBVMWD, EMWD, IEUA, and WMWD all own capacity in the line. The pipeline capacity can be sold by individual member agencies to other entities requiring capacity and having discharges that meet specific SAWPA discharge requirements. The sale of capacity is made by individual agencies, not SAWPA.

SAWPA member agencies also own treatment and disposal capacity rights in the SARI System. Treatment and disposal capacity represents a volume and strength of effluent that may be passed through the OCSD treatment plant at Huntington Beach. Table 2-2 summarizes SARI capacity and treatment and disposal ownership (in millions of gallons per day or MGD):

Table 2-2
SARI Capacity Ownership

Agency	Pipeline Capacity (MGD)	Treatment capacity (MGD)
SAWPA	0.000	0.295
SBVMWD	7.198	0.804
EMWD	5.946	3.548
IEUA*	4.13	2.25
WMWD	11.624	6.753
Chino Desalter Authority	3.67	3.35
Total	32.568	17.000

An agency or business wishing to discharge into the SARI System usually contracts for needed pipeline, treatment and disposal capacity with the appropriate member agency. Permit requirements for discharge are set by OCSD/SAWPA and may be administered by SAWPA or by the contracting member agency. Upon payment of a connection fee, the discharger may use the System within the bounds established by both contract and appropriate discharge permit. All flow within the system is

ultimately treated at the OCSD facility at Huntington Beach before discharge into the Pacific Ocean. As effluent is ultimately discharged into the Pacific Ocean, discharges from the OCSD plant must conform to standards established for ocean discharge, and acceptable constituents to the SARI System may be limited.

2.1.4 Planned System Improvements

Currently, the main improvement planned for the SARI line is an eastward extension of Reach IV-E from San Bernardino to Yucaipa. Yucaipa has 1.108 mgd of capacity purchased for the SARI line, but has not yet purchased treatment capacity from Orange County Sanitation District. Yucaipa is initially planning to discharge 1 mgd of brine flows, but its needs are projected to eventually expand to 3 mgd as discussed further in Section 6. The City of Beaumont, beyond Yucaipa, did not participate in the routing of the new connection, but the extension is being sized to accommodate potential future flow from Beaumont. The construction of the line is planned in three phases, with the third phase projected to be completed at the end of 2010.[1]

An extension of the brine pipeline system, within EMWD, at the upstream end of Reach V is currently being designed to serve the planned Perris II Desalter, which is also in design stage.

2.1.5 Overview of Operations, Management and Finances

The SARI line is owned and operated by SAWPA in the upper watershed. SAWPA administers permits and fees to member agencies based on discharge to the SARI line. Day to day operations and maintenance of all of the system with the exception of upper Reach IV-A is carried out by staff of WMWD under a contract arrangement with SAWPA. Operations and maintenance of upper Reach IV-A north of the RP-2 plant is conducted by staff from IEUA. Local Permitting and Pretreatment programs with respect to discharges to the SARI line are implemented by each member agency for discharges within their service area. Financial management of the system is the responsibility of SAWPA. SAWPA establishes rates for use of the SARI, with current rates adopted in October 2009. Charges are based on flow, BOD and TSS.

SAWPA owns, operates and maintains the SARI up to terminus points with each member agency or discharger. In general, these terminus points are defined by the flow meter at the lateral or connection. SAWPA owns, operates, and maintains the flow meter and vault. The flow meters are typically located near the SARI mainline; however, there are exceptions.

Following is a brief description of the limits of SAWPA O&M responsibilities within each member agency's service area:

- EMWD is served by Reach V of the SARI. The pressure sustaining station with flow meter located just southeast of the intersection of Collier and Chaney streets

[1] Discussion with Jack Nelson at Yucaipa Water District on 9/24/09

in Lake Elsinore is the terminus of SAWPA's ownership and O&M responsibility. EMWD is responsible for the brine line "upstream" of this location.

- A recent agreement between SAWPA, WMWD, and EMWD assigns O&M responsibility of the PSS to EMWD which plans to modify the PSS.

- IEUA is served by Reaches IV, IV-A, and IV-D. On Reach IV-A, SAWPA owns, operates, and maintains the pipeline up to the master meter (S-05). Upstream of the master meter, SAWPA continues to own the pipeline but has contracted with IEUA which operates and maintains the pipeline on SAWPA's behalf. The individual dischargers on Reach IV and IV-D maintain the laterals beyond the flow meters. The IEUA truck dump station is located just upstream of the master meter near Regional Plant 2. IEUA operates the IEUA truck dump station.

- SBVMWD is served by Reach IV-D/E. SAWPA owns, operates, and maintains the pipeline up to the City of San Bernardino WWTP. The individual dischargers maintain the laterals beyond the flow meters (Mountainview Power Plant, EI Colton Power Plant). The SBVMWD truck dump station is located at the City of San Bernardino WWTP.

- WMWD is served by Reach IV-B and IV-D. SAWPA owns, operates, and maintains the pipeline through the service area. The individual dischargers maintain the laterals beyond the flow meters. WMWD currently operates a truck dump station located at WWTP No. 1 within the City of Corona.

SAWPA contracts its operation and maintenance responsibilities to WMWD and Pre-Treatment Program responsibilities to G&G Consulting and WMWD. These contracts are managed by SAWPA's Engineering and Operations Department. Other SARI activities conducted by the Department include:

- Handling requests for new or revised service from member agencies;

- Coordination with U.S. ACOE on Prado Dam modifications;

- Developer requested pipeline relocations or protection;

- Maintenance and evaluation of flow and quality data;

- Preparation and coordination of an Emergency Response Plan;

- Maintenance of record drawings and data;

- Conducting a CCTV inspection program;

- Pipeline and manhole repairs (larger efforts);

- Special pipeline cleaning efforts (non-recurring);

- Financial management –tracking of revenues, expenses, rate model updates, etc.
- Coordination with OCSD – sampling and flow measurement, billing, operation of SARI in Orange County, SARI protection in Orange County, etc.

WMWD's contract with SAWPA includes the following core tasks:

- General Operations;
- Meter Maintenance;
- Sample Collection and Analysis;
- Line Cleaning (recurring);
- Video Logging (smaller efforts);
- Right of Way Maintenance;
- Pipeline Maintenance;
- Manhole Maintenance;
- Valve Maintenance; and
- Pretreatment Program including Permitting and Inspections.

WMWD uses two contractors, Babcock Laboratories for sampling and laboratory testing, and G&G Consulting for conducting of the pre-treatment program within its service area. WMWD also performs numerous non-recurring activities related to operations, maintenance, and repair. These activities are documented with work orders issued by SAWPA.

SAWPA conducts a pre-treatment program as required by agreement with OCSD.

SAWPA has executed multi-jurisdictional pretreatment agreements with EMWD, IEUA, SBVMWD and WMWD for the conduct of pretreatment programs within their respective service areas. The major activities for the pre-treatment program include:

- Permits – issue new and revised; monitor compliance
- Facility inspections;
- Sampling – conduct and review results;
- Enforcement responses in accordance with the approved Enforcement;
- Management System;

- Audit member agency programs;
- Permit database management including flow and water quality data;
- Regulatory reporting – semi-annual and annual reports;

Sampling is performed for verification of permit compliance and for billing purposes.

The frequency and constituents sampled for permit compliance differ from those sampled for billing. Samples are obtained by WMWD either directly by its personnel or by contract laboratory personnel.

2.2 Existing Projects

The following is a summary of existing or near-term projects that are currently discharging to the SARI line. Near-term projects are those being constructed that have been included in the baseline basin TDS projections described in Sections 3-5.

Existing projects are grouped by the following categories:

- Groundwater Desalters
- Nitrite Removal/Ion Exchange projects
- Domestic, Industrial and Waste Haulers

The information on existing projects was developed from various sources of information and documentation from SAWPA and the member agencies. The references are grouped into categories based on the affiliated member agency.

WMWD

- WMWD Final Integrated Regional Water Management Plan, May 2008
- WMWD Lake Matthews Water Treatment Plant 2nd DRAFT, Cost Evaluation Report, March 2009
- City of Corona Urban Water Management Plan, 2005
- WMWD Arlington Desalter Evaluation, February 2007
- WMWD Groundwater Basin Report Temescal Valley Basin, September 2007
- WMWD Arlington Groundwater Basin Report, September 2007
- Rancho California Water District (RCWD) Regional Integrated Resources Plan, October 2005
- WMWD Chino Desalter Phase 3 alternatives Evaluation Report, May 2007

- Western Outlook 07-08 (WMWD annual report)
- Discussion with Arlington operator, Ray Marshal, on September 29, 2009
- WMWD Water Resources Systems Simulation Model Report, July 2008
- Preliminary Design Report (PDR) for the Chino Creek Wellfield and Chino II Expansion Wellfield Chino Desalter Phase 3 Project, May 2009

EMWD

- EMWD Integrated Resources Plan (in progress)
- EMWD Summary of Brine Users, September 2008
- EMWD Allocations Table for Brine
- EMWD Recycled Water Strategic Plan, June 2009
- EMWD Brine Management System, Basis of Design Report, March 2009
- EMWD Moving Forward with Desalination, West San Jacinto Groundwater Basin Management, 26th Biennial Groundwater Conference, September 2007, Behrooz Mortazavi presenting.
- Email from Joe Mouawad, September 29, 2009

IEUA

- Non-Reclaimable Wastewater Line Pretreatment Program Annual Report, 2007-2008
- IEUA Phase II Chino Basin Facilities Improvement Program, May-July 2009

SBVMWD

- Upper Santa Ana Regional Water Management Plan, October 2007

SAWPA

- Santa Ana Regional Interceptor Market Analysis, August 2009 (from Don's desk)
- Santa Ana Integrated Watershed Plan Volume 1: Water Resources Component, June 2002

Other

- Brine Concentrate Treatment and Disposal Options, August 2009, U.S. Department of the Interior Bureau of Reclamation.

- Survey Report, Southern California Regional Brine-Concentrate Management, Study – Phase I, Lower Colorado Region, September 2009, U.S. Department of the Interior Bureau of Reclamation.
- Discussion with Jack Nelson at Yucaipa Water District on September 24, 2009
- Mountainview Power Plant Summary, 2009, http://www.edison.com/ourcompany/sce.asp?id=6754
- Rialto SlurryCarb™ Facility Summary, EnerTech Environmental, Inc., 2009 http://www.enertech.com/facilities/sitedevelopments/rcrf.html
- Metropolitan Water District (MWD) Groundwater Assessment Study, September 2007

2.2.1 Groundwater Desalters

The following is a summary of the desalters that currently discharge brine to the SARI line, as listed in Table 2-3. The flows and concentrations represented below are the capacities for existing projects. Note that some projects are operating at a different condition than design capacity. For those facilities, the capacity and existing conditions are listed. For desalters, raw water refers to that piped from the wells, while product water refers to the combined product water of RO permeate and bypass flow not treated by RO.

Chino I Desalter

The Chino I Desalter is a desalination facility operated by the Chino Basin Desalter Authority (CDA) and located in the City of Chino. CDA is a joint powers authority organized within San Bernardino County to manage the production, treatment and distribution of high quality treated potable water to various cities and water agencies. The CDA is responsible for groundwater desalination and recharge with the goal to decrease dependency on imported water in its service area. CDA includes IEUA, WMWD (newest member), the Jurupa Community Services District, the Santa Ana River Water Company, and the cities of Chino, Chino Hills, Ontario, and Norco.

The Chino I Desalter has a raw water capacity of 14.4 mgd (16,140 AFY) and product water capacity of 12.7 mgd (14,200 AFY)[2]. This is based on the current recovery of the Chino I Desalter, which is 88 percent, and an operational factor of 89 percent (assuming that the facility does not operate 100 percent of the year). Brine flow at capacity is 1.7 mgd (1,900 AFY). Currently, the plant is operating better than originally anticipated so that product water flows are higher than capacity, and the current brine flow to the SARI line is 2.0 mgd. For the purposes of this study, capacity figures are used as it is planned that over the long term the Chino I desalter flows will decrease back to design capacity levels.

[2] WMWD Chino Desalter Phase 3 Alternatives Evaluation Final Report, May 2007 (Table ES.1)

Table 2-3
Existing Projects

SAWPA Member Agency	Project Name	Type (water supply vs.	Responsible Entity	Description	Product Water Capacity (AFY)	Brine Flow Rate (mgd)	Brine TDS (mg/L)	Brine TDS (lbs/d)
IEUA/WMWD	Chino I Desalter	groundwater	WMWD/IEUA	desalter	14,200	1.70	3,600	51,000
IEUA/WMWD	Chino II Desalter	groundwater	WMWD/IEUA	desalter	10,400	1.30	3,700	40,000
IEUA/WMWD	Chino II Desalter Expansion	groundwater	WMWD/IEUA	desalter expansion	10,600	1.40	3,700	43,000
WMWD	Arlington Desalter	groundwater	WMWD	desalter	7,800	1.38	3,900	45,000
WMWD	Temescal Basin Desalter	groundwater	City of Corona	desalter	16,800	1.80	5,300	80,000
EMWD	Perris Desalter	groundwater	EMWD	desalter	7,200	1.50	6,000	75,000
EMWD	Menifee Desalter	groundwater	EMWD	desalter	3,500	1.00	6,000	50,000
EMWD	Inland Empire Energy Center	recycled water	EMWD	brine discharge to SARI	NA	1.20	4,800	48,000
WMWD	Corona Energy Partners	industrial	Private	brine discharge to SARI	NA	0.076	2,600	2,000
SBVMWD	Mountainview Power Plant	industrial	Edison	brine discharge to SARI	NA	0.37	10,000	31,000
SBVMWD	Agua Mansa Power Plant	industrial	Edison	brine discharge to SARI	NA	0.019	1,100	170
SBVMWD	EnerTech	industrial	Private	brine discharge to SARI	NA	0.046	620	240
WMWD	RCSD Anita Smith IX	groundwater	Private	nitrate removal/IX	NA	0.0123	80,000	8,210

The raw water has a TDS concentration of 900 mg/L, with product water at 480 mg/L and brine at 3,600 mg/L concentrations, respectively. For the current plant operation, this results in 51,000 lbs/d of TDS at 1.7 mgd of brine.

Chino II Desalter

The Chino II Desalter is a desalination facility also operated by CDA and located in Jurupa (Mira Loma, CA). The desalter has a raw water capacity of 10.6 mgd[3] (11,820 AFY) with a recovery of 88 percent[4], so it has a product water capacity of 9.3 mgd (10,400 AFY), and has a brine flow of 1.3 mgd (1,400 AFY). The raw water has a TDS concentration of 630 mg/L, with product water at 340 mg/L and brine at 3,700 mg/L concentrations. This results in 40,000 lb/d of TDS to the SARI line at 1.3 mgd.

Chino II Desalter Expansion

This project, being led by WMWD, will be an expansion of the existing Chino II desalter, which will allow installation of an additional 10.8 mgd (12,040 AFY) raw water capacity[5]. This will result in approximately 9.4 mgd (10,600 AFY) of product water. The project also includes a new well field in the Chino Creek area of Chino Basin and expansion of production from the existing Chino II Desalter wellfield. This expansion is predicted to serve Western retail, Norco, Jurupa, and all agencies connected to Mills Gravity Line[6]. This is projected to increase the brine flow to 2.7 mgd (3,000 AFY), which is a 1.4 mgd (1,600 AFY) increase over current capacity. Projected increase in salt removal, based on the existing brine concentration of 3,700 mg/L, will be 43,000 lb/d.

Because this expansion project is currently being constructed, the projected TDS removal is included in the baseline TDS projections are described in Sections 3-5.

Arlington Desalter

The Arlington Desalter is a desalination facility operated by WMWD and located in the City of Riverside directly east of SAWPA's property. The desalter has a listed product water capacity of 6.6 mgd[7] (7,400 AFY), but has been achieving 7 mgd[8] (7,800 AFY) due to improved performance. Current overall recovery is approximately 80 percent, and brine flow is 1.38 mgd (1,550 AFY). The raw water has an average TDS concentration of 1,190 mg/L[9], product water TDS concentration of 266 mg/L, with a permit limit of 350 mg/L. The brine concentration ranges from 3,600 to 3,900 mg/L. This results in approximately 45,000 lb/d of TDS removed by the SARI line.

Temescal Basin Desalter

The Temescal Basin Desalter is a desalination facility located in the City of Corona, in the WMWD service area. It is owned and operated by the city. The desalter has a product water capacity of 15 mgd[10] (16,800 AFY). Currently, the desalter is producing

[3] WMWD Chino Desalter Phase 3 Alternatives Evaluation Final Report, May 2007 (Page 3-1)
[4] WMWD Chino Desalter Phase 3 Alternatives Evaluation Final Report, May 2007 (Table ES.1)
[5] Chino PDR, May 2009
[6] WMWD Water Resources Systems Simulation Model Report, July 2008 (Table 1-7)
[7] Western Outlook 07-08 (Page 3)
[8] Discussion with Arlington operator, Ray Marshal, on 9/29/09
[9] WMWD Arlington Desalter Evaluation, February 2007 (Page 2-2)
[10] WMWD Groundwater Basin Report Temescal Valley Basin, September 2007 (Page IV-15-13)

10.7 mgd (12,000 AFY) of product water and 1.82 mgd of brine. Although the product water capacity may increase, the brine flows are projected to remain at 1.80 mgd. The raw water is projected to have an average TDS concentration of 870 mg/L[11] with the product water delivering 120 mg/L TDS. This results in approximately 80,000 lb/d TDS removed through the SARI line, with the brine at a concentration of 5,300 mg/L.

Perris I Desalter

The Perris I Desalter is a desalination facility operated by EMWD and located in the City of Sun City, at the Sun City Regional Water Reclamation Facility. The RO desalter produces 5.6 mgd (6,300 AFY) of product water, with a product water capacity of 6.4 mgd (7,200 AFY) [12]. The raw water is supplied by 9 production wells[13], located in the Perris South section of the West San Jacinto Groundwater Basin, where the TDS concentration is about 2,300 mg/L[14]. Current brine flows are at 0.74 mgd (1120 AFY), at a concentration of approximately 6,000 mg/L[15]. However, the brine flow when the plant is at full capacity will be 1.5 mgd. This results in a TDS discharge of 75,000 lb/d through the SARI line at 1.5 mgd of brine flow.

Menifee Desalter

The Menifee Desalter is a desalination facility also operated by EMWD and located in the City of Sun City, at the Sun City Regional Water Reclamation Facility. The desalter product water capacity is a 3.1 mgd (3,500 AFY)[16]. The raw water is supplied by three production wells[17] located in the Perris South section of the West San Jacinto Groundwater Basin, where the TDS concentration is about 1,000 mg/L[18]. The desalter is operating at a 70 percent recovery due to the high concentration of silica. Current brine flows are at 1.0 mgd (1120 AFY), at a concentration of approximately 6,000 mg/L[19]. This results in a TDS discharge of 50,000 lb/d through the SARI line.

Inland Empire Energy Center

The Inland Empire Energy Center is a power plant located in the EMWD area. Recycled water is used for cooling. The facility desalinates groundwater, with a brine flow capacity of 1.2 mgd. The typical TDS concentration of brine is 4,800 mg/L from the Inland Empire Energy Center for a total of 48,000 lb/d of salt removal.

Corona Energy Partners

This is a power plant disposing a small quantity of water through the SARI line.

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[11] WMWD Groundwater Basin Report Temescal Valley Basin, September 2007 M(Table 15-4)
[12] EMWD Moving Forward with Desalination, September 2007 (Slide 21)
[13] EMWD Moving Forward with Desalination, September 2007 (Slide 21)
[14] EMWD Moving Forward with Desalination, September 2007 (Slide 18)
[15] Email from Joe Mouawad, 9/29/09
[16] EMWD Moving Forward with Desalination, September 2007 (Slide 20)
[17] EMWD Moving Forward with Desalination, September 2007 (Slide 20)
[18] EMWD Moving Forward with Desalination, September 2007 (Slide 18)
[19] Email from Joe Mouawad, 9/29/09

Mountainview Power Plant
The Mountainview Power Plant is a major power plant operated by Southern California Edison (SCE) and located in the city of Redlands[20].

Agua Mansa Power Plant (EI Colton)
The Agua Mansa Power Plant Power Plant is a major power plant operated by the City of Colton and located in the city.

Ener Tech/Rialto SlurryCarb Facility
The Rialto SlurryCarb Facility is located in the city of Rialto, and owned by Ener Tech, which is a renewable energy company. This facility was designed to provide a long-term biosolids recycling plan for the city of Rialto, the Sanitation District of Los Angeles, the Orange County Sanitation District (OCSD), the San Bernardino Municipal Water Department (SBMWD), and the city of Riverside[21].

2.2.2 Nitrate Removal/Ion Exchange

The following is a summary of nitrate removal facilities:

Rubidoux Anita B. Smith Ion Exchange Facility
The Anita B. Smith Water Treatment Facility is an ion exchange plant owned by Rubidoux Community Services District (RCSD) for nitrate removal. The facility is in WMWD's area, and is permitted to dispose of 0.03 mgd into the SARI. The current flow from this facility is shown in Table 2-4.

Pomona IX Plant
The Pomona Ion/Exchange (IX) Plant is within the Chino North basin. However, the brine from this plant is discharged to the Los Angeles County Sanitation District brine line. Therefore, the brine will not affect the SARI line capacity.

2.2.3 Domestic, Industrial and Waste Hauler Dischargers

As previously stated, due to the initially low flows of these higher salinity wastewaters, the SARI line has accommodated lower salinity domestic and industrial wastewaters to provide revenue and maintain system flows closer to design capacities. The long term intent has been to eventually eliminate these flows from the line, but there are still a number of active discharges today. These dischargers have direct connections to the SARI line. In addition, the SARI line receives flow at four existing truck dump stations. In 2009 these stations received flow from 49 waste haulers (indirect discharges). A total of 2.8 mgd of flow to the SARI line is received from domestic and industrial direct dischargers. A total of 0.2 mgd of flow to the SARI line is from waste haulers through the truck dump stations. Table 2-4 lists the direct domestic and industrial wastewater dischargers. Table 2-5 lists the waste haulers.

[20] Mountainview Power Plant Summary, 2009
[21] Rialto SlurryCarb™ Facility Summary, 2009

Table 2-4
SARI Line Direct Domestic and Industrial Dischargers[4]

Agency	Name	Wastewater Type	Flow (2) (MGD) (3)
IEUA	Bonview (Chino Preserve Development)	Domestic	0.2444
IEUA	IEUA S05 (Master Meter)	Industrial	0.2604
IEUA	Chino Institution for Women	Domestic/Industrial	0.3196
IEUA	Green River Golf Club	Domestic	0.0118
WMWD	UBF Food Solution	Industrial	0.001
WMWD	DFA Distilled Waater Plant	Industrial	0.0428
WMWD	Dart Container	Industrial	0.0555
WMWD	Stringfellow	Industrial	0.0972
WMWD	JCSD Hamner	Domestic	0.0541
WMWD	JCSD Wineville	Domestic	0.086
WMWD	JCSD Celebration	Domestic	0.1047
WMWD	JCSD Etiwanda	Domestic	0.8625
WMWD	California Rehabilitation Center	Domestic	0.6364
		Total	**2.7764**

Notes:
1) This table is based on information which is current as of July 1, 2009
2) The "Flow" information is based on data from July 2008 through March 2009
3) MGD = million gallons per day
4) From the SARI Market Analysis (August 2009)

Table 2-5
SARI Line Indirect Dischargers and Liquid Waste Haulers[4]

SITE	DISCHARGER	TYPICAL DISCHARGE VOLUME (2) (gpd)(3)
2	Clement Papas	28,417
3	CC Graber Olives	821
4	ICL	74
5	Ludfords	328
6	Mizkan	1,491
7	RMS	3,859
8	Hexfet(EMWD)	46,794
9	Aztec Uniform and Towel Rental	205
11	Doane/Mars Pet Care Company	1,853
13	East Valley Water District Well 27	1,894
14	Far West Meats	199
15	Farmdale Creamery	72
16	Glen Helen Rehabilitation Center	257
17	Loma Linda East Campus	12
18	Loma Linda Power Plant	1,046
19	National Concrete Washout, Inc.	8
20	Patton	56
21	Rayne Water Conditioning	2,918
24	CA School for the Deaf	27
25	Corona Regional Medical Center	1,304
26	Decra Roofing	1,688
28	Gene Belk	2,791
29	Hexfet (WMWD)	429
30	La Sierra University	91
31	Norco Egg Ranch	37,599
32	Prudential Overall Supply	516
33	Qualified Mobile	288
34	Rancho Springs Medical Center	89
36	Sierra Aluminum	1,496
37	Triple H Food	90
38	VA Medical Center	18
39	Shaw Pipe	122
40	Fresh and Easy	1,610
41	Ventura Foods	23,020
42	Flavor Specialties	2,057
43	Angelica Textile Services	1,387
44	Aramark	673
45	Juice Heads, Inc.	27
46	Food for Life Baking	10,187
47	East Valley Water District Well 107	2,287
48	Best Brands Corporation	130
49	E&M Ranch	2,351
50	Frontier Aluminum	175
	TOTAL	**180,756**

Notes:
1) This Table is based on information which is current as of July 1, 2009
2) The "Typical Discharge volume" information is based on data from July 2008 through March 2009
3) gpd = gallons per day
4) From the SARI Market Analysis (August 2009)

Section 3
Water Demand Projections and Water Supply/Disposal Plans

The need for future salt removal from the watershed is directly linked to the future water demands and supply plans of water-supply agencies in the watershed as well as the agencies' wastewater discharge and reuse plans. This is true because groundwater is a key component of the water-supply plans for most agencies in the watershed. The CDM Team used the water demand and supply plan projections and projections of wastewater disposal/reuse to assist in the development of salt budget and projection tools for the groundwater basins (see Section 4). Together, these projection tools were used to describe future salt management requirements (i.e. where, when, and how much future desalting may need to be implemented for the greatest benefit [see Section 5]).

This section describes the future water demands and supply plans of all water-supply agencies in the watershed. The CDM Team collected and compiled water demand projections and water supply/disposal plans (WSDPs) for all water supply agencies in the watershed. This information was obtained from groundwater management plans, reports on TDS projection tools for the Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin (Cooperative Agreement), groundwater modeling reports, and integrated regional water management plans (IRWMPs), including:

- Eastern Municipal Water District's Modeling Report for the San Jacinto Upper Pressure Management Zone (EMWD, 2009)
- Total Dissolved Solids and Nitrate Projections for the Beaumont Management Zone (Wildermuth, 2009a)
- Initial Report of Recharge Parties Pursuant to RWQCB Resolution No. R8-2008-0019, Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin, Bunker Hill-A, Bunker Hill-B, Lytle, Rialto, Colton, and Yucaipa Management Zones (GSS, 2009)
- Upper Santa Ana River Watershed Integrated Regional Water Management Plan (GEI, 2007)
- Draft Newmark Groundwater Flow Model Report (Stantec Consulting, 2008)
- Elsinore Valley Municipal Water District, Elsinore Basin Groundwater Management Plan (MWH, 2005)
- Imported Water Recharge Modeling Study for the Elsinore Basin (MWH, 2009).

- Draft AB 3030 Groundwater Management Plan. Prepared for the City of Corona Department of Water and Power (Todd Engineers, 2008)
- Draft Phase 1 Salt Balance Model of the Temescal Subbasin (Todd Engineers, 2009)
- Total Dissolved Solids and Nitrate Projections for the Chino-North Management Zone (Wildermuth, 2009b)
- Salt and Nitrate Projections for the Orange County Management Zone, Technical Memorandum (OCWD, 2009)

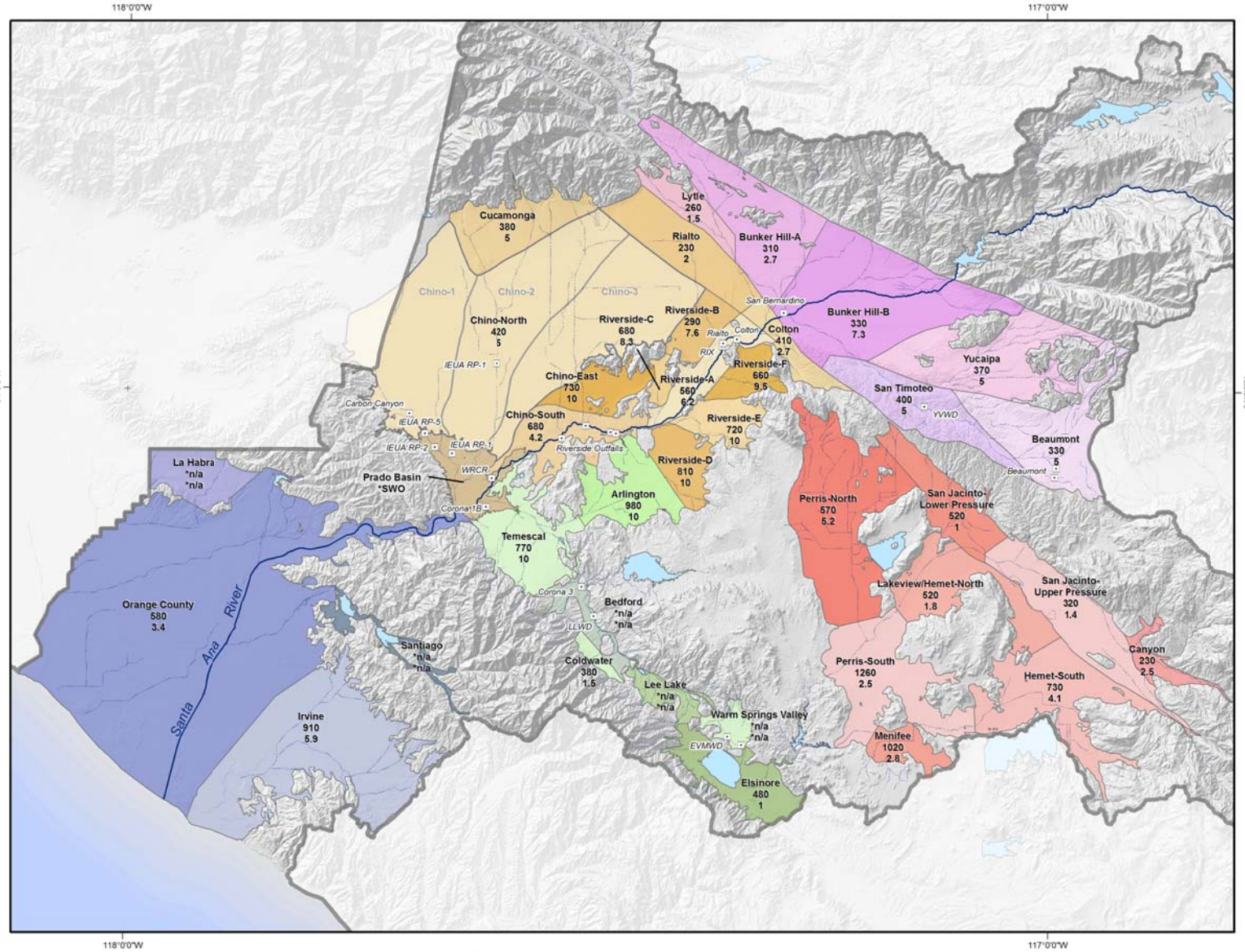
The CDM Team also reviewed the 2009 Integrated Regional Watershed Management Plan (IRWMP) (SAWPA, 2009), the 2004 Basin Plan (Regional Board, 2004), the recent recomputation of ambient TDS[1] concentrations in the watershed (WEI, 2008), and the wasteload allocation for the Santa Ana River and its tributaries (WEI, 2009).

Water demand projections and WSDPs were compiled into MS Excel spreadsheets and are provided in tabular format in Appendix A (Tables A-1 through A-30). In these tables, the WSDPs show the various water supply sources projected by the agencies. Projected supplies include pumped groundwater from management zones in the Santa Ana Watershed (Figure 3-1), pumped groundwater from groundwater basins outside of the Santa Ana Watershed, surface water diversions, imported water (State Water Project [SWP] and Colorado River Aqueduct [CRA]), desalter product water, recycled water for direct use, and horizontal tunnels.

The disposal plans describe how supplies are used, including indoor and outdoor use. Water used indoors is assumed to ultimately flow to Publicly-Owned Treatment Works (POTWs). Water used outdoors is typically for landscape irrigation—a portion of which will return to the aquifer system, but in a concentrated form due to evapotranspiration. This is an important process to understand and quantify because return flows impact the TDS of groundwater, which impacts the TDS of the water supply, which ultimately drives the need for salt removal from the watershed.

Outdoor supply is operationally defined as 100 percent of the recycled water planned for direct use (irrigation) plus a percentage—typically 60 percent—of the potable supply. The percentage of potable supply used for outdoor irrigation varies by agency. When water is used for irrigation, a percentage of the applied water is evaporated or transpired by the plant. The net effect is less water that becomes deep percolation of applied water, but at a higher concentration of TDS.

[1] In this study, TDS is defined as being functionally equivalent to salinity—although volatile compounds and some chlorides can be lost in drying during the measurement of TDS.



Ambient Water Quality Objectives

Management Zone — Orange County
TDS Objective (mg/L) — 580
NO3-N Objective (mg/L) — 3.4

Recycled Water Discharge Location

*SWO: Surface Water Objectives Apply.

*n/a: not enough data were available to calculate water quality objectives.

Other Features

RWQCB Boundary

Management Zone Boundary

Santa Ana River

Lakes & Reservoirs

Produced by:

WILDERMUTH ENVIRONMENTAL INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: ETL
Date: 20100111
File: Figure_3-1.mxd

0 5 10 15 Miles
0 5 10 15 20 25 KM

Santa Ana Watershed Salinity Management Program
Phase I Salinity Management Plan Technical Memorandum

Management Zone Boundaries

Santa Ana Watershed - 2004 Basin Plan Amendment

Figure 3-1

If irrigation efficiency is 75 percent, 75 percent of the applied water is used by the plant or evaporates, leaving 25 percent of the water and nearly all of the salt for deep percolation to the aquifer system. In addition, fertilizers and pesticides add to the salt load of return flows, which, in this exercise, were assumed to be a TDS increment of 250 mg/L.

The TDS concentration of the returns from use (deep percolation of applied water) is defined as:

$$C_{rf} = \frac{C_{sw}}{(1 - IE)} + C_{incr}$$

where C_{rf} = concentration of TDS in the returns from use (mg/L)
C_{sw} = concentration of TDS in the source water (mg/L)
IE = irrigation efficiency
C_{incr} = concentration of TDS increment (mg/L)

The CDM Team extended the WSDPs by determining which groundwater management zones would be impacted by returns from use. This was done by using geographical information system (GIS) tools to determine the percentage of each Water Service Area (WSA) that overlies each groundwater management zone. Returns from use (flux and concentration) are allocated by these percentages. These percentages are provided in Appendix A (see Table A-31).

For water supply and water disposal, planned flux and TDS concentration values are provided on an annual time step. If WSDP information was provided at a 5- or 10-year interval, linear interpolation was used to provide annual estimates. For long-term future estimates of supply and demand, the CDM Team used the last year of the plan (typically 2030) and carried these values forward from 2030 to 2060, essentially assuming complete build-out of the urban areas by 2030.

All changes to the WSDPs made by the CDM Team are carefully documented in footnotes at the bottom of each table. Some of the changes included normalizing assumptions made throughout the watershed—some of which are listed below:

- All SWP supplies have the same TDS (250 mg/L), which is the approximate long-term average concentration.
- All CRA supplies have the same TDS (650 mg/L), which is the approximate long-term average concentration.
- 100 percent of the recycled water supply for direct use is assumed to be used for outdoor irrigation.
- Outdoor water use is 60 percent of the total supply unless better information was available for an agency.

- The TDS concentration of product water from the Chino 1 and Chino 2 Desalters produced by the Chino Desalter Authority (CDA) is assumed to be a constant 350 mg/L for the modeled period.
- 75 percent is the irrigation efficiency of outdoor use.
- A TDS increment of 250 mg/L is added to all return flows from outdoor use to account for application of fertilizers, pesticides, etc.
- The TDS increment added by indoor use was calculated for each POTW using near-term (2006 through 2008) historical data (Section 4.3) for source water and effluent TDS concentrations.

Section 4
TDS Projections in Groundwater

As described in the previous section, water is typically used outdoors for irrigation—a portion of which will return to the aquifer system, but in a concentrated form due to evapotranspiration. This is an important process to quantify because return flows impact the TDS of the groundwater, which may impact the TDS of the water supply for most water-supply agencies, which may impact the TDS at POTWs and may ultimately drive the need for salt removal from the watershed.

This section describes the tools that were used to predict TDS accumulation in groundwater and how those tools are linked with the WSDPs and ultimately the POTWs to predict long-term salt removal needs.

4.1 Constantly-Stirred Reactor Models (CSRMs)

Historically, the Regional Board has used its Basin Planning Models (BPMs) to develop the required TDS and nitrate projections. In the mid-1990s, the N/TDS Task Force, which included the Regional Board, formally determined not to use BPMs for future planning. The N/TDS Task Force also elected not to develop a new groundwater model for simulating the fate of TDS.

Currently, one method used to project groundwater TDS concentrations in the watershed is a version of a Constantly-Stirred Reactor Modeling (CSRM) tool. This method is accepted by the Regional Board and the parties to the Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin (Cooperative Agreement) that became effective January 18, 2008 (Regional Board Resolution R8-2008-0019). In some groundwater basins, numerical groundwater flow models were used to provide some of the inputs to the CSRM tools.

In a CSRM, fluid particles enter a theoretical reactor and are instantaneously dispersed throughout the reactor volume. The fluid particles leave the theoretical reactor in proportion to their statistical population. This approximation is used to study lakes and reservoirs with continuous inputs and outputs (Tchobanoglous and Schroeder, 1987). The extension of this approach to a groundwater basin provides a first-order approximation of the time scale of TDS changes.

The CSRM approach is as follows:

- Estimate the volume of water in storage and volume-averaged TDS concentrations of the management zone at the start of the simulation period (initial condition).
- For each time step, the following are performed:
  - Estimate inflow and outflow volumes.

- Estimate the change in storage.
- Estimate the TDS concentration for each recharge component.
- Assume that the TDS in the discharge components are equal to the TDS concentrations at the end of the previous time step.
- Estimate the TDS mass in the reactor (i.e. equivalent to groundwater basin).
- Estimate the volume-averaged TDS concentrations in the reactor at the end of the time step.

The recharge terms consist of the deep percolation of precipitation, the deep percolation of applied water (urban and agricultural), the natural and artificial recharge of storm waters, the artificial recharge of supplemental water, and subsurface inflows from adjacent groundwater basins. With the exception of the deep percolation of applied water, the recharge terms are independent of the groundwater discharge terms and are calculated or assumed values. The deep percolation of applied water is closely related to the total water demand and is derived from the portion of water demand required to satisfy irrigation uses.

Put simply, the water volume and TDS mass balance for a groundwater basin (reactor) is:

$$\text{Recharge} - \text{Discharge} = \text{Change in Storage} \qquad (1)$$

For TDS concentrations, an implicit finite-difference approximation is used:

$$\Sigma\,[\,I_{j,t\text{ to }t+1} * C_{j,t}\,] - \Sigma\,[O_{k,t\text{ to }t+1} * CGW_t] = VGW_{t+1}*CGW_{t+1} - VGW_t*CGW_t \qquad (2)$$

where:

$I_{j,t\text{ to }t+1}$ = the jth recharge term during the period *t* to *t+1*,

$C_{j,t}$ = the concentration for the jth recharge term during the period *t* to *t+1*,

$O_{k,t\text{ to }t+1}$ = the kth discharge term from the groundwater basin during the period *t* to *t+1*,

VGW_{t+1} = the volume of groundwater in storage at *t+1*, and

CGW_{t+1} = the concentration of groundwater at *t+1*.

The mass balance is solved for CGW_{t+1} after the hydrologic or water volume mass balance is solved.

The TDS concentrations of the deep percolation of applied water vary over time in response to changes in the TDS concentrations of the water supply (e.g. the pumped groundwater TDS concentrations of the management zone). The TDS concentrations

in returns from use are a function of the groundwater concentration, the fraction consumptively used, and the mass increments added through use. This can be expressed as:

$$C_{rf} \cdot V_{rf} = (V_{sw} \cdot C_{sw}) + M_{incr} - M_{decr} \quad (3)$$

$$V_{rf} = V_{sw} \cdot (1\text{-}FC) \quad (4)$$

Combining equations (3) and (4) yields:

$$C_{rf} = [(V_{sw} \cdot C_{sw}) + M_{incr} - M_{decr}] / [V_{sw} \cdot (1\text{-}FC)] \quad (5)$$

$$C_{rf} = [C_{sw} / (1\text{-}FC)] + [M_{inc}r - M_{decr}] / [V_{sw} \cdot (1\text{-}IE)] \quad (6)$$

where:

C_{rf} = the constituent concentration in the returns from use,

V_{rf} = the volume of the returns from use,

C_{sw} = the constituent concentration in the source water,

V_{sw} = the volume of the source water,

M_{incr} = the mass added by a specific water use,

M_{decr} = the mass taken out by consumptive use and degradation processes within a specific water use, and

IE = the fraction of irrigation efficiency

4.2 Review and Revision of Existing TDS Projections

SAWPA developed salt balance or budget projections for the watershed in its 2005 Integrated Regional Water Management Plan (SAWPA, 2005) and more currently in its 2009 Santa Ana Integrated Watershed Plan (SAWPA, 2009), which was written as part of the One Water One Watershed (OWOW) initiative. Both reports describe the accumulation of salt in the watershed. The salt budgets identify and quantify the sources of salt to the watershed and existing salt discharges from the watershed. The SAWPA approach is generally referred to as a salt flux approach.

More recently, several watershed stakeholders[2] prepared TDS and nitrate groundwater projections in response to the requirements that were agreed upon in the Memorandum of Understanding to Implement the Cooperative Agreement and are overseen by the Regional Board. In concept, these TDS and nitrate projections are similar to the salt balances prepared by SAWPA, except they also include groundwater simulation tools that project TDS and nitrate concentrations in groundwater for the next 20 years or more. The importance of this distinction is that the stakeholder tools can be used to estimate when beneficial uses will be impaired by salt loading, when regulatory actions that will require additional response from water-supply or wastewater agencies will likely occur, as well as the responses of ground and surface water bodies to salt management programs. The following TDS Projection Tools/Reports were reviewed and utilized in this study:

- San Jacinto Upper Pressure Management Zone (EMWD, 2009)
- Bunker Hill-A, Bunker Hill-B, Lytle, Rialto, Colton, and Yucaipa Management Zones (GSS, 2009)
- Chino-North Management Zone (WEI, 2009)
- Elsinore Management Zone (MWH, 2009)
- Temescal Management Zone (Todd Engineers, 2009)
- Orange County Management Zone (OCWD, 2009)

In most cases, the TDS projection tools developed by the stakeholders were revised into a consistent format with consistent assumptions. All changes made to the CSRMs by the CDM Team are carefully documented in footnotes at the bottom of each table. Some of these changes included normalizing assumptions made throughout the watershed (e.g. consistent irrigation efficiencies). Some of the main assumptions and standardizations are listed below:

- The TDS of the deep of percolation of precipitation is assumed to be 100 mg/L, which includes a TDS increment to account for evapotranspiration.
- The TDS of storm water recharge is assumed to be 100 mg/L, which includes a TDS increment to account for TDS added during runoff to the recharge basin.
- At the start of the each CSRM model, groundwater supplies are assigned the TDS concentrations estimated during the 2006 recomputation of TDS for the applicable

[2] These include the so-called Maximum Benefit parties—the City of Beaumont, San Timoteo Watershed Management Authority, Yucaipa Valley Water District, Eastern Municipal Water District, Chino Basin Watermaster, and Inland Empire Utilities Agency—and the Cooperative Agreement Parties—EMWD, San Bernardino Valley Municipal Water District, the Cities of Corona and Riverside, Western Municipal Water District, and Orange County Water District.

groundwater management zone(s) (Wildermuth, 2008). If it is known that pumped groundwater is of better/worse quality (based on TDS waste increment reports), a translator is applied to the TDS of the groundwater supply.

The CSRMs developed for this project are presented in Appendix B (Tables B-1 through B-7). The first three columns of each CSRM show the year, starting storage (AF), and the starting TDS concentration (mg/L). The subsequent columns show the flows and TDS concentrations for the various recharge and discharge terms. The final three columns depict the change in storage (recharge minus discharge [AF]), the ending storage (AF), and the ending TDS concentration (mg/L). The latter two columns become the starting storage and TDS values for the subsequent year.

A CSRM was not developed for the Riverside Management Zones; TDS concentration trends were estimated by reviewing trends in ambient water quality concentrations (WEI, 2008).

A CSRM was developed by EMWD for the San Jacinto Upper Pressure Management Zone—an area where EMWD plans to recharge imported water. CSRMs were not conducted for other management zones in the EMWD service area. Desalting plans were obtained directly from EMWD staff and are discussed in Section 5.2.

4.3 Linking WSDPs, CSRMs, and POTWs – The Integrated Salt Flux Model (ISFM)

The modified and normalized WSDPs are dynamically linked to the modified and normalized CSRMs, and ultimately to the POTWs. The following links and dependencies were modeled:

- Each water supply agency may pump from one or more management zones. The future TDS concentration trends in each of the management zones are accounted for by linking the WSDPs with each management zone where the water supply agency is actively pumping.

- The WSDPs estimate returns from use from each water supply over each management zone. These returns from use were factored into the CSRM such that subsequent TDS concentrations in the groundwater management zone reflect the impact from various returns from use. A water supply agency may have returns from use that impact more than one management zone. In addition, a management zone can have returns from use from more than one water supply agency.

- The TDS of recycled water used outdoors or for groundwater recharge in the CSRM is equal to the previous year's volume-weighted TDS in the potable supply in the WSDP plus the TDS increment calculated for the wastewater treatment plant.

- The water supply agencies discharge to one wastewater agency; although, in some cases, they export wastewater out of the watershed. Each wastewater agency can accept discharges from one or several water supply areas. The potable water supply TDS concentration tributary to each POTW is the volume-weighted average of the TDS concentrations of all potable water served in the sewershed (these values are the flux and concentration terms for indoor supply in the WSDPs).

The CDM Team collected monthly Waste Increment Reports (WIRs) from the Regional Board for all POTWs in the watershed for years 2006 through 2008. These POTWs include:

- Beaumont WWTP
- Colton WWTP
- Corona WWTP
- EVMWD WWTP
- IEUA WWTPs
- Redlands WWTP
- Rialto WWTP
- Riverside WWTP
- RIX
- San Bernardino WWTP
- WRCRWTP
- Yucaipa WWTP

From these reports, the CDM Team constructed time history plots of discharge, source water quality, and effluent quality. These data served two purposes:

- The near-term historical trend in source water TDS concentrations served as a rough check of the source water TDS concentrations calculated from the volume-weighted average of the TDS concentrations in WSAs tributary to the POTW. In some cases, the estimates of the volume-weighted average of the TDS concentrations in WSAs tributary to the POTW had to be adjusted to lower values to reflect the data in the WIRs; calculated values for TDS concentrations in the water supply were sometimes higher than actual values because calculated values use average management zone TDS concentrations, whereas water supply

agencies typically pump from areas in the management zone where water quality is better.

- The average difference in source water and effluent TDS concentrations provided an estimate of the actual waste increment achieved by the POTW. This waste increment was added to the projected volume-weighted average of the TDS concentrations in WSAs tributary to the POTW to provide an estimate of the projected POTW effluent TDS concentration.

The linking of the WSDPs to the CSRMs and the POTWs creates an integrated Salt Flux Model (ISFM) of the watershed. Figure C-1 (Appendix C) schematically shows the linkages between the groundwater management zones, the water supply agencies, and the POTWs. The ISFM predicts (1) future TDS concentrations in the groundwater management zones of the watershed, (2) the TDS of the water supply for water-supply agencies in the watershed, and (3) the TDS of the wastewater effluent from POTWs in the watershed. These TDS projections are vital to estimating future salt removal needs throughout the watershed (Section 5 below).

Section 5
Salt Budget and Salt Removal Needs for the Santa Ana Watershed

Section 5.1 describes the CDM Team's examination of the salt budget for the watershed, based on the ISFM, essentially seeking to answer the question: *Are the masses and concentrations of TDS increasing or decreasing in each management zone?*

Section 5.2 presents the CDM Team's review of the likely regulatory drivers for salt removal and how much salt will need to be removed to meet those regulatory drivers from both a water supply and wastewater discharge perspective.

5.1 Watershed Salt Budget Projections

Figures 5-1 through 5-7 contain plots, generated from the CSRMs, of the salt in storage in each management zone over the modeled period (2010 to 2060). Specifically, these plots are the area-graphs in each of the figures. The blue portion of the area-graph represents the mass of salt (in tons) in the management zone corresponding to concentrations less than the TDS water quality objective for that management zone. The red area-graph represents the mass of salt in the management zone associated with concentrations greater than the TDS water quality objective for that management zone. The Beaumont, Bunker Hill-B, Chino-North, Elsinore, and Yucaipa Management Zones all currently have some assimilative capacity, so there is a period before the TDS objective is exceeded. In contrast, the Bunker Hill-A and Temescal Management Zones do not have assimilative capacity, so a current portion of the salt mass in the management zone is associated with TDS concentrations greater than the management zone objective for TDS.

Figures 5-1 through 5-7 also show time histories of groundwater in storage (AF) and TDS concentrations in groundwater (mg/L) for the modeled period. In the Beaumont Management Zone, TDS concentrations are projected to increase from 269 mg/L to 455 mg/L, while the storage is projected to increase from 876,000 to a high of 975,000 AF in 2029 and thereafter decreases to 908,000 AF. The loss of groundwater storage in the out years results in a smaller mass of salt in the management zone than there would be if the storage were constant or increasing over time.

Figure 5-1
Salt in Storage: Beaumont Management Zone

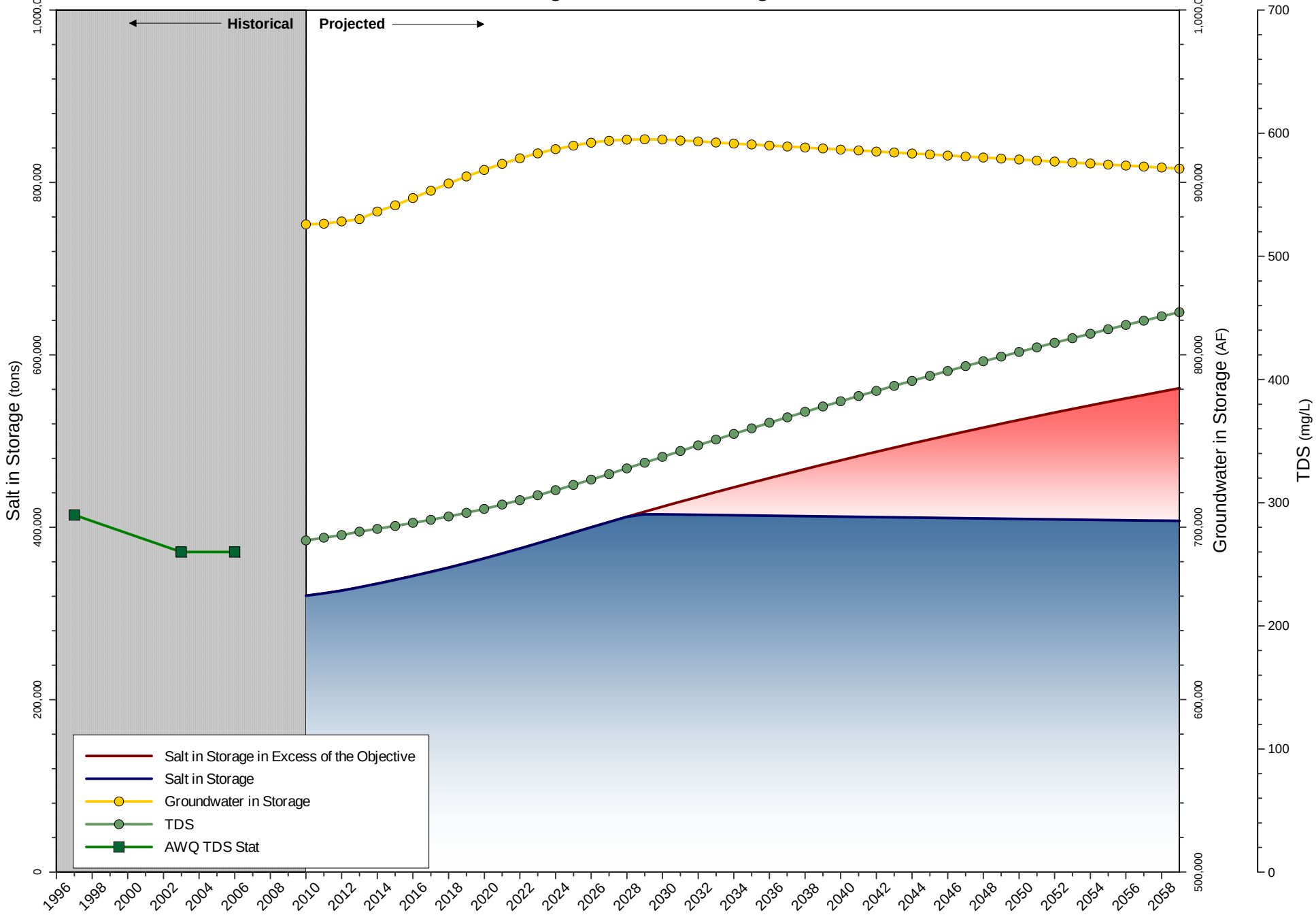


Figure 5-2
Salt in Storage: Bunker Hill A Management Zone

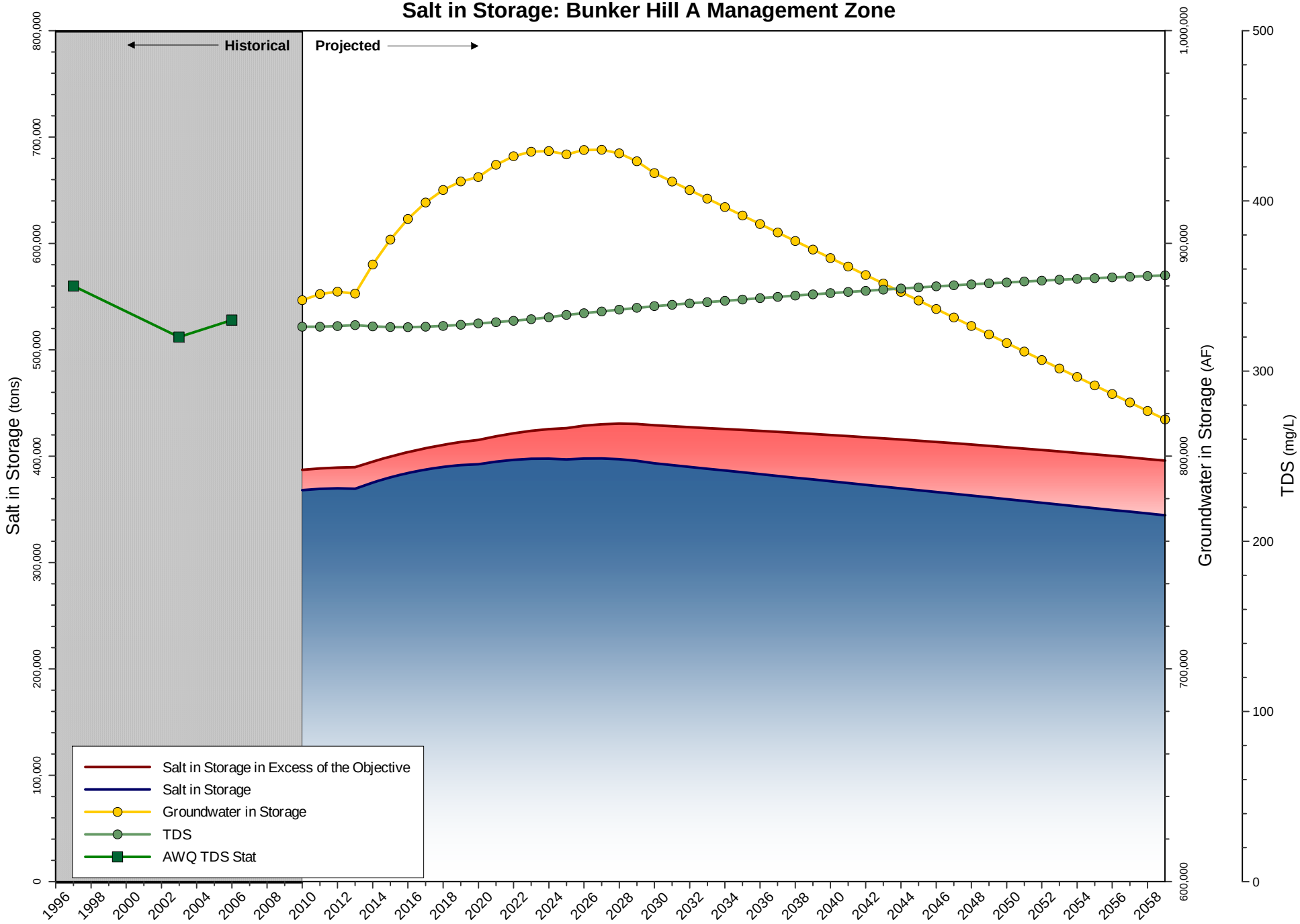


Figure 5-3
Salt in Storage: Bunker Hill B Management Zone

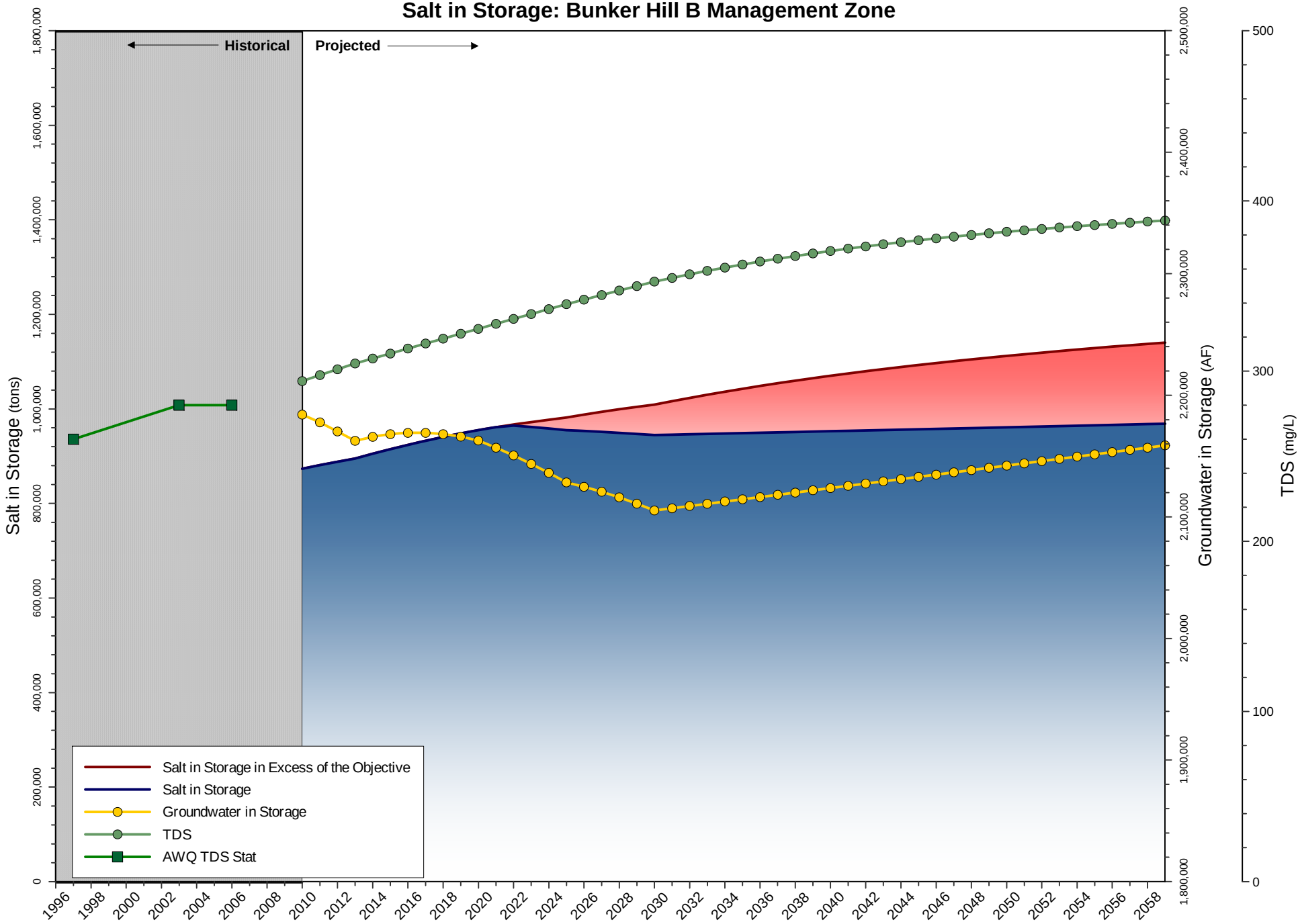


Figure 5-4
Salt in Storage: Chino North Management Zone

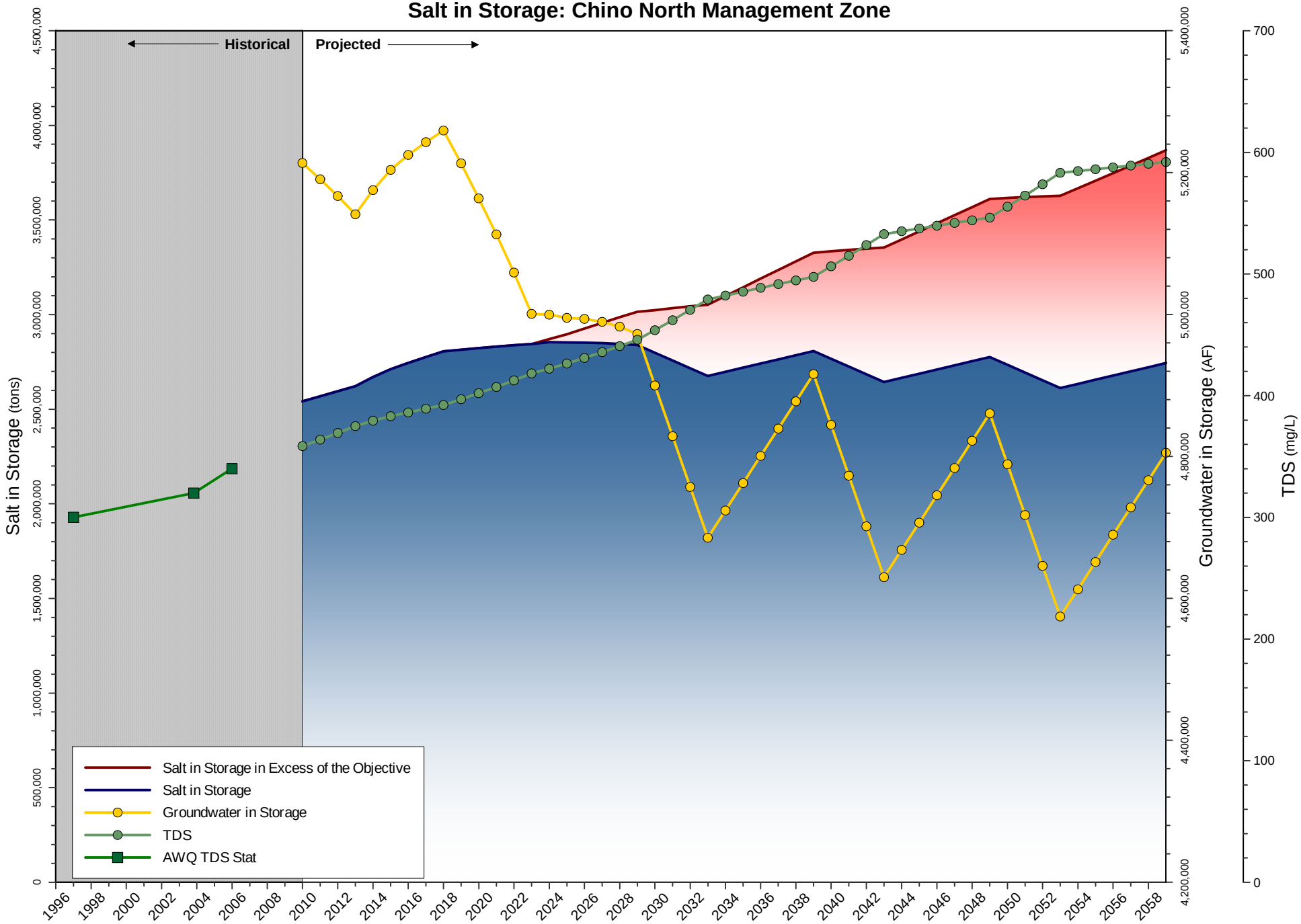


Figure 5-5
Salt in Storage: Elsinore Management Zone

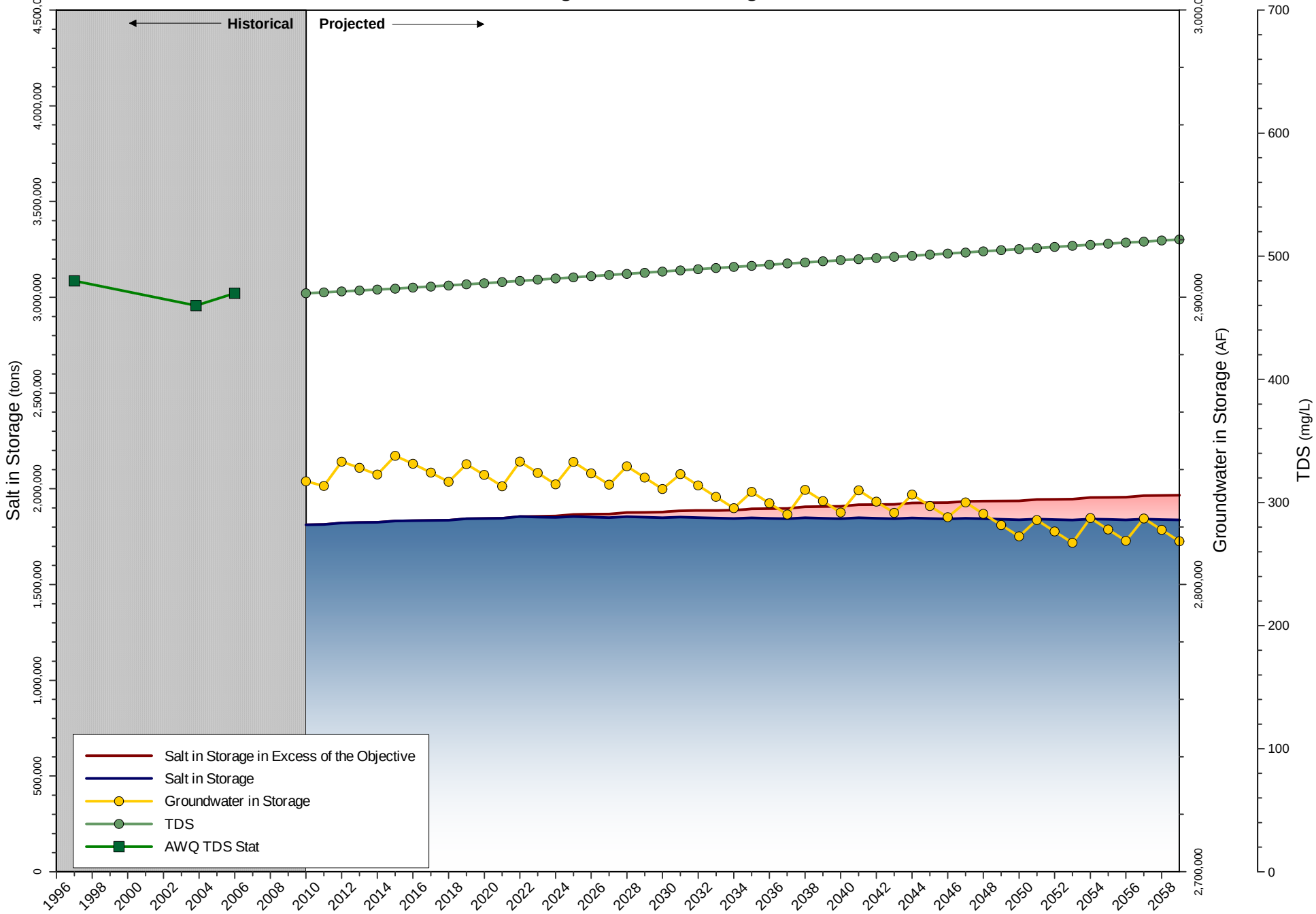


Figure 5-6
Salt in Storage: Temescal Management Zone

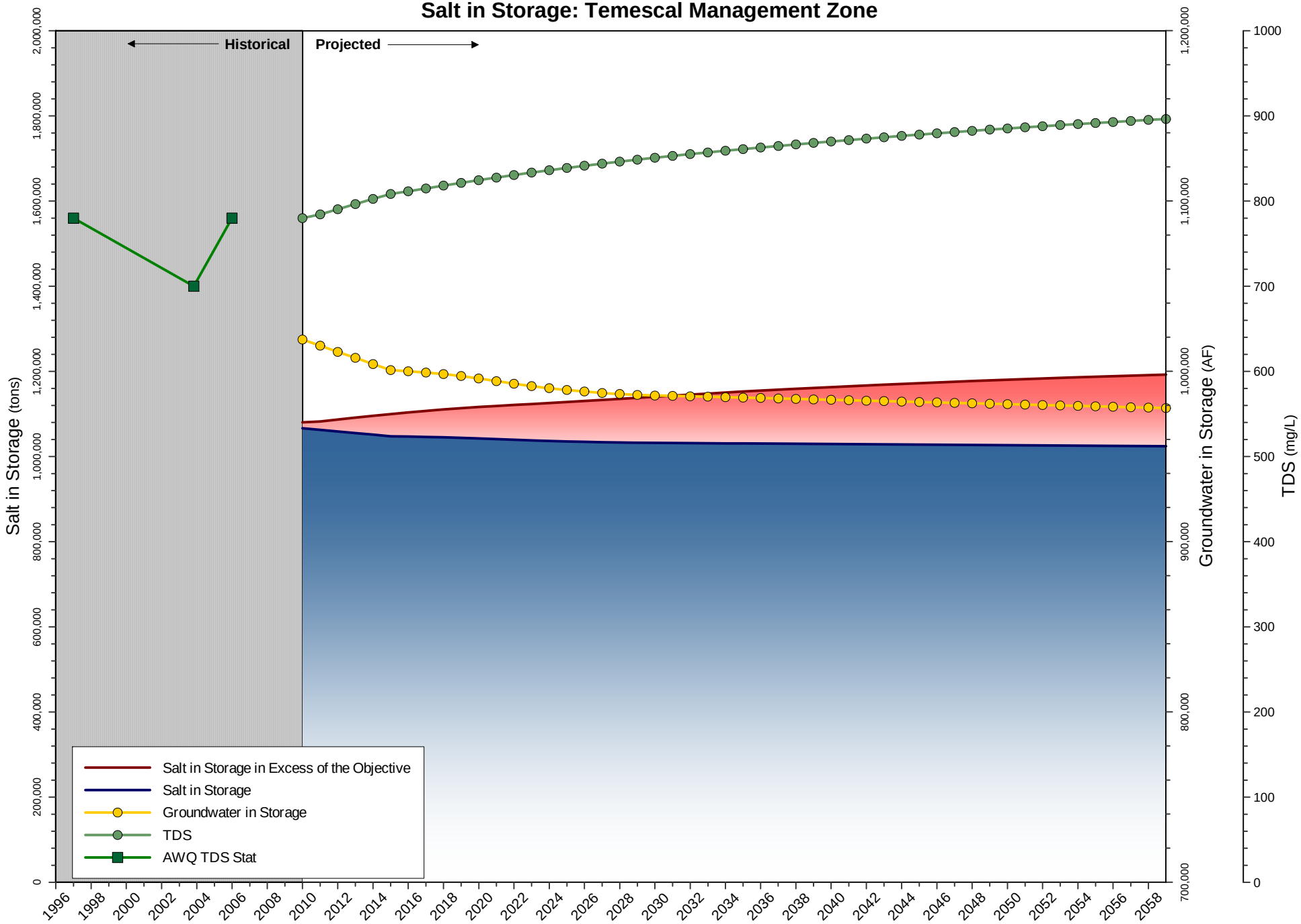
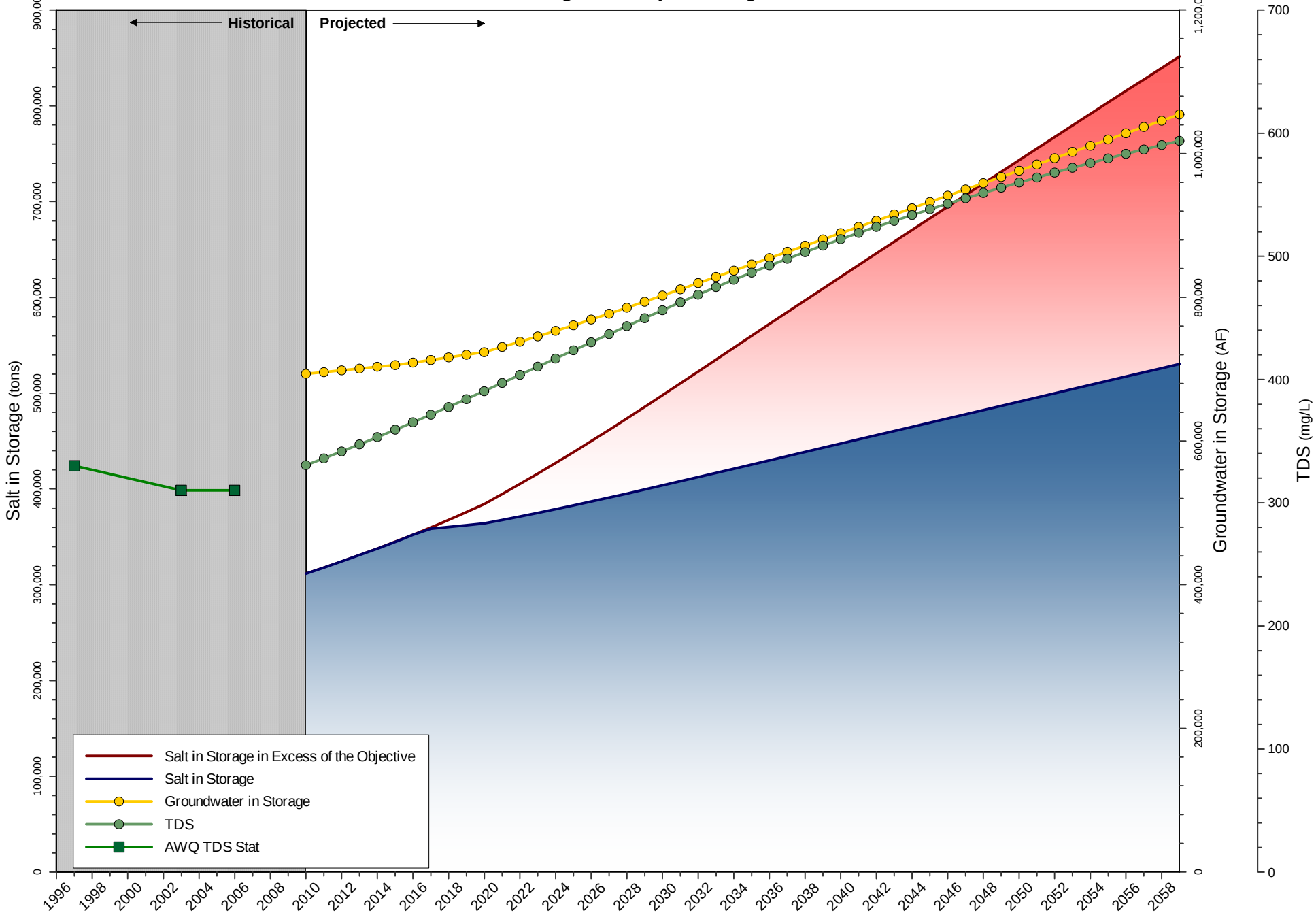


Figure 5-7
Salt in Storage: Yucaipa Management Zone



5.2 Salt Removal Needs Predicted by Watershed Salt Budget Projections

The future salt removal needs of the watershed will be driven by four main regulatory limits:

- The TDS objectives within the Basin Plan
- The EPA secondary MCL for TDS in the potable water supply
- The TDS discharge limits in the NPDES permits for each POTW
- Projected recycled water TDS concentrations that exceed Basin Plan water quality objectives, preventing its use for irrigation or recharge in management zones with no assimilative capacity.

The future needs, quantities, and timing for salt removal are discussed below.

5.2.1 Management Zone TDS Exceeds the Basin Plan Water Quality Objective

Table 5-1 provides the salinity management requirements for management zone water quality. The table lists, by management zone, the TDS objective from the Basin Plan (Regional Board, 2008b), the 2006 current ambient TDS concentration and the assimilative capacity (WEI, 2008). The table also includes the year and TDS concentration when the TDS projection tools (CSRMs described in Section 4) predict that groundwater TDS concentrations will exceed TDS objectives. For management zones that currently have assimilative capacity, this means there would no longer be assimilative capacity after the year shown. The Regional Board, therefore, has no discretion as to the allocation of assimilative capacity and would require a salt offset or other mitigation for the recharge or re-use of water that exceeds the objective. A management zone in which there is no assimilative capacity may, or may not, trigger an action by an agency that would impact SARI capacity.

For parties with Maximum Benefit objectives, the Regional Board would require desalting or some other mitigation when the management zone TDS concentrations encroach within 10 mg/L of the Maximum Benefit water quality objective. According to the TDS projection tools, this condition would occur in 2028 for the Beaumont Management Zone, 2016 for the Yucaipa Management Zone, and 2023 for the Chino-North Management Zone. The desalting requirements in the Basin Plan are somewhat undefined, but future desalting will likely be driven by other needs/requirements before these requirements are encountered (see Sections 5.2.2 and 5.2.3 below).

Table 5-1
Salinity Management Requirements for Management Zone Water Quality

Groundwater Basin	Management Zone	Total Dissolved Solids (TDS) Water Quality Objective *mg/L*	2006 Current Ambient[2] *mg/L*	Assimilative Capacity *mg/L*	Year[4]	TDS Projections[5] *mg/L*	Triggers Action?[6]
San Bernardino Valley & Yucaipa/Beaumont Plains							
	Beaumont -- "max benefit"[3]	330	260	**70**	2028	332	Additional Desalting
	Beaumont -- "antideg"	230	260	-30	2010	271	Meet Max Benefit Commitments
	Bunker Hill-A	310	330	-20	2010	326	No
	Bunker Hill-B	330	280	**50**	2036	330	Maybe
	Lytle	260	230	**30**	-	-	-
	San Timoteo -- "max benefit"	400	?	--	-	-	-
	San Timoteo -- "antideg"	300	?	--	-	-	-
	Yucaipa -- "max benefit"	370	310	**60**	2016	371	Additional Desalting
	Yucaipa -- "antideg"	320	310	**10**	2010	336	Meet Max Benefit Commitments
San Jacinto Basins							
	Canyon	230	370	-140	-	-	-
	Hemet-South	730	920	-190	-	-	-
	Lakeview/Hemet-North	520	880	-360	-	-	-
	Menifee	1020	2140	-1120	-	-	-
	Perris-North	570	730	-160	-	-	-
	Perris-South	1260	2600	-1340	-	-	-
	San Jacinto-Lower	520	810	-290	-	-	-
	San Jacinto-Upper -- "antideg"	320	350	-30	2010	411	No
	San Jacinot-Upper -- "max benefit"	500	350	150	2025	503	Meet Max Benefit Commitments
Chino, Rialto/Colton, & Riverside Basins							
	Chino-North -- "max benefit"	420	340	**80**	2023	420	Additional Desalting
	Chino 1 -- "antideg"	280	340	-60	-	-	-
	Chino 2 -- "antideg"	250	360	-110	-	-	-
	Chino 3 -- "antideg"	260	310	-50	-	-	-
	Chino-East	730	650	**80**	-	-	-
	Chino-South	680	940	-260	-	-	-
	Colton	410	450	-40	-	-	-
	Cucamonga -- "max benefit"	380	250	**130**	-	-	-
	Cucamonga -- "antideg"	210	250	-40	-	-	-
	Rialto	230	230	0	-	-	-
	Riverside-A	560	440	**120**	-	-	-
	Riverside-B	290	340	-50	-	-	-
	Riverside-C	680	740	-60	-	-	-
	Riverside-D	810	?	--	-	-	-
	Riverside-E	720	710	**10**	-	-	-
	Riverside-F	660	570	**90**	-	-	-
	Prado Basin	surface water objective applies		surface water objective applies	NA	NA	NA
Elsinore/Temescal Valleys							
	Arlington	980	960	**20**	-	-	-
	Bedford	?	?	--	-	-	-
	Coldwater	380	420	-40	-	-	-
	Elsinore	480	470	**10**	2014	481	Maybe
	Lee Lake	?	?	--	-	-	-
	Temescal	770	780	-10	2010	878	No
	Warm Springs Valley	?	?	--	-	-	-
Orange County Basins							
	Irvine	910	920	-10	-	-	-
	La Habra	?	?	--	-	-	-
	Orange County[6]	580	590	-10	2025	580	No
	Santiago	?	?	--	-	-	-

? = Not enough data to estimate TDS concentrations; management zone is presumed to have no assimilative capacity. If assimilative capacity is demonstrated by an existing or proposed discharger, that discharge would be regulated accordingly.

" - " No TDS model projection of this management zone.

[1] Data sampling period was 20 years (1954-1973) for historical ambient water quality computations. Water quality objective set close to the historical ambient.

[2] Data sampling period was 20 years (1987-2006) for current ambient water quality computations.

[3] Assimilative capacity created by "maximum benefit" objectives is allocated solely to agency(ies) responsible for "maximum benefit" implementation.

[4] Year the management zone projected TDS concentrations exceed the water quality objective.

[5] TDS concentration in the year that the water quality objective is met or exceeded.

[6] For management zones that currently have assimilative capacity, this means there is no longer assimilative capacity after the year shown. The Regional Board, therefore, has no discretion as to the allocation of assimilative capacity and would require a salt offset or other mitigation for recharge or re-use of water that exceeds the objective. For parties with Maximum Benefit objectives, the Regional Board would require desalting or some other mitigation when the management zone TDS concentrations is within 10 mg/L of the maximum benefit water quality objective.

Beaumont	2026
Yucaipa	2015
Chino-North	2021

5.2.2 Projected Water Supply Concentrations Exceed Water Quality Standards

Table 5-2 provides the salinity impact on potable water supply quality. The table uses the US Environmental Protection Agency (EPA) and California DPH secondary maximum contaminant level (MCL) for TDS of 500 mg/L and indicates whether or not the secondary MCL is predicted to be exceeded in the blended water supplied by the ISFM. The "0" symbol indicates that the secondary MCL is not predicted to be exceeded in the potable water supply during the modeled period. If the secondary MCL is predicted to be exceeded for a water supply agency, the year and the concentration at that time are listed on the table. This may trigger an action by the agency, which could include blending, desalting, importing more water of higher quality, or capturing and recharging more stormwater upgradient of municipal supply well fields. Future desalting will likely be driven by POTW discharge limitations before these requirements are encountered (see Section 5.2.3 below) because most POTW discharge limits are less than or equal to 700 mg/L and most TDS waste increments are greater than 200 mg/L.

A WSDP was not obtained at the member agency level in the OCMZ and therefore future, potential impacts of TDS on potable water supply quality could not be projected. However, OCWD (2009) presented information on the delivered blend water quality by member agency in the 2007/08 Engineer's Report. The delivered blend includes untreated groundwater and treated imported MWD water (i.e., blend of Colorado River water and State Project water as measured at the MWD Diemer Plant), except Serrano Water District, which blends with treated Santiago Reservoir water. Member agencies with TDS concentrations in delivered blends greater than 500 mg/L are listed in Table 5-2.

Table 5-2
Salinity Management Requirements for Potable Water Quality

Management Zone	Year	TDS Projections *mg/L*	Criterion Type	Criterion *mg/L*	Triggers Action?	Action
Eastern Municipal Water District						
Eastern Municipal Water District	E	E	EPA Secondary MCL	500	E	E
City of Hemet	E	E	EPA Secondary MCL	500	E	E
City of San Jacinto	E	E	EPA Secondary MCL	500	E	E
Lake Hemet Municipal Water District	E	E	EPA Secondary MCL	500	E	E
Soboba Reservation	E	E	EPA Secondary MCL	500	E	E
Upper Watershed						
Beaumont Cherry Water District	O	O	EPA Secondary MCL	500	O	O
City of Banning	O	O	EPA Secondary MCL	500	O	O
City of Chino	O	O	EPA Secondary MCL	500	O	O
City of Chino Hills	O	O	EPA Secondary MCL	500	O	O
City of Colton	O	O	EPA Secondary MCL	500	O	O
City of Corona	2016	502	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge
City of Loma Linda	O	O	EPA Secondary MCL	500	O	O
City of Norco	-	-	EPA Secondary MCL	500	-	-
City of Ontario	O	O	EPA Secondary MCL	500	O	O
City of Pomona	O	O	EPA Secondary MCL	500	O	O
City of Redlands	O	O	EPA Secondary MCL	500	O	O
City of Rialto	O	O	EPA Secondary MCL	500	O	O
City of Riverside	O	O	EPA Secondary MCL	500	O	O
City of San Bernardino	O	O	EPA Secondary MCL	500	O	O
City of Upland	O	O	EPA Secondary MCL	500	O	O
Cucamonga Valley Water District	O	O	EPA Secondary MCL	500	O	O
East Valley Water District	O	O	EPA Secondary MCL	500	O	O
Elsinore Valley Municipal Water District	2010	514	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge
Fontana Water Company	O	O	EPA Secondary MCL	500	O	O
Golden State Water Company	O	O	EPA Secondary MCL	500	O	O
Home Gardens	-	-	EPA Secondary MCL	500	-	-
Jurupa Community Service District	O	O	EPA Secondary MCL	500	O	O
Marygold Mutual Water Company	O	O	EPA Secondary MCL	500	O	O
Meeks and Daley Water Company	-	-	EPA Secondary MCL	500	-	-
Monte Vista Water Company	O	O	EPA Secondary MCL	500	O	O
Muscoy Mutual Water Company	O	O	EPA Secondary MCL	500	O	O
Riverside Highland Water Company	O	O	EPA Secondary MCL	500	O	O
Rubidoux Community Service District	-	-	EPA Secondary MCL	500	-	-
San Antonio Water Company	O	O	EPA Secondary MCL	500	O	O
Santa Ana River Water Company	-	-	EPA Secondary MCL	500	-	-
South Mesa Water District	O	O	EPA Secondary MCL	500	O	O
Terrace Water Company	-	-	EPA Secondary MCL	500	-	-
West Valley Water District	O	O	EPA Secondary MCL	500	O	O
Yucaipa Valley Water District	O	O	EPA Secondary MCL	500	O	O
Orange County Water District						
Anaheim	2007	511	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge
Buena Park	OC	OC	EPA Secondary MCL	500	OC	OC
East Orange County Water District	OC	OC	EPA Secondary MCL	500	OC	OC
Fountain Valley	OC	OC	EPA Secondary MCL	500	OC	OC
Fullerton	2007	504	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge
Garden Grove	OC	OC	EPA Secondary MCL	500	OC	OC
Golden State Water Company	OC	OC	EPA Secondary MCL	500	OC	OC
Huntington Beach	OC	OC	EPA Secondary MCL	500	OC	OC
Irvine Ranch Water District	OC	OC	EPA Secondary MCL	500	OC	OC
La Palma	OC	OC	EPA Secondary MCL	500	OC	OC
Mesa Consolidated Water District	OC	OC	EPA Secondary MCL	500	OC	OC
Newport Beach	OC	OC	EPA Secondary MCL	500	OC	OC
Orange	OC	OC	EPA Secondary MCL	500	OC	OC
Orange Park Acres Mutual Water Co	2007	598	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge
Santa Ana	OC	OC	EPA Secondary MCL	500	OC	OC
Seal Beach	OC	OC	EPA Secondary MCL	500	OC	OC
Serrano Water District	2007	630	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge
Tustin	2007	549	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge
Westminster	OC	OC	EPA Secondary MCL	500	OC	OC
Yorba Linda Water District	2007	525	EPA Secondary MCL	500	Maybe	Desalt, Import Water, Stormwater Recharge

- No WSDP developed for this water supply agency.
O Criterion not exceeded in the modeled period.
E Obtain data from EMWD
OC Obtain data from OCWD - note agencies with values greater than 500 mg/L are for 2006/07.

5.2.3 Projected POTW Effluent TDS Concentrations Exceed the Discharge Limits

Table 5-3 provides the future salinity management requirements for POTWs, based on projected effluent water quality. The table lists, by POTW, the discharge limit and summarizes the ISFM-predicted TDS concentration (every 10 years: 2010, 2020…2060). When the ISFM-predicted TDS exceeds the existing discharge limit, it is assumed that some action would be triggered. In these cases, either a portion of the water supply or a portion of the POTW effluent can be desalted to achieve the discharge limit. The amount of desalting required increases over time, principally driven by increases in the TDS of the water supply.

The assumption made in this analysis is that desalting a portion of the POTW effluent is the more likely scenario. Desalting POTW effluent requires a much smaller volume of raw water and, therefore, produces a smaller volume of brine than treating the potable supply. However, any agency has the flexibility to approach this in different ways as described in Section 6.

Figures 5-8 through 5-18 show the historical monthly flow-weighted TDS of the water supply to POTWs along with the historical monthly TDS of POTW effluent for 2006-2008. These data were used to compute and average TDS waste increments for each POTW. These figures also show daily POTW discharge for 2006-2008.

In addition, Figures 5-8 through 5-18 show the TDS projections along with the regulatory requirements. Moreover, each figure shows three projections of TDS for 2010-2059: (i) projected TDS concentrations for the management zone, (ii) projected TDS concentrations in the potable water supply, and (iii) projected TDS concentrations in POTW effluent. The latter is determined by adding the TDS waste increment for the POTW to the projected TDS in the potable supply. The projected TDS concentrations are compared with the TDS objective for the management zone and the POTW effluent discharge limit for TDS. In Figure 5-8, for example, the projected TDS in the Beaumont management zone exceeds the water quality objective of 330 mg/L in 2028, and the projected TDS of the POTW effluent increases above the discharge limit of 490 mg/L for the Beaumont WWTP in 2033.

Table 5-3
Salinity Management Requirements
for POTW Water Quality

POTW	POTW Discharge Limit	Year	ISFM Predicted Discharge TDS	Triggers Action?	Alternate Action	Influent to the WWTP	Influent to the WWTP	Conc. of Salt in Influent	Mass of Salt in Influent	Volume of Influent to be Desalted	Volume of Influent to be Bypassed	Volume of Effluent	Conc. of Salt in Effluent	Mass of Salt in Effluent	Volume of Brine	Volume of Brine	Conc. of Salt in Brine	Mass of Salt in Brine	Percent Influent Desalted
	mg/L		*mg/L*			*mgd*	*AFY*	*mg/L*	*tons/yr*	*AFY*	*AFY*	*AFY*	*mg/L*	*tons/yr*	*AFY*	*mgd*	*mg/L*	*tons/yr*	*%*
Beaumont WWTP	490	2010	416	No	No Action Required	4.3	4,788	416	2,705	0	4,788	4,788	416	2,705	0	0.00	0	0	0%
	490	2020	440	No	No Action Required	5.9	6,642	440	3,974	0	6,642	6,642	440	3,974	0	0.00	0	0	0%
	490	2030	480	No	No Action Required	6.8	7,565	480	4,939	0	7,565	7,565	480	4,939	0	0.00	0	0	0%
	490	2040	523	Yes	Desalt Effluent	6.8	7,565	523	5,382	570	6,995	7,480	490	4,983	86	0.08	3,432	399	8%
	490	2050	562	Yes	Desalt Effluent	6.8	7,565	562	5,777	1,130	6,435	7,396	490	4,927	170	0.15	3,688	850	15%
	490	2060	593	Yes	Desalt Effluent	6.8	7,565	593	6,097	1,522	6,043	7,337	490	4,888	228	0.20	3,895	1,209	20%
Colton WWTP	550	2010	511	No	Discharges to RIX.														
	550	2020	520	No															
	550	2030	536	No															
	550	2040	549	No															
	550	2050	560	No *															
	550	2060	569	No *															
Corona WWTP	700	2010	711	Yes	Desalt Effluent	3.6	4,032	711	3,898	74	3,958	4,021	700	3,827	11	0.01	4,683	71	2%
	700	2020	746	Yes	Desalt Effluent	1.5	1,680	746	1,704	122	1,558	1,662	700	1,582	18	0.02	4,917	123	7%
	700	2030	751	Yes	Desalt Effluent	1.5	1,680	751	1,715	134	1,546	1,660	700	1,580	20	0.02	4,949	135	8%
	700	2040	755	Yes	Desalt Effluent	1.5	1,680	755	1,724	143	1,537	1,658	700	1,579	22	0.02	4,975	145	9%
	700	2050	758	Yes	Desalt Effluent	1.5	1,680	758	1,731	151	1,529	1,657	700	1,577	23	0.02	4,996	154	9%
	700	2060	761	Yes	Desalt Effluent	1.5	1,680	761	1,738	158	1,522	1,656	700	1,576	24	0.02	5,016	162	9%
EVMWD WWTP	700	2010	746	Yes	Desalt Effluent	19.6	21,960	746	22,273	1,596	20,364	21,721	700	20,673	239	0.21	4,916	1,600	7%
	700	2020	748	Yes	Desalt Effluent	26.1	29,280	748	29,772	2,207	27,073	28,949	700	27,553	331	0.30	4,929	2,219	8%
	700	2030	750	Yes	Desalt Effluent	26.1	29,280	750	29,859	2,300	26,980	28,935	700	27,540	345	0.31	4,943	2,319	8%
	700	2040	752	Yes	Desalt Effluent	26.1	29,280	752	29,943	2,390	26,890	28,922	700	27,527	358	0.32	4,958	2,416	8%
	700	2050	754	Yes	Desalt Effluent	26.1	29,280	754	30,026	2,477	26,803	28,908	700	27,514	372	0.33	4,971	2,511	8%
	700	2060	756	Yes	Desalt Effluent	26.1	29,280	756	30,097	2,552	26,728	28,897	700	27,504	383	0.34	4,983	2,594	9%
IEUA WWTPs	540	2010	511	No	No Action Required	74.7	83,665	511	58,162	0	83,665	83,665	511	58,162	0	0.00	0	0	0%
	540	2020	534	No	No Action Required	81.9	91,711	534	66,596	0	91,711	91,711	534	66,596	0	0.00	0	0	0%
	540	2030	563	Yes	Desalt Effluent	90.4	101,226	563	77,486	4,913	96,313	100,489	540	73,782	737	0.66	3,697	3,704	5%
	540	2040	591	Yes	Desalt Effluent	90.4	101,226	591	81,294	10,230	90,996	99,691	540	73,196	1535	1.37	3,881	8,098	10%
	540	2050	617	Yes	Desalt Effluent	90.4	101,226	617	84,864	14,709	86,517	99,020	540	72,703	2206	1.97	4,054	12,161	15%
	540	2060	636	Yes	Desalt Effluent	90.4	101,226	636	87,549	17,796	83,430	98,557	540	72,363	2669	2.38	4,184	15,186	18%
Redlands WWTP	Discharge to Ponds																		
Rialto WWTP	490	2010	510	Yes	Desalt Effluent	14.0	15,716	510	10,896	731	14,985	15,606	490	10,398	110	0.10	3,343	498	5%
	490	2020	528	Yes	Desalt Effluent	17.5	19,556	528	14,034	1,658	17,898	19,307	490	12,863	249	0.22	3,462	1,171	8%
	490	2030	550	Yes	Desalt Effluent	23.7	26,516	550	19,817	3,383	23,133	26,009	490	17,328	507	0.45	3,608	2,489	13%
	490	2040	561	Yes	Desalt Effluent	23.7	26,516	561	20,216	3,918	22,598	25,928	490	17,275	588	0.52	3,682	2,942	15%
	490	2050	571	Yes	Desalt Effluent	23.7	26,516	571	20,597	4,405	22,111	25,855	490	17,226	661	0.59	3,752	3,371	17%
	490	2060	580	Yes	Desalt Effluent	23.7	26,516	580	20,915	4,797	21,719	25,796	490	17,187	720	0.64	3,811	3,729	18%
Riverside WWTP	650	2010	650	No	No Action Required	45.7	51,220	650	45,253	0	51,220	51,220	650	45,253	0	0.00	0	0	0%
	650	2020	667	Yes	Desalt Effluent	51.8	58,035	667	52,656	1,789	56,246	57,766	650	51,054	268	0.24	4,392	1,603	3%
	650	2030	683	Yes	Desalt Effluent	54.9	61,473	683	57,116	3,550	57,924	60,941	650	53,859	532	0.48	4,499	3,257	6%
	650	2040	699	Yes	Desalt Effluent	54.9	61,473	699	58,397	5,047	56,426	60,716	650	53,660	757	0.68	4,601	4,736	8%
	650	2050	711	Yes	Desalt Effluent	54.9	61,473	711	59,447	6,218	55,255	60,540	650	53,505	933	0.83	4,685	5,941	10%
	650	2060	720	Yes	Desalt Effluent	54.9	61,473	720	60,193	7,022	54,452	60,420	650	53,399	1053	0.94	4,744	6,794	11%
RIX	550	2010	495	No	No Action Required	39.1	43,738	495	29,420	0	43,738	43,738	495	29,420	0	0.00	0	0	0%
	550	2020	504	No	No Action Required	47.3	52,973	504	36,301	0	52,973	52,973	504	36,301	0	0.00	0	0	0%
	550	2030	519	No	No Action Required	50.9	57,050	519	40,267	0	57,050	57,050	519	40,267	0	0.00	0	0	0%
	550	2040	530	No	No Action Required	51.0	57,090	530	41,105	0	57,090	57,090	530	41,105	0	0.00	0	0	0%
	550	2050	538	No	No Action Required	51.0	57,090	538	41,725	0	57,090	57,090	538	41,725	0	0.00	0	0	0%
	550	2060	543	No	No Action Required	51.0	57,090	543	42,144	0	57,090	57,090	543	42,144	0	0.00	0	0	0%
San Bernardino WRP	550	2010	511	No	Discharges to RIX.														
	550	2020	520	No															
	550	2030	535	No															
	550	2040	545	No															
	550	2050	552	No *															
	550	2060	557	No *															
WRCRWTP	625	2010	598	No	No Action Required	5.3	5,933	598	4,824	0	5,933	5,933	598	4,824	0	0.00	0	0	0%
	625	2020	618	No	No Action Required	5.9	6,618	618	5,561	0	6,618	6,618	618	5,561	0	0.00	0	0	0%
	625	2030	638	Yes	Desalt Effluent	6.1	6,803	638	5,901	165	6,638	6,778	625	5,760	25	0.02	4,197	141	2%
	625	2040	658	Yes	Desalt Effluent	6.1	6,803	658	6,086	404	6,399	6,742	625	5,730	61	0.05	4,330	357	6%
	625	2050	678	Yes	Desalt Effluent	6.1	6,803	678	6,271	626	6,177	6,709	625	5,701	94	0.08	4,463	570	9%
	625	2060	696	Yes	Desalt Effluent	6.1	6,803	696	6,438	813	5,989	6,681	625	5,677	122	0.11	4,583	760	12%
Yucaipa WWTP	540	2010	489	No	No Action Required	6.5	7,256	489	4,828	0	7,256	7,256	489	4,828	0	0.00	0	0	0%
	540	2020	507	No	No Action Required	8.2	9,184	507	6,332	0	9,184	9,184	507	6,332	0	0.00	0	0	0%
	540	2030	522	No	No Action Required	9.6	10,720	522	7,613	0	10,720	10,720	522	7,613	0	0.00	0	0	0%
	540	2040	547	Yes	Desalt Effluent	9.6	10,720	547	7,971	161	10,559	10,696	540	7,853	24	0.02	3,589	118	2%
	540	2050	567	Yes	Desalt Effluent	9.6	10,720	567	8,263	604	10,116	10,629	540	7,804	91	0.08	3,723	459	6%
	540	2060	582	Yes	Desalt Effluent	9.6	10,720	582	8,482	913	9,807	10,583	540	7,770	137	0.12	3,823	712	9%
														Totals	**2010**	**0.32**	**4,430**	**2,169**	
															2020	**0.77**	**4,341**	**5,115**	
															2030	**1.93**	**4,089**	**12,046**	
															2040	**3.06**	**4,120**	**19,211**	
															2050	**4.06**	**4,207**	**26,018**	
															2060	**4.76**	**4,293**	**31,146**	

Notes:
The shaded cells contain the input information. Non shaded cells are calculated.
An 85% RO membrane efficiency was used.
A 10mg/L permeate quality was used.
In the case of the City of San Bernardino and the City of Colton - Desalting is not triggered in the out years because the over production that occurs at RIX, slightly improves the water quality of the incoming influent.

Figure 5-8

TDS Projections - City of Beaumont Wastewater Treatment Plant

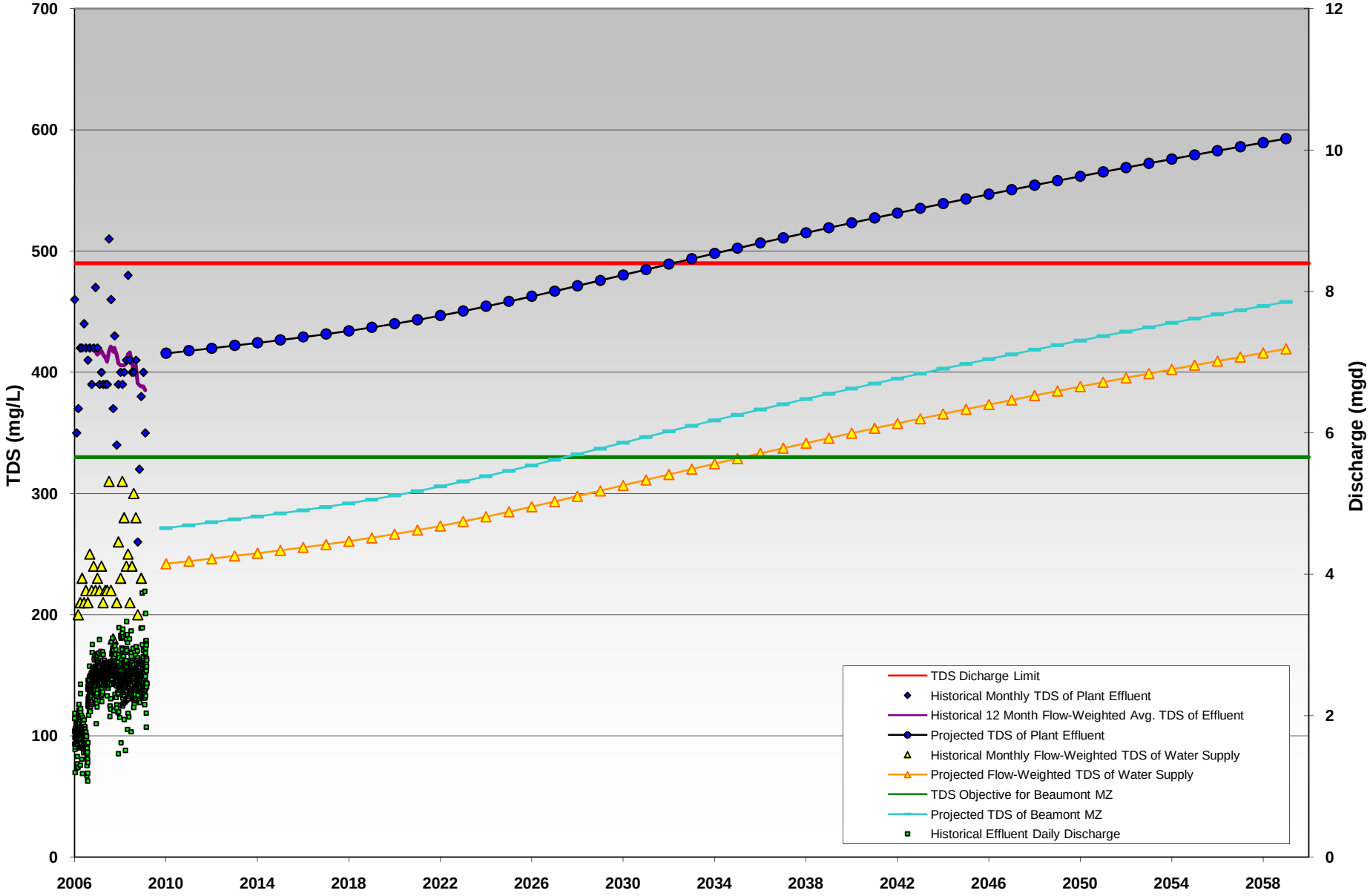


Figure 5-9

TDS Projections - City of Colton Water Reclamation Facility

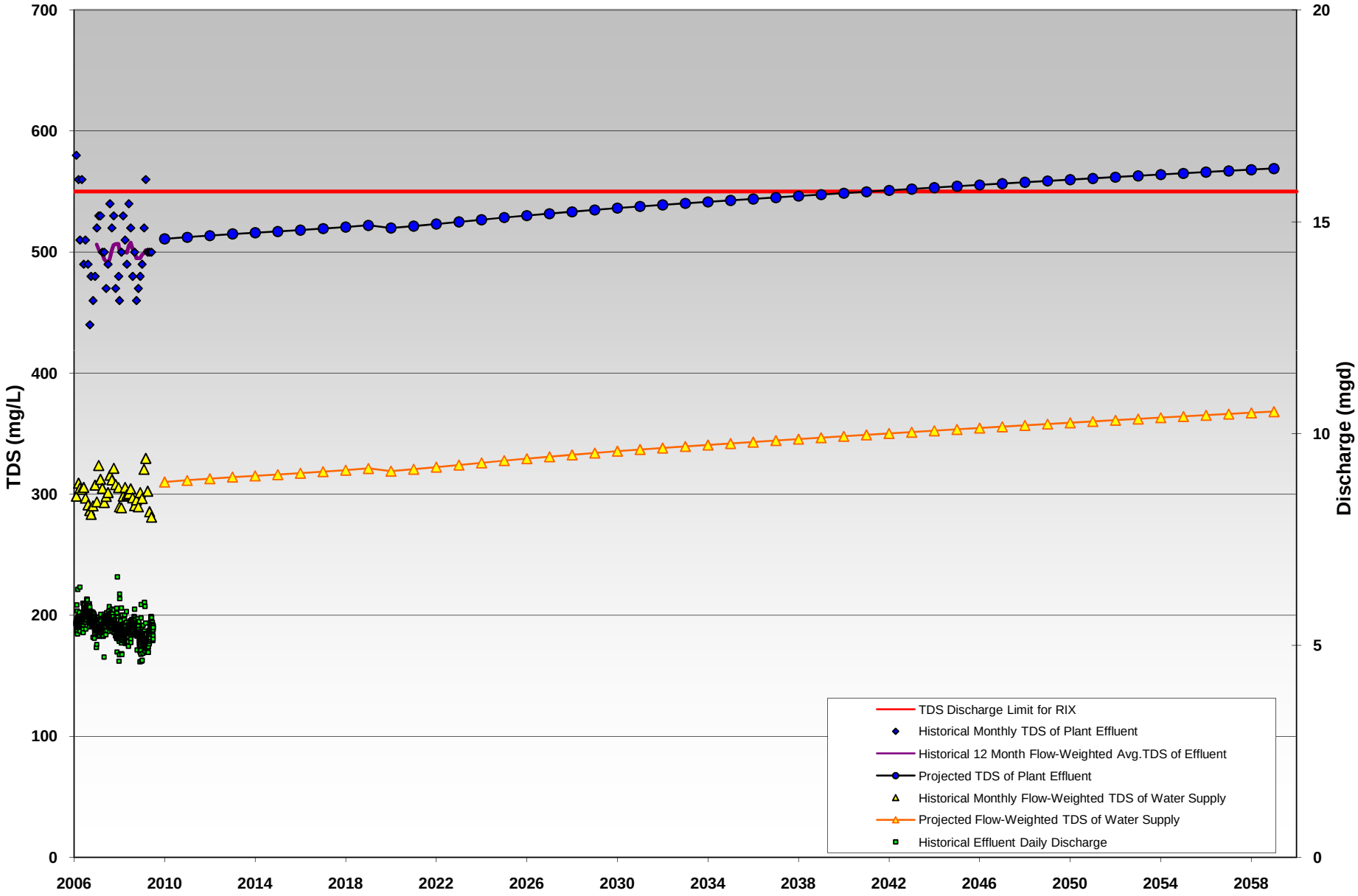


Figure 5-10

TDS Projections - City of Corona Wastewater Treatment Plant 1B

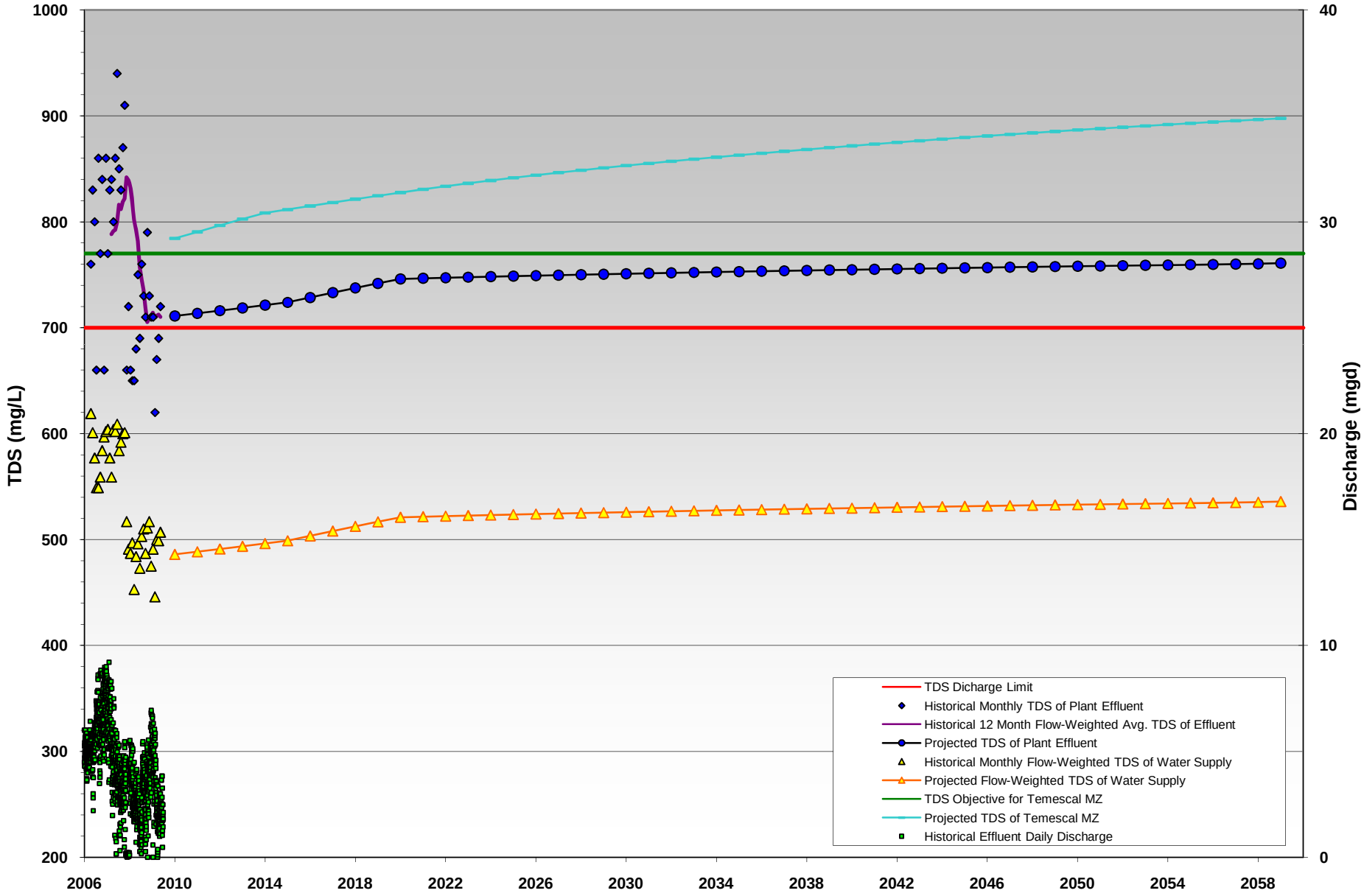


Figure 5-11

TDS Projections - City of Corona Wastewater Treatment Plant 3

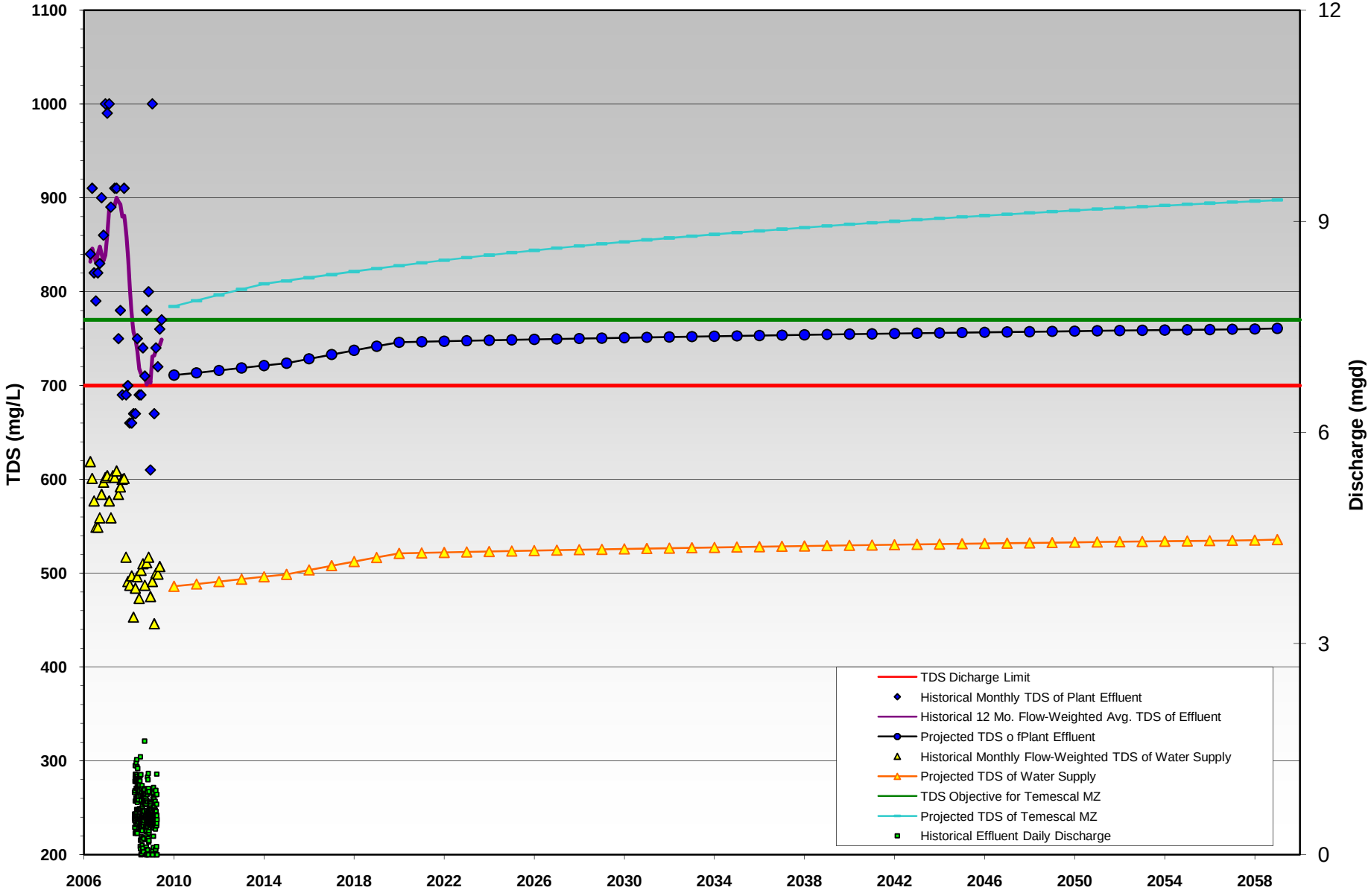


Figure 5-12

TDS Projections - Elsinore Valley Municipal Water District Regional Water Reclamation Facility

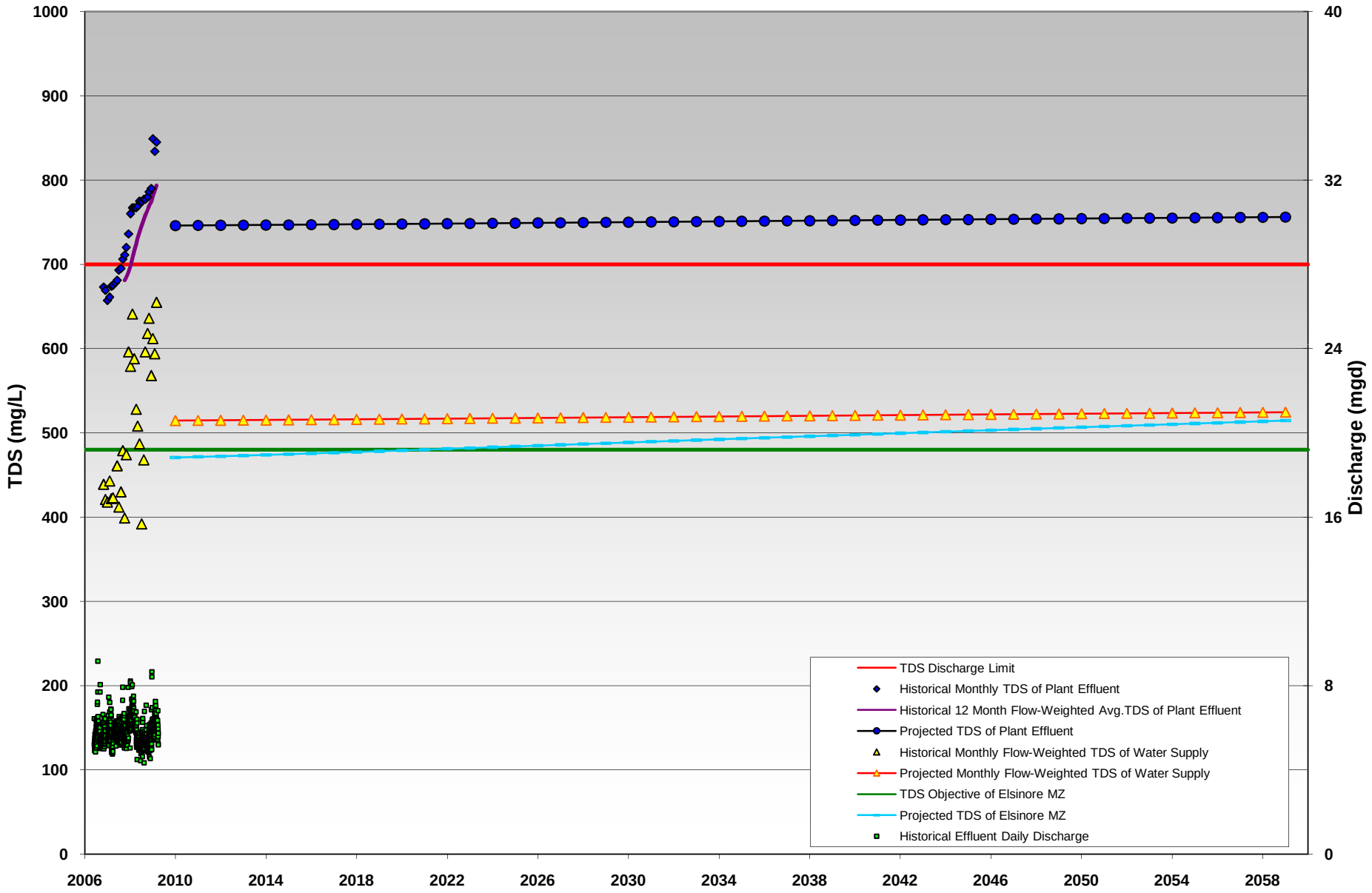


Figure 5-13

TDS Projections - IEUA Water Reclamation Facilities

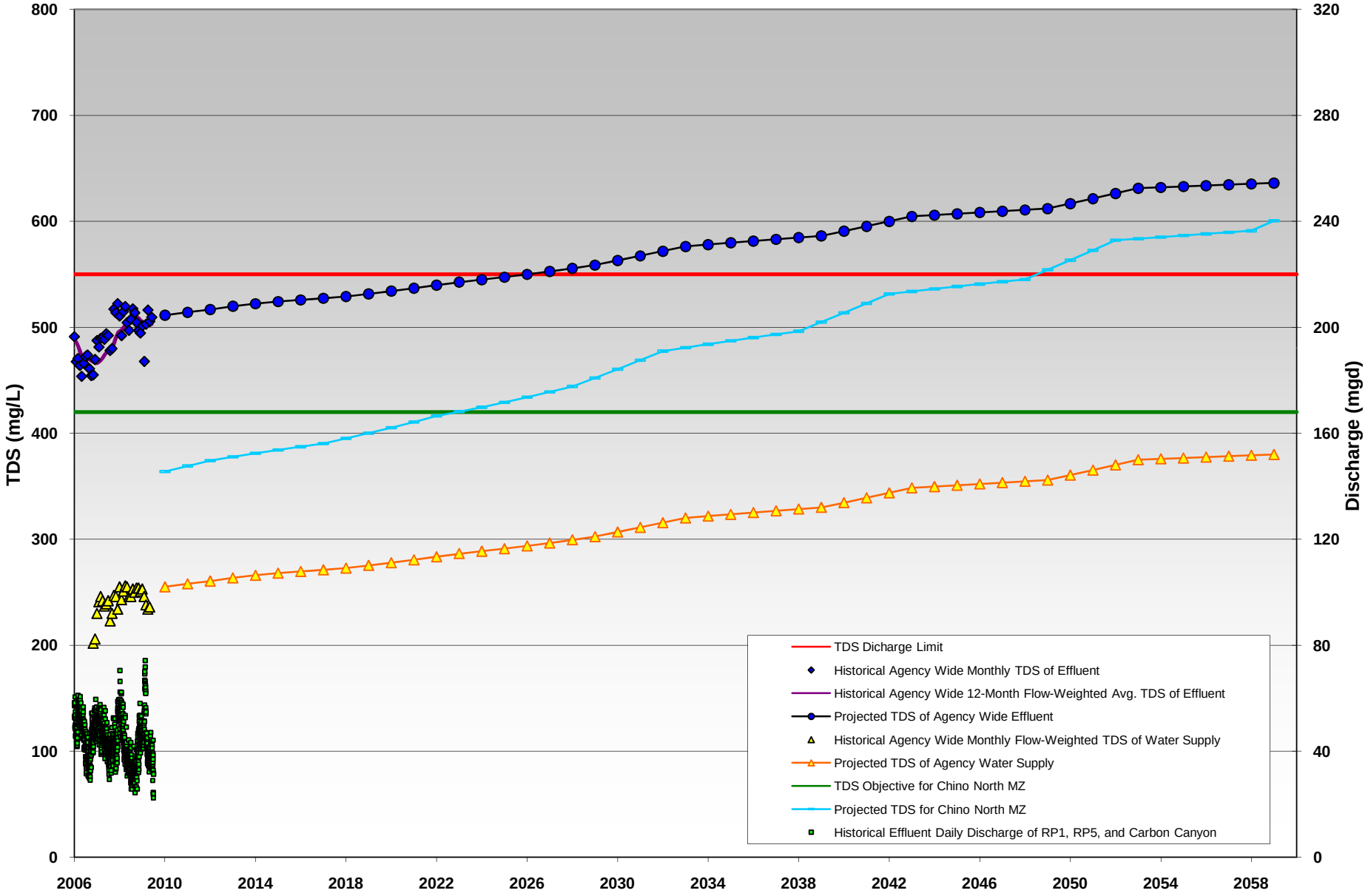


Figure 5-14

TDS Projections - City of Rialto Municipal Wastewater Treatment Plant

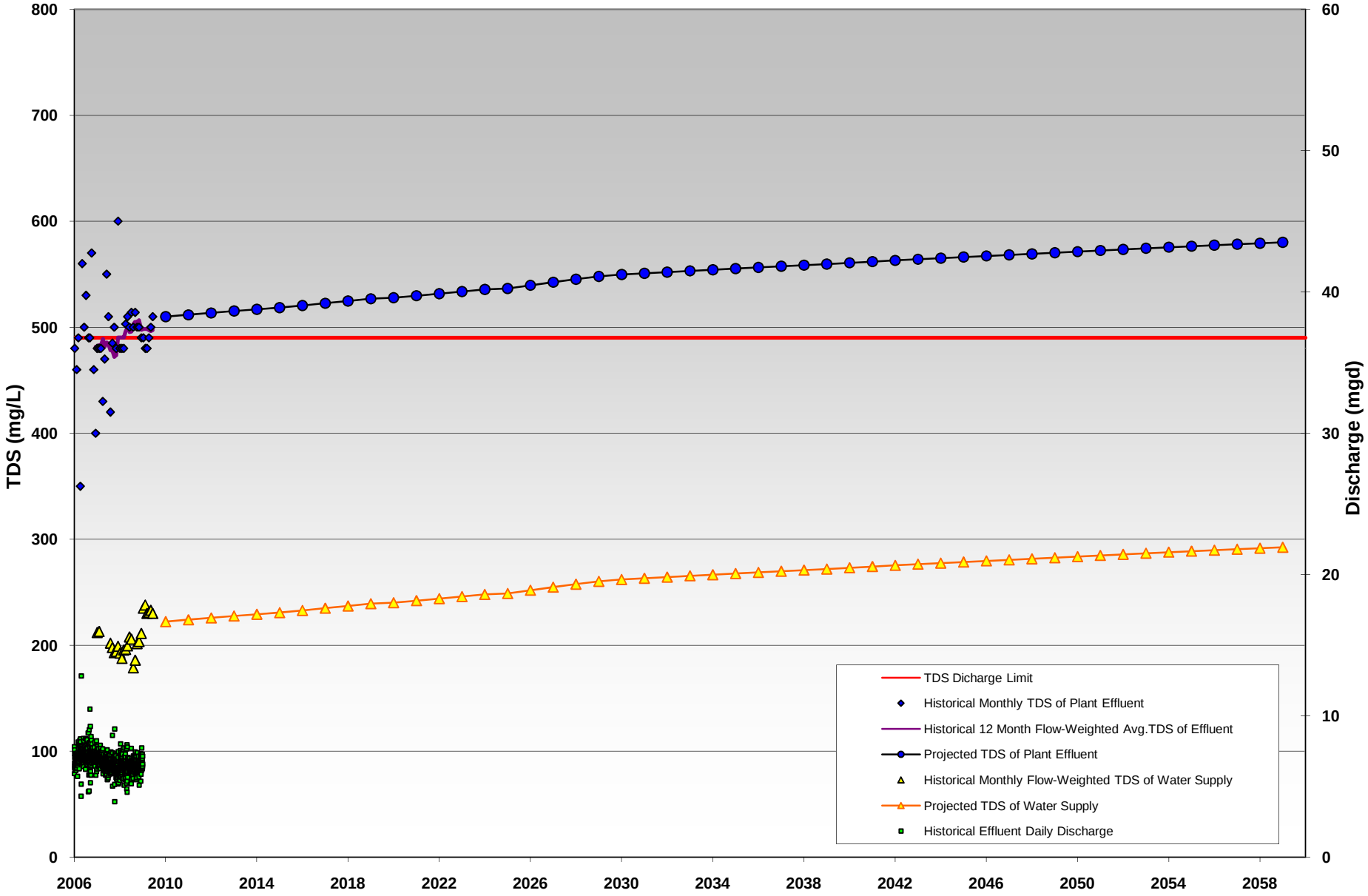


Figure 5-15

TDS Projections - City of Riverside Regional Water Quality Control Plant

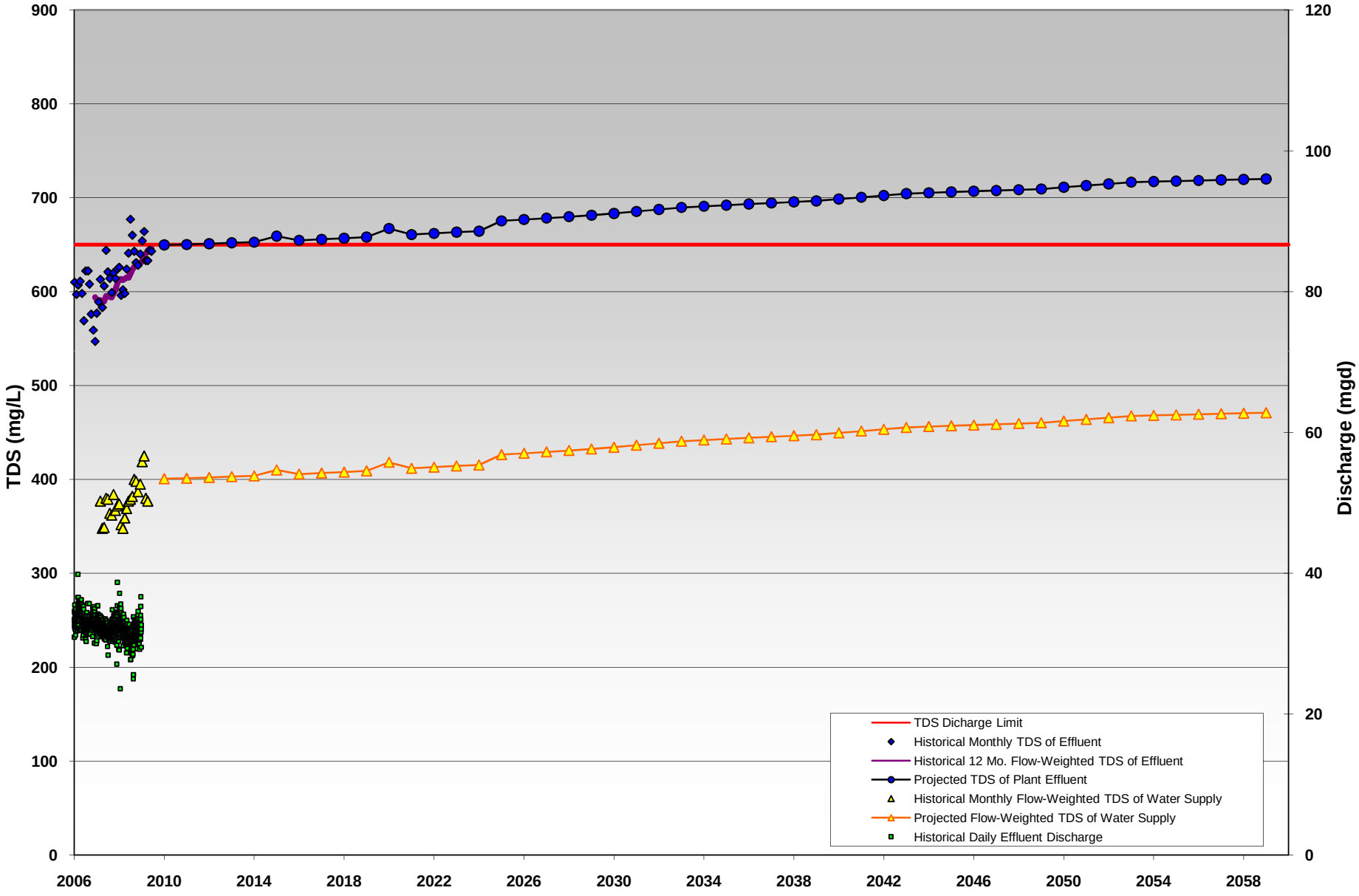


Figure 5-16

TDS Projections - Colton/San Bernardino Regional Tertiary Treatment RIX Facility

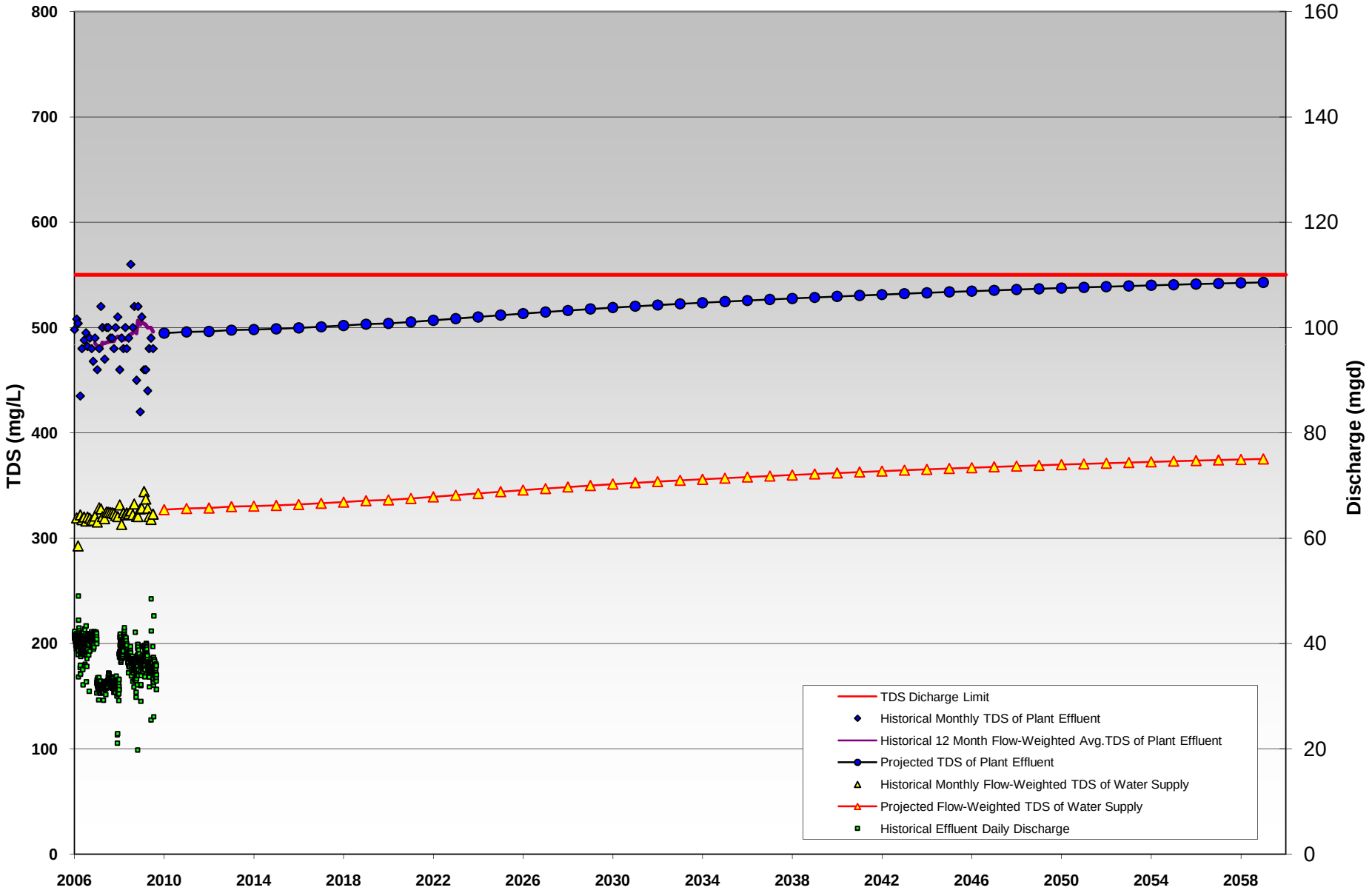


Figure 5-17

TDS Projections - City of San Bernardino Water Reclamation Facility

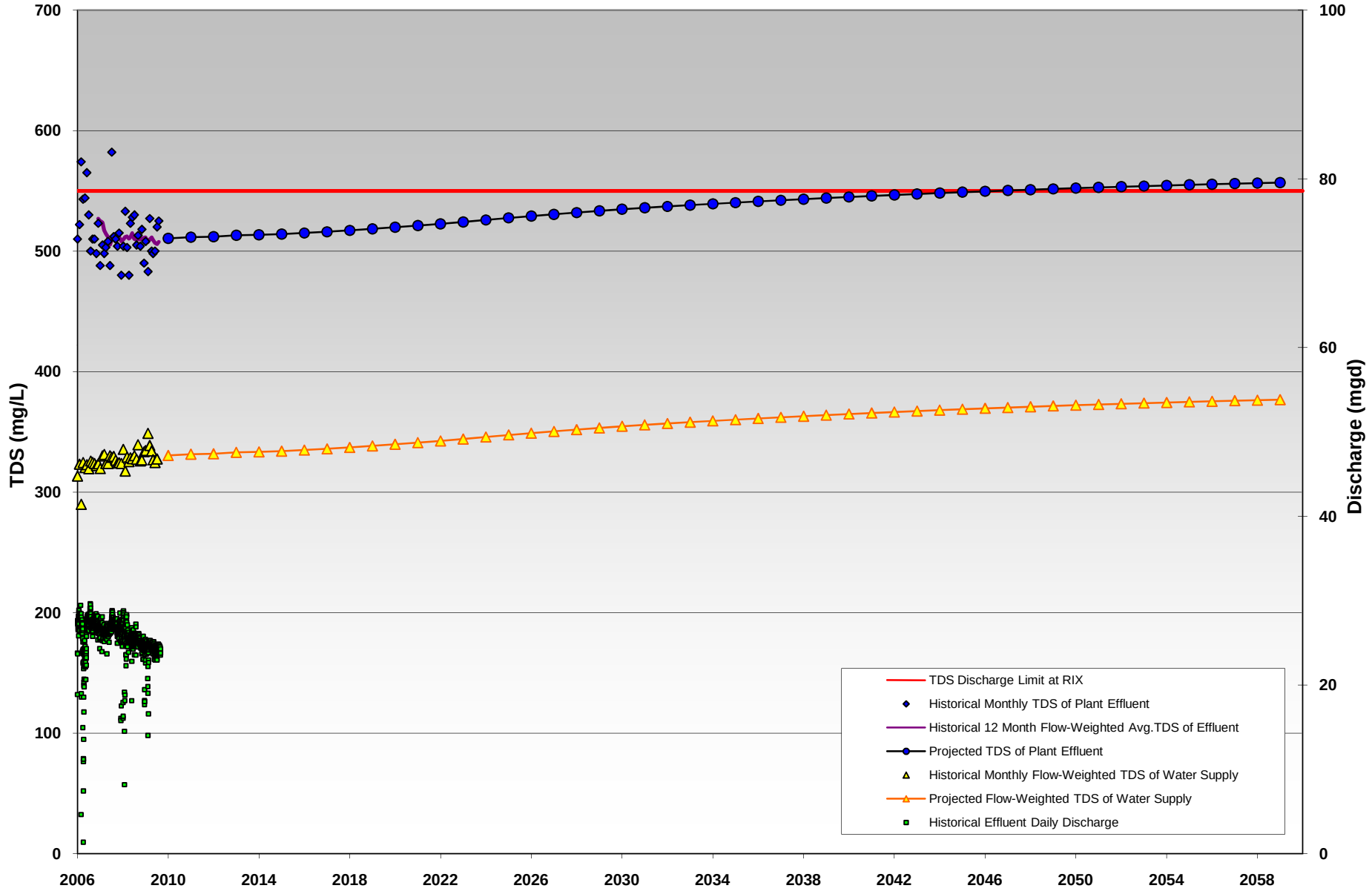
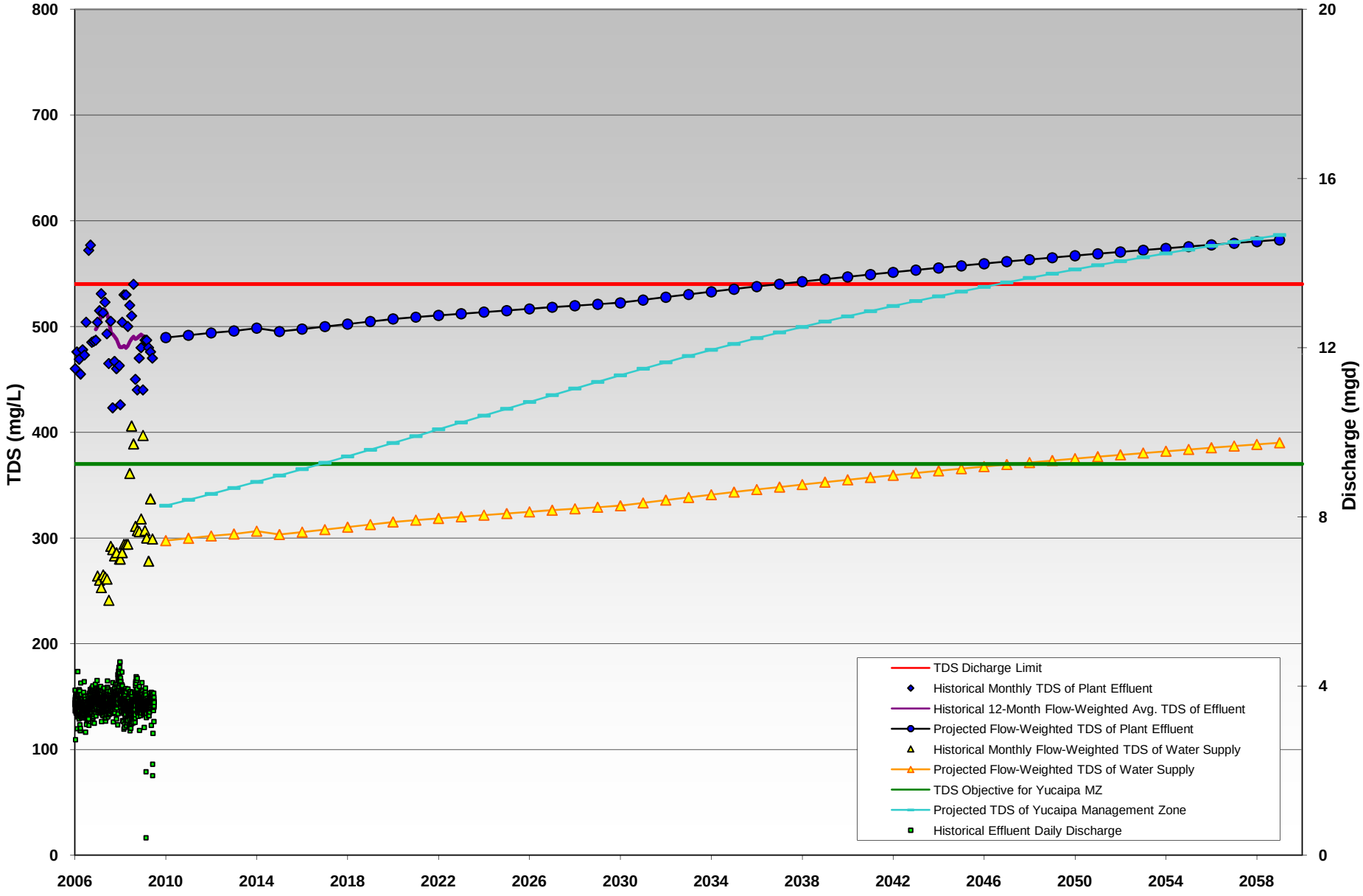


Figure 5-18

TDS Projections - Yucaipa Valley Water District Regional Water Recycling Facility



5.2.4 Assumptions and Context

The long-term projections of salt budget and salt removal needs are based on several assumptions:

- The ISFM is based on CSRMs that disperse constituents throughout the management zones in annual time steps. This approach provides a first-order approximation of the time scale of TDS impacts to management zones, water supply agencies, and POTWs. The ISFM shows that salt accumulation is a real concern across the watershed and provides an estimate of when trigger points will be reached; however, the time-scale should be considered an approximation.

- The WSDPs that were reviewed often contained assumptions that are not sustainable long term. For example, the implementation of one of the WSDPs would result in the long-term mining of the management zone.

- Information provided by a given agency may not always be consistent. For example, projected decreases in POTW discharge volumes provided to SAWPA for the Waste Load Allocation update were not consistent with recycled water direct reuse and recharge values that did not change over time in the WSPD.

- Based on the WSDPs, it was assumed that SWP would be available. The CDM Team performed a sensitivity analysis to show the effect on the watershed salt budget should the water quality of the SWP and CRA sources degrade or improve, but reliability, from a supply standpoint, was not modeled. We have included a new table that provides an estimate of the volumes of brine produced if the TDS concentration in SWP and CRA were decreased and increased by 50 mg/L. The quantities of imported water delivered to a management zone were based on amounts defined in the modeling reports and were not modified to account for possible further regulatory cutbacks to SWP deliveries or from climate change impacts which may have the potential to further degrade groundwater quality in the evaluated management zones. Table 5-4 presents the estimated brine volumes resulting from a decrease in TDS concentrations in both SWP and CRA sources of 50 mg/L and an increase in TDS concentrations in both SWP and CRA sources of 50 mg/L.

Table 5-4
Summary of Sensitivity Analysis:
Effects of TDS Concentration Changes of SWP and CRA on Total Volume of Brine Produced

Year	SWP = 200 CRA = 625	SWP = 250 CRA = 675	SWP = 300 CRA = 725
	Volume of Brine Produced (mgd)		
2010	0.1	0.32	0.56
2020	0.44	0.77	1.45
2030	0.9	1.95	2.96
2040	1.86	3.1	4.29
2050	2.77	4.11	5.37
2060	3.43	4.83	6.21

Section 6
Future Scenarios to Maximize SARI as a Salt Management Tool

6.1 Introduction

The existing conditions relative to the SARI system and current salt removal projects were described in Section 2. Sections 3-5 developed future projections of salinity in the watershed including the impact of these current projects, identified potential future needs that must be addressed through some form or further salt remediation or reduction, and made estimates of potential additional salt and brine loads that might be generated through implementation of either water supply or wastewater desalting approaches. This section reviews future project that are already in some form of conceptual or detailed planning and relates these to the salt needs identified in Section 5, identifies other potential approaches to address any remaining "gap" that the analysis suggests, and then uses all of this information to forecast the role that the SARI system and/or other options for salt removal or reduction will need to serve in the future. This general approach is illustrated in Figure 6-1.

6.2 Planned Projects

The following is a summary of planned projects that were identified in the process of developing this Technical Memorandum through the research and contacts identified in Section 2. For the purposes of this study, planned projects are those that have been identified sufficiently to generally characterize the project and quantify potential salt impacts and brine flow and mass through studies, discussions, or detailed planning at the Member Agency or local agency level. Note that the flows and concentrations reported are estimates based on are number of assumptions for any planned projects with some more fully defined than others depending upon the current stage of planning.

Similar to the existing projects, the proposed projects are grouped by the following categories.

- Desalters
- Wastewater recycling projects
- Nitrite Removal/Ion Exchange projects

To the extent that information is available, the future potential for additional loads or changes related to other sources of discharge to the system such as domestic connections, industrial connections and waste haulers are also discussed.

In addition, proposed conservation/water use efficiency plans for agencies are discussed, as well as proposed brine minimization projects.

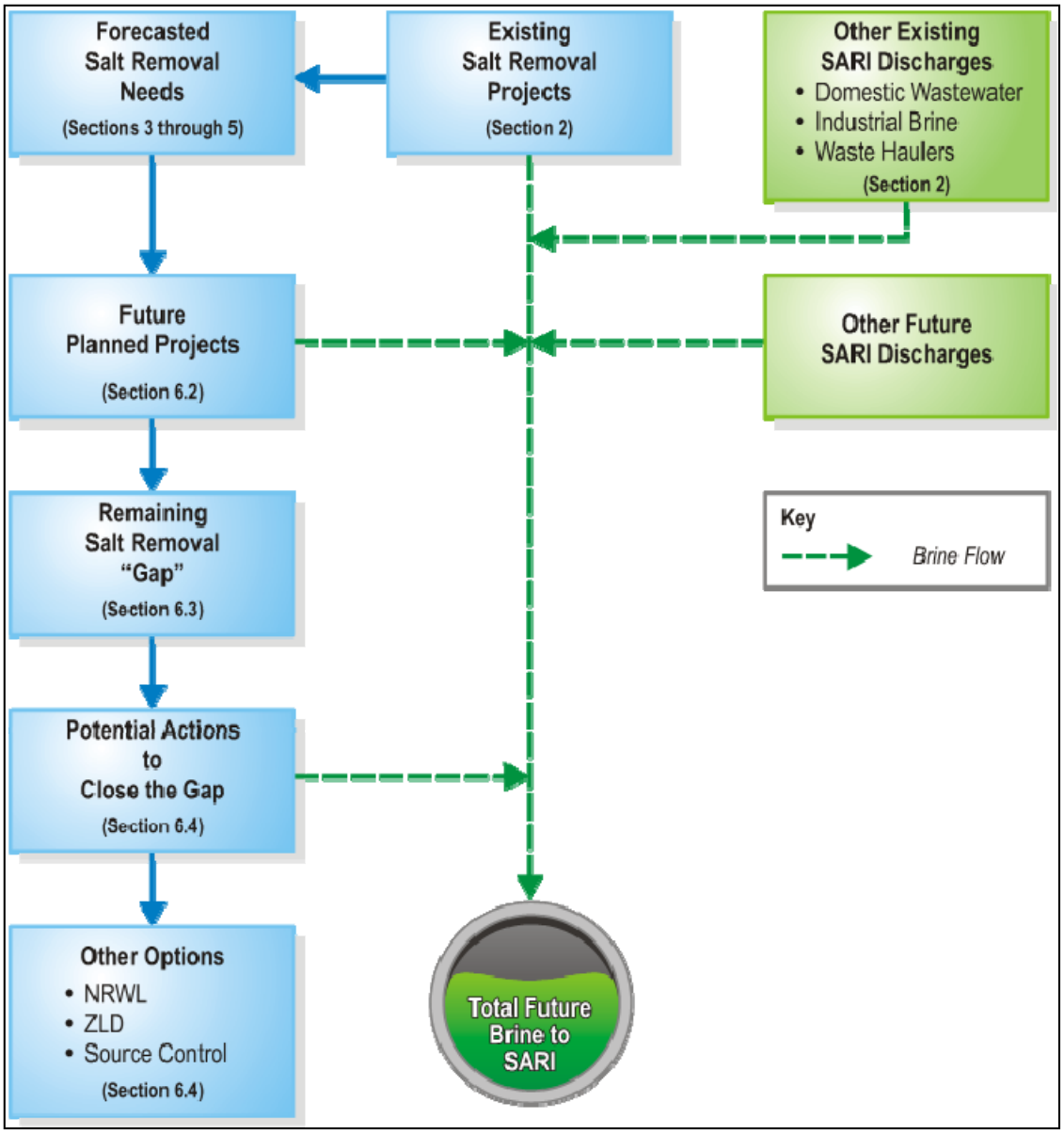


Figure 6-1
Salt Management-Removal Overview

6.2.1 Desalters

The following is a description of potential desalters that will discharge to the SARI line. Table 6-1 summarizes the information presented below on potential desalters.

Table 6-1
Planned Projects

SAWPA Member Agency	Project	Expected Implementation	Type	Responsible Entity	Description	Product Water Added Capacity (AFY)	Projected Brine Flow Rate (mgd)	Projected Brine TDS (mg/L)	Projected Brine TDS (lbs/d)
WMWD	Arlington Desalter Expansion	by 2015	groundwater	WMWD	Expand to 10 MGD	3,700	1.32	3,900	43,000
EMWD	Perris II Desalter	by 2015	groundwater	EMWD	New desalter	5,600	1.00	6,000	50,000
WMWD	Rincon Groundwater Treatment Project	by 2025	groundwater	City of Corona	New desalter	5,600	1.00	3,500	29,000
WMWD	Riverside South Desalter	by 2025	groundwater	City of Riverside	New desalter	5,600	1.00	3,500	29,000
WMWD	Lake Mathews WTP	by 2025	surface water	WMWD	New plant to treat purchased imported water	11,202 to 44,808	2.00	3,500	58,000

Arlington Desalter Expansion

Led by WMWD, the Arlington Desalter expansion project will increase the treatment capacity of the existing Arlington Desalter to 10 mgd (11,200 AFY)[1]. This expansion is predicted to yield 3.4 mgd (3,800 AFY) additional product water. The total projected brine flows will be 2.70 mgd for the year 2015[2], which is a 1.4 mgd increase over the current flow of 1.3 mgd. At a brine TDS concentration of 3,900 mg/L, the brine will increase salt removal by 43,000 lb/d.

Perris II Desalter

The Perris II Desalter will be a new groundwater desalter built and operated by EMWD in the West San Jacinto Groundwater Basin. This desalter is described as Phase 3 of EMWD groundwater desalination program and is intended to have a product capacity of 5 mgd (5,600 AFY)[3]. The raw water will be supplied by 5 production wells located in the Perris South section of the West San Jacinto Groundwater Basin. The additional projected brine flow is 1 mgd (1,120 AFY)[4]. The expected brine TDS concentration is 6,000 mg/L, for a total salt removal of 50,000 lb/d. The Perris II Desalter is currently in design, with a SARI line extension being built to accommodate new flows.[5]

Rincon Groundwater Treatment Project

Sponsored by the City of Corona, the Rincon Groundwater Treatment Project is scheduled for the fiscal year 2015-2016[6]. The project will be composed of three wells, a raw water pipeline, a treatment facility, a product pipeline, property acquisition, and a brine disposal to the SARI line[7]. This project is predicted to produce 5 mgd (5,600

[1] WMWD Water Resources Systems Simulation Model Report, July 2008 (Table 1-7)
[2] Survey Report U.S. Department of the Interior Bureau of Reclamation, September 2009 (Table 3.3)
[3] EMWD Moving Forward with Desalination, September 2007 (Slide 22)
[4] WMWD Water Resources Systems Simulation Model Report, July 2008 (Table 1-7)
[5] EMWD Brine Management System, Basis of Design Report, March 2009
[6] WMWD Final Integrated Regional Water Management Plan, May 2008 (Table 6-2)
[7] Survey Report U.S. Department of the Interior Bureau of Reclamation, September 2009 (Table 3.3)

AFY)[8] of additional water supply. At an assumed recovery of 80 percent, with an assumed brine concentration of 3,500 mg/L, this will result in a brine flow of 1 mgd and an increase salt removal of 29,000 lb/d.

Riverside South Desalter
The Riverside South Desalter will be a new groundwater desalter constructed by WMWD in the Riverside South Basin[9], where the TDS concentration is approximately 750 mg/L[10]. This desalter is predicted to yield 5 mgd (5,600 AFY) of water supply, and will serve Western Retail, Norco, Jurupa, and all agencies connected to Mills Gravity line[11]. At an assumed recovery of 80 percent and a brine concentration of 3,500 mg/L, this will yield 1 mgd of brine for 29,000 lb/d of salt removal.

Lake Mathews Water Treatment Plant
The Lake Mathews Water Treatment Plant will be a new RO facility built by WMWD to treat imported surface water purchased from the Metropolitan Water District (MWD)[12]. The plant will be located in at a site owned by WMWD at La Sierra Avenue and El Sobrante Road in Riverside and will have a ultimate capacity of 40 mgd[13]. Depending on availability of imported water, it is predicted to yield between 10 mgd (11,202 AFY) and 40 mgd (44,808 AFY) and will serve Western Retail, Lee Lake, Elsinore, Corona, Riverside, Jurupa, Rubidoux, and Norco[14]. The raw water purchased from MWD is Colorado River Water stored in Lake Mathews, which has a TDS concentration of about 700 mg/L; in addition, the produced finished water is predicted to have a concentration of 325 mg/L[15]. Assuming the lower yield of 10 mgd (11,200 AFY), the anticipated brine flows is 2 mgd (2,240 AFY) at a concentration of 3,500 mg/L for a total salt removal of 58,000 lb/d. Note that this is salt removal from imported water and is not included in the basin salt balances.

6.2.2 Wastewater Reuse/Recycling

Several agencies already have future plans to add desalting using reverse osmosis as part of advanced wastewater treatment (AWT) for municipal wastewater. For all of the proposed projects, the AWT serves two purposes:

- Meet or exceed the DPH requirements for removal of organic contaminants. In all cases, the reclamation projects are anticipated to provide recycled water for supplemental groundwater recharge. It is anticipated that recharge would be accomplished through surface spreading; therefore, full treatment of all wastewater by RO would not be required.

- Recharge water that would be below the basin plan objective for the groundwater in which the recharge would occur in order to meet regional board requirements and maintain or improve groundwater quality.

[8] WMWD Final Integrated Regional Water Management Plan, May 2008 (Table 5-3)
[9] WMWD Water Resources Systems Simulation Model Report, July 2008 (Table 1-7)
[10] GW Basin Reports Eastside Metropolitan Service Area: Riverside Basin September 2007 (Table 13-4)
[11] WMWD Water Resources Systems Simulation Model Report, July 2008 (Table 1-7)
[12] WMWD Water Resources Systems Simulation Model Report, July 2008 (Table 1-7)
[13] WMWD Lake Matthews Water Treatment Plant 2nd DRAFT, Cost Evaluation Report, March 2009 (Page 1-1)
[14] WMWD Water Resources Systems Simulation Model Report, July 2008 (Table 1-7)
[15] WMWD Lake Matthews Water Treatment Plant 2nd DRAFT, Cost Evaluation Report, March 2009 (Table 2.2)

The following is a description of potential recycled water projects that are proposed to discharge to the SARI line for brine disposal. Table 6-2 summarizes the information presented below on potential recycled water projects.

Table 6-2
Planned Recycling Projects

SAWPA Member Agency	Project	Expected Implementation	Type	Responsible Entity	Description	Product Water Added Capacity (AFY)	Projected Brine Flow Rate (mgd)	Projected Brine TDS (mg/L)	Projected Brine TDS (lbs/d)
WMWD	RCWD Ag Demineralization	by 2015	wastewater	RCWD/WMWD	Temecula - out of SAWPA service area	16,000	2.8	3,500	82,000
EMWD	EMWD IPR	by 2015	wastewater	EMWD	Indirect Potable Reuse	15,000	3.0	3,500	88,000
WMWD	Riverside Regional Water Quality Control Plant	by 2025	wastewater	City of Riverside	wastewater treatment for discharge	4,000	0.5	3,500	15,000
WMWD	Riverside Pierce Street Sewer Lift Station	by 2025	wastewater	City of Riverside	recycled water skimming plant	1,120	0.15	3,500	4,000
WMWD	Pellissier Rancho Groundwater Recharge	by 2025	wastewater	City of Riverside	groundwater recharge	10,000	1.80	3,500	53,000
WMWD	Colombia Basin Groundwater Recharge	by 2025	wastewater	City of Riverside	groundwater recharge	3,000	0.50	3,500	15,000
SBVMWD	San Bernadino IPR	by 2025	wastewater	City of San Bernadino	Indirect potable reuse	17,000	2.3	3,500	66,000
SBVMWD	Yucaipa Valley IPR	by 2025	wastewater	Yucaipa	Indirect potable reuse	4,700	0.80	3,500	23,000
SBVMWD	Beaumont WWTP IPR	by 2025	wastewater	Beaumont	Indirect potable reuse	4,500	0.50	8,000	33,000

RCWD Ag Demineralization

The Agricultural Demineralization Project (Ag Demineralization) is a joint project between RCWD and WMWD. This project will be implemented when the Temecula Valley Regional Water Reclamation Facility (TVRWRF) flows are 15.5 mgd (17,360 AFY) or more[16]. The project intends to replace treated imported water as an agricultural supply in Rancho California Water District area with a blend of demineralized recycled water and raw water imported[17]. Under supervision of EMWD, TVRWRF will supply the demineralized recycled water. This project is predicted to add 8.48 mgd (9,500 AFY) to recycled water demand in 2015, with up to 14.3 mgd (16,000 AFY) in ultimate demand[18]. This could ultimately yield 2.8 mgd of brine, which, at an assumed concentration of 3,500 mg/L, will result in 82,000 lb/d of salt removed. It should be noted that for this project, EMWD may not have enough supply for this project as indicated. At the present time, this project is not identified on EMWD's Strategic plan.

EMWD Indirect Potable Reuse

EMWD is in the planning stages for an indirect potable reuse project that would provide advance treatment of municipal wastewater for replenishment of the San Jacinto groundwater basin. The anticipated capacity is 16.7 mgd. However, due to seasonal variations associated with recycled water supply and demand, the amount of water treated by the plant will fluctuate throughout the year. The anticipated water treated product water will be up to 15,000 AFY. At a flow of 16.7 mgd, the project could yield 3 mgd of brine, which at an assumed concentration of 3,500 mg/L will result in 88,000 lb/d of salt removed.

[16] WMWD Lake Matthews Water Treatment Plant 2nd DRAFT, Cost Evaluation Report, March 2009 (Table 2.2)
[17] EMWD Minutes - Board Planning Committee 4-21-08 (Page 1)
[18] EMWD Minutes - Board Planning Committee 4-21-08 (Page 2)

Riverside Regional Water Quality Control Plant
The City of Riverside anticipates constructing a 3.5 mgd (4,000 AFY) desalination facility to treat effluent wastewater. This is based on 10 percent of the current 34 mgd (38,000 AFY) flow to meet the effluent permit limit of 650 mg/L TDS. The concentrate flow is anticipated at 0.5 mgd for the brine line. At an assumed concentration of 3,500 mg/L, this will yield 15,000 lb/d of salt removed.

Riverside Pierce Street Sewer Lift Station
The City of Riverside is in conceptual planning for a recycled water facility at the Pierce Street sewer lift station. The anticipate facility would be a 1 mgd skimming plant, with 0.15 mgd of brine flow.

Pellissier Rancho and Colombia Basin Groundwater Recharge Projects
The City of Riverside is in conceptual planning for two groundwater recharge projects. The Pellissier Ranch groundwater recharge project is anticipated to treat 10,000 AFY of recycled water. The Colombia Basin groundwater recharge project is anticipated to treat 3,000 AFY of recycled water for the Colombia basin, which is a county flood control basin east of Hunter Park.

San Bernardino Indirect Potable Reuse
The City of San Bernardino is in the planning stages for an indirect potable reuse project that would provide water to replenish the Bunker Hill groundwater basin. The anticipated product water design flow is 15 mgd (17,000 AFY). This project would include reverse osmosis treatment that would generate a brine flow of approximately 2.3 mgd for discharge into the SARI system.

Yucaipa Valley Indirect Potable Reuse
The Yucaipa Valley Water District (YVWD) has a current Recycled Water program that utilizes water from the Henry N. Wochholz WWTP, which is owned and operated by the District[19]. By 2010, the treatment facility is planned to be a 6 mgd (6,720 AFY) tertiary treatment facility, with a projected available recycled water supply of about 4.2 mgd (4,700 AFY), all of which will be allocated to more than 10 landscape irrigation users[20]. The District is also in the detailed implementation stages for an indirect potable reuse project that would provide water for groundwater recharge. The estimated capacity of the plant is estimated to be 4,700 AFY with an estimated brine flow of 0.8 mgd.

Beaumont Recycled Water and Indirect Potable Reuse
Based on salt balance projections, the City of Beaumont recognized that there will be a future time when salt removal is needed, either by exceeding the effluent TDS permit or as a result of increasing ambient salt concentrations in the basin. In a joint effort between the City of Beaumont and the Beaumont-Cherry Valley Water District, a planning project is underway to reduce the demand for imported water by 4,500 AFY[21]. The project will include a recycled component, as there is more recycled demand than available recycled water supply in the area due to the three golf courses.

[19] Santa Ana Integrated Watershed Plan Volume 1: Water Resources Component, June 2002 (Page 7-19)
[20] Survey Report U.S. Department of the Interior Bureau of Reclamation, September 2009 (Table 3.3)
[21] Santa Ana Integrated Watershed Plan Volume 1: Water Resources Component, June 2002 (Page 7-17)

However, there will also be a recharge component to maintain groundwater TDS concentrations that will require Advanced Wastewater Treatment with salt removal.

Future concentrated brine flows were estimated at 0.5 mgd with 8,000 mg/L, assuming a dual pass system. These results in 33,300 lb/d of TDS removed from the area. Beaumont does not currently have a connection to the SARI line although the Yucaipa SARI extension is being designed to provide capacity for Beaumont flows. However, the project proponents may consider not delivering brine to the SARI. Alternatives include zero liquid discharge, if cost effective at the time the project is needed, or sending brine east to join other communities.

6.2.3 Nitrate Removal/Ion Exchange

The following is a summary of proposed nitrate removal projects.

Arlington Desalter
WMWD is planning a biological denitrification project for the Arlington desalter. The purpose of the project is to decrease the nitrogen from 18 mg/L to 5 mg/L. This will allow the desalter to increase the proportion of blend water used, thereby increasing overall plant output.

El Sobrante Groundwater Treatment Project
Sponsored by the City of Corona, the El Sobrante Groundwater Treatment Project is described as a Temescal Basin short term outage supply. It will be composed of three groundwater wells, one raw water pipeline, a nitrate treatment plant, and product pipeline for a total flow of 4.46 mgd (5,600 AFY)[22].

6.2.4 Domestic, Industrial and Waste Hauler Dischargers

Additional industrial dischargers have been predicted for EMWD. To provide the basis for identifying alternatives for the brine management system, the potential system users were defined. EMWD provided information on existing and future brine sources that may be generated in the EMWD service area. The sources include brine discharges from groundwater desalters and from power plants. An existing industrial discharger in Temecula, Hex- Fet, currently discharges into the existing brine system by hauling brine waste to Menifee/Perris I Desalter site for disposal. Otherwise, all of the sources are connected to the system through the existing brine system. The brine sources, including a description of the type of effluent, are summarized in Table 6-3.

[22] WMWD Final Integrated Regional Water Management Plan, May 2008 (Tables 5-8 and 6-2)

Table 6-3
EMWD Planned Users

Brine Source	Type	Estimated Flow					
		2008	2010	2015	2020	2025	2030
Hemet Corridor							
Hemet Desalters	Brackish Groundwater	0	0	0	1	1	1
Hex Fet*	Recycled Water	0.3	0.3	0	0	0	0
Inland Empire Energy Centre (IEEC)	Recycled Water	1	1	1	1	1	1
Menifee/Perris I Desalters	Brackish Groundwater	1.5	3	3	3	3	3
Mission Energy Centre **	Recycled Water Recovered Brine	0	0	0.17	0.17	0.17	0.17
Western Riverside County Agricultural Coalition	Agricultural Discharge Brine	Unknown			***		
Sub Total- Hemet Corridor		**2.8**	**4.3**	**4.17**	**5.17**	**5.17**	**5.17**
Moreno Valley Corridor							
Moreno Valley Manufacturing & Industrial	Various Sources	0	0	0	1	1	1
Perris II Desalters	Brackish Groundwater	0	0	1.75	1.75	1.75	1.75
Western Riverside County Agricultural Coalition	Agricultural Discharge Brine	Unknown			***		
Sub Total- Moreno Valley Corridor		**0**	**0**	**1.75**	**2.75**	**2.75**	**2.75**
San Jacinto Corridor							
San Jacinto Valley Regional Water Reclamation Facility (SJVRWRF) Desalter	Recycled Water	0	0	1	2	2	2
Western Riverside County Agricultural Coalition	Agricultural Discharge Brine	Unknown			***		
Sub Total- San Jacinto Corridor		0	0	1	2	2	2
Temecula Corridor							
Temecula Valley Regional Water Reclamation Facility (TVRWRF) Desalter	Recycled Water	0	0	0.7	0.7	1	1
Hex Fet*	Recycled Water	0	0	0.3	0.3	0.3	0.3
Western Riverside County Agricultural Coalition	Agricultural Discharge Brine	Unknown			***		
Sub Total- Temecula Corridor		0	0	0.7	0.7	1	1
Total - All Four Corridors		**2.8**	**4.3**	**7.62**	**10.62**	**10.92**	**10.92**

* HexFet currently hauls to the Menifee Desalter but it is assumed that it will be included with the Temecula corridor starting 2015

** Values used are 3 month peaking brine reduction values (25% used for brine reduction- Total flow-0.623 MGD, brine-0.17 MGD)

*** Coordination with Western Riverside county Agricultural Coalition required

No quantifiable information was available from other member agency areas with respect to future domestic discharges.

6.2.5 Conservation/Water Use Efficiency Plans

All retail water agencies have extensive water conservation and water use efficiency programs. At a minimum, agencies are required to adopt Urban Water Management Plans and update these every five years, with the next round of plans due to be submitted to DWR in 2010. Other agencies have conducted additional water use efficiency studies, such as the Water Use Efficiency Master Plan adopted by Western Municipal Water District in November of 2008. Water conservation and efficiency are

becoming a much more integral element of plans as new local water supplies to serve future growth in the watershed are limited and imported supplies much more vulnerable than in earlier years. Section 6.4 of SAWPA's One Water/One Watershed 2009 Integrated Watershed Plan is devoted to Water Use Efficiency.

There are a wide range of water conservation and efficiency approaches and each water supplier is implementing a mix that is particularly suited for its customers and situation. Many of the programs focus on the range of Best Management Practices (BMPs) and many agencies in the watershed are signatory to the "MOU Regarding Urban Water Conservation in California", which is the foundation of the CUWCC. This program is centered on 14 urban water conservation BMPs:

- BMP 1 Residential Surveys
- BMP 2 Residential Retrofits
- BMP 3 System Water Audits
- BMP 4 Metering
- BMP 5 Landscape
- BMP 6 Clothes Washers
- BMP 7 Public Information
- BMP 8 School Education
- BMP 9 Commercial, Industrial & Institutional
- BMP 10 Wholesaler
- BMP 11 Rates
- BMP 12 Conservation Coordinator
- BMP 13 Waste Prohibitions
- BMP 14 ULFTs

Extensive documentation is provided through individual agency plans, SAWPA's OWOW section, DWR and CUWCC literature and many other sources. The primary focus of this Technical Memorandum is to review the potential implications to Salt Management and SARI line planning in the watershed as a result of increasing implementation on water conservation.

One particular impact is the possibility that wastewater effluent may incrementally increase in TDS as a result of enhanced indoor water conservation practices which tend to reduce indoor per capita wastewater flow rates without necessarily decreasing

the increment of added salt mass. This would tend to increase the effective concentration of TDS in the effluent for an equivalent area or population served, though not the total mass of salt. To the extent that this may increase the measured TDS in wastewater effluent, it could potentially result in the need to consider wastewater desalting slightly sooner (see section 3). As discussed in Section 6.2.2, a number of agencies are already considering future wastewater desalting projects, primarily driven by plans to reuse more wastewater. If implemented within the projected time frames, these projects would account for most of the possible increase in wastewater TDS, that might result from water conservation. Incremental increases in TDS in other areas that might trigger additional un-identified projects, as discussed in Section 6.5, are not anticipated to occur for more 20 years. Therefore planning for such projects, even if slightly accelerated, is not expected to substantially change plans for the near to intermediate range planning horizon.

6.2.6 Brine Minimization

Brine minimization is a strategy to decrease brine flow by increasing brine TDS concentration. The result is that additional product water can be delivered to the system and less brine flow requires disposal. Brine minimization pilot testing is underway for both EMWD and WMWD. Below is a summary of the pilot testing and preliminary results.

EMWD Brine Minimization Pilot Testing

EMWD owns and operates the Menifee and Perris desalters. Typically, acid or scale inhibitors are added to reverse osmosis (RO) feed water to prevent membrane scaling, allowing a somewhat higher recovery than would be otherwise possible. Even with such chemical addition, the Menifee Desalters currently achieve only about 70 percent recovery due, primarily, to the high concentration of silica. EMWD's primary RO desalters produces brine of about 7,000 mg/L TDS which presently discharges to the SARI line. As part of EMWD's efforts to approach zero liquid discharge (ZLD), concentrate management pilot studies were conducted to recover additional water and reduce the volume of brine for disposal.

In Phase I of the brine minimization project (June 2006 – Dec 2006) that was partially funded by California Prop-50 Grant, intermediate brine softening via caustic soda (NaOH) demonstrated effective removal (up to 60 percent) of scaling precursors (calcium, magnesium, silica). The chemical softening unit tested was a conventional solids contact clarifier that consisted of a rapid mixing and flocculation tank followed by a lamellar flow inclined plate clarification section with a sludge hopper. Secondary RO and (electro-dialysis reversal) EDR recovery of 75 percent and 70 percent were achieved, respectively. Figure 6-2 depicts the pilot set up at the Menifee Plant. Unfortunately, hindered by the solids breakthrough from the softening phase, which outstripped the capacity of the downstream filters, the membranes experienced irreversible fouling.

Figure 6-2
Phase I Pilot Testing System

Encouraged by Phase I testing results and recognizing the value of brine minimization, Phase II testing leveraged previous experience for a more robust system that should limit or eliminate solids break-through. Both EDR and RO were investigated as the secondary desalting processes due to fundamental differences in the operation of each process and their ability to handle certain types of chemical scaling. One of the scale-forming constituents found in the Menifee brine stream is silica. EDR, by the nature of its operation, is not impacted by silica scaling since silica is uncharged and will not be attracted to the membrane surfaces of the EDR unit. In contrast, RO units are susceptible to silica scaling due to the concentration of the overall bulk stream. Figure 6-3 depicts the pilot set up for Phase II of the concentrate minimization testing.

Figure 6-3
Phase II Pilot Testing System

Phase II piloting efforts determined the hardness and silica removal efficiency of conventional lime-soda ash softening of the primary RO concentrate using a novel

high rate thickening softener. The softened effluent was polished by dual media filters prior to a secondary RO treatment, and silica-tolerant electro-dialysis reversal (EDR) in synergy to recover more potable water from the existing RO plant. The results are summarized as follows:

- Lime-soda ash softening reduced the feed brine stream Ca, Mg, and Si concentration by 69 percent, 38 percent, and 61 percent, respectively.
- Lime sludge produced by the high-rate solids up-flow thickener contained over 20 percent solids.
- Lime sludge generated by the thickener can be classified as California Non-Hazardous waste for landfill applications.
- 70 percent of secondary RO recovery was achievable, bringing the overall plant recovery to 91 percent.
- 60-65 percent of EDR recovery was achievable, bringing the overall plant recovery to 88-89 percent.

EMWD currently operates the Menifee and Perris I desalters, with a designed production capacity of 3.1 and 5.6 MGD, respectively. Construction of Perris II desalter will increase the capacity of EMWD's desalters by an additional 3.1 MGD. EMWD has completed both phases of the brine concentration pilot studies in 2009, and have plans for incorporating a full scale brine concentration program in the future.

WMWD Brine Minimization Pilot Testing

The Arlington Desalter is a RO water treatment plant treating groundwater with high TDS and nitrates. Currently the treatment plant discharges the RO concentrate waste stream to the SARI line. In order to expand the capacity of the Arlington Desalter while reducing the cost of the finished water, a concentrate treatment system is proposed to treat and recover more potable water from the existing RO concentrate stream.

The pilot testing conducted at Arlington Desalter evaluated concentrate treatment for the existing RO concentrate stream produced from three RO trains. The pilot testing involved removal of calcium and silica from the concentrate using a pellet-softening reactor. Concentrate treatment involves processes already used at the desalter (cartridge filters, RO), conventional filtration, and pellet reactor softening. Pellet softeners operate as high-rate softening treatment systems and produce pellets that can rapidly dewater by gravity in seconds instead of producing large quantities of sludge. Instead of disposing of sludge at a cost to the treatment plant, solid pellets may be sold to offset treatment costs. Following the pellet reactor softening, the brine stream is polished through media filtration as a pretreatment step for the secondary RO system.

Figure 6-4 shows the overall pilot plant installation at the Arlington Desalter. Up to 90 percent of calcium removal and 60 percent of silica removal were obtained by the softening step. Up to 70 percent of the primary RO concentrate can be recovered as permeate for use in blending with the other treated streams (primary RO permeate and biological nitrate removal treated effluent) to make the Arlington Desalter potable water system. The existing concentrate waste stream from the Arlington Desalter will be reduced from the existing flow rate of 1.4 mgd to approximately 0.4 mgd.

Figure 6-4
Overall Pilot Plant Installation at the Arlington Desalter

WMWD has planned for biological nitrate and concentrate treatment expansions for in the near future. Designs for the biological nitrate system will be completed by the end of 2009 and the designs for the concentrate management treatment expansion with pelletized softening will likely commence in 2010.

6.3 Comparison of Planned Projects with Identified Salt Reduction Needs

As presented in Section 5, a number of agencies throughout the watershed are projected to need to take additional action in the future either because blended water supply quality might exceed the secondary drinking water MCL, or more commonly because wastewater effluent is projected to exceed the effluent limits for TDS at some point in the future. A number of the planned or anticipated projects described in Section 6-2 are expected to help address and offset the needs shown in Table 5-3 or

other potential needs in sub-basins for which direct salt balance calculations were not available. These include:

- Yucaipa Valley Water District wastewater desalting and reuse
- City of Riverside water supply and wastewater desalting projects
- Western Municipal Water District and City of Corona water supply projects
- Eastern Municipal Water District groundwater desalter expansion and wastewater desalting and reuse

In each of these examples the anticipated projects, if implemented as planned are expected to result in the removal of salt that is greater than the minimum future requirement identified in Table 5-3. Thus if all of these projects were to be implemented to the full capacity planned, a greater load of salt would be removed from the watershed than would be required just to meet drinking water or wastewater discharge requirements. As projects are refined during more detailed planning under Phase 2, the salt balance projections can be updated to reflect some of these planned projects.

There are also areas and agencies where Section 5 identified potential salt removal needs and quantified these on the assumption they would be met through wastewater desalting, but for which there are currently no specific projects planned. These include:

- Beaumont
- Elsinore Valley MWD
- IEUA
- Rialto

For these agencies, a future potential salt load equivalent to that shown in Table 5-3 will be carried forward in planning to be met by the SARI system or other approaches.

6.4 Potential Actions/Activities to Close the Salt Removal Gap

As noted in Section 6.3 even with the existing and currently proposed projects or programs, theses do not totally account for the potential long-term salt export needs from the Upper Basin. This section addresses other potential long term options for removing and exporting salt, and/or reducing or eliminating flow to the SARI system.

These include the following range of approaches:

- Best Management Practices

- Desalters for Water Supply
- Desalters for Wastewater
- Zero Liquid Discharge/Evaporation Ponds
- NRWL to LACSD

This section briefly discusses each of these approaches, their potential for use, and the implications with respect to impacts on the SARI system.

6.4.1 Best Management Practices

In the context of this study, Best Management Practices are assumed to be source control measures aimed at reducing salt mass that would otherwise be discharged to ground or surface waters, or would be introduced into wastewater that would increase the TDS of the wastewater. These can take a number of forms. Several examples taken from Section 6.2, Water Quality Improvement from SAWPA's IRWP include:

- Support the elimination of domestic water softening devices that discharge into the sewer system. Elimination of domestic water softening devices that use salt should be a priority for local water agencies and cities. There are still a number of softening devices in service. Elimination or replacement of these devices with no-salt softeners can have a significant impact on reducing the increment of salt added to wastewater. There are a wide range of no-salt water softeners on the market that can be offered and promoted for home use.
- Promote the use of solid waste containers for disposal of food waste, pharmaceuticals, and household chemicals
- Develop and implement outreach programs to identify and promote the use of detergents and household products with low salt levels. There are a variety of products offered that are lower in salt content with alternative formulations. There are materials and information available that can be distributed or made available through a variety of methods to inform the public of lower salt formulations.
- Promote regional efforts to establish BMPs for reducing impacts from salt in runoff. Such efforts are consistent with programs being implemented by County-wide and individual City stormwater Management Programs. Examples include educational programs to reduce residential and commercial fertilizer use and control application; increased or enhanced street sweeping programs; enhanced programs to detect and eliminate illegal connections and illicit discharge and dumping activities; and strengthened industrial and commercial site runoff management.

In addition, most wastewater collection agencies use their industrial pre-treatment programs and ordinances to require or encourage new and existing industrial discharges that have elevated TDS to bypass the sanitary sewer collection system and

either make a direction connection to the SARI system or segregate high saline wastewater and haul the wastewater to SARI dump stations. As agencies approach TDS limits in their effluent, it is expected that this will trigger actions that may range from:

- Reduce the TDS increment in wastewater through source controls, industrial diversion, high salinity I/I inflow reduction, etc.
- Further reduce the salinity of the source water mix through new sources or additional water desalting; or
- Add a by-pass increment of reverse osmosis treatment on the tertiary effluent to blend down the final effluent before discharge.

6.4.2 Desalters for Water Supply or Wastewater Discharge

As described in Section 6-3, there are a few agencies who's blended water supply is projected to slightly exceed the secondary drinking water standard of 500 mg/l which could potentially trigger consideration for reducing the salinity of the water supply. Also it is anticipated that there may be several agencies with future wastewater effluent TDS that may exceed current discharge limits but where specific additional projects have not been identified. Agencies have the potential to reduce the TDS of their wastewater effluent in several ways:

- Implement additional source controls
- Reduce the TDS of source water supplies, as previously discussed (recognizing however that in some cases the wastewater treatment and disposal agencies are not the same as the retail water supply agencies)
- Add partial wastewater desalting to the current treatment capacities

Agencies could potentially add additional source water desalting either because it is cost effective in the future, because other supplies that are currently planned may not be as available, or because the wastewater effluent is projected to increase beyond the allowable discharge limit and they elect to manage the quality of wastewater though new or additional desalting of source water.

Specific projects have not been identified based on these needs. However, an allowance for brine production based on the assumption that partial wastewater desalting would be the approach taken is included in the needs assessment as previously described.

6.4.3 Zero Liquid Discharge/Evaporation Ponds

As discussed in Section 2, some agencies in the watershed have begun exploring brine concentration projects to reduce the quantity of flow remaining for discharge to the SARI line, while still exporting essentially the same salt load. These and other possible brine concentration approaches will be explored further under Phase 2. The ultimate

extension of this approach would be to evaporate all water from the remaining brine such that the salts are in a solid form and could potentially be disposed of as solid waste.

6.4.4 LACSD NWRL

In addition to the SARI system, IEUA has approximately 60 miles of pipeline that make up its North Non-Reclaimable Wastewater Systems. This pipeline system is used to convey higher TDS wastewater westward into the interceptor sewer system owned by the County Sanitation Districts of Los Angeles County for treatment CSDLAC's Carson Treatment Plant with for ocean discharge. As of FY 2007/2008, IEUA owned 10.16 mgd of capacity in the NRW North System, and the total flow in that year averaged approximately 4.2 mgd *(source IEUA Non-Reclaimable Wastewater System Pretreatment Program Annual Report 2007-2008)*. Therefore, there is potentially excess capacity currently in this system. IEUA makes this capacity available for appropriate industrial users or other sources of high TDS wastewater.

While there is apparently excess capacity available in the pipeline, in part it is reserved for future potential industrial dischargers. Furthermore, the system is generally north of and at a higher elevation than the current desalters. However, the potential exists for considering use of this pipeline as an additional possible means of exporting brine from the watershed and will be considered further under Phase 2.

6.5 Projections of Future Potential Impact on SARI System

In this section, the maximum potential salt loads and associated flows that may need to be managed in the Upper Basin are summarized, based on information derived from preceding sections of the document. The initial estimate represents effectively a set of "worst case" conditions, assuming all of the projected conditions are realized, and there are no source reduction BMPs implemented and/or no other approaches are taken to either reduce concentrate flows (e.g. additional brine minimization), divert brine flow (e.g. to the NRWL), or eliminate salt and brine (e.g. ZLD). To the extent that any of these steps are taken in the future at locations within the watershed, flows that would need to be carried in the SARI system could be reduced.

To develop the maximum loads, the following information was compiled from earlier sections and shown in the following tables:

- Estimated salt load and brine flows from existing or planned water supply desalting projects are shown in Table 6-4
- Estimated salt load and brine flows from existing or planned wastewater desalting projects for reuse or discharge are shown in Table 6-5
- All potential salt loads and brine flows from all sources are summarized in Table 6-6.

Table 6-4
Existing & Planned Water Supply Desalting Projects

Project	Salt Load (tons/yr)		Brine Flow (mgd)				SARI Line Reach
	Near Term	Long Term	Current/ Near Term	2010 - 2015 Increase	2015 - 2025 Increase	Beyond 2025 Increase	
SBVMWD	--	--	--	--	--	--	IVE
EMWD							
• Menifee Desalter	9,125	--	1.00	--	--	--	V
• Perris I Desalter	75,000	--	1.50	--	--	--	V
• Perris II Desalter	--	9,125	--	--	1.00	--	V
IEUA/CDA							
• Chino I Desalter	9,308	--	1.70	--	--	--	IVD
• Chino II Desalter	7,300	--	1.30	--	--	--	IVD
• Chino II Desalter Expansion	7,847	--	1.40	--	--	--	IVD
WMWD							
• Arlington Desalter(1)	8,212	--	1.38	-1.00	--	-1.00	IVB
• Temescal Basin Desalter	14,600	--	1.80	--	--	--	IVB
• Arlington Desalter Expansion	--	7,848	--	1.32	--	1.32	IVB
• Rincon Groundwater Treatment Project	--	5,293	--	--	1.00	--	IVB
• Riverside South Desalter	--	5,293	--	--	1.00	--	IVB
• Lake Matthews WTP	--	10,585	--	--	2.00	--	IVB
Total	**131,392**	**38,144**	**10.08**	**0.32**	**5.00**	**--**	**--**

(1) Brine flow decrease of 1 mgd is expected from planned brine minimization project.

Table 6-5
Existing & Planned Wastewater Supply Desalting Projects

Project	Salt Load (tons/yr)		Brine Flow (mgd)				SARI Line Reach
	Current/ Near Term	Future	Current/ Near Term	2010 - 2015 Increase	2015 - 2025 Increase	Beyond 2025 Increase	
EMWD							
• Inland Empire Energy Center	8,760	--	1.20	--	--		V
• EMWD IPR	--	16,060	--	--	3.00		V
WMWD							
• RCWD Ag Demineralization	--	14,965	--	--	2.8		V
• Riverside Regional Water Quality C.P.	--	2,738	--	--	0.5		IVD or IVB
• Riverside Pierce St. Sewer Lift Station	--	730	--	--	0.15		IVD or IVB
• Pellissier Rancho Groundwater Recharge	--	9,673	--	--	1.8		IVD or IVE
• Colombia Basin Groundwater Recharge	--	2,738	--	--	0.5		IVD or IVE
SBVMWD							
• San Bernardino IPR	--	12,045	--	--	2.3		IVE
• Yucaipa Valley IPR	--	4,198	--	0.8	--		IVE
• Beaumont WWTP IPR	--	6,023	--	--	0.5		IVE or None
Total	**8,760**	**69,170**	**1.20**	**0.80**	**11.55**	**0.00**	**--**

Table 6-6
Summary Potential Future Brine Export Needs

Project	Salt Load (tons/yr)			Brine Flow (mgd)				
	Current/ Near Term	Future	Total	Current/ Near Term	2010 - 2015 Increase	2015 - 2025 Increase	Beyond 2025 Increase	Total
Water Supply Desalting	131,392	38,144	169,536	10.08	0.32	5.00	--	15.40
Wastewater & Recycled Water Desalting	8,760	69,170	77,930	1.20	0.80	11.55	0.00	13.55
Unspecified Desalting (1)	--	24,006	24,006	--	--	--	3.74	3.74
Other								
Domestic Wastewater	--	Remove	0	2.27	0.00	Remove (-2.27)	0.00	0.00
Direct Industrial Connection & Waste Haulers (2)	--	--	0	0.69	0.50	1.00	0.60	2.79
Total	**140,152**	**131,320**	**271,472**	**14.24**	**1.62**	**15.28**	**4.34**	**35.48**

(1) Based on future projected volume of brine to meet the salt "gap" from Table 5-3 less brine associated with future wastewater desalting projects as discussed above
(2) From 12-02-09 Draft Brine Line (Industrial/Commercial) Demand Anlysis

Table 6-6 includes the following data:

- Total load and flow from water supply desalting projects from Table 6-4
- Total load and flow from wastewater desalting projects from Table 6-5
- Additional load and flow needed to meet the salt "gap" described in Section 5.3 that is not otherwise accounted for from the future water and wastewater desalting projects identified above Projections for future direct connection of other sources of brine (e.g. industrial), and future flow received via dumping stations, were derived from recent projections documented in the December 2009 draft Brine Line Demand (Industrial/Commercial) Analysis report prepared for SAWPA (Environmental Engineering and Contracting, Inc. 2009). The draft report identified three "cases" representing minimum, moderate and aggressive growth in possible brine line flows for such sources. While the report made projections for various sources of flow in the SARI line under each case, most of the sources are already accounted for in the Technical Memorandum under other categories. The flows representing the direct and indirect industrial and brine discharges only (other than desalters), the range of additional future flows projected was 0.03, 0.96 and 2.04 mgd, for the minimum, moderate and aggressive cases. For conservative planning purposes, a value of 2 mgd was included. No time frame was given for these demands, so they were proportionately increased over time.
- For planning purposes in the table, it is assumed that at some point in the future, untreated municipal/domestic wastewater would eventually be and re-directed to local municipal collection and treatment systems. Some flows are already in the process of being re-directed. The potential impact if this does not happen is discussed further below.

If all of the projected flows shown in Table 6-6 were to eventually be generated, the flow rate of all sources of brine has the potential to exceed 35 mgd, not counting current domestic wastewater flows to the SARI line. This total is approximately 23 percent greater than the nominal maximum capacity of the existing system. Furthermore, this does not include a comparison of potential future flows in individual reaches compared to the design capacity of each reach. This will be further evaluated in subsequent phases of the study. Note that the brine flow could be increased by 2.27 mgd if the domestic wastewater dischargers are not removed.

The Brine Line Demand (Industrial/Commercial) Analysis prepared by Environmental Engineering and Contracting, Inc for SAWPA in December 2009 predicts the anticipated increase in flow from direct industrial connections and waste haulers. The prediction is a minimum increase of 0.2 mgd, mid-range increase of 1.0 mgd, and maximum increase of 2.1 mgd. For a conservative estimate in SARI capacity, it is assumed that the increase will be 2.1 mgd. It is anticipated that the increase will be staged. Table 6-6 allocated 0.5 mgd increase in the near term, an additional 1.0 mgd increase in the intermediate term, and an additional 0.6 mgd increase for the long term.

At the same time, the maximum projections do not take account several factors that could reduce the total flow and/or salt load to be handled by the SARI line. These include such action as:

- Implementing source control BMPs such as further controls on water softeners
- Reducing brine flow through brine concentration and minimization processes and techniques up to and including zero liquid discharge and solid salt removal
- Diverting some brine flow to the LACSD NRWL

In subsequent phases of the study, these approaches will be further considered in conjunction with further evaluation of the potential sources and a more detailed evaluation of the SARI line and other conveyance options. The second phase will also evaluate the implications of this forecasted brine mass, flow rate and concentration on the downstream conveyance and treatment systems in Orange County.

6.6 Conclusions

Evaluation of future salt removal needs within the Upper Watershed as expected has identified and quantified a substantial amount of additional future salt reduction needs across most of the Upper Watershed in order to ensure that water and wastewater agencies will be able to provide acceptable drinking water and meet wastewater NPDES permit requirements consistent with current regulatory objectives. At the same time, there are significant number of future potential projects already identified within the watershed for which agencies are in various stages of planning, from very early conceptualization to detailed planning and design, that if and when implemented will address many of the needs. Even with these contemplated projects, it is forecasted that there would still need to be some additional future measures taken in some areas to meet the objectives. The timing of these needs will vary and likely extend over many years.

If the rate of brine that could potentially be generated from all these future projects was similar to that from existing projects, effectively assuming single pass reverse osmosis with no significant further concentrating, the maximum estimated potential flow could exceed the nominal maximum capacity of the existing SARI system by close to 25 percent, even if all domestic wastewater were eventually to be removed from the line. At the same time, there are several other options including source control, brine concentration and possible additional use of the NRWL that could reduce the maximum potential flow rate.

Subsequent phases will further refine the estimates, investigate some of the options, and provide a more detailed evaluation of specific capacity issues throughout the existing system.

additional future measures taken in some areas to meet the objectives. The timing of these needs will vary and likely extend over many years.

If the rate of brine that could potentially be generated from all these future projects was similar to that from existing projects, effectively assuming single pass reverse osmosis with no significant further concentrating, the maximum estimated potential flow could exceed the nominal maximum capacity of the existing SARI system by close to 25 percent, even if all domestic wastewater were eventually to be removed from the line. At the same time, there are several other options including source control, brine concentration and possible additional use of the NRWL that could reduce the maximum potential flow rate.

Subsequent phases will further refine the estimates, investigate some of the options, and provide a more detailed evaluation of specific capacity issues throughout the existing system.

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Appendices

Appendix A-1
Water Supply Plan for the Beaumont Cherry Valley Water District

Year	Beaumont Cherry Valley Water District															
	Total Demand	Raw Groundwater (Beaumont Basin)		Raw Groundwater (Edgar Canyon)		Non-Potable (50% Recycled plus 50% SWP)		Total Supply	Outdoor Water Use		Return Flow from Use		Return Flow to Beaumont MZ		Indoor Water Use	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	13,758	11,958	239	1,800	260	0	0	13,758	8,255	242	2,064	1,218	2,064	1,218	4,788	242
2011	13,749	11,949	241	1,800	262	0	0	13,749	8,249	244	2,062	1,227	2,062	1,227	4,785	244
2012	15,879	14,079	244	1,800	264	0	0	15,879	9,528	246	2,382	1,234	2,382	1,234	5,526	246
2013	16,931	15,131	246	1,800	266	0	0	16,931	10,158	249	2,540	1,244	2,540	1,244	5,892	249
2014	18,460	16,021	249	1,800	268	638	336	18,460	11,331	255	2,833	1,272	2,833	1,272	6,202	251
2015	19,298	16,221	251	1,800	270	1,277	337	19,298	12,089	262	3,022	1,298	3,022	1,298	6,271	253
2016	20,140	16,425	254	1,800	272	1,915	338	20,140	12,850	268	3,213	1,321	3,213	1,321	6,342	255
2017	20,987	16,633	256	1,800	274	2,554	340	20,987	13,613	273	3,403	1,343	3,403	1,343	6,415	258
2018	21,838	16,846	259	1,800	276	3,192	341	21,838	14,380	278	3,595	1,363	3,595	1,363	6,489	260
2019	22,694	17,064	262	1,800	278	3,830	342	22,694	15,149	283	3,787	1,383	3,787	1,383	6,565	263
2020	23,555	17,287	265	1,800	280	4,469	344	23,555	15,921	288	3,980	1,402	3,980	1,402	6,642	266
2021	24,422	17,568	268	1,800	282	5,054	345	24,422	16,675	293	4,169	1,420	4,169	1,420	6,740	270
2022	25,232	17,793	272	1,800	284	5,639	347	25,232	17,395	297	4,349	1,438	4,349	1,438	6,818	273
2023	26,049	18,131	276	1,800	286	6,118	349	26,049	18,076	301	4,519	1,455	4,519	1,455	6,936	277
2024	26,749	18,405	280	1,800	288	6,544	350	26,749	18,667	305	4,667	1,471	4,667	1,471	7,031	281
2025	27,394	18,678	284	1,800	290	6,916	352	27,394	19,203	309	4,801	1,487	4,801	1,487	7,126	285
2026	27,984	19,002	289	1,800	292	7,182	354	27,984	19,663	313	4,916	1,502	4,916	1,502	7,239	289
2027	28,459	19,317	293	1,800	294	7,342	356	28,459	20,012	316	5,003	1,516	5,003	1,516	7,349	293
2028	28,819	19,517	298	1,800	296	7,501	359	28,819	20,292	320	5,073	1,531	5,073	1,531	7,418	298
2029	29,185	19,725	302	1,800	298	7,661	361	29,185	20,576	324	5,144	1,546	5,144	1,546	7,491	302
2030	29,559	19,939	307	1,800	300	7,820	363	29,559	20,864	328	5,216	1,561	5,216	1,561	7,565	307
2031	29,559	19,939	312	1,800	302	7,820	365	29,559	20,864	331	5,216	1,576	5,216	1,576	7,565	311
2032	29,559	19,939	317	1,800	304	7,820	368	29,559	20,864	335	5,216	1,590	5,216	1,590	7,565	316
2033	29,559	19,939	321	1,800	306	7,820	370	29,559	20,864	339	5,216	1,605	5,216	1,605	7,565	320
2034	29,559	19,939	326	1,800	308	7,820	372	29,559	20,864	342	5,216	1,619	5,216	1,619	7,565	324
2035	29,559	19,939	330	1,800	310	7,820	374	29,559	20,864	346	5,216	1,633	5,216	1,633	7,565	329
2036	29,559	19,939	335	1,800	312	7,820	376	29,559	20,864	349	5,216	1,647	5,216	1,647	7,565	333
2037	29,559	19,939	339	1,800	314	7,820	379	29,559	20,864	353	5,216	1,661	5,216	1,661	7,565	337
2038	29,559	19,939	344	1,800	316	7,820	381	29,559	20,864	356	5,216	1,675	5,216	1,675	7,565	341
2039	29,559	19,939	348	1,800	318	7,820	383	29,559	20,864	359	5,216	1,688	5,216	1,688	7,565	346
2040	29,559	19,939	352	1,800	320	7,820	385	29,559	20,864	363	5,216	1,701	5,216	1,701	7,565	350
2041	29,559	19,939	357	1,800	322	7,820	387	29,559	20,864	366	5,216	1,714	5,216	1,714	7,565	354
2042	29,559	19,939	361	1,800	324	7,820	389	29,559	20,864	369	5,216	1,728	5,216	1,728	7,565	358
2043	29,559	19,939	365	1,800	326	7,820	391	29,559	20,864	373	5,216	1,740	5,216	1,740	7,565	362
2044	29,559	19,939	369	1,800	328	7,820	393	29,559	20,864	376	5,216	1,753	5,216	1,753	7,565	366
2045	29,559	19,939	373	1,800	330	7,820	395	29,559	20,864	379	5,216	1,766	5,216	1,766	7,565	369
2046	29,559	19,939	377	1,800	332	7,820	397	29,559	20,864	382	5,216	1,778	5,216	1,778	7,565	373
2047	29,559	19,939	381	1,800	334	7,820	399	29,559	20,864	385	5,216	1,790	5,216	1,790	7,565	377
2048	29,559	19,939	385	1,800	336	7,820	401	29,559	20,864	388	5,216	1,803	5,216	1,803	7,565	381
2049	29,559	19,939	389	1,800	338	7,820	402	29,559	20,864	391	5,216	1,815	5,216	1,815	7,565	384
2050	29,559	19,939	392	1,800	340	7,820	404	29,559	20,864	394	5,216	1,827	5,216	1,827	7,565	388
2051	29,559	19,939	396	1,800	342	7,820	406	29,559	20,864	397	5,216	1,838	5,216	1,838	7,565	392
2052	29,559	19,939	400	1,800	344	7,820	408	29,559	20,864	400	5,216	1,850	5,216	1,850	7,565	395
2053	29,559	19,939	404	1,800	346	7,820	410	29,559	20,864	403	5,216	1,861	5,216	1,861	7,565	399
2054	29,559	19,939	407	1,800	348	7,820	411	29,559	20,864	406	5,216	1,873	5,216	1,873	7,565	402
2055	29,559	19,939	411	1,800	350	7,820	413	29,559	20,864	409	5,216	1,884	5,216	1,884	7,565	406
2056	29,559	19,939	414	1,800	352	7,820	415	29,559	20,864	411	5,216	1,895	5,216	1,895	7,565	409
2057	29,559	19,939	418	1,800	354	7,820	417	29,559	20,864	414	5,216	1,906	5,216	1,906	7,565	413
2058	29,559	19,939	421	1,800	356	7,820	418	29,559	20,864	417	5,216	1,917	5,216	1,917	7,565	416
2059	29,559	19,939	425	1,800	358	7,820	420	29,559	20,864	419	5,216	1,928	5,216	1,928	7,565	419

Notes
1--Water Supply plan obtained from Wildermuth Environmental, Inc (2009b).
2--BCVWD required to blend recycled water 50/50 with SWP water, per their Maximum Benefit Commitments listed in the Santa Ana Regional Board Basin Plan
3--Recycled water source is City of Beaumont Wastewater Treatment Plant No. 1.
4--Approximately 87% of the BCVWD service area is connected to the City of Beaumont sewer system

Appendix A-2
Water Supply Plan for the Beaumont Cherry Valley Water District

Year	City of Banning																				
	Total Demand	Raw Groundwater (Beaumont Basin)		Raw Groundwater (Banning Basin)		Raw Groundwater (Cabazon Basin)		Banning Canyon		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Beaumont MZ		Indoor Water Use	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	12,501	3,791	269	1,660	260	2,050	250	5,000	150	0	415	12,501	7,501	217	1,875	1,119	30	1,119	5,000	217
2011	13,105	4,395	271	1,660	262	2,050	250	5,000	150	0	417	13,105	7,863	221	1,966	1,132	31	1,132	5,242	221
2012	13,708	3,378	274	1,660	264	2,050	250	5,000	150	1,620	421	13,708	8,873	224	2,218	1,144	35	1,144	4,835	217
2013	14,311	3,921	276	1,660	266	2,050	250	5,000	150	1,680	417	14,311	9,259	226	2,315	1,154	37	1,154	5,053	221
2014	14,915	4,765	279	1,660	268	2,050	250	5,000	150	1,440	421	14,915	9,525	229	2,381	1,167	38	1,167	5,390	225
2015	15,518	5,008	281	1,660	270	2,050	250	5,000	150	1,800	425	15,518	10,031	232	2,508	1,179	40	1,179	5,487	227
2016	16,121	5,531	284	1,660	272	2,050	250	5,000	150	1,880	427	16,121	10,425	235	2,606	1,191	42	1,191	5,697	231
2017	16,725	6,055	286	1,660	274	2,050	250	5,000	150	1,960	431	16,725	10,819	238	2,705	1,202	43	1,202	5,906	234
2018	17,328	6,578	289	1,660	276	2,050	250	5,000	150	2,040	434	17,328	11,213	241	2,803	1,214	45	1,214	6,115	237
2019	17,932	7,102	292	1,660	278	2,050	250	5,000	150	2,120	437	17,932	11,607	244	2,902	1,226	46	1,226	6,325	240
2020	18,535	7,625	295	1,660	280	2,050	250	5,000	150	2,200	440	18,535	12,001	247	3,000	1,239	48	1,239	6,534	243
2021	19,138	8,168	298	1,660	282	2,050	250	5,000	150	2,260	443	19,138	12,387	250	3,097	1,252	50	1,252	6,751	247
2022	19,742	8,712	302	1,660	284	2,050	250	5,000	150	2,320	447	19,742	12,773	254	3,193	1,265	51	1,265	6,969	251
2023	20,345	9,255	306	1,660	286	2,050	250	5,000	150	2,380	451	20,345	13,159	257	3,290	1,279	53	1,279	7,186	254
2024	20,948	9,798	310	1,660	288	2,050	250	5,000	150	2,440	454	20,948	13,545	261	3,386	1,293	54	1,293	7,403	258
2025	21,552	10,342	314	1,660	290	2,050	250	5,000	150	2,500	458	21,552	13,931	264	3,483	1,308	56	1,308	7,621	262
2026	22,155	10,885	319	1,660	292	2,050	250	5,000	150	2,560	462	22,155	14,317	268	3,579	1,323	57	1,323	7,838	266
2027	22,759	11,429	323	1,660	294	2,050	250	5,000	150	2,620	466	22,759	14,703	272	3,676	1,338	59	1,338	8,055	270
2028	23,362	11,972	328	1,660	296	2,050	250	5,000	150	2,680	470	23,362	15,089	276	3,772	1,354	60	1,354	8,273	275
2029	23,965	12,515	332	1,660	298	2,050	250	5,000	150	2,740	475	23,965	15,475	280	3,869	1,369	62	1,369	8,490	279
2030	24,569	13,059	337	1,660	300	2,050	250	5,000	150	2,800	479	24,569	15,861	284	3,965	1,385	63	1,385	8,707	283
2031	24,569	13,059	342	1,660	302	2,050	250	5,000	150	2,800	483	24,569	15,861	287	3,965	1,397	63	1,397	8,707	286
2032	24,569	13,059	347	1,660	304	2,050	250	5,000	150	2,800	486	24,569	15,861	290	3,965	1,408	63	1,408	8,707	289
2033	24,569	13,059	351	1,660	306	2,050	250	5,000	150	2,800	489	24,569	15,861	292	3,965	1,419	63	1,419	8,707	292
2034	24,569	13,059	356	1,660	308	2,050	250	5,000	150	2,800	492	24,569	15,861	295	3,965	1,430	63	1,430	8,707	295
2035	24,569	13,059	360	1,660	310	2,050	250	5,000	150	2,800	495	24,569	15,861	298	3,965	1,441	63	1,441	8,707	298
2036	24,569	13,059	365	1,660	312	2,050	250	5,000	150	2,800	498	24,569	15,861	300	3,965	1,451	63	1,451	8,707	301
2037	24,569	13,059	369	1,660	314	2,050	250	5,000	150	2,800	501	24,569	15,861	303	3,965	1,462	63	1,462	8,707	304
2038	24,569	13,059	374	1,660	316	2,050	250	5,000	150	2,800	504	24,569	15,861	306	3,965	1,472	63	1,472	8,707	306
2039	24,569	13,059	378	1,660	318	2,050	250	5,000	150	2,800	506	24,569	15,861	308	3,965	1,482	63	1,482	8,707	309
2040	24,569	13,059	382	1,660	320	2,050	250	5,000	150	2,800	509	24,569	15,861	311	3,965	1,493	63	1,493	8,707	312
2041	24,569	13,059	387	1,660	322	2,050	250	5,000	150	2,800	512	24,569	15,861	313	3,965	1,503	63	1,503	8,707	314
2042	24,569	13,059	391	1,660	324	2,050	250	5,000	150	2,800	514	24,569	15,861	316	3,965	1,512	63	1,512	8,707	317
2043	24,569	13,059	395	1,660	326	2,050	250	5,000	150	2,800	517	24,569	15,861	318	3,965	1,522	63	1,522	8,707	320
2044	24,569	13,059	399	1,660	328	2,050	250	5,000	150	2,800	520	24,569	15,861	320	3,965	1,532	63	1,532	8,707	322
2045	24,569	13,059	403	1,660	330	2,050	250	5,000	150	2,800	522	24,569	15,861	323	3,965	1,541	63	1,541	8,707	325
2046	24,569	13,059	407	1,660	332	2,050	250	5,000	150	2,800	525	24,569	15,861	325	3,965	1,551	63	1,551	8,707	327
2047	24,569	13,059	411	1,660	334	2,050	250	5,000	150	2,800	527	24,569	15,861	328	3,965	1,560	63	1,560	8,707	330
2048	24,569	13,059	415	1,660	336	2,050	250	5,000	150	2,800	530	24,569	15,861	330	3,965	1,570	63	1,570	8,707	332
2049	24,569	13,059	419	1,660	338	2,050	250	5,000	150	2,800	532	24,569	15,861	332	3,965	1,579	63	1,579	8,707	335
2050	24,569	13,059	422	1,660	340	2,050	250	5,000	150	2,800	535	24,569	15,861	334	3,965	1,588	63	1,588	8,707	337
2051	24,569	13,059	426	1,660	342	2,050	250	5,000	150	2,800	537	24,569	15,861	337	3,965	1,597	63	1,597	8,707	340
2052	24,569	13,059	430	1,660	344	2,050	250	5,000	150	2,800	540	24,569	15,861	339	3,965	1,606	63	1,606	8,707	342
2053	24,569	13,059	434	1,660	346	2,050	250	5,000	150	2,800	542	24,569	15,861	341	3,965	1,614	63	1,614	8,707	344
2054	24,569	13,059	437	1,660	348	2,050	250	5,000	150	2,800	544	24,569	15,861	343	3,965	1,623	63	1,623	8,707	347
2055	24,569	13,059	441	1,660	350	2,050	250	5,000	150	2,800	547	24,569	15,861	345	3,965	1,632	63	1,632	8,707	349
2056	24,569	13,059	444	1,660	352	2,050	250	5,000	150	2,800	549	24,569	15,861	347	3,965	1,640	63	1,640	8,707	351
2057	24,569	13,059	448	1,660	354	2,050	250	5,000	150	2,800	551	24,569	15,861	350	3,965	1,648	63	1,648	8,707	354
2058	24,569	13,059	451	1,660	356	2,050	250	5,000	150	2,800	554	24,569	15,861	352	3,965	1,657	63	1,657	8,707	356
2059	24,569	13,059	455	1,660	358	2,050	250	5,000	150	2,800	556	24,569	15,861	354	3,965	1,665	63	1,665	8,707	358

Notes

1--Water Supply plan obtained from (WEI 2009b)

2--Recycled water source is the City of Banning Wastewater Treatment Plant. No data was available to calculate a TDS waste increment. Recycled water TDS concentrations in each year were estimated by adding a TDS waste increment of 200 mg/L to the previous year's volume weighted TDS concentration water supply.

3--City of Banning wastewater treatment plant is outside of the Santa Ana Region and is not evaluated in this analysis.

Appendix A-3
Water Supply Plan for the City of Chino

Year	City of Chino																	
	Total Demand	Pumped Chino North Groundwater		CDA Desalter Product Water		Imported SWP Water		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water use	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	21,571	9,971	259	5,000	350	3,600	250	3,000	509	21,571	12,100	338	3,025	1,602	2,329	1,602	9,471	282
2011	22,246	10,146	264	5,000	350	3,600	250	3,500	511	22,246	12,686	347	3,171	1,637	2,442	1,637	9,560	284
2012	22,920	10,320	269	5,000	350	3,600	250	4,000	514	22,920	13,271	355	3,318	1,672	2,555	1,672	9,649	287
2013	23,595	10,495	275	5,000	350	3,600	250	4,500	517	23,595	13,857	364	3,464	1,704	2,667	1,704	9,738	290
2014	24,269	10,669	279	5,000	350	3,600	250	5,000	520	24,269	14,442	371	3,610	1,734	2,780	1,734	9,827	292
2015	24,944	10,844	283	5,000	350	3,600	250	5,500	522	24,944	15,028	378	3,757	1,761	2,893	1,761	9,916	294
2016	25,237	11,037	286	5,000	350	3,600	250	5,600	524	25,237	15,222	380	3,806	1,769	2,930	1,769	10,015	296
2017	25,531	11,231	289	5,000	350	3,600	250	5,700	526	25,531	15,417	382	3,854	1,778	2,968	1,778	10,114	297
2018	25,824	11,424	292	5,000	350	3,600	250	5,800	527	25,824	15,612	384	3,903	1,786	3,005	1,786	10,212	299
2019	26,118	11,618	297	5,000	350	3,600	250	5,900	529	26,118	15,807	387	3,952	1,796	3,043	1,796	10,311	302
2020	26,411	11,811	302	5,000	350	3,600	250	6,000	531	26,411	16,001	390	4,000	1,809	3,080	1,809	10,410	305
2021	26,604	12,004	307	5,000	350	3,600	250	6,000	534	26,604	16,096	392	4,024	1,818	3,098	1,818	10,508	308
2022	26,797	12,197	313	5,000	350	3,600	250	6,000	537	26,797	16,191	395	4,048	1,828	3,117	1,828	10,606	311
2023	26,991	12,391	318	5,000	350	3,600	250	6,000	540	26,991	16,286	397	4,071	1,839	3,135	1,839	10,705	314
2024	27,184	12,584	322	5,000	350	3,600	250	6,000	543	27,184	16,380	399	4,095	1,847	3,153	1,847	10,804	317
2025	27,377	12,777	326	5,000	350	3,600	250	6,000	545	27,377	16,475	401	4,119	1,855	3,171	1,855	10,902	319
2026	27,414	12,814	331	5,000	350	3,600	250	6,000	547	27,414	16,493	404	4,123	1,865	3,175	1,865	10,921	322
2027	27,451	12,851	336	5,000	350	3,600	250	6,000	550	27,451	16,511	407	4,128	1,876	3,178	1,876	10,940	325
2028	27,489	12,889	341	5,000	350	3,600	250	6,000	553	27,489	16,530	409	4,132	1,887	3,182	1,887	10,959	328
2029	27,526	12,926	346	5,000	350	3,600	250	6,000	556	27,526	16,548	412	4,137	1,899	3,185	1,899	10,978	331
2030	27,563	12,963	354	5,000	350	3,600	250	6,000	559	27,563	16,566	416	4,141	1,915	3,189	1,915	10,997	336
2031	27,563	12,963	362	5,000	350	3,600	250	6,000	563	27,563	16,566	421	4,141	1,935	3,189	1,935	10,997	341
2032	27,563	12,963	371	5,000	350	3,600	250	6,000	567	27,563	16,566	426	4,141	1,954	3,189	1,954	10,997	346
2033	27,563	12,963	379	5,000	350	3,600	250	6,000	572	27,563	16,566	431	4,141	1,973	3,189	1,973	10,997	351
2034	27,563	12,963	382	5,000	350	3,600	250	6,000	576	27,563	16,566	434	4,141	1,985	3,189	1,985	10,997	353
2035	27,563	12,963	386	5,000	350	3,600	250	6,000	578	27,563	16,566	436	4,141	1,992	3,189	1,992	10,997	355
2036	27,563	12,963	389	5,000	350	3,600	250	6,000	580	27,563	16,566	437	4,141	1,999	3,189	1,999	10,997	357
2037	27,563	12,963	392	5,000	350	3,600	250	6,000	581	27,563	16,566	439	4,141	2,007	3,189	2,007	10,997	358
2038	27,563	12,963	395	5,000	350	3,600	250	6,000	583	27,563	16,566	441	4,141	2,014	3,189	2,014	10,997	360
2039	27,563	12,963	398	5,000	350	3,600	250	6,000	585	27,563	16,566	443	4,141	2,020	3,189	2,020	10,997	362
2040	27,563	12,963	406	5,000	350	3,600	250	6,000	586	27,563	16,566	446	4,141	2,036	3,189	2,036	10,997	367
2041	27,563	12,963	415	5,000	350	3,600	250	6,000	591	27,563	16,566	451	4,141	2,056	3,189	2,056	10,997	372
2042	27,563	12,963	424	5,000	350	3,600	250	6,000	595	27,563	16,566	456	4,141	2,076	3,189	2,076	10,997	378
2043	27,563	12,963	433	5,000	350	3,600	250	6,000	600	27,563	16,566	462	4,141	2,096	3,189	2,096	10,997	383
2044	27,563	12,963	435	5,000	350	3,600	250	6,000	605	27,563	16,566	464	4,141	2,107	3,189	2,107	10,997	385
2045	27,563	12,963	438	5,000	350	3,600	250	6,000	606	27,563	16,566	466	4,141	2,112	3,189	2,112	10,997	386
2046	27,563	12,963	440	5,000	350	3,600	250	6,000	607	27,563	16,566	467	4,141	2,117	3,189	2,117	10,997	387
2047	27,563	12,963	442	5,000	350	3,600	250	6,000	608	27,563	16,566	468	4,141	2,123	3,189	2,123	10,997	389
2048	27,563	12,963	444	5,000	350	3,600	250	6,000	610	27,563	16,566	469	4,141	2,128	3,189	2,128	10,997	390
2049	27,563	12,963	446	5,000	350	3,600	250	6,000	611	27,563	16,566	471	4,141	2,133	3,189	2,133	10,997	391
2050	27,563	12,963	455	5,000	350	3,600	250	6,000	612	27,563	16,566	475	4,141	2,148	3,189	2,148	10,997	397
2051	27,563	12,963	465	5,000	350	3,600	250	6,000	617	27,563	16,566	480	4,141	2,169	3,189	2,169	10,997	402
2052	27,563	12,963	474	5,000	350	3,600	250	6,000	621	27,563	16,566	485	4,141	2,190	3,189	2,190	10,997	408
2053	27,563	12,963	483	5,000	350	3,600	250	6,000	626	27,563	16,566	490	4,141	2,212	3,189	2,212	10,997	413
2054	27,563	12,963	485	5,000	350	3,600	250	6,000	631	27,563	16,566	493	4,141	2,221	3,189	2,221	10,997	414
2055	27,563	12,963	486	5,000	350	3,600	250	6,000	632	27,563	16,566	494	4,141	2,225	3,189	2,225	10,997	415
2056	27,563	12,963	488	5,000	350	3,600	250	6,000	633	27,563	16,566	495	4,141	2,228	3,189	2,228	10,997	416
2057	27,563	12,963	489	5,000	350	3,600	250	6,000	634	27,563	16,566	495	4,141	2,232	3,189	2,232	10,997	417
2058	27,563	12,963	491	5,000	350	3,600	250	6,000	634	27,563	16,566	496	4,141	2,235	3,189	2,235	10,997	418
2059	27,563	12,963	492	5,000	350	3,600	250	6,000	635	27,563	16,566	497	4,141	2,239	3,189	2,239	10,997	419

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Recycled water source is IEUA; All IEUA WWTPs regulated as one composite discharge

Appendix A-4
Water Supply Plan for the City of Chino Hills

Year	City of Chino Hills																	
	Total Demand	Pumped Chino North Groundwater		CDA Desalter Product Water		Imported SWP Water		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	21,300	14,200	259	4,200	350	1,200	250	1,700	509	21,300	11,304	312	2,826	1,500	367	1,500	9,996	278
2011	21,775	14,500	264	4,200	350	1,200	250	1,875	511	21,775	11,626	318	2,907	1,523	378	1,523	10,149	281
2012	22,250	14,800	269	4,200	350	1,200	250	2,050	514	22,250	11,948	324	2,987	1,547	388	1,547	10,302	285
2013	22,725	15,100	275	4,200	350	1,200	250	2,225	517	22,725	12,270	330	3,068	1,571	399	1,571	10,455	289
2014	23,200	15,400	279	4,200	350	1,200	250	2,400	520	23,200	12,592	335	3,148	1,592	409	1,592	10,608	292
2015	23,200	15,400	283	4,200	350	1,200	250	2,400	522	23,200	12,592	338	3,148	1,603	409	1,603	10,608	295
2016	23,340	15,520	286	4,200	350	1,200	250	2,420	524	23,340	12,671	340	3,168	1,612	412	1,612	10,669	297
2017	23,424	15,592	289	4,200	350	1,200	250	2,432	526	23,424	12,718	343	3,180	1,620	413	1,620	10,706	299
2018	23,620	15,760	292	4,200	350	1,200	250	2,460	527	23,620	12,828	345	3,207	1,629	417	1,629	10,792	301
2019	23,760	15,880	297	4,200	350	1,200	250	2,480	529	23,760	12,907	348	3,227	1,642	419	1,642	10,853	305
2020	23,900	16,000	302	4,200	350	1,200	250	2,500	531	23,900	12,986	351	3,247	1,656	422	1,656	10,914	309
2021	23,900	16,000	307	4,200	350	1,200	250	2,500	534	23,900	12,986	355	3,247	1,670	422	1,670	10,914	312
2022	23,900	16,000	313	4,200	350	1,200	250	2,500	537	23,900	12,986	359	3,247	1,685	422	1,685	10,914	316
2023	23,900	16,000	318	4,200	350	1,200	250	2,500	540	23,900	12,986	363	3,247	1,701	422	1,701	10,914	321
2024	23,900	16,000	322	4,200	350	1,200	250	2,500	543	23,900	12,986	366	3,247	1,713	422	1,713	10,914	324
2025	23,900	16,000	326	4,200	350	1,200	250	2,500	545	23,900	12,986	369	3,247	1,725	422	1,725	10,914	327
2026	23,900	16,000	331	4,200	350	1,200	250	2,500	547	23,900	12,986	372	3,247	1,738	422	1,738	10,914	330
2027	23,900	16,000	336	4,200	350	1,200	250	2,500	550	23,900	12,986	375	3,247	1,751	422	1,751	10,914	334
2028	23,900	16,000	341	4,200	350	1,200	250	2,500	553	23,900	12,986	379	3,247	1,766	422	1,766	10,914	337
2029	23,900	16,000	346	4,200	350	1,200	250	2,500	556	23,900	12,986	383	3,247	1,780	422	1,780	10,914	341
2030	23,900	16,000	354	4,200	350	1,200	250	2,500	559	23,900	12,986	388	3,247	1,802	422	1,802	10,914	347
2031	23,900	16,000	362	4,200	350	1,200	250	2,500	563	23,900	12,986	394	3,247	1,825	422	1,825	10,914	353
2032	23,900	16,000	371	4,200	350	1,200	250	2,500	567	23,900	12,986	400	3,247	1,849	422	1,849	10,914	360
2033	23,900	16,000	379	4,200	350	1,200	250	2,500	572	23,900	12,986	406	3,247	1,873	422	1,873	10,914	366
2034	23,900	16,000	382	4,200	350	1,200	250	2,500	576	23,900	12,986	409	3,247	1,884	422	1,884	10,914	369
2035	23,900	16,000	386	4,200	350	1,200	250	2,500	578	23,900	12,986	411	3,247	1,893	422	1,893	10,914	371
2036	23,900	16,000	389	4,200	350	1,200	250	2,500	580	23,900	12,986	413	3,247	1,902	422	1,902	10,914	373
2037	23,900	16,000	392	4,200	350	1,200	250	2,500	581	23,900	12,986	415	3,247	1,911	422	1,911	10,914	376
2038	23,900	16,000	395	4,200	350	1,200	250	2,500	583	23,900	12,986	417	3,247	1,919	422	1,919	10,914	378
2039	23,900	16,000	398	4,200	350	1,200	250	2,500	585	23,900	12,986	419	3,247	1,928	422	1,928	10,914	380
2040	23,900	16,000	406	4,200	350	1,200	250	2,500	586	23,900	12,986	425	3,247	1,950	422	1,950	10,914	386
2041	23,900	16,000	415	4,200	350	1,200	250	2,500	591	23,900	12,986	431	3,247	1,974	422	1,974	10,914	393
2042	23,900	16,000	424	4,200	350	1,200	250	2,500	595	23,900	12,986	437	3,247	1,999	422	1,999	10,914	400
2043	23,900	16,000	433	4,200	350	1,200	250	2,500	600	23,900	12,986	444	3,247	2,024	422	2,024	10,914	406
2044	23,900	16,000	435	4,200	350	1,200	250	2,500	605	23,900	12,986	446	3,247	2,034	422	2,034	10,914	408
2045	23,900	16,000	438	4,200	350	1,200	250	2,500	606	23,900	12,986	448	3,247	2,040	422	2,040	10,914	410
2046	23,900	16,000	440	4,200	350	1,200	250	2,500	607	23,900	12,986	449	3,247	2,047	422	2,047	10,914	412
2047	23,900	16,000	442	4,200	350	1,200	250	2,500	608	23,900	12,986	451	3,247	2,053	422	2,053	10,914	413
2048	23,900	16,000	444	4,200	350	1,200	250	2,500	610	23,900	12,986	452	3,247	2,059	422	2,059	10,914	415
2049	23,900	16,000	446	4,200	350	1,200	250	2,500	611	23,900	12,986	454	3,247	2,065	422	2,065	10,914	416
2050	23,900	16,000	455	4,200	350	1,200	250	2,500	612	23,900	12,986	460	3,247	2,088	422	2,088	10,914	423
2051	23,900	16,000	465	4,200	350	1,200	250	2,500	617	23,900	12,986	466	3,247	2,114	422	2,114	10,914	430
2052	23,900	16,000	474	4,200	350	1,200	250	2,500	621	23,900	12,986	472	3,247	2,140	422	2,140	10,914	437
2053	23,900	16,000	483	4,200	350	1,200	250	2,500	626	23,900	12,986	479	3,247	2,166	422	2,166	10,914	444
2054	23,900	16,000	485	4,200	350	1,200	250	2,500	631	23,900	12,986	481	3,247	2,174	422	2,174	10,914	445
2055	23,900	16,000	486	4,200	350	1,200	250	2,500	632	23,900	12,986	482	3,247	2,178	422	2,178	10,914	446
2056	23,900	16,000	488	4,200	350	1,200	250	2,500	633	23,900	12,986	483	3,247	2,182	422	2,182	10,914	447
2057	23,900	16,000	489	4,200	350	1,200	250	2,500	634	23,900	12,986	484	3,247	2,186	422	2,186	10,914	448
2058	23,900	16,000	491	4,200	350	1,200	250	2,500	634	23,900	12,986	485	3,247	2,191	422	2,191	10,914	450
2059	23,900	16,000	492	4,200	350	1,200	250	2,500	635	23,900	12,986	486	3,247	2,195	422	2,195	10,914	451

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Recycled water source is IEUA; All IEUA WWTPs regulated as one composite discharge

Appendix A-5
Water Supply Plan for the City of Colton

Year	City of Colton																			
	Total Demand	Raw Groundwater (Bunker Hill A)		Raw Groundwater (Rialto)		Raw Groundwater (Colton)		Raw Groundwater (Riverside B)		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Colton MZ		Return Flow to Rialto MZ		Indoor Water Use	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	13,500	7,000	326	3,075	242	1,025	454	2,400	333	10,425	8,100	318	2,025	1,522	824	1,522	259	1,522	5,400	318
2011	13,780	7,140	326	3,135	245	1,045	456	2,460	335	10,645	8,268	319	2,067	1,526	841	1,526	265	1,526	5,512	319
2012	14,060	7,280	326	3,195	248	1,065	457	2,520	337	10,865	8,436	320	2,109	1,531	858	1,531	270	1,531	5,624	320
2013	14,340	7,420	327	3,255	251	1,085	458	2,580	339	11,085	8,604	322	2,151	1,537	875	1,537	275	1,537	5,736	322
2014	14,620	7,560	326	3,315	254	1,105	459	2,640	341	11,305	8,772	323	2,193	1,540	893	1,540	281	1,540	5,848	323
2015	14,900	7,700	326	3,375	257	1,125	460	2,700	343	11,525	8,940	324	2,235	1,544	910	1,544	286	1,544	5,960	324
2016	15,140	7,820	326	3,435	260	1,145	461	2,740	345	11,705	9,084	325	2,271	1,548	924	1,548	291	1,548	6,056	325
2017	15,380	7,940	326	3,495	263	1,165	462	2,780	347	11,885	9,228	326	2,307	1,553	939	1,553	295	1,553	6,152	326
2018	15,620	8,060	327	3,555	266	1,185	463	2,820	349	12,065	9,372	327	2,343	1,559	954	1,559	300	1,559	6,248	327
2019	15,860	8,180	327	3,615	269	1,205	464	2,860	351	12,245	9,516	329	2,379	1,565	968	1,565	305	1,565	6,344	329
2020	16,100	8,300	328	3,675	272	1,225	465	2,900	353	12,425	9,660	330	2,415	1,571	983	1,571	309	1,571	6,440	330
2021	16,360	8,440	329	3,735	275	1,245	467	2,940	355	12,625	9,816	332	2,454	1,577	999	1,577	314	1,577	6,544	332
2022	16,620	8,580	330	3,795	278	1,265	468	2,980	357	12,825	9,972	333	2,493	1,583	1,015	1,583	319	1,583	6,648	333
2023	16,880	8,720	331	3,855	281	1,285	469	3,020	359	13,025	10,128	335	2,532	1,589	1,031	1,589	324	1,589	6,752	335
2024	17,140	8,860	332	3,915	284	1,305	470	3,060	361	13,225	10,284	337	2,571	1,596	1,046	1,596	329	1,596	6,856	337
2025	17,400	9,000	333	3,975	287	1,325	471	3,100	363	13,425	10,440	338	2,610	1,603	1,062	1,603	334	1,603	6,960	338
2026	17,400	9,000	334	3,975	290	1,325	472	3,100	365	13,425	10,440	340	2,610	1,610	1,062	1,610	334	1,610	6,960	340
2027	17,400	9,000	335	3,975	293	1,325	473	3,100	367	13,425	10,440	342	2,610	1,617	1,062	1,617	334	1,617	6,960	342
2028	17,400	9,000	336	3,975	296	1,325	474	3,100	369	13,425	10,440	343	2,610	1,623	1,062	1,623	334	1,623	6,960	343
2029	17,400	9,000	337	3,975	299	1,325	475	3,100	371	13,425	10,440	345	2,610	1,630	1,062	1,630	334	1,630	6,960	345
2030	17,400	9,000	338	3,975	302	1,325	476	3,100	373	13,425	10,440	347	2,610	1,637	1,062	1,637	334	1,637	6,960	347
2031	17,400	9,000	339	3,975	305	1,325	478	3,100	375	13,425	10,440	348	2,610	1,643	1,062	1,643	334	1,643	6,960	348
2032	17,400	9,000	340	3,975	308	1,325	479	3,100	377	13,425	10,440	350	2,610	1,649	1,062	1,649	334	1,649	6,960	350
2033	17,400	9,000	341	3,975	311	1,325	480	3,100	379	13,425	10,440	351	2,610	1,655	1,062	1,655	334	1,655	6,960	351
2034	17,400	9,000	341	3,975	314	1,325	481	3,100	381	13,425	10,440	353	2,610	1,661	1,062	1,661	334	1,661	6,960	353
2035	17,400	9,000	342	3,975	317	1,325	482	3,100	383	13,425	10,440	354	2,610	1,667	1,062	1,667	334	1,667	6,960	354
2036	17,400	9,000	343	3,975	320	1,325	483	3,100	385	13,425	10,440	356	2,610	1,673	1,062	1,673	334	1,673	6,960	356
2037	17,400	9,000	344	3,975	323	1,325	484	3,100	387	13,425	10,440	357	2,610	1,679	1,062	1,679	334	1,679	6,960	357
2038	17,400	9,000	344	3,975	326	1,325	485	3,100	389	13,425	10,440	359	2,610	1,685	1,062	1,685	334	1,685	6,960	359
2039	17,400	9,000	345	3,975	329	1,325	486	3,100	391	13,425	10,440	360	2,610	1,691	1,062	1,691	334	1,691	6,960	360
2040	17,400	9,000	346	3,975	332	1,325	487	3,100	393	13,425	10,440	362	2,610	1,697	1,062	1,697	334	1,697	6,960	362
2041	17,400	9,000	347	3,975	335	1,325	489	3,100	395	13,425	10,440	363	2,610	1,703	1,062	1,703	334	1,703	6,960	363
2042	17,400	9,000	347	3,975	338	1,325	490	3,100	397	13,425	10,440	365	2,610	1,709	1,062	1,709	334	1,709	6,960	365
2043	17,400	9,000	348	3,975	341	1,325	491	3,100	399	13,425	10,440	366	2,610	1,715	1,062	1,715	334	1,715	6,960	366
2044	17,400	9,000	349	3,975	344	1,325	492	3,100	401	13,425	10,440	368	2,610	1,721	1,062	1,721	334	1,721	6,960	368
2045	17,400	9,000	349	3,975	347	1,325	493	3,100	403	13,425	10,440	369	2,610	1,727	1,062	1,727	334	1,727	6,960	369
2046	17,400	9,000	350	3,975	350	1,325	494	3,100	405	13,425	10,440	371	2,610	1,733	1,062	1,733	334	1,733	6,960	371
2047	17,400	9,000	350	3,975	353	1,325	495	3,100	407	13,425	10,440	372	2,610	1,738	1,062	1,738	334	1,738	6,960	372
2048	17,400	9,000	351	3,975	356	1,325	496	3,100	409	13,425	10,440	374	2,610	1,744	1,062	1,744	334	1,744	6,960	374
2049	17,400	9,000	352	3,975	359	1,325	497	3,100	411	13,425	10,440	375	2,610	1,750	1,062	1,750	334	1,750	6,960	375
2050	17,400	9,000	352	3,975	362	1,325	498	3,100	413	13,425	10,440	376	2,610	1,755	1,062	1,755	334	1,755	6,960	376
2051	17,400	9,000	353	3,975	365	1,325	500	3,100	415	13,425	10,440	378	2,610	1,761	1,062	1,761	334	1,761	6,960	378
2052	17,400	9,000	353	3,975	368	1,325	501	3,100	417	13,425	10,440	379	2,610	1,767	1,062	1,767	334	1,767	6,960	379
2053	17,400	9,000	354	3,975	371	1,325	502	3,100	419	13,425	10,440	381	2,610	1,772	1,062	1,772	334	1,772	6,960	381
2054	17,400	9,000	354	3,975	374	1,325	503	3,100	421	13,425	10,440	382	2,610	1,778	1,062	1,778	334	1,778	6,960	382
2055	17,400	9,000	355	3,975	377	1,325	504	3,100	423	13,425	10,440	383	2,610	1,783	1,062	1,783	334	1,783	6,960	383
2056	17,400	9,000	355	3,975	380	1,325	505	3,100	425	13,425	10,440	385	2,610	1,789	1,062	1,789	334	1,789	6,960	385
2057	17,400	9,000	355	3,975	383	1,325	506	3,100	427	13,425	10,440	386	2,610	1,794	1,062	1,794	334	1,794	6,960	386
2058	17,400	9,000	356	3,975	386	1,325	507	3,100	429	13,425	10,440	387	2,610	1,799	1,062	1,799	334	1,799	6,960	387
2059	17,400	9,000	356	3,975	389	1,325	508	3,100	431	13,425	10,440	389	2,610	1,805	1,062	1,805	334	1,805	6,960	389

Notes

1--Water Supply plan obtained from GEI Consultants, Inc. (2007).

2--TDS of Colton groundwater increases by approximately 1 mg/L per year (Geoscience Support Services, Inc. 2009).

3--TDS of Rialto groundwater increases by approximately 3 mg/L per year (Geoscience Support Services, Inc. 2009).

4--All pumping from Riverside North is from Riverside-B; Riverside B is assumed to increase 2 mg/L per year over the 2006 AWQ TDS, per historical AWQ analysis trends.

5--Wastewater from the City of Colton service area flows to the Colton WWTP

Appendix A-6
Water Supply Plan for the City of Corona

Year	City of Corona																				
	Total Demand	Raw Groundwater Temescal Basin		Raw Groundwater Coldwater Basin		Desalter Product Water		Recycled Water		Imported SWP Water		Imported CRA Water		Total Supply	Outdoor Water Use		Return Flow to Temescal		Indoor Water Use	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	46,061	4,531	875	2,500	485	12,000	120	1,720	710	5,062	250	20,248	675	46,061	28,325	500	5,612	2,248	17,736	486
2011	46,396	4,698	879	2,500	487	12,000	120	1,720	711	5,096	250	20,382	675	46,396	28,525	502	5,592	2,257	17,870	488
2012	46,731	4,865	885	2,500	489	12,000	120	1,720	713	5,129	250	20,516	675	46,731	28,726	504	5,662	2,267	18,004	491
2013	47,065	5,033	892	2,500	491	12,000	120	1,720	716	5,163	250	20,650	675	47,065	28,927	507	5,576	2,277	18,138	494
2014	47,400	5,200	898	2,500	493	12,000	120	1,720	719	5,196	250	20,784	675	47,400	29,128	509	5,535	2,287	18,272	496
2015	47,735	5,368	903	2,500	495	12,000	120	1,720	721	5,230	250	20,918	675	47,735	29,329	512	5,308	2,297	18,406	499
2016	48,514	5,757	906	2,500	497	12,000	120	1,720	724	5,307	250	21,230	675	48,514	29,797	516	5,472	2,315	18,718	503
2017	49,293	6,147	910	2,500	499	12,000	120	1,720	728	5,385	250	21,541	675	49,293	30,264	521	5,439	2,332	19,029	508
2018	50,073	6,536	913	2,500	501	12,000	120	1,720	733	5,463	250	21,853	675	50,073	30,732	525	5,407	2,349	19,341	512
2019	50,852	6,926	916	2,500	503	12,000	120	1,720	737	5,541	250	22,165	675	50,852	31,199	529	5,375	2,366	19,653	517
2020	51,631	7,316	920	2,500	505	12,000	120	1,720	742	5,619	250	22,476	675	51,631	31,667	533	5,343	2,382	19,964	521
2021	51,631	7,316	923	2,500	507	12,000	120	1,720	746	5,619	250	22,476	675	51,631	31,667	534	5,310	2,385	19,964	522
2022	51,631	7,316	926	2,500	509	12,000	120	1,720	747	5,619	250	22,476	675	51,631	31,667	534	5,278	2,387	19,964	522
2023	51,631	7,316	928	2,500	511	12,000	120	1,720	747	5,619	250	22,476	675	51,631	31,667	535	5,246	2,389	19,964	523
2024	51,631	7,316	931	2,500	513	12,000	120	1,720	748	5,619	250	22,476	675	51,631	31,667	535	5,214	2,391	19,964	523
2025	51,631	7,316	934	2,500	515	12,000	120	1,720	748	5,619	250	22,476	675	51,631	31,667	536	5,181	2,393	19,964	524
2026	51,631	7,316	937	2,500	517	12,000	120	1,720	749	5,619	250	22,476	675	51,631	31,667	536	5,149	2,395	19,964	524
2027	51,631	7,316	939	2,500	519	12,000	120	1,720	749	5,619	250	22,476	675	51,631	31,667	537	5,120	2,397	19,964	525
2028	51,631	7,316	941	2,500	521	12,000	120	1,720	750	5,619	250	22,476	675	51,631	31,667	537	5,095	2,399	19,964	525
2029	51,631	7,316	944	2,500	523	12,000	120	1,720	750	5,619	250	22,476	675	51,631	31,667	538	5,074	2,401	19,964	525
2030	51,631	7,316	946	2,500	525	12,000	120	1,720	750	5,619	250	22,476	675	51,631	31,667	538	5,056	2,402	19,964	526
2031	51,631	7,316	948	2,500	527	12,000	120	1,720	751	5,619	250	22,476	675	51,631	31,667	539	5,041	2,404	19,964	526
2032	51,631	7,316	950	2,500	529	12,000	120	1,720	751	5,619	250	22,476	675	51,631	31,667	539	5,031	2,406	19,964	527
2033	51,631	7,316	952	2,500	531	12,000	120	1,720	752	5,619	250	22,476	675	51,631	31,667	539	5,024	2,407	19,964	527
2034	51,631	7,316	954	2,500	533	12,000	120	1,720	752	5,619	250	22,476	675	51,631	31,667	540	5,020	2,409	19,964	528
2035	51,631	7,316	956	2,500	535	12,000	120	1,720	753	5,619	250	22,476	675	51,631	31,667	540	5,020	2,410	19,964	528
2036	51,631	7,316	958	2,500	537	12,000	120	1,720	753	5,619	250	22,476	675	51,631	31,667	540	5,020	2,412	19,964	528
2037	51,631	7,316	960	2,500	539	12,000	120	1,720	753	5,619	250	22,476	675	51,631	31,667	541	5,020	2,413	19,964	529
2038	51,631	7,316	962	2,500	541	12,000	120	1,720	754	5,619	250	22,476	675	51,631	31,667	541	5,020	2,415	19,964	529
2039	51,631	7,316	963	2,500	543	12,000	120	1,720	754	5,619	250	22,476	675	51,631	31,667	542	5,020	2,416	19,964	529
2040	51,631	7,316	965	2,500	545	12,000	120	1,720	754	5,619	250	22,476	675	51,631	31,667	542	5,020	2,418	19,964	530
2041	51,631	7,316	967	2,500	547	12,000	120	1,720	755	5,619	250	22,476	675	51,631	31,667	542	5,020	2,419	19,964	530
2042	51,631	7,316	968	2,500	549	12,000	120	1,720	755	5,619	250	22,476	675	51,631	31,667	543	5,020	2,420	19,964	530
2043	51,631	7,316	970	2,500	551	12,000	120	1,720	755	5,619	250	22,476	675	51,631	31,667	543	5,020	2,422	19,964	531
2044	51,631	7,316	971	2,500	553	12,000	120	1,720	756	5,619	250	22,476	675	51,631	31,667	543	5,020	2,423	19,964	531
2045	51,631	7,316	973	2,500	555	12,000	120	1,720	756	5,619	250	22,476	675	51,631	31,667	544	5,020	2,424	19,964	531
2046	51,631	7,316	975	2,500	557	12,000	120	1,720	756	5,619	250	22,476	675	51,631	31,667	544	5,020	2,426	19,964	532
2047	51,631	7,316	976	2,500	559	12,000	120	1,720	757	5,619	250	22,476	675	51,631	31,667	544	5,020	2,427	19,964	532
2048	51,631	7,316	977	2,500	561	12,000	120	1,720	757	5,619	250	22,476	675	51,631	31,667	545	5,020	2,428	19,964	532
2049	51,631	7,316	979	2,500	563	12,000	120	1,720	757	5,619	250	22,476	675	51,631	31,667	545	5,020	2,429	19,964	533
2050	51,631	7,316	980	2,500	565	12,000	120	1,720	758	5,619	250	22,476	675	51,631	31,667	545	5,020	2,431	19,964	533
2051	51,631	7,316	982	2,500	567	12,000	120	1,720	758	5,619	250	22,476	675	51,631	31,667	545	5,020	2,432	19,964	533
2052	51,631	7,316	983	2,500	569	12,000	120	1,720	758	5,619	250	22,476	675	51,631	31,667	546	5,020	2,433	19,964	534
2053	51,631	7,316	984	2,500	571	12,000	120	1,720	759	5,619	250	22,476	675	51,631	31,667	546	5,020	2,434	19,964	534
2054	51,631	7,316	985	2,500	573	12,000	120	1,720	759	5,619	250	22,476	675	51,631	31,667	546	5,020	2,435	19,964	534
2055	51,631	7,316	987	2,500	575	12,000	120	1,720	759	5,619	250	22,476	675	51,631	31,667	547	5,020	2,436	19,964	534
2056	51,631	7,316	988	2,500	577	12,000	120	1,720	759	5,619	250	22,476	675	51,631	31,667	547	5,020	2,438	19,964	535
2057	51,631	7,316	989	2,500	579	12,000	120	1,720	760	5,619	250	22,476	675	51,631	31,667	547	5,020	2,439	19,964	535
2058	51,631	7,316	990	2,500	581	12,000	120	1,720	760	5,619	250	22,476	675	51,631	31,667	547	5,020	2,440	19,964	535
2059	51,632	7,314	991	2,501	583	12,001	120	1,721	760	5,619	250	22,476	676	51,632	31,668	548	5,020	2,442	19,964	536

Notes
1--Demands and supplies are adapted from the 2008 AB3030 Groundwater Management Plan (Todd Engineers and AKM Consulting Engineers, 2008).
2--The City of Corona's goal is to supply 50% of its demand with local supplies (i.e. groundwater from the Temescal and Coldwater Basins).
3--Distribution of groundwater production from Temescal and Coldwater basins is based on information from historical TDS waste increment reports--80% from Temescal and 20% from Coldwater.
4--TDS of Coldwater Basin in 2010 was based on the volume-weighted TDS of pumped water in 2009, and is assumed to increase by 2 mg/L TDS per year.
5--Desalter product water assumes 75% efficiency resulting in 12,000 af/yr of product water and 4,000 af/yr of brine concentrate.
6--Distribution of surface water supply from the SWP and Colorado River is based on information obtained in historical TDS waste increment reports--80% from CRA and 20% from SWP.
7--Return flow is based on the WEI model of return flows from applied water.

Appendix A-7
Water Supply Plan for the City of Loma Linda

Year	City of Loma Linda											
	Total Demand	Raw Groundwater (Bunker Hill-B)		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Bunker Hill-B MZ		Indoor Water Use	
	AF	Q *AFY*	TDS *mg/L*	Q *AFY*	Q *AFY*	TDS *mg/L*	Q *AFY*	TDS *mg/L*	Q *AFY*	TDS *mg/L*	Q *AFY*	TDS *mg/L*
2010	6,445	6,445	294	6,445	3,867	294	967	1,427	967	1,427	2,578	294
2011	6,653	6,653	298	6,653	3,992	298	998	1,440	998	1,440	2,661	298
2012	6,861	6,861	301	6,861	4,116	301	1,029	1,454	1,029	1,454	2,744	301
2013	7,068	7,068	304	7,068	4,241	304	1,060	1,468	1,060	1,468	2,827	304
2014	7,276	7,276	307	7,276	4,366	307	1,091	1,480	1,091	1,480	2,910	307
2015	7,484	7,484	310	7,484	4,490	310	1,123	1,491	1,123	1,491	2,994	310
2016	7,692	7,692	313	7,692	4,615	313	1,154	1,503	1,154	1,503	3,077	313
2017	7,899	7,899	316	7,899	4,740	316	1,185	1,515	1,185	1,515	3,160	316
2018	8,107	8,107	319	8,107	4,864	319	1,216	1,526	1,216	1,526	3,243	319
2019	8,315	8,315	322	8,315	4,989	322	1,247	1,538	1,247	1,538	3,326	322
2020	8,523	8,523	325	8,523	5,114	325	1,278	1,549	1,278	1,549	3,409	325
2021	8,730	8,730	328	8,730	5,238	328	1,310	1,561	1,310	1,561	3,492	328
2022	8,938	8,938	331	8,938	5,363	331	1,341	1,573	1,341	1,573	3,575	331
2023	9,146	9,146	334	9,146	5,487	334	1,372	1,584	1,372	1,584	3,658	334
2024	9,353	9,353	336	9,353	5,612	336	1,403	1,596	1,403	1,596	3,741	336
2025	9,561	9,561	339	9,561	5,737	339	1,434	1,607	1,434	1,607	3,824	339
2026	9,769	9,769	342	9,769	5,861	342	1,465	1,618	1,465	1,618	3,908	342
2027	9,977	9,977	345	9,977	5,986	345	1,497	1,629	1,497	1,629	3,991	345
2028	10,184	10,184	347	10,184	6,111	347	1,528	1,639	1,528	1,639	4,074	347
2029	10,392	10,392	350	10,392	6,235	350	1,559	1,650	1,559	1,650	4,157	350
2030	10,600	10,600	353	10,600	6,360	353	1,590	1,660	1,590	1,660	4,240	353
2031	10,600	10,600	355	10,600	6,360	355	1,590	1,669	1,590	1,669	4,240	355
2032	10,600	10,600	357	10,600	6,360	357	1,590	1,678	1,590	1,678	4,240	357
2033	10,600	10,600	359	10,600	6,360	359	1,590	1,686	1,590	1,686	4,240	359
2034	10,600	10,600	361	10,600	6,360	361	1,590	1,693	1,590	1,693	4,240	361
2035	10,600	10,600	363	10,600	6,360	363	1,590	1,701	1,590	1,701	4,240	363
2036	10,600	10,600	364	10,600	6,360	364	1,590	1,708	1,590	1,708	4,240	364
2037	10,600	10,600	366	10,600	6,360	366	1,590	1,714	1,590	1,714	4,240	366
2038	10,600	10,600	368	10,600	6,360	368	1,590	1,721	1,590	1,721	4,240	368
2039	10,600	10,600	369	10,600	6,360	369	1,590	1,727	1,590	1,727	4,240	369
2040	10,600	10,600	371	10,600	6,360	371	1,590	1,732	1,590	1,732	4,240	371
2041	10,600	10,600	372	10,600	6,360	372	1,590	1,738	1,590	1,738	4,240	372
2042	10,600	10,600	373	10,600	6,360	373	1,590	1,743	1,590	1,743	4,240	373
2043	10,600	10,600	375	10,600	6,360	375	1,590	1,748	1,590	1,748	4,240	375
2044	10,600	10,600	376	10,600	6,360	376	1,590	1,753	1,590	1,753	4,240	376
2045	10,600	10,600	377	10,600	6,360	377	1,590	1,758	1,590	1,758	4,240	377
2046	10,600	10,600	378	10,600	6,360	378	1,590	1,762	1,590	1,762	4,240	378
2047	10,600	10,600	379	10,600	6,360	379	1,590	1,766	1,590	1,766	4,240	379
2048	10,600	10,600	380	10,600	6,360	380	1,590	1,770	1,590	1,770	4,240	380
2049	10,600	10,600	381	10,600	6,360	381	1,590	1,774	1,590	1,774	4,240	381
2050	10,600	10,600	382	10,600	6,360	382	1,590	1,777	1,590	1,777	4,240	382
2051	10,600	10,600	383	10,600	6,360	383	1,590	1,781	1,590	1,781	4,240	383
2052	10,600	10,600	384	10,600	6,360	384	1,590	1,784	1,590	1,784	4,240	384
2053	10,600	10,600	384	10,600	6,360	384	1,590	1,787	1,590	1,787	4,240	384
2054	10,600	10,600	385	10,600	6,360	385	1,590	1,790	1,590	1,790	4,240	385
2055	10,600	10,600	386	10,600	6,360	386	1,590	1,793	1,590	1,793	4,240	386
2056	10,600	10,600	387	10,600	6,360	387	1,590	1,796	1,590	1,796	4,240	387
2057	10,600	10,600	387	10,600	6,360	387	1,590	1,799	1,590	1,799	4,240	387
2058	10,600	10,600	388	10,600	6,360	388	1,590	1,801	1,590	1,801	4,240	388
2059	10,600	10,600	388	10,600	6,360	388	1,590	1,804	1,590	1,804	4,240	388

Notes
1--Water Supply plan obtained from GEI Consultants, Inc. (2007) and Engineering Resources of Southern California, Inc. (2006b). Plan was verified with the City of Loma Linda Engineering Staff.
2--Wastewater from the City of Loma Linda service area flows to the City of San Bernardino WRF.

Appendix A-8
Water Supply Plan for the City of Ontario

Year	City of Ontario																	
	Total Demand	Pumped Chino North Groundwater		CDA Desalter Product Water		Imported SWP Water		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	54,329	28,796	259	5,400	350	16,200	250	3,933	509	54,329	38,202	291	9,551	1,413	9,551	1,413	16,127	266
2011	55,897	28,479	264	6,027	350	16,930	250	4,461	511	55,897	39,437	297	9,859	1,437	9,859	1,437	16,460	269
2012	56,838	28,289	269	6,403	350	17,368	250	4,778	514	56,838	40,179	302	10,045	1,456	10,045	1,456	16,659	273
2013	59,032	27,845	275	7,280	350	18,390	250	5,517	517	59,032	41,907	308	10,477	1,483	10,477	1,483	17,125	277
2014	60,599	27,528	279	7,906	350	19,120	250	6,045	520	60,599	43,142	313	10,785	1,502	10,785	1,502	17,457	279
2015	62,167	27,211	283	8,533	350	19,850	250	6,573	522	62,167	44,377	317	11,094	1,519	11,094	1,519	17,790	282
2016	63,735	28,241	286	8,533	350	19,860	250	7,101	524	63,735	45,612	321	11,403	1,533	11,403	1,533	18,123	283
2017	64,676	28,859	289	8,533	350	19,866	250	7,418	526	64,676	46,353	323	11,588	1,543	11,588	1,543	18,323	285
2018	66,870	30,300	292	8,533	350	19,880	250	8,157	527	66,870	48,082	327	12,020	1,559	12,020	1,559	18,788	286
2019	68,438	31,330	297	8,533	350	19,890	250	8,685	529	68,438	49,317	331	12,329	1,575	12,329	1,575	19,121	289
2020	70,006	32,360	302	8,533	350	19,900	250	9,213	531	70,006	50,552	335	12,638	1,592	12,638	1,592	19,454	292
2021	71,574	33,390	307	8,533	350	19,910	250	9,741	534	71,574	51,787	340	12,947	1,609	12,947	1,609	19,787	295
2022	73,141	34,419	313	8,533	350	19,920	250	10,269	537	73,141	53,022	344	13,255	1,626	13,255	1,626	20,119	298
2023	74,705	35,449	318	8,533	350	19,926	250	10,797	540	74,705	54,254	349	13,564	1,645	13,564	1,645	20,451	301
2024	76,276	36,478	322	8,533	350	19,940	250	11,325	543	76,276	55,491	352	13,873	1,660	13,873	1,660	20,784	304
2025	77,844	37,508	326	8,533	350	19,950	250	11,853	545	77,844	56,727	356	14,182	1,675	14,182	1,675	21,117	306
2026	79,402	38,538	331	8,533	350	19,950	250	12,381	547	79,402	57,955	360	14,489	1,691	14,489	1,691	21,447	309
2027	80,960	39,568	336	8,533	350	19,950	250	12,909	550	80,960	59,183	364	14,796	1,707	14,796	1,707	21,776	312
2028	82,517	40,598	341	8,533	350	19,950	250	13,436	553	82,517	60,411	368	15,103	1,724	15,103	1,724	22,106	316
2029	84,075	41,628	346	8,533	350	19,950	250	13,964	556	84,075	61,640	373	15,410	1,741	15,410	1,741	22,436	319
2030	85,683	42,658	354	8,533	350	20,000	250	14,492	559	85,683	62,902	378	15,725	1,763	15,725	1,763	22,781	324
2031	85,683	42,658	362	8,533	350	20,000	250	14,492	563	85,683	62,902	383	15,725	1,782	15,725	1,782	22,781	329
2032	85,683	42,658	371	8,533	350	20,000	250	14,492	567	85,683	62,902	388	15,725	1,802	15,725	1,802	22,781	334
2033	85,683	42,658	379	8,533	350	20,000	250	14,492	572	85,683	62,902	393	15,725	1,822	15,725	1,822	22,781	339
2034	85,683	42,658	382	8,533	350	20,000	250	14,492	576	85,683	62,902	395	15,725	1,832	15,725	1,832	22,781	341
2035	85,683	42,658	386	8,533	350	20,000	250	14,492	578	85,683	62,902	397	15,725	1,839	15,725	1,839	22,781	343
2036	85,683	42,658	389	8,533	350	20,000	250	14,492	580	85,683	62,902	399	15,725	1,847	15,725	1,847	22,781	345
2037	85,683	42,658	392	8,533	350	20,000	250	14,492	581	85,683	62,902	401	15,725	1,854	15,725	1,854	22,781	347
2038	85,683	42,658	395	8,533	350	20,000	250	14,492	583	85,683	62,902	403	15,725	1,861	15,725	1,861	22,781	349
2039	85,683	42,658	398	8,533	350	20,000	250	14,492	585	85,683	62,902	404	15,725	1,868	15,725	1,868	22,781	350
2040	85,683	42,658	406	8,533	350	20,000	250	14,492	586	85,683	62,902	409	15,725	1,885	15,725	1,885	22,781	356
2041	85,683	42,658	415	8,533	350	20,000	250	14,492	591	85,683	62,902	414	15,725	1,905	15,725	1,905	22,781	361
2042	85,683	42,658	424	8,533	350	20,000	250	14,492	595	85,683	62,902	419	15,725	1,926	15,725	1,926	22,781	366
2043	85,683	42,658	433	8,533	350	20,000	250	14,492	600	85,683	62,902	424	15,725	1,947	15,725	1,947	22,781	372
2044	85,683	42,658	435	8,533	350	20,000	250	14,492	605	85,683	62,902	426	15,725	1,955	15,725	1,955	22,781	373
2045	85,683	42,658	438	8,533	350	20,000	250	14,492	606	85,683	62,902	428	15,725	1,961	15,725	1,961	22,781	374
2046	85,683	42,658	440	8,533	350	20,000	250	14,492	607	85,683	62,902	429	15,725	1,966	15,725	1,966	22,781	376
2047	85,683	42,658	442	8,533	350	20,000	250	14,492	608	85,683	62,902	430	15,725	1,971	15,725	1,971	22,781	377
2048	85,683	42,658	444	8,533	350	20,000	250	14,492	610	85,683	62,902	432	15,725	1,976	15,725	1,976	22,781	378
2049	85,683	42,658	446	8,533	350	20,000	250	14,492	611	85,683	62,902	433	15,725	1,982	15,725	1,982	22,781	380
2050	85,683	42,658	455	8,533	350	20,000	250	14,492	612	85,683	62,902	437	15,725	1,999	15,725	1,999	22,781	385
2051	85,683	42,658	465	8,533	350	20,000	250	14,492	617	85,683	62,902	443	15,725	2,020	15,725	2,020	22,781	391
2052	85,683	42,658	474	8,533	350	20,000	250	14,492	621	85,683	62,902	448	15,725	2,042	15,725	2,042	22,781	396
2053	85,683	42,658	483	8,533	350	20,000	250	14,492	626	85,683	62,902	453	15,725	2,064	15,725	2,064	22,781	402
2054	85,683	42,658	485	8,533	350	20,000	250	14,492	631	85,683	62,902	455	15,725	2,071	15,725	2,071	22,781	403
2055	85,683	42,658	486	8,533	350	20,000	250	14,492	632	85,683	62,902	456	15,725	2,075	15,725	2,075	22,781	404
2056	85,683	42,658	488	8,533	350	20,000	250	14,492	633	85,683	62,902	457	15,725	2,078	15,725	2,078	22,781	404
2057	85,683	42,658	489	8,533	350	20,000	250	14,492	634	85,683	62,902	458	15,725	2,082	15,725	2,082	22,781	405
2058	85,683	42,658	491	8,533	350	20,000	250	14,492	634	85,683	62,902	459	15,725	2,085	15,725	2,085	22,781	406
2059	85,683	42,658	492	8,533	350	20,000	250	14,492	635	85,683	62,902	460	15,725	2,089	15,725	2,089	22,781	407

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Recycled water source is IEUA; All IEUA WWTPs regulated as one composite discharge.

Appendix A-9
Water Supply Plan for the City of Pomona

Year	City of Pomona																		
	Total Demand	Pumped Chino North Groundwater		Imported SWP Water		Other Groundwater		Pedley Treatment Plant		Recycled Water (LACSD)		Total Supply	Outdoor Water Use		Total Return Flow		Total Return Flow to Chino North MZ	
	AF	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	33,300	13,000	259	6,000	250	7,500	330	3,800	190	3,000	459	33,300	23,604	290	5,901	1,412	2,360	1,412
2011	33,300	13,000	264	6,000	250	7,500	330	3,800	190	3,000	466	33,300	23,604	293	5,901	1,423	2,360	1,423
2012	33,300	13,000	269	6,000	250	7,500	330	3,800	190	3,000	468	33,300	23,604	296	5,901	1,433	2,360	1,433
2013	33,300	13,000	275	6,000	250	7,500	330	3,800	190	3,000	471	33,300	23,604	298	5,901	1,443	2,360	1,443
2014	33,300	13,000	279	6,000	250	7,500	330	3,800	190	3,000	473	33,300	23,604	300	5,901	1,450	2,360	1,450
2015	33,300	13,000	283	6,000	250	7,500	330	3,800	190	3,000	475	33,300	23,604	302	5,901	1,457	2,360	1,457
2016	33,300	13,000	286	6,000	250	7,500	330	3,800	190	3,000	477	33,300	23,604	303	5,901	1,462	2,360	1,462
2017	33,300	13,000	289	6,000	250	7,500	330	3,800	190	3,000	478	33,300	23,604	304	5,901	1,468	2,360	1,468
2018	33,300	13,000	292	6,000	250	7,500	330	3,800	190	3,000	479	33,300	23,604	306	5,901	1,473	2,360	1,473
2019	33,300	13,000	297	6,000	250	7,500	330	3,800	190	3,000	480	33,300	23,604	308	5,901	1,481	2,360	1,481
2020	33,300	13,000	302	6,000	250	7,500	330	3,800	190	3,000	482	33,300	23,604	310	5,901	1,489	2,360	1,489
2021	33,300	13,000	307	6,000	250	7,500	330	3,800	190	3,000	485	33,300	23,604	312	5,901	1,498	2,360	1,498
2022	33,300	13,000	313	6,000	250	7,500	330	3,800	190	3,000	487	33,300	23,604	314	5,901	1,507	2,360	1,507
2023	33,300	13,000	318	6,000	250	7,500	330	3,800	190	3,000	489	33,300	23,604	317	5,901	1,517	2,360	1,517
2024	33,300	13,000	322	6,000	250	7,500	330	3,800	190	3,000	492	33,300	23,604	318	5,901	1,524	2,360	1,524
2025	33,300	13,000	326	6,000	250	7,500	330	3,800	190	3,000	493	33,300	23,604	320	5,901	1,531	2,360	1,531
2026	33,300	13,000	331	6,000	250	7,500	330	3,800	190	3,000	495	33,300	23,604	322	5,901	1,539	2,360	1,539
2027	33,300	13,000	336	6,000	250	7,500	330	3,800	190	3,000	497	33,300	23,604	324	5,901	1,547	2,360	1,547
2028	33,300	13,000	341	6,000	250	7,500	330	3,800	190	3,000	499	33,300	23,604	326	5,901	1,555	2,360	1,555
2029	33,300	13,000	346	6,000	250	7,500	330	3,800	190	3,000	501	33,300	23,604	329	5,901	1,564	2,360	1,564
2030	33,300	13,000	354	6,000	250	7,500	330	3,800	190	3,000	503	33,300	23,604	332	5,901	1,577	2,360	1,577
2031	33,300	13,000	362	6,000	250	7,500	330	3,800	190	3,000	507	33,300	23,604	335	5,901	1,591	2,360	1,591
2032	33,300	13,000	371	6,000	250	7,500	330	3,800	190	3,000	510	33,300	23,604	339	5,901	1,606	2,360	1,606
2033	33,300	13,000	379	6,000	250	7,500	330	3,800	190	3,000	514	33,300	23,604	343	5,901	1,621	2,360	1,621
2034	33,300	13,000	382	6,000	250	7,500	330	3,800	190	3,000	518	33,300	23,604	344	5,901	1,627	2,360	1,627
2035	33,300	13,000	386	6,000	250	7,500	330	3,800	190	3,000	519	33,300	23,604	346	5,901	1,633	2,360	1,633
2036	33,300	13,000	389	6,000	250	7,500	330	3,800	190	3,000	520	33,300	23,604	347	5,901	1,638	2,360	1,638
2037	33,300	13,000	392	6,000	250	7,500	330	3,800	190	3,000	522	33,300	23,604	348	5,901	1,643	2,360	1,643
2038	33,300	13,000	395	6,000	250	7,500	330	3,800	190	3,000	523	33,300	23,604	350	5,901	1,649	2,360	1,649
2039	33,300	13,000	398	6,000	250	7,500	330	3,800	190	3,000	524	33,300	23,604	351	5,901	1,654	2,360	1,654
2040	33,300	13,000	406	6,000	250	7,500	330	3,800	190	3,000	526	33,300	23,604	354	5,901	1,667	2,360	1,667
2041	33,300	13,000	415	6,000	250	7,500	330	3,800	190	3,000	529	33,300	23,604	358	5,901	1,682	2,360	1,682
2042	33,300	13,000	424	6,000	250	7,500	330	3,800	190	3,000	533	33,300	23,604	362	5,901	1,697	2,360	1,697
2043	33,300	13,000	433	6,000	250	7,500	330	3,800	190	3,000	537	33,300	23,604	366	5,901	1,713	2,360	1,713
2044	33,300	13,000	435	6,000	250	7,500	330	3,800	190	3,000	541	33,300	23,604	367	5,901	1,718	2,360	1,718
2045	33,300	13,000	438	6,000	250	7,500	330	3,800	190	3,000	542	33,300	23,604	368	5,901	1,722	2,360	1,722
2046	33,300	13,000	440	6,000	250	7,500	330	3,800	190	3,000	543	33,300	23,604	369	5,901	1,726	2,360	1,726
2047	33,300	13,000	442	6,000	250	7,500	330	3,800	190	3,000	544	33,300	23,604	370	5,901	1,730	2,360	1,730
2048	33,300	13,000	444	6,000	250	7,500	330	3,800	190	3,000	545	33,300	23,604	371	5,901	1,734	2,360	1,734
2049	33,300	13,000	446	6,000	250	7,500	330	3,800	190	3,000	546	33,300	23,604	372	5,901	1,737	2,360	1,737
2050	33,300	13,000	455	6,000	250	7,500	330	3,800	190	3,000	547	33,300	23,604	375	5,901	1,751	2,360	1,751
2051	33,300	13,000	465	6,000	250	7,500	330	3,800	190	3,000	550	33,300	23,604	379	5,901	1,767	2,360	1,767
2052	33,300	13,000	474	6,000	250	7,500	330	3,800	190	3,000	554	33,300	23,604	383	5,901	1,783	2,360	1,783
2053	33,300	13,000	483	6,000	250	7,500	330	3,800	190	3,000	558	33,300	23,604	387	5,901	1,799	2,360	1,799
2054	33,300	13,000	485	6,000	250	7,500	330	3,800	190	3,000	562	33,300	23,604	388	5,901	1,803	2,360	1,803
2055	33,300	13,000	486	6,000	250	7,500	330	3,800	190	3,000	563	33,300	23,604	389	5,901	1,806	2,360	1,806
2056	33,300	13,000	488	6,000	250	7,500	330	3,800	190	3,000	564	33,300	23,604	390	5,901	1,808	2,360	1,808
2057	33,300	13,000	489	6,000	250	7,500	330	3,800	190	3,000	564	33,300	23,604	390	5,901	1,811	2,360	1,811
2058	33,300	13,000	491	6,000	250	7,500	330	3,800	190	3,000	565	33,300	23,604	391	5,901	1,813	2,360	1,813
2059	33,300	13,000	492	6,000	250	7,500	330	3,800	190	3,000	566	33,300	23,604	391	5,901	1,816	2,360	1,816

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Other groundwater source is outside the Santa Ana Region (Claremont Basins).
4--Recycled water source is the LACSD plant outside the Santa Ana Region. No data was available to calculate a TDS waste increment. Recycled water TDS concentrations in each year were estimated by adding a TDS waste increment of 200 mg/L to the previous year's volume weighted TDS concentration water supply.

Appendix A-10
Water Supply Plan for the City of Redlands

Year	City of Redlands																											
	Total Demand	Raw Groundwater (Yucaipa)		Raw Groundwater (Bunker Hill-B)		Santa Ana River		Mill Creek		Imported SWP Water		Recycled Water (for Power Plant)		Recycled Water (for irrigation)		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Yucaipa MZ		Return Flow to Bunker Hill-B MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	42,317	381	330	19,047	294	10,285	204	6,857	178	1,524	250	3,080	431	1,143	431	42,317	30,475	254	7,619	1,267	1,905	1,267	5,714	1,267	8,762	248
2011	43,466	391	336	19,541	298	10,552	204	7,035	178	1,563	250	3,360	433	1,024	433	43,466	31,117	255	7,779	1,271	1,945	1,271	5,834	1,271	8,989	249
2012	44,615	401	342	20,035	301	10,819	204	7,212	178	1,603	250	3,360	434	1,186	434	44,615	32,039	258	8,010	1,281	2,002	1,281	6,007	1,281	9,216	251
2013	45,764	411	347	20,528	304	11,085	204	7,390	178	1,642	250	3,360	436	1,347	436	45,764	32,961	260	8,240	1,291	2,060	1,291	6,180	1,291	9,443	253
2014	46,913	420	353	21,022	307	11,352	204	7,568	178	1,682	250	3,360	438	1,509	438	46,913	33,883	263	8,471	1,300	2,118	1,300	6,353	1,300	9,670	254
2015	48,063	430	359	21,516	310	11,619	204	7,746	178	1,721	250	3,360	439	1,671	439	48,063	34,805	265	8,701	1,309	2,175	1,309	6,526	1,309	9,897	256
2016	49,212	440	365	22,010	313	11,885	204	7,923	178	1,761	250	3,360	441	1,832	441	49,212	35,727	267	8,932	1,317	2,233	1,317	6,699	1,317	10,124	257
2017	50,361	450	371	22,503	316	12,152	204	8,101	178	1,800	250	3,360	442	1,994	442	50,361	36,649	269	9,162	1,326	2,291	1,326	6,872	1,326	10,352	259
2018	51,510	460	378	22,997	319	12,419	204	8,279	178	1,840	250	3,360	444	2,156	444	51,510	37,571	271	9,393	1,334	2,348	1,334	7,045	1,334	10,579	260
2019	52,659	470	384	23,491	322	12,685	204	8,457	178	1,879	250	3,360	445	2,317	445	52,659	38,493	273	9,623	1,342	2,406	1,342	7,218	1,342	10,806	262
2020	53,808	480	391	23,985	325	12,952	204	8,635	178	1,919	250	3,360	447	2,479	447	53,808	39,415	275	9,854	1,350	2,463	1,350	7,390	1,350	11,033	263
2021	54,958	491	397	24,529	328	13,245	204	8,830	178	1,962	250	3,360	448	2,540	448	54,958	40,314	277	10,079	1,356	2,520	1,356	7,559	1,356	11,283	265
2022	56,107	501	404	25,072	331	13,539	204	9,026	178	2,006	250	3,360	450	2,602	450	56,107	41,213	278	10,303	1,362	2,576	1,362	7,728	1,362	11,533	266
2023	57,256	512	410	25,616	334	13,833	204	9,222	178	2,049	250	3,360	451	2,664	451	57,256	42,112	280	10,528	1,368	2,632	1,368	7,896	1,368	11,783	268
2024	58,405	523	417	26,160	336	14,126	204	9,418	178	2,093	250	3,360	453	2,725	453	58,405	43,012	281	10,753	1,375	2,688	1,375	8,065	1,375	12,034	270
2025	59,554	534	424	26,704	339	14,420	204	9,613	178	2,136	250	3,360	455	2,787	455	59,554	43,911	283	10,978	1,381	2,744	1,381	8,233	1,381	12,284	271
2026	60,703	545	430	27,247	342	14,714	204	9,809	178	2,180	250	3,360	456	2,849	456	60,703	44,810	284	11,202	1,386	2,801	1,386	8,402	1,386	12,534	272
2027	61,853	556	437	27,791	345	15,007	204	10,005	178	2,223	250	3,360	457	2,910	457	61,853	45,709	286	11,427	1,392	2,857	1,392	8,570	1,392	12,784	274
2028	63,002	567	443	28,335	347	15,301	204	10,201	178	2,267	250	3,360	459	2,972	459	63,002	46,608	287	11,652	1,398	2,913	1,398	8,739	1,398	13,034	275
2029	64,151	578	450	28,879	350	15,595	204	10,396	178	2,310	250	3,360	460	3,033	460	64,151	47,507	288	11,877	1,403	2,969	1,403	8,908	1,403	13,284	277
2030	65,300	588	456	29,423	353	15,888	204	10,592	178	2,354	250	3,360	462	3,095	462	65,300	48,406	290	12,101	1,409	3,025	1,409	9,076	1,409	13,534	278
2031	65,300	588	463	29,423	355	15,888	204	10,592	178	2,354	250	3,360	463	3,095	463	65,300	48,406	291	12,101	1,414	3,025	1,414	9,076	1,414	13,534	279
2032	65,300	588	469	29,423	357	15,888	204	10,592	178	2,354	250	3,360	464	3,095	464	65,300	48,406	292	12,101	1,418	3,025	1,418	9,076	1,418	13,534	280
2033	65,300	588	475	29,423	359	15,888	204	10,592	178	2,354	250	3,360	465	3,095	465	65,300	48,406	293	12,101	1,422	3,025	1,422	9,076	1,422	13,534	281
2034	65,300	588	481	29,423	361	15,888	204	10,592	178	2,354	250	3,360	466	3,095	466	65,300	48,406	294	12,101	1,426	3,025	1,426	9,076	1,426	13,534	282
2035	65,300	588	487	29,423	363	15,888	204	10,592	178	2,354	250	3,360	467	3,095	467	65,300	48,406	295	12,101	1,430	3,025	1,430	9,076	1,430	13,534	283
2036	65,300	588	493	29,423	364	15,888	204	10,592	178	2,354	250	3,360	468	3,095	468	65,300	48,406	296	12,101	1,434	3,025	1,434	9,076	1,434	13,534	284
2037	65,300	588	498	29,423	366	15,888	204	10,592	178	2,354	250	3,360	469	3,095	469	65,300	48,406	297	12,101	1,438	3,025	1,438	9,076	1,438	13,534	285
2038	65,300	588	503	29,423	368	15,888	204	10,592	178	2,354	250	3,360	470	3,095	470	65,300	48,406	298	12,101	1,441	3,025	1,441	9,076	1,441	13,534	286
2039	65,300	588	509	29,423	369	15,888	204	10,592	178	2,354	250	3,360	471	3,095	471	65,300	48,406	299	12,101	1,444	3,025	1,444	9,076	1,444	13,534	287
2040	65,300	588	514	29,423	371	15,888	204	10,592	178	2,354	250	3,360	472	3,095	472	65,300	48,406	299	12,101	1,447	3,025	1,447	9,076	1,447	13,534	288
2041	65,300	588	519	29,423	372	15,888	204	10,592	178	2,354	250	3,360	473	3,095	473	65,300	48,406	300	12,101	1,450	3,025	1,450	9,076	1,450	13,534	288
2042	65,300	588	524	29,423	373	15,888	204	10,592	178	2,354	250	3,360	473	3,095	473	65,300	48,406	301	12,101	1,453	3,025	1,453	9,076	1,453	13,534	289
2043	65,300	588	529	29,423	375	15,888	204	10,592	178	2,354	250	3,360	474	3,095	474	65,300	48,406	301	12,101	1,456	3,025	1,456	9,076	1,456	13,534	290
2044	65,300	588	534	29,423	376	15,888	204	10,592	178	2,354	250	3,360	475	3,095	475	65,300	48,406	302	12,101	1,458	3,025	1,458	9,076	1,458	13,534	290
2045	65,300	588	538	29,423	377	15,888	204	10,592	178	2,354	250	3,360	475	3,095	475	65,300	48,406	303	12,101	1,461	3,025	1,461	9,076	1,461	13,534	291
2046	65,300	588	543	29,423	378	15,888	204	10,592	178	2,354	250	3,360	476	3,095	476	65,300	48,406	303	12,101	1,463	3,025	1,463	9,076	1,463	13,534	292
2047	65,300	588	547	29,423	379	15,888	204	10,592	178	2,354	250	3,360	477	3,095	477	65,300	48,406	304	12,101	1,466	3,025	1,466	9,076	1,466	13,534	292
2048	65,300	588	552	29,423	380	15,888	204	10,592	178	2,354	250	3,360	477	3,095	477	65,300	48,406	304	12,101	1,468	3,025	1,468	9,076	1,468	13,534	293
2049	65,300	588	556	29,423	381	15,888	204	10,592	178	2,354	250	3,360	478	3,095	478	65,300	48,406	305	12,101	1,470	3,025	1,470	9,076	1,470	13,534	293
2050	65,300	588	560	29,423	382	15,888	204	10,592	178	2,354	250	3,360	478	3,095	478	65,300	48,406	305	12,101	1,472	3,025	1,472	9,076	1,472	13,534	294
2051	65,300	588	564	29,423	383	15,888	204	10,592	178	2,354	250	3,360	479	3,095	479	65,300	48,406	306	12,101	1,474	3,025	1,474	9,076	1,474	13,534	294
2052	65,300	588	568	29,423	384	15,888	204	10,592	178	2,354	250	3,360	479	3,095	479	65,300	48,406	306	12,101	1,476	3,025	1,476	9,076	1,476	13,534	295
2053	65,300	588	572	29,423	384	15,888	204	10,592	178	2,354	250	3,360	480	3,095	480	65,300	48,406	307	12,101	1,477	3,025	1,477	9,076	1,477	13,534	295
2054	65,300	588	576	29,423	385	15,888	204	10,592	178	2,354	250	3,360	480	3,095	480	65,300	48,406	307	12,101	1,479	3,025	1,479	9,076	1,479	13,534	295
2055	65,300	588	580	29,423	386	15,888	204	10,592	178	2,354	250	3,360	480	3,095	480	65,300	48,406	308	12,101	1,481	3,025	1,481	9,076	1,481	13,534	296
2056	65,300	588	583	29,423	387	15,888	204	10,592	178	2,354	250	3,360	481	3,095	481	65,300	48,406	308	12,101	1,482	3,025	1,482	9,076	1,482	13,534	296
2057	65,300	588	587	29,423	387	15,888	204	10,592	178	2,354	250	3,360	481	3,095	481	65,300	48,406	308	12,101	1,484	3,025	1,484	9,076	1,484	13,534	297
2058	65,300	588	590	29,423	388	15,888	204	10,592	178	2,354	250	3,360	482	3,095	482	65,300	48,406	309	12,101	1,485	3,025	1,485	9,076	1,485	13,534	297
2059	65,300	588	594	29,423	388	15,888	204	10,592	178	2,354	250	3,360	482	3,095	482	65,300	48,406	309	12,101	1,486	3,025	1,486	9,076	1,486	13,534	297

Notes
1--Water Supply plan adapted from GEI Consultants, Inc. (2007) and CH2MHill (2005). Plan was verified with the City of Redlands Engineering Staff.
2--Santa Ana River TDS is average of samples collected at the City of Redlands' Hinkley Water Treatment Plant from 2003-2009
3--Mill Creek TDS is average of samples collected at the City of Redlands' Tate Water Treatment Plant from 2003-2009
4--Recycled water source is the City of Redlands Wastewater Treatment Plant.
5--Outdoor water use for the City of Redlands service area is 77%

Appendix A-11
Water Supply Plan for the City of Rialto

Year	City of Rialto																						
	Total Demand	Raw Groundwater (Bunker Hill A)		Raw Groundwater (Rialto)		Raw Groundwater (Lytle Basin)		Raw Groundwater (Riverside-B)		Lytle Creek Surface Water		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Rialto MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2006	14,950	5,680	330	2,840	230	4,480	210	200	325	900	210	850	490	14,950	9,310	285	2,328	1,389	1,622	1,389	5,640	264
2007	14,750	5,260	328	2,800	233	4,360	210	400	327	1,000	210	850	521	14,670	9,142	287	2,286	1,398	1,593	1,398	5,528	263
2008	14,550	4,840	327	2,760	236	4,240	210	600	329	1,100	210	850	518	14,390	8,974	287	2,244	1,397	1,564	1,397	5,416	262
2009	14,350	4,420	326	2,720	239	4,120	210	800	331	1,200	210	850	516	14,110	8,806	287	2,202	1,396	1,534	1,396	5,304	262
2010	15,560	4,000	326	2,680	242	4,000	210	1,000	333	1,300	210	2,260	514	15,240	10,048	318	2,512	1,524	1,751	1,524	5,192	262
2011	15,680	4,100	326	2,680	245	4,020	210	1,000	335	1,300	210	2,260	510	15,360	10,120	318	2,530	1,523	1,763	1,523	5,240	263
2012	15,800	4,200	326	2,680	248	4,040	210	1,000	337	1,300	210	2,260	512	15,480	10,192	319	2,548	1,527	1,776	1,527	5,288	264
2013	15,920	4,300	327	2,680	251	4,060	210	1,000	339	1,300	210	2,260	513	15,600	10,264	320	2,566	1,531	1,789	1,531	5,336	266
2014	16,040	4,400	326	2,680	254	4,080	210	1,000	341	1,300	210	2,260	515	15,720	10,336	321	2,584	1,534	1,801	1,534	5,384	267
2015	16,160	4,500	326	2,680	257	4,100	210	1,000	343	1,300	210	2,260	517	15,840	10,408	322	2,602	1,536	1,814	1,536	5,432	267
2016	16,160	4,600	326	2,680	260	4,000	210	1,000	345	1,300	210	2,260	518	15,840	10,408	323	2,602	1,543	1,814	1,543	5,432	269
2017	16,160	4,700	326	2,680	263	3,900	210	1,000	347	1,300	210	2,260	520	15,840	10,408	325	2,602	1,550	1,814	1,550	5,432	271
2018	16,160	4,800	327	2,680	266	3,800	210	1,000	349	1,300	210	2,260	523	15,840	10,408	327	2,602	1,557	1,814	1,557	5,432	272
2019	16,160	4,900	327	2,680	269	3,700	210	1,000	351	1,300	210	2,260	525	15,840	10,408	329	2,602	1,565	1,814	1,565	5,432	274
2020	16,160	5,000	328	2,680	272	3,600	210	1,000	353	1,300	210	2,260	527	15,840	10,408	331	2,602	1,573	1,814	1,573	5,432	276
2021	16,160	5,000	329	2,680	275	3,600	210	1,000	355	1,300	210	2,260	528	15,840	10,408	332	2,602	1,576	1,814	1,576	5,432	277
2022	16,160	5,000	330	2,680	278	3,600	210	1,000	357	1,300	210	2,260	530	15,840	10,408	333	2,602	1,581	1,814	1,581	5,432	278
2023	16,160	5,000	331	2,680	281	3,600	210	1,000	359	1,300	210	2,260	532	15,840	10,408	334	2,602	1,587	1,814	1,587	5,432	279
2024	16,160	5,000	332	2,680	284	3,600	210	1,000	361	1,300	210	2,260	534	15,840	10,408	335	2,602	1,592	1,814	1,592	5,432	281
2025	16,160	5,000	333	2,680	287	3,600	210	1,000	363	1,300	210	2,260	536	15,840	10,408	337	2,602	1,597	1,814	1,597	5,432	282
2026	16,160	5,000	334	2,680	290	3,600	210	1,000	365	1,300	210	2,260	536	15,840	10,408	338	2,602	1,602	1,814	1,602	5,432	283
2027	16,160	5,000	335	2,680	293	3,600	210	1,000	367	1,300	210	2,260	540	15,840	10,408	339	2,602	1,608	1,814	1,608	5,432	284
2028	16,160	5,000	336	2,680	296	3,600	210	1,000	369	1,300	210	2,260	542	15,840	10,408	341	2,602	1,614	1,814	1,614	5,432	285
2029	16,160	5,000	337	2,680	299	3,600	210	1,000	371	1,300	210	2,260	545	15,840	10,408	342	2,602	1,620	1,814	1,620	5,432	286
2030	16,160	5,000	338	2,680	302	3,600	210	1,000	373	1,300	210	2,260	548	15,840	10,408	344	2,602	1,626	1,814	1,626	5,432	287
2031	16,160	5,000	339	2,680	305	3,600	210	1,000	375	1,300	210	2,260	550	15,840	10,408	345	2,602	1,630	1,814	1,630	5,432	288
2032	16,160	5,000	340	2,680	308	3,600	210	1,000	377	1,300	210	2,260	551	15,840	10,408	346	2,602	1,635	1,814	1,635	5,432	289
2033	16,160	5,000	341	2,680	311	3,600	210	1,000	379	1,300	210	2,260	552	15,840	10,408	347	2,602	1,639	1,814	1,639	5,432	290
2034	16,160	5,000	341	2,680	314	3,600	210	1,000	381	1,300	210	2,260	553	15,840	10,408	348	2,602	1,643	1,814	1,643	5,432	291
2035	16,160	5,000	342	2,680	317	3,600	210	1,000	383	1,300	210	2,260	554	15,840	10,408	349	2,602	1,647	1,814	1,647	5,432	292
2036	16,160	5,000	343	2,680	320	3,600	210	1,000	385	1,300	210	2,260	555	15,840	10,408	350	2,602	1,651	1,814	1,651	5,432	294
2037	16,160	5,000	344	2,680	323	3,600	210	1,000	387	1,300	210	2,260	556	15,840	10,408	351	2,602	1,656	1,814	1,656	5,432	295
2038	16,160	5,000	344	2,680	326	3,600	210	1,000	389	1,300	210	2,260	557	15,840	10,408	352	2,602	1,660	1,814	1,660	5,432	296
2039	16,160	5,000	345	2,680	329	3,600	210	1,000	391	1,300	210	2,260	559	15,840	10,408	353	2,602	1,664	1,814	1,664	5,432	297
2040	16,160	5,000	346	2,680	332	3,600	210	1,000	393	1,300	210	2,260	560	15,840	10,408	354	2,602	1,668	1,814	1,668	5,432	298
2041	16,160	5,000	347	2,680	335	3,600	210	1,000	395	1,300	210	2,260	561	15,840	10,408	355	2,602	1,672	1,814	1,672	5,432	299
2042	16,160	5,000	347	2,680	338	3,600	210	1,000	397	1,300	210	2,260	562	15,840	10,408	357	2,602	1,676	1,814	1,676	5,432	300
2043	16,160	5,000	348	2,680	341	3,600	210	1,000	399	1,300	210	2,260	563	15,840	10,408	358	2,602	1,680	1,814	1,680	5,432	301
2044	16,160	5,000	349	2,680	344	3,600	210	1,000	401	1,300	210	2,260	564	15,840	10,408	359	2,602	1,684	1,814	1,684	5,432	302
2045	16,160	5,000	349	2,680	347	3,600	210	1,000	403	1,300	210	2,260	565	15,840	10,408	360	2,602	1,688	1,814	1,688	5,432	303
2046	16,160	5,000	350	2,680	350	3,600	210	1,000	405	1,300	210	2,260	566	15,840	10,408	361	2,602	1,692	1,814	1,692	5,432	303
2047	16,160	5,000	350	2,680	353	3,600	210	1,000	407	1,300	210	2,260	567	15,840	10,408	361	2,602	1,696	1,814	1,696	5,432	304
2048	16,160	5,000	351	2,680	356	3,600	210	1,000	409	1,300	210	2,260	568	15,840	10,408	362	2,602	1,700	1,814	1,700	5,432	305
2049	16,160	5,000	352	2,680	359	3,600	210	1,000	411	1,300	210	2,260	569	15,840	10,408	363	2,602	1,704	1,814	1,704	5,432	306
2050	16,160	5,000	352	2,680	362	3,600	210	1,000	413	1,300	210	2,260	570	15,840	10,408	364	2,602	1,707	1,814	1,707	5,432	307
2051	16,160	5,000	353	2,680	365	3,600	210	1,000	415	1,300	210	2,260	571	15,840	10,408	365	2,602	1,711	1,814	1,711	5,432	308
2052	16,160	5,000	353	2,680	368	3,600	210	1,000	417	1,300	210	2,260	572	15,840	10,408	366	2,602	1,715	1,814	1,715	5,432	309
2053	16,160	5,000	354	2,680	371	3,600	210	1,000	419	1,300	210	2,260	573	15,840	10,408	367	2,602	1,719	1,814	1,719	5,432	310
2054	16,160	5,000	354	2,680	374	3,600	210	1,000	421	1,300	210	2,260	575	15,840	10,408	368	2,602	1,723	1,814	1,723	5,432	311
2055	16,160	5,000	355	2,680	377	3,600	210	1,000	423	1,300	210	2,260	575	15,840	10,408	369	2,602	1,726	1,814	1,726	5,432	312
2056	16,160	5,000	355	2,680	380	3,600	210	1,000	425	1,300	210	2,260	576	15,840	10,408	370	2,602	1,730	1,814	1,730	5,432	313
2057	16,160	5,000	355	2,680	383	3,600	210	1,000	427	1,300	210	2,260	577	15,840	10,408	371	2,602	1,734	1,814	1,734	5,432	314
2058	16,160	5,000	356	2,680	386	3,600	210	1,000	429	1,300	210	2,260	578	15,840	10,408	372	2,602	1,737	1,814	1,737	5,432	315
2059	16,160	5,000	356	2,680	389	3,600	210	1,000	431	1,300	210	2,260	579	15,840	10,408	373	2,602	1,741	1,814	1,741	5,432	315

Notes
1--Water Supply plan obtained from GEI Consultants, Inc. (2007) and John Egan and Associates, Inc. (2006).
2--Groundwater from Bunker Hill-A includes water purchased from SBVMWD, delivered through the Baseline Feeder
3--TDS of Rialto groundwater increases by approximately 3 mg/L per year (Geoscience Support Services, Inc. 2009).
4--TDS of Lytle groundwater is assumed to remain constant over the planning period (Geoscience Support Services, Inc. 2009).
5--All pumping from Riverside North is from Riverside-B; Riverside B is assumed to increase 2 mg/L per year over the 2006 AWQ TDS, per historical AWQ analysis trends
6--TDS of Lytle Creek surface water is 210 mg/L per the IEUA CSRM (MJW)
7--Recycled water source is the Rialto Wastewater Treatment Plant.
8--Wastewater from the City of Rialto service area flows to the Rialto WWTP

Appendix A-12
Water Supply Plan for the City of Riverside

Year	City of Riverside																	
	Total Demand	Raw Groundwater (Bunker Hill A)		Raw Groundwater (Bunker Hill B)		Raw Groundwater (Riverside A)		Raw Groundwater (Riverside E)		Raw Groundwater (Riverside F)		Imported SWP Water		Recycled Water		Total Supply	Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L
2010	85,231	6,371	326	46,717	294	9,048	440	9,048	710	9,048	570	3,800	250	1,200	630	85,231	33,612	385
2011	86,394	6,371	326	46,717	298	9,185	440	9,185	710	9,185	570	4,100	250	1,650	634	86,394	33,898	387
2012	87,558	6,371	326	46,717	301	9,323	440	9,323	710	9,323	570	4,400	250	2,100	636	87,558	34,183	389
2013	88,721	6,371	327	46,717	304	9,461	440	9,461	710	9,461	570	4,700	250	2,550	638	88,721	34,468	392
2014	89,885	6,371	326	46,717	307	9,599	440	9,599	710	9,599	570	5,000	250	3,000	641	89,885	34,754	394
2015	91,048	6,371	326	46,717	310	9,737	440	9,737	710	9,737	570	5,300	250	3,450	643	91,048	35,039	396
2016	92,010	6,371	326	46,717	313	9,807	440	9,807	710	9,807	570	5,600	250	3,900	645	92,010	35,244	397
2017	92,972	6,371	326	46,717	316	9,878	440	9,878	710	9,878	570	5,900	250	4,350	646	92,972	35,449	398
2018	93,934	6,371	327	46,717	319	9,949	440	9,949	710	9,949	570	6,200	250	4,800	647	93,934	35,654	400
2019	94,896	6,371	327	46,717	322	10,019	440	10,019	710	10,019	570	6,500	250	5,250	649	94,896	35,858	401
2020	95,858	6,371	328	46,717	325	10,090	440	10,090	710	10,090	570	6,800	250	5,700	650	95,858	36,063	403
2021	96,653	6,371	329	46,717	328	10,125	440	10,125	710	10,125	570	7,100	250	6,090	652	96,653	36,225	404
2022	97,449	6,371	330	46,717	331	10,160	440	10,160	710	10,160	570	7,400	250	6,480	653	97,449	36,388	405
2023	98,244	6,371	331	46,717	334	10,195	440	10,195	710	10,195	570	7,700	250	6,870	654	98,244	36,550	407
2024	99,040	6,371	332	46,717	336	10,231	440	10,231	710	10,231	570	8,000	250	7,260	656	99,040	36,712	408
2025	99,835	6,371	333	46,717	339	10,266	440	10,266	710	10,266	570	8,300	250	7,650	657	99,835	36,874	409
2026	100,743	6,371	334	46,717	342	10,298	440	10,298	710	10,298	570	8,600	250	8,160	658	100,743	37,033	410
2027	101,651	6,371	335	46,717	345	10,331	440	10,331	710	10,331	570	8,900	250	8,670	659	101,651	37,192	411
2028	102,558	6,371	336	46,717	347	10,363	440	10,363	710	10,363	570	9,200	250	9,180	660	102,558	37,351	412
2029	103,466	6,371	337	46,717	350	10,396	440	10,396	710	10,396	570	9,500	250	9,690	661	103,466	37,510	413
2030	104,374	6,371	338	46,717	353	10,429	440	10,429	710	10,429	570	9,800	250	10,200	662	104,374	37,670	414
2031	104,374	6,371	339	46,717	355	10,429	440	10,429	710	10,429	570	9,800	250	10,200	663	104,374	37,670	415
2032	104,374	6,371	340	46,717	357	10,429	440	10,429	710	10,429	570	9,800	250	10,200	664	104,374	37,670	417
2033	104,374	6,371	341	46,717	359	10,429	440	10,429	710	10,429	570	9,800	250	10,200	666	104,374	37,670	418
2034	104,374	6,371	341	46,717	361	10,429	440	10,429	710	10,429	570	9,800	250	10,200	667	104,374	37,670	419
2035	104,374	6,371	342	46,717	363	10,429	440	10,429	710	10,429	570	9,800	250	10,200	668	104,374	37,670	420
2036	104,374	6,371	343	46,717	364	10,429	440	10,429	710	10,429	570	9,800	250	10,200	669	104,374	37,670	420
2037	104,374	6,371	344	46,717	366	10,429	440	10,429	710	10,429	570	9,800	250	10,200	669	104,374	37,670	421
2038	104,374	6,371	344	46,717	368	10,429	440	10,429	710	10,429	570	9,800	250	10,200	670	104,374	37,670	422
2039	104,374	6,371	345	46,717	369	10,429	440	10,429	710	10,429	570	9,800	250	10,200	671	104,374	37,670	423
2040	104,374	6,371	346	46,717	371	10,429	440	10,429	710	10,429	570	9,800	250	10,200	672	104,374	37,670	424
2041	104,374	6,371	347	46,717	372	10,429	440	10,429	710	10,429	570	9,800	250	10,200	673	104,374	37,670	424
2042	104,374	6,371	347	46,717	373	10,429	440	10,429	710	10,429	570	9,800	250	10,200	673	104,374	37,670	425
2043	104,374	6,371	348	46,717	375	10,429	440	10,429	710	10,429	570	9,800	250	10,200	674	104,374	37,670	426
2044	104,374	6,371	349	46,717	376	10,429	440	10,429	710	10,429	570	9,800	250	10,200	675	104,374	37,670	426
2045	104,374	6,371	349	46,717	377	10,429	440	10,429	710	10,429	570	9,800	250	10,200	675	104,374	37,670	427
2046	104,374	6,371	350	46,717	378	10,429	440	10,429	710	10,429	570	9,800	250	10,200	676	104,374	37,670	428
2047	104,374	6,371	350	46,717	379	10,429	440	10,429	710	10,429	570	9,800	250	10,200	677	104,374	37,670	428
2048	104,374	6,371	351	46,717	380	10,429	440	10,429	710	10,429	570	9,800	250	10,200	677	104,374	37,670	429
2049	104,374	6,371	352	46,717	381	10,429	440	10,429	710	10,429	570	9,800	250	10,200	678	104,374	37,670	429
2050	104,374	6,371	352	46,717	382	10,429	440	10,429	710	10,429	570	9,800	250	10,200	678	104,374	37,670	430
2051	104,374	6,371	353	46,717	383	10,429	440	10,429	710	10,429	570	9,800	250	10,200	679	104,374	37,670	430
2052	104,374	6,371	353	46,717	384	10,429	440	10,429	710	10,429	570	9,800	250	10,200	679	104,374	37,670	431
2053	104,374	6,371	354	46,717	384	10,429	440	10,429	710	10,429	570	9,800	250	10,200	680	104,374	37,670	431
2054	104,374	6,371	354	46,717	385	10,429	440	10,429	710	10,429	570	9,800	250	10,200	680	104,374	37,670	431
2055	104,374	6,371	355	46,717	386	10,429	440	10,429	710	10,429	570	9,800	250	10,200	680	104,374	37,670	432
2056	104,374	6,371	355	46,717	387	10,429	440	10,429	710	10,429	570	9,800	250	10,200	681	104,374	37,670	432
2057	104,374	6,371	355	46,717	387	10,429	440	10,429	710	10,429	570	9,800	250	10,200	681	104,374	37,670	433
2058	104,374	6,371	356	46,717	388	10,429	440	10,429	710	10,429	570	9,800	250	10,200	682	104,374	37,670	433
2059	104,374	6,371	356	46,717	388	10,429	440	10,429	710	10,429	570	9,800	250	10,200	682	104,374	37,670	433

Notes
1--Water supply plan adapted from GEI Consultants, Inc. (2007) and City of Riverside (2005).
2--Distribution of pumping between Riverside-A, -E, and -F approximated based on the spatial location of the City's production wells.
3--TDS of Riverside-A, -E, and -F are assumed to remain constant at the 2006 AWQ TDS concentration per historical AWQ analysis trends.
4--Recycled water source is the Riverside Regional Water Quality Control Plant.

Appendix A-13
Water Supply Plan for the City of San Bernardino

Year	City of San Bernardino															
	Total Demand	Raw Groundwater (Bunker Hill A)		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Bunker Hill-B MZ		Return Flow to Bunker Hill-A MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	53,940	53,100	326	840	330	53,940	32,700	326	8,175	1,555	1,700	1,555	5,796	1,555	21,240	326
2011	55,360	54,520	326	840	330	55,360	33,552	326	8,388	1,555	1,745	1,555	5,947	1,555	21,808	326
2012	56,780	55,940	326	840	332	56,780	34,404	327	8,601	1,556	1,789	1,556	6,098	1,556	22,376	326
2013	58,199	57,359	327	840	332	58,199	35,256	327	8,814	1,559	1,833	1,559	6,249	1,559	22,944	327
2014	59,619	58,779	326	840	333	59,619	36,108	326	9,027	1,556	1,878	1,556	6,400	1,556	23,512	326
2015	61,039	60,199	326	840	333	61,039	36,959	326	9,240	1,554	1,922	1,554	6,551	1,554	24,080	326
2016	62,201	61,361	326	840	334	62,201	37,657	326	9,414	1,554	1,958	1,554	6,675	1,554	24,544	326
2017	63,363	62,523	326	840	335	63,363	38,354	326	9,589	1,555	1,994	1,555	6,798	1,555	25,009	326
2018	64,526	63,686	327	840	336	64,526	39,051	327	9,763	1,557	2,031	1,557	6,922	1,557	25,474	327
2019	65,688	64,848	327	840	337	65,688	39,749	327	9,937	1,560	2,067	1,560	7,045	1,560	25,939	327
2020	66,850	66,010	328	840	338	66,850	40,446	328	10,112	1,563	2,103	1,563	7,169	1,563	26,404	328
2021	68,013	67,173	329	840	340	68,013	41,144	329	10,286	1,566	2,139	1,566	7,293	1,566	26,869	329
2022	69,176	68,336	330	840	341	69,176	41,841	330	10,460	1,569	2,176	1,569	7,416	1,569	27,334	330
2023	70,338	69,498	331	840	343	70,338	42,539	331	10,635	1,573	2,212	1,573	7,540	1,573	27,799	331
2024	71,501	70,661	332	840	344	71,501	43,237	332	10,809	1,578	2,248	1,578	7,664	1,578	28,264	332
2025	72,664	71,824	333	840	346	72,664	43,934	333	10,984	1,583	2,285	1,583	7,787	1,583	28,730	333
2026	72,664	71,824	334	840	347	72,664	43,934	334	10,984	1,587	2,285	1,587	7,787	1,587	28,730	334
2027	72,664	71,824	335	840	349	72,664	43,934	335	10,984	1,591	2,285	1,591	7,787	1,591	28,730	335
2028	72,664	71,824	336	840	350	72,664	43,934	336	10,984	1,596	2,285	1,596	7,787	1,596	28,730	336
2029	72,664	71,824	337	840	352	72,664	43,934	337	10,984	1,600	2,285	1,600	7,787	1,600	28,730	337
2030	72,664	71,824	338	840	353	72,664	43,934	338	10,984	1,604	2,285	1,604	7,787	1,604	28,730	338
2031	72,664	71,824	339	840	355	72,664	43,934	339	10,984	1,607	2,285	1,607	7,787	1,607	28,730	339
2032	72,664	71,824	340	840	356	72,664	43,934	340	10,984	1,610	2,285	1,610	7,787	1,610	28,730	340
2033	72,664	71,824	341	840	357	72,664	43,934	341	10,984	1,613	2,285	1,613	7,787	1,613	28,730	341
2034	72,664	71,824	341	840	358	72,664	43,934	342	10,984	1,616	2,285	1,616	7,787	1,616	28,730	341
2035	72,664	71,824	342	840	359	72,664	43,934	342	10,984	1,620	2,285	1,620	7,787	1,620	28,730	342
2036	72,664	71,824	343	840	360	72,664	43,934	343	10,984	1,623	2,285	1,623	7,787	1,623	28,730	343
2037	72,664	71,824	344	840	361	72,664	43,934	344	10,984	1,626	2,285	1,626	7,787	1,626	28,730	344
2038	72,664	71,824	344	840	362	72,664	43,934	345	10,984	1,629	2,285	1,629	7,787	1,629	28,730	344
2039	72,664	71,824	345	840	363	72,664	43,934	345	10,984	1,632	2,285	1,632	7,787	1,632	28,730	345
2040	72,664	71,824	346	840	364	72,664	43,934	346	10,984	1,635	2,285	1,635	7,787	1,635	28,730	346
2041	72,664	71,824	347	840	365	72,664	43,934	347	10,984	1,638	2,285	1,638	7,787	1,638	28,730	347
2042	72,664	71,824	347	840	366	72,664	43,934	348	10,984	1,640	2,285	1,640	7,787	1,640	28,730	347
2043	72,664	71,824	348	840	366	72,664	43,934	348	10,984	1,643	2,285	1,643	7,787	1,643	28,730	348
2044	72,664	71,824	349	840	367	72,664	43,934	349	10,984	1,646	2,285	1,646	7,787	1,646	28,730	349
2045	72,664	71,824	349	840	368	72,664	43,934	350	10,984	1,648	2,285	1,648	7,787	1,648	28,730	349
2046	72,664	71,824	350	840	369	72,664	43,934	350	10,984	1,651	2,285	1,651	7,787	1,651	28,730	350
2047	72,664	71,824	350	840	369	72,664	43,934	351	10,984	1,653	2,285	1,653	7,787	1,653	28,730	350
2048	72,664	71,824	351	840	370	72,664	43,934	351	10,984	1,656	2,285	1,656	7,787	1,656	28,730	351
2049	72,664	71,824	352	840	371	72,664	43,934	352	10,984	1,658	2,285	1,658	7,787	1,658	28,730	352
2050	72,664	71,824	352	840	371	72,664	43,934	353	10,984	1,660	2,285	1,660	7,787	1,660	28,730	352
2051	72,664	71,824	353	840	372	72,664	43,934	353	10,984	1,662	2,285	1,662	7,787	1,662	28,730	353
2052	72,664	71,824	353	840	373	72,664	43,934	354	10,984	1,664	2,285	1,664	7,787	1,664	28,730	353
2053	72,664	71,824	354	840	373	72,664	43,934	354	10,984	1,666	2,285	1,666	7,787	1,666	28,730	354
2054	72,664	71,824	354	840	374	72,664	43,934	355	10,984	1,668	2,285	1,668	7,787	1,668	28,730	354
2055	72,664	71,824	355	840	374	72,664	43,934	355	10,984	1,670	2,285	1,670	7,787	1,670	28,730	355
2056	72,664	71,824	355	840	375	72,664	43,934	355	10,984	1,672	2,285	1,672	7,787	1,672	28,730	355
2057	72,664	71,824	355	840	375	72,664	43,934	356	10,984	1,673	2,285	1,673	7,787	1,673	28,730	355
2058	72,664	71,824	356	840	376	72,664	43,934	356	10,984	1,675	2,285	1,675	7,787	1,675	28,730	356
2059	72,664	71,824	356	840	376	72,664	43,934	357	10,984	1,677	2,285	1,677	7,787	1,677	28,730	356

Notes
1--Water Supply plan obtained from GEI Consultants, Inc. (2007) and CDM, (2005). Plan was verified with the City of San Bernardino's Engineering Staff.
2--Based on the City's TDS waste increment report, there are no active wells pumping in the Bunker Hill-B Management Zone.
3--Recycled water source is the San Bernardino WRF.
4--Wastewater from the City service area flows to the San Bernardino WRF.

Appendix A-14
Water Supply Plan for the City of Upland

Year	City of Upland																	
	Total Demand	Pumped Chino North Groundwater		Other Groundwater		Imported SWP Water		San Antonio Canyon		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	21,400	1,284	259	6,420	210	5,778	250	7,918	170	21,400	14,552	209	3,638	1,086	2,619	1,086	6,848	209
2011	21,185	1,455	264	6,420	210	5,478	250	7,832	170	21,185	14,406	209	3,601	1,087	2,593	1,087	6,779	209
2012	21,058	1,558	269	6,420	210	5,299	250	7,781	170	21,058	14,319	210	3,580	1,089	2,577	1,089	6,739	210
2013	20,758	1,798	275	6,420	210	4,879	250	7,661	170	20,758	14,115	210	3,529	1,091	2,541	1,091	6,643	210
2014	20,545	1,969	279	6,420	210	4,580	250	7,576	170	20,545	13,971	211	3,493	1,093	2,515	1,093	6,574	211
2015	20,330	2,140	283	6,420	210	4,280	250	7,490	170	20,330	13,824	211	3,456	1,096	2,488	1,096	6,506	211
2016	20,330	2,140	286	6,420	210	4,280	250	7,490	170	20,330	13,824	212	3,456	1,097	2,488	1,097	6,506	212
2017	20,330	2,140	289	6,420	210	4,280	250	7,490	170	20,330	13,824	212	3,456	1,098	2,488	1,098	6,506	212
2018	20,330	2,140	292	6,420	210	4,280	250	7,490	170	20,330	13,824	212	3,456	1,099	2,488	1,099	6,506	212
2019	20,330	2,140	297	6,420	210	4,280	250	7,490	170	20,330	13,824	213	3,456	1,101	2,488	1,101	6,506	213
2020	20,330	2,140	302	6,420	210	4,280	250	7,490	170	20,330	13,824	213	3,456	1,103	2,488	1,103	6,506	213
2021	20,330	2,140	307	6,420	210	4,280	250	7,490	170	20,330	13,824	214	3,456	1,106	2,488	1,106	6,506	214
2022	20,330	2,140	313	6,420	210	4,280	250	7,490	170	20,330	13,824	214	3,456	1,108	2,488	1,108	6,506	214
2023	20,330	2,140	318	6,420	210	4,280	250	7,490	170	20,330	13,824	215	3,456	1,110	2,488	1,110	6,506	215
2024	20,330	2,140	322	6,420	210	4,280	250	7,490	170	20,330	13,824	216	3,456	1,112	2,488	1,112	6,506	216
2025	20,330	2,140	326	6,420	210	4,280	250	7,490	170	20,330	13,824	216	3,456	1,114	2,488	1,114	6,506	216
2026	20,330	2,140	331	6,420	210	4,280	250	7,490	170	20,330	13,824	216	3,456	1,116	2,488	1,116	6,506	216
2027	20,330	2,140	336	6,420	210	4,280	250	7,490	170	20,330	13,824	217	3,456	1,118	2,488	1,118	6,506	217
2028	20,330	2,140	341	6,420	210	4,280	250	7,490	170	20,330	13,824	217	3,456	1,120	2,488	1,120	6,506	217
2029	20,330	2,140	346	6,420	210	4,280	250	7,490	170	20,330	13,824	218	3,456	1,122	2,488	1,122	6,506	218
2030	20,330	2,140	354	6,420	210	4,280	250	7,490	170	20,330	13,824	219	3,456	1,125	2,488	1,125	6,506	219
2031	20,330	2,140	362	6,420	210	4,280	250	7,490	170	20,330	13,824	220	3,456	1,129	2,488	1,129	6,506	220
2032	20,330	2,140	371	6,420	210	4,280	250	7,490	170	20,330	13,824	221	3,456	1,132	2,488	1,132	6,506	221
2033	20,330	2,140	379	6,420	210	4,280	250	7,490	170	20,330	13,824	221	3,456	1,136	2,488	1,136	6,506	221
2034	20,330	2,140	382	6,420	210	4,280	250	7,490	170	20,330	13,824	222	3,456	1,137	2,488	1,137	6,506	222
2035	20,330	2,140	386	6,420	210	4,280	250	7,490	170	20,330	13,824	222	3,456	1,139	2,488	1,139	6,506	222
2036	20,330	2,140	389	6,420	210	4,280	250	7,490	170	20,330	13,824	222	3,456	1,140	2,488	1,140	6,506	222
2037	20,330	2,140	392	6,420	210	4,280	250	7,490	170	20,330	13,824	223	3,456	1,141	2,488	1,141	6,506	223
2038	20,330	2,140	395	6,420	210	4,280	250	7,490	170	20,330	13,824	223	3,456	1,143	2,488	1,143	6,506	223
2039	20,330	2,140	398	6,420	210	4,280	250	7,490	170	20,330	13,824	223	3,456	1,144	2,488	1,144	6,506	223
2040	20,330	2,140	406	6,420	210	4,280	250	7,490	170	20,330	13,824	224	3,456	1,147	2,488	1,147	6,506	224
2041	20,330	2,140	415	6,420	210	4,280	250	7,490	170	20,330	13,824	225	3,456	1,151	2,488	1,151	6,506	225
2042	20,330	2,140	424	6,420	210	4,280	250	7,490	170	20,330	13,824	226	3,456	1,155	2,488	1,155	6,506	226
2043	20,330	2,140	433	6,420	210	4,280	250	7,490	170	20,330	13,824	227	3,456	1,159	2,488	1,159	6,506	227
2044	20,330	2,140	435	6,420	210	4,280	250	7,490	170	20,330	13,824	227	3,456	1,160	2,488	1,160	6,506	227
2045	20,330	2,140	438	6,420	210	4,280	250	7,490	170	20,330	13,824	228	3,456	1,161	2,488	1,161	6,506	228
2046	20,330	2,140	440	6,420	210	4,280	250	7,490	170	20,330	13,824	228	3,456	1,161	2,488	1,161	6,506	228
2047	20,330	2,140	442	6,420	210	4,280	250	7,490	170	20,330	13,824	228	3,456	1,162	2,488	1,162	6,506	228
2048	20,330	2,140	444	6,420	210	4,280	250	7,490	170	20,330	13,824	228	3,456	1,163	2,488	1,163	6,506	228
2049	20,330	2,140	446	6,420	210	4,280	250	7,490	170	20,330	13,824	229	3,456	1,164	2,488	1,164	6,506	229
2050	20,330	2,140	455	6,420	210	4,280	250	7,490	170	20,330	13,824	230	3,456	1,168	2,488	1,168	6,506	230
2051	20,330	2,140	465	6,420	210	4,280	250	7,490	170	20,330	13,824	230	3,456	1,172	2,488	1,172	6,506	230
2052	20,330	2,140	474	6,420	210	4,280	250	7,490	170	20,330	13,824	231	3,456	1,176	2,488	1,176	6,506	231
2053	20,330	2,140	483	6,420	210	4,280	250	7,490	170	20,330	13,824	232	3,456	1,180	2,488	1,180	6,506	232
2054	20,330	2,140	485	6,420	210	4,280	250	7,490	170	20,330	13,824	233	3,456	1,180	2,488	1,180	6,506	233
2055	20,330	2,140	486	6,420	210	4,280	250	7,490	170	20,330	13,824	233	3,456	1,181	2,488	1,181	6,506	233
2056	20,330	2,140	488	6,420	210	4,280	250	7,490	170	20,330	13,824	233	3,456	1,182	2,488	1,182	6,506	233
2057	20,330	2,140	489	6,420	210	4,280	250	7,490	170	20,330	13,824	233	3,456	1,182	2,488	1,182	6,506	233
2058	20,330	2,140	491	6,420	210	4,280	250	7,490	170	20,330	13,824	233	3,456	1,183	2,488	1,183	6,506	233
2059	20,330	2,140	492	6,420	210	4,280	250	7,490	170	20,330	13,824	233	3,456	1,184	2,488	1,184	6,506	233

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/ added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Other groundwater sources are Cucamonga and Claremont Basins.

Appendix A-15
Cucamonga Valley Water District

Year	Cucamonga Valley Water District																				
	Total Demand	Pumped Chino North Groundwater		Cucamonga Groundwater		Imported SWP Water		Deer and Cucamonga Canyons		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	60,798	16,598	259	5,400	215	33,000	250	2,500	160	3,300	509	60,798	42,399	266	10,600	1,313	5,512	1,313	18,399	245
2011	61,152	17,524	264	5,400	215	31,148	250	2,500	160	4,580	511	61,152	43,049	275	10,762	1,350	5,596	1,350	18,103	247
2012	61,937	18,080	269	5,400	215	31,889	250	2,500	160	4,068	514	61,937	43,419	274	10,855	1,345	5,644	1,345	18,518	249
2013	62,718	19,377	275	5,400	215	30,221	250	2,500	160	5,220	517	62,718	44,319	283	11,080	1,380	5,761	1,380	18,399	251
2014	63,358	20,303	279	5,400	215	29,295	250	2,500	160	5,860	520	63,358	44,959	288	11,240	1,402	5,845	1,402	18,399	253
2015	63,998	21,229	283	5,400	215	28,369	250	2,500	160	6,500	522	63,998	45,599	293	11,400	1,423	5,928	1,423	18,399	255
2016	65,098	22,329	286	5,400	215	28,369	250	2,500	160	6,500	524	65,098	46,347	294	11,587	1,427	6,025	1,427	18,751	257
2017	65,758	22,989	289	5,400	215	28,369	250	2,500	160	6,500	526	65,758	46,795	295	11,699	1,432	6,083	1,432	18,963	258
2018	67,298	24,529	292	5,400	215	28,369	250	2,500	160	6,500	527	67,298	47,843	297	11,961	1,436	6,220	1,436	19,455	260
2019	68,398	25,629	297	5,400	215	28,369	250	2,500	160	6,500	529	68,398	48,591	298	12,148	1,444	6,317	1,444	19,807	263
2020	69,498	26,729	302	5,400	215	28,369	250	2,500	160	6,500	531	69,498	49,339	301	12,335	1,452	6,414	1,452	20,159	266
2021	70,818	28,049	307	5,400	215	28,369	250	2,500	160	6,500	534	70,818	50,236	303	12,559	1,461	6,531	1,461	20,582	269
2022	72,138	29,369	313	5,400	215	28,369	250	2,500	160	6,500	537	72,138	51,134	305	12,783	1,472	6,647	1,472	21,004	272
2023	72,798	30,029	318	5,400	215	28,369	250	2,500	160	6,500	540	72,798	51,583	308	12,896	1,482	6,706	1,482	21,215	275
2024	73,898	31,129	322	5,400	215	28,369	250	2,500	160	6,500	543	73,898	52,331	310	13,083	1,491	6,803	1,491	21,567	277
2025	74,998	32,229	326	5,400	215	28,369	250	2,500	160	6,500	545	74,998	53,079	312	13,270	1,499	6,900	1,499	21,919	280
2026	76,098	33,329	331	5,400	215	28,369	250	2,500	160	6,500	547	76,098	53,827	315	13,457	1,509	6,997	1,509	22,271	283
2027	77,198	34,429	336	5,400	215	28,369	250	2,500	160	6,500	550	77,198	54,575	317	13,644	1,519	7,095	1,519	22,623	286
2028	78,738	35,969	341	5,400	215	28,369	250	2,500	160	6,500	553	78,738	55,622	320	13,905	1,531	7,231	1,531	23,116	289
2029	79,398	36,629	346	5,400	215	28,369	250	2,500	160	6,500	556	79,398	56,071	323	14,018	1,542	7,289	1,542	23,327	293
2030	80,498	37,729	354	5,400	215	28,369	250	2,500	160	6,500	559	80,498	56,819	327	14,205	1,559	7,386	1,559	23,679	297
2031	80,498	37,729	362	5,400	215	28,369	250	2,500	160	6,500	563	80,498	56,819	331	14,205	1,576	7,386	1,576	23,679	302
2032	80,498	37,729	371	5,400	215	28,369	250	2,500	160	6,500	567	80,498	56,819	336	14,205	1,593	7,386	1,593	23,679	306
2033	80,498	37,729	379	5,400	215	28,369	250	2,500	160	6,500	572	80,498	56,819	340	14,205	1,611	7,386	1,611	23,679	310
2034	80,498	37,729	382	5,400	215	28,369	250	2,500	160	6,500	576	80,498	56,819	342	14,205	1,619	7,386	1,619	23,679	312
2035	80,498	37,729	386	5,400	215	28,369	250	2,500	160	6,500	578	80,498	56,819	344	14,205	1,625	7,386	1,625	23,679	314
2036	80,498	37,729	389	5,400	215	28,369	250	2,500	160	6,500	580	80,498	56,819	345	14,205	1,632	7,386	1,632	23,679	315
2037	80,498	37,729	392	5,400	215	28,369	250	2,500	160	6,500	581	80,498	56,819	347	14,205	1,638	7,386	1,638	23,679	317
2038	80,498	37,729	395	5,400	215	28,369	250	2,500	160	6,500	583	80,498	56,819	349	14,205	1,644	7,386	1,644	23,679	318
2039	80,498	37,729	398	5,400	215	28,369	250	2,500	160	6,500	585	80,498	56,819	350	14,205	1,650	7,386	1,650	23,679	320
2040	80,498	37,729	406	5,400	215	28,369	250	2,500	160	6,500	586	80,498	56,819	354	14,205	1,666	7,386	1,666	23,679	324
2041	80,498	37,729	415	5,400	215	28,369	250	2,500	160	6,500	591	80,498	56,819	359	14,205	1,684	7,386	1,684	23,679	329
2042	80,498	37,729	424	5,400	215	28,369	250	2,500	160	6,500	595	80,498	56,819	363	14,205	1,702	7,386	1,702	23,679	333
2043	80,498	37,729	433	5,400	215	28,369	250	2,500	160	6,500	600	80,498	56,819	368	14,205	1,721	7,386	1,721	23,679	338
2044	80,498	37,729	435	5,400	215	28,369	250	2,500	160	6,500	605	80,498	56,819	369	14,205	1,727	7,386	1,727	23,679	339
2045	80,498	37,729	438	5,400	215	28,369	250	2,500	160	6,500	606	80,498	56,819	370	14,205	1,732	7,386	1,732	23,679	340
2046	80,498	37,729	440	5,400	215	28,369	250	2,500	160	6,500	607	80,498	56,819	372	14,205	1,736	7,386	1,736	23,679	341
2047	80,498	37,729	442	5,400	215	28,369	250	2,500	160	6,500	608	80,498	56,819	373	14,205	1,741	7,386	1,741	23,679	342
2048	80,498	37,729	444	5,400	215	28,369	250	2,500	160	6,500	610	80,498	56,819	374	14,205	1,746	7,386	1,746	23,679	343
2049	80,498	37,729	446	5,400	215	28,369	250	2,500	160	6,500	611	80,498	56,819	375	14,205	1,750	7,386	1,750	23,679	345
2050	80,498	37,729	455	5,400	215	28,369	250	2,500	160	6,500	612	80,498	56,819	379	14,205	1,767	7,386	1,767	23,679	349
2051	80,498	37,729	465	5,400	215	28,369	250	2,500	160	6,500	617	80,498	56,819	384	14,205	1,785	7,386	1,785	23,679	354
2052	80,498	37,729	474	5,400	215	28,369	250	2,500	160	6,500	621	80,498	56,819	389	14,205	1,804	7,386	1,804	23,679	359
2053	80,498	37,729	483	5,400	215	28,369	250	2,500	160	6,500	626	80,498	56,819	393	14,205	1,824	7,386	1,824	23,679	363
2054	80,498	37,729	485	5,400	215	28,369	250	2,500	160	6,500	631	80,498	56,819	395	14,205	1,829	7,386	1,829	23,679	364
2055	80,498	37,729	486	5,400	215	28,369	250	2,500	160	6,500	632	80,498	56,819	395	14,205	1,832	7,386	1,832	23,679	365
2056	80,498	37,729	488	5,400	215	28,369	250	2,500	160	6,500	633	80,498	56,819	396	14,205	1,835	7,386	1,835	23,679	366
2057	80,498	37,729	489	5,400	215	28,369	250	2,500	160	6,500	634	80,498	56,819	397	14,205	1,838	7,386	1,838	23,679	366
2058	80,498	37,729	491	5,400	215	28,369	250	2,500	160	6,500	634	80,498	56,819	398	14,205	1,841	7,386	1,841	23,679	367
2059	80,498	37,729	492	5,400	215	28,369	250	2,500	160	6,500	635	80,498	56,819	398	14,205	1,844	7,386	1,844	23,679	368

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of
mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Recycled water source is IEUA; All IEUA WWTPs regulated as one composite discharge.

Appendix A-16
Water Supply Plan for the East Valley Water District

Year	East Valley Water District																		
	Total Demand	Raw Groundwater (Bunker Hill A)		Raw Groundwater (Bunker Hill-B)		Santa Ana River		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Bunker Hill-B MZ		Return Flow to Bunker Hill-A MZ		Flow to San Bernardino WRF	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	31,400	6,673	326	20,018	294	4,710	204	31,400	18,840	287	4,710	1,400	4,390	1,400	320	1,400	12,560	287
2011	31,960	6,792	326	20,375	298	4,794	204	31,960	19,176	290	4,794	1,409	4,468	1,409	326	1,409	12,784	290
2012	32,520	6,911	326	19,756	301	5,854	204	32,520	19,512	289	4,878	1,406	4,546	1,406	332	1,406	13,008	289
2013	33,080	6,755	327	20,266	304	6,059	204	33,080	19,848	291	4,962	1,413	4,625	1,413	337	1,413	13,232	291
2014	33,640	6,870	326	20,609	307	6,162	204	33,640	20,184	292	5,046	1,419	4,703	1,419	343	1,419	13,456	292
2015	34,200	6,984	326	20,952	310	6,264	204	34,200	20,520	294	5,130	1,426	4,781	1,426	349	1,426	13,680	294
2016	34,540	7,053	326	21,160	313	6,327	204	34,540	20,724	296	5,181	1,433	4,829	1,433	352	1,433	13,816	296
2017	34,880	7,123	326	21,368	316	6,389	204	34,880	20,928	298	5,232	1,441	4,876	1,441	356	1,441	13,952	298
2018	35,220	7,192	327	21,577	319	6,451	204	35,220	21,132	300	5,283	1,448	4,924	1,448	359	1,448	14,088	300
2019	35,560	7,262	327	21,785	322	6,514	204	35,560	21,336	301	5,334	1,456	4,971	1,456	363	1,456	14,224	301
2020	35,900	7,331	328	21,993	325	6,576	204	35,900	21,540	303	5,385	1,464	5,019	1,464	366	1,464	14,360	303
2021	35,900	7,331	329	21,993	328	6,576	204	35,900	21,540	305	5,385	1,471	5,019	1,471	366	1,471	14,360	305
2022	35,900	7,331	330	21,993	331	6,576	204	35,900	21,540	307	5,385	1,479	5,019	1,479	366	1,479	14,360	307
2023	35,900	7,331	331	21,993	334	6,576	204	35,900	21,540	309	5,385	1,487	5,019	1,487	366	1,487	14,360	309
2024	35,900	7,331	332	21,993	336	6,576	204	35,900	21,540	311	5,385	1,495	5,019	1,495	366	1,495	14,360	311
2025	35,900	7,331	333	21,993	339	6,576	204	35,900	21,540	313	5,385	1,503	5,019	1,503	366	1,503	14,360	313
2026	35,900	7,331	334	21,993	342	6,576	204	35,900	21,540	315	5,385	1,510	5,019	1,510	366	1,510	14,360	315
2027	35,900	7,331	335	21,993	345	6,576	204	35,900	21,540	317	5,385	1,518	5,019	1,518	366	1,518	14,360	317
2028	35,900	7,331	336	21,993	347	6,576	204	35,900	21,540	319	5,385	1,525	5,019	1,525	366	1,525	14,360	319
2029	35,900	7,331	337	21,993	350	6,576	204	35,900	21,540	321	5,385	1,532	5,019	1,532	366	1,532	14,360	321
2030	35,900	7,331	338	21,993	353	6,576	204	35,900	21,540	322	5,385	1,540	5,019	1,540	366	1,540	14,360	322
2031	35,900	7,331	339	21,993	355	6,576	204	35,900	21,540	324	5,385	1,546	5,019	1,546	366	1,546	14,360	324
2032	35,900	7,331	340	21,993	357	6,576	204	35,900	21,540	325	5,385	1,552	5,019	1,552	366	1,552	14,360	325
2033	35,900	7,331	341	21,993	359	6,576	204	35,900	21,540	327	5,385	1,557	5,019	1,557	366	1,557	14,360	327
2034	35,900	7,331	341	21,993	361	6,576	204	35,900	21,540	328	5,385	1,562	5,019	1,562	366	1,562	14,360	328
2035	35,900	7,331	342	21,993	363	6,576	204	35,900	21,540	329	5,385	1,568	5,019	1,568	366	1,568	14,360	329
2036	35,900	7,331	343	21,993	364	6,576	204	35,900	21,540	331	5,385	1,572	5,019	1,572	366	1,572	14,360	331
2037	35,900	7,331	344	21,993	366	6,576	204	35,900	21,540	332	5,385	1,577	5,019	1,577	366	1,577	14,360	332
2038	35,900	7,331	344	21,993	368	6,576	204	35,900	21,540	333	5,385	1,582	5,019	1,582	366	1,582	14,360	333
2039	35,900	7,331	345	21,993	369	6,576	204	35,900	21,540	334	5,385	1,586	5,019	1,586	366	1,586	14,360	334
2040	35,900	7,331	346	21,993	371	6,576	204	35,900	21,540	335	5,385	1,590	5,019	1,590	366	1,590	14,360	335
2041	35,900	7,331	347	21,993	372	6,576	204	35,900	21,540	336	5,385	1,594	5,019	1,594	366	1,594	14,360	336
2042	35,900	7,331	347	21,993	373	6,576	204	35,900	21,540	337	5,385	1,598	5,019	1,598	366	1,598	14,360	337
2043	35,900	7,331	348	21,993	375	6,576	204	35,900	21,540	338	5,385	1,601	5,019	1,601	366	1,601	14,360	338
2044	35,900	7,331	349	21,993	376	6,576	204	35,900	21,540	339	5,385	1,605	5,019	1,605	366	1,605	14,360	339
2045	35,900	7,331	349	21,993	377	6,576	204	35,900	21,540	340	5,385	1,608	5,019	1,608	366	1,608	14,360	340
2046	35,900	7,331	350	21,993	378	6,576	204	35,900	21,540	340	5,385	1,611	5,019	1,611	366	1,611	14,360	340
2047	35,900	7,331	350	21,993	379	6,576	204	35,900	21,540	341	5,385	1,614	5,019	1,614	366	1,614	14,360	341
2048	35,900	7,331	351	21,993	380	6,576	204	35,900	21,540	342	5,385	1,617	5,019	1,617	366	1,617	14,360	342
2049	35,900	7,331	352	21,993	381	6,576	204	35,900	21,540	343	5,385	1,620	5,019	1,620	366	1,620	14,360	343
2050	35,900	7,331	352	21,993	382	6,576	204	35,900	21,540	343	5,385	1,623	5,019	1,623	366	1,623	14,360	343
2051	35,900	7,331	353	21,993	383	6,576	204	35,900	21,540	344	5,385	1,625	5,019	1,625	366	1,625	14,360	344
2052	35,900	7,331	353	21,993	384	6,576	204	35,900	21,540	344	5,385	1,628	5,019	1,628	366	1,628	14,360	344
2053	35,900	7,331	354	21,993	384	6,576	204	35,900	21,540	345	5,385	1,630	5,019	1,630	366	1,630	14,360	345
2054	35,900	7,331	354	21,993	385	6,576	204	35,900	21,540	346	5,385	1,632	5,019	1,632	366	1,632	14,360	346
2055	35,900	7,331	355	21,993	386	6,576	204	35,900	21,540	346	5,385	1,635	5,019	1,635	366	1,635	14,360	346
2056	35,900	7,331	355	21,993	387	6,576	204	35,900	21,540	347	5,385	1,637	5,019	1,637	366	1,637	14,360	347
2057	35,900	7,331	355	21,993	387	6,576	204	35,900	21,540	347	5,385	1,639	5,019	1,639	366	1,639	14,360	347
2058	35,900	7,331	356	21,993	388	6,576	204	35,900	21,540	348	5,385	1,641	5,019	1,641	366	1,641	14,360	348
2059	35,900	7,331	356	21,993	388	6,576	204	35,900	21,540	348	5,385	1,642	5,019	1,642	366	1,642	14,360	348

Notes

1--Water Supply plan obtained from GEI Consultants, Inc. (2007) and Lilburn Corporation, (2005). Plan was verified with EVWD's Engineering Staff.

2--Santa Ana River TDS is average of samples collected at the City of Redlands' Hinkley Water Treatment Plant from 2003-2009.

3--Wastewater from EVWD service area flows to the San Bernardino WRF.

Appendix A-17
Water Supply Plan for the Elsionor Valley Municipal Water District

Year	Elsinore Valley Municipal Water District																		
	Total Demand	Groundwater Elsinore Basin		TVP (SWP from Mills Plant)		AVP (SWP/CRA from Skinner Plant)		Canyon Lake WTP		Total Supply		Outdoor Water Use		Total Return Flow		Return Flow to Elsinore Management Zone		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	36,000	8,280	470	2,556	250	23,004	542	2,160	705	36,000	514	14,040	514	3,510	2,308	1,404	2,308	21,960	514
2011	37,200	8,556	471	2,641	250	23,771	542	2,232	705	37,200	515	14,508	515	3,627	2,309	1,451	2,309	22,692	515
2012	38,400	8,832	471	2,726	250	24,538	542	2,304	705	38,400	515	14,976	515	3,744	2,309	1,498	2,309	23,424	515
2013	39,600	9,108	472	2,812	250	25,304	542	2,376	705	39,600	515	15,444	515	3,861	2,310	1,544	2,310	24,156	515
2014	40,800	9,384	473	2,897	250	26,071	542	2,448	705	40,800	515	15,912	515	3,978	2,311	1,591	2,311	24,888	515
2015	42,000	9,660	474	2,982	250	26,838	542	2,520	705	42,000	515	16,380	515	4,095	2,311	1,638	2,311	25,620	515
2016	43,200	9,936	475	3,067	250	27,605	542	2,592	705	43,200	516	16,848	516	4,212	2,312	1,685	2,312	26,352	516
2017	44,400	10,212	475	3,152	250	28,372	542	2,664	705	44,400	516	17,316	516	4,329	2,313	1,732	2,313	27,084	516
2018	45,600	10,488	476	3,238	250	29,138	542	2,736	705	45,600	516	17,784	516	4,446	2,314	1,778	2,314	27,816	516
2019	46,800	10,764	477	3,323	250	29,905	542	2,808	705	46,800	516	18,252	516	4,563	2,315	1,825	2,315	28,548	516
2020	48,000	11,040	478	3,408	250	30,672	542	2,880	705	48,000	516	18,720	516	4,680	2,315	1,872	2,315	29,280	516
2021	48,000	11,040	479	3,408	250	30,672	542	2,880	705	48,000	517	18,720	517	4,680	2,316	1,872	2,316	29,280	517
2022	48,000	11,040	480	3,408	250	30,672	542	2,880	705	48,000	517	18,720	517	4,680	2,317	1,872	2,317	29,280	517
2023	48,000	11,040	481	3,408	250	30,672	542	2,880	705	48,000	517	18,720	517	4,680	2,318	1,872	2,318	29,280	517
2024	48,000	11,040	482	3,408	250	30,672	542	2,880	705	48,000	517	18,720	517	4,680	2,319	1,872	2,319	29,280	517
2025	48,000	11,040	483	3,408	250	30,672	542	2,880	705	48,000	517	18,720	517	4,680	2,320	1,872	2,320	29,280	517
2026	48,000	11,040	484	3,408	250	30,672	542	2,880	705	48,000	518	18,720	518	4,680	2,321	1,872	2,321	29,280	518
2027	48,000	11,040	485	3,408	250	30,672	542	2,880	705	48,000	518	18,720	518	4,680	2,322	1,872	2,322	29,280	518
2028	48,000	11,040	486	3,408	250	30,672	542	2,880	705	48,000	518	18,720	518	4,680	2,322	1,872	2,322	29,280	518
2029	48,000	11,040	487	3,408	250	30,672	542	2,880	705	48,000	518	18,720	518	4,680	2,323	1,872	2,323	29,280	518
2030	48,000	11,040	488	3,408	250	30,672	542	2,880	705	48,000	519	18,720	519	4,680	2,324	1,872	2,324	29,280	519
2031	48,000	11,040	489	3,408	250	30,672	542	2,880	705	48,000	519	18,720	519	4,680	2,325	1,872	2,325	29,280	519
2032	48,000	11,040	489	3,408	250	30,672	542	2,880	705	48,000	519	18,720	519	4,680	2,326	1,872	2,326	29,280	519
2033	48,000	11,040	490	3,408	250	30,672	542	2,880	705	48,000	519	18,720	519	4,680	2,327	1,872	2,327	29,280	519
2034	48,000	11,040	491	3,408	250	30,672	542	2,880	705	48,000	519	18,720	519	4,680	2,328	1,872	2,328	29,280	519
2035	48,000	11,040	492	3,408	250	30,672	542	2,880	705	48,000	520	18,720	520	4,680	2,328	1,872	2,328	29,280	520
2036	48,000	11,040	493	3,408	250	30,672	542	2,880	705	48,000	520	18,720	520	4,680	2,329	1,872	2,329	29,280	520
2037	48,000	11,040	494	3,408	250	30,672	542	2,880	705	48,000	520	18,720	520	4,680	2,330	1,872	2,330	29,280	520
2038	48,000	11,040	495	3,408	250	30,672	542	2,880	705	48,000	520	18,720	520	4,680	2,331	1,872	2,331	29,280	520
2039	48,000	11,040	496	3,408	250	30,672	542	2,880	705	48,000	520	18,720	520	4,680	2,332	1,872	2,332	29,280	520
2040	48,000	11,040	497	3,408	250	30,672	542	2,880	705	48,000	521	18,720	521	4,680	2,333	1,872	2,333	29,280	521
2041	48,000	11,040	498	3,408	250	30,672	542	2,880	705	48,000	521	18,720	521	4,680	2,333	1,872	2,333	29,280	521
2042	48,000	11,040	499	3,408	250	30,672	542	2,880	705	48,000	521	18,720	521	4,680	2,334	1,872	2,334	29,280	521
2043	48,000	11,040	500	3,408	250	30,672	542	2,880	705	48,000	521	18,720	521	4,680	2,335	1,872	2,335	29,280	521
2044	48,000	11,040	500	3,408	250	30,672	542	2,880	705	48,000	521	18,720	521	4,680	2,336	1,872	2,336	29,280	521
2045	48,000	11,040	501	3,408	250	30,672	542	2,880	705	48,000	522	18,720	522	4,680	2,337	1,872	2,337	29,280	522
2046	48,000	11,040	502	3,408	250	30,672	542	2,880	705	48,000	522	18,720	522	4,680	2,338	1,872	2,338	29,280	522
2047	48,000	11,040	503	3,408	250	30,672	542	2,880	705	48,000	522	18,720	522	4,680	2,338	1,872	2,338	29,280	522
2048	48,000	11,040	504	3,408	250	30,672	542	2,880	705	48,000	522	18,720	522	4,680	2,339	1,872	2,339	29,280	522
2049	48,000	11,040	505	3,408	250	30,672	542	2,880	705	48,000	523	18,720	523	4,680	2,340	1,872	2,340	29,280	523
2050	48,000	11,040	506	3,408	250	30,672	542	2,880	705	48,000	523	18,720	523	4,680	2,341	1,872	2,341	29,280	523
2051	48,000	11,040	507	3,408	250	30,672	542	2,880	705	48,000	523	18,720	523	4,680	2,342	1,872	2,342	29,280	523
2052	48,000	11,040	508	3,408	250	30,672	542	2,880	705	48,000	523	18,720	523	4,680	2,343	1,872	2,343	29,280	523
2053	48,000	11,040	508	3,408	250	30,672	542	2,880	705	48,000	523	18,720	523	4,680	2,343	1,872	2,343	29,280	523
2054	48,000	11,040	509	3,408	250	30,672	542	2,880	705	48,000	524	18,720	524	4,680	2,344	1,872	2,344	29,280	524
2055	48,000	11,040	510	3,408	250	30,672	542	2,880	705	48,000	524	18,720	524	4,680	2,345	1,872	2,345	29,280	524
2056	48,000	11,040	511	3,408	250	30,672	542	2,880	705	48,000	524	18,720	524	4,680	2,346	1,872	2,346	29,280	524
2057	48,000	11,040	512	3,408	250	30,672	542	2,880	705	48,000	524	18,720	524	4,680	2,346	1,872	2,346	29,280	524
2058	48,000	11,040	513	3,408	250	30,672	542	2,880	705	48,000	524	18,720	524	4,680	2,347	1,872	2,347	29,280	524
2059	48,000	11,040	514	3,408	250	30,672	542	2,880	705	48,000	525	18,720	525	4,680	2,348	1,872	2,348	29,280	525

Notes
1 -- Total Demands come from MWH (2005): Elsinore Basin Groundwater Management Plan.
2 -- Water supply mix comes from Alternative 4 in MWH (2005): Elsinore Basin Groundwater Management Plan.
3 -- TDS for Skinner Plant and Canyon Lake WTP comes from EVMWD Consumer Confidence Report (2008).
4 -- The ratio of outdoor/indoor use comes from MWH (2005): Elsinore Basin Groundwater Management Plan.

Appendix A-18
Water Supply Plan for the Fontana Water Company

Year	Fontana Water Company																						
	Total Demand	Pumped Chino North Groundwater		Raw Groundwater (Rialto)		Raw Groundwater (Lytle Basin)		Imported SWP Water		Lytle Creek Surface Water		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	46,500	13,500	259	7,860	242	6,140	230	12,000	250	4,500	210	2,500	509	46,500	32,420	265	8,105	1,309	7,035	1,309	14,080	244
2011	47,100	12,800	264	8,000	245	5,400	230	13,200	250	4,500	210	3,200	511	47,100	33,052	272	8,263	1,339	7,172	1,339	14,048	247
2012	47,460	12,380	269	8,000	248	5,040	230	13,920	250	4,500	210	3,620	514	47,460	33,431	277	8,358	1,360	7,255	1,360	14,029	249
2013	48,300	11,400	275	8,000	251	4,200	230	15,600	250	4,500	210	4,600	517	48,300	34,316	286	8,579	1,395	7,447	1,395	13,984	251
2014	48,900	10,700	279	8,000	254	3,600	230	16,800	250	4,500	210	5,300	520	48,900	34,948	293	8,737	1,421	7,584	1,421	13,952	252
2015	49,500	10,000	283	8,000	257	3,000	230	18,000	250	4,500	210	6,000	522	49,500	35,580	299	8,895	1,445	7,721	1,445	13,920	253
2016	50,000	10,200	286	8,000	260	3,200	230	18,000	250	4,600	210	6,000	524	50,000	35,920	300	8,980	1,449	7,795	1,449	14,080	255
2017	50,300	10,320	289	8,000	263	3,320	230	18,000	250	4,660	210	6,000	526	50,300	36,124	301	9,031	1,453	7,839	1,453	14,176	256
2018	51,000	10,600	292	8,000	266	3,600	230	18,000	250	4,800	210	6,000	527	51,000	36,600	301	9,150	1,455	7,942	1,455	14,400	257
2019	51,500	10,800	297	8,000	269	3,800	230	18,000	250	4,900	210	6,000	529	51,500	36,940	302	9,235	1,460	8,016	1,460	14,560	259
2020	52,000	11,000	302	8,000	272	4,000	230	18,000	250	5,000	210	6,000	531	52,000	37,280	304	9,320	1,465	8,090	1,465	14,720	260
2021	52,500	11,100	307	8,000	275	4,200	230	18,000	250	5,200	210	6,000	534	52,500	37,620	305	9,405	1,470	8,164	1,470	14,880	262
2022	53,000	11,200	313	8,000	278	4,400	230	18,000	250	5,400	210	6,000	537	53,000	37,960	306	9,490	1,476	8,237	1,476	15,040	263
2023	53,500	11,300	318	8,000	281	4,600	230	18,000	250	5,600	210	6,000	540	53,500	38,300	308	9,575	1,481	8,311	1,481	15,200	265
2024	54,000	11,400	322	8,000	284	4,800	230	18,000	250	5,800	210	6,000	543	54,000	38,640	309	9,660	1,486	8,385	1,486	15,360	266
2025	54,500	11,500	326	8,000	287	5,000	230	18,000	250	6,000	210	6,000	545	54,500	38,980	310	9,745	1,490	8,459	1,490	15,520	267
2026	54,700	11,600	331	8,000	290	5,100	230	18,000	250	6,000	210	6,000	547	54,700	39,116	312	9,779	1,496	8,488	1,496	15,584	269
2027	54,900	11,700	336	8,000	293	5,200	230	18,000	250	6,000	210	6,000	550	54,900	39,252	313	9,813	1,503	8,518	1,503	15,648	271
2028	55,100	11,800	341	8,000	296	5,300	230	18,000	250	6,000	210	6,000	553	55,100	39,388	315	9,847	1,510	8,547	1,510	15,712	272
2029	55,300	11,900	346	8,000	299	5,400	230	18,000	250	6,000	210	6,000	556	55,300	39,524	317	9,881	1,517	8,577	1,517	15,776	274
2030	55,500	12,000	354	8,000	302	5,500	230	18,000	250	6,000	210	6,000	559	55,500	39,660	319	9,915	1,527	8,606	1,527	15,840	276
2031	55,500	12,000	362	8,000	305	5,500	230	18,000	250	6,000	210	6,000	563	55,500	39,660	322	9,915	1,538	8,606	1,538	15,840	279
2032	55,500	12,000	371	8,000	308	5,500	230	18,000	250	6,000	210	6,000	567	55,500	39,660	325	9,915	1,549	8,606	1,549	15,840	282
2033	55,500	12,000	379	8,000	311	5,500	230	18,000	250	6,000	210	6,000	572	55,500	39,660	328	9,915	1,560	8,606	1,560	15,840	284
2034	55,500	12,000	382	8,000	314	5,500	230	18,000	250	6,000	210	6,000	576	55,500	39,660	329	9,915	1,567	8,606	1,567	15,840	285
2035	55,500	12,000	386	8,000	317	5,500	230	18,000	250	6,000	210	6,000	578	55,500	39,660	331	9,915	1,573	8,606	1,573	15,840	287
2036	55,500	12,000	389	8,000	320	5,500	230	18,000	250	6,000	210	6,000	580	55,500	39,660	332	9,915	1,578	8,606	1,578	15,840	288
2037	55,500	12,000	392	8,000	323	5,500	230	18,000	250	6,000	210	6,000	581	55,500	39,660	333	9,915	1,583	8,606	1,583	15,840	289
2038	55,500	12,000	395	8,000	326	5,500	230	18,000	250	6,000	210	6,000	583	55,500	39,660	335	9,915	1,588	8,606	1,588	15,840	290
2039	55,500	12,000	398	8,000	329	5,500	230	18,000	250	6,000	210	6,000	585	55,500	39,660	336	9,915	1,593	8,606	1,593	15,840	292
2040	55,500	12,000	406	8,000	332	5,500	230	18,000	250	6,000	210	6,000	586	55,500	39,660	338	9,915	1,603	8,606	1,603	15,840	294
2041	55,500	12,000	415	8,000	335	5,500	230	18,000	250	6,000	210	6,000	591	55,500	39,660	341	9,915	1,615	8,606	1,615	15,840	297
2042	55,500	12,000	424	8,000	338	5,500	230	18,000	250	6,000	210	6,000	595	55,500	39,660	344	9,915	1,626	8,606	1,626	15,840	299
2043	55,500	12,000	433	8,000	341	5,500	230	18,000	250	6,000	210	6,000	600	55,500	39,660	347	9,915	1,638	8,606	1,638	15,840	302
2044	55,500	12,000	435	8,000	344	5,500	230	18,000	250	6,000	210	6,000	605	55,500	39,660	349	9,915	1,645	8,606	1,645	15,840	303
2045	55,500	12,000	438	8,000	347	5,500	230	18,000	250	6,000	210	6,000	606	55,500	39,660	350	9,915	1,649	8,606	1,649	15,840	304
2046	55,500	12,000	440	8,000	350	5,500	230	18,000	250	6,000	210	6,000	607	55,500	39,660	351	9,915	1,653	8,606	1,653	15,840	305
2047	55,500	12,000	442	8,000	353	5,500	230	18,000	250	6,000	210	6,000	608	55,500	39,660	352	9,915	1,657	8,606	1,657	15,840	306
2048	55,500	12,000	444	8,000	356	5,500	230	18,000	250	6,000	210	6,000	610	55,500	39,660	353	9,915	1,662	8,606	1,662	15,840	307
2049	55,500	12,000	446	8,000	359	5,500	230	18,000	250	6,000	210	6,000	611	55,500	39,660	354	9,915	1,666	8,606	1,666	15,840	308
2050	55,500	12,000	455	8,000	362	5,500	230	18,000	250	6,000	210	6,000	612	55,500	39,660	356	9,915	1,675	8,606	1,675	15,840	311
2051	55,500	12,000	465	8,000	365	5,500	230	18,000	250	6,000	210	6,000	617	55,500	39,660	359	9,915	1,687	8,606	1,687	15,840	314
2052	55,500	12,000	474	8,000	368	5,500	230	18,000	250	6,000	210	6,000	621	55,500	39,660	362	9,915	1,700	8,606	1,700	15,840	316
2053	55,500	12,000	483	8,000	371	5,500	230	18,000	250	6,000	210	6,000	626	55,500	39,660	366	9,915	1,712	8,606	1,712	15,840	319
2054	55,500	12,000	485	8,000	374	5,500	230	18,000	250	6,000	210	6,000	631	55,500	39,660	367	9,915	1,718	8,606	1,718	15,840	320
2055	55,500	12,000	486	8,000	377	5,500	230	18,000	250	6,000	210	6,000	632	55,500	39,660	368	9,915	1,721	8,606	1,721	15,840	321
2056	55,500	12,000	488	8,000	380	5,500	230	18,000	250	6,000	210	6,000	633	55,500	39,660	369	9,915	1,725	8,606	1,725	15,840	322
2057	55,500	12,000	489	8,000	383	5,500	230	18,000	250	6,000	210	6,000	634	55,500	39,660	369	9,915	1,728	8,606	1,728	15,840	322
2058	55,500	12,000	491	8,000	386	5,500	230	18,000	250	6,000	210	6,000	634	55,500	39,660	370	9,915	1,731	8,606	1,731	15,840	323
2059	55,500	12,000	492	8,000	389	5,500	230	18,000	250	6,000	210	6,000	635	55,500	39,660	371	9,915	1,735	8,606	1,735	15,840	324

Notes

1--Water supply plan adapted from Wildermuth Environmental, Inc (2009a) and GEI Consultants, Inc. (2007).

2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a transla
of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.

3--Recycled water source is IEUA; All IEUA WWTPs regulated as one composite discharge

Appendix A-19
Water Supply Plan for the Golden State Water Company

Year	Golden State Water Company (City of Claremont)															
	Total Demand	Pumped Chino North Groundwater		Other Groundwater		Imported Water		Total Supply	Outdoor Water Use		Total Return Flow		Return flow to Chino North		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	13,920	400	259	4,850	330	8,670	250	13,920	9,466	278	2,366	1,362	166	1,362	4,454	278
2011	13,920	400	264	4,850	330	8,670	250	13,920	9,466	278	2,366	1,363	166	1,363	4,454	278
2012	13,920	400	269	4,850	330	8,670	250	13,920	9,466	278	2,366	1,364	166	1,364	4,454	278
2013	13,920	400	275	4,850	330	8,670	250	13,920	9,466	279	2,366	1,364	166	1,364	4,454	279
2014	13,920	400	279	4,850	330	8,670	250	13,920	9,466	279	2,366	1,365	166	1,365	4,454	279
2015	13,920	400	283	4,850	330	8,670	250	13,920	9,466	279	2,366	1,365	166	1,365	4,454	279
2016	13,920	400	286	4,850	330	8,670	250	13,920	9,466	279	2,366	1,366	166	1,366	4,454	279
2017	13,920	400	289	4,850	330	8,670	250	13,920	9,466	279	2,366	1,366	166	1,366	4,454	279
2018	13,920	400	292	4,850	330	8,670	250	13,920	9,466	279	2,366	1,366	166	1,366	4,454	279
2019	13,920	400	297	4,850	330	8,670	250	13,920	9,466	279	2,366	1,367	166	1,367	4,454	279
2020	13,920	400	302	4,850	330	8,670	250	13,920	9,466	279	2,366	1,367	166	1,367	4,454	279
2021	13,920	400	307	4,850	330	8,670	250	13,920	9,466	280	2,366	1,368	166	1,368	4,454	280
2022	13,920	400	313	4,850	330	8,670	250	13,920	9,466	280	2,366	1,369	166	1,369	4,454	280
2023	13,920	400	318	4,850	330	8,670	250	13,920	9,466	280	2,366	1,369	166	1,369	4,454	280
2024	13,920	400	322	4,850	330	8,670	250	13,920	9,466	280	2,366	1,370	166	1,370	4,454	280
2025	13,920	400	326	4,850	330	8,670	250	13,920	9,466	280	2,366	1,370	166	1,370	4,454	280
2026	13,920	400	331	4,850	330	8,670	250	13,920	9,466	280	2,366	1,371	166	1,371	4,454	280
2027	13,920	400	336	4,850	330	8,670	250	13,920	9,466	280	2,366	1,371	166	1,371	4,454	280
2028	13,920	400	341	4,850	330	8,670	250	13,920	9,466	280	2,366	1,372	166	1,372	4,454	280
2029	13,920	400	346	4,850	330	8,670	250	13,920	9,466	281	2,366	1,373	166	1,373	4,454	281
2030	13,920	400	354	4,850	330	8,670	250	13,920	9,466	281	2,366	1,373	166	1,373	4,454	281
2031	13,920	400	362	4,850	330	8,670	250	13,920	9,466	281	2,366	1,374	166	1,374	4,454	281
2032	13,920	400	371	4,850	330	8,670	250	13,920	9,466	281	2,366	1,375	166	1,375	4,454	281
2033	13,920	400	379	4,850	330	8,670	250	13,920	9,466	282	2,366	1,376	166	1,376	4,454	282
2034	13,920	400	382	4,850	330	8,670	250	13,920	9,466	282	2,366	1,377	166	1,377	4,454	282
2035	13,920	400	386	4,850	330	8,670	250	13,920	9,466	282	2,366	1,377	166	1,377	4,454	282
2036	13,920	400	389	4,850	330	8,670	250	13,920	9,466	282	2,366	1,377	166	1,377	4,454	282
2037	13,920	400	392	4,850	330	8,670	250	13,920	9,466	282	2,366	1,378	166	1,378	4,454	282
2038	13,920	400	395	4,850	330	8,670	250	13,920	9,466	282	2,366	1,378	166	1,378	4,454	282
2039	13,920	400	398	4,850	330	8,670	250	13,920	9,466	282	2,366	1,378	166	1,378	4,454	282
2040	13,920	400	406	4,850	330	8,670	250	13,920	9,466	282	2,366	1,379	166	1,379	4,454	282
2041	13,920	400	415	4,850	330	8,670	250	13,920	9,466	283	2,366	1,380	166	1,380	4,454	283
2042	13,920	400	424	4,850	330	8,670	250	13,920	9,466	283	2,366	1,381	166	1,381	4,454	283
2043	13,920	400	433	4,850	330	8,670	250	13,920	9,466	283	2,366	1,383	166	1,383	4,454	283
2044	13,920	400	435	4,850	330	8,670	250	13,920	9,466	283	2,366	1,383	166	1,383	4,454	283
2045	13,920	400	438	4,850	330	8,670	250	13,920	9,466	283	2,366	1,383	166	1,383	4,454	283
2046	13,920	400	440	4,850	330	8,670	250	13,920	9,466	283	2,366	1,383	166	1,383	4,454	283
2047	13,920	400	442	4,850	330	8,670	250	13,920	9,466	283	2,366	1,384	166	1,384	4,454	283
2048	13,920	400	444	4,850	330	8,670	250	13,920	9,466	283	2,366	1,384	166	1,384	4,454	283
2049	13,920	400	446	4,850	330	8,670	250	13,920	9,466	284	2,366	1,384	166	1,384	4,454	284
2050	13,920	400	455	4,850	330	8,670	250	13,920	9,466	284	2,366	1,385	166	1,385	4,454	284
2051	13,920	400	465	4,850	330	8,670	250	13,920	9,466	284	2,366	1,386	166	1,386	4,454	284
2052	13,920	400	474	4,850	330	8,670	250	13,920	9,466	284	2,366	1,387	166	1,387	4,454	284
2053	13,920	400	483	4,850	330	8,670	250	13,920	9,466	285	2,366	1,388	166	1,388	4,454	285
2054	13,920	400	485	4,850	330	8,670	250	13,920	9,466	285	2,366	1,388	166	1,388	4,454	285
2055	13,920	400	486	4,850	330	8,670	250	13,920	9,466	285	2,366	1,389	166	1,389	4,454	285
2056	13,920	400	488	4,850	330	8,670	250	13,920	9,466	285	2,366	1,389	166	1,389	4,454	285
2057	13,920	400	489	4,850	330	8,670	250	13,920	9,466	285	2,366	1,389	166	1,389	4,454	285
2058	13,920	400	491	4,850	330	8,670	250	13,920	9,466	285	2,366	1,389	166	1,389	4,454	285
2059	13,920	400	492	4,850	330	8,670	250	13,920	9,466	285	2,366	1,389	166	1,389	4,454	285

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.

Appendix A-20
Water Supply Plan for the Jurupa Community Services District

Year	Jurupa Community Services District															
	Total Demand	Pumped Chino North Groundwater		CDA Desalter Product Water		Chino South Groundwater		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	33,700	18,750	259	8,700	350	6,250	408	33,700	22,916	310	5,729	1,489	1,547	1,489	10,784	310
2011	34,700	19,500	264	8,700	350	6,500	410	34,700	23,596	313	5,899	1,501	1,593	1,501	11,104	313
2012	35,700	20,250	269	8,700	350	6,750	412	35,700	24,276	316	6,069	1,514	1,639	1,514	11,424	316
2013	36,700	21,000	275	8,700	350	7,000	414	36,700	24,956	319	6,239	1,527	1,685	1,527	11,744	319
2014	37,700	21,750	279	8,700	350	7,250	416	37,700	25,636	322	6,409	1,538	1,730	1,538	12,064	322
2015	38,411	22,283	283	8,700	350	7,428	418	38,411	26,119	324	6,530	1,548	1,763	1,548	12,292	324
2016	38,471	22,328	286	8,700	350	7,443	420	38,471	26,160	327	6,540	1,556	1,766	1,556	12,311	327
2017	38,506	22,355	289	8,700	350	7,452	422	38,506	26,184	329	6,546	1,565	1,767	1,565	12,322	329
2018	38,590	22,417	292	8,700	350	7,472	424	38,590	26,241	331	6,560	1,573	1,771	1,573	12,349	331
2019	38,649	22,462	297	8,700	350	7,487	426	38,649	26,282	334	6,570	1,586	1,774	1,586	12,368	334
2020	38,709	22,507	302	8,700	350	7,502	428	38,709	26,322	337	6,581	1,599	1,777	1,599	12,387	337
2021	38,709	22,507	307	8,700	350	7,502	430	38,709	26,322	341	6,581	1,612	1,777	1,612	12,387	341
2022	38,709	22,507	313	8,700	350	7,502	432	38,709	26,322	344	6,581	1,627	1,777	1,627	12,387	344
2023	38,709	22,507	318	8,700	350	7,502	434	38,709	26,322	348	6,581	1,641	1,777	1,641	12,387	348
2024	38,709	22,507	322	8,700	350	7,502	436	38,709	26,322	351	6,581	1,652	1,777	1,652	12,387	351
2025	38,709	22,507	326	8,700	350	7,502	438	38,709	26,322	353	6,581	1,663	1,777	1,663	12,387	353
2026	38,709	22,507	331	8,700	350	7,502	440	38,709	26,322	356	6,581	1,676	1,777	1,676	12,387	356
2027	38,709	22,507	336	8,700	350	7,502	442	38,709	26,322	360	6,581	1,688	1,777	1,688	12,387	360
2028	38,709	22,507	341	8,700	350	7,502	444	38,709	26,322	363	6,581	1,701	1,777	1,701	12,387	363
2029	38,709	22,507	346	8,700	350	7,502	446	38,709	26,322	366	6,581	1,715	1,777	1,715	12,387	366
2030	38,709	22,507	354	8,700	350	7,502	448	38,709	26,322	371	6,581	1,735	1,777	1,735	12,387	371
2031	38,709	22,507	362	8,700	350	7,502	450	38,709	26,322	376	6,581	1,756	1,777	1,756	12,387	376
2032	38,709	22,507	371	8,700	350	7,502	452	38,709	26,322	382	6,581	1,777	1,777	1,777	12,387	382
2033	38,709	22,507	379	8,700	350	7,502	454	38,709	26,322	387	6,581	1,798	1,777	1,798	12,387	387
2034	38,709	22,507	382	8,700	350	7,502	456	38,709	26,322	389	6,581	1,807	1,777	1,807	12,387	389
2035	38,709	22,507	386	8,700	350	7,502	458	38,709	26,322	392	6,581	1,816	1,777	1,816	12,387	392
2036	38,709	22,507	389	8,700	350	7,502	460	38,709	26,322	394	6,581	1,825	1,777	1,825	12,387	394
2037	38,709	22,507	392	8,700	350	7,502	462	38,709	26,322	396	6,581	1,834	1,777	1,834	12,387	396
2038	38,709	22,507	395	8,700	350	7,502	464	38,709	26,322	398	6,581	1,842	1,777	1,842	12,387	398
2039	38,709	22,507	398	8,700	350	7,502	466	38,709	26,322	400	6,581	1,851	1,777	1,851	12,387	400
2040	38,709	22,507	406	8,700	350	7,502	468	38,709	26,322	406	6,581	1,872	1,777	1,872	12,387	406
2041	38,709	22,507	415	8,700	350	7,502	470	38,709	26,322	411	6,581	1,894	1,777	1,894	12,387	411
2042	38,709	22,507	424	8,700	350	7,502	472	38,709	26,322	417	6,581	1,916	1,777	1,916	12,387	417
2043	38,709	22,507	433	8,700	350	7,502	474	38,709	26,322	422	6,581	1,939	1,777	1,939	12,387	422
2044	38,709	22,507	435	8,700	350	7,502	476	38,709	26,322	424	6,581	1,946	1,777	1,946	12,387	424
2045	38,709	22,507	438	8,700	350	7,502	478	38,709	26,322	426	6,581	1,953	1,777	1,953	12,387	426
2046	38,709	22,507	440	8,700	350	7,502	480	38,709	26,322	427	6,581	1,960	1,777	1,960	12,387	427
2047	38,709	22,507	442	8,700	350	7,502	482	38,709	26,322	429	6,581	1,966	1,777	1,966	12,387	429
2048	38,709	22,507	444	8,700	350	7,502	484	38,709	26,322	431	6,581	1,973	1,777	1,973	12,387	431
2049	38,709	22,507	446	8,700	350	7,502	486	38,709	26,322	432	6,581	1,980	1,777	1,980	12,387	432
2050	38,709	22,507	455	8,700	350	7,502	488	38,709	26,322	438	6,581	2,002	1,777	2,002	12,387	438
2051	38,709	22,507	465	8,700	350	7,502	490	38,709	26,322	444	6,581	2,025	1,777	2,025	12,387	444
2052	38,709	22,507	474	8,700	350	7,502	492	38,709	26,322	450	6,581	2,048	1,777	2,048	12,387	450
2053	38,709	22,507	483	8,700	350	7,502	494	38,709	26,322	455	6,581	2,072	1,777	2,072	12,387	455
2054	38,709	22,507	485	8,700	350	7,502	496	38,709	26,322	457	6,581	2,077	1,777	2,077	12,387	457
2055	38,709	22,507	486	8,700	350	7,502	498	38,709	26,322	458	6,581	2,082	1,777	2,082	12,387	458
2056	38,709	22,507	488	8,700	350	7,502	500	38,709	26,322	459	6,581	2,087	1,777	2,087	12,387	459
2057	38,709	22,507	489	8,700	350	7,502	502	38,709	26,322	460	6,581	2,092	1,777	2,092	12,387	460
2058	38,709	22,507	491	8,700	350	7,502	504	38,709	26,322	462	6,581	2,096	1,777	2,096	12,387	462
2059	38,709	22,507	492	8,700	350	7,502	506	38,709	26,322	463	6,581	2,101	1,777	2,101	12,387	463

Notes

1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).

2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.

3--Wastewater flows to the City of Riverside Regional Water Quality Control Plant

Appendix A-21
Water Supply Plan for the Marygold Mutual Water Company

Year	Marygold Mutual Water Company													
	Total Demand	Pumped Chino North Groundwater		Groundwater (Bunker Hill-A)		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	1,620	0	259	1,620	326	1,620	1,102	326	275	1,554	275	1,554	104	326
2011	1,628	0	264	1,628	326	1,628	1,107	326	277	1,554	277	1,554	104	326
2012	1,633	0	269	1,633	326	1,633	1,110	326	278	1,556	278	1,556	105	326
2013	1,644	0	275	1,644	327	1,644	1,118	327	279	1,558	279	1,558	105	327
2014	1,652	0	279	1,652	326	1,652	1,123	326	281	1,555	281	1,555	106	326
2015	1,660	0	283	1,660	326	1,660	1,129	326	282	1,554	282	1,554	106	326
2016	1,668	0	286	1,668	326	1,668	1,134	326	284	1,553	284	1,553	107	326
2017	1,673	0	289	1,673	326	1,673	1,138	326	284	1,554	284	1,554	107	326
2018	1,684	0	292	1,684	327	1,684	1,145	327	286	1,556	286	1,556	108	327
2019	1,692	0	297	1,692	327	1,692	1,151	327	288	1,559	288	1,559	108	327
2020	1,700	0	302	1,700	328	1,700	1,156	328	289	1,562	289	1,562	109	328
2021	1,700	0	307	1,700	329	1,700	1,156	329	289	1,565	289	1,565	109	329
2022	1,700	0	313	1,700	330	1,700	1,156	330	289	1,568	289	1,568	109	330
2023	1,700	0	318	1,700	331	1,700	1,156	331	289	1,572	289	1,572	109	331
2024	1,700	0	322	1,700	332	1,700	1,156	332	289	1,577	289	1,577	109	332
2025	1,700	0	326	1,700	333	1,700	1,156	333	289	1,582	289	1,582	109	333
2026	1,700	0	331	1,700	334	1,700	1,156	334	289	1,586	289	1,586	109	334
2027	1,700	0	336	1,700	335	1,700	1,156	335	289	1,590	289	1,590	109	335
2028	1,700	0	341	1,700	336	1,700	1,156	336	289	1,595	289	1,595	109	336
2029	1,700	0	346	1,700	337	1,700	1,156	337	289	1,599	289	1,599	109	337
2030	1,700	0	354	1,700	338	1,700	1,156	338	289	1,603	289	1,603	109	338
2031	1,700	0	362	1,700	339	1,700	1,156	339	289	1,606	289	1,606	109	339
2032	1,700	0	371	1,700	340	1,700	1,156	340	289	1,609	289	1,609	109	340
2033	1,700	0	379	1,700	341	1,700	1,156	341	289	1,612	289	1,612	109	341
2034	1,700	0	382	1,700	341	1,700	1,156	341	289	1,615	289	1,615	109	341
2035	1,700	0	386	1,700	342	1,700	1,156	342	289	1,618	289	1,618	109	342
2036	1,700	0	389	1,700	343	1,700	1,156	343	289	1,621	289	1,621	109	343
2037	1,700	0	392	1,700	344	1,700	1,156	344	289	1,624	289	1,624	109	344
2038	1,700	0	395	1,700	344	1,700	1,156	344	289	1,627	289	1,627	109	344
2039	1,700	0	398	1,700	345	1,700	1,156	345	289	1,630	289	1,630	109	345
2040	1,700	0	406	1,700	346	1,700	1,156	346	289	1,633	289	1,633	109	346
2041	1,700	0	415	1,700	347	1,700	1,156	347	289	1,636	289	1,636	109	347
2042	1,700	0	424	1,700	347	1,700	1,156	347	289	1,639	289	1,639	109	347
2043	1,700	0	433	1,700	348	1,700	1,156	348	289	1,642	289	1,642	109	348
2044	1,700	0	435	1,700	349	1,700	1,156	349	289	1,644	289	1,644	109	349
2045	1,700	0	438	1,700	349	1,700	1,156	349	289	1,647	289	1,647	109	349
2046	1,700	0	440	1,700	350	1,700	1,156	350	289	1,649	289	1,649	109	350
2047	1,700	0	442	1,700	350	1,700	1,156	350	289	1,652	289	1,652	109	350
2048	1,700	0	444	1,700	351	1,700	1,156	351	289	1,654	289	1,654	109	351
2049	1,700	0	446	1,700	352	1,700	1,156	352	289	1,656	289	1,656	109	352
2050	1,700	0	455	1,700	352	1,700	1,156	352	289	1,659	289	1,659	109	352
2051	1,700	0	465	1,700	353	1,700	1,156	353	289	1,661	289	1,661	109	353
2052	1,700	0	474	1,700	353	1,700	1,156	353	289	1,663	289	1,663	109	353
2053	1,700	0	483	1,700	354	1,700	1,156	354	289	1,665	289	1,665	109	354
2054	1,700	0	485	1,700	354	1,700	1,156	354	289	1,667	289	1,667	109	354
2055	1,700	0	486	1,700	355	1,700	1,156	355	289	1,668	289	1,668	109	355
2056	1,700	0	488	1,700	355	1,700	1,156	355	289	1,670	289	1,670	109	355
2057	1,700	0	489	1,700	355	1,700	1,156	355	289	1,672	289	1,672	109	355
2058	1,700	0	491	1,700	356	1,700	1,156	356	289	1,674	289	1,674	109	356
2059	1,700	0	492	1,700	356	1,700	1,156	356	289	1,675	289	1,675	109	356

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Approximately 20% of wastewater generated flows to the City of Fontana's sewer system and then to IEUA Treatment Plants.

Appendix A-22
Water Supply Plan for the Monte Vista Water District

Year	Monte Vista Water District															
	Total Demand	Pumped Chino North Groundwater		Imported SWP Water		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
		Q	TDS	Q	TDS	Q	TDS	Q	Q	TDS	Q	TDS	Q	TDS	Q	TDS
	AFY	*AFY*	*mg/L*	*AFY*	*mg/L*	*AFY*	*mg/L*	*AFY*	*AFY*	*mg/L*	*AFY*	*mg/L*	*AFY*	*mg/L*	*AFY*	*mg/L*
2010	27,300	16,000	259	11,000	250	300	509	27,300	18,660	259	4,665	1,287	4,665	1,287	8,640	255
2011	27,520	16,200	264	11,000	250	320	511	27,520	18,816	263	4,704	1,300	4,704	1,300	8,704	258
2012	27,660	16,320	269	11,000	250	340	514	27,660	18,918	266	4,729	1,315	4,729	1,315	8,742	262
2013	27,960	16,600	275	11,000	250	360	517	27,960	19,128	270	4,782	1,329	4,782	1,329	8,832	265
2014	28,180	16,800	279	11,000	250	380	520	28,180	19,284	273	4,821	1,341	4,821	1,341	8,896	268
2015	28,400	17,000	283	11,000	250	400	522	28,400	19,440	275	4,860	1,351	4,860	1,351	8,960	270
2016	28,710	17,300	286	11,000	250	410	524	28,710	19,654	277	4,914	1,360	4,914	1,360	9,056	272
2017	28,900	17,480	289	11,000	250	420	526	28,900	19,786	279	4,947	1,368	4,947	1,368	9,114	274
2018	29,330	17,900	292	11,000	250	430	527	29,330	20,082	282	5,021	1,376	5,021	1,376	9,248	276
2019	29,640	18,200	297	11,000	250	440	529	29,640	20,296	285	5,074	1,389	5,074	1,389	9,344	279
2020	29,950	18,500	302	11,000	250	450	531	29,950	20,510	288	5,128	1,402	5,128	1,402	9,440	283
2021	30,260	18,800	307	11,000	250	460	534	30,260	20,724	292	5,181	1,416	5,181	1,416	9,536	286
2022	30,570	19,100	313	11,000	250	470	537	30,570	20,938	295	5,235	1,431	5,235	1,431	9,632	290
2023	30,880	19,400	318	11,000	250	480	540	30,880	21,152	299	5,288	1,447	5,288	1,447	9,728	294
2024	31,190	19,700	322	11,000	250	490	543	31,190	21,366	302	5,342	1,458	5,342	1,458	9,824	296
2025	31,500	20,000	326	11,000	250	500	545	31,500	21,580	305	5,395	1,470	5,395	1,470	9,920	299
2026	31,800	20,300	331	11,000	250	500	547	31,800	21,784	308	5,446	1,483	5,446	1,483	10,016	303
2027	32,100	20,600	336	11,000	250	500	550	32,100	21,988	311	5,497	1,496	5,497	1,496	10,112	306
2028	32,400	20,900	341	11,000	250	500	553	32,400	22,192	315	5,548	1,510	5,548	1,510	10,208	309
2029	32,700	21,200	346	11,000	250	500	556	32,700	22,396	319	5,599	1,524	5,599	1,524	10,304	313
2030	33,000	21,500	354	11,000	250	500	559	33,000	22,600	324	5,650	1,546	5,650	1,546	10,400	319
2031	33,000	21,500	362	11,000	250	500	563	33,000	22,600	329	5,650	1,568	5,650	1,568	10,400	324
2032	33,000	21,500	371	11,000	250	500	567	33,000	22,600	335	5,650	1,590	5,650	1,590	10,400	330
2033	33,000	21,500	379	11,000	250	500	572	33,000	22,600	341	5,650	1,613	5,650	1,613	10,400	335
2034	33,000	21,500	382	11,000	250	500	576	33,000	22,600	343	5,650	1,621	5,650	1,621	10,400	338
2035	33,000	21,500	386	11,000	250	500	578	33,000	22,600	345	5,650	1,630	5,650	1,630	10,400	340
2036	33,000	21,500	389	11,000	250	500	580	33,000	22,600	347	5,650	1,638	5,650	1,638	10,400	342
2037	33,000	21,500	392	11,000	250	500	581	33,000	22,600	349	5,650	1,646	5,650	1,646	10,400	344
2038	33,000	21,500	395	11,000	250	500	583	33,000	22,600	351	5,650	1,654	5,650	1,654	10,400	346
2039	33,000	21,500	398	11,000	250	500	585	33,000	22,600	353	5,650	1,662	5,650	1,662	10,400	348
2040	33,000	21,500	406	11,000	250	500	586	33,000	22,600	359	5,650	1,684	5,650	1,684	10,400	353
2041	33,000	21,500	415	11,000	250	500	591	33,000	22,600	364	5,650	1,707	5,650	1,707	10,400	359
2042	33,000	21,500	424	11,000	250	500	595	33,000	22,600	370	5,650	1,730	5,650	1,730	10,400	365
2043	33,000	21,500	433	11,000	250	500	600	33,000	22,600	376	5,650	1,754	5,650	1,754	10,400	371
2044	33,000	21,500	435	11,000	250	500	605	33,000	22,600	378	5,650	1,761	5,650	1,761	10,400	373
2045	33,000	21,500	438	11,000	250	500	606	33,000	22,600	379	5,650	1,767	5,650	1,767	10,400	374
2046	33,000	21,500	440	11,000	250	500	607	33,000	22,600	381	5,650	1,773	5,650	1,773	10,400	376
2047	33,000	21,500	442	11,000	250	500	608	33,000	22,600	382	5,650	1,779	5,650	1,779	10,400	377
2048	33,000	21,500	444	11,000	250	500	610	33,000	22,600	384	5,650	1,784	5,650	1,784	10,400	378
2049	33,000	21,500	446	11,000	250	500	611	33,000	22,600	385	5,650	1,790	5,650	1,790	10,400	380
2050	33,000	21,500	455	11,000	250	500	612	33,000	22,600	391	5,650	1,814	5,650	1,814	10,400	386
2051	33,000	21,500	465	11,000	250	500	617	33,000	22,600	397	5,650	1,838	5,650	1,838	10,400	392
2052	33,000	21,500	474	11,000	250	500	621	33,000	22,600	403	5,650	1,862	5,650	1,862	10,400	398
2053	33,000	21,500	483	11,000	250	500	626	33,000	22,600	409	5,650	1,887	5,650	1,887	10,400	404
2054	33,000	21,500	485	11,000	250	500	631	33,000	22,600	410	5,650	1,891	5,650	1,891	10,400	405
2055	33,000	21,500	486	11,000	250	500	632	33,000	22,600	411	5,650	1,895	5,650	1,895	10,400	406
2056	33,000	21,500	488	11,000	250	500	633	33,000	22,600	412	5,650	1,899	5,650	1,899	10,400	407
2057	33,000	21,500	489	11,000	250	500	634	33,000	22,600	413	5,650	1,903	5,650	1,903	10,400	408
2058	33,000	21,500	491	11,000	250	500	634	33,000	22,600	414	5,650	1,907	5,650	1,907	10,400	409
2059	33,000	21,500	492	11,000	250	500	635	33,000	22,600	415	5,650	1,911	5,650	1,911	10,400	410

Notes

1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).

2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.

3--Recycled water source is IEUA; All IEUA WWTPs regulated as one composite discharge

Appendix A-23
Water Supply Plan for the Muscoy Mutual Water Company

Year	Muscoy Mutual Water Company													
	Total Demand	Lytle Basin Groundwater		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Bunker Hill-A MZ		Return Flow to Lytle MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2011	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2012	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2013	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2014	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2015	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2016	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2017	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2018	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2019	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2020	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2021	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2022	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2023	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2024	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2025	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2026	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2027	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2028	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2029	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2030	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2031	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2032	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2033	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2034	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2035	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2036	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2037	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2038	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2039	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2040	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2041	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2042	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2043	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2044	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2045	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2046	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2047	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2048	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2049	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2050	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2051	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2052	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2053	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2054	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2055	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2056	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2057	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2058	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230
2059	2,100	2,100	230	2,100	1,260	230	315	1,170	275	1,170	40	1,170	840	230

Notes

1--Water Supply plan obtained from GEI Consultants, Inc. (2007).

2--Wastewater from Muscoy service area predominantly flows to septic tanks, a very small fraction goes to the San Bernardino WRF

Appendix A-24
Water Supply Plan for the Riverside Highland Water Company

Year	Riverside Highland Water Company											
	Total Demand	Raw Groundwater (Lytle)		Raw Groundwater (Bunker Hill-B)		Raw Groundwater (Riverside F)		Raw Groundwater (Riverside A)		Total Supply	Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L
2006	4,500	2,500	210	0	280	1,500	370	500	440	4,000	1,800	289
2007	4,600	2,500	210	0	284	2,100	370	525	440	4,600	1,840	283
2008	4,700	2,500	210	0	287	2,200	370	550	440	4,700	1,880	285
2009	4,800	2,500	210	0	291	2,300	370	575	440	4,800	1,920	287
2010	4,900	2,500	210	0	294	2,400	370	600	440	4,900	1,960	288
2011	5,000	2,500	210	0	298	2,500	370	625	440	5,000	2,000	290
2012	5,100	2,500	210	0	301	2,600	370	650	440	5,100	2,040	292
2013	5,200	2,500	210	0	304	2,700	370	675	440	5,200	2,080	293
2014	5,300	2,500	210	0	307	2,800	370	700	440	5,300	2,120	295
2015	5,400	2,500	210	0	310	2,900	370	725	440	5,400	2,160	296
2016	5,500	2,500	210	0	313	3,000	370	750	440	5,500	2,200	297
2017	5,600	2,500	210	0	316	3,100	370	775	440	5,600	2,240	299
2018	5,700	2,500	210	0	319	3,200	370	800	440	5,700	2,280	300
2019	5,800	2,500	210	0	322	3,300	370	825	440	5,800	2,320	301
2020	5,900	2,500	210	1,800	325	1,600	370	400	440	5,900	2,360	288
2021	6,000	2,500	210	1,800	328	1,700	370	425	440	6,000	2,400	291
2022	6,100	2,500	210	1,800	331	1,800	370	450	440	6,100	2,440	293
2023	6,200	2,500	210	1,800	334	1,900	370	475	440	6,200	2,480	295
2024	6,300	2,500	210	1,800	336	2,000	370	500	440	6,300	2,520	297
2025	6,400	2,500	210	1,800	339	2,100	370	525	440	6,400	2,560	299
2026	6,500	2,500	210	1,800	342	2,200	370	550	440	6,500	2,600	301
2027	6,600	2,500	210	1,800	345	2,300	370	575	440	6,600	2,640	302
2028	6,700	2,500	210	1,800	347	2,400	370	600	440	6,700	2,680	304
2029	6,800	2,500	210	1,800	350	2,500	370	625	440	6,800	2,720	306
2030	6,900	2,500	210	1,800	353	2,600	370	650	440	6,900	2,760	307
2031	7,000	2,500	210	1,800	355	2,700	370	675	440	7,000	2,800	309
2032	7,000	2,500	210	1,800	357	2,700	370	675	440	7,000	2,800	309
2033	7,000	2,500	210	1,800	359	2,700	370	675	440	7,000	2,800	310
2034	7,000	2,500	210	1,800	361	2,700	370	675	440	7,000	2,800	311
2035	7,000	2,500	210	1,800	363	2,700	370	675	440	7,000	2,800	311
2036	7,000	2,500	210	1,800	364	2,700	370	675	440	7,000	2,800	311
2037	7,000	2,500	210	1,800	366	2,700	370	675	440	7,000	2,800	312
2038	7,000	2,500	210	1,800	368	2,700	370	675	440	7,000	2,800	312
2039	7,000	2,500	210	1,800	369	2,700	370	675	440	7,000	2,800	313
2040	7,000	2,500	210	1,800	371	2,700	370	675	440	7,000	2,800	313
2041	7,000	2,500	210	1,800	372	2,700	370	675	440	7,000	2,800	313
2042	7,000	2,500	210	1,800	373	2,700	370	675	440	7,000	2,800	314
2043	7,000	2,500	210	1,800	375	2,700	370	675	440	7,000	2,800	314
2044	7,000	2,500	210	1,800	376	2,700	370	675	440	7,000	2,800	314
2045	7,000	2,500	210	1,800	377	2,700	370	675	440	7,000	2,800	315
2046	7,000	2,500	210	1,800	378	2,700	370	675	440	7,000	2,800	315
2047	7,000	2,500	210	1,800	379	2,700	370	675	440	7,000	2,800	315
2048	7,000	2,500	210	1,800	380	2,700	370	675	440	7,000	2,800	315
2049	7,000	2,500	210	1,800	381	2,700	370	675	440	7,000	2,800	316
2050	7,000	2,500	210	1,800	382	2,700	370	675	440	7,000	2,800	316
2051	7,000	2,500	210	1,800	383	2,700	370	675	440	7,000	2,800	316
2052	7,000	2,500	210	1,800	384	2,700	370	675	440	7,000	2,800	316
2053	7,000	2,500	210	1,800	384	2,700	370	675	440	7,000	2,800	317
2054	7,000	2,500	210	1,800	385	2,700	370	675	440	7,000	2,800	317
2055	7,000	2,500	210	1,800	386	2,700	370	675	440	7,000	2,800	317
2056	7,000	2,500	210	1,800	387	2,700	370	675	440	7,000	2,800	317
2057	7,000	2,500	210	1,800	387	2,700	370	675	440	7,000	2,800	317
2058	7,000	2,500	210	1,800	388	2,700	370	675	440	7,000	2,800	317
2059	7,000	2,500	210	1,800	388	2,700	370	675	440	7,000	2,800	318

Appendix A-25
Water Supply Plan for the San Antonio Water Company

Year	San Antonio Water Company															
	Total Demand	Pumped Chino North Groundwater		Other Groundwater		San Antonio Tunnel		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Return Flow to Chino North MZ	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	9,600	900	259	7,700	330	1,000	200	9,600	6,528	310	1,632	1,489	49	1,489	3,072	310
2011	9,600	900	264	7,700	330	1,000	200	9,600	6,528	310	1,632	1,491	49	1,491	3,072	310
2012	9,600	900	269	7,700	330	1,000	200	9,600	6,528	311	1,632	1,493	49	1,493	3,072	311
2013	9,600	900	275	7,700	330	1,000	200	9,600	6,528	311	1,632	1,495	49	1,495	3,072	311
2014	9,600	900	279	7,700	330	1,000	200	9,600	6,528	312	1,632	1,497	49	1,497	3,072	312
2015	9,600	900	283	7,700	330	1,000	200	9,600	6,528	312	1,632	1,498	49	1,498	3,072	312
2016	9,600	900	286	7,700	330	1,000	200	9,600	6,528	312	1,632	1,499	49	1,499	3,072	312
2017	9,600	900	289	7,700	330	1,000	200	9,600	6,528	313	1,632	1,501	49	1,501	3,072	313
2018	9,600	900	292	7,700	330	1,000	200	9,600	6,528	313	1,632	1,502	49	1,502	3,072	313
2019	9,600	900	297	7,700	330	1,000	200	9,600	6,528	313	1,632	1,504	49	1,504	3,072	313
2020	9,600	900	302	7,700	330	1,000	200	9,600	6,528	314	1,632	1,505	49	1,505	3,072	314
2021	9,600	900	307	7,700	330	1,000	200	9,600	6,528	314	1,632	1,507	49	1,507	3,072	314
2022	9,600	900	313	7,700	330	1,000	200	9,600	6,528	315	1,632	1,509	49	1,509	3,072	315
2023	9,600	900	318	7,700	330	1,000	200	9,600	6,528	315	1,632	1,511	49	1,511	3,072	315
2024	9,600	900	322	7,700	330	1,000	200	9,600	6,528	316	1,632	1,513	49	1,513	3,072	316
2025	9,600	900	326	7,700	330	1,000	200	9,600	6,528	316	1,632	1,514	49	1,514	3,072	316
2026	9,600	900	331	7,700	330	1,000	200	9,600	6,528	317	1,632	1,516	49	1,516	3,072	317
2027	9,600	900	336	7,700	330	1,000	200	9,600	6,528	317	1,632	1,518	49	1,518	3,072	317
2028	9,600	900	341	7,700	330	1,000	200	9,600	6,528	317	1,632	1,520	49	1,520	3,072	317
2029	9,600	900	346	7,700	330	1,000	200	9,600	6,528	318	1,632	1,522	49	1,522	3,072	318
2030	9,600	900	354	7,700	330	1,000	200	9,600	6,528	319	1,632	1,525	49	1,525	3,072	319
2031	9,600	900	362	7,700	330	1,000	200	9,600	6,528	319	1,632	1,528	49	1,528	3,072	319
2032	9,600	900	371	7,700	330	1,000	200	9,600	6,528	320	1,632	1,531	49	1,531	3,072	320
2033	9,600	900	379	7,700	330	1,000	200	9,600	6,528	321	1,632	1,534	49	1,534	3,072	321
2034	9,600	900	382	7,700	330	1,000	200	9,600	6,528	321	1,632	1,535	49	1,535	3,072	321
2035	9,600	900	386	7,700	330	1,000	200	9,600	6,528	322	1,632	1,537	49	1,537	3,072	322
2036	9,600	900	389	7,700	330	1,000	200	9,600	6,528	322	1,632	1,538	49	1,538	3,072	322
2037	9,600	900	392	7,700	330	1,000	200	9,600	6,528	322	1,632	1,539	49	1,539	3,072	322
2038	9,600	900	395	7,700	330	1,000	200	9,600	6,528	323	1,632	1,540	49	1,540	3,072	323
2039	9,600	900	398	7,700	330	1,000	200	9,600	6,528	323	1,632	1,541	49	1,541	3,072	323
2040	9,600	900	406	7,700	330	1,000	200	9,600	6,528	324	1,632	1,544	49	1,544	3,072	324
2041	9,600	900	415	7,700	330	1,000	200	9,600	6,528	324	1,632	1,548	49	1,548	3,072	324
2042	9,600	900	424	7,700	330	1,000	200	9,600	6,528	325	1,632	1,551	49	1,551	3,072	325
2043	9,600	900	433	7,700	330	1,000	200	9,600	6,528	326	1,632	1,554	49	1,554	3,072	326
2044	9,600	900	435	7,700	330	1,000	200	9,600	6,528	326	1,632	1,555	49	1,555	3,072	326
2045	9,600	900	438	7,700	330	1,000	200	9,600	6,528	327	1,632	1,556	49	1,556	3,072	327
2046	9,600	900	440	7,700	330	1,000	200	9,600	6,528	327	1,632	1,557	49	1,557	3,072	327
2047	9,600	900	442	7,700	330	1,000	200	9,600	6,528	327	1,632	1,558	49	1,558	3,072	327
2048	9,600	900	444	7,700	330	1,000	200	9,600	6,528	327	1,632	1,559	49	1,559	3,072	327
2049	9,600	900	446	7,700	330	1,000	200	9,600	6,528	327	1,632	1,559	49	1,559	3,072	327
2050	9,600	900	455	7,700	330	1,000	200	9,600	6,528	328	1,632	1,563	49	1,563	3,072	328
2051	9,600	900	465	7,700	330	1,000	200	9,600	6,528	329	1,632	1,566	49	1,566	3,072	329
2052	9,600	900	474	7,700	330	1,000	200	9,600	6,528	330	1,632	1,570	49	1,570	3,072	330
2053	9,600	900	483	7,700	330	1,000	200	9,600	6,528	331	1,632	1,573	49	1,573	3,072	331
2054	9,600	900	485	7,700	330	1,000	200	9,600	6,528	331	1,632	1,574	49	1,574	3,072	331
2055	9,600	900	486	7,700	330	1,000	200	9,600	6,528	331	1,632	1,574	49	1,574	3,072	331
2056	9,600	900	488	7,700	330	1,000	200	9,600	6,528	331	1,632	1,575	49	1,575	3,072	331
2057	9,600	900	489	7,700	330	1,000	200	9,600	6,528	331	1,632	1,576	49	1,576	3,072	331
2058	9,600	900	491	7,700	330	1,000	200	9,600	6,528	332	1,632	1,576	49	1,576	3,072	332
2059	9,600	900	492	7,700	330	1,000	200	9,600	6,528	332	1,632	1,577	49	1,577	3,072	332

Notes
1--Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).
2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.
3--Service area is not served by wastewater services, all flows are to septic systems.

Appendix A-26
Water Supply Plan for the South Mesa Water Company

Year	South Mesa Water Company															
	Total Demand	Raw Groundwater (Beaumont Basin)		Raw Groundwater (Yucaipa Basin)		Imported SWP Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Yucaipa MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	2,692	600	269	2,140	330	0	250	2,740	1,644	317	411	1,518	411	1,518	1,096	317
2011	2,740	600	271	2,210	336	22	250	2,832	1,699	322	425	1,537	425	1,537	1,133	322
2012	2,832	600	274	2,280	342	44	250	2,924	1,754	326	439	1,555	439	1,555	1,170	326
2013	2,924	600	276	2,350	347	66	250	3,016	1,810	331	452	1,575	452	1,575	1,206	331
2014	3,016	600	279	2,705	353	88	250	3,393	2,036	337	509	1,600	509	1,600	1,357	337
2015	3,108	315	281	1,655	359	1,230	250	3,200	1,920	310	480	1,488	480	1,488	1,280	310
2016	3,200	315	284	1,720	365	1,237	250	3,272	1,963	314	491	1,505	491	1,505	1,309	314
2017	3,272	315	286	1,785	371	1,244	250	3,344	2,006	318	502	1,523	502	1,523	1,338	318
2018	3,344	315	289	1,850	378	1,251	250	3,416	2,050	323	512	1,541	512	1,541	1,366	323
2019	3,416	315	292	1,915	384	1,258	250	3,488	2,093	327	523	1,559	523	1,559	1,395	327
2020	3,488	315	295	1,980	391	1,265	250	3,560	2,136	332	534	1,579	534	1,579	1,424	332
2021	3,560	315	298	1,927	397	1,386	250	3,628	2,177	332	544	1,579	544	1,579	1,451	332
2022	3,628	315	302	1,874	404	1,507	250	3,696	2,218	332	554	1,580	554	1,580	1,478	332
2023	3,696	315	306	1,821	410	1,628	250	3,764	2,258	332	565	1,579	565	1,579	1,506	332
2024	3,764	315	310	1,768	417	1,749	250	3,832	2,299	332	575	1,578	575	1,578	1,533	332
2025	3,832	315	314	1,715	424	1,870	250	3,900	2,340	332	585	1,576	585	1,576	1,560	332
2026	3,900	315	319	1,672	430	1,993	250	3,980	2,388	331	597	1,575	597	1,575	1,592	331
2027	3,980	315	323	1,629	437	2,116	250	4,060	2,436	331	609	1,573	609	1,573	1,624	331
2028	4,060	315	328	1,587	443	2,238	250	4,140	2,484	330	621	1,570	621	1,570	1,656	330
2029	4,140	315	332	1,544	450	2,361	250	4,220	2,532	329	633	1,567	633	1,567	1,688	329
2030	4,220	315	337	1,501	456	2,484	250	4,300	2,580	328	645	1,564	645	1,564	1,720	328
2031	4,300	315	342	1,501	463	2,484	250	4,300	2,580	331	645	1,574	645	1,574	1,720	331
2032	4,300	315	347	1,501	469	2,484	250	4,300	2,580	334	645	1,584	645	1,584	1,720	334
2033	4,300	315	351	1,501	475	2,484	250	4,300	2,580	336	645	1,594	645	1,594	1,720	336
2034	4,300	315	356	1,501	481	2,484	250	4,300	2,580	338	645	1,604	645	1,604	1,720	338
2035	4,300	315	360	1,501	487	2,484	250	4,300	2,580	341	645	1,613	645	1,613	1,720	341
2036	4,300	315	365	1,501	493	2,484	250	4,300	2,580	343	645	1,622	645	1,622	1,720	343
2037	4,300	315	369	1,501	498	2,484	250	4,300	2,580	345	645	1,631	645	1,631	1,720	345
2038	4,300	315	374	1,501	503	2,484	250	4,300	2,580	348	645	1,640	645	1,640	1,720	348
2039	4,300	315	378	1,501	509	2,484	250	4,300	2,580	350	645	1,649	645	1,649	1,720	350
2040	4,300	315	382	1,501	514	2,484	250	4,300	2,580	352	645	1,657	645	1,657	1,720	352
2041	4,300	315	387	1,501	519	2,484	250	4,300	2,580	354	645	1,666	645	1,666	1,720	354
2042	4,300	315	391	1,501	524	2,484	250	4,300	2,580	356	645	1,674	645	1,674	1,720	356
2043	4,300	315	395	1,501	529	2,484	250	4,300	2,580	358	645	1,682	645	1,682	1,720	358
2044	4,300	315	399	1,501	534	2,484	250	4,300	2,580	360	645	1,690	645	1,690	1,720	360
2045	4,300	315	403	1,501	538	2,484	250	4,300	2,580	362	645	1,697	645	1,697	1,720	362
2046	4,300	315	407	1,501	543	2,484	250	4,300	2,580	364	645	1,705	645	1,705	1,720	364
2047	4,300	315	411	1,501	547	2,484	250	4,300	2,580	366	645	1,712	645	1,712	1,720	366
2048	4,300	315	415	1,501	552	2,484	250	4,300	2,580	367	645	1,719	645	1,719	1,720	367
2049	4,300	315	419	1,501	556	2,484	250	4,300	2,580	369	645	1,726	645	1,726	1,720	369
2050	4,300	315	422	1,501	560	2,484	250	4,300	2,580	371	645	1,733	645	1,733	1,720	371
2051	4,300	315	426	1,501	564	2,484	250	4,300	2,580	373	645	1,740	645	1,740	1,720	373
2052	4,300	315	430	1,501	568	2,484	250	4,300	2,580	374	645	1,747	645	1,747	1,720	374
2053	4,300	315	434	1,501	572	2,484	250	4,300	2,580	376	645	1,753	645	1,753	1,720	376
2054	4,300	315	437	1,501	576	2,484	250	4,300	2,580	377	645	1,760	645	1,760	1,720	377
2055	4,300	315	441	1,501	580	2,484	250	4,300	2,580	379	645	1,766	645	1,766	1,720	379
2056	4,300	315	444	1,501	583	2,484	250	4,300	2,580	381	645	1,772	645	1,772	1,720	381
2057	4,300	315	448	1,501	587	2,484	250	4,300	2,580	382	645	1,778	645	1,778	1,720	382
2058	4,300	315	451	1,501	590	2,484	250	4,300	2,580	384	645	1,784	645	1,784	1,720	384
2059	4,300	315	455	1,501	594	2,484	250	4,300	2,580	385	645	1,790	645	1,790	1,720	385

Notes
1--Water Supply plan obtained from Wildermuth Environmental, Inc (2009b).
2--Recycled water source is Yucaipa Valley Water District WWTP.

Year	West Valley Water District																									
	Total Demand	Raw Groundwater (Bunker Hill A)		Raw Groundwater (Rialto)		Raw Groundwater (Lytle Basin)		Raw Groundwater (Riverside North)		Raw Groundwater (Chino North)		Lytle Creek Surface Water		Imported SWP Water		Recycled Water		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Chino North MZ		Indoor Water Use	
	AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	30,000	2,730	326	3,500	242	6,500	210	2,580	298	1,000	259	3,000	210	7,000	250	3,690	514	30,000	19,476	298	4,869	1,441	682	1,441	10,524	247
2011	30,740	2,950	326	3,700	245	6,500	210	2,900	300	1,000	264	3,000	210	7,000	250	3,690	510	30,740	19,920	298	4,980	1,441	697	1,441	10,820	249
2012	31,480	3,330	326	3,900	248	6,500	210	3,060	302	1,000	269	3,000	210	7,000	250	3,690	512	31,480	20,364	299	5,091	1,445	713	1,445	11,116	252
2013	32,220	3,710	327	4,100	251	6,500	210	3,220	304	1,000	275	3,000	210	7,000	250	3,690	513	32,220	20,808	300	5,202	1,449	728	1,449	11,412	254
2014	32,960	4,090	326	4,300	254	6,500	210	3,380	306	1,000	279	3,000	210	7,000	250	3,690	515	32,960	21,252	301	5,313	1,453	744	1,453	11,708	256
2015	33,700	4,470	326	4,500	257	6,500	210	3,540	308	1,000	283	3,000	210	7,000	250	3,690	517	33,700	21,696	302	5,424	1,457	759	1,457	12,004	258
2016	34,760	5,090	326	4,780	260	6,500	210	3,700	310	1,000	286	3,000	210	7,000	250	3,690	518	34,760	22,332	303	5,583	1,461	782	1,461	12,428	260
2017	35,820	5,650	326	5,060	263	6,500	210	3,920	312	1,000	289	3,000	210	7,000	250	3,690	520	35,820	22,968	304	5,742	1,465	804	1,465	12,852	262
2018	36,880	6,210	327	5,340	266	6,500	210	4,140	314	1,000	292	3,000	210	7,000	250	3,690	523	36,880	23,604	305	5,901	1,470	826	1,470	13,276	265
2019	37,940	6,770	327	5,620	269	6,500	210	4,360	316	1,000	297	3,000	210	7,000	250	3,690	525	37,940	24,240	306	6,060	1,475	848	1,475	13,700	267
2020	39,000	6,830	328	5,900	272	6,500	210	4,580	318	1,000	302	3,500	210	7,000	250	3,690	527	39,000	24,876	306	6,219	1,475	871	1,475	14,124	268
2021	40,200	7,350	329	6,360	275	6,500	210	4,800	320	1,000	307	3,500	210	7,000	250	3,690	528	40,200	25,596	307	6,399	1,479	896	1,479	14,604	270
2022	41,400	8,050	330	6,820	278	6,500	210	4,840	322	1,000	313	3,500	210	7,000	250	3,690	530	41,400	26,316	308	6,579	1,484	921	1,484	15,084	272
2023	42,600	8,750	331	7,280	281	6,500	210	4,880	324	1,000	318	3,500	210	7,000	250	3,690	532	42,600	27,036	310	6,759	1,489	946	1,489	15,564	275
2024	43,800	9,450	332	7,740	284	6,500	210	4,920	326	1,000	322	3,500	210	7,000	250	3,690	534	43,800	27,756	311	6,939	1,494	971	1,494	16,044	277
2025	45,000	9,650	333	8,200	287	6,500	210	4,960	328	1,000	326	4,000	210	7,000	250	3,690	536	45,000	28,476	311	7,119	1,495	997	1,495	16,524	278
2026	47,280	11,530	334	8,560	290	6,500	210	5,000	330	1,000	331	4,000	210	7,000	250	3,690	536	47,280	29,844	313	7,461	1,502	1,045	1,502	17,436	281
2027	49,560	13,450	335	8,920	293	6,500	210	5,000	332	1,000	336	4,000	210	7,000	250	3,690	540	49,560	31,212	315	7,803	1,510	1,092	1,510	18,348	285
2028	51,840	15,370	336	9,280	296	6,500	210	5,000	334	1,000	341	4,000	210	7,000	250	3,690	542	51,840	32,580	317	8,145	1,518	1,140	1,518	19,260	288
2029	54,120	17,290	337	9,640	299	6,500	210	5,000	336	1,000	346	4,000	210	7,000	250	3,690	545	54,120	33,948	319	8,487	1,526	1,188	1,526	20,172	291
2030	56,400	18,710	338	10,000	302	6,500	210	5,000	338	1,000	354	4,500	210	7,000	250	3,690	548	56,400	35,316	320	8,829	1,529	1,236	1,529	21,084	293
2031	56,400	18,710	339	10,000	305	6,500	210	5,000	340	1,000	362	4,500	210	7,000	250	3,690	550	56,400	35,316	321	8,829	1,534	1,236	1,534	21,084	294
2032	56,400	18,710	340	10,000	308	6,500	210	5,000	342	1,000	371	4,500	210	7,000	250	3,690	551	56,400	35,316	322	8,829	1,539	1,236	1,539	21,084	296
2033	56,400	18,710	341	10,000	311	6,500	210	5,000	344	1,000	379	4,500	210	7,000	250	3,690	552	56,400	35,316	323	8,829	1,544	1,236	1,544	21,084	297
2034	56,400	18,710	341	10,000	314	6,500	210	5,000	346	1,000	382	4,500	210	7,000	250	3,690	553	56,400	35,316	324	8,829	1,548	1,236	1,548	21,084	298
2035	56,400	18,710	342	10,000	317	6,500	210	5,000	348	1,000	386	4,500	210	7,000	250	3,690	554	56,400	35,316	326	8,829	1,552	1,236	1,552	21,084	299
2036	56,400	18,710	343	10,000	320	6,500	210	5,000	350	1,000	389	4,500	210	7,000	250	3,690	555	56,400	35,316	327	8,829	1,557	1,236	1,557	21,084	300
2037	56,400	18,710	344	10,000	323	6,500	210	5,000	352	1,000	392	4,500	210	7,000	250	3,690	556	56,400	35,316	328	8,829	1,561	1,236	1,561	21,084	301
2038	56,400	18,710	344	10,000	326	6,500	210	5,000	354	1,000	395	4,500	210	7,000	250	3,690	557	56,400	35,316	329	8,829	1,565	1,236	1,565	21,084	302
2039	56,400	18,710	345	10,000	329	6,500	210	5,000	356	1,000	398	4,500	210	7,000	250	3,690	559	56,400	35,316	330	8,829	1,570	1,236	1,570	21,084	303
2040	56,400	18,710	346	10,000	332	6,500	210	5,000	358	1,000	406	4,500	210	7,000	250	3,690	560	56,400	35,316	331	8,829	1,574	1,236	1,574	21,084	304
2041	56,400	18,710	347	10,000	335	6,500	210	5,000	360	1,000	415	4,500	210	7,000	250	3,690	561	56,400	35,316	332	8,829	1,579	1,236	1,579	21,084	306
2042	56,400	18,710	347	10,000	338	6,500	210	5,000	362	1,000	424	4,500	210	7,000	250	3,690	562	56,400	35,316	333	8,829	1,584	1,236	1,584	21,084	307
2043	56,400	18,710	348	10,000	341	6,500	210	5,000	364	1,000	433	4,500	210	7,000	250	3,690	563	56,400	35,316	335	8,829	1,588	1,236	1,588	21,084	308
2044	56,400	18,710	349	10,000	344	6,500	210	5,000	366	1,000	435	4,500	210	7,000	250	3,690	564	56,400	35,316	336	8,829	1,593	1,236	1,593	21,084	309
2045	56,400	18,710	349	10,000	347	6,500	210	5,000	368	1,000	438	4,500	210	7,000	250	3,690	565	56,400	35,316	337	8,829	1,597	1,236	1,597	21,084	310
2046	56,400	18,710	350	10,000	350	6,500	210	5,000	370	1,000	440	4,500	210	7,000	250	3,690	566	56,400	35,316	338	8,829	1,601	1,236	1,601	21,084	311
2047	56,400	18,710	350	10,000	353	6,500	210	5,000	372	1,000	442	4,500	210	7,000	250	3,690	567	56,400	35,316	339	8,829	1,605	1,236	1,605	21,084	312
2048	56,400	18,710	351	10,000	356	6,500	210	5,000	374	1,000	444	4,500	210	7,000	250	3,690	568	56,400	35,316	340	8,829	1,609	1,236	1,609	21,084	313
2049	56,400	18,710	352	10,000	359	6,500	210	5,000	376	1,000	446	4,500	210	7,000	250	3,690	569	56,400	35,316	341	8,829	1,613	1,236	1,613	21,084	314
2050	56,400	18,710	352	10,000	362	6,500	210	5,000	378	1,000	455	4,500	210	7,000	250	3,690	570	56,400	35,316	342	8,829	1,617	1,236	1,617	21,084	315
2051	56,400	18,710	353	10,000	365	6,500	210	5,000	380	1,000	465	4,500	210	7,000	250	3,690	571	56,400	35,316	343	8,829	1,622	1,236	1,622	21,084	316
2052	56,400	18,710	353	10,000	368	6,500	210	5,000	382	1,000	474	4,500	210	7,000	250	3,690	572	56,400	35,316	344	8,829	1,626	1,236	1,626	21,084	317
2053	56,400	18,710	354	10,000	371	6,500	210	5,000	384	1,000	483	4,500	210	7,000	250	3,690	573	56,400	35,316	345	8,829	1,631	1,236	1,631	21,084	319
2054	56,400	18,710	354	10,000	374	6,500	210	5,000	386	1,000	485	4,500	210	7,000	250	3,690	575	56,400	35,316	346	8,829	1,635	1,236	1,635	21,084	320
2055	56,400	18,710	355	10,000	377	6,500	210	5,000	388	1,000	486	4,500	210	7,000	250	3,690	575	56,400	35,316	347	8,829	1,638	1,236	1,638	21,084	320
2056	56,400	18,710	355	10,000	380	6,500	210	5,000	390	1,000	488	4,500	210	7,000	250	3,690	576	56,400	35,316	348	8,829	1,642	1,236	1,642	21,084	321
2057	56,400	18,710	355	10,000	383	6,500	210	5,000	392	1,000	489	4,500	210	7,000	250	3,690	577	56,400	35,316	349	8,829	1,646	1,236	1,646	21,084	322
2058	56,400	18,710	356	10,000	386	6,500	210	5,000	394	1,000	491	4,500	210	7,000	250	3,690	578	56,400	35,316	350	8,829	1,650	1,236	1,650	21,084	323
2059	56,400	18,710	356	10,000	389	6,500	210	5,000	396	1,000	492	4,500	210	7,000	250	3,690	579	56,400	35,316	351	8,829	1,653	1,236	1,653	21,084	324

Notes

1--Water supply plan adapted from Wildermuth Environmental, Inc (2009a) and GEI Consultants, Inc. (2007).

2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.

3--Pumping from Riverside North is assumed to be pumped equally from Riverside-A and Riverside-B, based on spatial location of production wells. Assumed that TDS is the volume weighted 2006 AWQ values + 2 mg/L per year.

4--Recycled water source is the City of Rialto's Wastewater Treatment Plant

5--Wastewater from the WVWD's service area flows to the City of Rialto Wastewater Treatment Plant

Table A- Water Supply Plan for the Yucaipa Valley Water District

Year	Total Demand	Pass Region (Riv Co) Supplies								San Bernardino Region Supplies													Pass Region (Riv Co) Returns from Use								San Bernardino Region Returns from Use						Total Indoor Water Use	
		Pass Region Potable Demands	Raw Groundwater (Beaumont)		Imported SWP Water		Non-Potable (SWP Water)		Total Riv Supply	SB Co. Region Potable Demands	SB Co. Region Non-Potable Demands	Raw Groundwater (Yucaipa)		Raw Groundwater (Beaumont)		Imported SWP Water		Non-Potable: SWP for Blending		Non-Potable: Recycled Water		Total SB Supply	Outdoor Water Use in the Pass Region		Return Flow from Pass Region		Return Flow to Beaumont MZ		Return Flow to Yucaipa MZ		Outdoor Water Use in the San Bernardino County Region		Return Flow from San Bern. Demand		Return Flow to Yucaipa MZ			
			Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY			Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	18,600	1,030	633	269	197	250	200	250	1,030	17,570	3,001	7,800	330	2,000	269	4,769	250	1,500	250	1,501	490	17,570	698	260	175	1,292	91	1,292	84	1,292	11,742	315	2,936	1,509	2,936	1,509	6,160	294
2011	19,200	1,495	633	271	516	250	346	250	1,495	17,705	2,974	7,800	336	2,000	271	4,931	250	1,483	250	1,491	489	17,705	1,036	258	259	1,282	135	1,282	124	1,282	11,812	316	2,953	1,516	2,953	1,516	6,352	296
2012	19,799	1,959	633	274	824	250	502	250	1,959	17,840	2,937	7,800	342	2,000	274	5,103	250	1,478	250	1,459	492	17,840	1,376	257	344	1,276	179	1,276	165	1,276	11,879	318	2,970	1,523	2,970	1,523	6,544	298
2013	20,401	2,425	400	276	1,359	250	666	250	2,425	17,975	2,894	7,800	347	2,000	276	5,282	250	1,469	250	1,425	494	17,975	1,722	254	430	1,265	224	1,265	207	1,265	11,943	320	2,986	1,530	2,986	1,530	6,736	299
2014	21,000	2,891	400	279	1,656	250	835	250	2,891	18,110	2,845	7,800	353	2,000	279	5,464	250	1,455	250	1,390	496	18,110	2,068	253	517	1,263	269	1,263	248	1,263	12,004	322	3,001	1,536	3,001	1,536	6,928	300
2015	21,600	3,356	400	281	1,949	250	1,007	250	3,356	18,244	2,793	7,800	359	2,000	281	5,651	250	1,444	250	1,349	498	18,244	2,416	253	604	1,262	314	1,262	290	1,262	12,064	323	3,016	1,543	3,016	1,543	7,120	302
2016	22,160	3,676	400	284	2,153	250	1,123	250	3,676	18,484	2,917	7,800	365	2,000	284	5,767	250	1,489	250	1,428	495	18,484	2,655	253	664	1,262	345	1,262	319	1,262	12,257	326	3,064	1,553	3,064	1,553	7,248	304
2017	22,721	3,996	400	286	2,356	250	1,240	250	3,996	18,725	3,040	7,800	371	2,000	286	5,885	250	1,566	250	1,474	497	18,725	2,894	253	723	1,262	376	1,262	347	1,262	12,451	328	3,113	1,564	3,113	1,564	7,376	306
2018	23,281	4,316	400	289	2,558	250	1,357	250	4,316	18,965	3,163	7,800	378	2,000	289	6,002	250	1,643	250	1,519	500	18,965	3,132	253	783	1,262	407	1,262	376	1,262	12,644	331	3,161	1,574	3,161	1,574	7,504	308
2019	23,840	4,636	400	292	2,761	250	1,475	250	4,636	19,205	3,285	7,800	384	2,000	292	6,120	250	1,722	250	1,563	502	19,205	3,371	253	843	1,262	438	1,262	405	1,262	12,837	333	3,209	1,584	3,209	1,584	7,632	310
2020	24,400	4,956	400	295	2,948	250	1,608	250	4,956	19,444	3,392	7,800	391	2,000	295	6,252	250	1,793	250	1,599	505	19,444	3,616	253	904	1,262	470	1,262	434	1,262	13,024	336	3,256	1,594	3,256	1,594	7,760	312
2021	24,861	5,178	400	298	3,069	250	1,709	250	5,178	19,683	3,411	7,800	397	2,000	298	6,472	250	1,818	250	1,592	507	19,683	3,791	253	948	1,262	493	1,262	455	1,262	13,174	338	3,293	1,601	3,293	1,601	7,896	314
2022	25,320	5,401	400	302	3,190	250	1,811	250	5,401	19,919	3,429	7,800	404	2,000	302	6,690	250	1,839	250	1,590	509	19,919	3,965	253	991	1,263	515	1,263	476	1,263	13,323	340	3,331	1,608	3,331	1,608	8,032	316
2023	25,780	5,624	400	306	3,311	250	1,912	250	5,624	20,156	3,448	7,800	410	2,000	306	6,909	250	1,859	250	1,589	510	20,156	4,139	253	1,035	1,263	538	1,263	497	1,263	13,473	341	3,368	1,616	3,368	1,616	8,168	318
2024	26,239	5,846	400	310	3,433	250	2,014	250	5,846	20,393	3,466	7,800	417	2,000	310	7,127	250	1,879	250	1,588	512	20,393	4,313	253	1,078	1,263	561	1,263	518	1,263	13,622	343	3,406	1,623	3,406	1,623	8,304	320
2025	26,700	6,069	400	314	3,554	250	2,115	250	6,069	20,631	3,485	7,800	424	2,000	314	7,346	250	1,898	250	1,587	514	20,631	4,487	253	1,122	1,264	583	1,264	538	1,264	13,773	345	3,443	1,630	3,443	1,630	8,440	322
2026	27,080	6,292	400	319	3,676	250	2,216	250	6,292	20,788	3,484	7,800	430	2,000	319	7,504	250	1,906	250	1,578	515	20,788	4,661	254	1,165	1,264	606	1,264	559	1,264	13,867	347	3,467	1,638	3,467	1,638	8,552	323
2027	27,460	6,514	400	323	3,798	250	2,317	250	6,514	20,945	3,483	7,800	437	2,000	323	7,662	250	1,915	250	1,568	517	20,945	4,835	254	1,209	1,265	629	1,265	580	1,265	13,961	349	3,490	1,645	3,490	1,645	8,664	325
2028	27,839	6,737	400	328	3,920	250	2,417	250	6,737	21,102	3,482	7,800	443	2,000	328	7,820	250	1,924	250	1,559	518	21,102	5,009	254	1,252	1,265	651	1,265	601	1,265	14,054	351	3,514	1,653	3,514	1,653	8,776	327
2029	28,220	6,960	400	332	4,042	250	2,518	250	6,960	21,261	3,482	7,800	450	2,000	332	7,979	250	1,932	250	1,550	520	21,261	5,183	254	1,296	1,265	674	1,265	622	1,265	14,149	353	3,537	1,660	3,537	1,660	8,888	329
2030	28,600	7,182	400	337	4,164	250	2,619	250	7,182	21,418	3,481	7,800	456	2,000	337	8,136	250	1,939	250	1,542	521	21,418	5,357	254	1,339	1,266	696	1,266	643	1,266	14,243	354	3,561	1,668	3,561	1,668	9,000	331
2031	28,600	7,182	400	342	4,164	250	2,619	250	7,182	21,418	3,481	7,800	463	2,000	342	8,136	250	1,947	250	1,534	522	21,418	5,357	254	1,339	1,266	696	1,266	643	1,266	14,243	357	3,561	1,678	3,561	1,678	9,000	334
2032	28,600	7,182	400	347	4,164	250	2,619	250	7,182	21,418	3,481	7,800	469	2,000	347	8,136	250	1,962	250	1,519	525	21,418	5,357	254	1,339	1,267	696	1,267	643	1,267	14,243	359	3,561	1,688	3,561	1,688	9,000	336
2033	28,600	7,182	400	351	4,164	250	2,619	250	7,182	21,418	3,481	7,800	475	2,000	351	8,136	250	1,977	250	1,505	528	21,418	5,357	255	1,339	1,268	696	1,268	643	1,268	14,243	362	3,561	1,697	3,561	1,697	9,000	339
2034	28,600	7,182	400	356	4,164	250	2,619	250	7,182	21,418	3,481	7,800	481	2,000	356	8,136	250	1,991	250	1,491	530	21,418	5,357	255	1,339	1,269	696	1,269	643	1,269	14,243	364	3,561	1,707	3,561	1,707	9,000	341
2035	28,600	7,182	400	360	4,164	250	2,619	250	7,182	21,418	3,481	7,800	487	2,000	360	8,136	250	2,004	250	1,477	533	21,418	5,357	255	1,339	1,270	696	1,270	643	1,270	14,243	366	3,561	1,716	3,561	1,716	9,000	344
2036	28,600	7,182	400	365	4,164	250	2,619	250	7,182	21,418	3,481	7,800	493	2,000	365	8,136	250	2,017	250	1,465	535	21,418	5,357	255	1,339	1,271	696	1,271	643	1,271	14,243	369	3,561	1,725	3,561	1,725	9,000	346
2037	28,600	7,182	400	369	4,164	250	2,619	250	7,182	21,418	3,481	7,800	498	2,000	369	8,136	250	2,029	250	1,452	538	21,418	5,357	255	1,339	1,271	696	1,271	643	1,271	14,243	371	3,561	1,734	3,561	1,734	9,000	349
2038	28,600	7,182	400	374	4,164	250	2,619	250	7,182	21,418	3,481	7,800	503	2,000	374	8,136	250	2,041	250	1,440	540	21,418	5,357	256	1,339	1,272	696	1,272	643	1,272	14,243	373	3,561	1,742	3,561	1,742	9,000	351
2039	28,600	7,182	400	378	4,164	250	2,619	250	7,182	21,418	3,481	7,800	509	2,000	378	8,136	250	2,052	250	1,429	542	21,418	5,357	256	1,339	1,273	696	1,273	643	1,273	14,243	375	3,561	1,751	3,561	1,751	9,000	353
2040	28,600	7,182	400	382	4,164	250	2,619	250	7,182	21,418	3,481	7,800	514	2,000	382	8,136	250	2,063	250	1,418	545	21,418	5,357	256	1,339	1,274	696	1,274	643	1,274	14,243	377	3,561	1,759	3,561	1,759	9,000	356
2041	28,600	7,182	400	387	4,164	250	2,619	250	7,182	21,418	3,481	7,800	519	2,000	387	8,136	250	2,074	250	1,407	547	21,418	5,357	256	1,339	1,274	696	1,274	643	1,274	14,243	379	3,561	1,767	3,561	1,767	9,000	358
2042	28,600	7,182	400	391	4,164	250	2,619	250	7,182	21,418	3,481	7,800	524	2,000	391	8,136	250	2,084	250	1,397	549	21,418	5,357	256	1,339	1,275	696	1,275	643	1,275	14,243	381	3,561	1,775	3,561	1,775	9,000	360
2043	28,600	7,182	400	395	4,164	250	2,619	250	7,182	21,418	3,481	7,800	529	2,000	395	8,136	250	2,094	250	1,387	551	21,418	5,357	256	1,339	1,276	696	1,276	643	1,276	14,243	383	3,561	1,783	3,561	1,783	9,000	362
2044	28,600	7,182	400	399	4,164	250	2,619	250	7,182	21,418	3,481	7,800	534	2,000	399	8,136	250	2,104	250	1,377	553	21,418	5,357	257	1,339	1,277	696	1,277	643	1,277	14,243	385	3,561	1,790	3,561	1,790	9,000	364
2045	28,600	7,182	400	403	4,164	250	2,619	250	7,182	21,418	3,481	7,800	538	2,000	403	8,136	250	2,113	250	1,368	555	21,418	5,357	257	1,339	1,277	696	1,277	643	1,277	14,243	387	3,561	1,798	3,561	1,798	9,000	366
2046	28,600	7,182	400	407	4,164	250	2,619	250	7,182	21,418	3,481	7,800	543	2,000	407	8,136	250	2,122	250	1,359	557	21,418	5,357	257	1,339	1,278	696	1,278	643	1,278	14,243	389	3,561	1,805	3,561	1,805	9,000	368
2047	28,600	7,182	400	411	4,164	250	2,619	250	7,182	21,418	3,481	7,800	547	2,000	411	8,136	250	2,131	250	1,350	559	21,418	5,357	257	1,339	1,279	696	1,279	643	1,279	14,243	391	3,561	1,812	3,561	1,812	9,000	370
2048	28,600	7,182	400	415	4,164	250	2,619	250	7,182	21,418	3,481	7,800	552	2,000	415	8,136	250	2,139	250	1,342	561	21,418	5,357	257	1,339	1,280	696	1,280	643	1,280	14,243	392	3,561	1,819	3,561	1,819	9,000	372
2049	28,600	7,182	400	419	4,164	250	2,619	250	7,182	21,418	3,481	7,800	556	2,000	419	8,136	250	2,147	250	1,334	563	21,418	5,357	258	1,339	1,280	696	1,280	643	1,280	14,243	394	3,561	1,826	3,561	1,826	9,000	374
2050	28,600	7,182	400	422	4,164	250	2,619	250	7,182	21,418	3,481	7,800	560	2,000	422	8,136	250	2,155	250	1,326	565	21,418	5,357	258	1,339	1,281	696	1,281	643	1,281	14,243	396	3,561	1,833	3,561	1,833	9,000	376
2051	28,600	7,182	400	426	4,164	250	2,619	250	7,182	21,418	3,481	7,800	564	2,000	426	8,136	250	2,163	250	1,318	567	21,418	5,357	258	1,339	1,282	696	1,282	643	1,282	14,243	397	3,561	1,839	3,561	1,839	9,000	378
2052	28,600	7,182	400	430	4,164	250	2,619	250	7,182	21,418	3,481	7,800	568	2,000	430	8,136	250	2,170	250	1,311	569	21,418	5,357	258	1,339	1,282	696	1,282	643	1,282	14,243	399	3,561	1,846	3,561	1,846	9,000	379
2053	28,600	7,182	400	434	4,164	250	2,619	250	7,182	21,418	3,481	7,800	572	2,000	434	8,136	250	2,178	250	1,304	570	21,418	5,357	258	1,339	1,283	696	1,283	643	1,283	14,243	401	3,561	1,852	3,561	1,852	9,000	381
2054	28,600	7,182	400	437	4,164	250	2,619	250	7,182	21,418	3,481	7,800	576	2,000	437	8,136	250	2,185	250	1,297	572	21,418	5,357	258	1,339	1,284	696	1,284	643	1,284	14,243	402	3,561	1,859	3,561	1,859	9,000	383
2055	28,600	7,182	400	441	4,164	250	2,619	250	7,182	21,418	3,481	7,800	580	2,000	441	8,136	250	2,191	250	1,290	574	21,418	5,357	259	1,339	1,284	696	1,284	643	1,284	14,243	404	3,561	1,865	3,561	1,865	9,000	385
2056	28,600	7,182	400	444	4,164	250	2,619	250	7,182	21,418	3,481	7,800	583	2,000	444	8,136	250	2,198	250	1,283	576	21,418	5,357	259	1,339	1,285	696	1,285	643	1,285	14,243	405	3,561	1,871	3,561	1,871	9,000	386
2057	28,600	7,182	400	448	4,164	250	2,619	250	7,182	21,418	3,481	7,800	587	2,000	448	8,136	250	2,205	250	1,277	577	21,418	5,357	259	1,339	1,285	696	1,285	643	1,285	14,243	407	3,561	1,877	3,561	1,877	9,000	388
2058	28,600	7,182	400	451	4,164	250	2,619	250	7,182	21,418	3,481	7,800	590	2,000	451	8,136	250	2,211	250	1,270	579	21,418	5,357	259	1,339	1,286	696	1,286	643	1,286	14,243	408	3,561	1,883	3,561	1,883	9,000	389
2059	28,600	7,182	400	455	4,164	250	2,619	250	7,182	21,418	3,481	7,800	594	2,000	455	8,136	250	2,217	250	1,264	580	21,418	5,357	259	1,339	1,287	696	1,287	643	1,287	14,243	410	3,561	1,888	3,561	1,888	9,000	391

Notes:
1--YVWD water supply plan was split into two regions--The Pass Region and San Bernardino County Region. Water supplied to the SB Region is not imported/returned to the Pass Region and vice versa.
2--Pass Region demands were obtained from from (WEI 2009b)
3--San Bernardino County Region demands were calcuated by subtracting the Pass Region demands from the total demands of the YVWD as obtained from (GEI Consultants, Inc. 2007)
4--Recycled water sources is the YVWD's Henry Wochholz Wastewater Treatment Plant. Recycled water concentrations are equal to the previous year's volume wtd TDS of the water supply (including inflows from YVWD and SMWC) plus the TDS waste increment calculated for the YVWD WWTP.
5--The YVWD water supply plan was updated to remove recycled water use in the Pass Region, which overlies the Beaumont Management Zone. The Santa Ana Regional Board Basin Plan requires that recharge quality meet or exceed the Antidegradation objective of 230 mg/L.

Appendix A-29
Water Supply Plan for the Beaumont Basin Overlying Parties

Year	Beaumont Basin Overlying Parties									
	Total Demand	Raw Groundwater (Beaumont)		Total Supply	Outdoor Water Use		Total Return Flow		Return Flow to Beaumont MZ	
	AFY	Q *AFY*	TDS *mg/L*	Q *AFY*	Q *AFY*	TDS *mg/L*	Q *AFY*	TDS *mg/L*	Q *AFY*	TDS *mg/L*
2010	2,876	2,876	269	2,876	2,876	269	719	1,327	719	1,327
2011	2,876	2,876	271	2,876	2,876	271	719	1,336	719	1,336
2012	2,876	2,876	274	2,876	2,876	274	719	1,345	719	1,345
2013	2,876	2,876	276	2,876	2,876	276	719	1,356	719	1,356
2014	2,238	2,238	279	2,238	2,238	279	559	1,365	559	1,365
2015	1,599	1,599	281	1,599	1,599	281	400	1,374	400	1,374
2016	961	961	284	961	961	284	240	1,384	240	1,384
2017	599	599	286	599	599	286	150	1,395	150	1,395
2018	599	599	289	599	599	289	150	1,405	150	1,405
2019	599	599	292	599	599	292	150	1,417	150	1,417
2020	599	599	295	599	599	295	150	1,430	150	1,430
2021	599	599	298	599	599	298	150	1,444	150	1,444
2022	599	599	302	599	599	302	150	1,458	150	1,458
2023	599	599	306	599	599	306	150	1,474	150	1,474
2024	599	599	310	599	599	310	150	1,490	150	1,490
2025	599	599	314	599	599	314	150	1,507	150	1,507
2026	599	599	319	599	599	319	150	1,525	150	1,525
2027	599	599	323	599	599	323	150	1,543	150	1,543
2028	599	599	328	599	599	328	150	1,561	150	1,561
2029	599	599	332	599	599	332	150	1,580	150	1,580
2030	599	599	337	599	599	337	150	1,599	150	1,599
2031	599	599	342	599	599	342	150	1,618	150	1,618
2032	599	599	347	599	599	347	150	1,637	150	1,637
2033	599	599	351	599	599	351	150	1,655	150	1,655
2034	599	599	356	599	599	356	150	1,674	150	1,674
2035	599	599	360	599	599	360	150	1,692	150	1,692
2036	599	599	365	599	599	365	150	1,710	150	1,710
2037	599	599	369	599	599	369	150	1,727	150	1,727
2038	599	599	374	599	599	374	150	1,745	150	1,745
2039	599	599	378	599	599	378	150	1,762	150	1,762
2040	599	599	382	599	599	382	150	1,779	150	1,779
2041	599	599	387	599	599	387	150	1,796	150	1,796
2042	599	599	391	599	599	391	150	1,813	150	1,813
2043	599	599	395	599	599	395	150	1,829	150	1,829
2044	599	599	399	599	599	399	150	1,846	150	1,846
2045	599	599	403	599	599	403	150	1,862	150	1,862
2046	599	599	407	599	599	407	150	1,878	150	1,878
2047	599	599	411	599	599	411	150	1,894	150	1,894
2048	599	599	415	599	599	415	150	1,909	150	1,909
2049	599	599	419	599	599	419	150	1,924	150	1,924
2050	599	599	422	599	599	422	150	1,940	150	1,940
2051	599	599	426	599	599	426	150	1,955	150	1,955
2052	599	599	430	599	599	430	150	1,970	150	1,970
2053	599	599	434	599	599	434	150	1,984	150	1,984
2054	599	599	437	599	599	437	150	1,999	150	1,999
2055	599	599	441	599	599	441	150	2,013	150	2,013
2056	599	599	444	599	599	444	150	2,027	150	2,027
2057	599	599	448	599	599	448	150	2,041	150	2,041
2058	599	599	451	599	599	451	150	2,055	150	2,055
2059	599	599	455	599	599	455	150	2,069	150	2,069

Notes

1--Water Supply plan obtained from Wildermuth Environmental, Inc (2009b).

2--Beaumont Overlier groundwater demand is assumed to be used 100% outdoors (Wildermuth Environmental, Inc. 2009b)

Year	Bunker Hill Area Ag/Private																	
	Total Demand	Raw Groundwater (Bunker Hill-A)		Raw Groundwater (Bunker Hill-B)		Mill Creek		Total Supply	Bunker Hill-A Outdoor Water Use		Return Flow to Bunker Hill-A		Bunker Hill-B Outdoor Water Use		Return Flow to Bunker Hill-B MZ		Return Flow to Bunker Hill-B MZ	
		Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AFY	TDS mg/L
2010	20,200	2,020	326	13,880	294	4,300	178	20,200	1,555	326	389	1,554	13,999	267	3,500	1,317	875	5,517
2011	20,140	2,014	326	13,826	298	4,300	178	20,140	1,551	326	388	1,554	13,957	269	3,489	1,327	872	5,558
2012	20,080	2,008	326	13,772	301	4,300	178	20,080	1,546	326	387	1,556	13,915	272	3,479	1,337	870	5,598
2013	20,020	2,002	327	13,718	304	4,300	178	20,020	1,542	327	385	1,558	13,874	274	3,468	1,347	867	5,638
2014	19,960	1,996	326	13,664	307	4,300	178	19,960	1,537	326	384	1,555	13,832	276	3,458	1,356	865	5,673
2015	19,900	1,990	326	13,610	310	4,300	178	19,900	1,532	326	383	1,554	13,791	279	3,448	1,364	862	5,707
2016	19,840	1,984	326	13,556	313	4,300	178	19,840	1,528	326	382	1,553	13,749	281	3,437	1,373	859	5,741
2017	19,780	1,978	326	13,502	316	4,300	178	19,780	1,523	326	381	1,554	13,708	283	3,427	1,381	857	5,775
2018	19,720	1,972	327	13,448	319	4,300	178	19,720	1,518	327	380	1,556	13,666	285	3,416	1,390	854	5,808
2019	19,660	1,966	327	13,394	322	4,300	178	19,660	1,514	327	378	1,559	13,624	287	3,406	1,398	852	5,842
2020	19,600	1,960	328	13,340	325	4,300	178	19,600	1,509	328	377	1,562	13,583	289	3,396	1,406	849	5,875
2021	19,540	1,954	329	13,286	328	4,300	178	19,540	1,505	329	376	1,565	13,541	291	3,385	1,415	846	5,908
2022	19,480	1,948	330	13,232	331	4,300	178	19,480	1,500	330	375	1,568	13,500	293	3,375	1,423	844	5,941
2023	19,420	1,942	331	13,178	334	4,300	178	19,420	1,495	331	374	1,572	13,458	295	3,365	1,431	841	5,974
2024	19,360	1,936	332	13,124	336	4,300	178	19,360	1,491	332	373	1,577	13,416	297	3,354	1,439	839	6,007
2025	19,300	1,930	333	13,070	339	4,300	178	19,300	1,486	333	372	1,582	13,375	299	3,344	1,447	836	6,040
2026	19,240	1,924	334	13,016	342	4,300	178	19,240	1,481	334	370	1,586	13,333	301	3,333	1,455	833	6,070
2027	19,180	1,918	335	12,962	345	4,300	178	19,180	1,477	335	369	1,590	13,292	303	3,323	1,463	831	6,100
2028	19,120	1,912	336	12,908	347	4,300	178	19,120	1,472	336	368	1,595	13,250	305	3,313	1,470	828	6,130
2029	19,060	1,906	337	12,854	350	4,300	178	19,060	1,468	337	367	1,599	13,209	307	3,302	1,477	826	6,160
2030	19,000	1,900	338	12,800	353	4,300	178	19,000	1,463	338	366	1,603	13,167	309	3,292	1,485	823	6,189
2031	19,000	1,900	339	12,800	355	4,300	178	19,000	1,463	339	366	1,606	13,167	310	3,292	1,491	823	6,215
2032	19,000	1,900	340	12,800	357	4,300	178	19,000	1,463	340	366	1,609	13,167	312	3,292	1,498	823	6,241
2033	19,000	1,900	341	12,800	359	4,300	178	19,000	1,463	341	366	1,612	13,167	313	3,292	1,504	823	6,265
2034	19,000	1,900	341	12,800	361	4,300	178	19,000	1,463	341	366	1,615	13,167	315	3,292	1,509	823	6,288
2035	19,000	1,900	342	12,800	363	4,300	178	19,000	1,463	342	366	1,618	13,167	316	3,292	1,515	823	6,310
2036	19,000	1,900	343	12,800	364	4,300	178	19,000	1,463	343	366	1,621	13,167	318	3,292	1,520	823	6,331
2037	19,000	1,900	344	12,800	366	4,300	178	19,000	1,463	344	366	1,624	13,167	319	3,292	1,525	823	6,350
2038	19,000	1,900	344	12,800	368	4,300	178	19,000	1,463	344	366	1,627	13,167	320	3,292	1,530	823	6,369
2039	19,000	1,900	345	12,800	369	4,300	178	19,000	1,463	345	366	1,630	13,167	321	3,292	1,534	823	6,387
2040	19,000	1,900	346	12,800	371	4,300	178	19,000	1,463	346	366	1,633	13,167	322	3,292	1,539	823	6,405
2041	19,000	1,900	347	12,800	372	4,300	178	19,000	1,463	347	366	1,636	13,167	323	3,292	1,543	823	6,421
2042	19,000	1,900	347	12,800	373	4,300	178	19,000	1,463	347	366	1,639	13,167	324	3,292	1,547	823	6,437
2043	19,000	1,900	348	12,800	375	4,300	178	19,000	1,463	348	366	1,642	13,167	325	3,292	1,550	823	6,452
2044	19,000	1,900	349	12,800	376	4,300	178	19,000	1,463	349	366	1,644	13,167	326	3,292	1,554	823	6,466
2045	19,000	1,900	349	12,800	377	4,300	178	19,000	1,463	349	366	1,647	13,167	327	3,292	1,557	823	6,480
2046	19,000	1,900	350	12,800	378	4,300	178	19,000	1,463	350	366	1,649	13,167	328	3,292	1,561	823	6,493
2047	19,000	1,900	350	12,800	379	4,300	178	19,000	1,463	350	366	1,652	13,167	328	3,292	1,564	823	6,505
2048	19,000	1,900	351	12,800	380	4,300	178	19,000	1,463	351	366	1,654	13,167	329	3,292	1,567	823	6,517
2049	19,000	1,900	352	12,800	381	4,300	178	19,000	1,463	352	366	1,656	13,167	330	3,292	1,570	823	6,529
2050	19,000	1,900	352	12,800	382	4,300	178	19,000	1,463	352	366	1,659	13,167	331	3,292	1,572	823	6,540
2051	19,000	1,900	353	12,800	383	4,300	178	19,000	1,463	353	366	1,661	13,167	331	3,292	1,575	823	6,550
2052	19,000	1,900	353	12,800	384	4,300	178	19,000	1,463	353	366	1,663	13,167	332	3,292	1,578	823	6,560
2053	19,000	1,900	354	12,800	384	4,300	178	19,000	1,463	354	366	1,665	13,167	332	3,292	1,580	823	6,570
2054	19,000	1,900	354	12,800	385	4,300	178	19,000	1,463	354	366	1,667	13,167	333	3,292	1,582	823	6,579
2055	19,000	1,900	355	12,800	386	4,300	178	19,000	1,463	355	366	1,668	13,167	334	3,292	1,584	823	6,587
2056	19,000	1,900	355	12,800	387	4,300	178	19,000	1,463	355	366	1,670	13,167	334	3,292	1,586	823	6,596
2057	19,000	1,900	355	12,800	387	4,300	178	19,000	1,463	355	366	1,672	13,167	335	3,292	1,588	823	6,604
2058	19,000	1,900	356	12,800	388	4,300	178	19,000	1,463	356	366	1,674	13,167	335	3,292	1,590	823	6,611
2059	19,000	1,900	356	12,800	388	4,300	178	19,000	1,463	356	366	1,675	13,167	336	3,292	1,592	823	6,619

Notes
1--Water Supply plan adapted from GEI Consultants, Inc. (2007).

Appendix A-31
Combined Water Supply Plan of Agencies Tributary to Riverside Regional Water Quality Control Plant

Year	Agencies Tributary to Riverside Regional Water Quality Control Plant																									
	JCSD Groundwater (Chino-North)		JCSD Groundwater (Chino-South)		JCSD Chino Desalter Production		City of Riverside Groundwater (Bunker Hill A)		City of Riverside Groundwater (Bunker Hill B)		City of Riverside Groundwater (Riverside A)		City of Riverside Groundwater (Riverside E)		City of Riverside Groundwater (Riverside F)		City of Riverside Imported State Water		Rubidoux CSD Groundwater Riverside C		Rubidoux CSD Groundwater Riverside A		Total Supply	Indoor Water Use	
	Q AFY	TDS mg/L	Q AFY	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	Q AF	TDS mg/L
2010	18,750	259	6,250	408	8,700	350	6,371	326	46,717	380	9,500	440	6,786	710	10,857	570	3,800	250	1,368	740	7,752	440	126,851	50,740	401
2011	19,500	264	6,500	410	8,700	350	6,371	326	46,717	384	9,645	440	6,889	710	12,400	570	4,100	250	1,389	740	7,871	440	126,851	50,931	401
2012	20,250	269	6,750	412	8,700	350	6,371	326	46,717	387	9,789	440	6,992	710	12,586	570	4,400	250	1,410	740	7,990	440	126,851	51,664	402
2013	21,000	275	7,000	414	8,700	350	6,371	327	46,717	390	9,934	440	7,096	710	12,772	570	4,700	250	1,431	740	8,109	440	126,851	52,397	403
2014	21,750	279	7,250	416	8,700	350	6,371	326	46,717	393	10,079	440	7,199	710	12,958	570	5,000	250	1,452	740	8,228	440	126,851	53,130	404
2015	22,283	283	7,428	418	8,700	350	6,371	326	46,717	396	10,224	440	7,303	710	13,145	570	5,300	250	1,473	740	8,347	440	137,290	54,916	410
2016	22,328	286	7,443	420	8,700	350	6,371	326	46,717	399	10,298	440	7,356	710	13,240	570	5,600	250	1,494	740	8,466	440	126,851	54,028	406
2017	22,355	289	7,452	422	8,700	350	6,371	326	46,717	402	10,372	440	7,409	710	13,335	570	5,900	250	1,515	740	8,585	440	126,851	54,299	407
2018	22,417	292	7,472	424	8,700	350	6,371	327	46,717	405	10,446	440	7,462	710	13,431	570	6,200	250	1,536	740	8,704	440	126,851	54,589	408
2019	22,462	297	7,487	426	8,700	350	6,371	327	46,717	408	10,520	440	7,515	710	13,526	570	6,500	250	1,557	740	8,823	440	126,851	54,869	409
2020	22,507	302	7,502	428	8,700	350	6,371	328	46,717	411	10,595	440	7,568	710	13,622	570	6,800	250	1,578	740	8,942	440	140,901	56,360	418
2021	22,507	307	7,502	430	8,700	350	6,371	329	46,717	414	10,631	440	7,594	710	13,669	570	7,100	250	1,580	740	8,956	440	126,851	55,316	412
2022	22,507	313	7,502	432	8,700	350	6,371	330	46,717	417	10,668	440	7,620	710	13,716	570	7,400	250	1,583	740	8,969	440	126,851	55,482	413
2023	22,507	318	7,502	434	8,700	350	6,371	331	46,717	420	10,705	440	7,647	710	13,764	570	7,700	250	1,585	740	8,983	440	126,851	55,649	414
2024	22,507	322	7,502	436	8,700	350	6,371	332	46,717	422	10,742	440	7,673	710	13,811	570	8,000	250	1,588	740	8,996	440	126,851	55,815	415
2025	22,507	326	7,502	438	8,700	350	6,371	333	46,717	425	10,779	440	7,699	710	13,859	570	8,300	250	1,590	740	9,010	440	143,034	57,214	426
2026	22,507	331	7,502	440	8,700	350	6,371	334	46,717	428	10,813	440	7,724	710	13,903	570	8,600	250	1,590	740	9,010	440	143,437	57,375	428
2027	22,507	336	7,502	442	8,700	350	6,371	335	46,717	431	10,847	440	7,748	710	13,947	570	8,900	250	1,590	740	9,010	440	143,839	57,536	429
2028	22,507	341	7,502	444	8,700	350	6,371	336	46,717	433	10,882	440	7,773	710	13,991	570	9,200	250	1,590	740	9,010	440	144,242	57,697	431
2029	22,507	346	7,502	446	8,700	350	6,371	337	46,717	436	10,916	440	7,797	710	14,035	570	9,500	250	1,590	740	9,010	440	144,645	57,858	432
2030	22,507	354	7,502	448	8,700	350	6,371	338	46,717	439	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	434
2031	22,507	362	7,502	450	8,700	350	6,371	339	46,717	441	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	436
2032	22,507	371	7,502	452	8,700	350	6,371	340	46,717	443	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	439
2033	22,507	379	7,502	454	8,700	350	6,371	341	46,717	445	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	441
2034	22,507	382	7,502	456	8,700	350	6,371	341	46,717	447	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	442
2035	22,507	386	7,502	458	8,700	350	6,371	342	46,717	449	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	443
2036	22,507	389	7,502	460	8,700	350	6,371	343	46,717	450	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	444
2037	22,507	392	7,502	462	8,700	350	6,371	344	46,717	452	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	446
2038	22,507	395	7,502	464	8,700	350	6,371	344	46,717	454	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	447
2039	22,507	398	7,502	466	8,700	350	6,371	345	46,717	455	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	448
2040	22,507	406	7,502	468	8,700	350	6,371	346	46,717	457	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	450
2041	22,507	415	7,502	470	8,700	350	6,371	347	46,717	458	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	452
2042	22,507	424	7,502	472	8,700	350	6,371	347	46,717	459	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	454
2043	22,507	433	7,502	474	8,700	350	6,371	348	46,717	461	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	455
2044	22,507	435	7,502	476	8,700	350	6,371	349	46,717	462	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	456
2045	22,507	438	7,502	478	8,700	350	6,371	349	46,717	463	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	457
2046	22,507	440	7,502	480	8,700	350	6,371	350	46,717	464	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	458
2047	22,507	442	7,502	482	8,700	350	6,371	350	46,717	465	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	459
2048	22,507	444	7,502	484	8,700	350	6,371	351	46,717	466	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	460
2049	22,507	446	7,502	486	8,700	350	6,371	352	46,717	467	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	460
2050	22,507	455	7,502	488	8,700	350	6,371	352	46,717	468	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	462
2051	22,507	465	7,502	490	8,700	350	6,371	353	46,717	469	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	464
2052	22,507	474	7,502	492	8,700	350	6,371	353	46,717	470	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	466
2053	22,507	483	7,502	494	8,700	350	6,371	354	46,717	470	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	468
2054	22,507	485	7,502	496	8,700	350	6,371	354	46,717	471	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	468
2055	22,507	486	7,502	498	8,700	350	6,371	355	46,717	472	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	469
2056	22,507	488	7,502	500	8,700	350	6,371	355	46,717	473	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	469
2057	22,507	489	7,502	502	8,700	350	6,371	355	46,717	473	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	470
2058	22,507	491	7,502	504	8,700	350	6,371	356	46,717	474	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	471
2059	22,507	492	7,502	506	8,700	350	6,371	356	46,717	474	10,950	440	7,822	710	14,079	570	9,800	250	1,590	740	9,010	440	145,047	58,019	471

Notes

1--JSCD Water supply plan adapted from Wildermuth Environmental, Inc. (2009a).

2-- Chino North Groundwater pumped and served by municipal agencies is of better quality than the ambient quality of the Chino North Management Zone. Based on TDS waste increment reports submitted to the Regional Board by IEUA, a translator of (-)100 mg/L was added to the ambient TDS of Chino North groundwater to represent the pumped quality of Chino North groundwater.

3--City of Riverside Water supply plan for adapted from GEI Consultants, Inc. (2007) and City of Riverside (2005).

4-- Bunker Hill B Groundwater pumped and served by City of Riverside is of worse quality than the ambient quality of the Bunker Hill B Management Zone. Based on water quality data, a translator of (+) 86 mg/L was added to the TDS of Bunker Hill groundwater calculated in the TDS projections in Appendix B3.

5--Rubidoux Water Supply Plan adapted from Kennedy/Jenks Consultants (2008).

6--Distribution of pumping between Riverside-A, -E, and -F approximated based on the spatial location of the City of Riverside and Rubidoux Community Service District's production wells.

7--TDS of Riverside-A, -E, and -F are assumed to remain constant at the 2006 AWQ TDS concentration per historical AWQ analysis trends.

Appendix A-32
Percent of Water Supply Service Area that Overlies Management Zone

	Beaumont	Yucaipa	San Tim	Bunker Hill B	Bunker Hill A	Lytle	Rialto	Colton	Riv A	Riv B	Riv C	Riv D	Riv E	Riv F	Arlington	Chino E	Cucamonga	Chino N	Chino S	Prado	Temscal	Bedford	Warm Springs	Elsinore	Outside Region
City of Banning	2%																								98%
BCVWD	100%																								
SMWC		100%																							
YVWD	20%	78%		2%																					
Overliers	100%																								
Redlands		25%		75%																					
EVWD				93%	7%																				
Loma Linda				100%																					
San Bernardino				21%	71%	1%	7%	1%																	
City of Colton							13%	41%	37%	5%				5%											
Riverside Highland								6%	3%					91%											
City of Rialto							70%			16%								14%							
West Valley WD						8%	44%		7%	28%								14%							
Fontana WC						3%	10%											87%							
Muscoy Mutual WC					87%	13%																			
City of Riverside									3%			26%	22%	6%	38%				5%						
Rubidoux CSD									68%	2%	24%								6%						
City of Chino																		77%		23%					
City of Chino Hills																		13%							87%
City of Ontario																		100%							
City of Pomona																		40%							60%
City of Upland																		72%							28%
CVWD																	48%	52%							
JCSD											3%					33%		31%	27%	6%					
Marygold Mutual WC																		100%							
Monte Vista WD																		100%							
San Antonio WC																	38%	3%							59%
Golden State WC																		7%							93%
City of Corona																				9%	86%	5%			
City of Norco																			55%	3%	42%				
Home Gardens																					100%				
EVMWD																							5%	40%	55%

Appendix B1 -- Total Dissolved Solids Projection for the Beaumont Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Recharge From Septic Tanks		Deep Percolation of Applied Water		Imported Water Recharge		Storm Water Recharge		Recycled Water Recharge		Subsurface Discharge into the BMZ		Subsurface Discharge from Edgar Canyon		Total Recharge		Subsurface Outflow to STMZ and Banning		Groundwater Production		Total Discharge		Recharge minus Discharge	Ending Storage	Ending TDS
			Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS			
	AF	mg/L	AFY	mg/L	AFY	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	AF	mg/L
2010	875,631	269	2,350	100	360	369	2,904	1,246	10,000	250	2,977	100	790	414	2,618	258	1,668	319	23,667	352	1,478	269	21,859	269	23,337	269	329	875,960	271
2011	875,960	271	2,350	100	360	371	2,947	1,255	11,000	250	3,048	100	1,340	416	2,618	260	1,668	321	25,331	351	1,486	271	22,453	271	23,939	271	1,392	877,353	274
2012	877,353	274	2,350	100	360	374	3,315	1,260	11,000	250	3,109	100	1,890	418	2,618	262	1,668	324	26,311	366	1,490	274	23,566	274	25,057	274	1,254	878,606	276
2013	878,606	276	2,350	100	360	376	3,519	1,267	11,000	250	6,924	100	2,460	420	2,618	264	1,668	326	30,900	341	1,492	276	24,928	276	26,420	276	4,480	883,086	279
2014	883,086	279	2,350	100	360	379	3,699	1,284	11,000	250	6,974	100	2,460	423	2,618	266	1,668	329	31,130	349	1,493	279	26,024	279	27,517	279	3,613	886,699	281
2015	886,699	281	2,350	100	360	381	3,776	1,302	11,000	250	7,018	100	2,460	425	2,618	268	1,668	331	31,251	353	1,493	281	25,543	281	27,036	281	4,215	890,914	284
2016	890,914	284	2,350	100	360	384	3,840	1,318	11,000	250	7,049	100	2,460	427	2,618	270	1,668	334	31,345	357	1,492	284	25,632	284	27,124	284	4,221	895,135	286
2017	895,135	286	2,350	100	390	386	3,973	1,336	11,000	250	7,078	100	2,460	429	2,730	272	1,780	336	31,760	364	1,490	286	26,002	286	27,492	286	4,268	899,404	289
2018	899,404	289	2,350	100	421	389	4,197	1,353	11,000	250	7,098	100	2,460	432	2,841	274	1,891	339	32,259	373	1,487	289	26,738	289	28,226	289	4,033	903,437	292
2019	903,437	292	2,350	100	452	392	4,422	1,371	11,000	250	7,104	100	2,460	434	2,953	276	2,003	342	32,744	382	1,484	292	27,479	292	28,963	292	3,780	907,217	295
2020	907,217	295	2,350	100	482	395	4,648	1,387	11,000	250	7,110	100	2,460	437	3,064	278	2,114	345	33,230	391	1,480	295	28,226	295	29,705	295	3,524	910,741	298
2021	910,741	298	2,350	100	513	398	4,861	1,403	11,000	250	7,114	100	2,460	440	3,176	280	2,226	348	33,700	400	1,475	298	29,050	298	30,525	298	3,175	913,917	302
2022	913,917	302	2,350	100	543	402	5,065	1,419	11,000	250	7,121	100	2,460	444	3,288	282	2,338	352	34,165	408	1,470	302	29,819	302	31,288	302	2,877	916,794	306
2023	916,794	306	2,350	100	574	406	5,260	1,434	11,000	250	7,128	100	2,460	447	3,399	284	2,449	356	34,620	416	1,466	306	30,700	306	32,166	306	2,454	919,248	310
2024	919,248	310	2,350	100	604	410	5,431	1,448	11,000	250	7,124	100	2,460	451	3,511	286	2,561	360	35,042	424	1,468	310	31,517	310	32,986	310	2,056	921,304	314
2025	921,304	314	2,350	100	635	414	5,589	1,462	11,000	250	7,123	100	2,460	455	3,622	288	2,672	364	35,452	431	1,475	314	32,333	314	33,809	314	1,643	922,948	319
2026	922,948	319	2,350	100	665	419	5,729	1,475	11,000	250	7,122	100	2,460	459	3,734	290	2,784	369	35,845	437	1,483	319	33,201	319	34,684	319	1,160	924,108	323
2027	924,108	323	2,350	100	696	423	5,840	1,488	11,000	250	7,115	100	2,460	463	3,846	292	2,896	373	36,203	443	1,491	323	34,060	323	35,551	323	652	924,760	328
2028	924,760	328	2,350	100	726	428	5,934	1,501	11,000	250	7,117	100	2,460	467	3,957	294	3,007	378	36,552	448	1,500	328	34,803	328	36,303	328	249	925,009	332
2029	925,009	332	2,350	100	757	432	6,029	1,513	11,000	250	7,120	100	2,460	472	4,069	296	3,119	382	36,904	453	1,508	332	35,554	332	37,062	332	-158	924,851	337
2030	924,851	337	2,350	100	787	437	6,126	1,526	11,000	250	7,113	100	2,460	476	4,180	298	3,230	387	37,248	458	1,517	337	36,312	337	37,829	337	-581	924,270	342
2031	924,270	342	2,350	100	787	442	6,126	1,540	11,000	250	7,113	100	2,460	481	4,180	300	3,230	392	37,248	461	1,517	342	36,312	342	37,829	342	-581	923,688	347
2032	923,688	347	2,350	100	787	447	6,126	1,553	11,000	250	7,113	100	2,460	485	4,180	302	3,230	397	37,248	464	1,517	347	36,312	347	37,829	347	-581	923,107	351
2033	923,107	351	2,350	100	787	451	6,126	1,566	11,000	250	7,113	100	2,460	490	4,180	304	3,230	401	37,248	468	1,517	351	36,312	351	37,829	351	-581	922,526	356
2034	922,526	356	2,350	100	787	456	6,126	1,579	11,000	250	7,113	100	2,460	494	4,180	306	3,230	406	37,248	471	1,517	356	36,312	356	37,829	356	-581	921,944	360
2035	921,944	360	2,350	100	787	460	6,126	1,591	11,000	250	7,113	100	2,460	498	4,180	308	3,230	410	37,248	474	1,517	360	36,312	360	37,829	360	-581	921,363	365
2036	921,363	365	2,350	100	787	465	6,126	1,604	11,000	250	7,113	100	2,460	503	4,180	310	3,230	415	37,248	477	1,517	365	36,312	365	37,829	365	-581	920,781	369
2037	920,781	369	2,350	100	787	469	6,126	1,616	11,000	250	7,113	100	2,460	507	4,180	312	3,230	419	37,248	480	1,517	369	36,312	369	37,829	369	-581	920,200	374
2038	920,200	374	2,350	100	787	474	6,126	1,628	11,000	250	7,113	100	2,460	511	4,180	314	3,230	424	37,248	483	1,517	374	36,312	374	37,829	374	-581	919,618	378
2039	919,618	378	2,350	100	787	478	6,126	1,640	11,000	250	7,113	100	2,460	515	4,180	316	3,230	428	37,248	486	1,517	378	36,312	378	37,829	378	-581	919,037	382
2040	919,037	382	2,350	100	787	482	6,126	1,652	11,000	250	7,113	100	2,460	520	4,180	318	3,230	432	37,248	489	1,517	382	36,312	382	37,829	382	-581	918,456	387
2041	918,456	387	2,350	100	787	487	6,126	1,664	11,000	250	7,113	100	2,460	524	4,180	320	3,230	437	37,248	492	1,517	387	36,312	387	37,829	387	-581	917,874	391
2042	917,874	391	2,350	100	787	491	6,126	1,676	11,000	250	7,113	100	2,460	528	4,180	322	3,230	441	37,248	494	1,517	391	36,312	391	37,829	391	-581	917,293	395
2043	917,293	395	2,350	100	787	495	6,126	1,687	11,000	250	7,113	100	2,460	532	4,180	324	3,230	445	37,248	497	1,517	395	36,312	395	37,829	395	-581	916,711	399
2044	916,711	399	2,350	100	787	499	6,126	1,699	11,000	250	7,113	100	2,460	536	4,180	326	3,230	449	37,248	500	1,517	399	36,312	399	37,829	399	-581	916,130	403
2045	916,130	403	2,350	100	787	503	6,126	1,710	11,000	250	7,113	100	2,460	540	4,180	328	3,230	453	37,248	503	1,517	403	36,312	403	37,829	403	-581	915,549	407
2046	915,549	407	2,350	100	787	507	6,126	1,721	11,000	250	7,113	100	2,460	543	4,180	330	3,230	457	37,248	506	1,517	407	36,312	407	37,829	407	-581	914,967	411
2047	914,967	411	2,350	100	787	511	6,126	1,732	11,000	250	7,113	100	2,460	547	4,180	332	3,230	461	37,248	508	1,517	411	36,312	411	37,829	411	-581	914,386	415
2048	914,386	415	2,350	100	787	515	6,126	1,743	11,000	250	7,113	100	2,460	551	4,180	334	3,230	465	37,248	511	1,517	415	36,312	415	37,829	415	-581	913,804	419
2049	913,804	419	2,350	100	787	519	6,126	1,754	11,000	250	7,113	100	2,460	555	4,180	336	3,230	469	37,248	514	1,517	419	36,312	419	37,829	419	-581	913,223	422
2050	913,223	422	2,350	100	787	522	6,126	1,765	11,000	250	7,113	100	2,460	558	4,180	338	3,230	472	37,248	516	1,517	422	36,312	422	37,829	422	-581	912,641	426
2051	912,641	426	2,350	100	787	526	6,126	1,775	11,000	250	7,113	100	2,460	562	4,180	340	3,230	476	37,248	519	1,517	426	36,312	426	37,829	426	-581	912,060	430
2052	912,060	430	2,350	100	787	530	6,126	1,786	11,000	250	7,113	100	2,460	566	4,180	342	3,230	480	37,248	521	1,517	430	36,312	430	37,829	430	-581	911,479	434
2053	911,479	434	2,350	100	787	534	6,126	1,796	11,000	250	7,113	100	2,460	569	4,180	344	3,230	484	37,248	524	1,517	434	36,312	434	37,829	434	-581	910,897	437
2054	910,897	437	2,350	100	787	537	6,126	1,806	11,000	250	7,113	100	2,460	573	4,180	346	3,230	487	37,248	527	1,517	437	36,312	437	37,829	437	-581	910,316	441
2055	910,316	441	2,350	100	787	541	6,126	1,816	11,000	250	7,113	100	2,460	576	4,180	348	3,230	491	37,248	529	1,517	441	36,312	441	37,829	441	-581	909,734	444
2056	909,734	444	2,350	100	787	544	6,126	1,826	11,000	250	7,113	100	2,460	580	4,180	350	3,230	494	37,248	532	1,517	444	36,312	444	37,829	444	-581	909,153	448
2057	909,153	448	2,350	100	787	548	6,126	1,836	11,000	250	7,113	100	2,460	583	4,180	352	3,230	498	37,248	534	1,517	448	36,312	448	37,829	448	-581	908,572	451
2058	908,572	451	2,350	100	787	551	6,126	1,846	11,000	250	7,113	100	2,460	587	4,180	354	3,230	501	37,248	536	1,517	451	36,312	451	37,829	451	-581	907,990	455
2059	907,990	455	2,350	100	787	555	6,126	1,856	11,000	250	7,113	100	2,460	590	4,180	356	3,230	505	37,248	539	1,517	455	36,312	455	37,829	455	-581	907,409	458

Notes
1--Data for Beaumont Management Zone projections adapted from Wildermuth Environmental, Inc. (2009b)
2--Recycled water recharge source is City of Beaumont WWTP No. 1.

Appendix B2 -- Total Dissolved Solids Projection for the Bunker Hill-A Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Deep Percolation of Applied Water		Recharge from Mountain Front Runoff		Stream Channel Recharge		Artificial Recharge of SAR Surface Water		Artificial Recharge of SWP water		Subsurface Inflow from Bunker Hill-B		Total Recharge		Groundwater Production		Total Discharge		Recharge minus Discharge	Ending Storage	Ending TDS
			Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS			
	AF	mg/L	AFY	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	AF	mg/L
2010	873,254	326	2,750	100	6,780	1,532	8,700	100	34,500	204	0	204	5,000	250	31,000	294	88,730	326	85,794	326	85,794	326	2,937	876,190	326
2011	876,190	326	2,750	100	6,936	1,533	8,700	100	34,500	204	0	204	5,000	250	31,000	298	88,886	330	87,786	326	87,786	326	1,099	877,290	326
2012	877,290	326	2,750	100	7,091	1,534	8,700	100	34,500	204	0	204	5,000	250	31,000	301	89,041	333	89,939	326	89,939	326	-898	876,392	327
2013	876,392	327	2,750	100	7,247	1,537	8,700	100	34,500	204	6,298	204	15,000	250	31,000	304	105,495	320	91,818	327	91,818	327	13,677	890,069	326
2014	890,069	326	2,750	100	7,402	1,535	8,700	100	34,500	204	6,298	204	15,000	250	31,000	307	105,650	323	93,966	326	93,966	326	11,685	901,754	326
2015	901,754	326	2,750	100	7,558	1,534	8,700	100	34,500	204	6,298	204	15,000	250	31,000	310	105,806	325	96,114	326	96,114	326	9,692	911,446	326
2016	911,446	326	2,750	100	7,684	1,535	8,700	100	34,500	204	6,298	204	15,000	250	31,000	313	105,932	328	98,180	326	98,180	326	7,752	919,198	326
2017	919,198	326	2,750	100	7,810	1,536	8,700	100	34,500	204	6,298	204	15,000	250	31,000	316	106,058	330	100,185	326	100,185	326	5,873	925,070	327
2018	925,070	327	2,750	100	7,936	1,538	8,700	100	34,500	204	6,298	204	15,000	250	31,000	319	106,184	333	102,191	327	102,191	327	3,993	929,063	327
2019	929,063	327	2,750	100	8,062	1,542	8,700	100	34,500	204	6,298	204	15,000	250	31,000	322	106,310	335	104,196	327	104,196	327	2,113	931,176	328
2020	931,176	328	2,750	100	8,187	1,545	8,700	100	34,500	204	6,298	204	20,000	250	31,000	325	111,435	334	105,702	328	105,702	328	5,733	936,910	329
2021	936,910	329	2,750	100	8,310	1,548	8,700	100	34,500	204	6,298	204	20,000	250	31,000	328	111,558	336	107,519	329	107,519	329	4,039	940,949	330
2022	940,949	330	2,750	100	8,432	1,552	8,700	100	34,500	204	6,298	204	20,000	250	31,000	331	111,680	339	109,516	330	109,516	330	2,165	943,114	331
2023	943,114	331	2,750	100	8,555	1,556	8,700	100	34,500	204	6,298	204	20,000	250	31,000	334	111,803	341	111,512	331	111,512	331	291	943,404	332
2024	943,404	332	2,750	100	8,677	1,561	8,700	100	34,500	204	6,298	204	20,000	250	31,000	336	111,925	343	113,509	332	113,509	332	-1,584	941,820	333
2025	941,820	333	2,750	100	8,800	1,567	8,700	100	34,500	204	6,298	204	25,000	250	31,000	339	117,048	342	115,006	333	115,006	333	2,042	943,862	334
2026	943,862	334	2,750	100	8,799	1,571	8,700	100	34,500	204	6,298	204	25,000	250	31,000	342	117,047	343	116,880	334	116,880	334	167	944,029	335
2027	944,029	335	2,750	100	8,798	1,575	8,700	100	34,500	204	6,298	204	25,000	250	31,000	345	117,046	344	118,794	335	118,794	335	-1,748	942,281	336
2028	942,281	336	2,750	100	8,797	1,579	8,700	100	34,500	204	6,298	204	25,000	250	31,000	347	117,045	345	120,708	336	120,708	336	-3,664	938,617	337
2029	938,617	337	2,750	100	8,795	1,583	8,700	100	34,500	204	6,298	204	25,000	250	31,000	350	117,043	346	122,622	337	122,622	337	-5,579	933,038	338
2030	933,038	338	2,750	100	8,794	1,588	8,700	100	34,500	204	6,298	204	28,000	250	31,000	353	120,042	345	124,036	338	124,036	338	-3,994	929,045	339
2031	929,045	339	2,750	100	8,794	1,591	8,700	100	34,500	204	6,298	204	28,000	250	31,000	355	120,042	345	124,036	339	124,036	339	-3,994	925,051	340
2032	925,051	340	2,750	100	8,794	1,594	8,700	100	34,500	204	6,298	204	28,000	250	31,000	357	120,042	346	124,036	340	124,036	340	-3,994	921,057	341
2033	921,057	341	2,750	100	8,794	1,597	8,700	100	34,500	204	6,298	204	28,000	250	31,000	359	120,042	347	124,036	341	124,036	341	-3,994	917,063	341
2034	917,063	341	2,750	100	8,794	1,600	8,700	100	34,500	204	6,298	204	28,000	250	31,000	361	120,042	348	124,036	341	124,036	341	-3,994	913,069	342
2035	913,069	342	2,750	100	8,794	1,603	8,700	100	34,500	204	6,298	204	28,000	250	31,000	363	120,042	348	124,036	342	124,036	342	-3,994	909,075	343
2036	909,075	343	2,750	100	8,794	1,606	8,700	100	34,500	204	6,298	204	28,000	250	31,000	364	120,042	349	124,036	343	124,036	343	-3,994	905,082	344
2037	905,082	344	2,750	100	8,794	1,609	8,700	100	34,500	204	6,298	204	28,000	250	31,000	366	120,042	350	124,036	344	124,036	344	-3,994	901,088	344
2038	901,088	344	2,750	100	8,794	1,612	8,700	100	34,500	204	6,298	204	28,000	250	31,000	368	120,042	350	124,036	344	124,036	344	-3,994	897,094	345
2039	897,094	345	2,750	100	8,794	1,615	8,700	100	34,500	204	6,298	204	28,000	250	31,000	369	120,042	351	124,036	345	124,036	345	-3,994	893,100	346
2040	893,100	346	2,750	100	8,794	1,618	8,700	100	34,500	204	6,298	204	28,000	250	31,000	371	120,042	351	124,036	346	124,036	346	-3,994	889,106	347
2041	889,106	347	2,750	100	8,794	1,621	8,700	100	34,500	204	6,298	204	28,000	250	31,000	372	120,042	352	124,036	347	124,036	347	-3,994	885,112	347
2042	885,112	347	2,750	100	8,794	1,624	8,700	100	34,500	204	6,298	204	28,000	250	31,000	373	120,042	353	124,036	347	124,036	347	-3,994	881,118	348
2043	881,118	348	2,750	100	8,794	1,626	8,700	100	34,500	204	6,298	204	28,000	250	31,000	375	120,042	353	124,036	348	124,036	348	-3,994	877,125	349
2044	877,125	349	2,750	100	8,794	1,629	8,700	100	34,500	204	6,298	204	28,000	250	31,000	376	120,042	354	124,036	349	124,036	349	-3,994	873,131	349
2045	873,131	349	2,750	100	8,794	1,632	8,700	100	34,500	204	6,298	204	28,000	250	31,000	377	120,042	354	124,036	349	124,036	349	-3,994	869,137	350
2046	869,137	350	2,750	100	8,794	1,634	8,700	100	34,500	204	6,298	204	28,000	250	31,000	378	120,042	354	124,036	350	124,036	350	-3,994	865,143	350
2047	865,143	350	2,750	100	8,794	1,636	8,700	100	34,500	204	6,298	204	28,000	250	31,000	379	120,042	355	124,036	350	124,036	350	-3,994	861,149	351
2048	861,149	351	2,750	100	8,794	1,639	8,700	100	34,500	204	6,298	204	28,000	250	31,000	380	120,042	355	124,036	351	124,036	351	-3,994	857,155	352
2049	857,155	352	2,750	100	8,794	1,641	8,700	100	34,500	204	6,298	204	28,000	250	31,000	381	120,042	356	124,036	352	124,036	352	-3,994	853,162	352
2050	853,162	352	2,750	100	8,794	1,643	8,700	100	34,500	204	6,298	204	28,000	250	31,000	382	120,042	356	124,036	352	124,036	352	-3,994	849,168	353
2051	849,168	353	2,750	100	8,794	1,645	8,700	100	34,500	204	6,298	204	28,000	250	31,000	383	120,042	357	124,036	353	124,036	353	-3,994	845,174	353
2052	845,174	353	2,750	100	8,794	1,647	8,700	100	34,500	204	6,298	204	28,000	250	31,000	384	120,042	357	124,036	353	124,036	353	-3,994	841,180	354
2053	841,180	354	2,750	100	8,794	1,649	8,700	100	34,500	204	6,298	204	28,000	250	31,000	384	120,042	357	124,036	354	124,036	354	-3,994	837,186	354
2054	837,186	354	2,750	100	8,794	1,651	8,700	100	34,500	204	6,298	204	28,000	250	31,000	385	120,042	358	124,036	354	124,036	354	-3,994	833,192	355
2055	833,192	355	2,750	100	8,794	1,653	8,700	100	34,500	204	6,298	204	28,000	250	31,000	386	120,042	358	124,036	355	124,036	355	-3,994	829,198	355
2056	829,198	355	2,750	100	8,794	1,655	8,700	100	34,500	204	6,298	204	28,000	250	31,000	387	120,042	358	124,036	355	124,036	355	-3,994	825,205	355
2057	825,205	355	2,750	100	8,794	1,656	8,700	100	34,500	204	6,298	204	28,000	250	31,000	387	120,042	359	124,036	355	124,036	355	-3,994	821,211	356
2058	821,211	356	2,750	100	8,794	1,658	8,700	100	34,500	204	6,298	204	28,000	250	31,000	388	120,042	359	124,036	356	124,036	356	-3,994	817,217	356
2059	817,217	356	2,750	100	8,794	1,659	8,700	100	34,500	204	6,298	204	28,000	250	31,000	388	120,042	359	124,036	356	124,036	356	-3,994	813,223	357

Notes

1--Starting storage of the Bunker Hill-A Management Zone was calculated using water level elevations calculated for the 2006 ambient water quality analysis (Wildermuth Environmental, Inc. 2008) and the San Bernardino Basin Area aquifer layer elevations provided by Stantec (2008).

2--The deep percolation of precipitation was estimated from detailed hydrologic studies for the Beaumont groundwater model (Wildermuth Environmental Inc, 2009b). The estimated deep percolation is based on an average of 65 acre-ft/yr per square mile.

3--Recharge estimates from mountain front runoff and stream channel recharge was initially based on estimates developed by Geoscience (2009) and Stantec (2008) and was subsequently modified to balance the water budget. TDS of was assumed to be similar to the Santa Ana River quality, as measured at the City of Redlands' Hinkley Water Treatment Plant (3 year average: 204 mg/L)

4--The artificial recharge of Santa Ana River Water was based on planning estimates from the San Bernardino Valley Municipal Water District (Geoscience 2009) and were subsequently modified to balance the water budget.

5--The artificial recharge of imported water were based on planning estimates from the San Bernardino Valley Municipal Water District (Geoscience 2009) and were subsequently modified to balance the water budget.

Appendix B3 -- Total Dissolved Solids Projection for the Bunker Hill-B Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Deep Percolation of Applied Water		Recharge from Mountain Front Runoff		Stream Channel Recharge (City, Plunge)		Stream Channel Recharge (San Timoteo)		Stream Channel Recharge (Mill Creek)		Stream Channel Recharge (SAR)		Artificial Recharge of SAR Surface Water		Artificial Recharge of SWP water		Recycled Water Discharge to Redlands Percolation Ponds		Subsurface Recharge from San Timoteo MZ		Subsurface Recharge from Yucaipa MZ		Total Recharge		Subsurface Outflow to Colton Basin		Subsurface Outflow to Bunker Hill A		Groundwater Production		Total Discharge		Recharge minus Discharge	Ending Storage	Ending TDS
	AF	mg/L	Q AFY	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	AF	AF	mg/L
2010	2,184,138	294	4,525	100	16,271	1,353	7,600	100	24,800	204	10,619	423	36,742	178	24,134	204	4,000	204	0	250	2,000	431	2,497	400	1,540	330	134,728	352	69		31,000		110,007		141,076		-6,348	2,177,790	298
2011	2,177,790	298	4,525	100	16,534	1,360	7,600	100	24,800	204	10,257	423	36,742	178	24,134	204	4,000	204	0	250	1,900	433	2,497	400	1,540	336	134,529	355	69	298	31,000	298	111,011	298	142,080	298	-7,551	2,170,239	301
2012	2,170,239	301	4,525	100	16,851	1,366	7,600	100	24,800	204	9,895	423	36,742	178	24,134	204	4,000	204	0	250	1,800	434	2,497	400	1,540	342	134,384	358	69	301	31,000	301	111,040	301	142,109	301	-7,725	2,162,514	304
2013	2,162,514	304	4,525	100	17,167	1,375	7,600	100	24,800	204	9,533	423	36,742	178	24,134	204	11,049	204	5,300	250	1,700	436	2,497	400	1,540	347	146,587	349	69	304	31,000	304	112,197	304	143,266	304	3,321	2,165,835	307
2014	2,165,835	307	4,525	100	17,483	1,382	7,600	100	24,800	204	9,171	423	36,742	178	24,134	204	11,049	204	5,300	250	1,600	438	2,497	400	1,540	353	146,441	352	69	307	31,000	307	113,188	307	144,257	307	2,185	2,168,019	310
2015	2,168,019	310	4,525	100	17,799	1,389	7,600	100	24,800	204	8,810	423	36,742	178	24,134	204	11,049	204	5,300	250	1,500	439	2,497	400	1,540	359	146,296	355	69	310	31,000	310	114,179	310	145,248	310	1,048	2,169,067	313
2016	2,169,067	313	4,525	100	18,077	1,396	7,600	100	24,800	204	8,448	423	36,742	178	24,134	204	11,049	204	5,300	250	1,400	441	2,497	400	1,540	365	146,111	358	69	313	31,000	313	115,034	313	146,103	313	8	2,169,075	316
2017	2,169,075	316	4,525	100	18,354	1,404	7,600	100	24,800	204	8,086	423	36,742	178	24,134	204	11,049	204	5,300	250	1,300	442	2,497	400	1,540	371	145,927	361	69	316	31,000	316	115,890	316	146,959	316	-1,032	2,168,043	319
2018	2,168,043	319	4,525	100	18,632	1,411	7,600	100	24,800	204	7,724	423	36,742	178	24,134	204	11,049	204	5,300	250	1,200	444	2,497	400	1,540	378	145,742	364	69	319	31,000	319	116,746	319	147,815	319	-2,072	2,165,971	322
2019	2,165,971	322	4,525	100	18,909	1,419	7,600	100	24,800	204	7,362	423	36,742	178	24,134	204	11,049	204	5,300	250	1,100	445	2,497	400	1,540	384	145,558	366	69	322	31,000	322	117,602	322	148,671	322	-3,113	2,162,858	325
2020	2,162,858	325	4,525	100	19,186	1,426	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	5,300	250	1,000	447	2,497	400	1,540	391	145,373	369	69	325	31,000	325	120,257	325	151,326	325	-5,953	2,156,905	328
2021	2,156,905	328	4,525	100	19,412	1,433	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	5,300	250	1,000	448	2,497	400	1,540	397	145,599	372	69	328	31,000	328	120,955	328	152,024	328	-6,425	2,150,480	331
2022	2,150,480	331	4,525	100	19,638	1,440	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	5,300	250	1,000	450	2,497	400	1,540	404	145,825	375	69	331	31,000	331	121,653	331	152,722	331	-6,897	2,143,583	334
2023	2,143,583	334	4,525	100	19,863	1,447	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	5,300	250	1,000	451	2,497	400	1,540	410	146,050	377	69	334	31,000	334	122,350	334	153,419	334	-7,369	2,136,215	336
2024	2,136,215	336	4,525	100	20,089	1,454	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	5,300	250	1,000	453	2,497	400	1,540	417	146,276	380	69	336	31,000	336	123,048	336	154,117	336	-7,841	2,128,374	339
2025	2,128,374	339	4,525	100	20,315	1,461	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	10,000	250	1,000	455	2,497	400	1,540	424	151,202	378	69	339	31,000	339	123,745	339	154,814	339	-3,612	2,124,761	342
2026	2,124,761	342	4,525	100	20,504	1,467	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	10,000	250	1,000	456	2,497	400	1,540	430	151,391	381	69	342	31,000	342	124,443	342	155,512	342	-4,121	2,120,641	345
2027	2,120,641	345	4,525	100	20,693	1,473	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	10,000	250	1,000	457	2,497	400	1,540	437	151,580	383	69	345	31,000	345	125,140	345	156,209	345	-4,629	2,116,012	347
2028	2,116,012	347	4,525	100	20,883	1,479	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	10,000	250	1,000	459	2,497	400	1,540	443	151,770	385	69	347	31,000	347	125,838	347	156,907	347	-5,137	2,110,875	350
2029	2,110,875	350	4,525	100	21,072	1,485	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	10,000	250	1,000	460	2,497	400	1,540	450	151,959	388	69	350	31,000	350	126,535	350	157,604	350	-5,645	2,105,230	353
2030	2,105,230	353	4,525	100	21,261	1,491	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	462	2,497	400	1,540	456	160,148	383	69	353	31,000	353	127,233	353	158,302	353	1,847	2,107,076	355
2031	2,107,076	355	4,525	100	21,261	1,497	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	463	2,497	400	1,540	463	160,148	384	69	355	31,000	355	127,233	355	158,302	355	1,847	2,108,923	357
2032	2,108,923	357	4,525	100	21,261	1,502	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	464	2,497	400	1,540	469	160,148	384	69	357	31,000	357	127,233	357	158,302	357	1,847	2,110,769	359
2033	2,110,769	359	4,525	100	21,261	1,507	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	465	2,497	400	1,540	475	160,148	385	69	359	31,000	359	127,233	359	158,302	359	1,847	2,112,616	361
2034	2,112,616	361	4,525	100	21,261	1,512	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	466	2,497	400	1,540	481	160,148	386	69	361	31,000	361	127,233	361	158,302	361	1,847	2,114,462	363
2035	2,114,462	363	4,525	100	21,261	1,516	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	467	2,497	400	1,540	487	160,148	387	69	363	31,000	363	127,233	363	158,302	363	1,847	2,116,309	364
2036	2,116,309	364	4,525	100	21,261	1,521	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	468	2,497	400	1,540	493	160,148	387	69	364	31,000	364	127,233	364	158,302	364	1,847	2,118,156	366
2037	2,118,156	366	4,525	100	21,261	1,525	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	469	2,497	400	1,540	498	160,148	388	69	366	31,000	366	127,233	366	158,302	366	1,847	2,120,002	368
2038	2,120,002	368	4,525	100	21,261	1,529	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	470	2,497	400	1,540	503	160,148	388	69	368	31,000	368	127,233	368	158,302	368	1,847	2,121,849	369
2039	2,121,849	369	4,525	100	21,261	1,533	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	471	2,497	400	1,540	509	160,148	389	69	369	31,000	369	127,233	369	158,302	369	1,847	2,123,695	371
2040	2,123,695	371	4,525	100	21,261	1,537	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	472	2,497	400	1,540	514	160,148	390	69	371	31,000	371	127,233	371	158,302	371	1,847	2,125,542	372
2041	2,125,542	372	4,525	100	21,261	1,540	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	473	2,497	400	1,540	519	160,148	390	69	372	31,000	372	127,233	372	158,302	372	1,847	2,127,388	373
2042	2,127,388	373	4,525	100	21,261	1,544	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	473	2,497	400	1,540	524	160,148	391	69	373	31,000	373	127,233	373	158,302	373	1,847	2,129,235	375
2043	2,129,235	375	4,525	100	21,261	1,547	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	474	2,497	400	1,540	529	160,148	391	69	375	31,000	375	127,233	375	158,302	375	1,847	2,131,081	376
2044	2,131,081	376	4,525	100	21,261	1,550	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	475	2,497	400	1,540	534	160,148	392	69	376	31,000	376	127,233	376	158,302	376	1,847	2,132,928	377
2045	2,132,928	377	4,525	100	21,261	1,553	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	475	2,497	400	1,540	538	160,148	392	69	377	31,000	377	127,233	377	158,302	377	1,847	2,134,774	378
2046	2,134,774	378	4,525	100	21,261	1,556	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	476	2,497	400	1,540	543	160,148	392	69	378	31,000	378	127,233	378	158,302	378	1,847	2,136,621	379
2047	2,136,621	379	4,525	100	21,261	1,559	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	477	2,497	400	1,540	547	160,148	393	69	379	31,000	379	127,233	379	158,302	379	1,847	2,138,467	380
2048	2,138,467	380	4,525	100	21,261	1,561	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	477	2,497	400	1,540	552	160,148	393	69	380	31,000	380	127,233	380	158,302	380	1,847	2,140,314	381
2049	2,140,314	381	4,525	100	21,261	1,564	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	478	2,497	400	1,540	556	160,148	394	69	381	31,000	381	127,233	381	158,302	381	1,847	2,142,160	382
2050	2,142,160	382	4,525	100	21,261	1,566	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	478	2,497	400	1,540	560	160,148	394	69	382	31,000	382	127,233	382	158,302	382	1,847	2,144,007	383
2051	2,144,007	383	4,525	100	21,261	1,568	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	479	2,497	400	1,540	564	160,148	394	69	383	31,000	383	127,233	383	158,302	383	1,847	2,145,853	384
2052	2,145,853	384	4,525	100	21,261	1,571	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	479	2,497	400	1,540	568	160,148	395	69	384	31,000	384	127,233	384	158,302	384	1,847	2,147,700	384
2053	2,147,700	384	4,525	100	21,261	1,573	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	480	2,497	400	1,540	572	160,148	395	69	384	31,000	384	127,233	384	158,302	384	1,847	2,149,547	385
2054	2,149,547	385	4,525	100	21,261	1,575	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	480	2,497	400	1,540	576	160,148	395	69	385	31,000	385	127,233	385	158,302	385	1,847	2,151,393	386
2055	2,151,393	386	4,525	100	21,261	1,577	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	480	2,497	400	1,540	580	160,148	396	69	386	31,000	386	127,233	386	158,302	386	1,847	2,153,240	387
2056	2,153,240	387	4,525	100	21,261	1,579	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	481	2,497	400	1,540	583	160,148	396	69	387	31,000	387	127,233	387	158,302	387	1,847	2,155,086	387
2057	2,155,086	387	4,525	100	21,261	1,580	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	481	2,497	400	1,540	587	160,148	396	69	387	31,000	387	127,233	387	158,302	387	1,847	2,156,933	388
2058	2,156,933	388	4,525	100	21,261	1,582	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	482	2,497	400	1,540	590	160,148	396	69	388	31,000	388	127,233	388	158,302	388	1,847	2,158,779	388
2059	2,158,779	388	4,525	100	21,261	1,584	7,600	100	24,800	204	7,000	423	36,742	178	24,134	204	11,049	204	18,000	250	1,000	482	2,497	400	1,540	594	160,148	397	69	388	31,000	388	127,233	388	158,302	388	1,847	2,160,626	389

Notes

1--Starting storage of the Bunker Hill-B Management Zone was calculated using water level elevations calculated for the 2006 ambient water quality analysis (Wildermuth Environmental, Inc. 2008) and the San Bernardino Basin Area aquifer layer elevations provided by Stantec (2008).

2--The deep percolation of precipitation was estimated from detailed hydrologic studies for the Beaumont groundwater model (Wildermuth Environmental Inc, 2009b). The estimated deep percolation is based on an average of 65 acre-ft/yr per square mile.

3--Recharge estimates of recharge from mountain front runoff and stream recharge in Plunge, City, and Mill Creeks was initially based on estimates developed by Geoscience (2009) and Stantec (2008) and was subsequently modified to balance the water budget. TDS of Plunge and City Creeks was assumed to be similar to the Santa Ana River. TDS for Mill Creek were based on the three year average concentration of TDS grab samples from the City of Redlands' Tate Water Treatment Plant.

4--Stream recharge from San Timoteo Creek includes storm and recycled water. Recharge estimates are based on the Wasteload Allocation Model simulations for the 2010 Basin Plan update. Estimates were then modified to reflect planned future changes in YVWD recycled water discharged to the creek. TDS for San Timoteo Creek were based on the three year average concentration of TDS grab samples from the stream measured by the YVWD.

5--Stream Recharge for the Santa Ana River is based on the Wasteload Allocation Model simulations for the 2010 Basin Plan update. TDS of the Santa Ana River was based on the three year average concentration of SAR water measured at the City of Redlands' Hinkley water treatment plant.

6--The artificial recharge of Santa Ana River water was based on planning estimates from the San Bernardino Valley Municipal Water District (Geoscience 2009) and were subsequently modified to balance the water budget.

7--The artificial recharge of imported water were based on planning estimates from the San Bernardino Valley Municipal Water District (Geoscience 2009) and were subsequently modified to balance the water budget.

8--The TDS of underflow from the San Timoteo Management Zone was assumed to equal the Maximum Benefit Objective for the Management Zone (400 mg/L) because the AWQ of the Management Zone is unknown.

Appendix B4 -- Total Dissolved Solids Projection for the Chino North Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Deep Percolation of Applied Water -- Agricultural		Deep Percolation of Applied Water -- Dairies		Deep Percolation of Applied Water -- Urban		Storm Water Recharge		Imported Water Replenishment		Recycled Water Recharge		Subsurface Inflow - Other Chino MZs		Subsurface Inflow - Adjacent Basins		Total Recharge		Subsurface Outflow - CEMZ, CSMZ, PBMZ		CDA Production in Chino North		Non-CDA Production in Chino North		Total Discharge		Recharge minus Discharge	Ending Storage	Ending TDS
	AF	mg/L	Q AFY	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	AF	AF	mg/L
2010	5,213,530	359	33,580	100	4,185	1,530	1,046	3,611	37,157	1,357	11,830	100	0	250	8,000	509	12,784	956	33,300	390	141,882	665	4,121	359	26,356	956	134,399	359	164,876	454	-22,994	5,190,536	364
2011	5,190,536	364	33,363	100	3,766	1,548	942	3,629	37,887	1,381	11,830	100	0	250	8,000	511	13,213	960	33,300	392	142,301	674	3,653	364	26,356	960	135,904	364	165,913	459	-23,612	5,166,924	369
2012	5,166,924	369	31,417	100	3,348	1,561	837	3,642	38,398	1,396	11,830	100	0	250	8,000	514	13,867	964	33,300	394	140,997	687	2,940	369	26,356	964	137,297	369	166,593	463	-25,596	5,141,327	375
2013	5,141,327	375	30,035	100	2,929	1,570	732	3,651	39,341	1,422	11,830	100	60,000	250	8,000	517	14,603	968	33,300	396	200,770	567	1,611	375	26,356	968	138,915	375	166,882	469	33,888	5,175,215	379
2014	5,175,215	379	29,704	100	2,511	1,575	628	3,656	40,069	1,442	11,830	100	60,000	250	10,000	520	14,825	972	33,300	398	202,867	572	1,001	379	32,878	972	140,419	379	174,298	491	28,569	5,203,784	383
2015	5,203,784	383	29,063	100	2,092	1,582	523	3,663	40,773	1,459	11,830	100	60,000	250	10,000	522	14,908	976	33,300	400	202,489	577	567	383	39,400	976	141,407	383	181,374	512	21,115	5,224,899	386
2016	5,224,899	386	28,293	100	1,674	1,586	418	3,667	41,373	1,467	11,830	100	60,000	250	10,000	524	15,164	980	33,300	402	202,052	581	244	386	39,400	980	144,395	386	184,039	513	18,013	5,242,912	389
2017	5,242,912	389	28,139	100	1,255	1,591	314	3,672	41,758	1,475	11,830	100	60,000	250	10,000	526	15,565	984	33,300	404	202,161	582	55	389	39,400	984	146,266	389	185,721	515	16,440	5,259,351	392
2018	5,259,351	392	26,537	100	837	1,596	209	3,677	42,572	1,483	11,830	100	0	250	12,000	527	16,146	988	33,300	406	143,431	731	0	392	39,400	988	150,370	392	189,770	516	-46,339	5,213,012	397
2019	5,213,012	397	25,920	100	418	1,605	105	3,686	43,172	1,494	11,830	100	0	250	12,000	529	16,618	992	33,300	408	143,363	738	0	397	39,400	992	153,359	397	192,759	519	-49,396	5,163,616	402
2020	5,163,616	402	24,110	100	0	0	0	0	43,771	1,505	11,830	100	0	250	15,000	531	16,991	996	33,300	410	145,002	745	50	402	39,400	996	156,347	402	195,797	522	-50,794	5,112,821	407
2021	5,112,821	407	23,229	100	0	0	0	0	44,368	1,516	11,830	100	0	250	15,000	534	17,252	1,000	33,300	412	144,979	757	26	407	39,400	1,000	159,290	407	198,716	525	-53,737	5,059,084	413
2022	5,059,084	413	21,841	100	0	0	0	0	44,964	1,528	11,830	100	0	250	14,000	537	17,540	1,004	33,300	414	143,475	774	0	413	39,400	1,004	162,232	413	201,632	528	-58,157	5,000,927	418
2023	5,000,927	418	20,075	100	0	0	0	0	45,501	1,541	11,830	100	60,000	250	14,000	540	17,867	1,008	33,300	416	202,573	631	0	418	39,400	1,008	164,516	418	203,916	532	-1,343	4,999,584	422
2024	4,999,584	422	18,795	100	0	0	0	0	46,078	1,551	11,830	100	60,000	250	14,000	543	18,242	1,012	33,300	418	202,245	640	0	422	39,400	1,012	167,238	422	206,638	535	-4,393	4,995,192	426
2025	4,995,192	426	17,450	100	0	0	0	0	46,655	1,561	11,830	100	60,000	250	20,000	545	18,733	1,016	33,300	420	207,968	648	0	426	39,400	1,016	169,961	426	209,361	537	-1,393	4,993,799	431
2026	4,993,799	431	16,184	100	0	0	0	0	47,191	1,572	11,830	100	60,000	250	20,000	547	19,336	1,020	33,300	422	207,841	658	0	431	39,400	1,020	172,528	431	211,928	540	-4,087	4,989,712	436
2027	4,989,712	436	15,210	100	0	0	0	0	47,727	1,584	11,830	100	60,000	250	20,000	550	19,619	1,024	33,300	424	207,686	667	0	436	39,400	1,024	175,095	436	214,495	544	-6,809	4,982,903	441
2028	4,982,903	441	13,928	100	0	0	0	0	48,302	1,596	11,830	100	60,000	250	20,000	553	19,761	1,028	33,300	426	207,121	677	0	441	39,400	1,028	178,103	441	217,503	547	-10,381	4,972,522	446
2029	4,972,522	446	13,097	100	0	0	0	0	48,800	1,609	11,830	100	0	250	20,000	556	20,148	1,032	33,300	428	147,175	864	0	446	39,400	1,032	180,230	446	219,630	551	-72,455	4,900,067	454
2030	4,900,067	454	11,872	100	0	0	0	0	49,344	1,626	11,830	100	0	250	24,000	559	20,297	1,036	33,300	430	150,643	872	0	454	39,400	1,036	182,797	454	222,197	557	-71,553	4,828,513	462
2031	4,828,513	462	11,872	100	0	0	0	0	49,344	1,642	11,830	100	0	250	24,000	563	20,297	1,040	33,300	432	150,643	879	0	462	39,400	1,036	182,797	462	222,197	564	-71,553	4,756,960	471
2032	4,756,960	471	11,872	100	0	0	0	0	49,344	1,659	11,830	100	0	250	24,000	567	20,297	1,044	33,300	434	150,643	886	0	471	39,400	1,036	182,797	471	222,197	571	-71,553	4,685,406	479
2033	4,685,406	479	11,872	100	0	0	0	0	49,344	1,676	11,830	100	110,000	250	24,000	572	20,297	1,048	33,300	436	260,643	622	0	479	39,400	1,036	182,797	479	222,197	578	38,447	4,723,853	482
2034	4,723,853	482	11,872	100	0	0	0	0	49,344	1,684	11,830	100	110,000	250	24,000	576	20,297	1,052	33,300	438	260,643	624	0	482	39,400	1,036	182,797	482	222,197	581	38,447	4,762,300	486
2035	4,762,300	486	11,872	100	0	0	0	0	49,344	1,691	11,830	100	110,000	250	24,000	578	20,297	1,056	33,300	440	260,643	626	0	486	39,400	1,036	182,797	486	222,197	583	38,447	4,800,746	489
2036	4,800,746	489	11,872	100	0	0	0	0	49,344	1,697	11,830	100	110,000	250	24,000	580	20,297	1,060	33,300	442	260,643	628	0	489	39,400	1,036	182,797	489	222,197	586	38,447	4,839,193	492
2037	4,839,193	492	11,872	100	0	0	0	0	49,344	1,704	11,830	100	110,000	250	24,000	581	20,297	1,064	33,300	444	260,643	630	0	492	39,400	1,036	182,797	492	222,197	588	38,447	4,877,639	495
2038	4,877,639	495	11,872	100	0	0	0	0	49,344	1,710	11,830	100	110,000	250	24,000	583	20,297	1,068	33,300	446	260,643	632	0	495	39,400	1,036	182,797	495	222,197	591	38,447	4,916,086	498
2039	4,916,086	498	11,872	100	0	0	0	0	49,344	1,716	11,830	100	0	250	24,000	585	20,297	1,072	33,300	448	150,643	914	0	498	39,400	1,036	182,797	498	222,197	593	-71,553	4,844,532	506
2040	4,844,532	506	11,872	100	0	0	0	0	49,344	1,731	11,830	100	0	250	24,000	586	20,297	1,076	33,300	450	150,643	921	0	506	39,400	1,036	182,797	506	222,197	600	-71,553	4,772,979	515
2041	4,772,979	515	11,872	100	0	0	0	0	49,344	1,748	11,830	100	0	250	24,000	591	20,297	1,080	33,300	452	150,643	928	0	515	39,400	1,036	182,797	515	222,197	607	-71,553	4,701,425	524
2042	4,701,425	524	11,872	100	0	0	0	0	49,344	1,765	11,830	100	0	250	24,000	595	20,297	1,084	33,300	454	150,643	935	0	524	39,400	1,036	182,797	524	222,197	615	-71,553	4,629,872	533
2043	4,629,872	533	11,872	100	0	0	0	0	49,344	1,783	11,830	100	110,000	250	24,000	600	20,297	1,088	33,300	456	260,643	650	0	533	39,400	1,036	182,797	533	222,197	622	38,447	4,668,318	535
2044	4,668,318	535	11,872	100	0	0	0	0	49,344	1,790	11,830	100	110,000	250	24,000	605	20,297	1,092	33,300	458	260,643	653	0	535	39,400	1,036	182,797	535	222,197	624	38,447	4,706,765	538
2045	4,706,765	538	11,872	100	0	0	0	0	49,344	1,795	11,830	100	110,000	250	24,000	606	20,297	1,096	33,300	460	260,643	654	0	538	39,400	1,036	182,797	538	222,197	626	38,447	4,745,211	540
2046	4,745,211	540	11,872	100	0	0	0	0	49,344	1,800	11,830	100	110,000	250	24,000	607	20,297	1,100	33,300	462	260,643	656	0	540	39,400	1,036	182,797	540	222,197	628	38,447	4,783,658	542
2047	4,783,658	542	11,872	100	0	0	0	0	49,344	1,805	11,830	100	110,000	250	24,000	608	20,297	1,104	33,300	464	260,643	657	0	542	39,400	1,036	182,797	542	222,197	630	38,447	4,822,105	544
2048	4,822,105	544	11,872	100	0	0	0	0	49,344	1,809	11,830	100	110,000	250	24,000	610	20,297	1,108	33,300	466	260,643	659	0	544	39,400	1,036	182,797	544	222,197	631	38,447	4,860,551	546
2049	4,860,551	546	11,872	100	0	0	0	0	49,344	1,814	11,830	100	0	250	24,000	611	20,297	1,112	33,300	468	150,643	960	0	546	39,400	1,036	182,797	546	222,197	633	-71,553	4,788,998	555
2050	4,788,998	555	11,872	100	0	0	0	0	49,344	1,829	11,830	100	0	250	24,000	612	20,297	1,116	33,300	470	150,643	967	0	555	39,400	1,036	182,797	555	222,197	641	-71,553	4,717,444	565
2051	4,717,444	565	11,872	100	0	0	0	0	49,344	1,847	11,830	100	0	250	24,000	617	20,297	1,120	33,300	472	150,643	974	0	565	39,400	1,036	182,797	565	222,197	648	-71,553	4,645,891	574
2052	4,645,891	574	11,872	100	0	0	0	0	49,344	1,865	11,830	100	0	250	24,000	621	20,297	1,124	33,300	474	150,643	982	0	574	39,400	1,036	182,797	574	222,197	656	-71,553	4,574,337	583
2053	4,574,337	583	11,872	100	0	0	0	0	49,344	1,884	11,830	100	110,000	250	24,000	626	20,297	1,128	33,300	476	260,643	678	0	583	39,400	1,036	182,797	583	222,197	664	38,447	4,612,784	585
2054	4,612,784	585	11,872	100	0	0	0	0	49,344	1,890	11,830	100	110,000	250	24,000	631	20,297	1,132	33,300	478	260,643	680	0	585	39,400	1,036	182,797	585	222,197	665	38,447	4,651,230	586
2055	4,651,230	586	11,872	100	0	0	0	0	49,344	1,893	11,830	100	110,000	250	24,000	632	20,297	1,136	33,300	480	260,643	681	0	586	39,400	1,036	182,797	586	222,197	666	38,447	4,689,677	588
2056	4,689,677	588	11,872	100	0	0	0	0	49,344	1,896	11,830	100	110,000	250	24,000	633	20,297	1,140	33,300	482	260,643	682	0	588	39,400	1,036	182,797	588	222,197	667	38,447	4,728,123	589
2057	4,728,123	589	11,872	100	0	0	0	0	49,344	1,899	11,830	100	110,000	250	24,000	634	20,297	1,144	33,300	484	260,643	683	0	589	39,400	1,036	182,797	589	222,197	668	38,447	4,766,570	591
2058	4,766,570	591	11,872	100	0	0	0	0	49,344	1,903	11,830	100	110,000	250	24,000	634	20,297	1,148	33,300	486	260,643	685	0	591	39,400	1,036	182,797	591	222,197	670	38,447	4,805,017	592
2059	4,805,017	592	11,872	100	0	0	0	0	49,344	1,906	11,830	100	0	250	24,000	635	20,297	1,152	33,300	488	150,643	1,004	0	592	39,400	1,036	182,797	592	222,197	671	-71,553	4,733,463	602

Notes

1--Data for Chino North Management Zone projections adapted from Wildermuth Environmental, Inc. (2009a)

Appendix B5 -- Total Dissolved Solids Projection for the Elsinore Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Deep Percolation of Applied Water		Streambed Recharge in San Jacinto River		Imported Water Recharge		Septic Tank Returns		Total Recharge		Groundwater Production		Total Discharge		Recharge minus Discharge	Ending Storage	Ending TDS
			Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS			
	AF	mg/L	AFY	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	AF	mg/L
2010	2,835,909	470	2,800	100	1,404	2,308	1,392	525	0	475	1,032	765	6,628	761	8,280	470	8,280	470	-1,652	2,834,257	471
2011	2,834,257	471	2,800	100	1,451	2,309	1,392	525	10,330	475	1,032	765	17,005	591	8,556	471	8,556	471	8,449	2,842,706	471
2012	2,842,706	471	2,800	100	1,498	2,309	1,392	525	0	475	1,032	765	6,722	782	8,832	471	8,832	471	-2,110	2,840,596	472
2013	2,840,596	472	2,800	100	1,544	2,310	1,392	525	0	475	1,032	765	6,768	793	9,108	472	9,108	472	-2,340	2,838,256	473
2014	2,838,256	473	2,800	100	1,591	2,311	1,392	525	9,106	475	1,032	765	15,921	616	9,384	473	9,384	473	6,537	2,844,793	474
2015	2,844,793	474	2,800	100	1,638	2,311	1,392	525	0	475	1,032	765	6,862	814	9,660	474	9,660	474	-2,798	2,841,995	475
2016	2,841,995	475	2,800	100	1,685	2,312	1,392	525	0	475	1,032	765	6,909	824	9,936	475	9,936	475	-3,027	2,838,968	475
2017	2,838,968	475	2,800	100	1,732	2,313	1,392	525	0	475	1,032	765	6,956	835	10,212	475	10,212	475	-3,256	2,835,712	476
2018	2,835,712	476	2,800	100	1,778	2,314	1,392	525	9,615	475	1,032	765	16,617	631	10,488	476	10,488	476	6,129	2,841,841	477
2019	2,841,841	477	2,800	100	1,825	2,315	1,392	525	0	475	1,032	765	7,049	855	10,764	477	10,764	477	-3,715	2,838,126	478
2020	2,838,126	478	2,800	100	1,872	2,315	1,392	525	0	475	1,032	765	7,096	865	11,040	478	11,040	478	-3,944	2,834,182	479
2021	2,834,182	479	2,800	100	1,872	2,316	1,392	525	12,526	475	1,032	765	19,622	616	11,040	479	11,040	479	8,582	2,842,764	480
2022	2,842,764	480	2,800	100	1,872	2,317	1,392	525	0	475	1,032	765	7,096	865	11,040	480	11,040	480	-3,944	2,838,820	481
2023	2,838,820	481	2,800	100	1,872	2,318	1,392	525	0	475	1,032	765	7,096	865	11,040	481	11,040	481	-3,944	2,834,876	482
2024	2,834,876	482	2,800	100	1,872	2,319	1,392	525	11,688	475	1,032	765	18,784	623	11,040	482	11,040	482	7,744	2,842,620	483
2025	2,842,620	483	2,800	100	1,872	2,320	1,392	525	0	475	1,032	765	7,096	866	11,040	483	11,040	483	-3,944	2,838,676	484
2026	2,838,676	484	2,800	100	1,872	2,321	1,392	525	0	475	1,032	765	7,096	866	11,040	484	11,040	484	-3,944	2,834,732	485
2027	2,834,732	485	2,800	100	1,872	2,322	1,392	525	10,330	475	1,032	765	17,426	634	11,040	485	11,040	485	6,386	2,841,118	486
2028	2,841,118	486	2,800	100	1,872	2,322	1,392	525	0	475	1,032	765	7,096	866	11,040	486	11,040	486	-3,944	2,837,174	487
2029	2,837,174	487	2,800	100	1,872	2,323	1,392	525	0	475	1,032	765	7,096	867	11,040	487	11,040	487	-3,944	2,833,230	488
2030	2,833,230	488	2,800	100	1,872	2,324	1,392	525	9,106	475	1,032	765	16,202	647	11,040	488	11,040	488	5,162	2,838,392	489
2031	2,838,392	489	2,800	100	1,872	2,325	1,392	525	0	475	1,032	765	7,096	867	11,040	489	11,040	489	-3,944	2,834,448	489
2032	2,834,448	489	2,800	100	1,872	2,326	1,392	525	0	475	1,032	765	7,096	867	11,040	489	11,040	489	-3,944	2,830,504	490
2033	2,830,504	490	2,800	100	1,872	2,327	1,392	525	0	475	1,032	765	7,096	868	11,040	490	11,040	490	-3,944	2,826,560	491
2034	2,826,560	491	2,800	100	1,872	2,328	1,392	525	9,615	475	1,032	765	16,711	642	11,040	491	11,040	491	5,671	2,832,231	492
2035	2,832,231	492	2,800	100	1,872	2,328	1,392	525	0	475	1,032	765	7,096	868	11,040	492	11,040	492	-3,944	2,828,287	493
2036	2,828,287	493	2,800	100	1,872	2,329	1,392	525	0	475	1,032	765	7,096	868	11,040	493	11,040	493	-3,944	2,824,343	494
2037	2,824,343	494	2,800	100	1,872	2,330	1,392	525	12,526	475	1,032	765	19,622	617	11,040	494	11,040	494	8,582	2,832,925	495
2038	2,832,925	495	2,800	100	1,872	2,331	1,392	525	0	475	1,032	765	7,096	869	11,040	495	11,040	495	-3,944	2,828,981	496
2039	2,828,981	496	2,800	100	1,872	2,332	1,392	525	0	475	1,032	765	7,096	869	11,040	496	11,040	496	-3,944	2,825,037	497
2040	2,825,037	497	2,800	100	1,872	2,333	1,392	525	11,688	475	1,032	765	18,784	624	11,040	497	11,040	497	7,744	2,832,781	498
2041	2,832,781	498	2,800	100	1,872	2,333	1,392	525	0	475	1,032	765	7,096	869	11,040	498	11,040	498	-3,944	2,828,837	499
2042	2,828,837	499	2,800	100	1,872	2,334	1,392	525	0	475	1,032	765	7,096	870	11,040	499	11,040	499	-3,944	2,824,893	500
2043	2,824,893	500	2,800	100	1,872	2,335	1,392	525	10,330	475	1,032	765	17,426	636	11,040	500	11,040	500	6,386	2,831,279	500
2044	2,831,279	500	2,800	100	1,872	2,336	1,392	525	0	475	1,032	765	7,096	870	11,040	500	11,040	500	-3,944	2,827,335	501
2045	2,827,335	501	2,800	100	1,872	2,337	1,392	525	0	475	1,032	765	7,096	870	11,040	501	11,040	501	-3,944	2,823,391	502
2046	2,823,391	502	2,800	100	1,872	2,338	1,392	525	9,106	475	1,032	765	16,202	648	11,040	502	11,040	502	5,162	2,828,553	503
2047	2,828,553	503	2,800	100	1,872	2,338	1,392	525	0	475	1,032	765	7,096	871	11,040	503	11,040	503	-3,944	2,824,609	504
2048	2,824,609	504	2,800	100	1,872	2,339	1,392	525	0	475	1,032	765	7,096	871	11,040	504	11,040	504	-3,944	2,820,665	505
2049	2,820,665	505	2,800	100	1,872	2,340	1,392	525	0	475	1,032	765	7,096	871	11,040	505	11,040	505	-3,944	2,816,721	506
2050	2,816,721	506	2,800	100	1,872	2,341	1,392	525	9,615	475	1,032	765	16,711	643	11,040	506	11,040	506	5,671	2,822,392	507
2051	2,822,392	507	2,800	100	1,872	2,342	1,392	525	0	475	1,032	765	7,096	871	11,040	507	11,040	507	-3,944	2,818,448	508
2052	2,818,448	508	2,800	100	1,872	2,343	1,392	525	0	475	1,032	765	7,096	872	11,040	508	11,040	508	-3,944	2,814,504	508
2053	2,814,504	508	2,800	100	1,872	2,343	1,392	525	12,526	475	1,032	765	19,622	619	11,040	508	11,040	508	8,582	2,823,086	509
2054	2,823,086	509	2,800	100	1,872	2,344	1,392	525	0	475	1,032	765	7,096	872	11,040	509	11,040	509	-3,944	2,819,142	510
2055	2,819,142	510	2,800	100	1,872	2,345	1,392	525	0	475	1,032	765	7,096	872	11,040	510	11,040	510	-3,944	2,815,198	511
2056	2,815,198	511	2,800	100	1,872	2,346	1,392	525	11,688	475	1,032	765	18,784	625	11,040	511	11,040	511	7,744	2,822,942	512
2057	2,822,942	512	2,800	100	1,872	2,346	1,392	525	0	475	1,032	765	7,096	873	11,040	512	11,040	512	-3,944	2,818,998	513
2058	2,818,998	513	2,800	100	1,872	2,347	1,392	525	0	475	1,032	765	7,096	873	11,040	513	11,040	513	-3,944	2,815,054	514
2059	2,815,054	514	2,800	100	1,872	2,348	1,392	525	0	475	1,032	765	7,096	873	11,040	514	11,040	514	-3,944	2,811,110	515

Notes

1--Initial Starting Storage and Starting TDS comes from MWH (2009): Imported Water Recharge Modeling Study for the Elsinore Basin.

2--Q for Deep Percolation of Precipitation comes from MWH (2005): Elsinore Basin Groundwater Management Plan.

3--Streambed Recharge and associated TDS comes from MWH (2009): Imported Water Recharge Modeling Study for the Elsinore Basin.

4--Imported Water Recharge and associated TDS was provided by Matthew Huang (MWH).

5--Septic Tank Returns and associated TDS comes from MWH (2009): Imported Water Recharge Modeling Study for the Elsinore Basin.

Appendix B6 -- Total Dissolved Solids Projection for the Temescal Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Deep Percolation of Applied Water		Storm Water Recharge		Recycled Water Recharge		Subsurface Inflow Arlington Gap		Subsurface Inflow Mountain Front		Total Recharge		Subsurface Outflow - SAR		Groundwater Production		Total Discharge		Recharge minus Discharge	Ending Storage	Ending TDS
			Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS	Q	TDS			
	AF	mg/L	AFY	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	mg/L	AF	AF	mg/L
2010	1,018,656	780	1,500	100	5,612	2,248	170	100	8,511	710	966	950	3,917	700	20,676	1,088	3,780	780	20,531	875	24,311	860	-3,635	1,015,021	784
2011	1,015,021	784	1,500	100	5,592	2,248	172	100	8,502	711	991	950	3,917	700	20,675	1,087	3,611	784	20,698	879	24,309	865	-3,634	1,011,388	790
2012	1,011,388	790	1,500	100	5,662	2,248	175	100	8,502	713	1,017	950	3,917	700	20,772	1,091	3,442	790	20,865	885	24,307	872	-3,535	1,007,852	797
2013	1,007,852	797	1,500	100	5,576	2,248	177	100	8,502	716	1,042	950	3,917	700	20,713	1,087	3,273	797	21,033	892	24,306	879	-3,592	1,004,260	803
2014	1,004,260	803	1,500	100	5,535	2,248	179	100	8,511	719	1,068	950	3,917	700	20,709	1,086	3,104	803	21,200	898	24,304	885	-3,595	1,000,665	808
2015	1,000,665	808	1,500	100	5,308	2,248	3,300	100	8,502	721	1,093	950	3,917	700	23,620	945	2,935	808	21,368	903	24,303	892	-682	999,983	811
2016	999,983	811	1,500	100	5,472	2,248	3,300	100	8,502	724	1,118	950	3,917	700	23,809	955	2,766	811	21,757	906	24,523	896	-714	999,269	815
2017	999,269	815	1,500	100	5,439	2,248	3,300	100	8,502	728	1,144	950	3,917	700	23,802	955	2,597	815	22,147	910	24,744	900	-941	998,327	818
2018	998,327	818	1,500	100	5,407	2,248	3,300	100	8,511	733	1,169	950	3,917	700	23,804	955	2,428	818	22,536	913	24,964	904	-1,160	997,167	821
2019	997,167	821	1,500	100	5,375	2,248	3,300	100	8,502	737	1,195	950	3,917	700	23,789	955	2,259	821	22,926	916	25,185	908	-1,396	995,771	825
2020	995,771	825	1,500	100	5,343	2,248	3,300	100	8,502	742	1,220	950	3,917	700	23,782	955	2,090	825	23,316	920	25,406	912	-1,624	994,147	828
2021	994,147	828	1,500	100	5,310	2,248	3,300	100	8,502	746	1,220	950	3,917	700	23,749	954	1,921	828	23,316	923	25,237	915	-1,487	992,660	831
2022	992,660	831	1,500	100	5,278	2,248	3,300	100	8,511	747	1,220	950	3,917	700	23,726	953	1,752	831	23,316	926	25,068	919	-1,341	991,319	833
2023	991,319	833	1,500	100	5,246	2,248	3,300	100	8,502	747	1,220	950	3,917	700	23,685	951	1,583	833	23,316	928	24,899	922	-1,214	990,105	836
2024	990,105	836	1,500	100	5,214	2,248	3,300	100	8,502	748	1,220	950	3,917	700	23,653	950	1,414	836	23,316	931	24,730	926	-1,077	989,028	839
2025	989,028	839	1,500	100	5,181	2,248	3,300	100	8,511	748	1,220	950	3,917	700	23,629	948	1,245	839	23,316	934	24,561	929	-931	988,097	842
2026	988,097	842	1,500	100	5,149	2,248	3,300	100	8,502	749	1,220	950	3,917	700	23,588	946	1,076	842	23,316	937	24,392	932	-803	987,293	844
2027	987,293	844	1,500	100	5,120	2,248	3,300	100	8,502	749	1,220	950	3,917	700	23,559	945	907	844	23,316	939	24,223	935	-663	986,630	846
2028	986,630	846	1,500	100	5,095	2,248	3,300	100	8,502	750	1,220	950	3,917	700	23,534	944	738	846	23,316	941	24,054	938	-519	986,111	849
2029	986,111	849	1,500	100	5,074	2,248	3,300	100	8,511	750	1,220	950	3,917	700	23,522	943	569	849	23,316	944	23,885	941	-363	985,748	851
2030	985,748	851	1,500	100	5,056	2,248	3,300	100	8,502	750	1,220	950	3,917	700	23,495	942	400	851	23,316	946	23,716	944	-221	985,528	853
2031	985,528	853	1,500	100	5,041	2,248	3,300	100	8,502	751	1,220	950	3,917	700	23,480	941	400	853	23,316	948	23,716	946	-235	985,293	855
2032	985,293	855	1,500	100	5,031	2,248	3,300	100	8,502	751	1,220	950	3,917	700	23,470	941	400	855	23,316	950	23,716	949	-246	985,047	857
2033	985,047	857	1,500	100	5,024	2,248	3,300	100	8,502	752	1,220	950	3,917	700	23,463	941	400	857	23,316	952	23,716	951	-253	984,794	859
2034	984,794	859	1,500	100	5,020	2,248	3,300	100	8,502	752	1,220	950	3,917	700	23,459	940	400	859	23,316	954	23,716	952	-257	984,537	861
2035	984,537	861	1,500	100	5,020	2,248	3,300	100	8,502	753	1,220	950	3,917	700	23,459	941	400	861	23,316	956	23,716	954	-257	984,281	863
2036	984,281	863	1,500	100	5,020	2,248	3,300	100	8,502	753	1,220	950	3,917	700	23,459	941	400	863	23,316	958	23,716	956	-257	984,024	865
2037	984,024	865	1,500	100	5,020	2,248	3,300	100	8,502	753	1,220	950	3,917	700	23,459	941	400	865	23,316	960	23,716	958	-257	983,768	867
2038	983,768	867	1,500	100	5,020	2,248	3,300	100	8,502	754	1,220	950	3,917	700	23,459	941	400	867	23,316	962	23,716	960	-257	983,511	868
2039	983,511	868	1,500	100	5,020	2,248	3,300	100	8,502	754	1,220	950	3,917	700	23,459	941	400	868	23,316	963	23,716	962	-257	983,255	870
2040	983,255	870	1,500	100	5,020	2,248	3,300	100	8,502	754	1,220	950	3,917	700	23,459	941	400	870	23,316	965	23,716	963	-257	982,998	872
2041	982,998	872	1,500	100	5,020	2,248	3,300	100	8,502	755	1,220	950	3,917	700	23,459	941	400	872	23,316	967	23,716	965	-257	982,741	873
2042	982,741	873	1,500	100	5,020	2,248	3,300	100	8,502	755	1,220	950	3,917	700	23,459	942	400	873	23,316	968	23,716	967	-257	982,485	875
2043	982,485	875	1,500	100	5,020	2,248	3,300	100	8,502	755	1,220	950	3,917	700	23,459	942	400	875	23,316	970	23,716	968	-257	982,228	876
2044	982,228	876	1,500	100	5,020	2,248	3,300	100	8,502	756	1,220	950	3,917	700	23,459	942	400	876	23,316	971	23,716	970	-257	981,972	878
2045	981,972	878	1,500	100	5,020	2,248	3,300	100	8,502	756	1,220	950	3,917	700	23,459	942	400	878	23,316	973	23,716	971	-257	981,715	880
2046	981,715	880	1,500	100	5,020	2,248	3,300	100	8,502	756	1,220	950	3,917	700	23,459	942	400	880	23,316	975	23,716	973	-257	981,459	881
2047	981,459	881	1,500	100	5,020	2,248	3,300	100	8,502	757	1,220	950	3,917	700	23,459	942	400	881	23,316	976	23,716	974	-257	981,202	882
2048	981,202	882	1,500	100	5,020	2,248	3,300	100	8,502	757	1,220	950	3,917	700	23,459	942	400	882	23,316	977	23,716	976	-257	980,946	884
2049	980,946	884	1,500	100	5,020	2,248	3,300	100	8,502	757	1,220	950	3,917	700	23,459	942	400	884	23,316	979	23,716	977	-257	980,689	885
2050	980,689	885	1,500	100	5,020	2,248	3,300	100	8,502	758	1,220	950	3,917	700	23,459	942	400	885	23,316	980	23,716	979	-257	980,433	887
2051	980,433	887	1,500	100	5,020	2,248	3,300	100	8,502	758	1,220	950	3,917	700	23,459	943	400	887	23,316	982	23,716	980	-257	980,176	888
2052	980,176	888	1,500	100	5,020	2,248	3,300	100	8,502	758	1,220	950	3,917	700	23,459	943	400	888	23,316	983	23,716	981	-257	979,920	889
2053	979,920	889	1,500	100	5,020	2,248	3,300	100	8,502	759	1,220	950	3,917	700	23,459	943	400	889	23,316	984	23,716	983	-257	979,663	890
2054	979,663	890	1,500	100	5,020	2,248	3,300	100	8,502	759	1,220	950	3,917	700	23,459	943	400	890	23,316	985	23,716	984	-257	979,407	892
2055	979,407	892	1,500	100	5,020	2,248	3,300	100	8,502	759	1,220	950	3,917	700	23,459	943	400	892	23,316	987	23,716	985	-257	979,150	893
2056	979,150	893	1,500	100	5,020	2,248	3,300	100	8,502	759	1,220	950	3,917	700	23,459	943	400	893	23,316	988	23,716	986	-257	978,893	894
2057	978,893	894	1,500	100	5,020	2,248	3,300	100	8,502	760	1,220	950	3,917	700	23,459	943	400	894	23,316	989	23,716	988	-257	978,637	895
2058	978,637	895	1,500	100	5,020	2,248	3,300	100	8,502	760	1,220	950	3,917	700	23,459	943	400	895	23,316	990	23,716	989	-257	978,380	896
2059	978,380	896	1,500	100	5,020	2,248	3,300	100	8,502	760	1,220	950	3,917	700	23,459	943	400	896	23,315	991	23,715	990	-256	978,125	898

Notes

1--Data for Beaumont Management Zone projections adapted from Todd Engineers (2009).

2--A stormwater recharge component of 3,300 acre-ft/yr was added in 2015.

Appendix B7 -- Total Dissolved Solids Projection for the Yucaipa Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Deep Percolation of Applied Water		Recharge from Streamflow and Mountain Front Runoff		Artificial Recharge of SWP water		Recharge of Recycled Water		Total Recharge		Subsurface Outflow to Bunker Hill-B		Groundwater Production		Total Discharge		Recharge minus Discharge	Ending Storage	Ending TDS
	AF	mg/L	Q AFY	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	AF	AF	mg/L
2010	693,478	330	2,600	100	5,335	1,420	5,329	100	1,000	250	0	490	14,264	604	1,540	330	10,321	330	11,861	330	2,403	695,881	336
2011	695,881	336	2,600	100	5,447	1,425	5,329	100	1,000	250	0	489	14,376	612	1,540	336	10,401	336	11,941	336	2,435	698,317	342
2012	698,317	342	2,600	100	5,576	1,431	5,329	100	1,000	250	0	492	14,505	622	1,540	342	10,481	342	12,021	342	2,484	700,801	347
2013	700,801	347	2,600	100	5,705	1,438	5,329	100	1,000	250	0	494	14,634	632	1,540	347	10,561	347	12,101	347	2,533	703,334	353
2014	703,334	353	2,600	100	5,876	1,445	5,329	100	1,000	250	0	496	14,805	644	1,540	353	10,925	353	12,465	353	2,339	705,673	359
2015	705,673	359	2,600	100	5,961	1,440	5,329	100	1,000	250	0	498	14,890	646	1,540	359	9,885	359	11,425	359	3,465	709,138	365
2016	709,138	365	2,600	100	6,107	1,448	5,329	100	1,000	250	0	495	15,036	657	1,540	365	9,960	365	11,500	365	3,535	712,674	371
2017	712,674	371	2,600	100	6,252	1,456	5,329	100	1,000	250	0	497	15,181	669	1,540	371	10,035	371	11,575	371	3,606	716,280	378
2018	716,280	378	2,600	100	6,398	1,465	5,329	100	1,000	250	0	500	15,327	679	1,540	378	10,110	378	11,650	378	3,677	719,956	384
2019	719,956	384	2,600	100	6,543	1,473	5,329	100	1,000	250	0	502	15,472	690	1,540	384	10,185	384	11,725	384	3,747	723,703	391
2020	723,703	391	2,600	100	6,687	1,481	5,329	100	2,284	250	2,036	505	18,936	649	1,540	391	10,260	391	11,800	391	7,137	730,840	397
2021	730,840	397	2,600	100	6,812	1,486	5,329	100	2,303	250	2,017	507	19,061	657	1,540	397	10,218	397	11,758	397	7,304	738,144	404
2022	738,144	404	2,600	100	6,937	1,491	5,329	100	2,317	250	2,003	509	19,186	664	1,540	404	10,175	404	11,715	404	7,470	745,614	410
2023	745,614	410	2,600	100	7,062	1,496	5,329	100	2,329	250	1,991	510	19,311	671	1,540	410	10,133	410	11,673	410	7,637	753,251	417
2024	753,251	417	2,600	100	7,186	1,501	5,329	100	2,341	250	1,979	512	19,435	678	1,540	417	10,091	417	11,631	417	7,804	761,055	424
2025	761,055	424	2,600	100	7,311	1,505	5,329	100	2,353	250	1,967	514	19,560	685	1,540	424	10,049	424	11,589	424	7,971	769,026	430
2026	769,026	430	2,600	100	7,424	1,510	5,329	100	2,363	250	1,957	515	19,673	691	1,540	430	10,017	430	11,557	430	8,115	777,142	437
2027	777,142	437	2,600	100	7,536	1,514	5,329	100	2,375	250	1,945	517	19,785	698	1,540	437	9,985	437	11,525	437	8,260	785,401	443
2028	785,401	443	2,600	100	7,649	1,519	5,329	100	2,386	250	1,934	518	19,898	704	1,540	443	9,953	443	11,493	443	8,404	793,806	450
2029	793,806	450	2,600	100	7,761	1,523	5,329	100	2,397	250	1,923	520	20,010	710	1,540	450	9,921	450	11,461	450	8,549	802,355	456
2030	802,355	456	2,600	100	7,874	1,527	5,329	100	2,407	250	1,913	521	20,123	716	1,540	456	9,889	456	11,429	456	8,694	811,048	463
2031	811,048	463	2,600	100	7,874	1,534	5,329	100	2,416	250	1,904	522	20,123	719	1,540	463	9,889	463	11,429	463	8,694	819,742	469
2032	819,742	469	2,600	100	7,874	1,541	5,329	100	2,435	250	1,885	525	20,123	722	1,540	469	9,889	469	11,429	469	8,694	828,435	475
2033	828,435	475	2,600	100	7,874	1,548	5,329	100	2,453	250	1,867	528	20,123	725	1,540	475	9,889	475	11,429	475	8,694	837,129	481
2034	837,129	481	2,600	100	7,874	1,555	5,329	100	2,470	250	1,850	530	20,123	727	1,540	481	9,889	481	11,429	481	8,694	845,822	487
2035	845,822	487	2,600	100	7,874	1,561	5,329	100	2,487	250	1,833	533	20,123	730	1,540	487	9,889	487	11,429	487	8,694	854,516	493
2036	854,516	493	2,600	100	7,874	1,568	5,329	100	2,503	250	1,817	535	20,123	732	1,540	493	9,889	493	11,429	493	8,694	863,209	498
2037	863,209	498	2,600	100	7,874	1,574	5,329	100	2,518	250	1,802	538	20,123	735	1,540	498	9,889	498	11,429	498	8,694	871,903	503
2038	871,903	503	2,600	100	7,874	1,580	5,329	100	2,533	250	1,787	540	20,123	737	1,540	503	9,889	503	11,429	503	8,694	880,596	509
2039	880,596	509	2,600	100	7,874	1,586	5,329	100	2,547	250	1,773	542	20,123	739	1,540	509	9,889	509	11,429	509	8,694	889,290	514
2040	889,290	514	2,600	100	7,874	1,591	5,329	100	2,561	250	1,759	545	20,123	741	1,540	514	9,889	514	11,429	514	8,694	897,983	519
2041	897,983	519	2,600	100	7,874	1,597	5,329	100	2,574	250	1,746	547	20,123	744	1,540	519	9,889	519	11,429	519	8,694	906,677	524
2042	906,677	524	2,600	100	7,874	1,602	5,329	100	2,587	250	1,733	549	20,123	746	1,540	524	9,889	524	11,429	524	8,694	915,370	529
2043	915,370	529	2,600	100	7,874	1,607	5,329	100	2,599	250	1,721	551	20,123	748	1,540	529	9,889	529	11,429	529	8,694	924,064	534
2044	924,064	534	2,600	100	7,874	1,613	5,329	100	2,611	250	1,709	553	20,123	750	1,540	534	9,889	534	11,429	534	8,694	932,757	538
2045	932,757	538	2,600	100	7,874	1,618	5,329	100	2,622	250	1,698	555	20,123	752	1,540	538	9,889	538	11,429	538	8,694	941,451	543
2046	941,451	543	2,600	100	7,874	1,622	5,329	100	2,634	250	1,686	557	20,123	754	1,540	543	9,889	543	11,429	543	8,694	950,144	547
2047	950,144	547	2,600	100	7,874	1,627	5,329	100	2,644	250	1,676	559	20,123	756	1,540	547	9,889	547	11,429	547	8,694	958,838	552
2048	958,838	552	2,600	100	7,874	1,632	5,329	100	2,655	250	1,665	561	20,123	757	1,540	552	9,889	552	11,429	552	8,694	967,531	556
2049	967,531	556	2,600	100	7,874	1,636	5,329	100	2,665	250	1,655	563	20,123	759	1,540	556	9,889	556	11,429	556	8,694	976,225	560
2050	976,225	560	2,600	100	7,874	1,641	5,329	100	2,675	250	1,645	565	20,123	761	1,540	560	9,889	560	11,429	560	8,694	984,918	564
2051	984,918	564	2,600	100	7,874	1,645	5,329	100	2,684	250	1,636	567	20,123	763	1,540	564	9,889	564	11,429	564	8,694	993,612	568
2052	993,612	568	2,600	100	7,874	1,649	5,329	100	2,693	250	1,627	569	20,123	764	1,540	568	9,889	568	11,429	568	8,694	1,002,305	572
2053	1,002,305	572	2,600	100	7,874	1,654	5,329	100	2,702	250	1,618	570	20,123	766	1,540	572	9,889	572	11,429	572	8,694	1,010,999	576
2054	1,010,999	576	2,600	100	7,874	1,658	5,329	100	2,711	250	1,609	572	20,123	767	1,540	576	9,889	576	11,429	576	8,694	1,019,692	580
2055	1,019,692	580	2,600	100	7,874	1,662	5,329	100	2,719	250	1,601	574	20,123	769	1,540	580	9,889	580	11,429	580	8,694	1,028,386	583
2056	1,028,386	583	2,600	100	7,874	1,666	5,329	100	2,728	250	1,592	576	20,123	771	1,540	583	9,889	583	11,429	583	8,694	1,037,080	587
2057	1,037,080	587	2,600	100	7,874	1,669	5,329	100	2,736	250	1,584	577	20,123	772	1,540	587	9,889	587	11,429	587	8,694	1,045,773	590
2058	1,045,773	590	2,600	100	7,874	1,673	5,329	100	2,743	250	1,577	579	20,123	773	1,540	590	9,889	590	11,429	590	8,694	1,054,467	594
2059	1,054,467	594	2,600	100	7,874	1,677	5,329	100	2,751	250	1,569	580	20,123	775	1,540	594	9,889	594	11,429	594	8,694	1,063,160	597

Notes

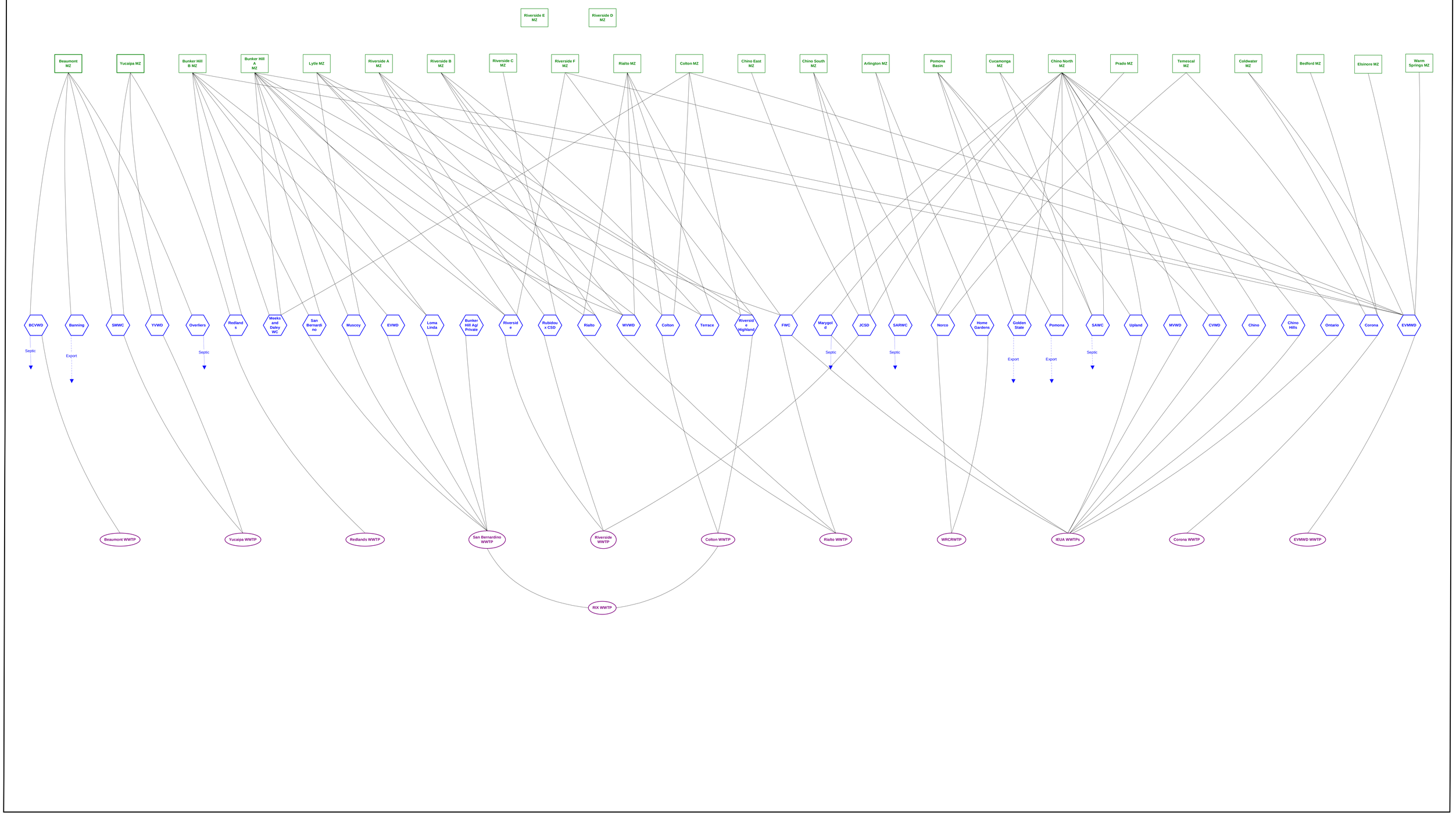
1--Volumes of SWP water and recycled water recharged into the Yucaipa Management Zone differ from YVWD stated plans and from Geoscience Support Services, Inc. (2009). Per the Maximum Benefit Commitments of the YVWD under the Regional Board Basin Plan, recycled water used for recharge must be blended with a higher quality source (in this case SWP water) to achieve a volume weighted concentration equal to the Management Zone objective (370 mg/L).

Appendix B8 -- Total Dissolved Solids Projection for the Orange County Management Zone

Year	Starting Storage	Starting TDS	Deep Percolation of Precipitation		Deep Percolation of Applied Water		Santa Ana River Baseflow Recharge		Storm Flow Recharge		Imported Water Replenishment		Recycled Water Replenishment		Subsurface Inflow		Alamitos Barrier		Total Recharge		Subsurface Outflow	Production	Total Discharge	Ending Storage	Ending TDS
	AF	mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	TDS mg/L	Q AF	Q AF	Q AF	Q AF	TDS mg/L
2010	35,800,000	590	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	589
2011	35,800,000	589	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	589
2012	35,800,000	589	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	588
2013	35,800,000	588	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	588
2014	35,800,000	588	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	587
2015	35,800,000	587	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	586
2016	35,800,000	586	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	586
2017	35,800,000	586	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	585
2018	35,800,000	585	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	585
2019	35,800,000	585	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	584
2020	35,800,000	584	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	584
2021	35,800,000	584	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	583
2022	35,800,000	583	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	583
2023	35,800,000	583	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	582
2024	35,800,000	582	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	582
2025	35,800,000	582	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	581
2026	35,800,000	581	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	581
2027	35,800,000	581	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	580
2028	35,800,000	580	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	580
2029	35,800,000	580	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	579
2030	35,800,000	579	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	579
2031	35,800,000	579	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	578
2032	35,800,000	578	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	578
2033	35,800,000	578	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	577
2034	35,800,000	577	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	577
2035	35,800,000	577	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	576
2036	35,800,000	576	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	576
2037	35,800,000	576	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	575
2038	35,800,000	575	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	575
2039	35,800,000	575	6,500	100	9,000	1,776	148,000	620	50,000	200	50,000	650	72,000	60	37,500	1,164	2,500	350	375,500	532	22,000	353,500	375,500	35,800,000	574

Notes

1 --All data for Orange County Management Zone projections adapted from Orange County Water District (2009) Case 4.



Appendix C-1 - Management Zone, Water Supply Agency, and Wastewater Treatment Plant Schematic of the Portions of the Santa Ana River Watershed Modeled in this Technical Memorandum.