improve reliability. These updates will be incorporated into subsequent UWMPs for SGPWA.

3.7.3 Facilities

As the SWP contractor for the region, SGPWA is planning for the necessary facilities to provide imported water supplies to its retail agencies. The following sub-sections describe existing and planned facilities required to convey and utilize imported water to meet demands in SGPWA's service area.

Conveyance

The current capacity in the East Branch Extension of the SWP is 16 cubic feet per second (cfs). This capacity is not sufficient for SGPWA to obtain the full SWP allocation of 17,300 AFY. With the 16 cfs of capacity and an assumed operation frequency of 75 percent, the maximum SWP delivery to SGPWA is approximately 8,650 AFY. The need for imported water by retail agencies will exceed this volume as soon as the period of declared temporary surplus in the Beaumont Groundwater Basin ends in 2013. The second phase of the East Branch extension is projected to be on-line in late 2013, and will provide additional capacity necessary to convey the full Table A allocation, if available (Figure 3-5). In fact, the expansion will increase conveyance capacity in portions of the pipeline to 48 cfs.

Ultimately, SGPWA plans to purchase an additional 16 cfs of capacity from the East Branch Extension Phase 2 expansion from SBVMWD, bringing the conveyance capacity to SGPWA service area to 64 cfs or approximately 35,000 AFY at a 75 percent frequency of operation. This volume of water would be sufficient to meet regional demand through 2035, assuming SGPWA obtains supplemental sources of imported water (Section 5 computes imported water supply requirements based on long-term demand and local supply projections).

Treatment

The only water treatment plant for SWP deliveries within the SGPWA service area is YVWD's Yucaipa Valley Regional Water Filtration Facility (YVRWFF). The first phase of this facility is complete and has a capacity of 12 mgd. Treated water from the YVRWFF is used to meet demands in both the SBVMWD and SGPWA service areas.

Groundwater Recharge

The predominant means of providing SWP supply to retail agencies is to recharge the Beaumont Groundwater Basin and then pump wells in this basin. Soils overlying the Beaumont Basin, where SWP deliveries are made through the East Branch Extension, are highly permeable.

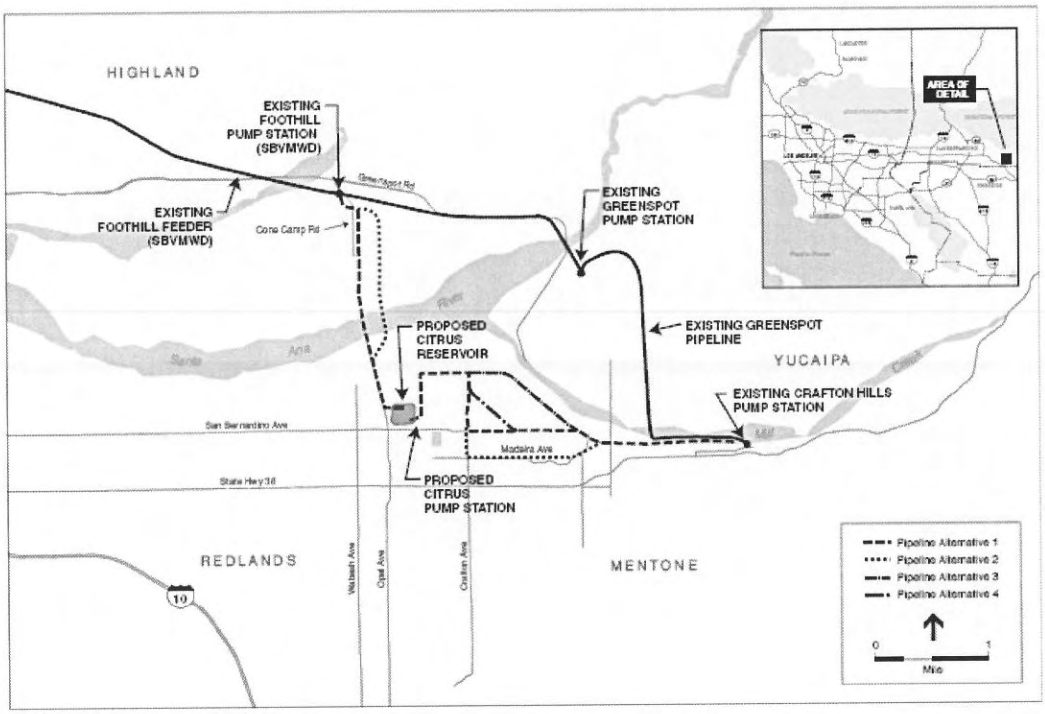

Figure 3-5
Phase II of SWP East Branch Extension (figure from DWR, 2008)

In addition, the storage capacity of the Beaumont Basin exceeds the total annual demand for water at buildout. The judgment for the Beaumont Basin includes a provision for groundwater storage,

> "...reserved for Conjunctive Use a minimum of 200,000 acre-feet of groundwater storage capacity in the Beaumont Basin, provided that such amount may be reduced as necessary to prevent injury to existing water rights or existing uses of water within the basin, and to prevent the waste of water."

Taking into account potential losses to San Timoteo Creek that may result from storing as much as 200,000 acre-feet of water in the Beaumont Basin, this UWMP conservatively assumes a maximum storage capacity of 100,000 acre feet. At this volume, storage capacity is not likely to be a limiting factor for importing SWP Table A and any additional supplemental imported sources of water.

The capacity to store imported water in the Beaumont Basin by spreading water in recharge basins is a key component of SGPWA's role as a wholesaler of SWP supply. Currently, two facilities exist to capture SWP deliveries for recharge in the Beaumont Basin:

SGPWA operates the Little San Gorgonio Creek Spreading Ponds, located on the northwest corner of Orchard Street and Avenida Miravilla in Cherry Valley. This facility has the ability to recharge up to approximately 2,000 AFY. SGPWA plans to use this facility to recharge up to 2,000 AFY of available Table A water to control the existing overdraft condition in the Beaumont Basin.

In addition, BCVWD's Noble Creek facility, located east of Beaumont Avenue between Brookside Avenue and Cherry Valley Boulevard in the City of Beaumont, is used for recharge of SWP deliveries. Noble Creek cuts through this facility with about equal acreage on either side of the creek. Currently, recharge basins (8 cells) are operational on the west side of Noble Creek, with the intended use for SWP recharge. Recent data from these basins approximate a long-term recharge capacity of approximately 20,000 AFY. SWP deliveries to this facility will consist of BCVWD's imported water supply requirements, plus any water purchased for long-term banking prior to completion of additional basins. For this UWMP, it is assumed that the portion on the east side of Noble Creek will be reserved for the capture of surface runoff and recycled water from the City of Beaumont and YVWD.

These facilities do not provide sufficient capacity to recharge all imported water supply that may be available in a given year. Conditions in the SWP may require that SGPWA use its Table A allocation over a shorter period of time (e.g. six month window as opposed to spread evenly over the course of the year). This would require SGPWA to plan for surplus capacity. Moreover, SGPWA plans to obtain supplemental sources of imported water and to use SWP Article 21 water whenever possible. The timing of supplemental sources of imported water are not known, but could also require deliveries to occur over a shorter time-period. Article 21 water is declared on a weekly basis, thus its use is highly limited by the capacity of conveyance and recharge facilities. For these reasons, SGPWA is working to construct additional recharge basins overlying the Beaumont Basin.

One project planned by SGPWA to be on-line by 2013 is the Brookside South project, located within the unimproved channel of Noble Creek, south of the Little San Gorgonio Creek confluence, south of Brookside Avenue and west of Beaumont Avenue. This facility will provide an additional 3,600 AFY of recharge capacity for SWP deliveries. Once complete, SGPWA plans to use this facility to recharge SWP purchased by YVWD (portion not going to WTP), City of Banning, and SMWC, as well as for overdraft mitigation.

The long-term imported water supply requirements exceed the combined capacity of the existing facilities including the YVRWFF, Little San Gorgonio Creek Spreading Ponds, the west side of BCVWD's Noble Creek project, and the planned SGPWA Brookside South recharge basins. Therefore, SGPWA has identified an available 55-acre property along Noble Creek where additional recharge basins could be constructed (referred to as the unnamed site in this UWMP). This site is similar in size, and is expected to have similar recharge potential to the BCVWD Noble Creek facility, thus an additional 15,000 AFY of capacity is assumed for the UWMP analysis.

Projections of the volume of imported water for recharge in the Beaumont Basin were developed to reflect increasing water demands, development of new local supplies, water conservation, and the variability associated with hydrologic year types. The volume of water delivered to existing and proposed SWP recharge facilities is based on preliminary operational concepts (Figure 3-6).

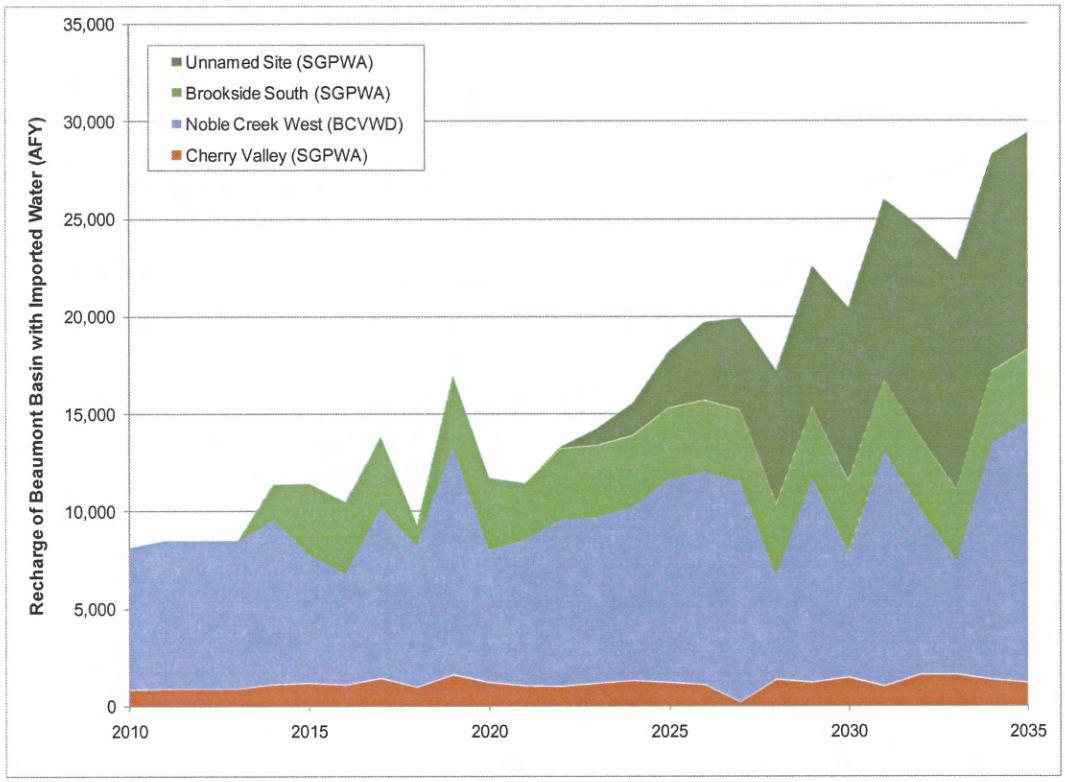

Figure 3-6
Recharge of Imported Water in SGPWA and BCVWD Existing and Planned Basins

3.8 Supplemental Imported Water

3.8.1 Water Transfers and Exchanges

SGPWA has studied a number of methods for augmenting its supplemental water supplies, including both short term, spot market purchases and long-term permanent transfers of water rights. SGPWA has already implemented or is in the process of implementing funding mechanisms for both of these transaction types.

SGPWA is currently in the process of implementing a facility capacity fee, which will be the funding mechanism for any permanent water transfers. The fee will include $5,500 per AF for any new water required by new development. SGPWA has previously included a $22 per acre-foot charge as part of its wholesale water rate that is specifically for a reserve account to purchase short-term, spot market water when needed.

Current, reserves earmarked for new water purchases total $4.6 million. Of this, approximately $200,000 is for short term, spot market purchases and $4.4 million is to purchase new permanent water rights.

In 2007 Kennedy-Jenks, produced a report titled "Evaluation of Potential Water Transfer Opportunities" for SGPWA. This report identified a number of potential short-term, spot market and long-term, permanent water transfer opportunities (see Table 3-6). What can be seen by this table is there are many opportunities for water transfers. However, the water transfer and exchange market is dynamic and the opportunities listed in Table 3-6 may no longer represent the current or future market opportunities. As needed, SGPWA will reevaluate various types of opportunities for obtaining supplemental water. With the capacity fee expected to be approved by the SGPWA Board of Directors in early 2011, the funding mechanism and cash reserves will be in place to take advantage of one of these or other opportunities when future water demands warrant.

SGPWA is a signatory to the Yuba Dry Year Water Transfer Program, and as such has the opportunity every year to supplement its Table A allocation with additional water. This water has generally been between 300 and 600 acre-feet per year. SGPWA's current rate structure includes a component to fund these purchases. In addition, SGPWA has had discussions with the San Bernardino Valley Municipal Water District (Valley District) regarding short term spot purchases as needed in the future. As a State Water Contractor with an excess of Table A water and as a partner with SGPWA in the East Branch Extension, Valley District is likely to be a ready source of spot water in the future.

SGPWA has previously engaged in two water transfers, one with the Valley District for 1,000 acre-feet and the other with the Crestline-Lake Arrowhead Water Agency (CLAWA), also for 1000 acre-feet. In the former case, SGPWA provided 1,000 AF of its Table A water to Valley District in 2008, and Valley District returned the same amount to SGPWA in 2009 and 2010. In the latter case, SGPWA received 1,000 AF of

CLAWA's Table A water in 2010 and will provide a similar amount back to CLAWA over the next ten years, as needed.

These deals indicate SGPWA's ability and willingness to participate in transfers, either short-term or long-term, to meet the needs of the region. The opportunity to purchase water on the spot market will always be available, either through Valley District, the Yuba program, a statewide drought water bank, or from other willing sellers, and the Agency's cash position ensures that it will be able to make such purchases in dry years as required to meet the demands of its retailers.

Table 3-6
Summary of Potential Water Transfers and Exchange Opportunities for SGPWA Identified in 2007

Supplemental Water Source	Description	Type and Reliability	Potential Partners
Table A Transfers	Purchase of Table A allocations from agencies with allocations in excess of demand	Permanent, 60%	County of Butte; Kern County Water Agency (KCWA); San Bernardino Valley Municipal Water District (Valley District)
Kern River Exchanges	Water agencies obtain diversion rights from the Kern River, making available Table A SWP supplies for exchange	Permanent, 100%	Nickel Family Farms via KCWA exchange; Buena Vista Water Storage District (WSD) via Buena Vista WSD or Rosedale-Rio Bravo WSD exchange
Banked Groundwater Exchanges	Purchases of banked groundwater delivered in-lieu from unused Table A deliveries	Short-term, 100%	Rosedale-Rio Bravo WSD; Water agencies participating in the Semitropic WSD Groundwater Storage Program[1]; Water agencies south of Edmonston Pumping Plant[2]
Banked Groundwater Pumpback	Purchase of banked groundwater delivered via a "pumpback" to the California aqueduct	Short-term, 100%	Rosedale-Rio Bravo WSD; Kern Delta Water District; Semitropic WSD - Stored Water Recovery Unit
Excess SWP Purchases	Purchase excess SWP supply from SWP or water agencies with a surplus	Short-term, 100%	SWP Article 21; SWP Turnback Pool (Table A); San Bernardino Valley Municipal Water District (Valley District); Crestline-Lake Arrowhead Water Agency
Dry Year Water Purchases or Transfer Programs	Purchase or transfer of unused water from water agencies with a surplus to water agencies requesting supplemental dry year supply	Short-term in dry years, 100%	SWP Contractors Authority (buyers and sellers are treated as singular entities); SWP Turnback Pool (Table A); Western Canal Water District; Yuba Dry Year Water Transfer Program

1) Vidler Water Company, Newhall Land and Farming Company, Metropolitan Water District of Southern California, or Santa Clara Valley Water District
2) Antelope Valley-East Kern Water Agency, Chino Basin Watermaster, Western Development and Storage LLC

Section 4
Water Demand Management Programs

4.1 Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibitions.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of such savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, which offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to the council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

4.2 Introduction

Effective water conservation practices are necessary to be able to provide adequate supplies to meet growing demands in SGPWA's service area. SGPWA is not a traditional wholesale water agency in southern California in that the core mission is to use imported water to replenish local groundwater basins for subsequent pumping by its retail agencies. As such, direct delivery of water provided by SGPWA is minimal. Therefore conservation activities in SGPWA service area come from retail agency initiatives for implementation of Best Management Practices (BMPs), also commonly referred to as Demand Management Measures.

SGPWA is not a signatory entity for conservation BMPs implemented by its retail agencies and is not itself a member of the California Urban Water Conservation Council (CUWCC).

4.3 Conservation BMP Implementation

SGPWA and its retail agencies are in varying phases of prioritizing, planning, or implementing water conservation BMPs required to be a member of the CUWCC. The CUWCC water conservation BMPs are incorporated into the UWMP development process per Part 10631(f) Subpart 1, shown in Section 4.1. Table 4-1 summarizes the status of SGPWA and its retail agency's activities related to each of these 14 conservation BMPs. The following sections summarize each BMP and describe implementation by the retail water agencies.

Table 4-1
BMPs Implementation in SGPWA Service Area

BMP #	Practices	YVWD[1]	BCVWD[2]	Banning[2]	SGPWA
1	Water Surveys programs for Single-family residential and Multifamily residential customers	Y	N	Y	n/a
2	Residential plumbing retrofit	Y	N	Y	n/a
3	System water audits, leak detection and repair	Y	Y	Y	n/a
4	Metering with commodity rates for all new connections, and retrofit of existing connections.	Y	Y	Y	n/a
5	Large landscape conservation programs and incentives	Y	Y	Y	n/a
6	High efficiency washing machine rebate program	N	N	N	n/a
7	Public information programs	Y	Y	Y	Y
8	School education programs	Y	Y	Y	N
9	Commercial/Industrial/Institutional water conservation	Y	Y	N	n/a
10	Wholesale agency assistance program	n/a	n/a	n/a	N
11	Conservation Pricing	Y	Y	Y	N
12	Water conservation Coordinator	Y	N	Y	N
13	Water waste prohibition	Y	N	Y	n/a
14	Residential ULFT replacement program	N	N	N	n/a

1) Data provided by YVWD in July of 2010
2) Status as specified in 2005 UWMPs

4.3.1 BMP1: Water Survey Programs for Single-family and Multi-family

Residential Customers

Usually, during these surveys a meter service supervisor checks the appearance of landscaping, looks of signs of irrigation system leaks, and interviews the customer to determine if the inside piping or plumbing fixtures are leaking. If the personnel notice leaks or unusually high water consumption, they will leave a door-tag alerting the

customer to check for leaks. These system audits are a cost-effective means of reducing water loss from undetected leaks.

BMP 1 is not applicable to SGPWA.

4.3.2 BMP 2: Residential Plumbing Retrofit

This BMP consists of developing a targeting and marketing strategy to distribute or directly install high quality, low-flow showerheads (rated 2.5 gpm or less), toilet displacement devices (as needed), toilet flappers (as needed), and faucet aerators (rated 2.2 gpm or less), where required, in single-family and multi-family residences constructed prior to 1992.

BMP 2 is not applicable to SGPWA.

4.3.3 BMP 3: System Water Audits, Leak Detention and Repair

In order to implement this BMP, water distribution lines are routinely checked and/or tested for leaks; when leaks are found they are promptly repaired. The distribution system water audit compares the amount of water produced (from wells, surface supplies, etc.) by the agency to the amount of water used by consumers (as reported by metering readings). The difference is unmetered water. After allowing for authorized unmetered uses such as fire fighting, main flushing, and public use, it can be assumed that the remaining unmetered water is explained by inaccurate meter readings, malfunctioning valves, leakage, and theft.

This requirement is not applicable to SGPWA. SWP deliveries come to SGPWA's via the East Branch Extension, which is owned and operated by DWR. SGPWA facilities are limited to recharge basins at the end of the East Branch extension.

4.3.4 BMP 4: Metering with Commodity Rates for all new Connections and Retrofit of Existing Connections

The implementation of this BMP shall consist of the following actions:

Require meters for all new connections and billing by volume of use;

Establish a program for retrofitting existing unmetered connections and billing by volume of use; and

Identifying intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting feasibility study to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

BMP 4 is not applicable to SGPWA.

4.3.5 BMP 5: Large Landscape Conservation Programs and Incentives

This BMP shall be implemented by providing support and incentives to non-residential customers to improve landscape water use efficiency, developing water use budgets for 90 percent of accounts with dedicated irrigation meters, and providing billing cycle notices of the relationship between the budget and actual consumption. The agency must develop and implement a water use survey program for accounts with mixed-use meters, directly contact and offer surveys to no less than 20 percent of accounts each reporting period, actively market landscape surveys to unmetered service areas with large landscapes or inefficient water use, and offer the following measures when cost effective:

Landscape water use analysis/surveys.

Voluntary water use budgets.

Installation of dedicated landscape meters.

Training (multi-lingual where appropriate) in landscape maintenance, irrigation system maintenance and irrigation system design.

Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water efficient irrigation systems.

Follow-up water use analyses/surveys consisting of a letter, phone call, or site visit where appropriate.

Survey elements will include: measurement of landscape area; measurement of total irrigable area; irrigation system check, and distribution uniformity analysis; review or develop irrigation schedules, as appropriate; provision of a customer survey report and information packet. The number of surveys offered, the survey findings, the devices installed, the potential water savings, and the survey costs shall be tracked. Information on climate-appropriate landscape design and efficient irrigation equipment/management shall be provided to new customers and change-of-service customer accounts.

BMP 5 is not applicable to SGPWA.

4.3.6 BMP 6: High-Efficiency Washing Machine Rebate Program

This BMP shall be implemented by offering customers a financial incentive, if cost effective, for the purchase of high-efficiency clothes washing machines (HEWs) that meet a water factor of 9.5 or less. Any financial incentive offered shall not be less than the marginal benefits of the water savings reduced by the necessary expense of administering the incentive program. Incentive levels shall be calculated by using methods found in *A Guide to Customer Incentives for Water Conservation* prepared by

Barakat and Chamberlain for the CUWA, CUWCC, and US EPA, February 1994. The agency is not required to implement a financial incentive program if the maximum cost-effective rebate is less than $50.

BMP 6 is not applicable to SGPWA.

4.3.7 BMP 7: Public Information Programs

This BMP Implementation method shall at least consist of implementing a public information program promoting water conservation and water conservation related benefits. The program should include, but is not limited to, providing speakers to employees, community groups, and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote water conservation practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

SGPWA has implemented a public education BMP involving the development and dissemination of a magazine called Water for Tomorrow. This magazine describes challenges facing the region to ensure a reliable long-term water supply to meet growing demands. The importance of conserving water is emphasized throughout the magazine.

4.3.8 BMP 8: School Education Programs

Implementation methods for this BMP shall consist of implementing a school education program to promote water conservation and water conservation related benefits. Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Education materials shall meet the state education framework requirements and grade appropriate materials shall be distributed to grade levels K-3, 4-6, 7-8, and high school.

SGPWA does not have any conservation programs at this point that support school education.

4.3.9 BMP 9: Commercial/Industrial/Institutional (CII) Conservation Programs

This BMP shall be implemented by identifying and ranking accounts according to water use and implementing a program to accelerate the replacement of existing high-water-using toilets with ultra-low flush (1.6 gallons or less) toilets in all facilities. In addition, the agency shall either implement a CII water use survey and customer incentive program or achieve water use reductions in the CII sector by equaling or exceeding the targets described below. The target water reduction for the CII sector is 10 percent of baseline use. The agency shall contact and offer, on a repeating basis, water use surveys and customer incentives to at least 10 percent of the CII customers

directly (by mail, telephone or personal visit). Water use surveys must include a site visit, an evaluation of all water-using apparatuses and processes, and a customer report identifying recommended efficiency measures, their expected payback period, and available agency incentives. Within one year of a completed survey, the agency shall follow-up with a phone call or site visit in regards to customer facility water use and water saving improvements. The agency shall track customer contacts, accounts receiving surveys, follow-ups, and measures implemented. The coverage for this BMP is to audit 10 percent of the total CII accounts or reduce annual water use by CII accounts by 10 percent of the annual baseline water use within 10 years of the date implementation is to commence.

BMP 9 is not applicable to SGPWA.

4.3.10 BMP 10: Wholesale Agency Assistance Program

This BMP shall be implemented by wholesale water suppliers. Wholesale water suppliers shall provide financial incentives, or equivalent resources, as appropriate, beneficial, and mutually agreeable to their retail water agency customers to advance water conservation efforts and effectiveness. All BMPs implemented by retail water agency customers that can be shown to be cost-effective in terms of avoided cost of water from the wholesaler's perspective, using CUWCC's cost-effectiveness analysis procedures, will be supported. The wholesale water agencies shall provide conservation-related technical support and information to all retail agencies that they serve as a wholesale supplier. At a minimum this requires:

- Conducting, funding, and/or promoting workshops that address the following topics:
  - CUWCC procedures for calculating program savings, costs, and cost-effectiveness;
  - Retail agencies' BMP implementation reporting requirements; and
  - The technical, programmatic, strategic, and/or other pertinent issues and developments associated with water conservation activities in each of the following areas: Ultra-Low-Flush Toilets (ULFT) replacement, residential retrofits, commercial, industrial and institutional surveys, residential and large turf irrigation, and conservation-related rates and pricing.
- Having the necessary staff or equivalent resources available to respond to retail agencies' technical and programmatic questions involving the CUWCC's BMPs and their associated reporting requirements.

When mutually agreeable and beneficial, the wholesaler may enforce all or any part of the conservation related activities that a given retail supplier is obligated to implement under the BMP's cost-effectiveness test. Wholesale agencies shall work in cooperation with their customers to identify and remove potential disincentives to long-term conservation created by water shortage allocation policies; and to identify

opportunities to encourage and reward cost-effective investments in long-term conservation shown to advance regional water supply reliability and sufficiency.

Currently, SGPWA does not have any programs that support this BMP.

4.3.11 BMP 11: Conservation Pricing

Implementation methods for this BMP shall be at least as effective as eliminating non-conservation pricing and adopting conservation pricing. This BMP applies to the pricing of both water and sewer services. Suppliers that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer services. Non-conservation pricing provides no incentives for customers to reduce use. Such pricing is characterized by one or more of the following components:

Rates in which the unit price decreases as the quantity used increases (declining block rates);

Rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used;

Pricing in which the typical bill is determined by high-fixed and low commodity charges.

Conservation pricing provides incentives for customers to reduce average or peak use, or both. Rates should be designed to recover the cost of providing service and billing for water and sewer service should be based on metered water use. Such pricing is characterized by one or more of the following components:

Rates in which the unit rate is constant regardless or the quantity used (uniform rate);

Rates in which the unit rate increases as the quantity used increases (increasing block rates);

Seasonal rates or excess-use surcharges to reduce peak demand during summer months;

Rates based upon the long-run marginal cost or the cost of adding the next unit of capacity to the system.

SGPWA does not have a conservation based rate structure at this time.

4.3.12 BMP 12: Conservation Coordinator

The implementation of this BMP shall consist of at least the following actions:

Designation of a water conservation coordinator, and support staff if necessary, whose duties shall include the following:

- Coordination and oversight of conservation programs and BMP implementation;
- Preparation and submittal of the CUWCC BMP Implementation Report (for signatories to the MOU);
- Communication and promotion of water conservation issues to agency senior management, coordination of agency conservation programs with operations and planning staff, preparation of annual conservation budget, and preparation of the conservation elements of the agency's Urban Water Management Plan.

Agencies that are jointly operating regional conservation programs are not expected to staff duplicative and redundant conservation coordinator positions.

SGPWA does not have a water conservation coordinator at this time to provide oversight of conservation programs and BMP implementation.

4.3.13 BMP 13: Water Waste Prohibition

Implementation methods for this BMP shall be enacted and enforced to prohibit gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car washes and commercial laundry systems, and non-recycling decorative water fountains. Agencies shall support the efforts to develop a state law regarding exchange-type water softeners that would:

Allow the sale of only more efficient, demand-initiated regenerating (DIR) models;

Develop minimum appliance efficiency standards that increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used and implement an identified maximum number of gallons discharged per gallon of soft water produced;

Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.

Agencies shall also include water softener checks in home water audit programs and include information about DIR and exchange-type water softeners in their educational efforts to encourage replacement of less efficient timer models.

BMP 13 is not applicable to SGPWA.

4.3.14 BMP 14: Residential ULFT Replacement

Programs

Implementation of this BMP shall consist of at least the following actions:

Implementation of programs for replacing existing high-water-using toilets with ultra-low-flush (1.6 gallons or less) toilets in single-family and multi-family residences;

Programs shall be at least as effective as requiring toilet replacement at time of resale.

At this point, none of the retail agencies (YVWD, BCVWD, and City of Banning Water Department) have implemented this BMP. YVWD is considering performing the cost-effectiveness analysis in the future to determine the feasibility of implementing a ULFT replacement program.

BMP 14 is not applicable to SGPWA.

4.4 Overview of Senate Bill 7 - 20x2020 Water Conservation Plan

The 20x2020 Plan sets forth a statewide road map to maximize the state's urban water efficiency and conservation opportunities between 2009 and 2020, and beyond. It aims to set in motion a range of activities designed to achieve the 20 percent per capita reduction in urban water demand by 2020. These activities include improving an understanding of the variation in water use across California, promoting legislative initiatives that incentivize water agencies to promote water conservation, and creating evaluation and enforcement mechanisms to assure regional and statewide goals are met. The 20x2020 Plan discusses these activities in detail.

This 20x2020 Plan was developed through the collaborative effort of an Agency Team, which consisted of state and federal agencies including DWR, State Water Resources Control Board (SWRCB), California Energy Commission (CEC), Department of Public Health (DPH), California Public Utilities Commission (CPUC), Air Resources Board (ARB), California Bay-Delta Authority (CBDA), and the United States Bureau of Reclamation (USBR). The Agency Team also developed research papers (Technical Memoranda) and solicited input from water suppliers and organizations through public workshops and conference calls during the planning phase of the 20x2020 Plan. In addition, the CUWCC contributed toward the analysis and development of this 20x2020 Plan.

Since SGPWA is a wholesale agency, it cannot use one of the four methods available to estimate the 2020 conservation target. In addition, at the time this UWMP was being prepared the retail water providers had not yet quantified future conservation savings. Therefore, to show compliance with 20x2020 on a regional basis, SGPWA assumed some regional level of conservation that together with planned recycled water supply would meet the per capita water use targets called for in SB 7.

Table 4-2 shows how the SGPWA service area would meet the overall requirements with the caveat that compliance with the law is at the retail level and not at the wholesale water provider level. Current per capita water use is approximately 290 gallons per capita per day (GPCD) based on current water demand and population in

the SGPWA service area. The reduction in per capita water use needed to achieve the 20x2020 target is translated to an annual volume in Table 4-2. The combination of recycled water and assumed reductions from water conservation BMP implementation shows that the 20x2020 targets are expected to be achieved with a margin of safety in the future.

Table 4-2
Demonstration of SGPWA Service Area Recycled Water or Conservation BMPs Achieving 20x2020 Targets

Evaluation Criteria	2010	2015	2020	2025	2030	2035
20x2020 Target Per Capita (GPCD) [1]	290	261	232	232	232	232
20x2020 Target Conservation (AFY)		4,395	10,393	15,483	20,443	22,689
Planned Recycled Water Supply (AFY)		6,349	9,358	13,434	17,907	18,783
Assumed Regional Conservation (AFY)		944	3,039	4,141	5,230	5,914
Total Recycled Water & Conservation (AFY)		7,293	12,397	17,575	23,137	24,697

1) Targeted reduction in per capita water use is 10 percent in 2015 and 20 percent in 2020

Section 5
Water Reliability

5.1 Law

10620. (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

- An average water year.
- A single dry water year.
- Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describes plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

5.2 Introduction

This section of the UWMP compares existing water and planned water supplies with projected water demand between 2010 and 2035 to evaluate whether there is sufficient water to allow for growth in the SGPWA service area. This comparison required the integration of information provided in previous sections of this UWMP. Section 2 summarizes regional water demand, which is based on data provided by retail water agencies in the SGPWA service area. Additional demand management measures are planned by each retail water agency that will reduce these demand projections to

meet requirement s in SBX7-7 (see Section 4). Section 3 describes the various local and imported sources of water supply available to meet regional water demands, which generally include groundwater, surface runoff, recycled water, and imported water.

Several factors affect water reliability in the SGPWA service area, including:

- Availability of SWP Table A deliveries
- Availability of supplemental imported water deliveries
- Capture and recharge of surface runoff in Edgar Canyon
- Long-term additions to and extractions from Beaumont groundwater basin storage accounts

Water reliability was evaluated in two distinct ways. The first method involved a comparison of water supply and demand for three categories of hydrologic condition; average, single dry year, and multiple dry years. The second approach involved the development of a long-term water balance model, designed to simulate the impact of different historical hydrologic sequences on water reliability for every year in the 2010 to 2035 evaluation period.

5.3 Water Reliability by Categorical Year Type

The availability of SWP Table A deliveries is shown as a probability curve in Figure 3-4, based on the recent 2009 update of DWR's SWP Reliability Report. This report estimated the reliability of Table A deliveries for specified hydrologic year types, as shown in Table 5-1. Surface runoff from Edgar Canyon is also sensitive to changing weather patterns, with a wide range in potential runoff capture and recharge depending upon local rainfall and antecedent moisture conditions in canyons (see Figure 3-2 for a probability curve of local surface runoff). The long-term average volume and estimate of recharge in SWP designated single-dry (1977) and multiple-dry (1932-1934) hydrologic categories is shown in Table 5-1.

Table 5-1
Imported and Local Runoff Supply Volume in Average, Single-Dry and Multiple-Dry Hydrologic Year Types

Hydrologic Year Type	Table A Deliveries (AFY) [1]	Edgar Canyon Runoff (AFY) [2]
Average	10,064 (60%)	3,000
Single Dry Year (1977)	1,651 (10%)	750
Multiple Dry Year (1932-1934)	6,116 (35%)	660

1) Fraction of full Table A allocation shown in parentheses
2) Estimated runoff capture from Noble Creek and Little San Gorgonio Creeks in years corresponding to single-dry and multiple-dry year types for the SWP, Driest year for Edgar Canyon is less than 50 AFY.

Values used to characterize hydrologic conditions are based on SWP reliability, which is a function of climate patterns in northern California. Estimates of runoff in Edgar Canyon in the corresponding years for single-dry and multiple-dry categories are less than the long-term average by at least 20-25 percent. However, these local surface runoff yields do not represent the most severe single-year or multiple dry-year droughts in southern California. Accordingly, for this UWMP, it is assumed that the most severe droughts would not occur simultaneously in southern and northern California in the 2010 to 2035 period.

Water supply and demand comparisons were developed for long-term average, single-dry, and multiple-dry hydrologic year types, as shown in Tables 5-2 to 5-4. The data used to develop these comparisons reflects the variability in SWP Table A and Edgar Canyon sources of supply. The comparisons also show temporal changes in supply and demand that are assumed to be unaffected by hydrologic year type. One example of this is the reduction in potable supplies between 2010 and 2015, which is caused by the ending of the temporary surplus in the Beaumont Basin.

Table 5-2
Water Supply and Demand Comparison for SGPWA Service Area for an Average Hydrologic Condition

Agency	Supply / Demand (AFY)	2010	2015	2020	2025	2030	2035
BCVWD	Potable	13,127	6,841	7,841	7,841	8,160	7,988
	Non-Potable	-	4,567	5,902	6,832	8,759	8,990
Banning	Potable	15,604	10,626	12,414	14,828	16,655	16,655
	Non-Potable	-	1,832	2,160	2,488	2,816	2,816
YVWD	Potable	1,000	780	780	780	780	780
	Non-Potable	100	269	491	851	1,349	2,166
CWD	Potable [1]	1,000	3,400	4,400	3,600	2,800	2,800
SMWC	Potable	2,869	2,437	2,437	2,644	2,389	2,533
	Non-Potable	-	110	145	190	244	244
SGPWA	Total Local Potable	33,600	24,084	27,872	29,693	30,784	30,756
SGPWA	Total Local Non-Potable	100	6,778	8,699	10,361	13,168	14,216
SGPWA	Conservation	-	944	3,039	4,141	5,230	5,914
SGPWA	Table A Supply	8,650	10,445	10,445	10,445	10,445	10,445
SGPWA	Supplemental – Permanent [2]	-	-	-	5,049	12,023	16,476
SGPWA	Supplemental - Short-term [3]	-	-	-	-	-	-
SGPWA	Total Supply [4]	42,350	42,251	50,055	59,690	71,650	77,806
SGPWA	Total Demand	29,767	39,256	47,850	59,690	71,650	77,806
SGPWA	Surplus/(Deficit)	12,583	2,994	2,204	-	-	-

1) CWD pumping from the Cabazon groundwater basin per the 2007 STWMA Report on Water Supply Conditions
2) Supplemental water that can be used to demonstrate sufficient water to meet long-term average annual demand from new development
3) Imported water transfers/exchanges or Beaumont Basin storage accounts to be used as needed when permanent supply is not sufficient (e.g. dry years)
4) Total supply includes demand reductions from water conservation BMPs

Table 5-3
Water Supply and Demand Comparison for SGPWA Service Area for a Single-Dry Year Hydrologic Condition

Agency	Supply / Demand (AFY)	2010	2015	2020	2025	2030	2035
BCVWD	Potable	13,127	4,841	4,841	4,841	5,161	4,988
	Non-Potable	-	4,567	5,902	6,832	8,759	8,990
Banning	Potable	15,604	10,626	12,414	14,828	16,655	16,655
	Non-Potable	-	1,832	2,160	2,488	2,816	2,816
YVWD	Potable	1,000	780	780	780	780	780
	Non-Potable	100	269	491	851	1,349	2,166
CWD	Potable [1]	1,000	3,400	4,400	3,600	2,800	2,800
SMWC	Potable	2,869	2,437	2,437	2,644	2,389	2,533
	Non-Potable	-	110	145	190	244	244
SGPWA	Total Local Potable	33,600	22,084	24,873	26,693	27,785	27,756
SGPWA	Total Local Non-Potable	100	6,778	8,699	10,361	13,168	14,216
SGPWA	Conservation	-	944	3,039	4,141	5,230	5,914
SGPWA	Table A Supply	1,651	1,651	1,651	1,651	1,651	1,651
SGPWA	Supplemental – Permanent [2]	-	-	-	5,049	12,023	16,476
SGPWA	Supplemental - Short-term [3]	-	7,799	9,589	11,794	11,794	11,794
SGPWA	Total Supply [4]	35,351	39,256	47,850	59,690	71,650	77,806
SGPWA	Total Demand	29,767	39,256	47,850	59,690	71,650	77,806
SGPWA	Surplus/(Deficit)	5,584	-	-	-	-	-

1) CWD pumping from the Cabazon groundwater basin per the 2007 STWMA Report on Water Supply Conditions
2) Supplemental water that can be used to demonstrate sufficient water to meet long-term average annual demand from new development
3) Imported water transfers/exchanges or Beaumont Basin storage accounts to be used as needed when permanent supply is not sufficient (e.g. dry years)
4) Total supply includes demand reductions from water conservation BMPs

In all three hydrologic condition categories, deficits in regional water supply occur during the 2010 to 2035 UWMP planning period. By 2035, average deficits are estimated to exceed 15,000 AFY, equivalent to approximately 20 percent of total demand. Regional deficits in dry year scenarios are greater, with a single dry year of almost 28,000 AFY in 2035. There are significant differences in the timing of when regional deficits occur between the average and dry year types. Under average hydrologic conditions, regional deficits do not occur until approximately 2023. On the other hand, regional deficits will occur as early as 2015, if conditions in that year are representative of a single dry year for the SWP.

SGPWA is fully cognizant that the demand for imported water will outstrip its Table A allotment of 17,300 acre-feet within the next 10-15 years. It is currently in the process of implementing a facility capacity fee that will be used to purchase additional permanent water rights. These additional rights may be Table A water from other State Water Contractors, or it may be other water from agricultural

interests. In either case, the SGPWA's Board is fully committed to financing the purchase of this required supplemental water.

Although SGPWA's Board is committed to obtaining additional imported water, all projections of an increase in SGPWA's future water supply rely, at least in part, upon the assumption that SGPWA is able to implement and to collect facility capacity fees on new development. If this assumption proves incorrect, SGPWA will need to significantly reduce its water supply projections in future water supply assessments and Urban Water Management Plans.

Table 5-4
Water Supply and Demand Comparison for SGPWA Service Area for a Multiple-Dry Year Hydrologic Condition

Agency	Supply / Demand (AFY)	2010	2015	2020	2025	2030	2035
BCVWD	Potable	13,127	5,387	5,660	5,660	5,979	5,807
	Non-Potable	-	4,567	5,902	6,832	8,759	8,990
Banning	Potable	15,604	10,626	12,414	14,828	16,655	16,655
	Non-Potable	-	1,832	2,160	2,488	2,816	2,816
YVWD	Potable	1,000	780	780	780	780	780
	Non-Potable	100	269	491	851	1,349	2,166
CWD	Potable [1]	1,000	3,400	4,400	3,600	2,800	2,800
SMWC	Potable	2,869	2,437	2,437	2,644	2,389	2,533
	Non-Potable	-	110	145	190	244	244
SGPWA	Total Local Potable	33,600	22,630	25,692	27,512	28,603	28,575
SGPWA	Total Local Non-Potable	100	6,778	8,699	10,361	13,168	14,216
SGPWA	Conservation	-	944	3,039	4,141	5,230	5,914
SGPWA	Table A Supply	5,999	5,999	5,999	5,999	5,999	5,999
SGPWA	Supplemental – Permanent [2]	-	-	-	5,049	12,023	16,476
SGPWA	Supplemental - Short-term [3]	-	2,906	4,423	6,627	6,627	6,627
SGPWA	Total Supply [4]	39,699	39,256	47,850	59,690	71,650	77,806
SGPWA	Total Demand	29,767	39,256	47,850	59,690	71,650	77,806
SGPWA	Surplus/Deficit	9,932	-	-	-	-	-

1) CWD pumping from the Cabazon groundwater basin per the 2007 STWMA Report on Water Supply Conditions
2) Supplemental water that can be used to demonstrate sufficient water to meet long-term average annual demand from new development
3) Imported water transfers/exchanges or Beaumont Basin storage accounts to be used as needed when permanent supply is not sufficient (e.g. dry years)
4) Total supply includes demand reductions from water conservation BMPs

The amount and timing of supplemental water needs depends upon climate patterns over the 2010-2035 planning period and additions to and extractions from Beaumont groundwater basin storage accounts. The following section describes an alternative approach used to simulate a long-term water balance that incorporates long-term groundwater banking in the Beaumont Basin. This alternative approach will be used to help SGPWA time its investments for supplemental water.

5.4 Regional Water Balance Model

5.4.1 Introduction

Comparisons of supply and demand for select categories of hydrologic conditions do not allow for the incorporation of cumulative benefits associated with long-term groundwater banking in the Beaumont Basin. Therefore, a continuous model of annual water supply and demand was developed. This model incorporates year-to-year variability in SWP availability and volume of local surface runoff capture by simulating water supply and demand for historical hydrologic sequences of 25 consecutive years for the period of 2010 to 2035. For example, a simulation could be run assuming 2010 will have similar hydrology to 1960, 2015 is like 1965, 2020 is like 1970, and so on. This approach was used to incorporate hydrologic variability for both southern and northern California sources of water. The model uses the same historical time period for both southern and northern California. Hydrologic conditions are comparable between the two climatic regions in more than 50 percent of years. Conversely, there are some years in the historical hydrologic trace when a dry condition limits local runoff in Edgar Canyon while a wet condition occurs for the SWP, and vice versa.

The model tracks water recharged to the Beaumont groundwater basin in excess of annual demands to be added to long-term storage. This condition is most common in the 2010-2013 during the period of temporary surplus in the Beaumont Basin. As discussed in Section 3.3.5, there is potential for substantial banking of water in the Beaumont groundwater basin. The role of groundwater banking in the Beaumont Basin is impacted by several key management decisions, which have been incorporated into the model as modifiable parameters:

- Table A deliveries in excess of water demand – In the near term, the combination of local supply sources from all the retail agencies exceeds regional annual water demand (BCVWD is the only agency currently relying on a portion of SWP deliveries to meet annual demands). The purchase of SWP water for recharge in the Beaumont Basin in excess of water demand is added to long-term storage accounts. While no agency wants to refuse available water, local politicians must support the expense of purchasing excess water for long-term banking. For purposes of the UWMP, it is assumed that 60 percent of available excess Table A supply would be purchased. The basis for this assumption comes from a review of each agency's use of SWP in recent years:
    - BCVWD and the City of Banning are currently purchasing water for addition to long-term storage accounts, and this is likely to continue between 2010 and 2013.
    - YVWD has implemented a new policy requiring banking of 7.0 acre-feet per EDU prior to completing a new development.
    - SGPWA has purchased SWP deliveries to mitigate overdraft in the Beaumont Basin

- Extractions from storage accounts - The use of water in long-term storage accounts when deficits occur in the future is a key factor that must be considered by SGPWA in evaluating the timing of obtaining supplemental sources of imported water. If agencies opt to leave water in long-term storage accounts in most hydrologic years, then supplemental sources of imported water will be needed sooner to meet annual demands in years when deficits cannot be overcome with Table A deliveries alone. On the other hand, extractions of water from long-term storage accounts can extend the schedule and reduce the amount of supplemental imported water requirements. For this UWMP, it is assumed that prior to 2025, extractions from storage accounts could be used to offset deficits. Prior to 2025, the model shows that needs for supplemental sources of imported water are relatively small (<3,000 AFY) and only occur in dry hydrologic years. After 2025, deficits increase so that extractions from long-term storage accounts would not be sustainable without supplemental sources of imported water. Therefore, the model assumes extractions from long-term storage occur only in dry hydrologic years. Supplemental sources of imported water are needed to make up the remainder of deficits in all hydrologic year types, and for replenishing storage accounts depleted during dry periods during wet years.

In addition to these decision criteria, several key assumptions were incorporated into the model to reflect other issues associated with SGPWA's management of imported water sources:

- Prior to the completion of the East Branch Extension Phase 2 (projected to be on-line in 2013), the capacity to convey SWP deliveries to the San Gorgonio Pass area is less than the full Table A allocation of water. Therefore, in the period between 2010-2013, the maximum delivery from the SWP is assumed to be 10,000 AFY. Once Phase 2 of the East Branch Extension is complete, the need for imported water in 2035 is not limited by conveyance capacity. Ultimately, additional conveyance capacity may be needed for the region. Subsequent updates to this UWMP will address this issue to reflect changing development patterns and projections.

- Retail water agencies will maximize use of local sources of supply, which requires completion of planned facilities for recycled water as soon as 2015.

- Part of the basis for declaring 160,000 acre-feet of temporary surplus in the Beaumont Basin was due to the loss of groundwater to San Timoteo Creek. If new water is used to recharge Beaumont groundwater basin, then a portion of stored water could also be lost to San Timoteo Creek. To account for this potential risk, this UWMP conservatively assumes a maximum storage capacity of 100,000 acre feet despite the Beaumont Basin Judgment's allowance of at least 200,000 acre-feet.

5.4.2 Results

Results are based on annual water supply, demand, and groundwater storage based on the values and assumptions used in the UWMP scenario, as described in the previous section. The values selected to characterize Beaumont Basin management

and imported water uses are intended to represent the SGPWA's best approximation of potential responses in the future. Updates to this UWMP will evaluate the parameters selected for this model scenario. Figure 5-1 is an example of the long-term water balance model results for a scenario with a wide range in SWP availability.

The simulation results shown in Figure 5-1 are based on a historical hydrologic trace of 1960 through 1985. For example, the results in the figure for 2020 are based on hydrologic conditions in the year 1970. The hydrologic period shown in this figure includes one of the wettest years for local runoff and full Table A availability (1969, model year 2019) and the single driest year for the SWP coinciding with reduced yields from local surface runoff (1977, model year 2027). The figure shows an increase in storage accounts during 1969 hydrology and extraction from storage accounts during 1977 hydrology. Overall, it is apparent that the ability to use the Beaumont Basin as a long-term bank allows the SGPWA region to meet water demands during drier years, by planning for levels of supplemental water needed in an average hydrologic condition.

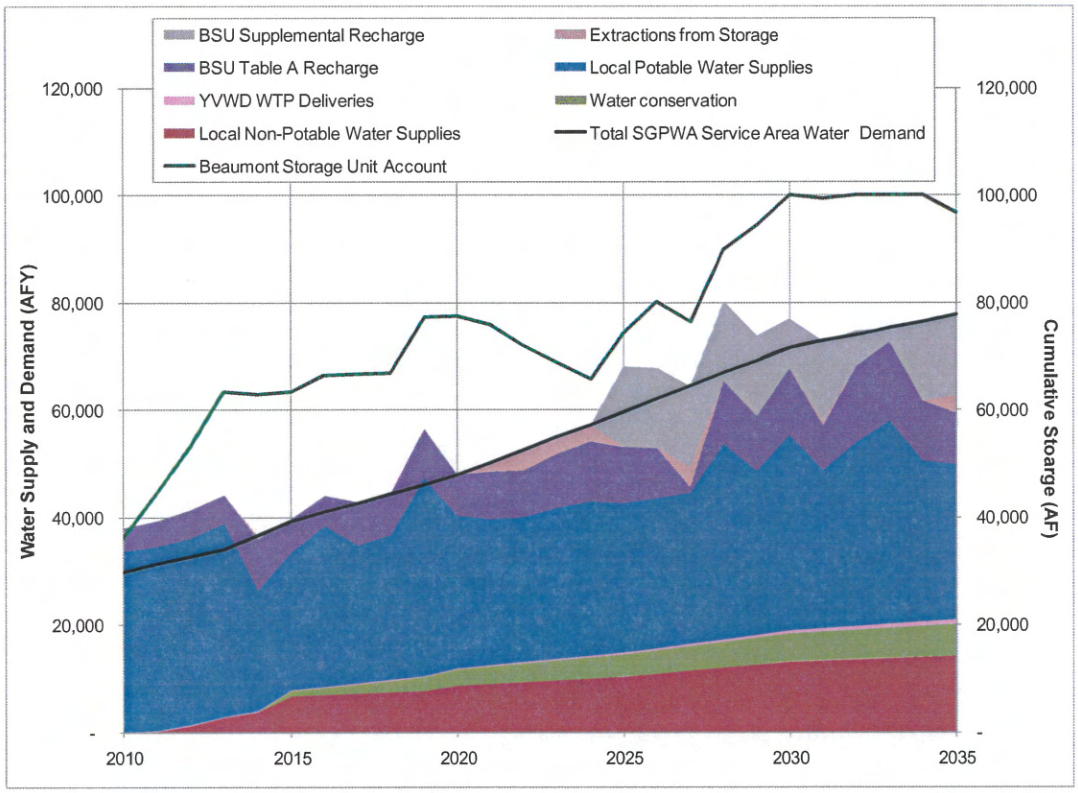

Figure 5-1
Results of Long-Term Water Balance Model for UWMP Scenario

Temporal variability in the model results is greatest for Table A recharge, which ranges from 10 to 100 percent of 17,300 AFY. While the variability of local surface runoff is even greater than SWP deliveries, it is only a small piece of local potable supply, which consists predominantly of baseline groundwater pumping. The limited

impact of year-to-year climate fluctuation on groundwater supply yield buffers the variability in local surface runoff when combined into one category of supply.

Numerous simulations were developed to test different 25-year sequences of hydrologic conditions, given three levels of SGPWA recharge for overdraft mitigation (long-term average of 1,000 AFY and 2,000 AFY) and supplemental water deliveries (long-term average of 5,000 AFY, 10,000 AFY, and 15,000 AFY). In total, 90 simulations tested the effect of these variables on long-term water supply reliability for the region (Appendix C). Table 5-5 shows the frequency of simulations showing a potential deficit, determined by complete drawdown of Beaumont Basin storage accounts prior to 2035. It should be noted that many of these model simulations, when extended to 2045, showed that the UWMP scenario is not sufficient and that additional supplemental water would be needed to maintain a balance of long-term storage in the Beaumont Basin.

Table 5-5
Summary of Alternative Scenario Simulations

Scenario	15,000 AFY of Supplemental Water (2025-2035) [2]	10,000 AFY of Supplemental Water (2025-2035) [2]	5,000 AFY of Supplemental Water (2025-2035) [2]
Low SGPWA Recharge for Overdraft Mitigation [1]	0 of 15	0 of 15	11 of 15
High SGPWA Recharge for Overdraft Mitigation [1]	0 of 15	2 of 15	14 of 15

1) Low to high range is 1,000 to 2,000 AFY
2) SGPWA is planning to obtain supplemental water prior to 2025, which would provide an even greater protection of water resources in the region than is shown by this summary of long-term water balance model simulations

Section 6
Water Shortage Contingency Plan

6.1 Law

10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street-cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

6.2 Introduction

SGPWA does not have the ability to adopt a water shortage contingency plan, because its role is limited to the use imported water to replenish local groundwater basins for subsequent pumping by its retail agencies. As such, direct delivery of water provided by SGPWA is minimal. Therefore, water shortage planning in SGPWA service area is

undertaken by retail agencies. This section summarizes water shortage contingency plans developed by SGPWA retail agencies. At time of this wholesale UWMP, retailers have not updated water shortage contingency plans for their respective 2010 UWMPs therefore information is based on 2005 UWMPs.

6.3 Three Years Minimum Water Supply

The minimum regional water supply for water all water agencies in the SGPWA service area for the current year and the next three years is shown in Table 6-1. The water supply and demand were based on dry-year assumptions for the SWP and annual supply available from groundwater. If an extended drought occurs over the next three years, the Agency would have a surplus of water and be able to meet the water needs of its customers.

Table 6-1
Minimum Water Supply During Multiple Dry Years (AFY)

Supply / Demand (AFY)	2010	2011	2012	2013
Total Water Supply	35,351	36,046	37,636	40,398
Total Demands	29,767	31,244	32,667	34,081
Supply Surplus	5,584	4,802	4,969	6,317

In this period of 2010-2013, BCVWD estimates that 2,500 AFY of recycled water will be delivered to irrigation customers throughout its service area. This source of supply is the primary reason that the supply surplus is not diminished as demand grows between 2010 and 2013.

6.4 Preparation for Catastrophic Water Supply Interruptions

Water supplies may be interrupted or reduced significantly in a number of ways, including

- Severe drought
- Earthquake that damages water delivery or storage facilities
- Toxic spills that affects water quality

This section of the UWMP describes how retail plans to respond to such emergencies so that emergency needs are met promptly and equitably.

6.4.1 Drought Conditions

Section 5 of this UWMP described a long-term water balance model developed to simulate additions to and extraction from storage accounts in the Beaumont

groundwater basin. The results of this model showed that under a variety of potential drought scenarios, there is sufficient water in storage to offset losses to climate sensitive sources of water supply (primarily local surface runoff and imported SWP). The drought protection benefit provided by the large amount of storage capacity in the Beaumont groundwater basin is a critical element of water resources management in the San Gorgonio Pass area.

Coordination between SGPWA and its retail agencies have met to discuss general principles and guidelines to manage SWP deliveries during times of drought. This process is still underway. One of the initial conclusions from meetings was that SWP deliveries needed for direct delivery should be prioritized over groundwater recharge. Accordingly, during drought conditions, SWP deliveries to the YVRWFF to serve customers in the City of Calimesa would be given higher priority. In subsequent years, make-up SWP deliveries can replenish Beaumont basin storage accounts, if extractions were made by other retail water agencies during the drought period.

6.4.2 Earthquake or other Natural Disasters

A severe earthquake anywhere along the SWP transmission system could impact the ability for SGPWA to provide water to its retail water agencies. DWR estimates that a worst-case outage, involving failure of levees in the Delta, could result in no reductions lasting for up to a full year (DWR, 2009). Similar to drought protection, the Beaumont Basin provides protection against SWP outages for retail water agencies that use the Beaumont Basin as the sole means of obtaining imported water. In the event of a worst-case outage in the Delta, SWP deliveries to the YVRWFF would not be available for an extended period of time. In the event of this scenario, YVWD has the ability to utilize water from its storage account in the Beaumont Basin to meet demands normally served by the YVRWFF in the City of Calimesa.

The San Andreas, San Jacinto, and San Gorgonio-Banning faults cut through portions of SGPWA's service area. These faults have the potential to cause a catastrophic earthquake in the area (Appendix D). Numerous other active faults in southern California do not cut through the SGPWA service area, but pose a risk to water facilities in the SGPWA service area. If a major earthquake were to occur along one of these faults, many facilities, including groundwater production wells and pump stations, could be affected. Currently, almost 100 percent of SGPWA service area demands are served by pumping of groundwater. By 2035, use of recycled water will reduced the portion of water supply coming from groundwater pumping to ~75 percent. Retail water agencies in SGPWA services area have developed gravity water storage and backup power systems to provide water to customers over a 72-hour period in the event of an emergency outage (Table 6-2).

Table 6-2
Emergency Reservoir Storage and Production Capacity with Backup Power for SGPWA Retail Water Agencies

Retail Water Agency	Emergency Reservoir Storage (AF)	Capacity with Backup Power (AF/day)
BCVWD	73.6 [1]	59.1 [1]
City of Banning	36.9 [1]	28.3 [1]
YVWD	18.9 [2]	9.9 [3]

1) Data obtained from 2005 UWMPs
2) Reservoir R.13 in Calimesa pressure zone is planned for replacement, increasing storage at the site from 1.17 to 4 MG. Once complete, total emergency reservoir storage for YVWD in SGPWA's service area will increase from 18.9 AF to 27.6 AF
3) Emergency storage is not available to all pressure zones; some pressure zones rely upon backup power at pump stations to convey water from lower zones during an emergency

6.4.3 Contamination

The local surface and groundwater quality is excellent in SGPWA service area. No wells or other water supplies have been shut down as a result of contamination. YVWD and BCVWD have plans to address long-term water quality issues related to salinity and nitrate, which are discussed in Section 7 of this UWMP.

6.5 Provisions to Reduce Water Consumption

Under the most severe drought conditions and under almost any catastrophe condition, SGPWA retail water agencies may call for voluntary or mandatory reductions in water consumption. Table 6-3 summarizes water use reduction targets set for various water shortage response stages developed by each of the SGPWA retail water agencies.

Table 6-3
Water Use Reductions Associated with Water Shortage Response Stages for SGPWA Retail Water Agencies

Stage	BCVWD	Banning	YVWD
1	Voluntary - 10%	Voluntary - 15%	Voluntary - 10%
2	Mandatory – 10%, Voluntary - 20%	Mandatory – 25%	Mandatory – 15%
3	Mandatory – 20%, Voluntary - 30%	Mandatory – 35%	Mandatory – 30%
4	Mandatory – 30%, Voluntary - 20%	Mandatory – 50%	Mandatory – 40%
5	n/a	n/a	Mandatory – 50%

The determination of which water shortage response stage is appropriate for a given condition is different for each agency. BCVWD uses the number of continuous dry years to determine the appropriate stage, whereby Stage 1 through 4 occur at Years 1,

2, 4, and 5 of consecutive drought. In the City of Banning, City Council holds a public meeting at each increase in stage, if it's shown that the previous stage is not providing sufficient use reductions. For YVWD, its Board of Directors is responsible for determining the appropriate water shortage response stage.

Various types of outreach, restriction, curtailment, and enforcement actions are used by the retail water agencies to achieve the use reduction shown in Table 6-3. Table 6-4 identifies the types of activities included in each retail water agency's water shortage contingency plans. The effectiveness of each agencies water shortage contingency plan is tracked by comparing consumption data from individual meters with water use reduction goals.

Table 6-4
Matrix Indicating Types and Implementation Levels for Key Elements of Retail Water Agency Water Shortage Contingency Plans

Water Agency	Water Shortage Response Stage	Encourage efficient water use	Water conservation advisory committee	Temporary rate structure	Customer notification	Media Campaign	Enforcement Actions	New development meter sale restrictions	New construction meter restrictions	Landscape watering time restrictions	Landscape watering day restrictions	Car Washing with shut-off nozzles	Car washing prohibition [1]	Leak repair and detection	Restaurants provide water on request only	Hardscape watering prohibition[2]	Filling pools / ponds prohibition	Construction only water allotments	System-wide water use allotments
YVWD	1	◓			●			◔		◔	◔	◔		◔		◔			
	2	◓			●	●		◓		◓	◓	◓		◓		◓			
	3				●	●	◔	●	●	●	●	●		●		●			□
	4				●	●	◔	●	●	●	●	●		●		●			◪
	5				●	●	◔	●	●	●	●	●		●		●			■
BCVWD	1	◓			●	●													
	2	◓	●		●	●													
	3		●	●	●	●	◔			●		●		●		●			
	4		●	●	●	●	◔			●		●		●		●			
Banning	1	◓			●														
	2				●					●		●			◓	●			
	3				●				●	●	●		●		●	●	●	◪	
	4				●				●	●	●		●		●	●	●	■	■

Legend: ◔ Voluntary, focused areas; ◓ Voluntary, district wide; ● Mandatory, district wide; □ Mild water allotments; ◪ Medium water allotments; ■ Strict water allotments

Notes:
1) Use of commercial car washing facility using recycled water is permitted
2) Hardscape watering to protect public health and safety is permitted

During periods of reduced consumption, revenue from water sales will decline. Reductions in the cost of energy for pumping groundwater are realized, but are not expected to make-up the difference in revenue. Also, a natural disaster may entail unpredicted expenditures for repairs. Therefore, each retail water agency has plans to address financial challenges of water shortages that include a mix of temporary base rate adjustment, use of reserves, fines for violation of mandatory water use restrictions, and deferring of non-critical maintenance items and filling of some personnel vacancies.

Section 7
Water Quality

7.1 Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describes plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

7.2 Contaminants of Concern

In the San Gorgonio Pass area, there are currently no contaminants in the local groundwater or surface waters at levels that may threaten the ability to use the waters for drinking water supplies. The primary future water quality concern is associated with the potential impact of large planned increases in water recycling on salinity and nitrate in underlying groundwater basins.

7.3 Salinity Management

7.3.1 Regulatory Objectives

Currently, the City of Beaumont and YVWD discharge most tertiary treated effluent to tributaries of San Timoteo Creek. Recharge of this water within unlined portions of San Timoteo Creek adds salinity to the San Timoteo groundwater management zone. Both agencies are planning to recycle treated effluent to serve non-potable water demands. The only limitation on water recycling is that the discharges must maintain a minimum flow requirement of approximately1.6 mgd in San Timoteo Creek that is necessary to maintain existing habitat.

Tertiary treated wastewater (a potential non-potable supply source for retail water agencies in the SGPWA service area) has elevated levels of total dissolved solids (TDS), compared with other source of supply historically used in the SGPWA service area due to normal pick-up of salinity in municipal wastewater of approximately (200-250 mg/L). Typical concentrations of recycled water are compared with other inflows to groundwater basins in Table 7-1. Current average levels of TDS are 269 mg/L in the Beaumont Basin and 330 mg/L in the Yucaipa Basin. As the use of recycled water for groundwater basin recharge or non-potable irrigation increases in the future, concentrations of TDS in these groundwater basins will increase without any planned salinity management. Conversely, increased recharge of SWP deliveries may offset some of this potential rise in TDS.

The City of Banning currently discharges treated wastewater to the San Gorgonio River watershed in spreading grounds overlying the Cabazon groundwater basin. The City of Banning is planning to use this wastewater source to recharge the West

Banning groundwater basin with a new indirect potable reuse project. The San Gorgonio River and Banning groundwater basin fall within the jurisdiction of the Colorado Regional Water Quality Control Board. At this time, the Colorado Regional Water Quality Control Board has no specific water quality objectives for the San Gorgonio River or underlying groundwater basins. The City of Banning is also planning to use recycled water to serve irrigation demands at the Sun Lakes Country Club and Pardee Golf Course, which include areas that overly the Beaumont Basin and proposed SARWQCB Beaumont Groundwater Management Zone (GMZ), where water quality objectives for nitrogen and TDS are mandated.

Table 7-1
Typical TDS Concentrations of Inflows to San Gorgonio Pass Area Groundwater Basins

Groundwater Recharge Source	TDS (mg/L) [1]
Deep percolation of precipitation	100
Stormwater runoff	100
SWP deliveries	250
Deep percolation of applied water [2]	1,300
Recycled water spreading	450
Subsurface inflows	280

1) TDS values from Year 2010 assumptions used in modeling the Beaumont and Yucaipa Basins to support the development of the Salinity Management Plan for the Santa Ana River Watershed (SAWPA, 2010)
2) High value comes from consumptive use of most applied water which increase TDS concentration of water that is percolated into lower soil layers

To support the development of a Salinity Management Plan for the Santa Ana River (SAR) watershed, a Constantly-Stirred Reactor Model (CSRM) was constructed for groundwater basins throughout the SAR watershed, including the Yucaipa and Beaumont Basins within the SGPWA service area (SAWPA, 2010).

This model computes a salt balance for each groundwater basin as a function of inflow and outflow volume and concentration. Data to support this model comes from current and projected supply and demand from agencies that overly and/or pump from the modeled groundwater basin. The CSRM showed a projected increase in groundwater TDS from 269 mg/L in 2010 to 360 mg/L in 2035 for the Beaumont Basin and from 330 mg/L in 2010 to 487 mg/L in 2035 for the Yucaipa Basin (Figure 7-1).

The need for salinity management in the San Gorgonio Pass area is determined by local agency 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. Future salinity removal needs are determined by one of several possible regulatory water quality objectives:

- 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

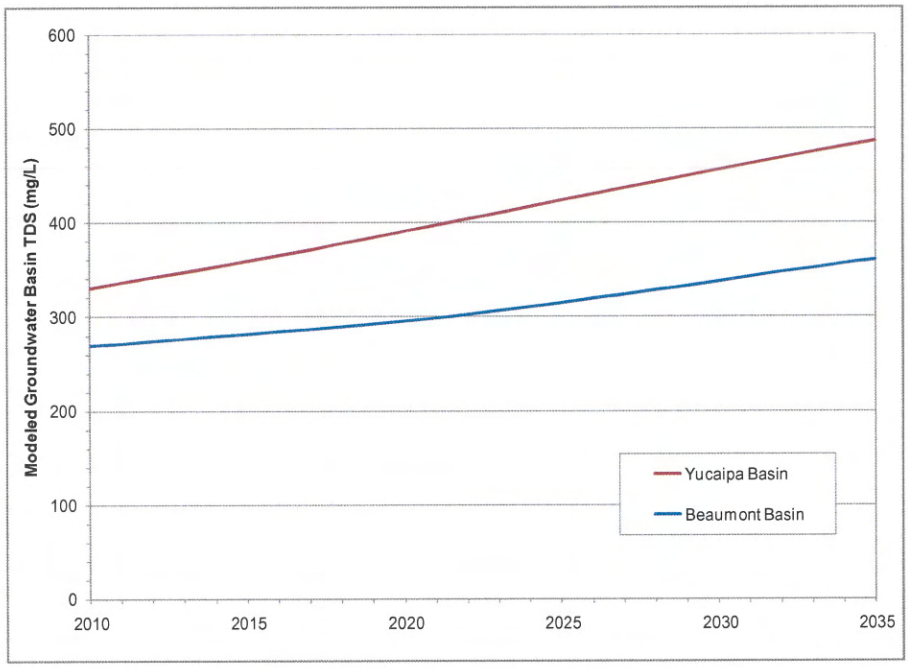

Figure 7-1
Modeled TDS in the Yucaipa and Beaumont Groundwater Basins

Table 7-2 summarizes these regulatory objectives for TDS and compares them to current and projected water quality levels of groundwater and/or wastewater plant effluent. For the Beaumont Basin, current TDS concentrations exceed water quality objectives developed for the original Santa Ana Regional Water Quality Control Plan (Basin Plan). The Santa Ana Regional Water Quality Control Board approved "Maximum Benefit" demonstrations for the Beaumont, Yucaipa and San Timoteo groundwater management zones. These "Maximum Benefit" demonstrations allow for less stringent water quality objectives to provide additional assimilative capacity for water recycling, as long as beneficial uses are maintained (anti-degradation).

Higher Maximum Benefit water quality objectives, shown in Table 7-2, are contingent on implementation of specific projects. For parties with Maximum Benefit objectives (YVWD and City of Beaumont only), the Regional Board requires 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 projections from the CSRMs, this condition would occur in 2028 for the Beaumont Management Zone and 2016 for the Yucaipa Management Zone.

Table 7-2
Water Quality Objectives in Groundwater and POTW Effluent Compared with Current and Projected TDS Concentrations

Groundwater Management Zone	Beaumont	Yucaipa	San Timoteo
Max Benefit Water Quality Objective (mg/L) [1]	330 (230)	370 (320)	400 (300)
EPA Secondary MCL (mg/L)	500	500	500
Current Groundwater Basin TDS (mg/L) [2]	260	310	NA [4]
Projected Year of No Assimilative Capacity	2028	2016	2010
POTW Effluent [3]	**City of Beaumont**	**YVWD**	
NPDES Discharge Permit (mg/L)	490	540	
Current POTW Effluent TDS (mg/L)	416	489	
Projected Year of Exceedance	2040	2040	

1) Original anti-degradation water quality objective shown in parenthesis
2) Data sampling period was 20 years (1987-2006) for current ambient water quality computations
3) City of Beaumont water recycling would add salinity to the Beaumont groundwater management zone; YVWD water recycling would add salinity to the Yucaipa groundwater management zone. Each of these POTWs currently adds salinity to the San Timoteo groundwater management zone through recharge of effluent in the unlined portion of San Timoteo Creek.
4) Not enough data to estimate TDS concentrations; management zone is presumed to have no assimilative capacity

The following section describes the steps YVWD and BCVWD are taking to manage salinity in the Yucaipa and Beaumont Basins to meet commitments of their Maximum Benefit demonstrations. The City of Banning is also planning to reduce TDS in recycled water for irrigation use, as discussed below.

7.3.2 YVWD Salinity Management

YVWD has several elements to its plan to maintain TDS concentrations in the Yucaipa Basin below the Maximum Benefit water quality objectives. These include:

- Long-term surface water monitoring in San Timoteo Creek and Reaches 4 and 5 of the Santa Ana River and groundwater monitoring in the San Timoteo and Yucaipa groundwater management zones
- Construction of desalters and brine disposal facilities if the 5-year running average TDS in recycled water exceeds 530 mg/L or is the volume-weighted TDS concentration in the Yucaipa Basin exceeds 360 mg/L
- Blending of recycled water with untreated imported water to maintain a running 10-year average TDS of less than 370 mg/L for irrigation uses and a 5-year running average TDS of less than 370 mg/L for groundwater recharge uses
- Elimination of discharge of treated wastewater effluent to unlined portions of San Timoteo Creek

- Construction of a Western Regional Interceptor to provide wastewater collection service to Dunlap Acres, an area where existing septic systems may be impacting groundwater quality

The District is already in the detailed implementation stages for an indirect potable reuse project that would involve addition of advanced treatment at the Henry N. Wochholz Regional Water Recycling Facility in the form of reverse osmosis. This treatment process will create a brine stream of very high TDS during backwash of membranes. The Yucaipa Valley Regional Brineline Project will extend the existing Santa Ana Regional Interceptor (SARI) owned and operated by the Santa Ana Watershed Project Authority (SAWPA) 15 miles from San Bernardino to Yucaipa. Once connected, the brine from the advanced treatment process will be delivered through downstream reaches of the SARI system to Orange County Sanitation District Wastewater Treatment Plant No. 2 in Huntington Beach for treatment prior to the ocean outfall.

7.3.3 City of Beaumont / BCVWD Salinity Management

The City of Beaumont recently initiated the San Timoteo Management Zone (STMZ) Water Quality Mitigation Project. This project involves construction of new wells in the upstream portion of the STMZ to extract groundwater, which will remove at least as much salinity as that added by channel bottom recharge from the minimum required discharge of 1.8 mgd of effluent to Coopers Creek[1], a tributary to San Timoteo Creek. The project includes a storage reservoir, pump station and pipeline to bring the STMZ groundwater to a City of Beaumont property where it will be used to recharge the Beaumont Basin. Recharge of the Beaumont Basin with tertiary treated effluent is projected to not cause an exceedance of Maximum Benefit objectives for TDS in the near term.

Based on the CSRM projections, the City of Beaumont recognizes that there will be a future time when additional salinity management measures may be needed, either because the TDS effluent limit of the NPDES permit will be exceeded or as a result of increasing ambient TDS concentrations in the basin. The Santa Ana Watershed Salinity Management Plan estimated a concentrated brine flow of 0.5 mgd from advanced treatment with reverse osmosis at the City of Beaumont WWTP to reduce TDS in effluent to protective levels. Beaumont does not currently have a connection to the SARI line although the Yucaipa Valley Regional Brineline Project is being designed to provide capacity for Beaumont flows. Future alternatives that may be considered include eventual wastewater desalting and an additional extension of the SARI line, desalting with secondary brine concentration up to zero liquid discharge if cost effective at the time the project is needed, or sending brine east to join other communities.

[1] Reduction from current discharge of 2.5 mgd to 1.8 mgd based on US Fish and Wildlife Service opinions of habitat requirements, amendment to the City's NPDES discharge Permit (Order No. R8-2009-0002: Amendment of Order No. R8-2006-0003, NPDES No. CA0105376

7.3.4 City of Banning Salinity Management

The City of Banning is planning to use recycled water to meet irrigation demands at the Sun Lakes Country Club and Pardee Golf Course. One project that is planned to manage the potential increase in TDS of the underlying Beaumont groundwater basin, is a new 12,000 foot pipeline to convey low TDS SWP water from Noble Canyon to Highland Springs Avenue for blending with recycled water before application.

7.4 Nitrate Issues

Nitrate concentrations in some Beaumont groundwater basin wells have experienced recent nitrate-nitrogen concentrations close to the EPA MCL of 10 mg/L. Potential causes of elevated nitrate in the Beaumont groundwater basin include naturally occurring sources, septic systems, and agricultural land uses. A STWMA study determined that septic systems in the Village of Cherry Valley are the main source of elevated nitrate in the Beaumont Basin (Schlange, 2008). To prevent nitrate concentrations in the Beaumont Basin to cause an exceedence of the MCL, BCVWD may consider providing sewer service to Cherry Valley. This will also increase the potential supply of recycled water for irrigation uses or groundwater recharge.

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