Final Draft

Santa Clarita Valley
Water Use Efficiency Strategic Plan

August 2008

Santa Clarita Valley Family of Water Suppliers

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EXECUTIVE SUMMARY

The Santa Clarita Valley Family of Water Suppliers (the Suppliers) has joined together to develop a plan to ensure the efficient use of water in our Valley. The Santa Clarita Valley Water Use Efficiency Strategic Plan (the Plan) includes programs and projects that will most effectively reduce the per capita water use in the Valley. The goal of the Plan is to achieve a long term reduction in water demand of at least 10% over the next 20 years.

This Plan is a tool that will generally guide the actions of the Suppliers by providing a broad perspective on a number of demand side management issues and opportunities. The Plan is described in seven chapters providing detailed information on the approach, data procurement and analysis, available water use efficiency (WUE) opportunities, defined potential program concepts, stakeholder process, recommended program mix, and funding opportunities.

Chapter 1 describes the purpose of the Plan and it provides an introduction to the Santa Clarita Valley Family of Water Suppliers:

- Wholesale Supplier
    - Castaic Lake Water Agency
- Retail Suppliers
    - Valencia Water Company
    - Santa Clarita Water Division
    - Newhall County Water District
    - Los Angeles County Waterworks District #36

Chapter 2 provides an overview of our process and approach to developing the Plan. The specific tasks were defined as follows:

- Gather end-user data and organize by sector
- Brainstorm potential water use efficiency program concepts
- Recommend viable programs
- Develop program modules
- Recommend a program mix and 5 year plan
- Finalize the WUE Strategic Plan
- Perform economic analysis

Chapter 3 provides an overview of the Customer Demand Profile—the data-intensive background work completed for the Plan. This chapter details information on data gathering methods, data content, data validation, and provides examples of some of these results. The sources of data include:

- Account level water consumption data
- The 2005 Urban Water Management Plan
- BMP Reports
- Other documents provided by agencies

Chapter 4 lists the specific WUE Measures that were identified as potentially viable for the Santa Clarita Valley. The project team cast a very wide net to identify all potentially relevant measures.

Chapter 5 describes the development of specific program concepts and their presentation to the stakeholder workshops. This constituted the next step in the process that specifically defined the optimal delivery method for each technology under consideration. Using a broad economic analysis, the program costs and benefits were projected for each program concept. This chapter also covers the stakeholder workshop inputs and outputs based on the presentations and stakeholder feedback.

Chapter 6 sets forth the Recommended Program Mix and economic analysis. The avoided supply costs are described, as well as program costs and savings.

Chapter 7 provides a 5 Year Implementation Plan that details the timing and resource requirements of the Recommended Programs. Also included are Facilitating Actions, such as potential partnerships, trade organizations, and funding opportunities.

Table E.1 - Five Year Implementation Plan: Budget and Savings

Program	2009	2010	2011	2012	2013
HET Rebates					
Savings (AFY)	15	31	46	61	76
Large Landscape Audits (w/ Incentives)					
Savings (AFY)	38	76	115	153	191
CII Audits and Customized Incentives					
Savings (AFY)	53	105	158	210	263
Landscape Contractor Certification (WBIC & Sprinklerheads)					
Savings (AFY)	50	151	301	502	753
HE Clothes Washer Rebates					
Savings (AFY)	5	11	16	21	26
New Construction Code					
Savings (AFY)	445	911	1,397	1,682	1,978
Total Annual Savings (AFY)[1]	607	1,284	2,033	2,629	3,287
Total Annual Budget (in Thousand $)	$ 743	$ 820	$ 823	$ 903	$ 983

[1] Total Annual Savings are those produced in the first five years from program implementation over the first five years. Savings after five years continue due to device lifespans that exceed five years and due to future program implemenation over the course of the planning period.

Appendices A.1 to A.3 provide an overview of the universe of water use efficiency measures and additional detail on water use efficiency programs. Appendices B.1 to B.2 describe the economic analysis. Appendices C.1 to C.2 contain materials from the stakeholder meetings. Appendix D provides an analysis of Water Rates and Conservation.

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CHAPTER 1: INTRODUCTION

Purpose and Goal of the Plan

Water is a valuable natural resource in California, requiring efficient management to ensure the availability of sufficient supplies to meet both the state and local area's agricultural, domestic, industrial, and environmental needs. The increasing demand for water requires efficient use and elimination of waste as important strategies in the overall management of water resources. Efficient and effective management of the public's demand for water is also an important element in meeting the long term water needs of the state and locally in the Santa Clarita Valley. The public simply needs to be provided the tools and education so that they can use water efficiently.

The Santa Clarita Valley Family of Water Suppliers (the Suppliers) joined together to developed a plan to ensure the efficient use of water in our Valley. The Santa Clarita Valley Water Use Efficiency Strategic Plan (the Plan) includes programs and projects that will most effectively reduce the per capita water use in the Valley. The goal of the Plan is to achieve a long term reduction in water demand of at least 10% over the next 20 years.

This Plan is a planning tool that will generally guide the actions of the Suppliers. It provides the Suppliers with a broad perspective on a number of demand side management issues and opportunities. The identification of such opportunities, and the inclusion of those opportunities in this Plan, neither commits a supplier to pursue a particular water use efficiency opportunity, nor preclude a supplier from exploring water use efficiency opportunities not identified in the plan.

Funding and demographics will be key issues in how aggressively each Supplier can implement the water use efficiency (WUE) programs. Nonetheless, each Supplier is committed to implementing many of the water use efficiency programs in their respective service territories.

Santa Clarita Valley Family of Water Suppliers

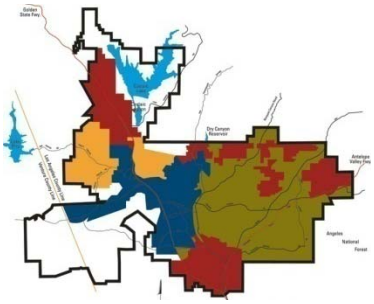
The Santa Clarita Valley is served by the following water suppliers:

- Wholesale Supplier
    - Castaic Lake Water Agency (CLWA)
- Retail Suppliers
    - Valencia Water Company (VWC)
    - Santa Clarita Water Division (SCWD) of CLWA
    - Newhall County Water District (NCWD)
    - Los Angeles County Waterworks District #36 (LACWWD #36)

CLWA is a public water agency that serves areas in Los Angeles and Ventura Counties. The Agency is a water wholesaler that provides more than half of the water used by Santa Clarita households and businesses. CLWA receives and treats surface ("imported") water from the State Water Project. The Santa Clarita Valley's four retail suppliers distribute the treated water.

The four retail suppliers provide water service to most residents of the Valley.

Figure 1.1 –Supplier Service Areas



LACWWD #36's service area includes the Hasley Canyon area in the unincorporated community of Val Verde. During most years, the District obtains its water supply from CLWA.

NCWD's service area includes portions of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Newhall, Canyon Country, Saugus, and Castaic. The District supplies water from local groundwater and CLWA imported water.

SCWD's service area includes portions of the city of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Canyon Country, Newhall, and Saugus. SCWD supplies water from local groundwater and CLWA imported water.

VWC's service area includes a portion of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Castaic, Stevenson Ranch, and Valencia. VWC supplies water from local groundwater, CLWA imported water, and recycled water.

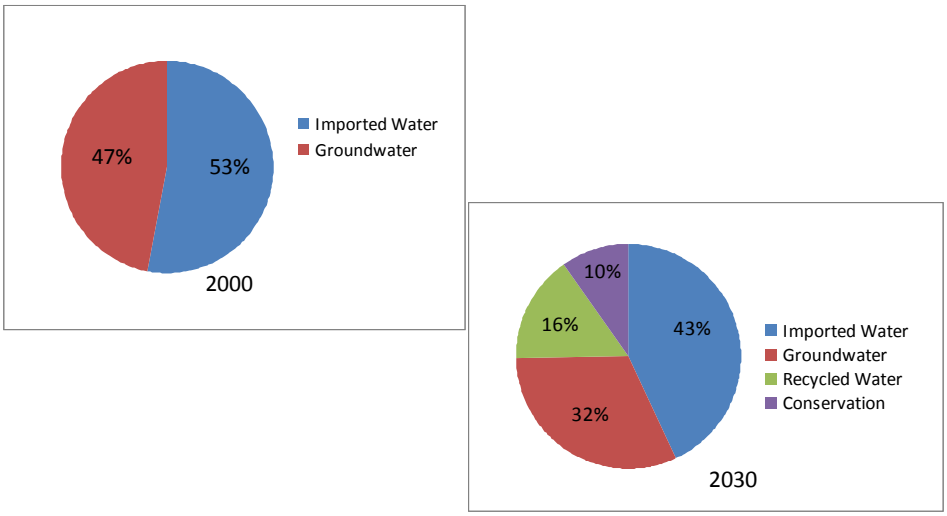
Water Sources and Uses in the Valley

The Santa Clarita Valley is a fast growing area located in Northwest Los Angeles County. The amenities of the Valley have attracted both residential and commercial customers. Water suppliers in the area rely on local groundwater supplies and, since 1980, on water imported from the State Water Project and other imported sources.

The water suppliers of the Santa Clarita Valley are at an important crossroads. The 2005 Urban Water Management Plan and the 2007 Santa Clarita Valley Water Report describe the reliance on ground water and imported supplies and the ongoing growth in demand. It indicates under current planning scenarios that water use practices must change in the Valley to reduce per capita water demand. This plan focuses its attention on water use efficiency in the Santa Clarita

Valley that provides not only an informed basis for additional investments but also the support and direction needed to secure funding for those water efficiency measures.

Figure 1.2 –Water Supply Sources



By implementing a portfolio of water use efficiency programs, Santa Clarita Valley and the water suppliers will benefit in a number of ways:

- **Cost avoidance for purchased water**- Although Santa Clarita Valley has projected adequate water supply for the near future, the cost of water has risen dramatically and is expected to continue to rise. The best way to avoid purchasing expensive imported water is to use less through efficiency. Programs are an effective efficiency mechanism.
- **Limited State Resources**- California's water resources are becoming increasingly stretched due to population, housing growth, and decreased water supply from state water projects. Agencies need to stretch water supplies and increase efficiencies.
- **Drought Preparedness**- It is inevitable that Southern California, as well as the state, will experience another drought. The big question is when and how severe the next one will be. One way to lessen the severity of a drought's effect on Santa Clarita Valley is to prepare in advance for this event by creating a community that operates at a high level of efficiency.
- **Environmental Sustainability**- As a signatory to the California Urban Water Conservation Council, Santa Clarita Valley and its suppliers undertook the obligation to implement the BMPs for water conservation.
- **Reduced Carbon Footprint**- The production and delivery of water requires a tremendous amount of energy on both a statewide and local level. The Santa Clarita Valley can do its part to reduce green house gases by becoming water efficient.

- **Reduced Waste Water Flows-** Sanitation plants and systems must be sized to meet historic and planned waste water flows. Increasing the efficient use of water will result in a reduction of waste water into the system.

- **Reduced Urban Runoff** – Achieving increased water use efficiency outdoors means less water running off landscaped areas into the streets, storm drains, and ultimately into the Santa Clara River. Education efforts and installation of efficient technologies will ensure that more of our valuable water is delivered to appropriate landscaping and less of it pollutes our communities as urban runoff.

To direct the preparation of the Plan, Santa Clarita Valley secured the services of A&N Technical Services (A&N), Maureen Erbeznik and Associates, Gary Fiske and Associates, David Mitchell of M. Cubed, and John Koeller and Associates.

With a commitment to achieve a water demand reduction of at least 10% over 20 years, Santa Clarita Valley has elected to strive for responsible environmental leadership. The WUE Strategic Plan forms the blueprint for implementation of this goal.

CHAPTER 2: APPROACH

In order to create the WUE Strategic Plan for Santa Clarita Valley, the project team deployed the following project tasks:

Process to Develop the WUE Strategic Plan

- ***Task 1-Specify Planning Goals.*** The SCV Family of Water Suppliers developed specific planning goals through the following steps:

    - A&N led initial meeting to elicit project goals from water supplier staff
    - Follow-up staff interviews to clarify ambiguities
    - Documented goals and objectives based on the initial meeting and interviews
    - Review at Stakeholder workshops

- ***Task 2 – Develop Customer Profile.*** A&N created a solid base of knowledge regarding existing conditions and opportunities by customer class and subclass as well as discovery regarding existing industry programs, technologies and ordinances that could benefit the Santa Clarita Valley.

- ***Task 3 – Develop Means of Measuring Savings.*** A & N Technical Services created a comprehensive tool demonstrating expected water use efficiency savings. Included in the Santa Clarita Valley WUE Strategic Plan are estimates of costs and savings to the year 2030.

- ***Task 4 – Identify Water Use Efficiency Measures.*** The consultant team researched a list of possible technologies, delivery mechanisms and programs. A set of Program Evaluation Criteria were developed in collaboration with water supplier staff. Each program was evaluated on a preliminary basis for cost-effectiveness, water savings potential, and ease of implementation and other key criteria of an effective program. The team then worked to refine program options and develop a short list of programs to be analyzed on a more in-depth basis.

- ***Task 5 – Analyze Cost and Benefits.*** The consultant team developed an avoided cost forecast using the AwwaRF Avoided Cost model.

- ***Task 6 – Select Water Use Efficiency Measures.*** The short list of programs was further expanded to include more program detail such as the marketing outreach, incentive format, potential program partners, preliminary budget and staffing requirements. Stakeholders and consultants eliminated low ranking programs and created a program package (the recommended package) showing the 5 year roll out plan. The plan was presented to the Santa Clarita Valley Family of Water Suppliers.

- ***Task 7- Develop WUE Strategic Plan.*** Following review, the A&N team created this document, the Santa Clarita Valley WUE Strategic Plan, to be submitted for approval. The Plan delivers a balanced portfolio of cost-effective programs for Santa Clarita Valley Suppliers' end-use customers.

An overview of the WUE Strategic Plan process is depicted below:

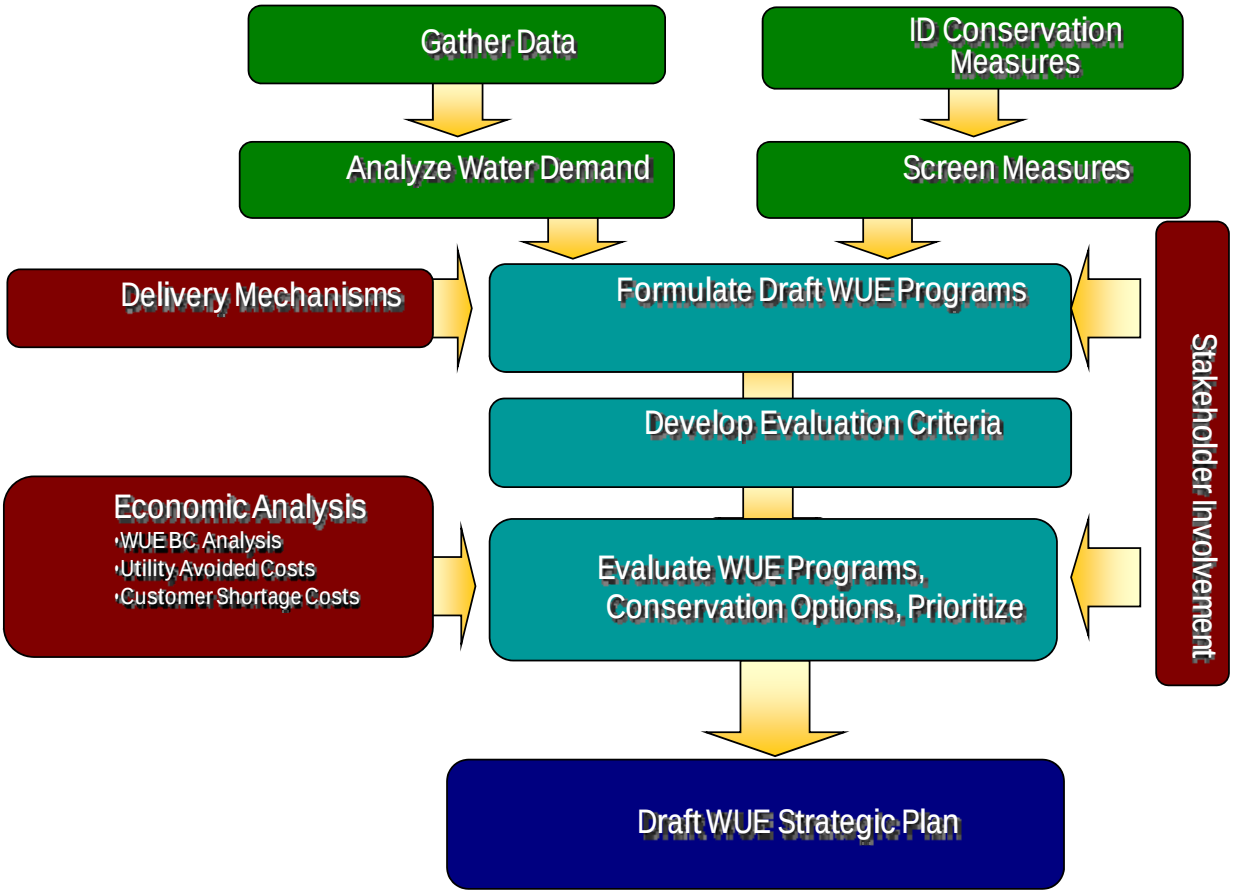


Figure 2.1 - WUE Strategic Plan Process

CHAPTER 3: CUSTOMER DEMAND PROFILE

The customer demand profile consists of the following components:

- Water Use Analysis
- Housing Units
- Past and Present Water Use Efficiency Programs
- WUE Device Saturation Analysis

Water Use

The next step in the process was to analyze water use tabulated into the following categories: 1) single-family residential, 2) multi-family residential, 3) dedicated landscape meters, 4) commercial, industrial, and, institutional (CII), 5) construction, and 6) recycled. This task was complicated (typically so) because each of the four retail water agencies have unique customer account data fields and formats. The water use analysis forms the foundation of the WUE Strategic Plan by first providing an understanding of water use by sector, supplier, and season, and by providing the foundation for designing programs to include in the Plan.

The process included data collection, category identification, validation, and tabulation. A & N Technical Services Inc. acquired the data by contacting the suppliers and requesting a data dump from their billing systems. A detailed data request was presented to each of the suppliers and each agency provided account level data for all customers for the most recent complete year (2006). The data included account number, account name, service address, account type, meter size and monthly volume reads. A&N ensured that all individual customer information was kept secure and confidential. Customer account identifiers and class categories were examined and each account was assigned one of the six common categories. All accounts that could be identified as dedicated landscape were grouped together because of the commonality of applicable WUE measures. Total water use was validated with existing sources such as the Urban Water Management Plan, BMP Reports, and other planning documents and data sources unique to each supplier.

As shown in Table 3.1, data on more than 66,000 accounts was collected, summing to over 30 million ccf (hundred cubic feet) per year. The single-family sector is the largest in terms of both number of customers and volume of water use.

Table 3.1 – Summary of Customers and 2006 Water Use

Customer Category	Number of Accounts	Water Use in 2006 (ccf)	Percent of Total Volume
Single Family	55,900	16,311,530	53.7%
Multi-Family (1)	5,374	3,174,067	10.4%
Dedicated Landscape	1,400	4,202,332	13.8%
Commercial, Industrial, and Institutional	3,155	5,736,791	18.9%
Construction	568	824,043	2.7%
Recycled	10	134,618	0.4%
Total	66,407	30,383,381	100.0%

(1) The total of 5374 multi-family accounts serves 28487 multi-family housing units.

Water Use by Supplier

Table 3.2 summarizes the number of accounts and water use for each of the suppliers in the Santa Clarita Valley Family of Water Suppliers.

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Table 3.2 – Summary of Accounts and 2006 Water Use by Supplier

Valencia Water Company Customer Category	Number of Accounts	Water Use in 2006 (ccf)	Mean Use per Account
Single Family	25,093	6,232,892	248
Multi Family (1)	333	595,528	1,788
Landscape	444	1,438,740	3,240
CII	1,910	4,351,654	2,278
Construction	135	397,440	2,944
Recycled	10	134,618	13,462
Total	27,925	13,150,872	471

(1) VWC has 333 accounts servicing 7827 multi-family housing units.

Santa Clarita Water Division Customer Category	Number of Accounts	Water Use in 2006 (ccf)	Mean Use per Account
Single Family	20,789	6,917,065	333
Multi Family (2)	4,671	1,884,470	403
Landscape	812	2,055,932	2,531
CII	790	862,362	1,092
Construction_Fire	331	333,005	1,005
Recycled	0	0	0
Total	27,393	12,052,834	440

(2) SCWD has 4671 accounts servicing 15574 multi-family housing units.

Newhall County Water District Customer Category	Number of Accounts	Water Use in 2006 (ccf)	Mean Use per Account
Single Family	8,723	2,713,350	311
Multi Family (3)	366	680,771	1,860
Landscape	139	698,424	5,025
CII	450	513,687	1,142
Construction	98	92,179	1,920
Recycled	0	0	0
Total	9,776	4,698,411	481

(3) NCWD has 366 accounts servicing 4967 multi-family housing units.

Los Angeles County Waterworks District No. 36 Customer Category	Number of Accounts	Water Use in 2006 (ccf)	Mean Use per Account
Single Family	1,295	448,223	346
Multi Family (4)	4	13,298	3,325
Landscape	5	9,236	1,847
CII	5	9,088	1,818
Construction	4	1,419	355
Recycled	0	0	0
Total	1,313	481,264	367

(4) LA36 has 4 accounts servicing 119 multi-family housing units.

Water Use by Season

For all of the suppliers, data were analyzed by month for each sector in a stacked area graph. To illustrate, Figure 3.1 shows water use by month using the 2006 account level data provided by the suppliers. The strong seasonal pattern reflects irrigation needs during the characteristic hot dry summers. Irrigation needs are apparent in all sectors except Construction. Notice also the non-zero winter irrigation needs shown in dedicated landscape accounts.

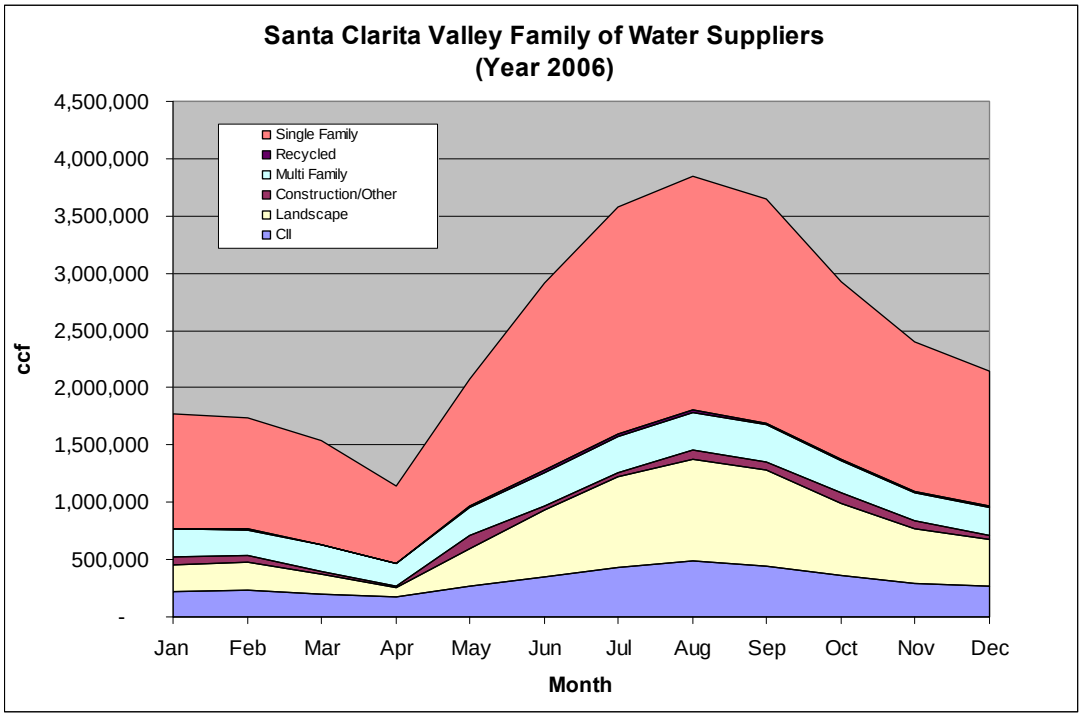


Figure 3.1 – Seasonal Pattern of Water Use

Water Use Distribution

Figures 3.2 and 3.3 show the distribution of annual water use for the single family and landscape sectors. Notice the single family distribution is the characteristic bell curve distribution, largely symmetric but with a long tail to the right indicating decreasing numbers of accounts with large water use. This graph is truncated at the extreme right tail which includes another 791 customers with use between 1,000 and 12,400 ccf per year. The purpose of displaying this distribution is to determine the similarity in use among single family customers. For example, the tall narrow shape shows a large share of the accounts fall between 100 and 500 ccf per year. A minority consume much more water (the right tail). This shape is characteristic of residential water use. In contrast, observe the distribution of dedicated landscape accounts in Figure 3.3 (also with truncated right tail). In this sector, the asymmetric distribution reflects the mix of site types including everything from large parks and schools down to small commercial strips and residential accounts.

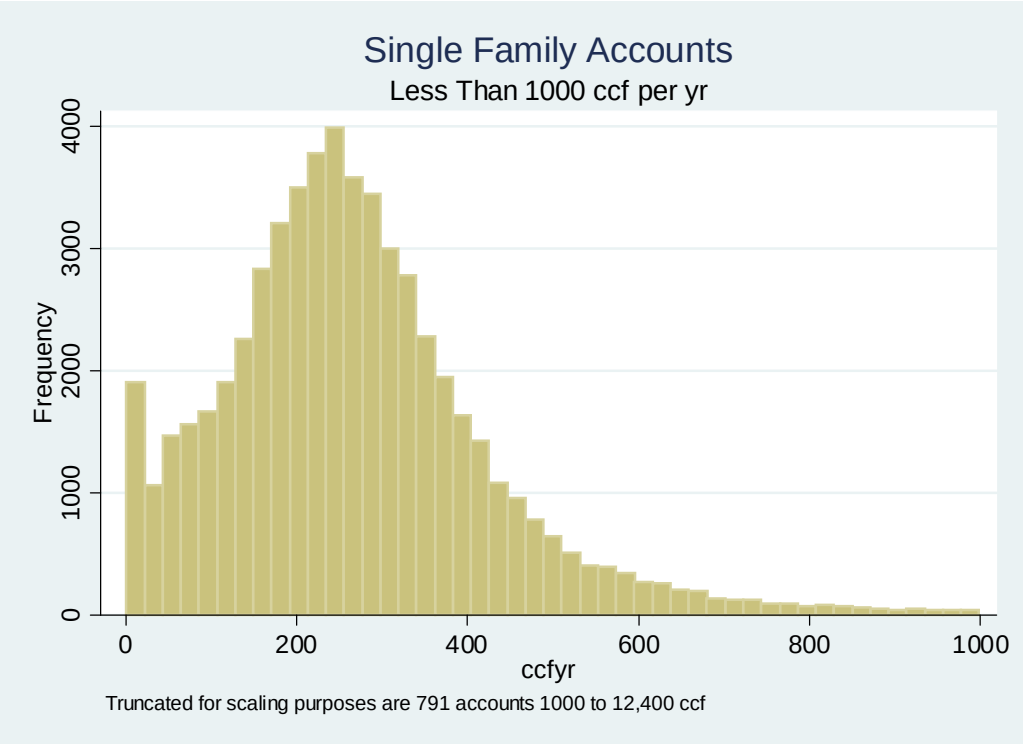


Figure 3.2 – Single Family Water Use Distribution

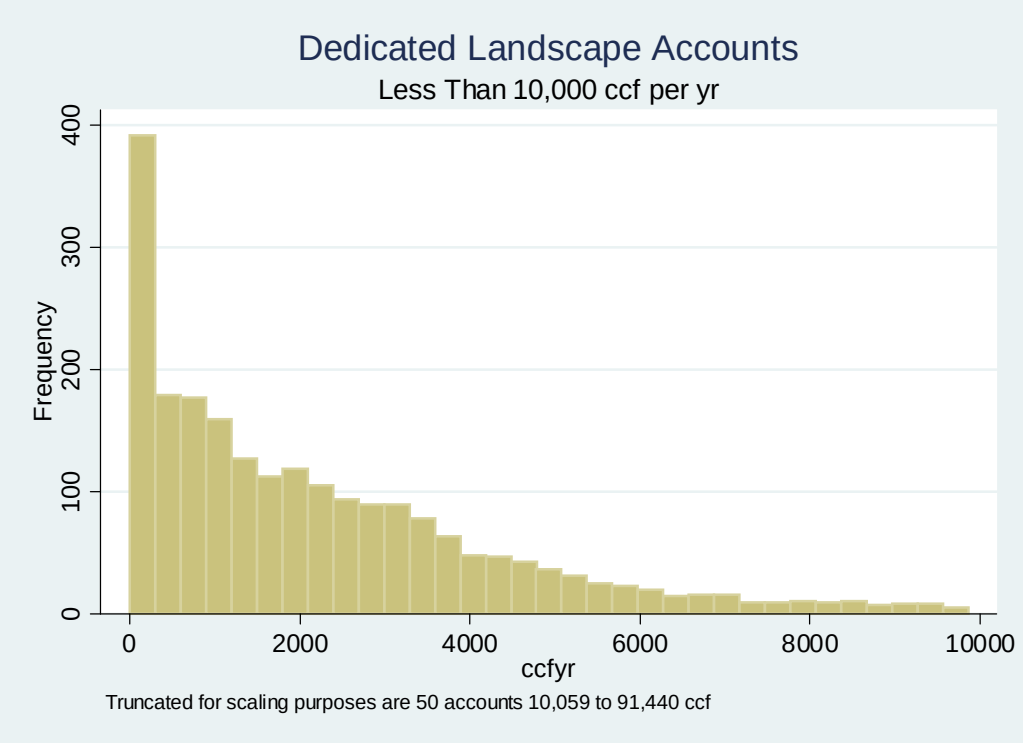


Figure 3.3 – Landscape Accounts Water Use Distribution

Housing Units

Figures 3.4, 3.5, 3.6 and 3.7 show the growth in single-family and multi-family housing units from 1991 to 2030. The data for these graphs was drawn from several sources including the 2005 Urban Water Management Plan, BMP Reports, and other planning documents provided by the suppliers. For the period 1990 to 2006, the BMP Reports provided a source for the number of housing units in 1990 and in recent years. Housing units in Years 1990 to 2006 are inferred in some cases. For future projections, the Urban Water Management Plan is the primary source. There is a close correlation between single family accounts and housing units. However, for the multi-family sector, the number of units per account can be highly variable. For conservation planning, it is important to understand the number of multi-family units in order to develop a plumbing fixture inventory. Water use summaries by residential unit and account were developed.

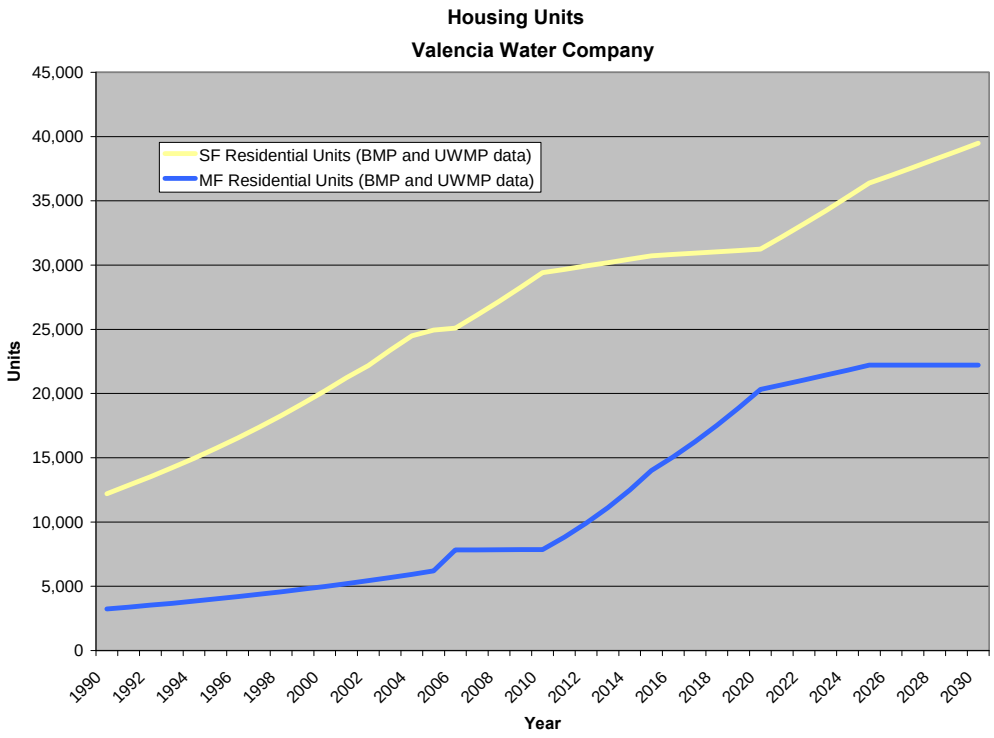


Figure 3.4 Valencia Water Company Housing Units

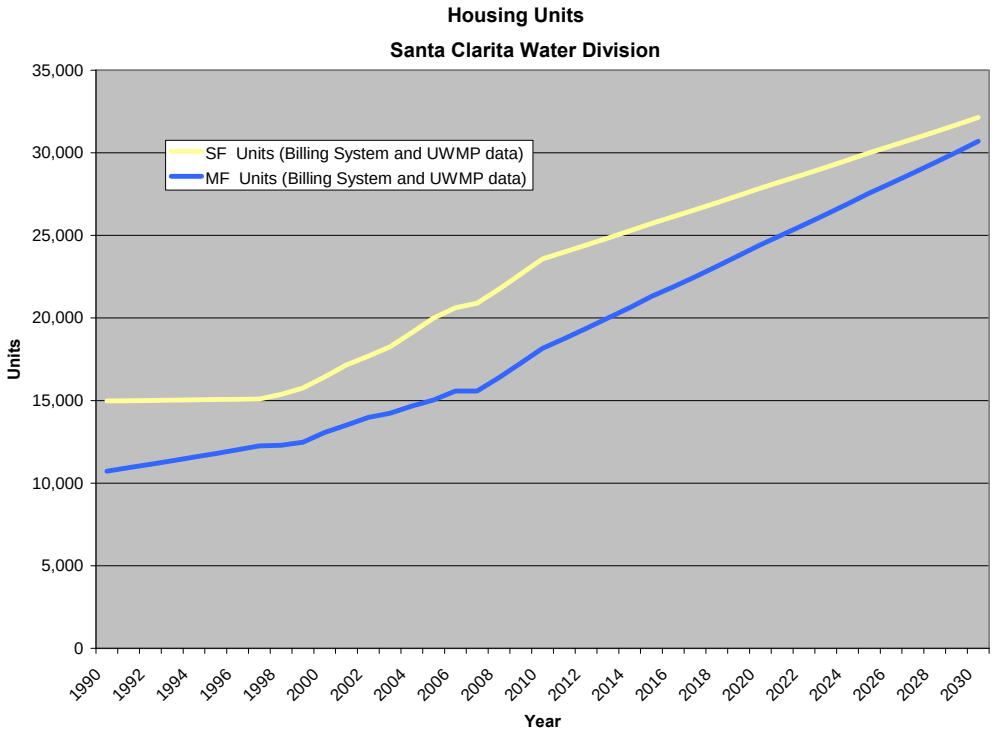


Figure 3.5 Santa Clarita Water Division Housing Units

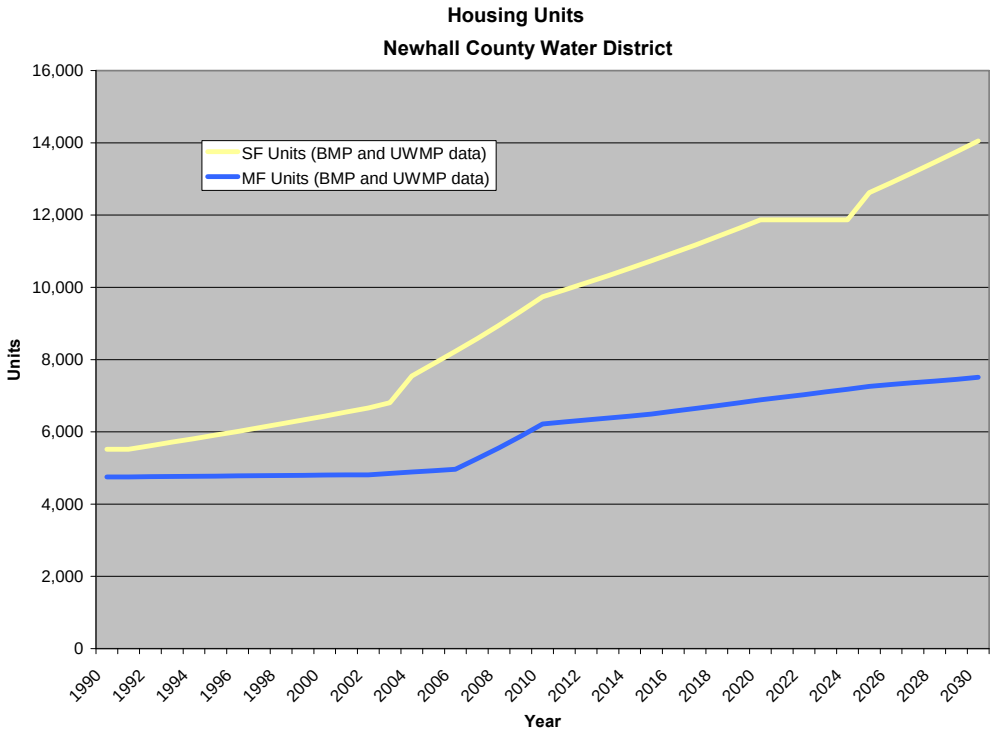


Figure 3.6 Newhall County Water District Housing Units

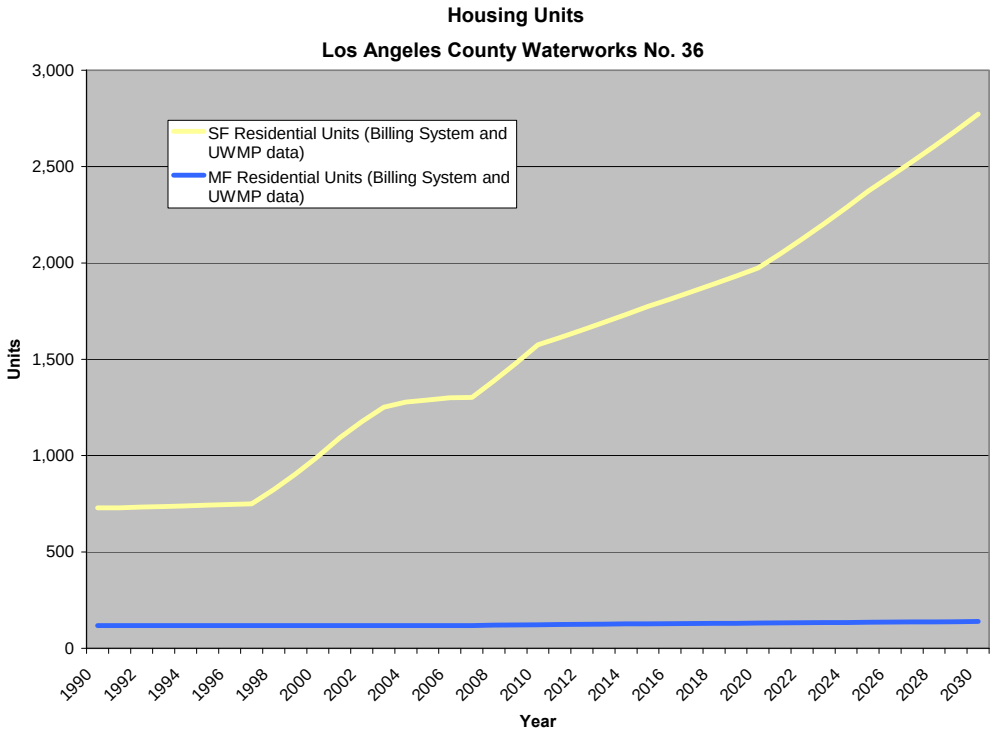


Figure 3.7 Los Angeles County Waterworks No. 36

Table 3.3 summarizes housing in 1991, the year before Ultra Low Flush Toilet plumbing code was enacted, 2007, and the projection for 2030. Because of the growth in housing units since 1991 40 percent of single family units were built post-1991 by 2007, and by 2030, 61 percent of single family units will be post-1991 construction. Post-1991 construction varies between retail service area and between single-family and multi-family sectors.

Table 3.3 Housing Units

Single-Family Housing Units

	1991Housing Units	2007 Housing Units	2030 Housing Units	Percent Post-1991 Units in 2007	Percent Post-1991 Units in 2030
Valencia Water Company	12,871	26,108	39,484	51%	67%
Santa Clarita Water Division	14,992	20,899	32,135	28%	53%
Newhall County Water District	5,522	8,580	14,050	36%	61%
Los Angeles County Waterworks District No. 36	729	1,302	2,772	44%	74%
Total	34,114	56,889	88,441	40%	61%

Multi-Family Housing Units

	1991Housing Units	2007 Housing Units	2030 Housing Units	Percent Post-1991 Units in 2007	Percent Post-1991 Units in 2030
Valencia Water Company	3,382	7,837	22,213	57%	85%
Santa Clarita Water Division	10,933	15,569	30,690	30%	64%
Newhall County Water District	4,756	5,254	7,508	9%	37%
Los Angeles County Waterworks District No. 36	119	119	140	0%	15%
Total	19,190	28,779	60,551	33%	68%

Past Achieved Conservation

For each of the suppliers, data from the BMP reports and other sources was collected to summarize past achieved conservation due to active conservation programs. For each supplier, the number of devices installed or measures completed was compiled, and for Castaic Lake Water Agency, the wholesaler, dollar amounts were summarized. These past achievements were incorporated into the WUE Strategic Plan

Conservation Device Saturation

To plan conservation programs it is important to know the number of target devices/fixtures, the level of past active conservation programs, and the effects of plumbing code on passive conservation. Passive conservation is the installation of conservation devices due to natural replacement, remodeling, or demolition in the presence of water efficiency plumbing code.

Combining the number of housing units with estimates of fixtures per household, an inventory of plumbing fixtures was developed. Figures 3.8 to 3.11 show how conservation devices' saturation will grow through 2030 for each water supplier. The saturation analysis allows the Plan to target its programs to achieve savings beyond what would be achieved without the Plan. Figure 3.12 shows the savings achieved by the type of passive conservation depicted in Figures 3.8 to 3.11 across all included water suppliers for single- and multi-family sectors.

As an example, consider the effects of passive conservation from ULF toilets, which is modeled using a rate of natural replacement whereby pre-1992 fixtures are replaced by ULF toilets at the end of their life span. In addition, conservation devices from active programs add to the number of conserving devices in the inventory. Table 3.4 shows the current saturation rates for single- and multi-family sectors by supplier and overall. For the pre-1992 housing stock approximately 47 percent of the toilets are already ULF toilets, driven largely by natural replacement and the past ULF toilet programs run by the SCV water agencies.[1] Over all single family housing units, 67 percent of the toilets are ULF toilets—a higher saturation because all units new since 1992 were required to have ULF toilets due to plumbing code.

[1] A natural replacement rate of 4 percent was applied for toilets. Due to the earthquake and high level of remodeling, this common planning assumption may understate device saturation for the Santa Clarita Valley due to the 1994 earthquake. A full set of assumptions in the saturation model is found in Appendix B-2.

Table 3.4 Saturation of Ultra Low Flush Toilets (ULFT) by Residential Sector

	Single-Family			Multi-Family		
Retailer	ULFT Saturation: Pre-1992 Inventory	ULFT Saturation: Total Inventory	Remaining Pre-1992 Toilets	ULFT Saturation: Pre-1992 Inventory	ULFT Saturation: Total Inventory	Remaining Pre-1992 Toilets
VWC	47%	73%	13,725	46%	77%	9,001
SCWD	47%	62%	15,813	46%	62%	19,310
NCWD	47%	65%	7,291	46%	48%	2,871
LA36	46%	70%	790	46%	46%	82
Total	47%	67%	37,619	46%	64%	31,263

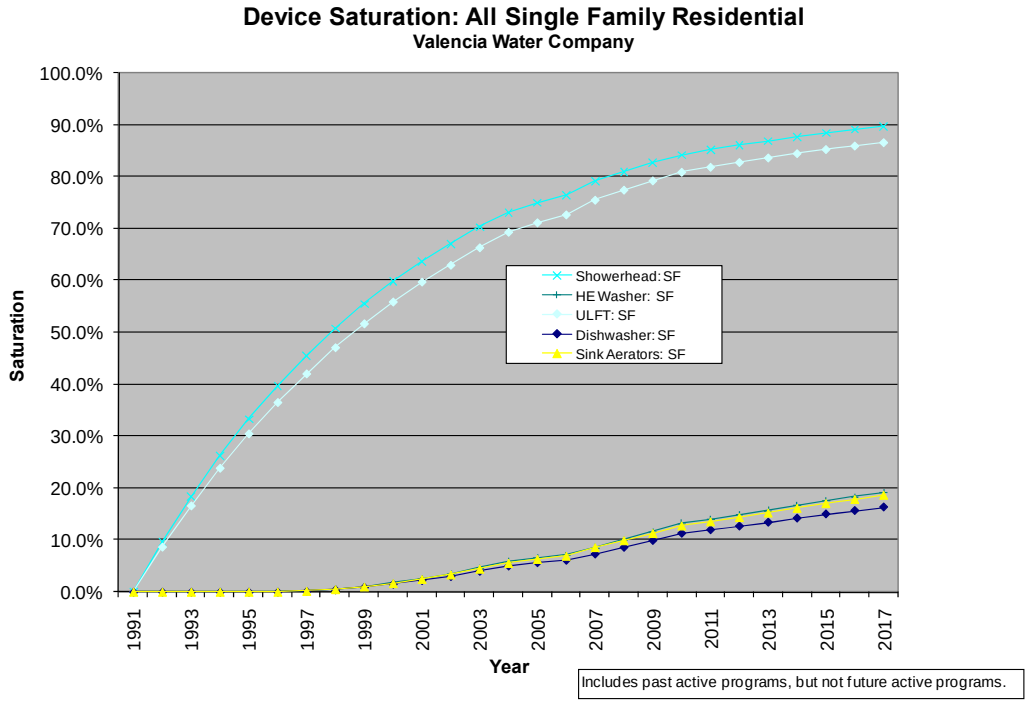


Figure 3.8 Device Saturation: Valencia Water Company Single Family Customers

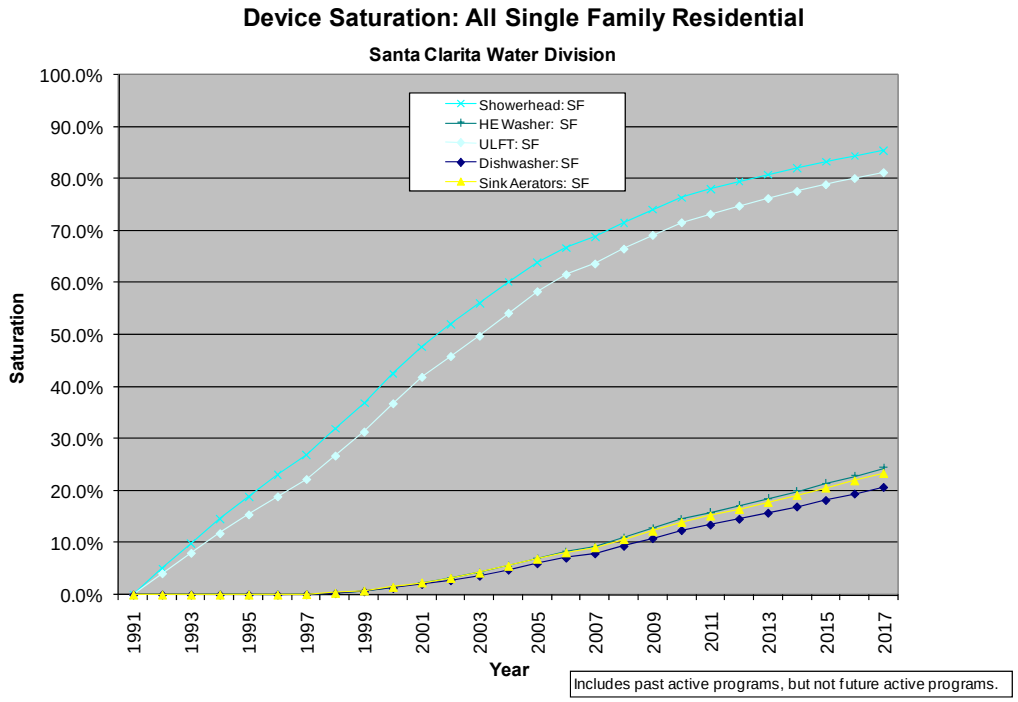


Figure 3.9 - Device Saturation: Santa Clarita Water Division Single Family Customers

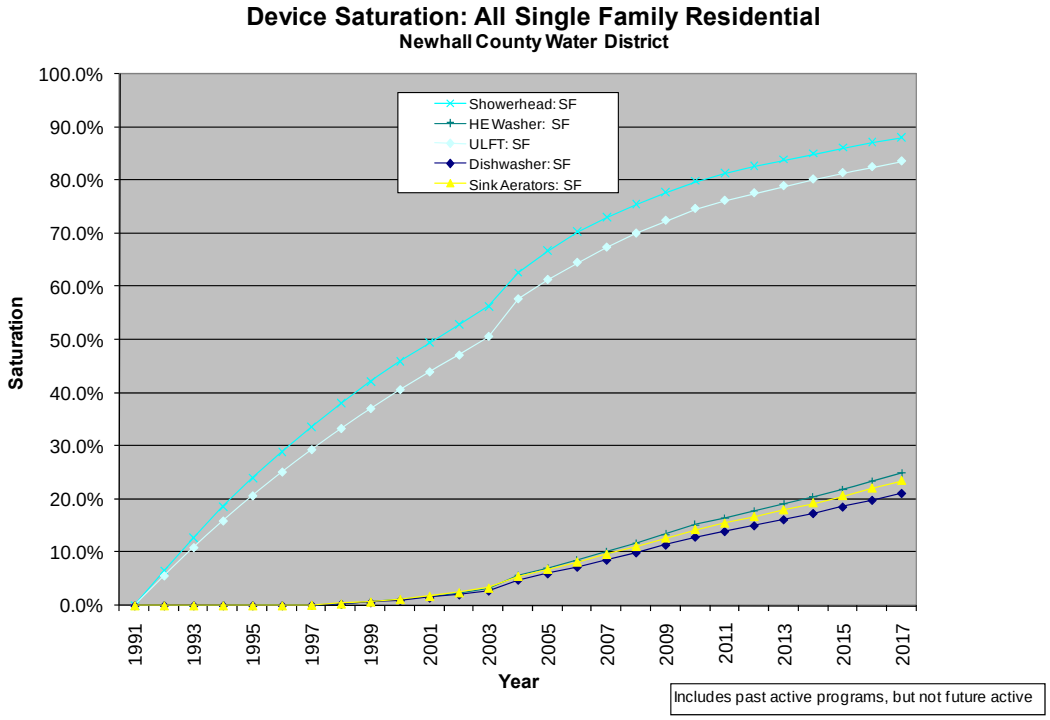


Figure 3.10 - Device Saturation: Newhall County Water District Single Family Customers

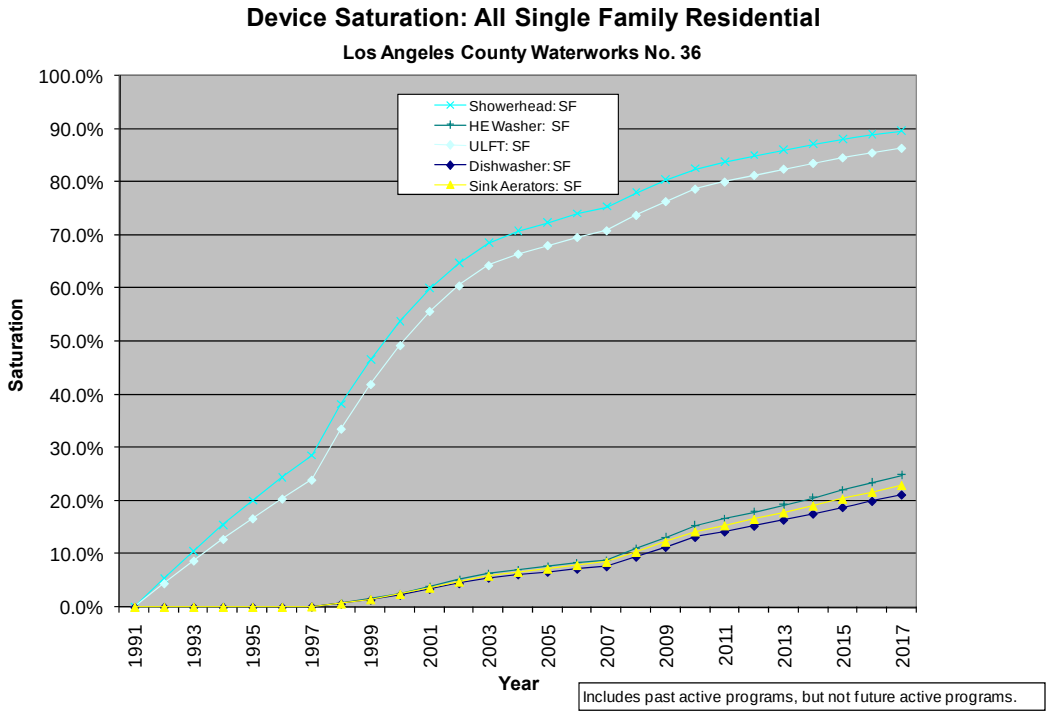


Figure 3.11 - Device Saturation: LA County Waterworks No. 36 Single Family Customers

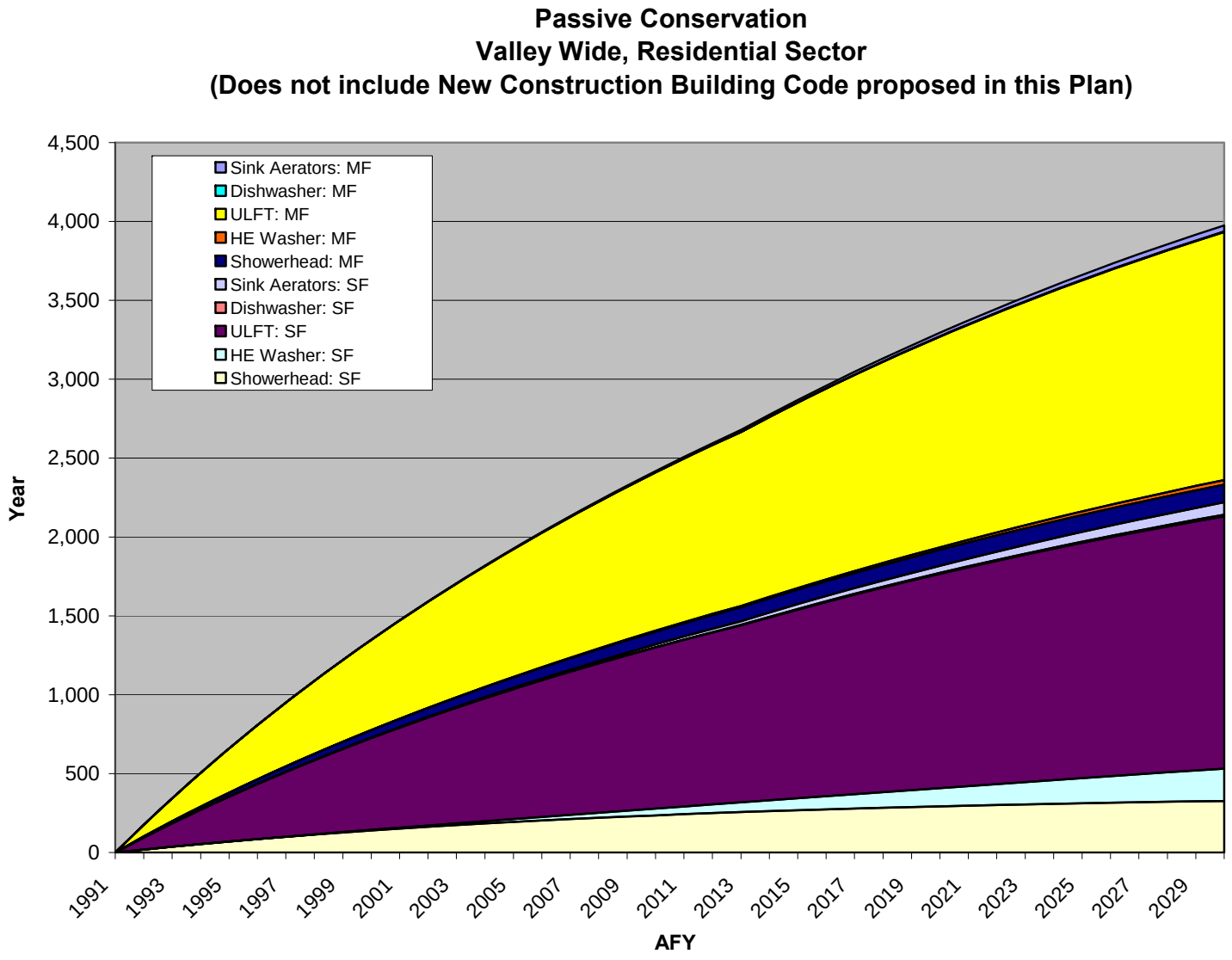


Figure 3.12 – Passive Conservation in the Valley, Residential
(Note: "ULFT" includes high efficiency toilets after 2014 due to the planned change in plumbing code.)

Using Customer Demand Profiles for Conservation Planning

In conclusion, the project team first analyzed water use and device saturation in order to develop programs that achieve savings above what would be achieved otherwise. The water use analysis lays the foundation for estimating the potential water savings and cost-effectiveness of alternative WUE programs—a necessary ingredient for a defensible and sensible WUE Strategic Plan

CHAPTER 4: AVAILABLE CONSERVATION MEASURES

After completing the data collection process, the project team conducted analyses of water conservation measures that might present opportunities for the Santa Clarita Valley Family of Water Suppliers. The objective was to identify opportunities for future water savings that might be achieved either through active conservation programs or new construction building code.

- Maureen Erbeznik summarized and analyzed a broad set of conservation measures that have been successful in the past in many types of active conservation programs (Conservation Measures Guide).

- John Koeller summarized several existing water conserving building codes from around the country and he provided commentary on a range of new technologies.

Potential Conservation Measures

In order to determine the optimum prospects for Santa Clarita Valley, the project team assembled a list of conservation technologies and practices (measures) that are currently available in the industry. Many of the measures have extensive performance histories while other options are emerging technologies with a shorter record of performance.

For the first Stakeholder Meeting, the project team distributed a *Conservation Measure Guide* providing an overview of conservation technologies for consideration. The list of measures was broadly cast to include the important conservation technologies with either a track record of performance, or strong potential for future conservation. The *Conservation Measure Guide* is provided in Appendix A.

Note that the listed products are presented independent of any particular conservation "program". Conservation programs are a more inclusive concept that specifies not only the conservation measure or measures but also a delivery mechanism—how can customers be induced to enact water efficiency measures? Figure 4.1 presents a range of delivery mechanisms from providing information, to incentives, to direct installation, to legal requirements. Conservation programs can include multiple products with overlapping administrative requirements, marketing, delivery, and verification mechanisms. Conservation programs are the topic of the following chapter.

Figure 4.1 - Delivery Mechanism for Conservation Measures

The *Conservation Measure Guide* focused on water use efficiency measures and did not directly address supply-side efficiency measures such as distribution system loss control programs or system pressure control programs. The reader should note that BMP 3—that addresses system delivery efficiency—has been undergoing revision in the last year.

Similarly, water rate reform—though not separately itemized on the Measures Guide—can play an important part in providing incentives for customers to participate in conservation programs. Water rates and conservation (tiered rates, water budget-based rates, and drought pricing) are addressed in Appendix D. An example of the cost and savings attributable to a water budget-based tier rate was also conducted.

The project team made informed decisions about which of the conservation measures might be applicable to the Santa Clarita Valley using: 1) stakeholder input; 2) data about the market described in Chapter 3; and 3) professional experience developing, implementing, and evaluating conservation programs. In general, the measures were not selected for further consideration if: 1) they did not have a relevant application to Santa Clarita Valley's territory; 2) they did not have the potential to deliver a meaningful volume of water savings; or 3) they had little chance of being cost-effective.

Tables 4.1 and 4.2 summarize the conservation measures considered and not considered for further inclusion in the Plan.

Table 4.1 - Measures Selected for Further Consideration

Measure	Action Taken
Showerheads (less than 2.5 gpm)	Added into proposed new building code
Aerators (less than 1.5 gpm)	Added into proposed new building code
High Efficiency Toilets	Recommended measure for active program and building code. Above code technology. Target pre-1992 buildings. Ideal for rebate program design. Savings based upon moving from non-ULF to high efficiency fixture.
High Efficiency, Zero Consumption and Ultra Low Flush Urinals	Above code technology. Recommend adding measure in Customized Incentive Program.
Cooling Tower Conductivity and pH Controllers	Not enough volume to support stand-alone program therefore recommend inclusion as a measure in Customized Incentive Program
Connectionless Food Steamers	Not enough volume to support stand-alone program therefore recommend inclusion as a

	measure in Customized Incentive Program
Water Efficiency Ice Makers	Still need to substantiate savings and market conditions. Not enough volume to support stand-alone program therefore recommend for inclusion as a measure in Customized Incentive Program
Residential Efficient Dishwashers	Added into proposed new building code
Commercial Efficient Dishwashers	Not enough volume to support stand-alone program therefore recommend for inclusion as a measure in Customized Incentive Program
Steam Sterilizers	Not enough volume to support stand-alone program therefore included as a measure in the Customized Incentive Program
Water Brooms	Not enough volume to support stand-alone program therefore included as a measure in the Customized Incentive Program
Industrial Process Water Use Improvement	Limited number of customers due to small market but high savings per customer therefore recommended as a customized incentive program.
Wet Cleaning	Included as part of Industrial Process Water Use recommendations. (See the CII Audit Program.)
Weather Based Irrigation Controllers (WBICs)	Selected measure. Volume of savings for both residential and commercial is significant – a large opportunity in the Valley. Recommendations for New Construction Standards include WBICs.
Car Wash Reclaim Water Systems	Many customers already implemented on their own. Screen customers and include as part of the industrial program. Note that Car Washes are covered within the CII Audit Program
Hot Water Distribution or Recirculation Systems	Per unit savings too low to justify retrofit program. Consider for building code.
Pool covers	Per unit savings too low to justify program. Consider for building code.
Drip or Low Precipitation Irrigation System	Customer education included in overall marketing and audit program. Retrofit costs too high (and required program costs) to justify its own program. Consider for building code.
Turf Buy Back	Volume of technical potential water savings was significant and Stakeholder expressed strong interest Economic savings potential is limited due to cost. (See Cash for Grass.)
Artificial Turf	Initially selected measure. Volume of savings significant and strong Stakeholder interest (see

	Cash for Grass).
Residential High Efficiency Clothes Washers	Selected measure due to customer demand.
Industrial Laundries	Selected measure. Covered by Industrial Audit Program.

Table 4.2 - Measures Not Selected for Further Consideration

Measure	Rationale
Low Flow Showerheads (2.5 gpm)	Code since 1992
Low Flow Aerators (1.5 gpm)	Code since 1992
ULF Toilets (1.6 gallons per flush)	Code since 1992 Over 40 percent of housing units built post 1992
ULF Urinals(1 gallon or less per flush)	Code since 1992
Pre-rinse Spray Valves	Code since 2006. High saturation from CUWCC installation program.
X-ray Film Processing Recycling Systems	Health care facilities moving to digital. Cannot justify lifetime savings.
Commercial High Efficiency Clothes Washers	Code
Water Softeners	New self-regenerating units banned in SCV since 2003. Rebate to voluntarily remove in place since 2005 by LA County Sanitation Districts.

New Construction Building Code

John Koeller, an expert on water conservation standards presented a review of alternative standards for new construction to the SCV water suppliers on August 27, 2007. This informational presentation addressed recent conservation related developments in building standards in California and the country, and concluded with a question and answer period.

Table 4.3 details 2 tiers of possible recommendations and future considerations for new construction based on the Smart from the Start program being developed by CUWCC.

Among single-family and multi-family residential items in table 4.3, kitchen faucets, lavatory faucets, showerheads, High Efficiency (HE, 1.2 gpf) toilets, and dishwashers are explicitly modeled in the saving calculations for New Construction Building Code. Savings from the landscape recommendations are included in the savings calculations as a percent reduction based on the assumption that a set of devices is implemented. Further detail is provided in Appendix B.2. Clothes washers are not included in New Construction Code because they

generally are not included with new housing.

All of the recommendations that apply to the CII sectors are included in the savings calculations as a percent reduction based on the assumption that a set of devices is implemented pursuant to the New Construction Code. Further detail is provided in Appendix B.2.

Table 4.3 - Recommendations for New Construction Building Standards

	TIER 1 - "SMART"	*TIER 2 - "GENIUS"*	*FOR FUTURE CONSIDERATION*
INDOOR - PLUMBING			
Kitchen Faucets	**≤ 2.2gpm (EPAct 92 maximum)**	**≤ 2.2gpm (EPAct 92 maximum)**	
Lavatory Faucets	**Bathroom lavatory faucets: Maximum flow rate of 1.5-gpm. No minimum flow rate.**	**Bathroom lavatory faucets: Maximum flow rate of 1.0-gpm. No minimum flow rate.**	**Need to determine how to specify WaterSense-certified products while, at the same time, allowing for faucets with flow rates below the 0.8-gpm WaterSense minimum.**
Showerheads & Shower Systems	**Showerhead is defined as including the following types of emitters: a traditional showerhead, rain system, waterfall, bodyspray, bodyspa, or jet. Maximum flow rate is 2.5 gallons per minute for each.**	**Showerhead is defined as including the following types of emitters: a traditional showerhead, rain system, waterfall, bodyspray, bodyspa, or jet. Maximum flow rate is 2.0 gallons per minute for each. Systems or heads with a total flow rate below 2.0-gallons per minute shall include a thermostatic mixing valve matched and certified to the specific flow rate of that showerhead and/or system.**	**Waiting for WaterSense specification, which may not be available until late 2008 due to difficulty with defining satisfactory performance in a specification and test protocol.**
Shower Stalls	**Residential shower compartment (stall) in dwelling units: The total allowable flow rate from all flowing showerheads at any given time, including rain systems, waterfalls, bodysprays, bodyspas, and jets, shall be limited to the allowable showerhead flow rate as specified above (2.5-gpm) per shower compartment, where the floor area of the shower compartment is less than 2,500 sq.in. For each increment of 2,500 sq.in. of floor area thereafter or part thereof, an additional showerhead with total allowable flow rate from all flowing devices equal to or less than the allowable flow rate as specified above shall be allowed.** **Exception: Showers that emit recirculated non-potable water originating from within the shower compartment while operating are allowed to exceed the maximum as long as the total potable water flow does not exceed the flow rate as specified above.**	**Residential shower compartment (stall) in dwelling units: The total allowable flow rate from all flowing showerheads at any given time, including rain systems, waterfalls, bodysprays, bodyspas, and jets, shall be limited to the allowable showerhead flow rate as specified above (2.0-gpm) per shower compartment, where the floor area of the shower compartment is less than 2,500 sq.in. For each increment of 2,500 sq.in. of floor area thereafter or part thereof, an additional showerhead with total allowable flow rate from all flowing devices equal to or less than the allowable flow rate as specified above shall be allowed.** **Exception: Showers that emit recirculated non-potable water originating from within the shower compartment while operating are allowed to exceed the maximum as long as the total potable water flow does not exceed the flow rate as specified above.**	
Toilets	**WaterSense HET (provides for effective flush volume maximum of 1.28-gpf or less)**	**WaterSense HET <u>AND</u> effective flush volume maximum of 1.00-gpf or less**	
Urinals	**High-Efficiency Urinal (HEU): Maximum flush volume of 0.5 gallons**	**High-Efficiency Urinal (HEU): Maximum flush volume of 0.25 gallons**	**Wating for WaterSense specification for HEUs.**
Indoor Water Pressure (line pressure)	**50 psi maximum (static)**	**50 psi maximum (static)**	**Note that this maximim applies <u>only</u> to indoor plumbing.**
INDOOR - APPLIANCES			
Dishwashers	**Where an automatic dishwasher is provided, it shall be Energy Star labeled <u>AND</u> have a maximum water use of 5.8 gallons per full wash and rinse cycle.**	**Where an automatic dishwasher is provided, it shall be Energy Star labeled <u>AND</u> have a maximum water use of 5.0 gallons per full wash and rinse cycle.**	**Need to make water consumption data for each dishwasher model more readily available to builders and consumers. Currently, Energy Star Canada is the only known publicly available source. Average water consumption is on the decline; will have to update these requirements periodically.**
Clothes Washers	**Where a clothes washing appliance is provided, it shall be Energy Star labeled <u>AND</u> be listed at CEE Tier 2 or better (i.e., maximum water factor of 6.0 or better)**	**Where a clothes washing appliance is provided, it shall be Energy Star labeled <u>AND</u> be listed at CEE Tier 3 or better (i.e., maximum water factor of 4.5 or better)**	**Average water consumption is on the decline; will have to update these requirements periodically.**

Table 4.3 - Recommendations for New Construction Building Standards, continued

	TIER 1 - "SMART"	TIER 2 - "GENIUS"	FOR FUTURE CONSIDERATION
INDOOR - HOT WATER			
Recirculating System Central Manifold System Specified Distance to Water Heater	Engineered Parallel Piping system (central manifold): WITHOUT recirc loop - Trunk line from water heater to central manifold ≤5' all twigs ≤4 cups of pipe	Structured plumbing system: trunk line >3/4" diameter, with on demand circulation pump; twig lines <1/2" diameter, within 15' and 3 cups pipe	Needs further work to define requirements
Insulation	Insulate hot water pipes from water heater to kitchen R4 Insulate all hot water pipes R4 (required for all of the plumbing layouts; includes both above and beneath slab where applicable; beneath slab hot water pipes to be contained within a chaseway)	Insulate hot water pipes from water heater to kitchen R4 Insulate all hot water pipes R4 (required for all of the plumbing layouts; includes both above and beneath slab where applicable; beneath slab hot water pipes to be contained within a chaseway)	Insulation requirement for water heater to kitchen will be a California requirement by 2009.
INDOOR - OTHER			
Direct and Indirect Evaporative Coolers	1) Maximum water use shall be 6 gallons per ton-hour of cooling, as tested and listed at CEC Title 20 design conditions of 97.5F / 68.5F (drybulb/wetbulb). 2) Bleed systems are NOT allowed; must use a pump-out system to replace water in reservoir. 3) Water discharge must be based on time of operation, or measured TDS level in reservoir water. 4) System must use rigid media and Title 20 listed saturation (or cooling) efficiency of 75% or greater. 5) Water inlet line connecting to the reservoir shall not exceed 3/8" diameter. 6) Sump overflow line shall terminate at a location that is easily visible to building occupants, not connected directly to a wastewater pipe.	1) Maximum water use shall be 5 gallons per ton-hour of cooling, as tested and listed at CEC Title 20 design conditions of 97.5F / 68.5F (drybulb/wetbulb). 2) Bleed systems are NOT allowed; must use a pump-out system to replace water in reservoir. 3) Water discharge must be based on time of operation, or measured TDS level in reservoir water. 4) System must use rigid media and Title 20 listed saturation (or cooling) efficiency of 75% or greater. 5) Water inlet line connecting to the reservoir shall not exceed 1/4" diameter. 6) Sump overflow line shall terminate at a location that is easily visible to building occupants, not connected directly to a wastewater pipe. 7) Discharged water shall be used beneficially, such as watering landscape or added to a gray water system.	
Evaporative Cooled Central Air Conditioners	1) Maximum water use shall be 5 gallons per ton-hour of cooling, as tested and listed at CEC Title 20 design conditions of 97.5F / 68.5F (drybulb/wetbulb). 2) Bleed systems are NOT allowed; must use a pump-out system to replace water in reservoir. 3) Water discharge must be based on time of operation, or measured TDS level in reservoir water. 4) Water inlet line connecting to the reservoir shall not exceed 3/8" diameter. 5) Sump overflow line shall terminate at a location that is easily visible to building occupants, not connected directly to a wastewater pipe. 6) Condensate water from AC evaporation coils must be routed to the water reservoir for the evaporative cooling.	1) Maximum water use shall be 4 gallons per ton-hour of cooling, as tested and listed at CEC Title 20 design conditions of 97.5F / 68.5F (drybulb/wetbulb). 2) Bleed systems are NOT allowed; must use a pump-out system to replace water in reservoir. 3) Water discharge must be based on time of operation, or measured TDS level in reservoir water. 4) Water inlet line connecting to the reservoir shall not exceed 1/4" diameter. 5) Sump overflow line shall terminate at a location that is easily visible to building occupants, not connected directly to a wastewater pipe. 6) Discharged water shall be used beneficially, such as watering landscape or added to a gray water system. 7) Condensate water from AC evaporation coils must be routed to the water reservoir for the evaporative cooling.	
Water Softeners	If a water softener is installed, shall not use sodium as a basis for regeneration; demand-based regeneration required.	If a water softener is installed, shall not use sodium as a basis for regeneration; demand-based regeneration required.	Restrict the installation of water softeners to areas where water supply exceeds some justifiable, scientific level of need (e.g. 400 TDS).
Drinking Water Systems	NA	NA	Include reverse osmosis filter guidelines (efficiency = yield percentage). Guidelines on other types of equipment allowed & its efficiency etc. Limitations on quantity and placement of the RO taps.

Table 4.3 - Recommendations for New Construction Building Standards, continued

	TIER 1 - "SMART"	TIER 2 - "GENIUS"	FOR FUTURE CONSIDERATION
OUTDOOR - LANDSCAPING			
Sub-metering of Landscape Irrigation System	Dedicated irrigation meter for 10,000 sq ft or more of irrigated landscape.	Dedicated irrigation meter for 5,000 sq ft or more of irrigated landscape.	
Weather-Based Irrigation Controllers and System Efficiency	Weather-based irrigation controllers required for automated systems.	Weather-based irrigation controllers required for automated systems.	Irrigation system efficiency standards and periodic inspections
OUTDOOR - OTHER			
Swimming Pools	Where a pool or spa is provided, a pool/spa cover is required.	Where a pool or spa is provided, a pool/spa cover is required. Filter backwash water shall be treated to a quality level suitable for landscape application; system shall be in place for distributing such water to the on-site landscape.	Dedicated sub-meter for each pool/spa to identify water use and leaks.
ALTERNATE SOURCES OF WATER			
Cooling Condensate Reuse	Condensate from comfort (cooling) systems shall be captured for reuse and application to the landscape.	Condensate from comfort (cooling) systems shall be captured for reuse and application to the landscape.	
Greywater Reuse	Plumb for greywater capture and reuse (at a minimum, greywater source shall include the clothes washer/laundry room regardless of whether the builder provides the clothes washer appliance)	Plumb for greywater capture and reuse (at a minimum. Plumbed potential greywater source shall include the clothes washer/laundry room regardless of whether the builder provides the clothes washer appliance) Install an operational greywater capture, treatment and reuse system	
MUNICIPAL WATER SOURCE			
Municipally Reclaimed Water	Plumb the property for the distribution and use of municipally reclaimed water where such water is available within 500 feet of the dwelling. Uses shall include landscape irrigation and other interior uses as permitted by prevailing plumbing and health codes.	Plumb the property and dwelling for the distribution and use of municipally reclaimed water where such water is available within 1,500 feet of the dwelling. Uses shall include landscape irrigation and other interior uses as permitted by prevailing plumbing and health codes.	

CHAPTER 5: POTENTIAL PROGRAMS

Program Evaluation Criteria

The next step in the evaluation process was to determine the criteria that defined a successful program. Once defined, each of the potential programs would be screened and ranked according to these criteria.

During the Kickoff Meeting, representatives from all of the Santa Clarita Valley Water Suppliers collectively defined and prioritized a list of program evaluation criteria. Definitions were developed for each criterion. Each one was given a point value showing its relative importance in relation to the other listed criteria. The most sought-after characteristics were scored the highest with 5 points. The least received a score of 1 point.

The result of this process was the list of Program Evaluation Criteria found below.

Program Evaluation Criteria

5 points Reduces Water Use – The quantified water savings potential within a service area in terms of potential acre-feet saved per year and potential participation (number of existing customers, devices, retrofit opportunities, etc.).

5 points Cost Effective – (Cost/Yield, $/AF) –Santa Clarita Valley's cost to operate the program (administration, marketing, incentives and implementation) divided by the projected or actual water savings in acre-feet. Ideally, programs should cost less than the utilities' marginal cost of water.

5 points Stakeholder Support – The programs should be developed to encourage stakeholders in the Santa Clarita Valley to support the programs.

4 points Easy for Customers to Participate In (Implement-ability) - The offer must incentivize the customer to participate. It also must have a customer-easy process, a proactive marketing strategy, a well developed plan with goals, quality operations and stakeholder acceptability and commitment.

3 points Changes Long Term Behavior – Program services, technologies or pricing mechanisms have documented successes and measurements for water savings showing long term change in conservation behavior.

2 points Good Public Relations – Program provides heightened awareness and good will towards wholesale and retail water agencies and/or water conservation.

2 points Environmentally Sensitive (peak reduction, reduced wastewater discharges and urban runoffs) – Program delivers benefits beyond water savings that are of benefit to Santa Clarita Valley's residents.

1 point Easy to Explain to Customers – Programs must be easy to explain to customers so the message of conservation and program participation is focused and effective.

1 point Encourages Partnerships – Program is eligible for grant monies, shared program costs or other outside funding sources in order to lower program costs and increase cost effectiveness.

Potential Program Concepts

A conservation program, in its basic form, is the selection of a technology in combination with an outreach delivery system. Logically the next step in the process was to identify the optimal delivery method for each technology under consideration.

Program delivery types include the following:

- Rebates
- Direct Installation
- Give-Away Events
- Provide Training and/or Education Materials
- Public Media
- Ordinance and Legislation

The project team packaged conservation measures from the *Conservation Measures Guide* with the Delivery Mechanisms listed above into a set of Programs. These programs, along with existing programs, were evaluated using the Program Evaluation Criteria and presented at Stakeholder Workshop #1 for feedback.

Table 5.1 shows the conservation programs that were developed and it provides summary description of the program's elements.

Table 5.1 Overview of Conservation Programs

PROGRAM NAME	STATUS	TECHNOLOGY	CUSTOMER OFFER	TARGET MARKET	SERVICES PROVIDED	OTHER BENEFITS
Recommended Programs						
High Efficiency Toilet Rebates	New/ Modified	High Efficiency Toilet	Single- and Multi-Family Rebates ($100)	Single family, Multi-family, and mobile homes.	Rebate administration.	Wastewater reduction
Large Landscape Audits with Incentives	New/ Modified	Audits, incentives for conservation equipment and measures.	Comprehensive landscape audit; $300/AF rebate for savings	Dedicated Landscape Meters, especially Large sites.	Customer contact, audits, incentive administration.	Peak-Season Savings; Runoff reduction
CII Audits and Customized Incentives	New / Modified	Audits, process improvements, conservation equipment incentives.	Audits and $300/AF rebate for savings	Commercial, Industrial, and Institutional Customers	Extensive customer contacts, scoping audit, comprehensive audits; rebate administration.	Peak-Season Savings; Runoff reduction ; Wastewater reduction
Landscape Contractor Certification	Modified	Weather-Based Irrigation Controllers; Conserving Sprinkler heads	Landscape contractor training; free WBICs and Sprinkler heads	Residential, Commercial, Institutional, and Large Landscape Customers	Training landscape contractors, equipment provision, verification and inspections.	Peak-Season Savings; Runoff reduction
High Efficiency Clothes Washer Rebates	New	High Efficiency Clothes Washers	Rebate $65/ HE Clothes Washer	Residential	Rebate administration, site inspections	Wastewater Reduction
New Construction Building Code	New	HE Toilets, landscape conservation, faucet aerators, showerheads, HE dishwashers	Required in new construction	All	Consistent new construction requirements; coordination with County.	Peak-Season Savings; Runoff reduction; wastewater reduction.

Table 5.1 Overview of Conservation Programs						
PROGRAM NAME	STATUS	TECHNOLOGY	CUSTOMER OFFER	TARGET MARKET	SERVICES PROVIDED	OTHER BENEFITS
Programs to Consider Further						
Cash for Grass	New	Turf replacement	$0.45 per sq.ft. incentive to customer	Residential, Commercial, and Institutional Sectors	Pre- and post-inspection, rebate administration	Peak-Season Savings; Runoff reduction
Industrial Process Audits and Incentives	New/ Modified	Audits, incentives for conservation equipment and measures.	Comprehensive audit; $300/AF rebate for savings	Commercial and Industrial	Customer contact, audits, incentive administration.	Wastewater reduction; Peak-Season Savings; Runoff reduction
HET Rebates, Aggressive Implementation	New/ Modified	High Efficiency Toilet	Single Family Rebates ($150), Multi-family and Mobile home rebate ($200)	Single family, Multi-family, and mobile homes, Non-ULFT households (pre-1992)	Rebate administration; phone support to identify pre-1992 fixtures; spot checks	Wastewater reduction

Stakeholder Workshop #1

With the criteria developed and list of preliminary program concepts completed, the next step was to hold the first of two scheduled Stakeholder Workshops. The primary goal of the Workshop was to secure feedback on the overall Master Plan process, the Conservation Measures Guide, and the programs as preliminary concepts. Stakeholder Workshop #1 was held on September 18, 2007. Invitations to attend were sent to Santa Clarita Valley customer groups, environmental groups, water conservation vendors, and local and state agencies.

At the workshop, Santa Clarita Valley staff along with the A&N consultant team walked attendees through a PowerPoint presentation that detailed the reasons for a Master Conservation Plan; the process to develop the Plan; promising markets and technologies; and preliminary program concepts. The presentation can be found in Appendix C.

At the end of the meeting, stakeholders were given the Stakeholder Feedback Form and asked to rank the top three programs and provide additional input as to programs that they believed were important to include in the master plan and reasons why.

In their feedback, attendees ranked the top seven programs as priorities:

1. High Efficiency Toilet Rebate Program
2. Large Landscape Audit & Customized Incentive Program
3. Landscape Contractor Certification and WBIC Distribution Program
4. CII Audit & Customized Incentive Program
5. Mandatory Indoor/Outdoor Efficiency Standards
6. Cash for Grass
7. Water Budgets

Attendees also provided comments on each of the above programs as well as general comments.

Development of Detailed Program Modules

Based upon the feedback gained during Stakeholder Workshop #1, the preliminary selection of seven programs was validated and the list remained intact. The project team undertook the next step to develop a comprehensive overview and evaluation of every one of the recommended programs. Each program overview was expanded to include specific details regarding market potential, productivity levels, annual and lifecycle water savings, costs per unit and overall budget.

Stakeholder Workshop #2

Stakeholder Meeting #2 was held December 11, 2007. The primary objectives of the meeting were to:

1. Review the additional information for each preliminary program concept
2. Perform a final evaluation and ranking of the list of programs
3. Provide any additional feedback

The project team, with the aid of a PowerPoint presentation, walked stakeholders through the details for each of the recommended programs. Following the presentation, an open forum discussion was held to solicit feedback and concerns from attendees.

Table 5.2 depicts the Stakeholder Feedback Form used in this meeting to elicit feedback on the Conservation Programs.

Table 5.3 shows the how the programs were scored using the Stakeholder Criteria defined above. The column labeled Stakeholder Feedback is the average of the stakeholder scores collected with the Stakeholder Feedback Forms (adjusted to be commensurate with the 5 point scale).

Table 5.2 Stakeholder Feedback Form

Santa Clarita Valley Family of Water Suppliers
Water Conservation Strategic Plan

Ranking of New Proposed Programs

Program	Ranking *1-7 7 being best*	Comments
High Efficiency Toilet Rebate Program		
Large Landscape Audit & Customized Incentive Program		
Landscape Contractor Certification and WBIC Distribution Program		
CII Audit & Customized Incentive Program		
Mandatory Indoor/Outdoor Efficiency Standards		
Cash for Grass		
Water Budgets		

Additionally we would like to hear about other products or programs you are interested in, please write down any of your ideas.

Note: It was explained verbally that Mandatory Efficiency Standards would be implemented through standards for New Construction.

Table 5.3 – Program Evaluation Matrix

Program	Reduces Water Use (Certainty of Savings)	Reduces Water Use (Volume of New Potential Savings)	Cost Effective (Cost/Yield $/AF)	Stakeholder Support	Easy for Customers to Participate	Changes Long Term Behavior	Good Public Relations	Environ-mentally Sensitive	Easy to Explain to Customers	Encourages Partnerships	Weighted Point Score
Weights → / Programs ↓ / Points ↘	5		5	5	4	3	2	2	1	1	
Recommended New Programs											
HET Rebates, Single Family	5	3	3	3	5	5	5	3	4	2	11.9
HET Rebates, Multi-Family	5	2	4	3	5	5	5	3	4	2	12.2
Large Landscape Audits (w/ Incentives)	4	5	3	4	3	3	4	4	3	3	10.9
CII Audits and Customized Incentives	4	3	3	3	3	4	4	3	3	3	10.1
Landscape Contractor Certification (WBIC & Sprinklerheads)	4	4	4	3	5	3	5	4	3	3	11.7
HE Clothes Washer Program (1)	5	2	2	3	5	5	5	4	5	3	11.5
Building Code for New Construction (1)	5	5	5	3	3	5	3	4	3	3	12.4
Programs to Consider Further											
Cash for Grass	5	5	1	2	3	4	5	4	5	3	10.2
Industrial Process Audits and Incentives (1)	5	2	3	3	2	5	3	4	4	3	10.2
HET Rebates, Aggressive Implementation	5	3	3	3	5	5	5	3	4	2	11.9
Water Budgets	3	5	3	3	2	4	4	2	2	1	9.3
Programs Considered, but Not Recommended											
Untargeted ULFT Rebate Program (1)	5	1	2	3	5	5	5	3	4	2	10.8
Untargeted HET Rebate Program (1)	5	2	3	3	5	5	5	3	4	2	11.6
Toilet Give-Away Programs (1)	5	1	2	3	4	5	5	3	3	3	10.3
Toilet Direct Install Program (1)	5	2	2	3	5	5	5	3	3	2	10.9
Residential Audit Program (1)	3	1	1	3	3	1	5	2	3	2	7.1
Existing Programs											
HET Rebate (1)	5	1	2	3	5	5	5	3	4	2	10.8
Free Residential Audit (VWC) (1)	3	1	1	3	3	1	5	2	3	2	7.1
Retrofit Devices (1)	5	2	3	3	4	3	5	3	4	2	10.5
WBICs (1)	4	5	4	3	3	4	5	4	2	3	11.5
Education and Schools (1)	2	3	3	3	5	5	5	3	5	2	11.2
Media Partnership (1)	1	3	3	3	5	3	5	3	5	2	10.2
CII Audits (1)	3	1	1	3	3	1	5	2	3	2	7.1
Pre-Rinse Spray Nozzles (1)	5	1	4	3	5	4	5	4	4	3	11.9
Landscape Training (1)	3	4	3	3	3	3	4	4	3	3	10.1
Demonstration Garden (1)	2	2	3	3	3	4	5	4	4	3	9.9

(1) Not used in original stakeholder elicitation. Average Stakeholder support is assumed.

CHAPTER 6: RECOMMENDED PROGRAMS

Program Mix Considerations

In addition to the elements of effective programs discussed in Chapter 5 and tabulated in Table 5.3, there were additional considerations that went beyond the boundaries of the program impacting the quality of the overall portfolio. Staff identified the following three additional portfolio considerations:

Program Mix Considerations

1. **Integrates into the Long Term Water Resources Plan-** Program neatly fits into the long term objectives of the water resource plan.

2. **Adds to the Overall Technology Mix of Programs.** Program expands the list of programs in various lifecycle stages (R&D, feasibility, pilot program, innovative technology, full scale)

3. **Contributes to the Goal of a Comprehensive Portfolio of Programs Targeting All Market Segments Including Hard-to-Reach Markets –** Program fills a desired "niche" in the overall portfolio that otherwise would not be addressed.

With final stakeholder input and program ranking completed, the project team then factored in practical aspects of program implementation. Elements that were considered in the final program review were:

- Budget implications
- Staffing requirements
- Variety in portfolio
- Transitioning existing program

The final selection of programs is listed below.

- **HET Rebates (Single and Multi-Family)**
- **Large Landscape Audits (w/incentives)**
- **CII Audits and Customized Incentives**
- **Landscape Contractor Certification (WBIC & Sprinkler-heads)**
- **HE Clothes Washer Rebates**
- **New Construction Building Code**
- **Valley-Wide Marketing**

Table 6.1 provides the Five Year Implementation Plan for the proposed conservation programs including the required budget and programs savings.

Table 6.1 - Five Year Implementation Plan: Savings and Annual Budget

Program	2009	2010	2011	2012	2013
HET Rebates					
Savings (AFY)	15	31	46	61	76
Large Landscape Audits (w/ Incentives)					
Savings (AFY)	38	76	115	153	191
CII Audits and Customized Incentives					
Savings (AFY)	53	105	158	210	263
Landscape Contractor Certification (WBIC & Sprinklerheads)					
Savings (AFY)	50	151	301	502	753
HE Clothes Washer Rebates					
Savings (AFY)	5	11	16	21	26
New Construction Code					
Savings (AFY)	445	911	1,397	1,682	1,978
Total Annual Savings (AFY)[1]	607	1,284	2,033	2,629	3,287
Total Annual Budget (in Thousand $)	$ 743	$ 820	$ 823	$ 903	$ 983

[1] Total Annual Savings are those produced in the first five years from program implementation over the first five years. Savings after five years continue due to device lifespans that exceed five years and due to future program implemenation over the course of the planning period.

Conservation Program Costs and Savings

The conservation program cost benefit analysis is provided in Table 6.2 below.

Table 6.2 – Active WUE Program Costs and Savings

Program	Total Costs, Present Value	Lifetime Savings (AF)	Total Benefits, Present Value	Net Benefit (Benefit - Costs)	Benefits/Costs
HET Rebates, Single Fami	$ 399,406	1,364	$ 703,415	$ 304,009	1.8
HET Rebates, Multi-Family	$ 470,981	2,859	$ 1,474,335	$ 1,003,354	3.1
Large Landscape Audits (w	$ 2,621,163	8,400	$ 4,499,900	$ 1,878,737	1.7
CII Audits and Customized	$ 4,499,560	11,563	$ 6,194,075	$ 1,694,515	1.4
Landscape Contractor Cert	$ 3,202,176	26,596	$ 14,543,471	$ 11,341,294	4.5
HE Clothes Washer Rebate	$ 313,765	632	$ 351,542	$ 37,777	1.1
Valley-Wide Marketing Cos	$ 278,751				
tal Costs, Active Programs	$ 11,785,802				
l Benefits, Active Programs		51,414	$ 27,766,737		
Benefit Cost Analysis				$ 15,980,935	2.4
New Construction Code		87,348			
Total w/ Marketing and New Construction Co		138,762			

Note: For active programs, total unit cost (Present Value Costs divided by Present $354 /AF

Below are definitions of the terms listed above:

Total Costs, Present Value: The present value of all direct program costs
Lifetime Savings (AF): Cumulative water savings over all estimated participants
Total Benefits, Present Value: The present value of program benefits, taken over the lifetime savings.
Net Benefits: The difference between benefits and costs.
Benefit Cost Ratio: Benefits divided by costs.

Water Savings from Recommended Water Use Efficiency Programs

Figures 6.1 to 6.4 provide depictions of the future water savings through time of

- Active Conservation Programs
- New Construction Building Code
- Price-Induce Conservation
- All Savings Combined of the WUE Strategic Plan

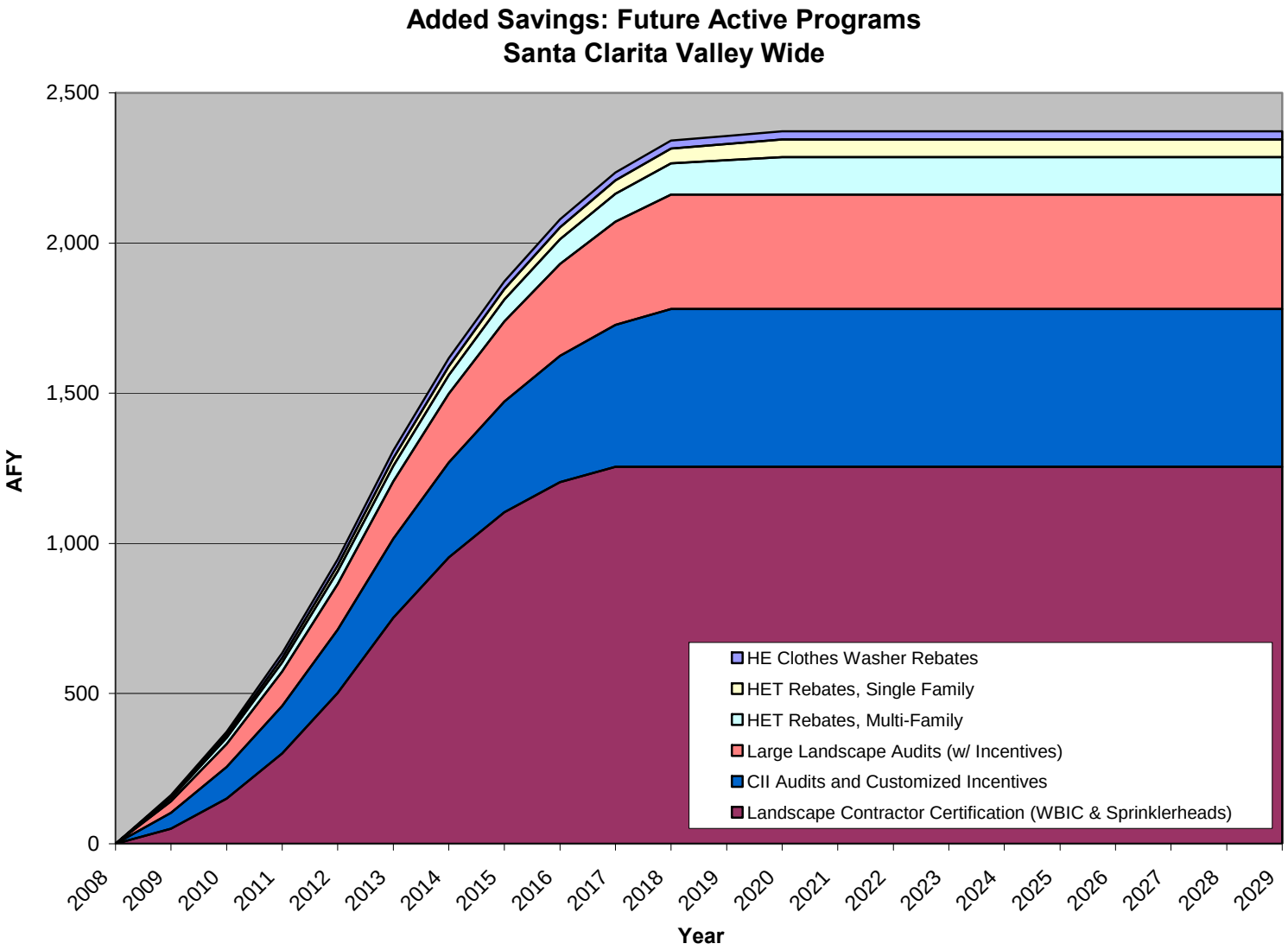


Figure 6.1 – Recommended Active Conservation Program Future Savings

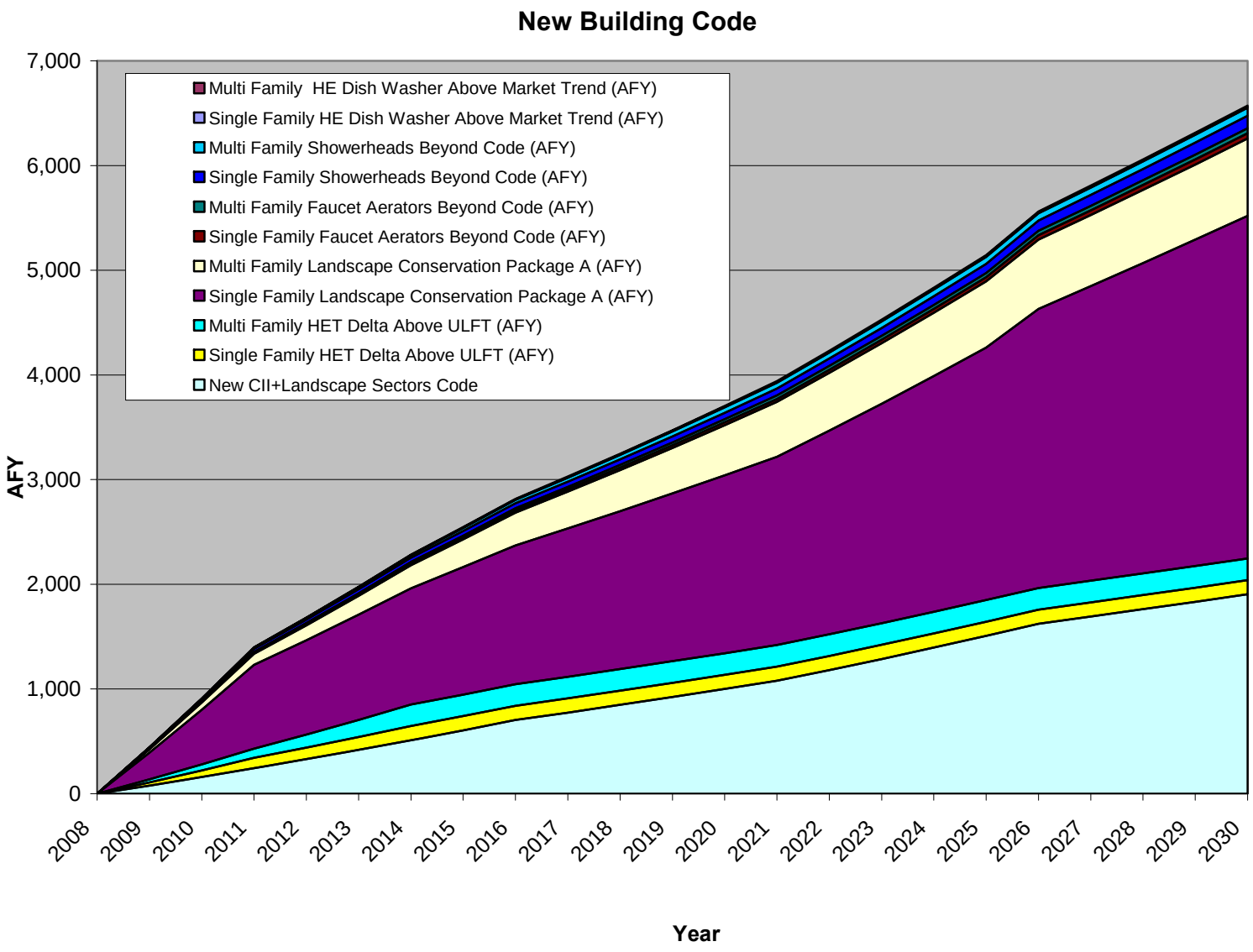


Figure 6.2 – Recommended New Construction Building Code Future Savings

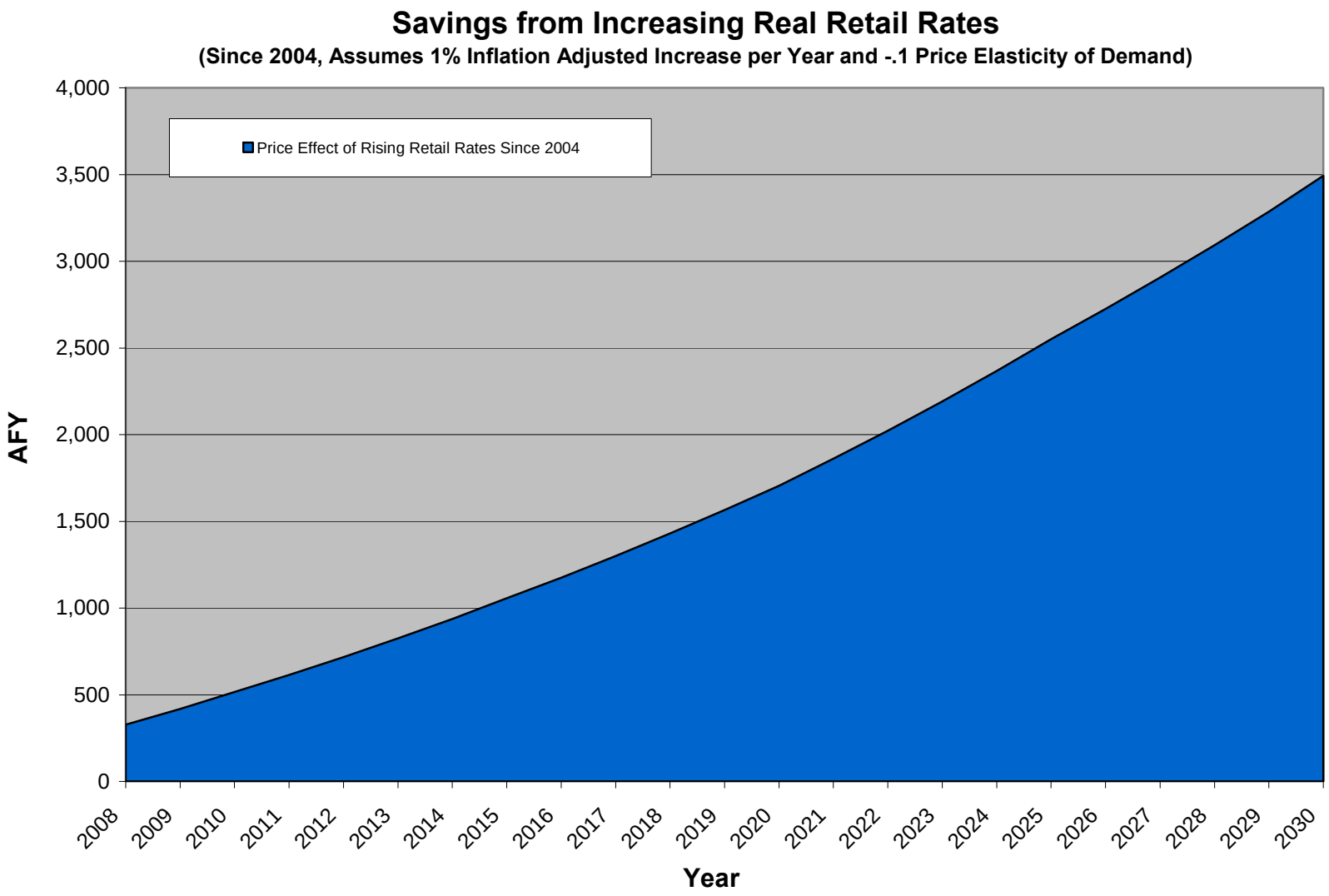


Figure 6.3 – Effect of Price-Induced Conservation Savings

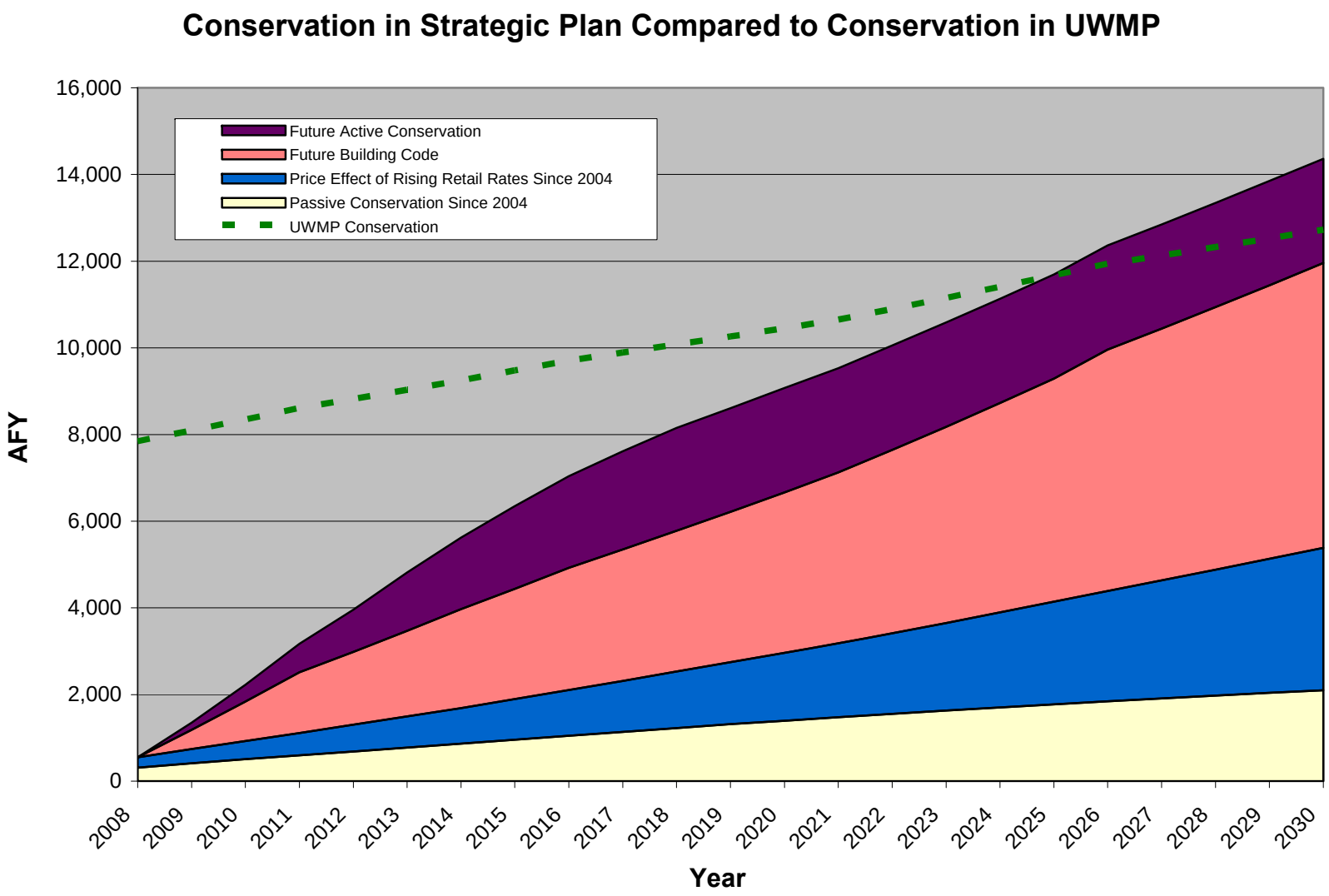
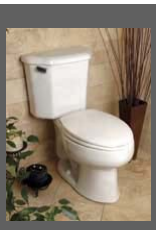


Figure 6.4 – Savings from the WUE Strategic Plan

Recommended Conservation Program Details

On the following pages are conservation program overviews with information regarding market opportunity, measure and program water savings and costs. Additionally there is information regarding program design and implementation requirements.



Solution for BMP 2

Santa Clarita Valley High Efficiency Toilet Rebate Program

Why Offer This Program?

Although the Santa Clarita Valley has an estimated 66 percent saturation rate for water efficient toilets (67 percent of single family toilets and 64 percent of multi-family toilets), there is significant opportunity for water savings in targeting the remaining old toilets, and saving even more water by promoting new "High Efficiency Toilets" throughout the service area.

Since 1992, only ULF toilets can be sold in the United States. Although this was a major advancement in residential water efficiency, there is still more that can be achieved. It is time to "raise the bar" and promote the newer high efficiency toilet (HET) technology which saves even more water.

The Santa Clarita Valley has a high percentage of new housing stock with 40 percent of single family and 33 percent of multi-family housing units built after 1992. As a result, these homes already utilize water saving ULF toilets. The savings opportunity lies within older residential sites that are utilizing non-ULF toilets.

Program Design

This is an open rebate program for residential customers, budgeted at approximately 500 rebates per year. Customers will be offered the following incentives for replacing a non-ULFT with an HET:

- Single family = **$100** rebate
- Multi-family and mobile home = **$100** rebate for HET replacement

Customers would be able to download program application form from utility website. Once new product is purchased and installed, customer completes application form and attaches original receipts. Then, the customer would be sent a rebate check or get a credit on their water bill.

New or Existing?	***Technology***	***Target Market***
Modified Program	High Efficiency Toilets	Single, Multi, Mobile home Non-ULFT households

Market Data

Pre 1992 Toilets: Single Family

	Total Toilets	Remaining non-ULF Toilets	Percent Remaining of Pre-1992	All Toilets	Remaining Potential Savings AFY
VWC	50,186	13,725	47%	73%	307
SCWD	41,238	15,813	47%	62%	354
NCWD	20,565	7,291	47%	65%	163
LA36	2,600	790	46%	70%	18
Total SF	114,589	37,619	47%	67%	843

Pre 1992 Toilets: Multi-Family

	Total Toilets	Remaining non-ULF Toilets	Percent Remaining	All Toilets	Remaining Potential Savings AFY
VWC	11,741	2,740	46%	77%	61
SCWD	31,148	11,838	46%	62%	265
NCWD	5,960	3,090	46%	48%	69
LA36	179	97	46%	46%	2
Total MF	49,027	17,764	46%	64%	398
Grand Total	163,616	55,383	46.5%	66.2%	1,241

Program Production

HET Rebates: Single-Family

	2009	2010	2011	2012	2013	5-Year Total
VWC	105	105	105	105	105	524
SCWD	104	104	104	104	104	522
NCWD	37	37	37	37	37	185
LA36	5	5	5	5	5	25
Total	251	251	251	251	251	1,256

HET Rebates: Multi-Family

	2009	2010	2011	2012	2013	5-Year Total
VWC	105	105	105	105	105	524
SCWD	104	104	104	104	104	522
NCWD	37	37	37	37	37	185
LA36	5	5	5	5	5	25
Total	251	251	251	251	251	1,256

Program Savings

A total of 2,512 HETs would be installed in the first five years of the program. A total of 6,030 HETs with the ongoing program of 500 per year until 2019 will save a total of **4,223 acre-feet** of water over the life of the product.

Program Costs

HET Rebate Program Cost per Acre Foot =

$475/acre-foot Single Family

$267/acre-foot Multi-Family

Santa Clarita Valley Large Landscape Audit & Incentive Program

Solution for BMP 5

Why Offer This Program?

In the Santa Clarita Valley, a high percentage of water is used for outdoor irrigation. Despite this high water use customers have little understanding of ways to alleviate excessive watering while still maintaining the health of their plants and turf.

Large landscape sites can be categorized into two types: public and private sector. Private sector customers, both property owners and Homeowner's Associations, typically pay landscape professionals to keep their grass green. They do not control the irrigation, the landscape companies do. On the flip side the landscape companies do not pay the water bill and have no incentive to reduce water use. To achieve success we must get both the landscape professional and the property owner engaged.

Public sector sites such as parks are typically maintained by city staff and require a somewhat different approach than private sector. The program must obtain support from multiple departments and staff levels.

Program Design

The program will offer water audits, minor repairs, equipment incentives, and water budgeting to public and private sector large landscape sites with high water use. At the onset the key targets will be the City of Santa Clarita Landscape Maintenance Districts, Los Angeles County Parks and Homeowner's Associations.

Targeted customers, both public and private sector, will be contacted via phone to solicit participation. Private sector customers will be asked to invite their landscape service company to the audit whereas public sector customers will be asked to invite the on-site maintenance staff and their respective supervisors.

During the audit process, the field auditor will assess the efficiency of the irrigation system and identify leaks and repair opportunities. Minor repair of problems such as broken sprinkler lines and faulty spray heads will be performed.

Following the site visit, an analysis of the irrigation system's efficiency will be conducted to determine the proper watering schedule for the landscape. In addition a water budget will be developed based upon the size of their landscape. Using the information from the site visit and the analysis, a report will be generated with upgrade recommendations, available incentives, new irrigation schedules, a water budget and a cost/benefit analysis. If possible the report will be delivered in person to further educate the customer. In addition customer will be provided with regular communication regarding their performance to budget.

Included in the report will be an application for available incentives. The available incentives include: high efficiency nozzles and weather based irrigation controllers. In order to maximum the incentive it is

recommended that the incentive be customized based upon the customer's site and paid at a per acre foot saved valve. Using the report as back up documentation the customer would submit the application for incentive reimbursement. Then, the customer would be sent a rebate check or get a credit on their water bill.

New or Existing?

New program (existing pilot with the City of Santa Clarita)

Technology and/or Service

- Audit
- Installation of efficient spray nozzles and weather based irrigation controllers
- Irrigation system minor repairs
- Water budgeting

Target Market

Residential & commercial customers with 2 or more acres of irrigated landscape.

Program Production

Production	2009	2010	2011	2012	2013	5 Year Total
Initial Contact	140	140	140	140	140	700
Audited Sites	28	28	28	28	28	140

Program Savings

The 140 landscape audits in the first five years of the program, and another 140 in the second five years, will result in **8,400 acre-feet** in a program that sustains constant savings through 2030. [2]

Program Costs

Large Landscape Audit and Incentive Cost per Acre Foot = **$486/acre-foot**

[2] Lifetime savings result from 280 audits in the first ten years, and a total of 615 audits in a program that replicates at the end of savings life to sustain constant savings through 2030.

Santa Clarita Valley CII Audit & Customized Incentive Program

Solution for BMP 9

Why Offer This Program?

Approximately 19% of Santa Clarita Valley water is consumed by Commercial and Industrial customers. Unlike the residential market, commercial and industrial sites vary widely in their functionality and water consuming equipment.

As a result, water efficiency programs need to go beyond the menu-based programs to also allow customized incentives for site-specific opportunities. Because this is a smaller customer segment for Santa Clarita it is all the more important for the program to be tailored to the customer to identify the best opportunities.

Program Design

The program will offer comprehensive water audits and reporting of cost effective recommendations in a clear and concise format with a focus on payback. Recommendations will include both the site-specific opportunities such as waterbrooms at Magic Mountain or cooling tower modifications at the College of the Canyons. Customers will then be offered a per acre-foot saved incentive based upon the findings of the audit.

The program will target high opportunity customers. These customers include: amusements parks, colleges and universities, hotels, hospitals and other customers identified by the retail water agencies. The key decision maker will be identified and contacted via phone to enlist participation.

If possible the audit report will be delivered in person and fully explained to customer. The staff person delivering the report would be able to answers questions and motivate and aid the customer in accomplishing the recommended retrofits.

If the customer moves forward with the conservation measures they will be required to submit an application to the water agency. The application will be compared against the report and then the customer would be sent a rebate check or get a credit on their water bill.

A number of water audits have already been performed by Valencia Water Company and others. For sites that already have audits, the program will focus on achieving recommended conservation actions.

New or Existing?

Modified program

Technology and/or Service

- Audit
- Customized incentive for equipment retrofits

Target Market

Commercial and Industrial water users

Targeted equipment

- High efficiency toilets and urinals
- Waterbrooms
- Commercial/coin op HEWs
- Cooling tower conductivity controller
- Sub-meters for landscape

Market Data

Supplier	Freq.	Sum(ccfyr)	Mean(ccfyr)
VWC	1,910	4,351,654	2,278
SCWD	790	862,362	1,092
NCWD	450	513,687	1,142
LA36	5	9,088	1,818
	3,155	5,736,791	1,819

Program Production

Production	2009	2010	2011	2012	2013	5 Year Total
Initial Contact	316	316	316	316	316	1,578
Audited Sites	63	63	63	63	63	316

Program Savings

The 316 audits over the first five years of the program, and another 316 over the second five years will save **11,563 acre-feet** of water in a program that sustains constant savings through 2030. [3]

Program Costs

CII Audit and Customized Incentive Cost per Acre Foot = **$606/acre-foot**

[3] Lifetime savings result from 632 audits over ten years, and a total of 1,387 audits in a program that replicates at the end of savings life to sustain constant savings through 2030.

Solution for BMP 5

Santa Clarita Valley Landscape Contractor Certification and Weather-based Irrigation Controller Program

Why Offer This Program?

A large portion of Santa Clarita Valley water consumption is for residential outdoor water use. A new technology that is proving to save a tremendous amount of water savings is weather-based irrigation controllers (WBIC) or smart controllers. This is ideal for large lot sizes with excessive watering, WBICs save water by changing irrigation schedules much more frequently and more accurately than controllers that are manually set. WBICs follow either average historical data or real-time evapotranspiration (ET) through a radio frequency signal or on-site weather sensor.

Since WBICs are an emerging technology, they have limited availability on suppliers' shelves. The product is best obtained directly from manufacturers. Adding to the limited product availability, most customers do not know how to install and operate WBICs. To make things more complex typical landscape contractors and maintenance companies may not have sufficient incentive to install water efficient technology. They are paid to keep the customer's landscape green and do not pay the water bill. There can also be language issues to overcome.

These barriers have greatly impacted the quantity of WBICs being moved in the market. Water agencies, therefore, must rethink how WBICs can most effectively be introduced in the market. Because landscape service providers are the key influencer in the market chain it makes sense to leverage these companies.

It will be necessary to educate landscape service providers on the value of WBICs and installation guidelines as well as incentivize them to install them at customer sites. In addition to WBICs, replacement of high flow sprinkler nozzles with water efficient models will further reduce excessive water flows and increase spray quality for the residential homeowner. This measure will be offered under the program, as well.

Program Design

The Program would target all landscape contractors and maintenance companies in the Santa Clarita Valley. These companies would be invited to water efficiency training workshops where their staff would be trained in the classroom and in the field on the importance of general water use efficiency, properly installed WBICs, hydro-zoning, and high distribution uniformity. Each staff person as well as the landscape company would receive an official certification for attending the workshop and committing to implementing water use efficiency at their customer's sites. Proactive contractors would be encouraged to sign up for the California Landscape Contractors Association (CLCA) Water Manager Certification Program [http://www.clca.org].

End use customers would be marketed via their landscape contractors. A list of landscape contractors will be developed through local business licenses. These companies will be sent a direct mail piece inviting them to a water use efficiency workshop. The mailer will also highlight the benefits of the training &

certification and free WBICs.

The one day workshop consists of basic irrigation principles, irrigation scheduling, the value of WBICs and guidelines to proper installation. Classes should be taught in English and Spanish and offered at least every year. Every participant would receive a certificate for attending training. This certificate would allow them to install the Free WBIC or supervise installations.

After attending the training and receiving certification, landscape contractor would be eligible to receive Free WBICs and Free high efficiency nozzles. The contractors would receive one WBIC and one set of nozzles after the initial training. They would be required to install them at a customer's site within a participating Santa Clarita Valley water agency. The installation must be inspected and installed properly before they were eligible to receive additional product. As contractors need additional product they would submit an application to the utility or their program vendor and the product would be picked up at the water supplier's office. The first two – four installations for each installer would be required to have an inspection. Regular customers (not landscape contractors) would also be able to participate and attend the classes, but they get the equipment only for their home.

New or Existing?	***Technology and/or Service***	***Target Market***
NEW program	▪ Landscaper training and certification ▪ Weather based irrigation controllers ▪ HE spray nozzles	Customers of landscape service providers receiving certification

Program Production

Production	2009	2010	2011	2012	2013	5 Year Total
Initial Contacts	5	5	5	5	5	25
Personnel completing tra	25	25	25	25	25	126
Sites Retrofitted	301	603	904	1,206	1,507	4,522
Controllers	301	603	904	1,206	1,507	4,522
Sprinklerheads	6,030	12,059	18,089	24,119	30,149	90,446
Inspections	30	60	90	121	151	452

Program Savings

The 4,500 WBICs and 90,500 high efficiency nozzles installed over the five year program will save **26,596 acre-feet** of water in a program that replicates over time to sustain constant savings through 2030.

Program Costs

Landscape Contractor Certification/WBIC Program Cost per Acre Foot = **$184/acre-foot.**

Solution for BMP 6

Santa Clarita Valley Residential High Efficiency Clothes Washer Rebate Program

Why Offer This Program?

Residential High Efficiency Washers cut water and sewer flows by 60% and energy use by 50% per machine. HEWs with a water factor of 6.0 or less save an estimated 5,085 gallons per year. With a 12 year life, the savings per machine are substantial.

Currently it is estimated that the saturation rate of residential HEWs is less than 10% in Santa Clarita Valley.

Unfortunately, many customers are still resistant to purchase HEWs due to the higher price tag. Standard clothes washers are still $200 - $500 less expensive than high efficiency models. Because this is a large ticket item for most customers the program can only leverage the annual replacement sales. Getting customers to replace their clothes washer without already needing to is extremely challenging.

HEW customer incentives reduce this differential, therefore overcoming the product's major barrier to sale. Currently the Southern California Gas Company offers an instant or point of purchase incentive of $35 for 2008 Energy Star Qualified HEWs. Although the water savings does not justify a large incentive even a $65 incentive coupled with the Gas Company's incentive will help the customer make a purchasing decision.

Program Design

The program would target single family and multi-family residential customer purchasing a new clothes washer. Because this is a large ticket item for most customers the program can only leverage the annual replacement sales. Getting customers to replace their clothes washer without already needing to is extremely challenging.

The program would offer an incentive of $65 for the replacement of a non-efficient washer with a high efficiency model. The model must be a qualified Energy Star model with a water factor of 6.0 or less and an energy factor of 1.72 or greater.

The program would be advertised through point of purchase materials displayed at local appliance stores, hardware stores and big box retailers and websites of water suppliers.

Customers would be able to download program application form from utility website. Once new product is purchased and installed, customer completes application form and attaches original receipts. Then, the customer would be sent a rebate check or get a credit on their water bill.

New or Existing?	*Technology*	*Target Market*
Modified Program	High Efficiency Clothes Washers	Single family and Multi-Family

Market Data

There are approximately 58,200 single and multi-family residences with clothes washers in the Santa Clarita Valley, of which perhaps 4,600 are high efficiency. High efficiency clothes washers currently represent approximately 30 percent of new sales.

Program Production

Proposed production is 1 percent of total (single and multi-family) residential units per year for five years.

Production	2009	2010	2011	2012	2013	Total
Administration (per Reba	422	422	422	422	422	2,110
Rebates	422	422	422	422	422	2,110

Program Savings

The 2,110 high efficiency washers installed over the five year program will save 632 **acre-feet** of water in a program that sustains constant savings through 2030.[4]

Program Costs

HEW Rebate Program Cost per Acre Foot $740**/AF.**

[4] Lifetime savings result from 2,110 units installed in the first five years, and a total of 4,219 units in a program that replicates at the end of savings life to sustain constant savings through 2030.

CHAPTER 7: IMPLEMENTATION PLAN

Facilitating Actions

The programs described in the previous chapter do not describe all the needed work from Santa Clarita Valley Family of Water Suppliers to implement conservation in the area. There are additional non-programmatic actions—to be performed by the water suppliers—that are needed to facilitate implementation of cost-effective programs. These include:

- Pursuit of local and state-wide changes to building code;
- Pursuit of local ordinances supporting water use efficiency and water recycling;
- Local, state, and federal legislative advocacy on conservation-related issues;
- Active participation in trade groups and policy forums such as the California Urban Water Conservation Council working groups;
- Support of research and studies on new technologies and approaches to water use efficiency;
- Education and training within communities on water use efficiency and conservation practices;
- Outreach and marketing to cities, agencies, consumers, and other stakeholders, either directly or through partnerships with other agencies and entities; and
- Identification of outside funding possibilities and coordination of partnering agencies.

Partnerships

Santa Clarita Valley is fortunate to have a number of capable organizations and coalitions with which to join forces on programs and water efficiency initiatives. Organizations that may share interests and want to develop partnerships include the utilities and agencies that provide electricity, natural gas, wastewater collection and treatment, surface runoff mitigation, and other conservation and planning activities.

Trade Organizations

There are a number of trade organizations that actively drive changes and advancements within the state of California. Santa Clarita Valley suppliers actively participate in these organizations and derive many benefits including:

- Energy/water policy
- Efficiency Standards
- Legislation for water efficiency

CUWCC is the lead organization in California, affecting much positive change in the industry over the past ten years. Santa Clarita Valley could also benefit from the recent water/energy collaborative policy processes under way. Santa Clarita Valley will continue to support these efforts.

Funding Opportunities

By securing outside funding, the Santa Clarita Valley Family of Water Suppliers will be able to leverage its funding and increase the cost effectiveness of programs.

- United States Bureau of Reclamation
- Department of Water Resources
- Partnerships with other local utilities (electric, gas, sanitation) and customer agencies.

Department of Water Resources
DWR issues grants under Prop 50, formerly issued under Prop 13. Funding is issued for a two year cycle. Based upon a DWR-issued timetable, agencies can download RFP requirements from the DWR website and submit their grant proposal(s) for programs. DWR funding is appropriated for programs that are innovative in marketing outreach or technology. Generally, DWR supports newer technologies as long as there is some record of product performance.

United States Bureau of Reclamation
USBR provides a smaller pool of grant money than DWR, but is worth pursuing none the less. USBR creates an annual time calendar for grant submittals and posts the RFP and response template on their website. Programs receiving grant awards are innovative in design or meet the needs for a niche market.

Energy Utilities- Southern California's energy utilities are becoming an ever more viable program resource for water suppliers. Presently there are four general categories of program opportunities for water agencies to pursue:

- **Internally-operated utility programs-**Water suppliers can often piggyback energy programs, adding a water measure, audit, or service onto the site visit. The water agency typically pays only an incremental cost for their portion of the program.
- **Programs awarded through a competitive bid-**Water suppliers can submit bids to the energy utility to provide shared services for a program.
- **Partnership Programs-**Programs such as Rinse & Save are partnership programs that are funded by a number of organizations in order to operate the program on a larger and more cost effective basis.

Santa Clarita Valley suppliers are keeping track of the various funding entities and timetables in order to gain maximum benefit from these organizations.

Program Life cycle

As additional funding opportunities appear and as successful programs prove themselves, it is intended that this master plan be periodically updated. Figure 7.1 below depicts the first stages in the Lifecycle of a Conservation Program. Much of the data assessment has been performed in the process of creating this master plan, but the remaining stages can vary from program to program.

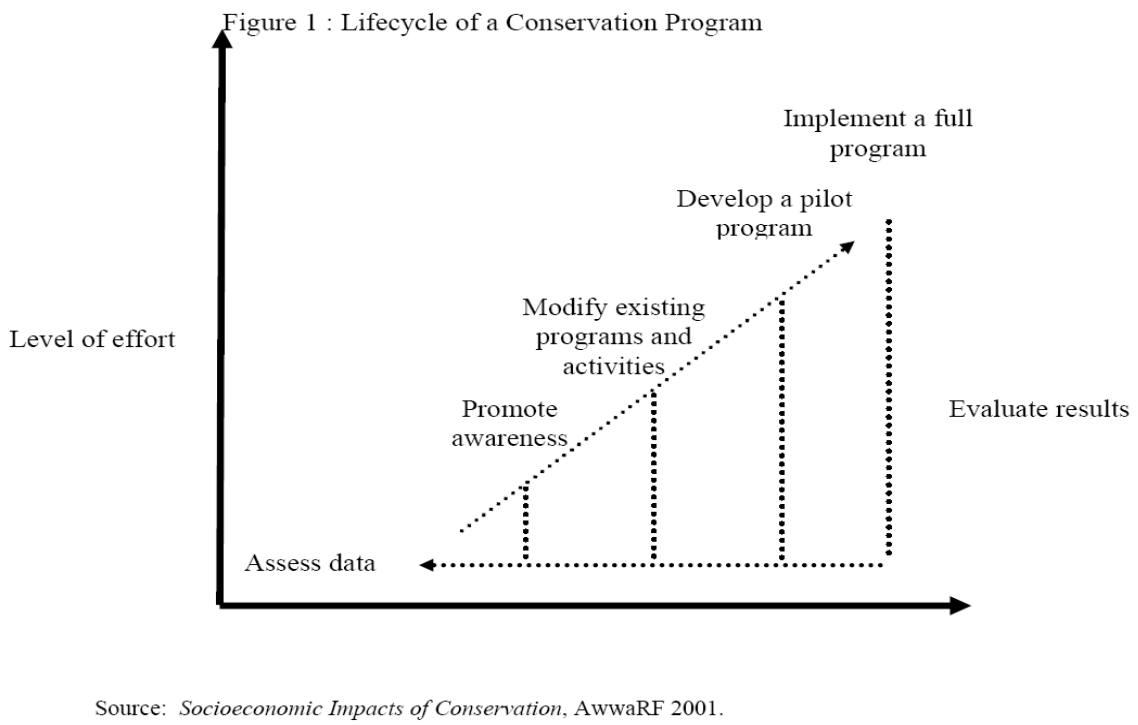
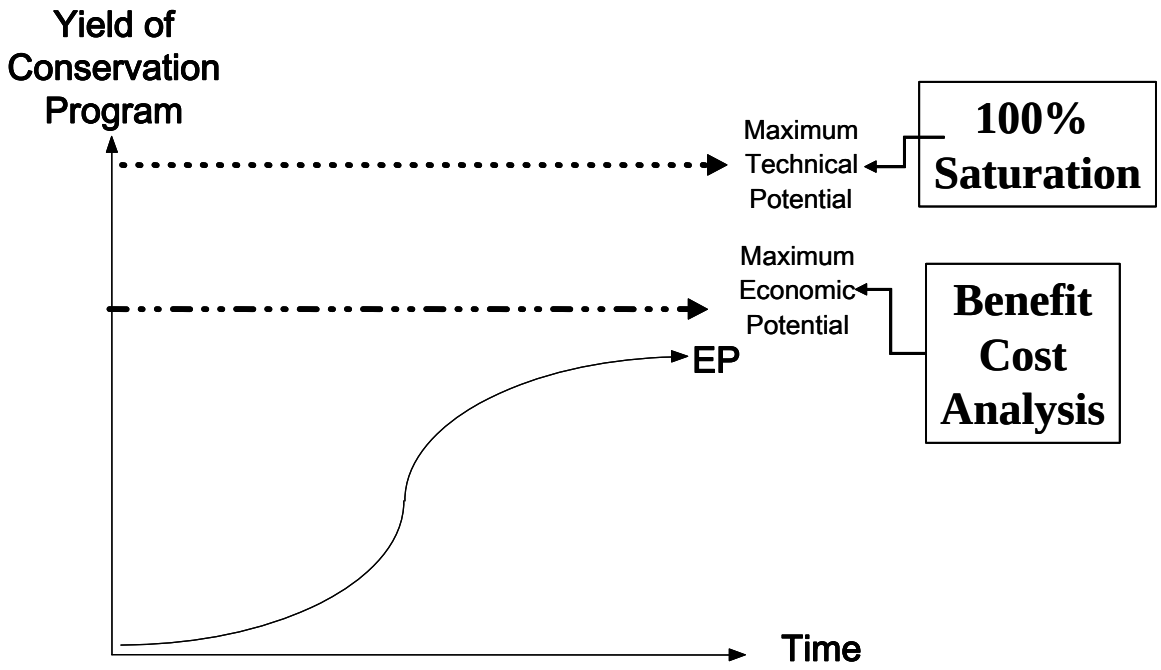


Figure 7.1: Lifecycle of a Typical Conservation Program

Even fully functioning programs will, however, face decreasing returns to scale as the market for the particular water efficient technology or measure becomes saturated. Figure 7.2, on the following page, depicts a typical *S*-shaped technology diffusion curve that describes the adoption and diffusion of new technologies. Thus, today's most attractive conservation program opportunities will, if correctly implemented, become less attractive at some point in the future.



Source: Authors' Construct

Figure 7.2: Expansion Path (EP) of a Typical Conservation Program

The relationship between cost and yield from conservation programs can be summarized in a "supply curve". Figure 7.3 depicts this economic relationship between conservation supply and cost based on estimates provided in the economic analyses conducted in this study.

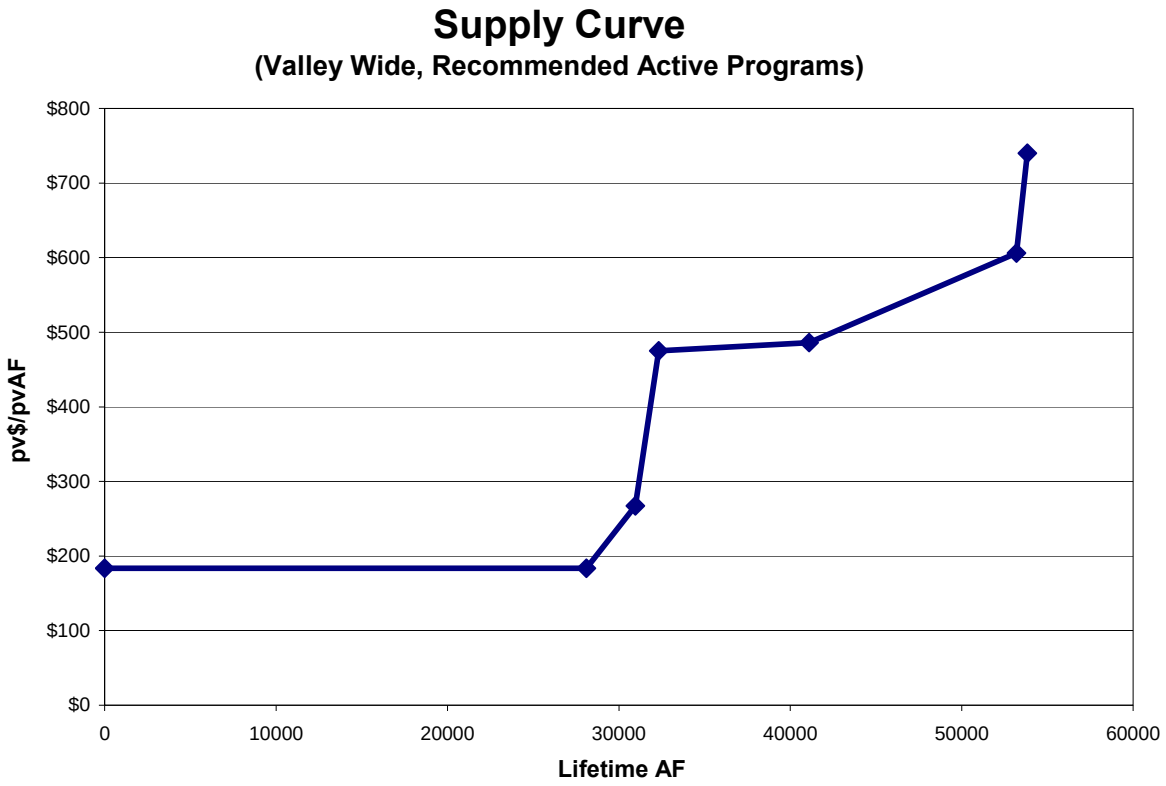


Figure 7.3: Supply Curve of Active Conservation Programs

The reader should note that the estimated supply curve from conservation is based upon prospective data estimates of expected costs and yield from conservation programs. Each implemented program saves water over their life of their respective installed devices. Figures 6.1 to 6.4 displayed in the previous chapter depict the estimated "yield" from conservation programs over time. Note this Plan was designed so that active conservation savings do not decay over time (Figure 6.1). To achieve this, the Plan includes replicating programs at the end of their savings life

Updates to the Plan

The current implementation plan has positive net benefits for Santa Clarita Valley and the region. The adopted 5-year implementation plan represents a significant commitment from Santa Clarita Valley, beyond its direct economic costs. The implementation hurdles that need to be addressed include marketing challenges, negotiations with potential co-funding partners, support for enabling building codes and legislation, and facilitating political support. If the current comprehensive set of conservation programs can be implemented feasibly and cost-effectively, the suppliers can be expected to expand the scale of the effect programs. On the other hand, if some conservation programs cannot be effectively implemented, the suppliers can and should scale these programs back. This WUE Strategic Plan is

designed to be a living document that adapts as the District learns more about delivering conservation programs.

Santa Clarita Valley suppliers will need to revisit and revise this WUE Strategic Plan on an on-going basis to reflect changing outside funding, learning of what works with existing opportunities, and new market opportunities.

APPENDIX A.1: CONSERVATION MEASURE GUIDE

This appendix contains the Conservation Measure Guide.

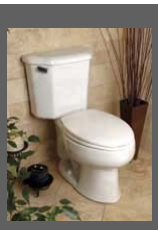
APPENDIX A.2: ADDITIONAL PROGRAMS/MODIFICATIONS TO PROPOSED PROGRAMS

This appendix contains the program description sheets that are not part of the recommended programs for one of two reasons:

1. Alternative WUE Programs that depend on local conditions for implementation:
    a. Santa Clarita Valley Cash for Grass Rebate Program – The Santa Clarita Valley Family of Water Suppliers has decided to suspend immediate implementation of a "Cash for Grass" program due to a recent Center for Disease Control (CDC) health advisory that cited concerns about lead levels found in certain kinds of artificial turf recently tested in New Jersey. [http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00275]
    b. Santa Clarita Valley Industrial Process Audits and Incentives Program—this would replace part of the CII Audit Program with a specialized program for large industrial customers.

2. Aggressive implementation of WUE Programs that are contingent on additional funding:
    a. Aggressive HET Program – This program, contingent on additional funding, would attempt to accomplish 50% of the HET replacements within a 5-year time frame.

It is important for the WUE Strategic Plan to be flexible and adaptable. The programs in this appendix could be used if outside funding can be obtained or if more aggressive implementation is desired.



Solution for BMP 2

Santa Clarita Valley Aggressive High Efficiency Toilet Rebate Program

Why Offer This Program?

Although the Santa Clarita Valley has an estimated 66 percent saturation rate for water efficient toilets (67 percent of single family toilets and 64 percent of multi-family toilets), there is significant opportunity for water savings in targeting the remaining old toilets, and saving even more water by promoting new "High Efficiency Toilets" throughout the service area.

Since 1992, only ULF toilets can be sold in the United States. Although this was a major advancement in residential water efficiency, there is still more that can be achieved. It is time to "raise the bar" and promote the newer high efficiency toilet (HET) technology which saves even more water. The Santa Clarita Valley has a high percentage of new housing stock with 40 percent of single family and 33 percent of multi-family housing units built after 1992. As a result, these homes already utilize water saving ULF toilets. The savings opportunity lies within older residential sites that are utilizing non-ULF toilets.

Program Design

For this program, staff will target the market comprised of older residential housing stock that carries a high likelihood for existing non-ULF toilets. Bill stuffers and direct mail would be utilized to target the older residential housing stock. Previous rebate program participants would be removed from the mailings. The main objective is to replace non-ULF toilets. Customers will be offered the following incentives for replacing a non-ULFT with an HET:

- Single family = **$150** rebate
- Multi-family and mobile home = **$200** rebate for HET replacement

Multi-family and mobile home customers are offered a higher rebate due to the higher density of people per home and therefore higher water savings. Customers would be able to download program application form from utility website. Once new product is purchased and installed, customer completes application form and attaches original receipts. Then, the customer would be sent a rebate check or get a credit on their water bill.

New or Existing?	*Technology*	*Target Market*
Modified Program	High Efficiency Toilets	Single, Multi, Mobile home Non-ULFT households

Market Data

Pre 1992 Toilets: Single Family

	Total Toilets	Remaining non-ULF Toilets	Percent Remaining of Pre-1992	All Toilets	Remaining Potential Savings AFY
VWC	50,186	13,725	47%	73%	307
SCWD	41,238	15,813	47%	62%	354
NCWD	20,565	7,291	47%	65%	163
LA36	2,600	790	46%	70%	18
Total SF	114,589	37,619	47%	67%	843

Pre 1992 Toilets: Multi-Family

	Total Toilets	Remaining non-ULF Toilets	Percent Remaining	All Toilets	Remaining Potential Savings AFY
VWC	11,741	2,740	46%	77%	61
SCWD	31,148	11,838	46%	62%	265
NCWD	5,960	3,090	46%	48%	69
LA36	179	97	46%	46%	2
Total MF	49,027	17,764	46%	64%	398
Grand Total	163,616	55,383	46.5%	66.2%	1,241

Program Production

HET Rebates: Single-Family

	2009	2010	2011	2012	2013	Total
VWC	1,372	1,372	1,372	1,372	1,372	6,862
SCWD	1,581	1,581	1,581	1,581	1,581	7,907
NCWD	729	729	729	729	729	3,645
LA36	79	79	79	79	79	395
Total	3,762	3,762	3,762	3,762	3,762	18,809

HET Rebates: Multi-Family

	2009	2010	2011	2012	2013	Total
VWC	274	274	274	274	274	1,370
SCWD	1,184	1,184	1,184	1,184	1,184	5,919
NCWD	309	309	309	309	309	1,545
LA36	10	10	10	10	10	49
Total	1,776	1,776	1,776	1,776	1,776	8,882
Grand Total	5,538	5,538	5,538	5,538	5,538	27,692

Program Savings

The 27,692 toilets will save **24,022 acre-feet** of water over the life of the product.

Program Costs

HET Rebate Program Cost per Acre Foot =

$385/acre-foot Single Family, $231/acre-foot Multi-Family

Solution for BMP 9

Santa Clarita Valley Industrial Process Audits and Incentives Program

Why Offer This Program?

In the Santa Clarita Valley, industrial customers consume approximately 23% of all CII use. However, few if any, water conservation programs have been directed at industrial customers, many of which use "process water" for which there are often conservation opportunities.

Five industry sectors offer the most promising opportunities for water efficiency improvements in industrial processes:

- food processing
- textiles
- fabricated metals
- electronics
- industrial laundries

Program Design

Commercial and industrial survey and incentive programs are known to have low participation greatly due to poor marketing, customer support and minimal customer follow through with the retrofit process. The Santa Clarita Valley Program will be initiated to break through these traditional barriers.

The program will overcome these obstacles by providing superior customer support to aid the customer with education and assistance through each step of the retrofit process.

Traditional programs attempt to identify every opportunity for savings; allowing the customer to pick through the report and likely select the easy retrofit, such as toilets. The Santa Clarita Valley Program will focus on the process upgrade, the value of the retrofit, how to make it happen and available incentive monies.

The Survey Process

The survey will not include all retrofits possible for the site. The engineer will focus on the best bang-for-the-buck for the customer and the program. For this reason, the program

will include two levels of surveys, the Focused Survey and the Comprehensive Survey.

The Focused Survey will include a limited number of measures; those most likely to be implemented by the customer. The engineer will determine which measures to include, balancing between the customer's interest and those which save the most water. The Focused Survey might include only one building or one major process. The engineer will provide diagrams and photos to clearly illustrate their recommendations. The overall goal is to give the customer a template so they learn how to secure the incentives; how to retrofit and how to incorporate water reduction and reuse into their everyday business.

The Comprehensive Survey will be used for customers who express a strong interest in a wide-ranging list of retrofits as well as motivation to implement the retrofits. The engineer will spend up to three days on-site measuring flows to determine equipment design ranges; identifying reduction, recycling and reuse opportunities. The engineer will diagram system modifications including before and after water balance, take supporting photos and detail a thorough list of measures for the site. It is anticipated that 20% of all surveys will be Comprehensive Surveys and that 80% will be Focused Surveys.

The Survey Report

Typical survey reports, with all their technical detail, say little to the customer on how the upgrades can benefit their business. The report is often stuffed with technical terminology yet fails to roll up the recommendations for the customer in a summary page. As importantly, there is no practical next step information that would aid the customer in retrofitting their facility.

<u>The survey report for this program will be clear and concise, with heavy use of photographs and diagrams</u>. The report will focus on water saving opportunities that have the highest potential for retrofit, not every savings opportunity.

The reports created for both the Focused and the Comprehensive Survey will be customer friendly and provide a guide to retrofitting their facility.

The report will include:

- Use of color and photos
- A summary page listing all recommended retrofits with costs, savings and payback information
- A water use summary page
- Information that is customized to their specific industry
- Next steps page telling the customer how to make the retrofits happen

Report Delivery

The next step in the process is to deliver the report to the customer. This will be done in person and target attendees should include: program sales person, the engineer that

conducted the audit and if possible the customer's technical staff as well as the decision maker. In the meeting the technical information will be overviewed as well as the benefits to making the retrofits and the retrofit process.

Application Submittal

Once the customer has agreed to perform the retrofits, it will be necessary for the program staff to assist the customer in completing all program paperwork.

Customer Support through Retrofit Process

Traditional programs have failed to support the customer once the survey is delivered. Once the report is delivered, a technical trained program staff person will follow up with the customer on a continuous basis. The job of the staff member is to provide solutions, facilitate contact with vendors and answer questions.

Focus on the Money

Every step of the program, starting with front-end marketing, will emphasize the financial benefits to the customer. The sales team, the auditor/field engineer, the printed report, and the follow-up customer support team will all incorporate the financial benefits when delivering information to the customer.

The customers' incentive package with program rebates will provide strong financial motivation to complete the retrofit process. The amount of the incentive will be based upon the water savings and calculated at $9.20 per thousand gallons per year saved ($300/AF, 10 year savings). The incentive will be based upon total water saved and will be given to the customer at the onset of the project. The Program will not end with delivery of the customer report. Program staff will stay connected to the customer and gently push them and support them through each step.

New or Existing?	***Technology***	***Target Industrial Processes***
This will be a new program	Process water use reduction and reuse technologies	▪ food processing ▪ textiles ▪ fabricated metals ▪ electronics ▪ industrial laundries

The table below shows the full set of customers identified as industrial in the Santa Clarita Valley. Of these, we propose to include 32 with 10 AFY or more (20.1AFY mean savings).

Industrial Customers

VWC	433	775,353	1,791
SCWD	19	55,243	2,908
NCWD	7	30122	4303
LA36	0	0	0
Total	459	860,718	1,875

Note: These customers are included in the CII Audit Program and cut sheet elsewhere in this document.

Program Savings

The program will result in 1,004 acre-feet of water saved.

Program Costs

The program will cost $715/AF.

Santa Clarita Valley

Cash for Grass Rebate Program

The Santa Clarita Valley Family of Water Suppliers has decided to suspend immediate implementation of a “Cash for Grass” program due to a recent Center for Disease Control (CDC) health advisory that cited concerns about lead levels found in certain kinds of artificial turf recently tested in New Jersey.
[http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00275]

Limited testing by New Jersey health officials of artificial turf playing fields has indicated several artificial turf products made of nylon or nylon-blended fibers contain levels of lead that may pose a potential health concern. According to the advisory, the fields found to have high lead levels in New Jersey were weathered and dusty, used frequently, and the turf fibers were abraded, broken, or faded.

The CDC advisory indicated the risk of harmful lead exposure is low from fields that are new or in good condition and it will continue to monitor the situation in coordination with other agencies.

The Santa Clarita Valley Family of Water Suppliers will hold off implementing this program as a precautionary measure until more definitive information and a recommendation on the safety of artificial turf is made available by the CDC or other proper public health and consumer product regulatory agencies.

The original program description follows.

Why Offer This Program?

A large portion of Santa Clarita Valley water consumption is for residential and business outdoor water use. A significant amount of that water is used to irrigate water-thirsty turf grasses.

In recent years water agencies, including Las Vegas Valley Water District, Southern Nevada Water Authority and the City of Scottsdale have had success with turf removal programs. Southern Nevada Water District, for example, states that their customers have removed and replace over 90 million square feet of grass with water efficient landscape saving over 5 billion gallons per day.

Program Design

For this program, Santa Clarita Valley customers would be offered an incentive of $.45 per square foot for the removal of turf and replacement with low water using landscape and efficient irrigation. Synthetic turf would be allowed as a replacement option. $.45 would pay for roughly 9% of the average cost to remove turf and replace it with low water using plant material and an efficient irrigation system which averages $5.00 per square foot. This may not achieve a high volume of customers but stays within the cost effectiveness threshold and provides a complete menu of water conservation measures.

Staff will promote the program during water audits and on the supplier web sites.

Customers would be able to download a program application and guidelines from the utility website. Preliminary site inspection by program staff will take place, prior to turf modifications, in order to confirm customer eligibility. Exposed soil where turf has been removed must be covered with mulch, rock, synthetic turf, or approved low water use plant material. When the landscape renovation is finished, a final inspection is required. Upon final approval, the customer would be sent a rebate check or get a credit on their water bill.

The program would be offered to single and multi-family customers, HOAs, and commercial and industrial customers in the first two years as a stand-alone program. Thereafter, it will be offered through the CII and Large Landscape Audits. This design would allow interested customers to receive an incentive without an audit in order to jump start the market. Then customers would be targeted through the audit programs.

New or Existing?	***Technology and/or Service***	***Target Market***
NEW Program	▪ Turf removal ▪ Low water using plants ▪ Synthetic turf ▪ Efficient irrigation	Residential, commercial, and industrial sites with inefficient turf usage

Program Production

Production	2009	2010	2011	2012	2013	5 Year Total
Administration & Inspection (per Rebate)	41	41	41	41	41	205
Sq. Ft. Replaced: Comm. And Industrial	41,000	41,000	41,000	41,000	41,000	205,000
Sq. Ft. Replaced: Residential Sector	41,000	41,000	41,000	41,000	41,000	205,000
Total Sq. Ft	82,000	82,000	82,000	82,000	82,000	410,000

Program Savings

The 410,000 square feet of turf replace in the five year program will result in 846 **acre-feet** in a program that sustains constant savings through 2030.[5]

Program Costs

[5] Lifetime savings result from 410,000 sq. ft. replaced turf in the first five years, and a total of 984,000 sq. ft. in a program that replicates at the end of savings life to sustain constant savings through 2030.

Turf Removal Program Cost per Acre Foot = **$707/acre-foot.**

APPENDIX A.3: CONSERVATION – PAST ACHIEVEMENTS

This appendix contains a summary of past conservation achieved by the Santa Clarita Valley Family of Water Suppliers.

CLWA – Santa Clarita Water Division

BMP 1, Residential Survey - None reported.
BMP 2, Residential Plumbing Retrofit

- Showerheads distributed to SF and MF residential (1.3-6). Advertise in newspaper, flyers, newsletters, and distribution events.
- All funding provided by CLWA in 2003 report. (1.3).
- Track which address get LF devices.
- City of Santa Clarita requires low flow BMP 2 plumbing fixtures during drought (NCWD 6).

BMP 3, System Audits and Leak Detection

- No pre-screening system audit reported in BMP reports.
- Visual inspections and responses to customer. (1.3).

BMP 4, Metering and Commodity Rates

- All connections metered (1.3)

BMP 5, Large Landscape

- Information and training provided by CLWA. Irrigated water at SCWD has dedicated meters. (1.4).

BMP 6, High-Efficiency Washers

- No existing program. (1.3)
- Los Angeles County Sanitation District has program for reduced rates if a customer makes a 20% reduction in sewer discharge. (NCWD 6)

BMP 7, Public Information

- CLWA runs public information program for SCWD. Bills show last year's usage. (1.4)

BMP 8, School Education

- CLWA runs public information program for SCWD. (1.4)
- See CLWA reports for specifics.

BMP 9, CII Conservation

- SCWD has identified and ranked CII accounts (1.6)

BMP 11, Conservation Pricing

- Uniform rates (1.6)

BMP 12, Conservation Coordinator

- Yes, 10% FTE (1.6), provided by CLWA.

BMP 13, Water Waste Prohibition

- Non-recirculating car washes and new decorative fountains are prohibited under City of Santa Clarita and LACSD ordinances. (1.6).
- Agency supported LACSD water softener ban ordinance adopted in 2003.

BMP 14, Residential ULF Toilets

- Residential Rebate Program. CLWA has run the residential ULFT rebate program for all suppliers in the SCV since 2003. Rebates for pre-1992 toilets start June 1. Rebate is $50 for single family and $60 for multi-family. $20,000 total for all four suppliers is split up based on population/eligible residents. (2)
- No retrofit on resale ordinances apply to SCV. (2)

ET Controller Program - None reported.

Sources

(1.1 - 1.6) Santa Clarita Water Division, BMP Report, 2001-2006
(2) Santa Clarita Water Division, BMP Coverage Report, 2005-06

Los Angeles County Waterworks District No. 36

BMP 1, Residential Survey - None reported.
BMP 2, Residential Plumbing Retrofit - None reported.
BMP 3, System Audits and Leak Detection

- Pre-screening completed 2001-2006. (2.6)
- Leak detection conducted by consultant throughout the year. Leaks reported by personnel in the field. Main replacements made with street repairs. (1.4)
- Full scale audit completed. (1.2)

BMP 4, Metering and Commodity Rates

- All connections metered. (3)

BMP 5, Large Landscape

- None reported.

BMP 6, High-Efficiency Washers

- No existing program. (1.3)
- Los Angeles County Sanitation District has program for reduced rates if a customer makes a 20% reduction in sewer discharge. (NCWD 6)

BMP 7, Public Information

- "Three full time staff dedicated to water conservation practices – newsletter, bill inserts, Web site, radio PSA's, outreach materials at public counter and at public events, planned BMP program for next year." (1.4)

BMP 8, School Education

BMP 9, CII Conservation

- LA36 has identified and ranked CII accounts. (2.6)

BMP 11, Conservation Pricing

- Uniform rates. (1.6)

BMP 12, Conservation Coordinator

- Yes, 4% FTE. (1.6) Reported to be 20% in 2004. (1.4)

BMP 13, Water Waste Prohibition

- On March 21, 1991, the County Board of Supervisors adopted. Ordinance No. 91-0046U that called for "No Water Wasting" in only unincorporated areas of the County. They include the following measures: * Washing down paved surfaces is prohibited unless required for health or safety * Landscape watering is prohibited between 10:00 a.m. and 5:00 p.m. * Excessive landscape watering that results in runoff into adjoining streets, parking lots or alleys is prohibited * Plumbing leaks must be repaired as soon as practical * Washing of vehicles is prohibited excepted at a commercial carwash or with a hand-held bucket or hose equipped with an automatic shutoff nozzle * Serving drinking water at public eating places is prohibited unless requested by customers * Water used in decorative fountains must flow through a recycling system." "These measures could have resulted in fines up to $500. However, this Ordinance was active from March 1991 to January 1993. Currently, there is no water wasting ordinance in effect in the District. Two cities within our service have a similar ordinance implemented." (1.4)

BMP 14, Residential ULF Toilets

- Residential Rebate Program. CLWA has run the residential ULFT rebate program for all suppliers in the SCV since 2003. Rebates for pre-1992 toilets start June 1. Rebate is $50 for single family and $60 for multi-family. $20,000 total for all four suppliers is split up based on population/eligible residents. (2)
- No retrofit on resale ordinances apply
- County Ordinance No. 91-0097U requires all new buildings to use ULF toilets and urinals. (1.2)
-

Sources

(1.1 - 1.6) Los Angeles County Waterworks No. 36, BMP Report, 2001-2006
(2.4 and 2.6) Los Angeles County Waterworks No. 36, BMP Coverage Reports, 2003-04 and 2005-06.
(3) Los Angeles County Waterworks No. 36, BMP Base Year Data
(NCWD 6) Newhall County Water District, BMP Report, 2003

Newhall County Water District

BMP 1, Residential Survey

- Survey program started in 2003. (2)
- Self report survey with $5 bill credit for completion (3).
- Conservation packets with self audit info distributed in 2002-03. Created tracking database (6)

BMP 2, Residential Plumbing Retrofit

- Showerheads distributed to SF and MF residential (2)
- City of Santa Clarita requires low flow BMP 2 plumbing fixtures during drought (6)

BMP 3, System Audits and Leak Detection

- Pre-screen audits completed in 2003, 2005, and 2006. Full audit in 2004.(2)
- District compares production and sales with monthly records (6)

BMP 4, Metering and Commodity Rates

- On track to meet 100% metering. (2)
- All customers metered and billed based on usage. Water rate study conducted about 2004-05. (6)
- Dedicated irrigation meters already on appropriate CII sites (6)

BMP 5, Large Landscape

- Surveys offered for mixed-use CII accounts, none reported completed (2)

BMP 6, High-Efficiency Washers

- No existing program. (1, 2)
- Los Angeles County Sanitation District has program for reduced rates if a customer makes a 20% reduction in sewer discharge. (6)

BMP 7, Public Information

- NCWD has had a public information program since at least 1999. (2)
- Comprehensive program for public education for SF and MF customers that includes public events and newsletters. (6)

BMP 8, School Education

- NCWD has had a public information program since at least 2003. (2)
- Education program has been provided by CLWA since 1993 for K through 6th grades. (6)

BMP 9, CII Conservation

- NCWD has identified and ranked CII accounts (2)
- Some informal surveys in the context of customer service (6)

BMP 11, Conservation Pricing

- Tiered rates, 12 billing cycles per year (1). Conserving sewer rate structure reported in 2003 and 2004, but not 2005 and 2006 (2).
- Tiered rate structured was adopted in July 2005 and effective January 2005. Rate structure was previously a uniform rate. (7)

BMP 12, Conservation Coordinator

- Yes, 50% FTE (1). Since 2002 (2).

BMP 13, Water Waste Prohibition

- Water Conservation Ordinance, Adopted 1/1991, rev. 7/2005 (1). Ordinance 112 amended Ordinance 101. Includes irrigation hours and schedules, inspect and repair leaks, vehicle washing, fountains, serving water in restaurants.
- State of California, County of Los Angeles, and City of Santa Clarita ordinances apply. State urban runoff and county health codes prohibit gutter flooding.
- Supports DIR water softeners, provides information

BMP 14, Residential ULF Toilets

- Residential Rebate Program. CLWA coordinated residential ULFT rebate program for all suppliers in the SCV. Rebates for pre-1992 toilets start June 1. Rebate is $50 for single family and $60 for multi-family. $20,000 total for all four suppliers is split up based on population/eligible residents. (2)

ET Controller Program

- Rebate of $40 per valve up to $480 per residence for an ET controller. (4)
- Rebate was lower before May 2007; they raised it increase participation. (5)

Sources

(1) Newhall County Water District, BMP Report, 2006
(2) Newhall County Water District, BMP Coverage Report, 2005-06
(3) Residential Water Survey flyer
(4) ET Controller letter and application
(5) NCWD staff
(6) Newhall County Water District, BMP Report, 2003
(7) www.ncwd.org, printout provided by NCWD staff

Valencia Water Company

BMP 1, Residential Survey

- Free Residential Water Audit Program implemented by a contractor (Water Wise Consulting). Contact highest water users and low income users and offer indoor / outdoor survey and monetary incentives to replace devices such as toilets and irrigation controllers. Started February 2007 with the intent to survey 300 homes per year. (4)
- School Education and Retrofit Kits. Local schools with VWC contractor Resource Action Programs provides kits to 6th grade students. Intends to reach 2000 homes per year. (4)

BMP 2, Residential Plumbing Retrofit

- LF showerheads, toilet displacement devices, leak detection dues, and aerators are installed through the Free Residential water Audit program during surveys. (4)
- Weather-based Irrigation Controller give away program is also integrated into the Free Residential Water Audit Program. (4)

BMP 3, System Audits and Leak Detection

- Annual review of water purchases and sales. Leak detection capability also used in its radio meters. (4)
- Aggressive meter replacement program in 2006 (replaced 2000 meters). (4)
- Pre-screening completed 2001-2006. (2.6)
- Leak detection conducted by consultant throughout the year. Leaks reported by personnel in the field. Main replacements made with street repairs. (1.4)
- Full scale audit completed. (1.2)

BMP 4, Metering and Commodity Rates

- All connections metered. (3) (4)

BMP 5, Large Landscape

- VWC contracts with Resource Management Corporation to contact large CII customers to offer and conduct water audits. The program conducted 87 mixed use surveys since 2003. (4)

- Starting in 2008, AB 1881 requires separate irrigation meters for new service for non single family landscape areas greater than 5,000 sq. ft. (4)

BMP 6, High-Efficiency Washers

- No existing program. (1.3)

BMP 7, Public Information

- VWC participates via newsletter, bill inserts, Web site, radio PSA's, outreach materials at public counter and at public events, planned BMP programs for next year. (1.4)
- CLWA offers classroom and garden setting classes through their Landscape Education Program. They also have a 7 acre demonstration garden. (4)

BMP 8, School Education

- School retrofit kits (see BMP 1)
- VWC administers an extensive school education program that provides interactive activities regarding water conservation.

BMP 9, CII Conservation

- VWC contracts with Resource Management Corporation to provide free water audit s to CII customers, including restaurants, schools, hotels, and manufacturing companies. Recommendations have included pre-rinse spray nozzles, toilets, urinals, cooling tower conductivity controllers, HE washers, irrigation clock management and drought tolerant plants. VWC has done 89 since 2003. (4)

BMP 11, Conservation Pricing

- Uniform rates. (1.6)

BMP 12, Conservation Coordinator

- Yes, full time beginning in 2006.

BMP 13, Water Waste Prohibition

- "VWC includes wastewater prohibitions in its tariffs. The voluntary provisions are encouraged at all times; however mandatory restrictions are enforced only during drought conditions." (4)

BMP 14, Residential ULF Toilets

- ULF Toilet Rebate Program. In cooperation with CLWA, VWC offers a rebate program during its "Water Awareness Month." The program has provided over 300 rebates and it is funded by CLWA. (4)
- The Free Residential Water Audit program offers Ultra Low Flow (ULF is a 1.6 gallon per flush) and High Efficiency (HE is a 1.2 gallon per flush) toilet rebates that supplement the program during Water Awareness Month. The program started in February 2007.
- No retrofit on resale ordinances apply

ET Controller Pilot Study

- VWC has funded and is conducting a pilot study to assess savings and customer acceptance of ET controllers. The pilot and analysis will be conducted in 2008 with the intent to use the results to refine a give away program. (4)

Sources

(1.1 - 1.6) Valencia Water Company, BMP Reports, 2001-2006
(2.4 and 2.6) Valencia Water Company, BMP Coverage Reports, 2003-04 and 2005-06.
(3) Valencia Water Company, BMP Base Year Data
(4) "2006 Annual Report Valencia Water Company," to the Public Utilities Commission for the year ended December 31, 2006.
(5) "Valencia Water Company Results of Operations, Revenue Requirement, and Rate Design Test Years 2007-2008 and 2008-2009," before the Public Utilities Commission of the State of California, June 2006.

APPENDIX B.1: ECONOMICS - AVOIDED COST ANALYSIS

This appendix contains Gary Fiske's Avoided Cost memo.

Each unit of water conservation provides an economic benefit to Santa Clarita Valley by allowing the Castaic Lake Water Agency (CLWA) to avoid certain supply and/or infrastructure costs. To estimate these costs, we used the CUWCC/AwwaRF Avoided Cost Model. The model estimates the costs that CLWA will avoid as a result of additional conserved water. There are two types of avoided costs that are estimated, so-called short run and long run costs.

Following are descriptions of the manner in which each of these was estimated for the Valley.

Short-Run Avoided Costs

As water conservation programs reduce demand, less water must be purchased, produced, pumped, and/or treated. These reduced variable operating costs constitute the so-called 'short-run' avoided costs. They are typically expressed in dollars per acre-foot.

To estimate the short-run avoided costs, it must be determined which supplies will be cut back and/or for which facilities the utilization will be reduced in response to conservation-induced demand reductions. In the case of CLWA, it was determined that the 'marginal' supply is currently the water being purchased from the Buena Vista Water District in Kern County. Moreover, it was assumed that this supply will continue to be the marginal supply through the planning period.

There are three cost components associated with this supply that are avoidable:

- Cost of water. The current purchase cost of this supply is $589/AF.
- Wheeling. CLWA pays $117/AF to wheel the Buena Vista water to its service territory.
- Treatment. For each acre-foot of water, it is estimated that about $22 of power and chemical costs is avoided.

The total short-run cost that is avoided as a result of not having to purchase, wheel, and treat this supply is thus $728 per acre-foot. In addition, we must account for system losses, which are estimated at 8%. That is to say, for each acre-foot of water produced at the treatment plant, approximately 0.92 acre-foot is actually consumed and paid for by end-users. Thus, the total avoided cost per acre-foot of demand reduction is approximately $790/AF.

It is assumed that these costs will stay constant in real terms (i.e. they will increase at the overall rate of inflation).

Long-Run Avoided Costs

In addition to the immediate reduction on variable operating costs, peak-season demand reductions may, in the long run, also enable the water supplier to defer or downsize planned future capital investments in supply or infrastructure capacity. For CLWA, two such projects were identified:

- The Rio Vista Treatment Plant expansion, scheduled to become operational in 2015. The cost of this investment, expressed in 2007 dollars, is assumed to be $20 million, with fixed annual operating and maintenance costs of $500,000.

- A recycled water plant scheduled to become operational in 2020. The cost of this investment, also in 2007 dollars, is assumed to be $20 million, with fixed annual O&M costs of $100,000.

The long-run avoided costs associated with each of these projects begin in each project's on-line year (2015 and 2020 respectively). Thus, beginning in 2015, and based on the annualized costs of these projects, the peak-season avoided costs include both long-run and short-run components.

Table B.1.1 shows the forecasted avoided supply costs in real (2007) dollars through 2030.

Table B.1.1

Total Direct Utility Avoided Costs: 2007 Dollars

($/AF)

Year	Peak Season			Off-Peak Season		
	Short-Run	Long-Run	**Total**	Short-Run	Long-Run	**Total**
2007	$790	$0	**$790**	$790	$0	**$790**
2008	$790	$0	**$790**	$790	$0	**$790**
2009	$790	$0	**$790**	$790	$0	**$790**
2010	$790	$0	**$790**	$790	$0	**$790**
2011	$790	$0	**$790**	$790	$0	**$790**
2012	$790	$0	**$790**	$790	$0	**$790**
2013	$790	$0	**$790**	$790	$0	**$790**
2014	$790	$0	**$790**	$790	$0	**$790**
2015	$790	$86	**$876**	$790	$0	**$790**
2016	$790	$85	**$875**	$790	$0	**$790**
2017	$790	$84	**$874**	$790	$0	**$790**
2018	$790	$83	**$872**	$790	$0	**$790**
2019	$790	$82	**$871**	$790	$0	**$790**
2020	$790	$130	**$919**	$790	$0	**$790**
2021	$790	$128	**$917**	$790	$0	**$790**
2022	$790	$126	**$915**	$790	$0	**$790**
2023	$790	$124	**$914**	$790	$0	**$790**
2024	$790	$122	**$912**	$790	$0	**$790**
2025	$790	$120	**$910**	$790	$0	**$790**
2026	$790	$118	**$908**	$790	$0	**$790**
2027	$790	$117	**$906**	$790	$0	**$790**
2028	$790	$115	**$905**	$790	$0	**$790**
2029	$790	$113	**$903**	$790	$0	**$790**
2030	$790	$111	**$901**	$790	$0	**$790**

APPENDIX B.2: ECONOMICS – COST AND SAVINGS ASSUMPTIONS

This appendix contains cost and savings assumptions used in the cost benefit analysis.

Global Assumptions

- Dollars are real 2007 dollars (a.k.a. constant dollars $2007)
- One year time increments; end of year accounting; present is Year 0.
- Year 1 of the plan is 2008

Recommended Active Programs

High Efficiency Toilets

Program

- Open program, single- and multi-family.
- 500 rebates per year, ongoing until the Year 2019, which is 5 years after plumbing code requires HETs.
- A contractor will administer rebates.

Costs

- Administration (per Rebate) $30
- Rebates $100

Savings

- CMHC 2004 and Aquacraft 2000 reported in AWWARF 2007 indicate savings from HETs are approx. 24%-26% greater than savings from ULFTs.
- Percent replacing pre-1992 toilets is assumed to be 50% replace ULFTs and 50% replace pre-ULF fixtures--based on un-targeted program.
- Savings life assumed to be 23 years after which replacement savings are include in passive savings.
- Assume single family homes have 2 toilets and multi-family units have 1.5 for pre-1992 homes for VWC and LA36 per BMP Report Base Year Data. Likewise, assume 2.5 SF and 1.2 MF for NCWD, and 2 SF and 2 MF for SCWD per BMP Report Base Year Data.

Large Landscape Audit and Incentives

Program

- Agency outreach to enough customers to get 10% to respond each year for 10 years. Of those 10% each year that respond, 20% agree to participate. After 10 years the program has audited 20% of the total.
- Includes all dedicated landscape meters in all sectors.
- Target existing accounts; new construction accounts will be covered under New Construction Code.

Costs

- Initial Contact $50 per responsive customer.
- Audited Sites $1,500
- Rebate $/AF Saved, Lifetime Savings (AF) $300

Savings

- Savings assumed to be 20% of current use.
- Life span of savings assumed 10yrs.
- Savings after end of life span continued by replication of program costs and savings.

CII Audits and Customized Incentives

Program

- Agency outreach to all customers in this class. Successfully contact 10% per year for 10 years.
- Of those responding, 20% participate each year, so after 10 years you have audited 20%.
- Assume you can get 20% savings.
- Incentive is $/AF at the time the conservation measures are put in place.

Costs

- Initial Contact $50 per customer who responds.
- Audited Sites $1,700
- Rebate $/AF Saved, Savings (AF) $300

Savings

- Savings assumed to be 20% of current use.
- Life span of savings assumed 10yrs.
- Savings after end of life span continued by replication of program costs and savings.

Landscape Contractor Certification

Program

- 5 large contractors recruited for the program
- Each contractor sends 5 employees for training each of the five years
- 12 sites retrofitted per trained person per year
- 1 WBICs per site on average
- 20 sprinkler heads per site on average
- 10% of sites inspected

Costs

- Initial Contact per contractor $50
- Personnel completing training $200
- Controllers $150 with rain sensor
- Sprinkler heads $5
- Inspections $150

Savings

- Residential Sprinkler head. Assume 10% of ET savings. Assume 80 sprinkler heads per acre (1 new per 2 replaced old on average for MP Rotators) for single family or small CII sites. Works out to 4.6 gpd per sprinkler head.
- ET Controller: 37 gallons per day.
- Life span of savings assumed 10yrs.
- Savings after end of life span continued by replication of program costs and savings.

High Efficiency Clothes Washer Rebates

Program

- Contractor administer rebates; spot check on site installations; document installation receipts
- .5% of residential units get rebates each year for 5 program years.

Costs

- Administration (per Rebate) $30
- Rebates $65

Savings

- Savings of 5085.6 gpy from literature (gross savings). If we assume 20% free riders, this converts to 11.1 gallons per day. Savings life span is assumed to be 12 years.
- Savings after end of life span continued by replication of program costs and savings.

Joint Marketing – Valley Wide

Program

- Two bill suffers in the first year, then one per year for the remaining 4 years of the 5 year program.
- 50 Radio ads per year for Years 1-3, then 10 per year for Years 4-5
- 36 Radio ads per year for Years 1-3, then 3 per year for Years 4-5
- 5 Radio ads per year for Years 1-3, then 3 per year for Years 4-5

Costs

- Stuffers $0.05 per stuffer
- Radio Ads $1,000 per ad
- Newspaper Ads $1,000 per ad
- Public Events $3,000 per event
- Cost share to suppliers based on total number of accounts.

Active Programs to Consider Further

Cash for Grass

Program

- Assume 410,000 square ft. replaced over a five year program life.[6]
- Assume program is enacted at 205 sites with 2,000 sq ft each.
- Sites distributed across suppliers based on percent of total accounts in SCV.
- Administration includes pre- and post-inspection as well as rebate forms and distribution.

Costs

- Administration & Inspection (per Rebate) $100
- Sq. Ft. Replaced: CII Sector .45c
- Sq. Ft. Replaced: Residential Sector .45c

Savings

- Savings assumed to be 80% of ETo. Assume ETo requirement of 60 inches per year. Sovocol and Rosales 2001 report that conventional landscape uses 4 to 5 times that of xeriscape).
- Savings assumed to last 10 years.

[6] •As base of comparison, Las Vegas did 90 million sq. ft. 2,000 was typical of rebates in Las Vegas program. An important difference is that the ETo in Las Vegas is 90 inches and they get 4" of rain.

- Savings after end of life span continued by replication of program costs and savings.

Industrial Audits

Note that the Industrial Audit Program is an option for consideration that would replace part of the CII Audit Program with a specialized program for large industrial customers. This program is not on the list of recommended programs at this time; however, the industrial customers that would participate are included in the CII Audit Program on the list.

Program

- Applies to sites with 10 AFY or more (n=32)
- Intensive marketing to recruit for program.
- Sites that participate in Scoping Audit: 50% of n
- Sites that participate in Full Audit: 25% of n
- Sites that implement Full Audit recommendations: 20% of n

Costs

- Marketing (Sites) $500
- Scoping Audit (Sites) $2,000
- Full Audit (Sites) $10,000
- Rebate is $300/AF savings

Savings

- 30% savings
- Savings life: 10 years

High Efficiency Toilets, Aggressive Implementation

Program

- Bill stuffers will be sent to all pre-1992 units in Years 1 and 3.
- A contractor will administer rebates, providing phone support for identifying pre-1992 fixtures and spot check installations.
- 10% of pre-1992 toilets get rebates each year for five years.

Costs

- Direct Mail to Pre-1992 Housing Units $0.50 each
- Administration (per Rebate) $30
- Rebates $100
- Aggressive Rebates $150 SFU
  $200 MFU

Savings

- CMHC 2004 and Aquacraft 2000 reported in AWWARF 2007 indicate savings from HETs are approx. 24%-26% greater than savings from ULFTs.
- Percent replacing pre-1992 toilets is assumed to be 20% replace ULFTs and 80% replace pre-ULF fixtures--based on a program design with targeted direct mail and phone support to identify pre-1992 fixtures and spot checking.
- Savings life assumed to be 23 years after which replacement savings are include in passive savings.

New Construction Code

HE Toilets

Code Requirements

- New construction code for toilets could require all new fixtures meet the standards for High Efficiency Toilets.

Savings

- Savings from New Construction Code is defined as the additional increment of savings above ULFT savings required in Plumbing Code.
- Savings are estimated at 24% above ULFT savings (CMHC 2004 and Aquacraft 2000 reported in AWWARF 2007). ULFT savings are calculated based on persons per household according to the method in CUWCC Cost and Savings Study. Savings are calculated separately for single family and multi family.
- Added savings from new units are attributed to new construction code only until 2014 when plumbing code requires all new fixtures meet HET standards. Savings from devices installed before that date continue to be attributed to New Construction Code. (If period of analysis is extended beyond 2030, need to add lifespan to savings because savings would then be counted in passive savings.)

Residential Landscape

Code Requirements

- New construction landscape code could include limits on square footage of new irrigated area in new sites, requirements for very low water need vegetation, efficient irrigation equipment and practices (weather-based "Smart" irrigation controllers, high efficiency sprinklers, hydro zones, smart edgescapes), or combinations thereof. Since new construction often includes only front-yard landscaping, code would need to apply to subsequent landscape work at new sites.

Savings

- Savings in the SF and MF residential sectors due to New Construction Code include an ambitious package of these water efficiency measures mentioned above that achieve 30% savings using 2006 mean outdoor use per unit.
- Outdoor use for SCV is estimated roughly to be 53% of annual use for SF and 34% of annual use for MF – using a simple ratio method.

Faucet Aerators and Showerheads

Code Requirements

- New Construction Code for sink aerators and showerheads can include requirements for savings beyond required in plumbing code.

Savings

- For sink aerators, the model assumes a move from 2.2 gpm to an aerator with an unspecified lower flow rate that achieves in practice .5 gallons per day savings. Kitchen models would have toggle for fast filling and variable spray control to improve device retention..
- For showerheads, 1.6gpm flow rates are 36% less than 2.5 gpm. Typical savings from empirical savings of 2.5gpm showerheads is 5.5gpd, so we assume that each 1.6gpm fixture due to the new building code saves an additional 1.98gpd (5.5gpd *.36).

High Efficiency Dish Washers

Code Requirements

- New Construction Code for dish washers could require the installation of high efficiency machines in all new units.

Savings

- The model assumes 1.2 gallons per day savings per machine by moving from an average of 9.5 to 7.5 gallons per cycle, 215 cycles per year.
- Prevalence of dish washers is assumed to be 65% for single family and 48% for multi family as midpoints found between two empirical studies on this issue (EBMUD 2002, Market Penetration Study, OC Saturation Study 2002). Arguments can be made for higher or other rates depending on the style of new planned construction.

CII and Landscape Sectors

Code Requirements

- Savings would come from: 1) landscape accounts with dedicated meters and master meters and 2) industrial process efficiency improvements for new industrial customers.
- New construction landscape code could include limits on square footage of new irrigated area in new CII sites, requirements for very low water need vegetation, efficient irrigation equipment and practices, or combinations thereof.
- New construction industrial code could include requirements for rinse water recycling where feasible, high efficiency water consuming equipment (e.g., industrial clothes washers, dishwashers, food processers and steamers, car washes, cooling towers, film processing, etc.). Also included are code measures listed in the residential sector that apply (e.g., toilets).

Savings

- Assume savings of 10% of all new deliveries projected for CII and Landscape in the UWMP. Savings due to code are from 2008-2030. These actions would work toward the objectives of AB 1881.

Passive Conservation

Passive Conservation is that which would occur without programs implemented by agencies. One reason it is important to identify passive conservation is to understand full extent of conservation. Another reason is to assure that savings attributed to Active Conservation are only the additional increment of savings beyond passive savings. Since you are spending hard earned dollars on Active Conservation, you want to be sure to know what you are getting for your money and not to spend money on conservation that would be achieved without the Active Program.

Assumptions:

- Passive conservation is driven by growth in number of housing units and plumbing code.
- Housing units growth summarized in Chapter 3.
- Devices per housing unit summarized in Table B.2.1.
- Natural replacement Rate summarized in Table B.2.2.
- Existence/Adoption Rates summarized in Table B.2.3.
- Savings per device summarized in Table B.2.4.

Table B.2.1 - Conservation Device Saturation Parameters

Parameters	SCWD	LA36	NCWD	VWC	Source
SF Toilets per structure pre-92	2	2	2.5	2	BMP Report Base Year Data
SF Toilets per structure >= 92	2	2	2.5	2	BMP Report Base Year Data
SF Showers per HH	1.8	1.8	1.8	1.8	EBMUD 2002, Market Penetration Study
SF Persons per HH	3.30	2.93	3.35	3.00	BMP Report Base Year Data
SF Pct HH with Clothes Washer	93%	93%	93%	93%	EBMUD 2002 Market Penetration Study (90%); OC Saturation Study 2002 (96.5%)
SF Pct HH with Dishwasher	65%	65%	65%	65%	EBMUD 2002, Market Penetration Study (60%), OC Saturation Study 2002 (83.0%)
MF Toilets per structure pre-92	2	1.5	1.2	1.5	BMP Report Base Year Data
MF Toilets per structure >= 92	2	1.5	1.2	1.5	BMP Report Base Year Data
MF Showers per HH	1.1	1.1	1.1	1.1	EBMUD 2002, Market Penetration Study
MF Persons per HH	3.30	2.93	2.51	3.00	BMP Report Base Year Data
MF Pct HH with Clothes Washer*	26%	15.0%	15.0%	26.0%	EBMUD 2002, Market Penetration Study (15%), OC Saturation Study 2002 (25.6%)
MF Pct HH with Dishwasher**	48%	30.0%	30.0%	48%	EBMUD 2002, Market Penetration Study (30%), OC Saturation Study 2002 (65.8%)

* If multi-family is mostly apartments, use EBMUD Study because multi-family were only apartments in that study.

** If multi-family is mix of apartments and condos use mean of both studies because OC Study included many condos.

Table B.2.2 - Replacement/Remodel Rate* Assumptions for Passive Conservation Model

	SCWD	LA36	NCWD	VWC
Showerhead: SF	5.0%	5.0%	5.0%	5.0%
HE Washer: SF	3.0%	3.0%	3.0%	3.0%
ULFT: SF	4.0%	4.0%	4.0%	4.0%
Dishwasher: SF	3.0%	3.0%	3.0%	3.0%
Sink Aerators: SF	4.0%	4.0%	4.0%	4.0%
Showerhead: MF	5.0%	5.0%	5.0%	5.0%
HE Washer: MF	3.0%	3.0%	3.0%	3.0%
ULFT: MF	4.0%	4.0%	4.0%	4.0%
Dishwasher: MF	3.0%	3.0%	3.0%	3.0%
Sink Aerators: MF	4.0%	4.0%	4.0%	4.0%

*This is the rate at which the existing stock of devices gets replaced either due to repair OR remodel OR demolition.

Table B.2.3 – Existence / Adoption Rates

Existence/Adoption/Compliance Rate

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Showerhead: SF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HE Washer: SF	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	5.0%	8.0%	11.0%	14.0%	17.0%	20.0%	23.0%
ULFT: SF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dishwasher: SF	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	4.5%	7.0%	9.5%	12.0%	14.5%	17.0%	19.5%
Sink Aerators: SF	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	4.5%	7.0%	9.5%	12.0%	14.5%	17.0%	19.5%
Showerhead: MF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HE Washer: MF	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	5.0%	8.0%	11.0%	14.0%	17.0%	20.0%	23.0%
ULFT: MF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dishwasher: MF	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	4.5%	7.0%	9.5%	12.0%	14.5%	17.0%	19.5%
Sink Aerators: MF	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	4.5%	7.0%	9.5%	12.0%	14.5%	17.0%	19.5%

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Showerhead: SF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HE Washer: SF	26.0%	29.0%	32.0%	35.0%	38.0%	41.0%	44.0%	47.0%	50.0%	53.0%	56.0%	59.0%	62.0%	65.0%
ULFT: SF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dishwasher: SF	22.0%	24.5%	27.0%	29.5%	32.0%	34.5%	37.0%	39.5%	42.0%	44.5%	47.0%	49.5%	52.0%	54.5%
Sink Aerators: SF	22.0%	24.5%	27.0%	29.5%	32.0%	34.5%	37.0%	39.5%	42.0%	44.5%	47.0%	49.5%	52.0%	54.5%
Showerhead: MF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HE Washer: MF	26.0%	29.0%	32.0%	35.0%	38.0%	41.0%	44.0%	47.0%	50.0%	53.0%	56.0%	59.0%	62.0%	65.0%
ULFT: MF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dishwasher: MF	22.0%	24.5%	27.0%	29.5%	32.0%	34.5%	37.0%	39.5%	42.0%	44.5%	47.0%	49.5%	52.0%	54.5%
Sink Aerators: MF	22.0%	24.5%	27.0%	29.5%	32.0%	34.5%	37.0%	39.5%	42.0%	44.5%	47.0%	49.5%	52.0%	54.5%

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Showerhead: SF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HE Washer: SF	68.0%	71.0%	74.0%	77.0%	80.0%	83.0%	86.0%	89.0%	92.0%	95.0%	98.0%	100.0%
ULFT: SF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dishwasher: SF	57.0%	59.5%	62.0%	64.5%	67.0%	69.5%	72.0%	74.5%	77.0%	79.5%	82.0%	84.5%
Sink Aerators: SF	57.0%	59.5%	62.0%	64.5%	67.0%	69.5%	72.0%	74.5%	77.0%	79.5%	82.0%	84.5%
Showerhead: MF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
HE Washer: MF	68.0%	71.0%	74.0%	77.0%	80.0%	83.0%	86.0%	89.0%	92.0%	95.0%	98.0%	100.0%
ULFT: MF	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Dishwasher: MF	57.0%	59.5%	62.0%	64.5%	67.0%	69.5%	72.0%	74.5%	77.0%	79.5%	82.0%	84.5%
Sink Aerators: MF	57.0%	59.5%	62.0%	64.5%	67.0%	69.5%	72.0%	74.5%	77.0%	79.5%	82.0%	84.5%

Notes: If there is code, this is compliance rate.
If there is no code, this is the adoption rate.
If the conserving technology is not on the market yet, this value is zero.

Table B.2.4 - Passive Conservation Savings Inputs by Measure

Measures	Gallons per Day	Days Per Yr	Days Per Yr
Showerhead: SF	5.5	365	See AWWARF 2007 p 140
HE Washer: SF	13.9	365	See AWWARF 2007 p 122
ULFT: SF	23.1	365	See AWWARF 2007 pp 149-154
Dishwasher: SF	1.2	365	See CUWCC Potential PBMP p 10
Showerhead: MF	5.5	365	See AWWARF 2007 p 140
HE Washer: MF	13.9	365	See AWWARF 2007 p 122
ULFT: MF	49.1	365	See AWWARF 2007 pp 149-154
Dishwasher: MF	1.2	365	See CUWCC Potential PBMP p 10

Note: ULFT savings are calculated in this table using localized estimates of persons per household. Savings were calculated separately for each agency.

AWWARF 2007 refers to "Water Efficiency Programs for Integrated Water Management," American Water Works Research Foundation, 2007, Appendix C, "Compendium of WUE Savings and Cost Assumptions."

CUWCC Potential PBMP p 10 refers to "Potential Best Management Practices: Year 3 Report," January 2007, prepared for CUWCC by John Koeller

APPENDIX C.1: STAKEHOLDER MEETING 1 PRESENTATION

APPENDIX C.2: STAKEHOLDER MEETING 2 PRESENTATION

APPENDIX D: WATER RATES AND CONSERVATION

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Introduction

This appendix provides a discussion of water rate structures and conservation, sometimes referred to as "conservation pricing". It addresses 1) the theoretical and empirical underpinnings for viewing rate structure design as a key tool for promoting efficient water use decisions, 2) alternative conservation-oriented water rate structures, and 3) cost-of-service considerations of rate design.

Linkages Between Rates and Water Use

Analysts have pointed out that water rates can be an extremely valuable public policy tool. Water rates can be more than a means of meeting utility revenue requirements. Water rates can be used to communicate to water users the private and social costs of water development. Water users can then base their consumption decisions on a more accurate accounting of the benefits and costs of using more or less water. If done correctly, the pricing of water can be a powerful means of signaling the cost and scarcity of the resource to water users, most of whom experience very little connection between their water usage and their total bill. In an era in which customer water demands are increasing while water supplies are constant or diminishing, it is important to apply economic tools to communicate the true value of fresh water.

The "Law of Demand" underpins the ability of conservation-oriented rate structures to promote water conservation. The "Law of Demand" derives from the empirical fact that, all else equal, as the price of a good or service increases, the quantity demanded tends to decrease.[7] This relationship is why graphical depictions of demand curves are usually presented as downward sloping.

To be sure, some goods and services exhibit this tendency to a greater degree than others. Economists use the concept of "price elasticity" to measure the extent to which the demand for a good or service is sensitive to changes in its price. Price elasticity tells you the percentage change in demand for a one percent change in price. For example, if a good has an elasticity of magnitude 1.0, then a 10% increase in its price will produce a 10% decrease in its demand.[8] If instead, the good had an elasticity of magnitude 0.5, then the same 10% increase in price would produce only a 5% decrease in demand. A good or service with an elasticity of magnitude less

[7] Economists have noted rare exceptions to this "Law"; these exceptions include some luxury goods and heroin. Presumably, potable water supply is not included in this subset of goods immune to the "Law of Demand".
[8] Price elasticity actually has a negative sign because price and quantity demanded move in opposite directions. To keep the discussion simple, we are presenting elasticity as a positive parameter. Technically, what we actually are presenting is the absolute value of the elasticity parameter.

than 1.0 is termed "inelastic,"[9] which means the percentage change in demand will be less than the percentage change in price. Conversely, an "elastic" demand is one with a price elasticity magnitude greater than 1.0. For an elastic demand, the percentage change in demand is greater than the percentage change in price.

Over the historic range of prices and consumption, urban demand for water has been relatively inelastic – generally the percentage change in customer water demand has been smaller than the percentage increase in water price. A large body of empirical research over the last 30 years has demonstrated this conclusively.[10] While the demand for water in urban settings is inelastic, its elasticity is not zero, as has been sometimes assumed by most water planning studies done over the past several decades. This distinction is crucial. If demand for water exhibited zero elasticity, what economist's term "perfect inelasticity," water rates would have no relevance to consumer decisions about water use, and rate structure would prove an ineffective policy instrument for encouraging water conservation. But customer demand for water is not perfectly inelastic. It is relatively inelastic, yes, but not perfectly inelastic. This means that rates can be used strategically to influence the level of demand.

Comprehensive reviews of the empirical evidence have suggested the following regarding the price elasticity of residential customers demand for water:[11]

- The majority of empirical studies have found the long-term residential price elasticity to range between 0.2 and 0.6. After reviewing the evidence, Griffin (2006) concluded that price elasticity for annual residential water use is likely to lie in the range of 0.35 to 0.45, meaning a 10% rate increase may produce a 3.5% to 4.5% reduction in demand over time.[12]
- Outdoor residential demand is more elastic than indoor residential demand. All else equal, residential water users will reduce outdoor consumption more readily than indoor consumption. The corollary of this finding is that summer demand tends to be more elastic than winter demand, because most outdoor use occurs during the summer.
- Residential customer demand for water is more responsive to price over the long-term than over the short-term. Another way of stating this is that it takes time for price changes to fully influence the demand for water. Right after a price increase, consumers are mostly locked into their water using appliances and landscaping. While they can modify their water using behavior in response to the price increase or change in rate structure, they may not be able to adjust their stock of water using capital, at least not right away. Over time, as this stock of capital wears out and is replaced, improvements in the efficiency of the capital can be realized. Thus, long-run demand tends to be less inelastic than short-run demand. Griffin (2006) estimates that long-run demand elasticity

[9] Note that many often read the label of "inelasticity" to mean "no elasticity". The authors are unaware how the label of "inelasticity" was chosen to mean "limited elasticity". Economists refer to a complete lack of demand responsiveness to price as "perfectly inelastic". This subtlety has been a longstanding and unfortunate source for misunderstanding between economists studying water demand and non-economists.
[10] Renzetti, Steven (2002). The Economics of Water Demands, Kluwer Academic Publishers, Boston.
[11] Epsey, M., J. Epsey, and W. Shaw (1997). *Price Elasticity of Residential Demand for Water: A Meta-Analysis*. Water Resources Research 33 (June) 1369-1374. Also see Dalhuisen, J., et. al. (2003). *Price and Income Elasticities of Residential Demand: A Meta-Analysis.* Land Economics 79 (May): 292-308.
[12] Griffin, Ronald C. (2006). Water Resource Economics: The Analysis of Scarcity, Policies, and Projects. The MIT Press, Cambridge, MA.

is typically on the order of 0.2 points higher than short-run elasticity (e.g. if long-run elasticity is 0.4, then short-run elasticity is probably around 0.2). These are broad generalizations, however. Demand responses are often specific to the time and circumstances in which the price adjustment occurs, and therefore can significantly vary by region and time period.

Far fewer studies have been completed for commercial and industrial customer demand for water than for residential customers and the heterogeneity of commercial and industrial water uses can make generalizations more difficult. Some industrial uses, such as flow through cooling, have been found to be very elastic – probably because of the relatively low cost involved in switching to more water efficient cooling practices once cost for water begins to increase. Process water uses are generally less elastic than cooling uses. Commercial and office uses, which are primarily related to sanitation, space cooling, and landscape irrigation, also have been shown to be relatively inelastic. The empirical evidence suggests the following about commercial and industrial price elasticity:

- Industrial demand tends to be less price inelastic than commercial demand, though demand for certain industrial processes requiring very high quality water can be very inelastic.
- Commercial demand tends to be inelastic, though empirical estimates span a wide range. Commercial water demand studies reviewed by Renzetti (2002) reported price elasticity's ranging from 0.1 to 0.9. Elasticity varied considerably by commercial sector.
- As with residential customer demand for water, commercial and industrial demands are less inelastic in the long-run than in the short-run.

Using Rates to Influence Customer Demand for Water

Different rate structures have different types of effects on customer demand for water. Water agencies use rates to help manage water demand—throughout the year, during periods of seasonal peak demand, or in specific geographical zones.

Goal 1 - Reduce average system load. Conservation rates can reduce total annual water use, that is, reduce average day demand. This goal may be particularly appropriate if the agency faces a supply source constraint that could necessitate the importing or purchasing relatively costly supplies. Demand management through pricing can help utilities avoid these costs.

Goal 2 - Reduce peak system load. A related goal for a water agency in implementing conservation rates can be to reduce seasonal water demand. This objective may be particularly appropriate for agencies facing costly capacity expansion. Again, these costs may be avoidable through effective demand management.

Goal 3 - Reduce system diseconomies. Finally, agencies may want to ensure that customers in expensive-to-serve areas absorb the cost of this capacity through rates.

Agencies should also recognize, however, that customers willing to pay more for expensive types of water service are communicating a willingness to pay for additional investments to

provide additional water service. Rather than a failing of conservation pricing, customer preferences for additional water service should be viewed as a form of desirable two-way price signaling.

The evidence on how residential, commercial, and industrial customer demand for water typically responds to changes in the cost of water can be used to structure rates to promote conservation. Before discussing the advantages and limitations of specific conservation-oriented rate designs, some general principals are presented. These are as follows:

- Conservation-oriented rates are likely to have the most impact on outdoor water uses because these uses are more responsive to price than indoor uses. Thus, rate structure can play an important role in promoting efficient landscape water use. As we will see in the case study section, combining a well-designed rate structure with landscape budgets or other landscape conservation programs can be particularly effective.
- Because customer demand for water exhibits strong seasonality, as do many water system costs, differentiating rates by season can both promote more efficient outdoor water use and more equitably allocate water system costs among water users.
- Water rates can influence the choice of landscaping, water-using appliances, fixtures, and processes. These are decisions that can affect regional water demands for many years into the future. Rate structures can be designed to promote water efficient capital investments. They can also be paired with conservation programs promoting replacement of inefficient water using appliances, irrigation systems, and landscaping materials.
- Water agencies need rates primarily to recover the costs of providing water service, not just to promote conservation. Sometimes the concern is expressed that using rates to promote conservation will result in lower water sales and jeopardize the financial integrity of the utility. As a factual matter, the evidence strongly suggests that this concern is misplaced. When customer demand for a good is inelastic, as is the case for urban water uses, the positive effect on revenue of the higher price will outweigh the negative effect of lower sales. The net effect will be an increase, not a decrease, in sales revenue.13

Conservation-Oriented Rate Designs

Water rates have been designed in a variety of ways to promote water conservation. Three of the most commonly employed designs are: (1) increasing-block rates, (2) seasonally adjusted rates, and (3) budget-based rates. This section describes each of these approaches as well as how they can be combined to further refine the price signal or meet other policy or financial objectives.

Increasing-Block Rates

With an increasing-block rate, the price of water increases with the quantity of water consumed. The rate structure defines two or more consumption blocks (or tiers) and the price for water in each block. For example, a 3-block structure might define the first block as monthly consumption between 0 and 6 CCF; the second block as monthly consumption between 6 and 10 CCF; and the third block as anything more than 10 CCF. A customer consuming 7 CCF in a

[13] Because rate increases sometimes follow periods of mandatory, non-price rationing during droughts, the effect on utility revenues of the non-price rationing and the rate increase are sometimes confused. Non-price rationing results in lower water use and lower system revenue. Price rationing, on the other hand, results in lower water use but higher system revenue.

month would pay the lower first block price for the first six CCF and the higher second block price for the seventh. A customer consuming 12 CCF would pay the first block price for the first six CCF, the second block price for the next four CCF, and the third block price for the last two CCF.

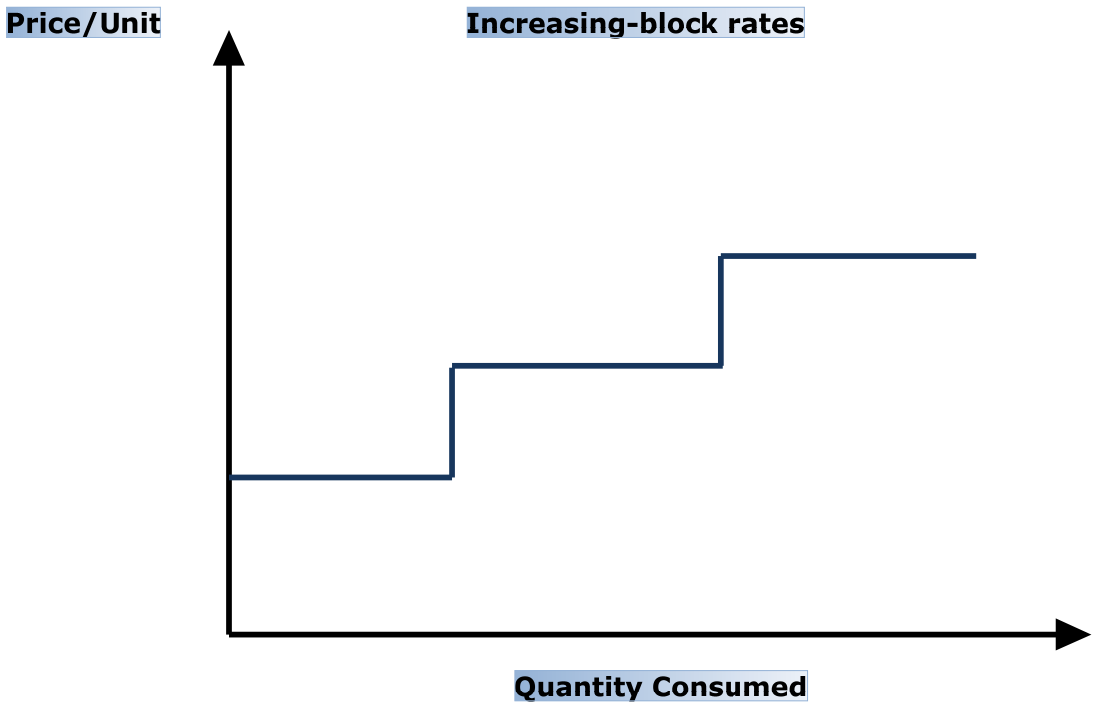

Figure 1 Increasing-block Rates

Water agencies typically use increasing-block rate designs to send a price signal to their customers that higher amounts of consumption require the agency to acquire, treat, and distribute more expensive water supplies. Ideally this is done by setting the price for water equal to the marginal cost of supply. Doing this, however, can result in the water agency collecting too much revenue. Agencies can use a block-rate design to avoid over collecting revenue. The upper-block rates are set to approximate the marginal cost of water supply. The lower-block rates are set so the agency does not exceed its revenue requirement.

The effectiveness of increasing block-rates as a conservation tool depends on the design of the blocks and block-prices. As previously noted, upper-block prices should reflect long-run system marginal costs. The blocks should be such that transitions between blocks are attainable through reasonable modifications in water using behavior and capital. For example, designing a block-rate so the top 25% of residential water users fall within the upper block and could through modest to moderate investments in water use efficiency move into the lower block would be more effective than a block-rate structure where 75% of residential water users fall into the upper-block and only a small percentage would be expected to move into the lower block through moderate to extraordinary investments in water use efficiency. In all cases, designing a good block-rate structure requires thoughtful analysis of customer water usage patterns and water system costs.

Seasonal Rates

Seasonal rates can be used to reflect temporal differences in the cost of providing water service. For many water agencies, costs increase during the summer months because of the need for extra capacity to serve increased outdoor demand. Some water agencies may also have to increase their reliance on more expensive sources of water during summer periods. A seasonal rate design can be used to signal to water users that the resource they are demanding costs more to provide in some periods than others. This is a type of peak-load pricing; a pricing structure commonly used in the electricity, gas, communication, and transportation industries.

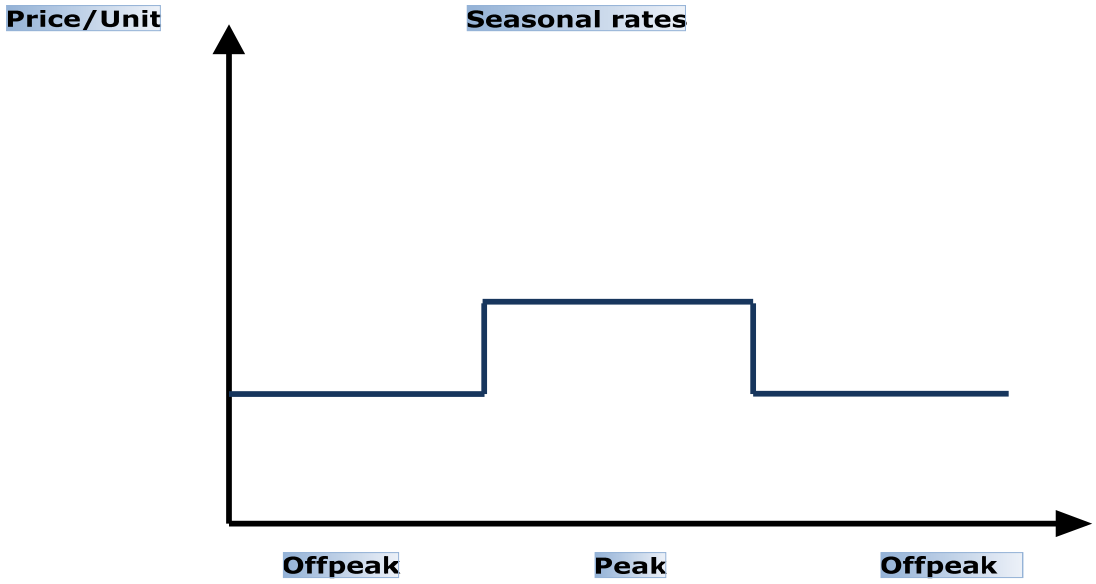

Figure 2 Seasonal Rates

Seasonal pricing can be especially effective in promoting outdoor water conservation. As discussed previously, empirical studies have shown outdoor water use tends to be more responsive to rates. Partly this is because at historic prices water users have not placed much emphasis on landscape water use efficiency. As price rises, relatively easy changes in irrigation scheduling and maintenance can result in significant changes in water use. Also, a seasonal rate increase provides water users with a bigger financial incentive to fix outdoor leaks. Given that outdoor water uses typically account for almost two-thirds of residential water demand, using a rate structure that signals to customers the full cost of meeting these demands is a good way to promote more efficient water use. Seasonal rate designs can be an effective way to do this.

Budget-Based Rates

Budget-based rates combine a water use budget (typically for landscape-only water uses) with a schedule of rates. Rates are tiered to provide a financial incentive to stay within the water use budget. Exceeding the budget results in a higher rate or surcharge. Charges for exceeding the budget can be on a sliding scale, increasing as the amount the budget is exceeded increases. Budget-based rates are a requirement of BMP 5 for accounts with dedicated landscape meters.

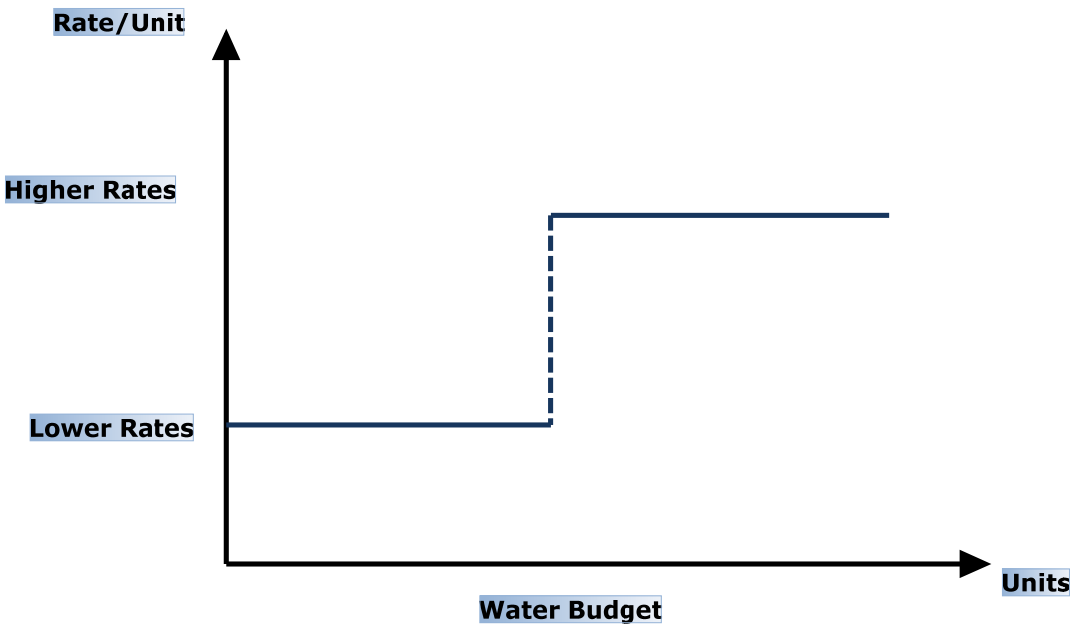

Figure 3 Water Budget Based Rates

Budget-based rates have several key advantages for promoting landscape water use efficiency. First, they establish for customers the correct amount of landscape water usage designed to keep both landscape healthy and water use reasonable. This is important because a surprisingly large proportion of water users really have no idea how much water their landscape requires to stay healthy and vibrant. Given this lack of knowledge, many water users adopt a "more is better" approach to watering. Second, the budget allows the water agency to identify customers with excessive outdoor water usage and provide direct assistance to them to become more water efficient. Third, the budget provides information about whether landscape water usage is excessive to the person responsible for paying the water bill. This is useful because for accounts with large landscaped areas it is frequently the case that the person responsible for paying the water bill is not the same as the person managing the landscape. In these cases, the person paying the bill learns whether they are using too much water for landscape and need to work with their landscape manager to curb usage.

A study of four southern California water agencies with budget-based rates found they reduced landscape water use by about 20%.[14] The study also found that the rates were effective at reducing seasonal peak demand and that customers became more responsive to information about evapotranspiration and plant water needs.[15]

[14] A&N Technical Services (1997), "Landscape Water Conservation Programs: Evaluation of Water Budget Based Rate Structures," prepared for the Metropolitan Water District of Southern California, September.

[15] Budget-based rates have been criticized as less than perfectly conservation-oriented because they primarily aim to improve water use efficiency of current landscape (short run efficiency). Budget-based rates may provide insufficient incentive to change to a more efficient landscape mix (long run efficiency). These rates represent an informative tradeoff that communities have made between administrative costs, equity of water shortage allocations, and short and long run water efficiencies.

Drought Pricing

The concept of drought pricing is to incorporate water rates into drought/shortage planning. Water agencies in California currently develop drought management plans (refer to USBR Drought Management Planning Guidelines) that call for coordinated response to water shortages. Part of the coordination needs to include planning for water rates. The AWWA M1 Manual of Rates includes a section on Drought Pricing. The basic idea is as follows: when a water agency declares a shortage emergency and requests voluntary or mandatory customer curtailment of water use a corresponding change in water rates for the duration of the drought emergency will accomplish several things:

- Customers are sent a higher price signal to indicate the scarcity value of water during a drought emergency.
- Water agencies avoid the inevitable "unexpected" revenue shortfall that follows a successful citizen response to calls for curtailed water use.
- Water agencies can avoid the political backlash if water rates are increased after customers have heeded the call to perform a civic duty by curtailing use.

Hybrid Designs

Different rate designs can be combined to better tailor the price signal to specific policy objectives. Seasonally differentiated rates, for example, can also incorporate block- or budget-based components. Existing rates can be combined with excess use surcharges or discounts to discourage wasteful water uses and reward efficient practices. In San Francisco, for example, customers that retrofit their homes or businesses with low water using fixtures are eligible for a lower rate than those that do not. Water budgets have been very successfully married to drought pricing in areas that have experience severe water shortages.[16]

Cost-of-Service Considerations

It is practically a truism to say that higher water rates will result in lower water use. One could thus conclude that in terms of promoting water conservation, the higher the rate the better. But this would be wrong. Rates should be designed to accurately transmit to water users the cost of providing water service. This is a fundamental requirement for economically efficient pricing policies and also a legal requirement in California.[17] A detailed cost-of-service study should be at the core of every rate design. Rates should be designed to allocate and recover system costs in a way that closely approximates the causation of those costs. Simple rates based on average system costs often fail to do this because they ignore important temporal, spatial, and volume differences in daily, monthly, and annual demands that drive system capacity and operating requirements. More sophisticated rate designs that reflect long-run marginal costs and include seasonality can do a better job at equitably and efficiently allocating system costs while simultaneously helping to meet an agency's water conservation policy objectives.

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[16] See the recent AwwaRF study by Mayer, DeOreo, Chesnutt, Pekelney, and Summers, *Water Budgets and Rate Structures– Innovative Management Tools*, 2007.

[17] The passage or Proposition 218 in 1996 amended the California Constitution to require a strong nexus between cost-of-service and the fees charged to property owners for a property-related service. A recent decision by the California Supreme Court (Bighorn-Desert View Water Agency v. Beringson) affirmed that water service is subject to these requirements.

2010 Urban Water Management Plan

Final

Prepared for:

Castaic Lake Water Agency (CLWA)
CLWA Santa Clarita Water Division
Newhall County Water District
Valencia Water Company
(Los Angeles County Waterworks District No. 36/Cooperating Agency)

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List of Abbreviations and Acronyms

The following abbreviations and acronyms are used in this report.

AB	Assembly Bill
ACOE	U.S. Army Corps of Engineers
Act	California Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
Agency	Castaic Lake Water Agency
APA	Administrative Procedure Act
AWRM	Alternative Water Resources Management Program
AWWARF	American Water Works Association Research Foundation
Basin	Santa Clara River Valley Groundwater Basin, East Subbasin
BDCP	Bay Delta Conservation Plan
BMPs	Best Management Practices
BO	Biological Opinion
BVWSD	Buena Vista Water Storage District
CCF	One Hundred Cubic Feet

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CCR	Consumer Confidence Report
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CLWA	Castaic Lake Water Agency
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DBP	Disinfection by-products
D/DBP	Disinfectants and Disinfectant By-Products
Delta	Sacramento-San Joaquin Delta
DFG	California Department of Fish and Game
DHS	California Department of Health Services
District	Los Angeles County Waterworks District No. 36
DMM	Demand Management Measure
DOF	Department of Finance
DPH	Department of Public Health
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	Electrical conductivity
Edison	Southern California Edison
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ETo	evapotranspiration
FWS	United States Fish and Wildlife Service
GPCD	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
GSWI	groundwater and surface water interaction model
GWMP	Groundwater Management Plan
HAA5	Haloacetic Acids
KCWA	Kern County Water Agency
LACDRP	Los Angeles County Department of Regional Planning
LACSD	Sanitation Districts of Los Angeles County
LACWWD 36	Los Angeles County Waterworks District No. 36

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M&I	Municipal and Industrial
MCL	Maximum contaminant level
Metropolitan	Metropolitan Water District of Southern California
MAF	million acre-feet
mgd	million gallons per day
mg/L	milligrams per liter
MOU	Memorandum of Understanding Regarding Water Conservation in California
MWD	Metropolitan Water District of Southern California
NCWD	Newhall County Water District
NEPA	National Environmental Protection Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OVOV	One Valley One Vision
Plan	Urban Water Management Plan 2010
PPHH	persons-per-household
PUC	California Public Utilities Commission
Purveyor	Supplier of drinking water at the retail level (also retailer and retail purveyor)
RAP	Remedial Action Plan
RO	Reverse Osmosis
RRB	Rosedale-Rio Bravo
RRBWSD	Rosedale-Rio Bravo Water Storage District
RPA	Reasonable and Prudent Alternative
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SCLLC	Santa Clarita LLC
SCOPE	Santa Clarita Organization for Planning the Environment
SCVSD	Santa Clarita Valley Sanitation District
SCWD	Santa Clarita Water Division
SRWS	self-regenerating water-softeners
Semitropic	Semitropic Water Storage District
SSO	site specific objective
SOC	Synthetic organic compounds
SWP	State Water Project
Suppliers	CLWA and purveyors collectively

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SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
THM	Trihomethanes
TTHM	Total Trihalomethanes
TOC	Total Organic Carbon
umhos/cm	Micromhos per centimeter
USCR	Upper Santa Clara River
UWMP	Urban Water Management Plan
Valley	Santa Clarita Valley
VOC	Volatile organic compounds
VWC	Valencia Water Company
WTP	Wastewater Treatment Plant
WRP	Water Reclamation Plant
WQOs	Water Quality Objectives

RESOLUTION NO. 2809

RESOLUTION OF THE CASTAIC LAKE WATER AGENCY BOARD OF DIRECTORS ADOPTING THE 2010 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Urban Water Management Planning Act, Water Code Section 10610, et seq. (the Act) mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt an updated urban water management plan (UWMP) at least once every five years on or before December 31, in years ending five and zero; and

WHEREAS, the Castaic Lake Water Agency (CLWA), which includes the CLWA Santa Clarita Water Division (SCWD), is an urban water supplier for purposes of the Act, and in 2005 approved and adopted its most recent UWMP and submitted its 2005 UWMP to the California Department of Water Resources (DWR); and

WHEREAS, the Water Conservation Act of 2009, Water Code Section 10608 et seq. (SBX7-7), extended the time by which urban retail water suppliers must adopt 2010 UWMPs to July 1, 2011 to permit coordination between urban wholesale water suppliers and urban retail water suppliers and, among other things, established requirements for urban retail water suppliers to prepare urban water use targets in accordance with the goals of SBX7-7 to reduce statewide daily per capita water use by 15 percent by the year 2015 and 20 percent by the year 2020; and

WHEREAS, the SCWD is an "urban retail water supplier" for purposes of SBX7-7 because it directly provides potable municipal water to more than 3,000 end users; and

WHEREAS, Section 10620(d)(1) of the Act encourages urban water suppliers to satisfy the requirements of the Act by participation in area wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use; and

WHEREAS, CLWA, in cooperation with SCWD, Newhall County Water District (NCWD) and the Valencia Water Company (VWC), prepared a document labeled "Public Review Draft 2010 Urban Water Management Plan" for the CLWA service area (Draft 2010 UWMP), upon which Los Angeles County Waterworks District No. 36 (LACWWD #36) participated as a cooperating agency; and

WHEREAS, in accordance with applicable law, including the requirements of the Act and of SBX7-7, CLWA has prepared the Draft 2010 UWMP and has undertaken certain agency coordination, public notice, public involvement and outreach, public comment, and other procedures in relation to the Draft 2010 UWMP; and

WHEREAS, as authorized by Section 10620(e) of the Act, CLWA has prepared its Draft 2010 UWMP with its own staff, with the assistance of consulting professionals and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its Draft 2010 UWMP, and has, in part, utilized and relied upon the DWR Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan (March 2011) and the DWR Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009) (February 2011) in preparing its Draft 2010 UWMP; and

WHEREAS, CLWA began its public outreach and community involvement in the preparation of the Draft 2010 UWMP in May 2010, with its first scheduled community workshop, followed by five more community workshops and three public hearings; and

WHEREAS, pursuant to Section 10621(b) of the Act, on March 3, 2011, CLWA notified the City of Santa Clarita and the Counties of Ventura and Los Angeles that it would be preparing its 2010 UWMP, and that it would be releasing the Draft 2010 UWMP in April 2011, and subsequently met with, consulted with and obtained comments from the City of Santa Clarita, the United Water Conservation District and the County of Los Angeles; and

WHEREAS, in accordance with applicable law, including Water Code Sections 10608.26 and 10642, and Government Code Section 6066, CLWA made its Draft 2010 UWMP available for public inspection, and provided notice of the time and place of each joint public hearing on the Draft UWMP; and

WHEREAS, on March 23, 2011, CLWA and NCWD held a joint public hearing, properly noticed pursuant to Section 10642 of the Act and Government Code Section 6066, at which time CLWA's Board of Directors reviewed draft sections and tables for inclusion in the Draft 2010 UWMP, and, as part of that review, considered a presentation regarding the Draft 2010 UWMP by its staff and consultants, and oral and written public comments; and

WHEREAS, on May 18, 2011, CLWA and NCWD held a second joint public hearing, properly noticed pursuant to Section 10642 of the Act and Government Code Section 6066, at which time CLWA's Board of Directors considered further oral and written public comments, and responses to those comments by its staff and consultants, which included a presentation of the changes that had been made in the Public Review Draft 2010 UWMP; and

WHEREAS, on June 15, 2011, CLWA circulated to each of the members of its Board of Directors a Final Draft 2010 UWMP; and

WHEREAS, on June 22, 2011, CLWA and NCWD held a properly noticed joint public meeting and public hearing to consider adoption of the Final Draft 2010 UWMP, at which time CLWA's Board of Directors considered further oral and written public comments, and responses to those comments by its staff and consultants, which included a presentation of the changes that had been made in the Final Draft 2010 UWMP, and reviewed and considered adoption of the Final Draft 2010 UWMP; and

WHEREAS, pursuant to Water Code Section 10620(d)(2), CLWA coordinated the preparation of its Draft 2010 UWMP and Final Draft 2010 UWMP with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies and relevant public agencies, to the extent practicable; and

WHEREAS, pursuant to Water Code Section 10620(f), CLWA describes in the Draft 2010 UWMP and in the Draft Final 2010 UWMP water management tools and options used by CLWA that will maximize resources and minimize the need to import water from other regions; and

WHEREAS, pursuant to Water Code Section 10641, CLWA consulted with and obtained comments from those public agencies or persons with special expertise with respect to demand management methods and techniques; and

WHEREAS, CLWA has encouraged the active involvement of diverse social, cultural and economic elements of the population within the Agency's service area with regard to the preparation of the Draft UWMP and Final Draft UWMP, allowed input by members of the public and any other interested party regarding all aspects of the Draft 2010 UWMP and Final Draft 2010 UWMP, allowed community input regarding SCWD's implementation plan for complying with SBX7-7, considered the economic impacts of the SCWD's implementation plan for complying with SBX7-7 and adopted Method 1 under Water Code Section 10608.20(b) for determining its urban water use targets; and

WHEREAS, to assure public participation in the process, CLWA has exceeded the requirements of the Act, by holding more than one public hearing; and

WHEREAS, the CLWA Board of Directors has considered the public and Board comments made at the three public hearings, as well as all written public comments on the Draft 2010 UWMP and the Final Draft 2010 UWMP distributed to the Board of Directors; and

WHEREAS, the CLWA Board of Directors has carefully reviewed the Final Draft 2010 UWMP, any errata, revisions and modifications made at the hearing; and

WHEREAS, the CLWA Board of Directors has carefully reviewed and considered the purposes and requirements of the Act and SBX7-7, the contents of the Final Draft 2010 UWMP, any errata, revisions and modifications made at the hearing, the documentation contained in the administrative record in support of the Final Draft 2010 UWMP, and all public and agency input received with regard to the Final Draft 2010 UWMP, and has determined that the factual analyses and conclusions set forth in the 2010 UWMP are supported by substantial evidence.

NOW THEREFORE, BE IT RESOLVED that this Board of Directors of Castaic Lake Water Agency does hereby adopt Method 1 under Water Code Section 10608.20(b) for determining its urban water use targets, and the Final Draft 2010 UWMP attached hereto as Exhibit "A" and incorporated herein by this reference, including any errata, revisions and modifications made at the hearing, is hereby approved and adopted as CLWA's 2010 Urban Water Management Plan, and filed with the Secretary of the Board; and

RESOLVED FURTHER that the General Manager of the Agency is hereby authorized and directed to include a copy of this Resolution in the Agency's 2010 Urban Water Management Plan and, in accordance with Water Code Section 10644(a), to file the 2010 Urban Water Management Plan with the California Department of Water Resources, the California State Library, and any city or county within which the Agency provides water supplies within thirty (30) days of this adoption date; and

RESOLVED FURTHER that in accordance with Water Code Section 10645, the General Manager is hereby authorized and directed to make the 2010 Urban Water Management Plan available for public review during normal business hours at CLWA's administrative offices at 27234 Bouquet Canyon Road, Santa Clarita, CA, not later than thirty (30) days after filing a copy thereof with the California Department of Water Resources; and

RESOLVED FURTHER that in accordance with Water Code Section 10635(b), the General Manager is hereby authorized and directed to provide that portion of the 2010 Urban Water Management Plan prepared pursuant to Water Code Section 10635(a) to any city or county within which the Agency provides water supplies not later than sixty (60) days after filing a copy thereof with the California Department of Water Resources; and

RESOLVED FURTHER in accordance with the Urban Water Management Planning Act and SBX7-7, including, but not limited to, the Agency's Water Conservation Programs and its Water Shortage Contingency Plan, the General Manager is hereby authorized and directed to implement the components of the 2010 Urban Water Management Plan; and

RESOLVED FURTHER that the General Manager is authorized and directed to recommend to the Board of Directors additional steps necessary or appropriate to effectively carry out the implementation of the 2010 Urban Water Management Plan, the Urban Water Management Planning Act and SBX7-7.

William L. Lange
Vice President

I, the undersigned, hereby certify I am the duly appointed and acting Secretary of the Castaic Lake Water Agency and at a regular meeting of the Board of Directors of said Agency held on Wednesday, June 22, 2011, the foregoing Resolution No. 2809 was duly and regularly adopted by said Board, and that said resolution has not been rescinded or amended since the date of its adoption, and it is now in full force and effect.

DATED: June 22, 2011

April Jacobs
April Jacobs, Secretary

EXHIBIT "A"

FINAL DRAFT 2010 UWMP
(Attached hereto)

RESOLUTION NO. 2011-10

RESOLUTION OF THE BOARD OF DIRECTORS OF NEWHALL COUNTY WATER DISTRICT ADOPTING ITS 2010 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Urban Water Management Planning Act, Water Code Section 10610, et seq. (the Act) mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt an updated urban water management plan (UWMP) at least once every five years on or before December 31, in years ending five and zero; and

WHEREAS, the Newhall County Water District (NCWD) is an urban water supplier for purposes of the Act, and in 2005 approved and adopted its most recent UWMP and submitted its 2005 UWMP to the California Department of Water Resources (DWR); and

WHEREAS, the Water Conservation Act of 2009, Water Code section 10608 et seq. (SBX7-7), extended the time by which urban retail water suppliers must adopt 2010 UWMPs to July 1, 2011 and, among other things, established requirements for urban retail water suppliers to prepare urban water use targets in accordance with the goals of SBX7-7 to reduce statewide daily per capita water use by 15 percent by the year 2015 and 20 percent by the year 2020; and

WHEREAS, SBX7-7 was amended in 2010, extending the time by which urban water wholesale suppliers must adopt 2010 UWMPs to July 1, 2011, to permit coordination between urban wholesale water suppliers and urban retail water suppliers; and

WHEREAS, section 10620(d)(1) of the Act encourages urban water suppliers to satisfy the requirements of the Act by participation in area wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use; and

WHEREAS, NCWD, Castaic Lake Water Agency (CLWA), Santa Clarita Water Division (SCWD) and the Valencia Water Company (VWC) collectively referred to as the Water Suppliers, prepared a document labeled "Public Review Draft 2010 Urban Water Management Plan" (Draft 2010 UWMP), upon which Los Angeles County Waterworks District No. 36 (LACWWD #36) participated as a cooperating agency; and

WHEREAS, in accordance with applicable law, including the requirements of the Act and of SBX7-7, the Water Suppliers have prepared the Draft 2010 UWMP and have undertaken certain agency coordination, public notice, public involvement and outreach, public comment, and other procedures in relation to the Draft 2010 UWMP; and

WHEREAS, as authorized by Section 10620(e) of the Act, the Water Suppliers have prepared the Draft 2010 UWMP with their own staff, with the assistance of consulting professionals and in cooperation with other governmental agencies, and have utilized and relied upon industry standards and the expertise of industry professionals in preparing the Draft 2010 UWMP, and have, in part, utilized and relied upon the DWR Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan (March 2011) and the DWR Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the

Consistent Implementation of the Water Conservation Act of 2009) (February 2011) in preparing the Draft 2010 UWMP; and

WHEREAS, the Water Suppliers began public outreach and community involvement in the preparation of the Draft 2010 UWMP in May 2010, with the first scheduled community workshop, followed by five more community workshops and three public hearings; and

WHEREAS, pursuant to Section 10621(b) of the Act, on March 3, 2011, the Water Suppliers notified the City of Santa Clarita and the Counties of Ventura and Los Angeles that they would be preparing the 2010 UWMP, and that they would be releasing the Draft 2010 UWMP in April 2011; and, in addition the Water Suppliers subsequently met with, consulted with and obtained comments on the 2010 UWMP from the City of Santa Clarita, the United Water Conservation District and the County of Los Angeles; and

WHEREAS, in accordance with applicable law, including Water Code sections 10608.26 and 10642, and Government Code section 6066, the Water Suppliers made the Draft 2010 UWMP available for public inspection, and published notice of the time and place of each joint public hearing on the Draft UWMP; and

WHEREAS, on March 23, 2011, NCWD and CLWA held a joint public hearing, properly noticed pursuant to Section 10642 of the Act and Government Code section 6066, at which time NCWD's Board of Directors reviewed draft sections and tables for inclusion in the Draft 2010 UWMP, and, as part of that review, considered a presentation regarding the Draft 2010 UWMP by staff and consultants, and oral and written public comments; and

WHEREAS, on May 18, 2011, NCWD and CLWA held a second joint public hearing, properly noticed pursuant to Section 10642 of the Act and Government Code section 6066, at which time NCWD's Board considered further oral and written public comments, and responses to those comments by staff and consultants, which included a presentation of the changes that had been made in the Public Review Draft 2010 UWMP; and

WHEREAS, on June 15, 2011, NCWD circulated to each of the members of its Board of Directors a Final Draft 2010 UWMP; and

WHEREAS, on June 22, 2011, CLWA and NCWD held a properly noticed joint public meeting and public hearing to consider adoption of the Final Draft 2010 UWMP, at which time NCWD's Board of Directors considered further oral and written public comments, and responses to those comments by staff and consultants, which included a presentation of the changes that had been made in the Final Draft 2010 UWMP and reviewed and considered adoption of the Final Draft 2010 UWMP; and

WHEREAS, pursuant to Water Code Section 10620(d)(2), the Water Suppliers coordinated the preparation of the Draft 2010 UWMP and Final Draft 2010 UWMP with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies and relevant public agencies, to the extent practicable; and

WHEREAS, pursuant to Water Code Section 10620(f), the Water Suppliers describe in the Draft 2010 UWMP and in the Draft Final 2010 UWMP water management tools and options used by the Water Suppliers which will maximize resources and minimize the need to import water from other regions; and

WHEREAS, pursuant to Water Code Section 10641, the Water Suppliers consulted with and obtained comments from those public agencies or persons with special expertise with respect to demand management methods and techniques; and

WHEREAS, the Water Suppliers have encouraged the active involvement of diverse social, cultural and economic elements of the population within NCWD's service areas and surrounding communities, with regard to the preparation of the Draft UWMP and Final Draft UWMP, allowed input by members of the public and any other interested party regarding all aspects of the Draft 2010 UWMP and Final Draft 2010 UWMP, allowed community input regarding NCWD's implementation plan for complying with SBX7-7, considered the economic impacts of NCWD's implementation plan for complying with SBX7-7 and adopted Method 1 under Water Code section 10608.20(b) for determining its urban water use targets; and

WHEREAS, to assure public participation in the process, the Water Suppliers have exceeded the requirements of the Act, by holding more than one public hearing; and

WHEREAS, the NCWD Board of Directors has considered the public and Board comments made at the three public hearings, as well as all written public comments on the Draft 2010 UWMP and the Final Draft 2010 UWMP distributed to the Board of Directors; and

WHEREAS, the NCWD Board of Directors has carefully reviewed and considered the purposes and requirements of the Act and SBX7-7, the contents of the Final Draft 2010 UWMP, any errata, revisions and modifications made at the hearing, the documentation contained in the administrative record in support of the Final Draft 2010 UWMP, and all public and agency input received with regard to the Final Draft 2010 UWMP, and has determined that the factual analyses and conclusions set forth in the 2010 UWMP are supported by substantial evidence.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of Newhall County Water District do hereby adopt Method 1 under Water Code section 10608.20(b) for determining its urban water use targets, and the Final Draft 2010 UWMP attached hereto as Exhibit "A" and incorporated herein by this reference, including any errata, revisions and modifications made at the hearing, is hereby approved and adopted as NCWD's 2010 Urban Water Management Plan, and ordered filed with the Secretary of the Board; and

RESOLVED FURTHER that the General Manager of the District is hereby authorized and directed to include a copy of this Resolution in the District's 2010 Urban Water Management Plan and, in accordance with Water Code section 10644(a), to file the 2010 Urban Water Management Plan with the California Department of Water Resources, the California State Library, and any city or county within which the District provides water supplies, within thirty (30) days of this adoption date; and

RESOLVED FURTHER that in accordance with Water Code section 10645, the General Manager is hereby authorized and directed to make the 2010 Urban Water Management Plan available for public review during normal business hours at NCWD's administrative offices at 23780 North Pine Street, Santa Clarita, CA, not later than thirty (30) days after filing a copy thereof with the California Department of Water Resources; and

RESOLVED FURTHER that in accordance with Water Code section 10635(b), the General Manager is hereby authorized and directed to provide that portion of the 2010 Urban Water Management Plan prepared pursuant to Water Code section 10635(a) to any city or county

within which the District provides water supplies not later than sixty (60) days after filing a copy thereof with the California Department of Water Resources; and

RESOLVED FURTHER in accordance with the Urban Water Management Planning Act and SBX7-7, including, but not limited to, the District's Water Conservation Programs and its Water Shortage Contingency Plan, the General Manager is hereby authorized and directed to implement the components of the 2010 Urban Water Management Plan; and

RESOLVED FURTHER that the General Manager is authorized and directed to recommend to the Board of Directors additional steps necessary or appropriate to effectively carry out the implementation of the 2010 Urban Water Management Plan, the Urban Water Management Planning Act and SBX7-7.

RESOLVED FURTHER that the General Manager and District staff are hereby authorized and directed to take such other and further actions as may be necessary or appropriate to carry out the purposes of this resolution, the Act and SBX7-7.

PASSED, APPROVED AND ADOPTED at a Special Meeting of the Board of Directors of Newhall County Water District held on June 22, 2011. Resolution No. 2011-10 was adopted by the following vote:

AYES:	**Directors**	ATKINS, COLLEY, GUTZEIT, MORTENSEN, PLAMBECK
NOES:	**Directors**	NONE
ABSTAIN:	**Directors**	NONE

Dan Mortensen, President,
Board of Directors of the
Newhall County Water District

ATTEST:

Karin J. Russell
Secretary of the Board of Directors

EXHIBIT "A"

2010 UWMP
(Attached hereto)

STATE OF CALIFORNIA)
) ss.
COUNTY OF LOS ANGELES)

I, Karin J. Russell, Secretary of the Newhall County Water District, DO HEREBY CERTIFY that the foregoing is full, true and correct copy of Resolution No. 2011-10 of the Board of Directors of Newhall County Water District adopted at a Special Meeting held on June 22, 2011, and that the same has not been amended or repealed.

Karin J. Russell
Secretary of the Board of Directors

DATED: 6-22-2011 (SEAL)

VALENCIA WATER COMPANY
BOARD OF DIRECTORS MEETING (JUNE 27, 2011)
RESOLUTION ADOPTING
THE 2010 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Urban Water Management Planning Act, Water Code Section 10610, et seq. (the Act) mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt an updated urban water management plan (UWMP) at least once every five years on or before December 31, in years ending five and zero; and

WHEREAS, the Valencia Water Company (VWC) is an urban water supplier for purposes of the Act, and in 2005 approved and adopted its most recent UWMP and submitted its 2005 UWMP to the California Department of Water Resources (DWR); and

WHEREAS, the Water Conservation Act of 2009, Water Code Section 10608 et seq. (SBX7-7), extended the time by which urban retail water suppliers must adopt 2010 UWMPs to July 1, 2011 to permit coordination between urban wholesale water suppliers and urban retail water suppliers and, among other things, established requirements for urban retail water suppliers to prepare urban water use targets in accordance with the goals of SBX7-7 to reduce statewide daily per capita water use by 15 percent by the year 2015 and 20 percent by the year 2020; and

WHEREAS, the VWC is an "urban retail water supplier" for purposes of SBX7-7 because it directly provides potable municipal water to more than 3,000 end users; and

WHEREAS, Section 10620(d)(1) of the Act encourages urban water suppliers to satisfy the requirements of the Act by participation in area wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use; and

WHEREAS, Valencia Water Company, in cooperation with Castaic Lake Water Agency (CLWA), the CLWA Santa Clarita Water Division (SCWD), and Newhall County Water District (NCWD), prepared a document labeled "Public Review Draft 2010 Urban Water Management Plan" for the CLWA service area (Draft 2010 UWMP), upon which Los Angeles County Waterworks District No. 36 (LACWWD #36) participated as a cooperating agency; and

WHEREAS, in accordance with applicable law, including the requirements of the Act and of SBX7-7, CLWA has prepared the Draft 2010 UWMP and has undertaken certain agency coordination, public notice, public involvement and outreach, public comment, and other procedures in relation to the Draft 2010 UWMP; and

WHEREAS, as authorized by Section 10620(e) of the Act, CLWA and the retail purveyors have prepared the Draft 2010 UWMP with their own staff, with the assistance of consulting professionals and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its Draft 2010 UWMP, and have, in part, utilized and relied upon the DWR Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan (March 2011) and the DWR Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009) (February 2011) in preparing the Draft 2010 UWMP; and

WHEREAS, CLWA and the retail purveyors began the public outreach and community involvement in the preparation of the Draft 2010 UWMP in May 2010, with the first scheduled community

workshop, followed by five more community workshops and three public hearings; and

WHEREAS, pursuant to Section 10621(b) of the Act, on March 3, 2011, CLWA notified the City of Santa Clarita and the Counties of Ventura and Los Angeles that it would be preparing the 2010 UWMP, and that the Draft 2010 UWMP would be released in April 2011, and subsequently met with, consulted with and obtained comments from the City of Santa Clarita, the United Water Conservation District and the County of Los Angeles; and

WHEREAS, in accordance with applicable law, including Water Code Sections 10608.26 and 10642, and Government Code Section 6066, the Draft 2010 UWMP was made available for public inspection, and notice was provided of the time and place of each joint public hearing on the Draft UWMP; and

WHEREAS, on March 23, 2011, CLWA and NCWD held a joint public hearing, properly noticed pursuant to Section 10642 of the Act and Government Code Section 6066, at which time CLWA's Board of Directors reviewed draft sections and tables for inclusion in the Draft 2010 UWMP, and, as part of that review, considered a presentation regarding the Draft 2010 UWMP by its staff and consultants, and oral and written public comments; and

WHEREAS, on May 18, 2011, CLWA and NCWD held a second joint public hearing, properly noticed pursuant to Section 10642 of the Act and Government Code Section 6066, at which time CLWA's Board of Directors considered further oral and written public comments, and responses to those comments by its staff and consultants, which included a presentation of the changes that had been made in the Public Review Draft 2010 UWMP; and

WHEREAS, on June 3, 2011, the VWC Board Secretary sent each Board of Director the Draft 2010 UWMP, Public Review Draft, dated April 2011, along with six public workshop presentations, two public hearing presentations and transcripts and eight letters/emails received to date from the public commenting on the Plan. At the time, the Secretary informed the Board that a secondary transmittal of information would be forthcoming on June 24, 2011;

WHEREAS, on June 15, 2011, CLWA circulated to each of the members of its Board of Directors a Final Draft 2010 UWMP; and

WHEREAS, on June 22, 2011, CLWA and NCWD held a properly noticed joint public meeting and public hearing to consider adoption of the Final Draft 2010 UWMP, at which time CLWA's Board of Directors considered further oral and written public comments, and responses to those comments by its staff and consultants, which included a presentation of the changes that had been made in the Final Draft 2010 UWMP, and reviewed and considered adoption of the Final Draft 2010 UWMP; and

WHEREAS, on June 24, 2010, the VWC Board received and reviewed a second transmittal, dated June 24, 2011, with additional information about the 2010 UWMP process, further 2010 UWMP documents, and the 2010 UWMP timeline;

WHEREAS, pursuant to Water Code Section 10620(d)(2), VWC coordinated the preparation of the Draft 2010 UWMP and Final Draft 2010 UWMP with CLWA and other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies and relevant public agencies, to the extent practicable; and

WHEREAS, pursuant to Water Code Section 10620(f), the Draft 2010 UWMP and in the Draft Final 2010 UWMP describe the water management tools and options used by CLWA and the retail purveyors that will maximize resources and minimize the need to import water from other regions; and

WHEREAS, pursuant to Water Code Section 10641, CLWA and the retail purveyors consulted with and obtained comments from those public agencies or persons with special expertise with respect to demand management methods and techniques; and

WHEREAS, CLWA and the retail purveyors have encouraged the active involvement of diverse social, cultural and economic elements of the population within the CLWA service area with regard to the preparation of the Draft UWMP and Final Draft UWMP, allowed input by members of the public and any other interested party regarding all aspects of the Draft 2010 UWMP and Final Draft 2010 UWMP, allowed community input regarding the implementation plan for complying with SBX7-7, considered the economic impacts of the implementation plan for complying with SBX7-7 and adopted Method 1 under Water Code Section 10608.20(b) for determining its urban water use targets; and

WHEREAS, to assure public participation in the process, CLWA and the retail purveyors have exceeded the requirements of the Act, by holding more than one public hearing; and

WHEREAS, the VWC Board of Directors has considered the public and Board comments made at the three public hearings, as well as all written public comments on the Draft 2010 UWMP and the Final Draft 2010 UWMP distributed to the Board of Directors; and

WHEREAS, the VWC Board of Directors has carefully reviewed the Final Draft 2010 UWMP, any errata, revisions and modifications made at the final public hearing; and

WHEREAS, the VWC Board of Directors has carefully reviewed and considered the purposes and requirements of the Act and SBX7-7, the contents of the Final Draft 2010 UWMP, any errata, revisions and modifications made at the final public hearing, the documentation contained in the administrative record in support of the Final Draft 2010 UWMP, and all public and agency input received with regard to the Final Draft 2010 UWMP, and has determined that the factual analyses and conclusions set forth in the 2010 UWMP are supported by substantial evidence.

NOW THEREFORE, BE IT RESOLVED that the VWC Board of Directors does hereby adopt Method 1 under Water Code Section 10608.20(b) for determining urban water use targets, and the Final Draft 2010 UWMP, incorporated herein by this reference, including any errata, revisions and modifications made at the final public hearing, is hereby approved and adopted as the 2010 Urban Water Management Plan, and filed with the Secretary of the Board; and

RESOLVED FURTHER that the General Manager is hereby authorized and directed to include a copy of this Resolution in the 2010 Urban Water Management Plan and, in accordance with Water Code Section 10644(a), to file the 2010 Urban Water Management Plan with the California Department of Water Resources, the California State Library, and any city or county within which the Valencia Water Company provides water supplies within thirty (30) days of this adoption date; and

RESOLVED FURTHER that in accordance with Water Code Section 10645, the General Manager is hereby authorized and directed to make the 2010 Urban Water Management Plan available for public review during normal business hours at VWC's offices not later than thirty (30) days after filing a copy thereof with the California Department of Water Resources; and

RESOLVED FURTHER that in accordance with Water Code Section 10635(b), the General Manager is hereby authorized and directed to provide that portion of the 2010 Urban Water Management Plan prepared pursuant to Water Code Section 10635(a) to any city or county within which the Valencia Water Company provides water supplies not later than sixty (60) days after filing a copy thereof with the California Department of Water Resources; and

RESOLVED FURTHER in accordance with the Act and SBX7-7, including, but not limited to, the Water Conservation Programs and the Water Shortage Contingency Plan, the General Manager is hereby authorized and directed to implement the components of the 2010 Urban Water Management Plan; and

RESOLVED FURTHER that the General Manager is authorized and directed to recommend to the Board of Directors additional steps necessary or appropriate to effectively carry out the implementation of the 2010 Urban Water Management Plan, the Act, and SBX7-7.

I, the undersigned, hereby certify that I am the duly appointed Secretary of the Valencia Water Company, and that at a regular meeting of the Board of Directors of said Company held on Monday, June 27, 2011, the foregoing Resolution was duly and regularly adopted by said Board, and that said resolution has not been rescinded or amended since the date of its adoption, and that it is in full force and effect.

July 8, 2011

Greg Milleman

Greg Milleman, Secretary

Section 1: Introduction

1.1 Overview

This volume presents the Urban Water Management Plan 2010 (Plan) for the Castaic Lake Water Agency (Agency, CLWA) service area, which includes four retail water purveyors. These retail water purveyors are the Santa Clarita Water Division of CLWA, Newhall County Water District, Valencia Water Company and Los Angeles County Waterworks District 36. Together CLWA and the purveyors are the Santa Clarita Valley's 'water suppliers'. This chapter describes the general purpose of the Plan, discusses Plan implementation and provides general information about CLWA, the retail purveyors and service area characteristics.

1.2 Purpose

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of urban water suppliers. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which "…describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (Wat. Code, § 10631, subd. (d)). The identification of such opportunities and the inclusion of those opportunities in a plan's general water service reliability analysis neither commits an urban water supplier to pursue a particular water exchange/transfer opportunity, nor precludes it from exploring exchange/transfer opportunities never identified in its plan. Before an urban water supplier is able to implement any potential future sources of water supply identified in a plan, detailed project plans are prepared and approved, financial and operational plans are developed and all required environmental analysis is completed.

"A plan is intended to function as a planning tool to guide broad-perspective decision making by the management of water suppliers." (*Sonoma County Water Coalition v. Sonoma County Water Agency* (2010) 189 Cal. App. 4th 33, 39.) It should not be viewed as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty and planning projections may change in response to a number of factors. "[L]ong-term water planning involves expectations and not certainties. Our Supreme Court has recognized the uncertainties inherent in long-term land use and water planning and observed that the generalized information required . . . in the early stages of the planning process are replaced by firm assurances of water supplies at later stages." (*Id.*, at 41.) From this perspective, it is appropriate to look at the UWMP as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions including:

- What are the potential sources of supply and what is the reasonable probable yield from them?
- What is the probable demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How well do supply and demand figures match up, assuming that the various probable supplies will be pursued by the implementing agency?

Using these "framework" questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to meet demands.

The water suppliers will explore enhancing basic supplies from traditional sources such as the State Water Project (SWP) as well as other options. These include groundwater extraction, water exchanges and transfers, water conservation, recycling, brackish water desalination and water banking/conjunctive use. Specific planning efforts will be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, how each option would impact the environment and how each option would affect customers. The objective of these more detailed evaluations would be to find the optimum mix of conservation and supply programs that ensure that the needs of the customers are met.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that:

- Accomplishes water supply planning over a 20-year period in five year increments. (CLWA and the purveyors are going beyond the requirements of the Act by developing a plan which spans forty years.)
- Identifies and quantifies adequate water supplies, including recycled water, for existing and future demands, in normal, single-dry and multiple-dry years.
- Implements conservation and efficient use of urban water supplies.

Additionally, newly passed State legislation, Senate Bill 7 of Special Extended Session 7 (SBX7-7), was signed into law in November 2009, which calls for progress towards a 20 percent reduction in per capita water use statewide by 2020. As a result, the legislation now mandates each urban retail supplier to develop and report a water use target in the retailer's 2010 UWMP. The legislation further requires that retailers report an interim 2015 water use target, their baseline daily per capita use and 2020 compliance daily per capita use, along with the basis for determining those estimates.

SBX7-7 provides four possible methods for an urban retail water supplier to use to calculate its water use target. The California Department of Water Resources (DWR) has also developed methodologies for calculating base daily per capita water use; baseline commercial, industrial and institutional water use; compliance daily per capita water use; gross water use; service area population; indoor residential water use and landscape area water use.

Also of importance is Assembly Bill (AB) 1420. AB 1420, passed in 2007 and in effect as of January 2009, changes the funding eligibility requirements of Section 10631.5 of the Water Code. For any urban water supplier to be eligible for grant or loan funding administered by DWR, the State Water Resources Control Board (SWRCB) or the Bay-Delta Authority (such as those funding programs Propositions 50 and 84), the supplier must show implementation of water use efficiency demand management measures/best management practices (DMMs/BMPs) listed and described in the Act and the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), or show the schedules and budgets by which the supplier will begin implementing the DMMs/BMPs. Any supplier not implementing the measures based on cost-effectiveness must submit proof showing why the measures are not cost-effective. Tables ensuring compliance with AB 1420 are provided in Appendix E.

A checklist to ensure compliance of this Plan with the Act requirements is provided in Appendix A.

It is the stated goal of CLWA and the retail water purveyors to deliver a reliable and high quality water supply to their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next forty years in combination with conservation of non-essential demand during normal water years, the UWMP successfully achieves this goal.

1.3 Implementation of the Plan

CLWA has a contract with the State of California, through DWR, to acquire and distribute SWP water to its four local retail water purveyors in the Santa Clarita Valley: CLWA Santa Clarita Water Division (SCWD), Newhall County Water District (NCWD), Valencia Water Company (VWC) and Los Angeles County Waterworks District No. 36 (LACWWD 36). This Plan is required for CLWA and three of the purveyors, SCWD, NCWD and VWC. The fourth purveyor, LACWWD 36, is not required to prepare an UWMP because the District does not provide water to more than 3,000 customers or supply more than 3,000 acre-feet (AF) of water annually; however, LACWWD 36 participated in the development of the Plan on an “ad-hoc” basis. This subsection provides the cooperative framework within which the Plan will be implemented including agency coordination, public outreach and resources maximization.

1.3.1 Joint Preparation of the Plan

Water suppliers are permitted by the State to work together to develop a cooperative regional plan for the CLWA service area. This approach has been adopted by the water suppliers in the Santa Clarita Valley (Valley), which are jointly sponsoring the current Plan. Water resource specialists with expertise in water resource management were retained to assist the local water suppliers in preparing the details of the Plan. Agency coordination for this Plan is summarized in Table 1-1.

TABLE 1-1
AGENCY COORDINATION SUMMARY

	Participated in UWMP Development	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Invited/Not Involved
Aquilar Landscape				X			
Atkins Environmental Help				X			
Assembly Member Audra Strickland (representatives)							X
Assembly Member Cameron Smyth (representatives)				X			
Assembly Member Jeff Gorell (representatives)				X			
Associated Builders and Contractors of CA				X			
Building Industry Association – Los Angeles/Ventura Chapter				X			
Burbank Water and Power				X			
California Department of Water Resources (SoCal; Glendale; retired)				X	X		
Castaic Lake Water Agency	X			X			
Castaic Area Town Council				X			
City of Los Angeles				X			
City of Santa Clarita Department of Planning and Building Services		X		X		X	
City of Santa Clarita Intergovernmental Relations				X		X	
CLWA Santa Clarita Water Division	X			X			
College of the Canyons				X			
Congressman Howard McKeon (representatives)				X			
Friends of the Santa Clara River			X				X
Grass Is Greener Landscape Design				X			
Impact Sciences				X	X		
Integrated Property Services Group, Inc.				X			
Los Angeles County Flood Control Department				X			
Los Angeles County Department of Public Works				X			
Los Angeles County Department of Regional Planning		X		X	X	X	
Los Angeles County LAFCO		X		X			
Los Angeles County Supervisor Mike Antonovich (representatives)				X		X	

	Participated in UWMP Development	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Invited/Not Involved
Los Angeles County Waterworks District 36	X			X			
Metropolitan Water District of Southern California					X		
Newhall County Water District	X			X			
Santa Clarita Organization for Planning the Environment – SCOPE			X	X			
Santa Clarita Valley Chamber of Commerce				X			
Santa Clarita Valley Fair Elections Committee			X	X			
Santa Clarita Valley Residents Mr. and Mrs. Dunn			X	X			
Santa Clarita Valley Resident Mr. Naoum			X				
Santa Clarita Valley Resident Ms. Nolltemeyer			X	X			
Santa Clarita Valley Sanitation District				X	X		
Santa Clarita Valley Well Owners Association							X
Sierra Club Angeles Chapter			X				
Southern California Association of Governments							X
State Senator George Runner (representatives)				X			
State Senator Sharon Runner (representatives)				X			
State Senator Tony Strickland							X
Sutters Home Owners Association				X			
United Water Conservation District		X			X		
Valley Industrial Association of Santa Clarita							X
Valencia Water Company	X			X			
Ventura County LAFCO		X					
Ventura County Resource Management Agency		X				X	X
Vista Ridge Homeowners Association				X			
Waterwise				X			
West Ranch Town Council				X			
Whittaker Bermite Citizens Advisory Group			X	X			

1.3.2 Plan Adoption

CLWA and the retail purveyors began preparation of this Plan for the CLWA service area in November 2009. The final draft of the Plan was adopted by the Agency Board on June 22, 2011 and submitted to DWR within thirty days of Board approval. NWCD's Board adopted the final draft of the Plan on June 22, 2011. VWC's Board adopted the final draft of the Plan on June 27, 2011. This plan includes all information necessary to meet the requirements of Water Conservation Act of 2009 (Wat. Code, §§ 10608.12-10608.64) and the Urban Water Management Planning Act (Wat. Code, §§ 10610-10656).

1.3.3 Public Outreach

The water suppliers have encouraged community participation in water planning. For the current Plan, five public workshop sessions were held to solicit input on the Draft Plan before its adoption. Interested groups were informed about the development of the Plan along with the schedule of public activities. Notices of public meetings were published in the local press and at the water supplier websites. Copies of the Draft Plan were made available at the water suppliers' offices and websites, local public libraries and sent to the City of Santa Clarita, the County of Los Angeles and the County of Ventura, as well as to interested parties as identified in Table 1-1. The water suppliers also convened meetings with various interests to gather data concerning planned development and the probable implementation of approved development. Such informed data gathering on important issues is a means of checking the short-term "reality" of official projections and understanding the concerns of various groups.

CLWA contracted with a local public relations firm to coordinate preparation of the Plan with the local community and stakeholders. CLWA notified the cities and counties within its service area of the opportunity to provide input regarding the Plan. Table 1-2 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials, including paid advertisements, newsletter covers, website postings and invitation letters are attached in Appendix B.

TABLE 1-2
PUBLIC PARTICIPATION TIMELINE

Public Workshops and Hearings	Date	Public Participation Task
1st Public Workshop	May 25, 2010	Presented UWMP requirements and Plan outline
2nd Public Workshop	July 27, 2010	Progress update on UWMP requirements and process, discuss supplies
Presentation to the Upper Santa Clara River IRWMP Stakeholder Group	November 9, 2010	UWMP requirements, process, preliminary SBX7-7 calculations
3rd Public Workshop	November 16, 2010	Discussed Santa Clarita Valley supplies and demands, reliability analysis and SBX7-7 calculations
4th Public Workshop	January 25, 2011	Discussed supply and demand analysis and SBX7-7 calculations
5th Public Workshop	March 8, 2011	Discussed supply and demand analysis
1st Public Hearing	March 23, 2011	Presented overview of Draft 2010 UWMP
2nd Public Hearing	May 18, 2011	Discussed comments on Public Draft 2010 UWMP
3rd Public Hearing	June 22, 2011	Discussed comments on Public Draft 2010 UWMP
Plan Adoption	June 22, 2011	Adoption Hearing for CLWA and NCWD for Final Draft 2010 UWMP
Plan Adoption	June 27, 2011	Adoption of Final Draft 2010 UWMP by VWC's Board of Directors
Plan Submittal	July 21, 2011	File 2010 UWMP with DWR within thirty days of adoption

The components of public participation include:

<u>Local Media</u>

- Paid advertisements in local newspapers
- Meeting(s) with local editorial boards (*The Signal*)

<u>Community-Based Outreach</u>

- Building Industry Association
- Castaic Town Council
- Santa Clarita Valley Chamber of Commerce
- Friends of the Santa Clara River
- Santa Clarita Valley Well Owners Association
- Santa Clarita Organization for Planning the Environment
- Sierra Club
- Valley Industrial Association of Santa Clarita Valley
- West Ranch Town Council

Water Suppliers Public Participation

- Presentations to NCWD Board
- Presentations to CLWA Board

City/County Outreach

- Meeting with City of Santa Clarita Planning Division
- Meeting with Los Angeles County Department of Regional Planning
- Meeting with Supervisor Antonovich representatives Rosalind Wayman and Edel Vizcarra

Public Availability of Documents

- Water suppliers' offices and websites
- City Hall
- Local libraries

1.3.4 Resources Maximization

Several documents were developed to enable the water suppliers to maximize the use of available resources and minimize use of imported water, including the 2005 CLWA UWMP, CLWA's 2009 Water Supply Reliability Plan Update, the 2008 Integrated Regional Water Management Plan for the Upper Santa Clara River, the 2009 Santa Clarita Valley Water Report, DWR's 2009 State Water Project Delivery Reliability Report, the 2002 Draft Recycled Water Master Plan, the 2009 Basin Yield Analysis by Luhdorff and Scalmanini Consulting Engineers and GSI Water Solutions, Inc., the 2010 Data Document[1] and the 2003 Groundwater Management Plan (GWMP). Chapter 3 of this Plan describes in detail the water resources available to CLWA and the retail purveyors for the forty-year period covered by the Plan. A complete reference list is provided in Section 9 of this Plan.

1.4 Water Suppliers of the Santa Clarita Valley

1.4.1 Castaic Lake Water Agency

CLWA was formed in 1962 for the purpose of contracting with DWR to acquire and distribute imported SWP water to the water purveyors in the Valley. CLWA serves an area of 195 square miles in Los Angeles and Ventura Counties.

Adequate planning for, and the procurement of, a reliable water supply is a fundamental function of CLWA. CLWA obtains its water supply for wholesale purposes principally from the

[1] CLWA regularly updates its Data Document as the basis for establishing its facility capacity fees. Several significant developments since the last Data Document update in 2008 were incorporated into the 2010 Update: water conservation legislation that could significantly affect water demand projections and the cost of water conservation programs; the need to coordinate water supply and demand projections with the preparation of the 2010 Urban Water Management Plan; establishment of Total Maximum Daily Load allocations for the Santa Clara River that could affect recycled water availability; judicial and regulatory determinations for the Delta that affect SWP reliability; engineering studies completed since the 2008 Data Document, particularly those related to emergency and operating storage, recycled water, and transmission system improvements; and updated cost allocation issues from the 2008 Document.

SWP and currently has a Water Supply Contract with DWR for 95,200 acre-feet per year (AFY) of SWP Table A Amount[2]. The maximum annual Table A Amount in CLWA's SWP Water Supply Contract with DWR was originally 23,000 AF, but was amended to 41,500 AF in 1966. In 1991 CLWA purchased 12,700 AF of annual Table A Amount from a Kern County water district and in 1999 CLWA purchased 41,000 AF of annual Table A Amount from another Kern County water district, for the current total of 95,200 AFY. CLWA also imports water from two other water districts in Kern County. Under the 2007 Water Acquisition Agreement with the Buena Vista Water Storage District (Buena Vista, BVWSD) and the Rosedale-Rio Bravo Water Storage District (Rosedale-Rio Bravo, RRBWSD), Buena Vista's high flow Kern River entitlements (and other acquired waters that may become available) are captured and recharged within the Rosedale-Rio Bravo's service area on an ongoing basis. CLWA receives 11,000 AF of these supplies annually through either exchange of Buena Vista's and Rosedale-Rio Bravo's SWP supplies or through direct delivery of water to the California Aqueduct via the Cross Valley Canal. All imported water is delivered to Castaic Lake through SWP facilities. From Castaic Lake, which serves as the terminal reservoir of the SWP's West Branch, the water is treated at either CLWA's Earl Schmidt Filtration Plant or Rio Vista Water Treatment Plant and delivered to the retail water purveyors through transmission lines owned and operated by CLWA.

CLWA is able to meet approximately half of the Valley's urban demand with imported water. However, the availability of SWP supply is variable. It fluctuates from year to year depending on precipitation, regulatory restrictions, legislative restrictions and operational conditions and is subject to severe curtailment during dry years. Of particular concern is the recent (2007) U.S. District Court ruling whereby the SWP was held in violation of the federal Endangered Species Act due to potential pumping impacts on populations of the Delta smelt, a fish species living in the Sacramento-San Joaquin Delta, resulting in the order to curb water imports from the Delta by up to 35 percent from the SWP and the Central Valley Project. A similar court decision was rendered in 2009 involving endangered salmon. The results of these impacts on environmental resources in the Delta, when combined with recent socioeconomic conditions and hydrology changes, have already reduced the utilization of SWP and other imported supplies in the Region from a high in 2004 of about 47,500 AF to approximately 38,700 AF in 2009. Recently (December 14, 2010), the court overturned these rulings and has required new analysis of Delta pumping requirements. While the results are unknown at this time, it is expected that some level of SWP pumping restrictions will continue into the future. Further, in June 2008, Governor Arnold Schwarzenegger declared California to be in a statewide drought condition, and called for a reduction in statewide water uses by 20 percent by the year 2020, which resulted in the passage of SBX7-7 in late 2009.

CLWA and the retail purveyors mainly meet the balance of their demands with local groundwater and a small amount of recycled water. CLWA has evaluated the long-term water needs (water demand) within its service area based on applicable county and city land use plans and has compared these needs against existing and potential water supplies. Results indicate that as CLWA's water requirements utilize increased proportions of its SWP Table A Amount, conjunctive use, water conservation, water transfers, recycled water and water banking are becoming increasingly more important water management elements for CLWA's long-term water supply strategy.

[2] Table A is a schedule of annual water amounts as set forth in long-term SWP delivery contracts. Table A defines the annual volume of water that could be delivered to a SWP contractor in a given year under regular contract provisions without consideration of surplus SWP water deliveries or other supplies available to a SWP contractor.

Since the preparation of the 2005 Plan, DWR has prepared updates to the SWP Reliability Report in 2007 and 2009. Also, the water demand projections within CLWA's service area have been updated based on detailed information provided by CLWA's retail purveyors. In addition, based on DWR estimates of SWP supply reliability, CLWA has developed additional water supplies as well as capacity in groundwater banks. Together with its SWP Table A supply and the flexible storage allowed under the Monterey Amendments to the SWP Water Supply Contracts, these additional water management strategy elements have created a series of water management options that are addressed in this UWMP Update.

1.4.2 Retail Water Purveyors

Four retail purveyors provide water service to most residents of the Valley.

1. LACWWD 36's service area includes the Hasley Canyon area in the unincorporated community of Val Verde. During most years, the District obtains its water supply from CLWA.

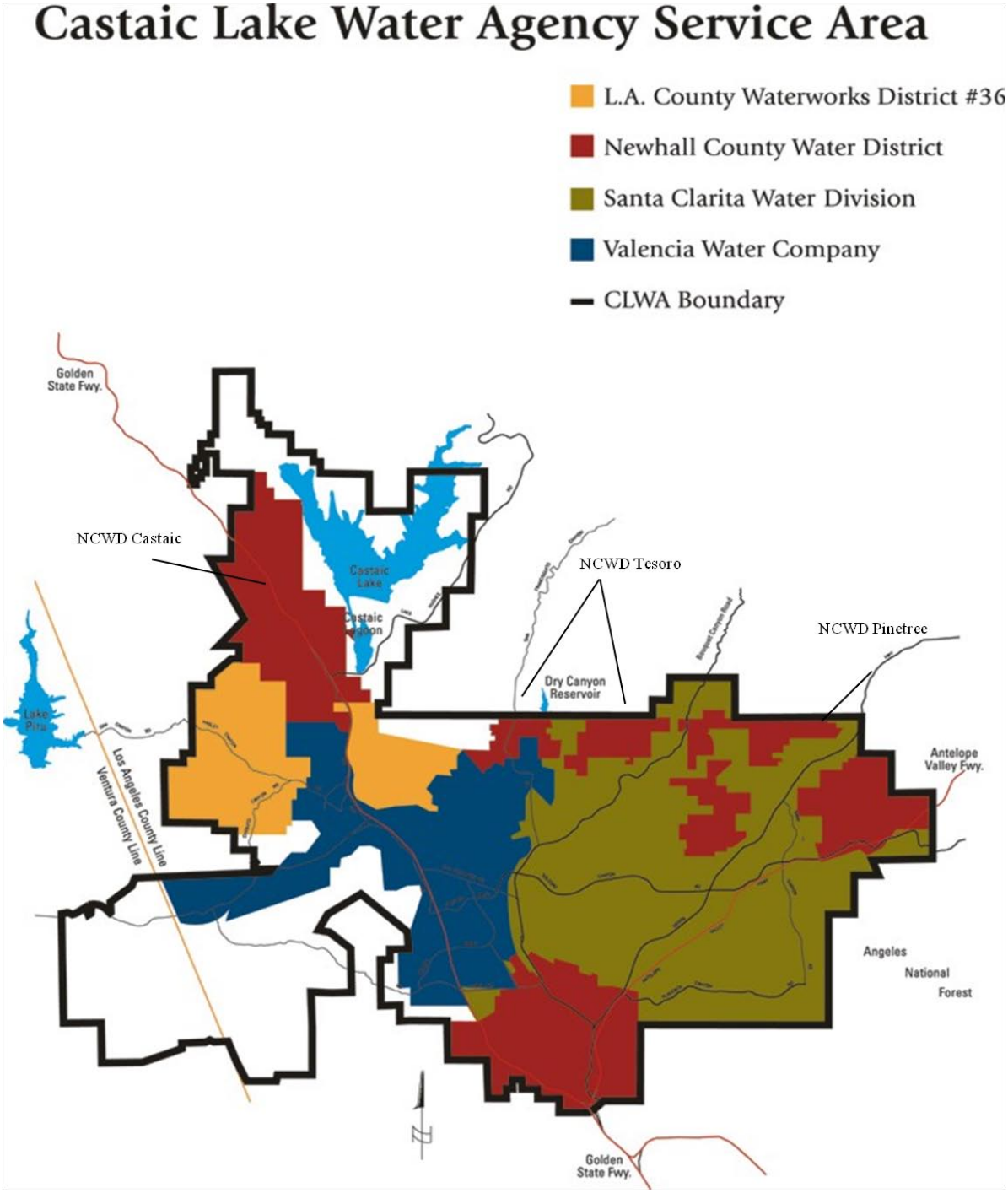
2. NCWD's service area includes portions of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Castaic, Newhall, Valencia and Canyon Country. The District supplies water from local groundwater and CLWA imported water.

3. SCWD's service area includes portions of the city of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Canyon Country, Newhall and Saugus. SCWD supplies water from local groundwater and CLWA imported water.

4. VWC's service area includes a portion of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Valencia, Stevenson Ranch and portions of Castaic, Saugus and Newhall. VWC supplies water from local groundwater, CLWA imported water and recycled water.

The service area for CLWA and the retail water purveyors is shown on Figure 1-1.

FIGURE 1-1


Castaic Lake Water Agency Service Area
L.A. County Waterworks District #36
Newhall County Water District
Santa Clarita Water Division
Valencia Water Company
CLWA Boundary
Golden State Fwy.
NCWD Castaic
Castaic Lake
Castaic Lagoon
NCWD Tesoro
Dry Canyon Reservoir
NCWD Pinetree
Lake Piru
Los Angeles County Line
Ventura County Line
Antelope Valley Fwy.
Angeles National Forest
Golden State Fwy.

The four retail purveyors – (1) SCWD, (2) NCWD, (3) VWC and (4) LACWWD 36 – deliver these waters to primarily municipal and industrial (M&I) users within the Valley. Together, as shown below in Table 1-3, the purveyors provide water to nearly 70,000 service connections (2009 Santa Clarita Valley Water Report, May 2010).

TABLE 1-3
RETAIL WATER SERVICE CONNECTIONS

Retail Water Purveyor	Connections
LACWWD 36	1,400
NCWD	9,600
SCWD	28,700
VWC	30,000
Total Connections	**69,700**

Source: 2009 Santa Clarita Valley Water Report (May 2010)

1.5 Climate

The climate in CLWA's service area is generally semi-arid and warm. Summers are dry with temperatures as high as 110°F. Winters are somewhat cool with temperatures as low as 20°F. Average rainfall since 1980 is about 17.3 inches per year in the flat areas and about 25 to 30 inches in the mountains. The region is subject to wide variations in annual precipitation and also experiences periodic wildfires. The region's average climate conditions are presented in Tables 1-4 and 1-5.

TABLE 1-4
CLIMATE DATA FOR THE SANTA CLARITA VALLEY

Month	Standard Monthly Avg. ETo (in.)	Avg. Max. Temperature (Fahrenheit)
Jan	3.43	65.4
Feb	3.08	67.7
Mar	5.6	74.6
Apr	6.5	79.4
May	7.94	85.5
Jun	8.36	90.3
Jul	9.15	95.8
Aug	8.76	95.5
Sep	6.75	88.7
Oct	5.24	79.5
Nov	4.03	73.9
Dec	2.58	64.3
Annual	**71.42**	**80.0**

Source: California Irrigation Management System (CIMIS) data provided from Santa Clarita Station No. 204, Los Angeles region, January 2007 to December 2010 http://wwwcimis.water.ca.gov/cimis/welcome.jsp.
ETo = evapotranspiration

TABLE 1-5
ANNUAL RAINFALL RECORD FOR THE SANTA CLARITA VALLEY

Year	Annual Rainfall (in.)	Year	Annual Rainfall (in.)
1980	24.3	1995	29.2
1981	13.4	1996	15.8
1982	20.2	1997	7.1
1983	39.1	1998	28.2
1984	12.9	1999	9.0
1985	8.4	2000	13.6
1986	18.0	2001	18.8
1987	14.5	2002	7.8
1988	16.9	2003	15.6
1989	7.6	2004	22.8
1990	7.0	2005	37.2
1991	17.2	2006	13.9
1992	32.0	2007	5.8
1993	22.1	2008	18.2
1994	10.3	2009	11.6
		Average	**17.3**

Source: Data provided from rain gage Newhall-Soledad 32c, January 1980 to January 2009

1.6 Potential Effects of Climate Change

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. Climate change models have predicted that potential effects from climatic changes will result in increased temperature, reduction in Sierra Nevada snowpack depth, early snow melt and a rise in sea level.

In June 2005, Governor Arnold Schwarzenegger issued Executive Order S-3-05, which requires biennial reports on climate change impacts in several areas, including water resources. The Climate Action Team (CAT) was formed in response to Executive Order S-3-05. To help unify analysis across topic areas, the CAT worked with scientists from the California Applications Program's California Climate Change Center to select a set of future climate projections to be used for analysis. In the assessment *"Using Future Climate Projections to Support Water Resources Decision Making in California,"* the CAT selected six different global climate change models to evaluate climate change impacts, assuming two different greenhouse gas emission levels (a high end and a low end), for a total of 12 scenarios. The results of the study indicated that climate change has already been observed, in that in the last 100 years air temperatures have risen about one degree Fahrenheit and there has been a documented greater variance in precipitation, with greater extremes in both heavy flooding and severe droughts.

In July 2006, DWR issued "*Progress on Incorporating Climate Change into Management of California's Water Resources*," as required by Executive Order S-3-05. That report demonstrated how various analytical tools could be used to address issues related to climate change. The report presents analysis results showing potential impacts on SWP operations, including reservoir inflows, delivery reliability, and average annual carryover storage, as well as many other operational parameters. Some of the main impacts include changes to south-of-Delta SWP deliveries (from an increase of about one percent in a wetter climate change scenario to about a ten percent reduction for a drier scenario), increased winter runoff and lower

SWP allocations in the three driest scenarios, lower carryover storage in drier scenarios and higher carryover storage in the wetter scenario.

In the 2009 update of the DWR *California Water Plan*, multiple scenarios of future climate conditions are evaluated. These changing hydrological conditions could affect future planning efforts, which are typically based on historic conditions. The *California Water Plan* identifies the following probable impacts due to changes in temperature and precipitation:

- Decrease in snowpack, which is a major part of annual water storage, due to increasing winter temperatures.
- More winter runoff and less spring/summer runoff due to warmer temperatures.
- Greater extremes in flooding and droughts.
- Greater water demand for irrigation and landscape water due to increased temperatures and their impacts on plant water needs.
- Increased sea level rise, further endangering the functions of the SWP, which can depend on movement of water through the low-lying channels of the low-lying Sacramento-San Joaquin Delta. Sea level rise could also require the SWP to release additional storage water to avoid sea water intrusion into the Delta.

In its *State Water Project Delivery Reliability Report (Reliability Report)* (2009), DWR included the potential effects of climate change in its analysis of SWP delivery reliability under future conditions. For that report, DWR used a single climate change scenario, selecting a scenario with median effects out of a number of climate change scenarios it analyzed in 2009.

Even without population changes, water demand could increase. Precipitation and temperature influence water demand for outdoor landscaping and irrigated agriculture. Outdoor water use is a large component of Santa Clarita Valley water demands. Lower spring rainfall increases the need to apply irrigation water. Further, warmer temperatures increase crop evapotranspiration, which increases water demand.

These effects and their potential to impact the supplies available to the Santa Clarita Valley have been evaluated indirectly in DWR's *Reliability Report*, and their potential to impact demand is considered in CLWA's assessment of demands in Chapter 2 of this UWMP.

Section 2: Water Use

2.1 Overview

This chapter describes historic and current water usage and the methodology used to project future demands within CLWA's service area. Water usage is divided into sectors such as residential, industrial, commercial, landscape, agricultural, and other purposes. To undertake this evaluation, existing land use data and new housing construction information were compiled from each of the retail water purveyors and projections evaluated from each retailer's master planning documents. This information was then compared to historical trends for new water service connections and customer water usage information. In addition, weather and water conservation effects on historical water usage were considered in the evaluation.

Several factors can affect demand projections, including:

- Land use revisions
- New regulations
- Consumer choice
- Economic conditions
- Transportation needs
- Highway construction
- Environmental factors
- Conservation programs
- Building and plumbing codes

The foregoing factors affect the amount of water needed, as well as the timing of when it is needed. During an economic recession, there is a major downturn in development and a subsequent slowing of the projected demand for water. The projections in this Plan do not attempt to forecast recessions or droughts. Likewise, no speculation is made about future building and plumbing codes or other regulatory changes. However, the projections do include water conservation consistent with new legislative requirements calling for a 20 percent reduction in per capita demand by 2020 (SBX7-7).

An analysis was performed that combined growth projections with water use data to forecast total water demand in future years. Water uses were broken out into specific categories and assumptions made about each to more accurately project future use. Three separate data sets were collected and included in the model: historical water use by land use type, current population and projected population.

2.2 Demographics

Water service is provided to residential, commercial, industrial, institutional, recreational, and agricultural customers and for environmental and other uses, such as fire protection and landscaping.

The total demand trend on water supplies is expected to continue to rise within the Valley area (along with most of California) because of population, economic activity, environmental and water quality needs and regulatory requirements.

2.3 Historical Water Use

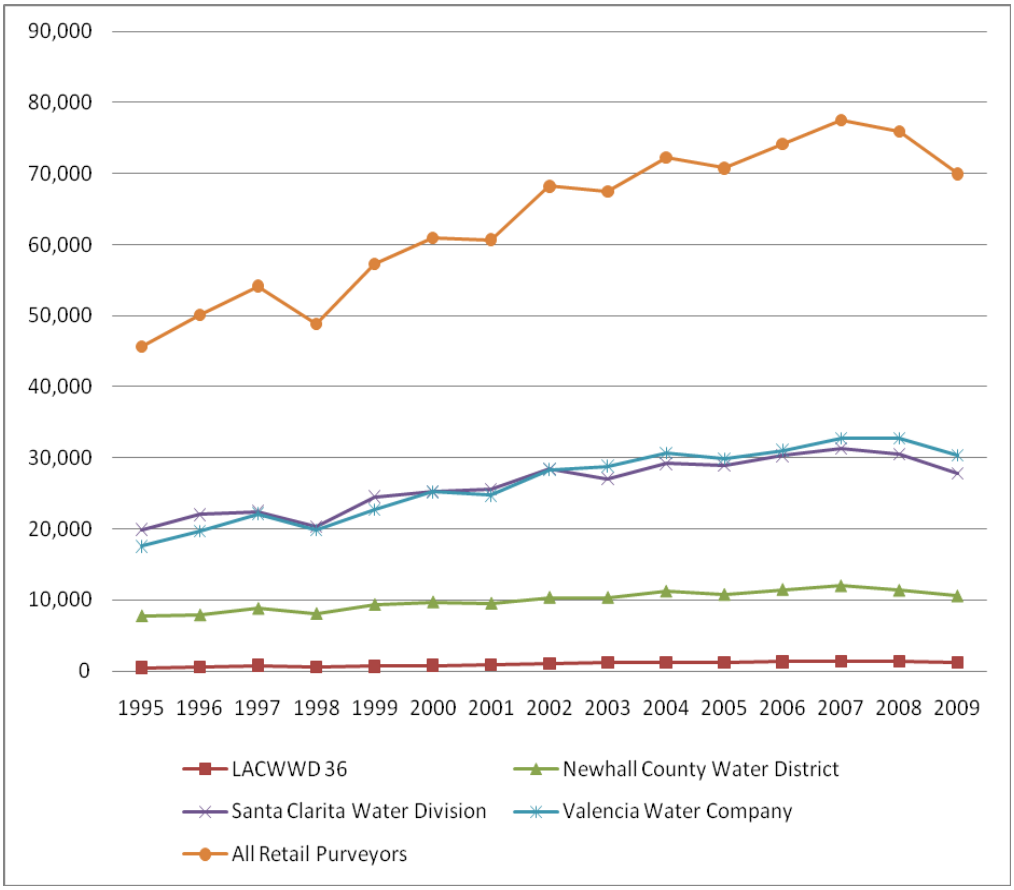
Predicting future water supply requires accurate historic water use patterns and water usage records. The historical use of all water supplies used to meet municipal water requirements, including the use of local groundwater, imported water supplies and recycled water, are summarized in Table 2-1. Figure 2-1 illustrates this use, which shows an increasing trend in Valley water demand since 1995 with a downturn in recent years likely due to weather conditions, response by customers to dry-year conservation efforts and economic conditions.

TABLE 2-1
HISTORICAL WATER USE BY RETAIL WATER PURVEYORS

Year	LACWWD 36	Newhall County Water District	Santa Clarita Water Division	Valencia Water Company	All Retail Purveyors
1995	477	7,755	19,898	17,543	45,673
1996	533	7,887	22,006	19,721	50,147
1997	785	8,801	22,456	22,131	54,173
1998	578	8,087	20,319	19,874	48,858
1999	654	9,348	24,513	22,735	57,250
2000	800	9,718	25,280	25,190	60,988
2001	907	9,525	25,544	24,715	60,691
2002	1,069	10,362	28,434	28,360	68,225
2003	1,175	10,351	27,092	28,829	67,447
2004	1,234	11,217	29,191	30,654	72,296
2005	1,200	10,756	28,921	29,891	70,768
2006	1,289	11,470	30,302	31,065	74,126
2007	1,406	11,975	31,355	32,756	77,492
2008	1,354	11,340	30,476	32,730	75,900
2009	1,243	10,560	27,816	30,355	69,974

Source: 2009 Santa Clarita Valley Water Report (May 2010)

FIGURE 2-1
HISTORICAL WATER USE



Source: 2009 Santa Clarita Valley Water Report (May 2010)

2.4 Projected Water Use

2.4.1 Purveyor Projections

Each of the four retail water purveyors provided projected water demands based on development projects that are under evaluation, in the planning process or the result of its own water planning efforts for its service area. The purveyors maintain historical data, as well as work closely with property owners and developers in their service areas, to ensure they have an adequate water supply and the necessary infrastructure to provide water service.

Since there are only four purveyors in the service area, there is close coordination and exchange of data. SCWD's engineering department continually updates expected demands and infrastructure needs. NCWD's master plans provide the basis for projected demands. VWC is an investor-owned utility regulated by the California Public Utilities Commission (PUC) and is required to regularly provide its service plan for rate increases and service area changes.

The projected water demands provided by the four purveyors are shown in Tables 2-3 through 2-6, for LACWWD 36, NCWD, SCWD and VWC, respectively. These tables show current and projected water demand, by customer type and in total, through 2050. Table 2-2 provides a summary from these tables of each purveyor's projected total water demands through 2050.

TABLE 2-2
SUMMARY OF PROJECTED WATER DEMANDS[(a)(b)(c)]

	2010	2015	2020	2025	2030	2035	2040	2045	2050	Annual Increase
Water Demands										
LACWWD 36[(d)]	1,243	1,759	2,189	2,619	3,048	3,478	3,908	4,338	4,768	3.5%
NCWD	10,560	12,571	14,246	15,922	17,598	19,273	20,949	22,624	24,300	2.2%
SCWD	27,816	31,633	34,814	37,995	41,176	44,357	47,538	50,719	53,900	1.7%
VWC	30,354	34,107	37,235	40,362	43,490	46,617	49,745	52,872	56,000	1.6%
Total Demand	69,973	80,070	88,484	96,898	105,313	113,725	122,141	130,553	138,968	1.8%

Notes:
(a) Summary of demands from Tables 2-3 to 2-6.
(b) Reflects existing and projected demands in CLWA service area only. CLWA's Annexation Policy requires annexing parties to provide additional fully reliable supplies.
(c) Demands exclude non-purveyor demands. Similarly, supplies evaluated in this UWMP exclude non-purveyor supplies.
(d) LACWWD 36 included for purposes of providing regional completeness; however, it is not required to prepare an UWMP.

TABLE 2-3
LOS ANGELES COUNTY WATERWORKS DISTRICT 36
CURRENT AND PROJECTED WATER DELIVERIES BY CUSTOMER TYPE

Year	Water Use Sectors	Single Family Residential[(a)]	Multi Family Residential[(a)]	Commercial	Construction/ Industrial	Institutional/ Government	Landscape	Total[(b)]
2010	No. of Accounts	1,527	6	5	6	6	6	1,555
	Deliveries (AF)	1,168	35	1	4	24	13	1,243
2015	No. of Accounts	2,155	8	5	8	8	8	2,194
	Deliveries (AF)	1,649	49	1	5	33	23	1,759
2020	No. of Accounts	2,682	10	5	10	10	10	2,729
	Deliveries (AF)	2,052	61	1	6	42	28	2,189
2025	No. of Accounts	3,209	12	5	12	12	12	3,264
	Deliveries (AF)	2,455	73	1	7	50	34	2,619
2030	No. of Accounts	3,735	14	5	14	14	14	3,797
	Deliveries (AF)	2,857	85	1	9	58	39	3,048
2035	No. of Accounts	4,262	17	6	17	17	17	4,333
	Deliveries (AF)	3,260	97	1	10	66	45	3,478
2040	No. of Accounts	4,788	19	6	19	19	19	4,863
	Deliveries (AF)	3,663	109	1	11	74	50	3,908
2045	No. of Accounts	5,315	21	7	21	21	21	5,405
	Deliveries (AF)	4,066	121	1	12	82	56	4,338
2050	No. of Accounts	5,842	23	8	23	23	23	5,940
	Deliveries (AF)	4,469	133	1	14	91	61	4,768

Notes:
(a) Projected Single Family and Multi-Family residential accounts have been adjusted to reflect dwelling units.
(b) Totals do not include fire services.

TABLE 2-4
NEWHALL COUNTY WATER DISTRICT
CURRENT AND PROJECTED WATER DELIVERIES BY CUSTOMER TYPE

Year	Water Use Sectors	Single Family Residential[a]	Multi Family Residential[a]	Commercial	Construction/ Industrial	Institutional/ Government	Landscape	Total[b]
2010 [c]	No. of Accounts	8,500	4,893	400	80	70	250	14,193
	Deliveries (AF)	6,400	1,500	560	100	400	1,600	10,560
2015	No. of Accounts	10,135	4,955	476	95	83	298	16,042
	Deliveries (AF)	7,631	1,785	655	119	476	1,906	12,571
2020	No. of Accounts	11,485	5,003	540	108	94	337	17,568
	Deliveries (AF)	8,647	2,023	742	135	540	2,159	14,246
2025	No. of Accounts	12,620	5,093	600	135	120	375	18,493
	Deliveries (AF)	9,665	2,261	831	151	603	2,412	15,922
2030	No. of Accounts	14,188	5,100	667	133	117	417	20,621
	Deliveries (AF)	10,682	2,499	917	168	667	2,666	17,598
2035	No. of Accounts	15,538	5,148	730	146	128	456	22,146
	Deliveries (AF)	11,699	2,737	1,005	182	730	2,920	19,273
2040	No. of Accounts	16,889	5,196	794	159	139	496	23,673
	Deliveries (AF)	12,716	2,975	1,091	198	793	3,175	20,949
2045	No. of Accounts	18,241	5,245	857	171	150	536	25,200
	Deliveries (AF)	13,733	3,213	1,179	214	857	3,428	22,624
2050	No. of Accounts	19,591	5,293	921	184	161	575	26,725
	Deliveries (AF)	14,750	3,452	1,266	230	920	3,681	24,300

Notes:
(a) Projected Single Family and Multi-Family residential accounts have been adjusted from the 2005 UWMP to reflect dwelling units.
(b) Totals do not include fire services.
(c) Year 2010 projection based on 2009 actual data. Growth to 2015 reflects six years of data.

TABLE 2-5
SANTA CLARITA WATER DIVISION
CURRENT AND PROJECTED WATER DELIVERIES BY CUSTOMER TYPE

Year	Water Use Sectors	Single Family Residential[a]	Multi Family Residential[a]	Commercial	Construction/ Industrial	Institutional/ Government	Landscape	Total[b]
2010[c]	No. of Accounts	24,382	13,151	726	71	107	890	39,327
	Deliveries (AF)	16,189	4,200	1,029	445	862	5,090	27,816
2015	No. of Accounts	26,368	14,311	781	135	117	990	42,702
	Deliveries (AF)	18,410	4,776	1,170	506	982	5,789	31,633
2020	No. of Accounts	29,019	15,750	859	148	129	1,089	46,994
	Deliveries (AF)	20,261	5,257	1,288	558	1,079	6,371	34,814
2025	No. of Accounts	31,670	17,188	938	162	141	1,189	51,288
	Deliveries (AF)	22,111	5,737	1,406	608	1,178	6,955	37,995
2030	No. of Accounts	34,320	18,627	1,016	175	152	1,288	55,578
	Deliveries (AF)	23,962	6,217	1,523	659	1,276	7,539	41,176
2035	No. of Accounts	36,971	20,066	1,095	189	164	1,388	59,873
	Deliveries (AF)	25,813	6,697	1,641	715	1,375	8,116	44,357
2040	No. of Accounts	39,622	21,504	1,174	203	176	1,487	64,166
	Deliveries (AF)	27,664	7,177	1,759	761	1,479	8,698	47,538
2045	No. of Accounts	42,273	22,943	1,252	216	188	1,587	68,459
	Deliveries (AF)	29,514	7,658	1,876	812	1,579	9,280	50,719
2050	No. of Accounts	44,930	24,385	1,331	230	200	1,687	72,763
	Deliveries (AF)	31,370	8,139	1,994	862	1,671	9,864	53,900

Notes:
(a) Projected Single Family and Multi-Family residential accounts have been adjusted from the 2005 UWMP to reflect dwelling units.
(b) Totals do not include fire services.
(c) Year 2010 projection based on 2009 actual data. Growth to 2015 reflects six years of data.

TABLE 2-6
VALENCIA WATER COMPANY
CURRENT AND PROJECTED WATER DELIVERIES BY CUSTOMER TYPE

Year	Water Use Sectors	Single Family Residential[a]	Multi Family Residential[a]	Commercial	Industrial	Institutional/ Government	Landscape[b]	Total[c]
2010[d]	No. of Accounts	25,386	8,854	1,546	451	646	13	36,896
	Deliveries (AF)	14,384	1,845	6,981	1,856	4,586	702	30,354
2015	No. of Accounts	26,497	11,956	1,598	485	647	362	41,545
	Deliveries (AF)	14,883	2,993	7,203	1,990	4,595	2,442	34,107
2020	No. of Accounts	27,423	14,542	1,641	514	648	652	45,419
	Deliveries (AF)	15,299	3,949	7,389	2,101	4,603	3,894	37,235
2025	No. of Accounts	28,348	17,127	1,684	542	650	943	49,294
	Deliveries (AF)	15,715	4,906	7,575	2,213	4,611	5,343	40,362
2030	No. of Accounts	29,274	19,713	1,727	570	651	1,233	53,168
	Deliveries (AF)	16,130	5,862	7,760	2,324	4,619	6,794	43,490
2035	No. of Accounts	30,200	22,298	1,770	599	652	1,524	57,042
	Deliveries (AF)	16,546	6,818	7,946	2,436	4,627	8,244	46,617
2040	No. of Accounts	31,125	24,883	1,813	627	653	1,814	60,917
	Deliveries (AF)	16,962	7,775	8,131	2,548	4,635	9,696	49,745
2045	No. of Accounts	32,051	27,469	1,856	656	654	2,105	64,791
	Deliveries (AF)	17,378	8,731	8,317	2,659	4,643	11,144	52,872
2050	No. of Accounts	32,977	30,054	1,900	684	655	2,395	68,665
	Deliveries (AF)	17,793	9,687	8,503	2,771	4,650	12,596	56,000

Notes:
(a) Projected Single Family and Multi-Family residential accounts have been adjusted from the 2005 UWMP to reflect dwelling units.
(b) Landscape customers consist of potable and recycled water users for outdoor irrigation.
(c) Totals do not include fire services.
(d) Year 2010 projection based on 2009 actual data. Growth to 2015 reflects six years of data.

2.5 Population

2.5.1 Historical Population

The methodology for estimating the historical populations of areas served by the water purveyors is prescribed by DWR[3]. The method enables those suppliers whose service areas are not fully contained in existing city boundaries to obtain service area population from a data source such as a regional planning agency or an association of governments (such as Southern California Association of Governments, SCAG), assuming that their estimates use the State Department of Finance (DOF) or U.S. Census Bureau data as a basis. In such situations water suppliers must use DOF, Census or SCAG data to a define persons per Single Family (SF) and Multi-Family (MF) residential connection factor, and then calculate yearly populations based on the number of SF and MF connections each year. This calculation of historical population must cover each year of the period 1995 to 2010.

Accordingly, each purveyor provided an accounting of its historical SF residential and MF residential dwelling units for the years 1995 to 2009 (LACWWD 36 provided 2000-2009 data). Planning assumptions utilized the 2000 U.S. Census, SCAG's 2012 Regional Transportation Plan (RTP) growth forecast (baseline 2008) and the DOF 2000 and 2010 datasets to capture both City of Santa Clarita and the northern portion of unincorporated Los Angeles County within the CLWA service area. Actual data for 2010 SF and MF dwelling units were provided by the purveyors.

The population for each purveyor was estimated by taking the number of accounts for SF and MF in a given year and multiplying by a persons-per-household (PPHH) factor for the number of people living at each type of account, and then summing the result. Using a PPHH factor of 3.11[4] and a growth rate of 0.53 percent, annual historical populations were calculated for each purveyor from 1995, as shown in Table 2-7. The total of these estimates, as summarized in Table 2-8, reflect the total population within the CLWA service area.

[3] See Appendix A in "*Methodologies for Calculating Baseline and Compliance per Capita Urban Water Use"* (DWR 2010).
[4] The PPHH of 3.11 was anchored to the purveyors' year 2000 residential connections and then projected backward to 1995 and forward to 2010 using the calculated growth rate.

TABLE 2-7
HISTORICAL POPULATION BY RETAIL PURVEYOR SERVICE AREA

	NCWD			SCWD		
Year	SF Residential Units[a]	MF Residential Units[a]	Population[b][c]	SF Residential Units[a]	MF Residential Units[a]	Population[b][c][d]
1995	5,680	4,552	30,898	17,632	10,062	83,628
1996	5,723	4,589	31,323	17,812	10,100	84,784
1997	6,035	4,612	32,533	17,856	9,842	84,634
1998	6,037	4,622	32,764	18,222	9,884	86,394
1999	6,202	4,651	33,561	18,671	9,994	88,642
2000	6,255	4,713	34,121	19,408	10,527	93,128
2001	6,428	4,768	35,041	20,145	10,985	97,430
2002	6,777	4,823	36,526	20,691	11,458	101,230
2003	7,199	4,852	38,178	21,278	11,685	104,427
2004	7,873	4,870	40,618	22,152	12,104	109,189
2005	8,163	4,875	41,814	23,035	12,479	113,897
2006	8,292	4,875	42,490	23,620	13,066	118,385
2007	8,431	4,875	43,206	24,347	13,195	121,903
2008	8,450	4,875	43,539	24,398	13,133	122,631
2009	8,492	4,875	43,951	24,374	13,126	123,302
2010	8,500	4,893	44,316	24,382	13,151	124,192

Notes:
(a) Single Family (SF) and Multi-Family (MF) residential units provided by each retail purveyor.
(b) Population estimated for non-census years assuming consistent exponential growth 1990-2000 and 2000-2010.
(c) Population derived from DOF population data for City of Santa Clarita. Table 1 Total Population 2000 and 2010 Incorporated Cities by County in California and Table 1 Population Change 1990-2000 Incorporated Cities by County, and City of Santa Clarita, 2000-2010 U.S. Census Bureau, 2000 Summary File 1 (SF1) 100 Percent Data, City of Santa Clarita, 2000, SCAG, Adopted 2008 RTP.
(d) SCWD data for 2010 population based on 2009 population and SCWD Water Master Plan (2008).
(e) LACWWD 36, rather than calculating population based on dwelling units, provided its historical population for 2000-2010.

TABLE 2-7 CON'T
HISTORICAL POPULATION BY RETAIL PURVEYOR SERVICE AREA

	VWC			LACWWD 36		
Year	**SF Residential Units[(a)]**	**MF Residential Units[(a)]**	**Population[(b)(c)]**	**SF Residential Units[(a)]**	**MF Residential Units[(a)]**	**Population[(e)]**
1995	14,696	4,184	57,012	-	-	-
1996	15,433	4,285	59,895	-	-	-
1997	16,276	4,285	62,826	-	-	-
1998	17,311	5,191	69,168	-	-	-
1999	18,264	5,457	73,353	-	-	-
2000	19,179	5,725	77,476	948	5	2,965
2001	20,631	6,342	84,420	1,093	5	3,393
2002	21,818	6,941	90,556	1,177	5	4,232
2003	22,822	7,676	96,618	1,251	5	4,508
2004	24,193	7,949	102,451	1,278	5	4,600
2005	24,953	8,405	106,983	1,289	5	4,624
2006	25,044	8,437	108,043	1,300	5	4,660
2007	25,131	8,537	109,324	1,303	5	4,681
2008	25,211	8,590	110,443	1,310	5	4,688
2009	25,171	8,854	111,876	1,310	5	4,684
2010	25,386	8,854	113,296	1,527	6	4,947

Notes:
(a) Single Family (SF) and Multi-Family (MF) residential units provided by each retail purveyor.
(b) Population estimated for non-census years assuming consistent exponential growth 1990-2000 and 2000-2010.
(c) Population derived from DOF population data for City of Santa Clarita. Table 1 Total Population 2000 and 2010 Incorporated Cities by County in California and Table 1 Population Change 1990-2000 Incorporated Cities by County, and City of Santa Clarita, 2000-2010 U.S. Census Bureau, 2000 Summary File 1 (SF1) 100 Percent Data, City of Santa Clarita, 2000, SCAG, Adopted 2008 RTP.
(d) SCWD data for 2010 population based on 2009 population and SCWD Water Master Plan (2008).
(e) LACWWD 36, rather than calculating population based on dwelling units, provided its historical population for 2000-2010.

TABLE 2-8
SUMMARY OF HISTORICAL POPULATION BY RETAIL PURVEYOR SERVICE AREA[(a)]

Year	NCWD	SCWD	VWC	LACWWD 36[(b)]	Total CLWA Service Area
1995	30,898	83,628	57,012	-	**171,537**
1996	31,323	84,784	59,895	-	**176,002**
1997	32,533	84,634	62,826	-	**179,994**
1998	32,764	86,394	69,168	-	**188,326**
1999	33,561	88,642	73,353	-	**195,556**
2000	34,121	93,128	77,476	2,965	**207,690**
2001	35,041	97,430	84,420	3,393	**220,284**
2002	36,526	101,230	90,556	4,232	**232,544**
2003	38,178	104,427	96,618	4,508	**243,730**
2004	40,618	109,189	102,451	4,600	**256,857**
2005	41,814	113,897	106,983	4,624	**267,318**
2006	42,490	118,385	108,043	4,660	**273,578**
2007	43,206	121,903	109,324	4,681	**279,114**
2008	43,539	122,631	110,443	4,688	**281,301**
2009	43,951	123,302	111,876	4,684	**283,813**
2010	44,316	124,192	113,296	4,947	**286,750**

Notes:
(a) Summary of population from Table 2-7.
(b) LACWWD 36 included for purposes of providing regional completeness; however, it is not required to prepare an UWMP.

2.5.2 Population Projections

The population for the CLWA service area was projected for the years 2010 to 2050 using the connection-PPHH method described in Section 2.5.1. The purveyors provided their projections of SF and MF residential dwelling units within their service areas for the years 2010 to 2050, as estimated in their master planning documents. SCWD, rather than providing dwelling units, provided its projections of population at build-out of its service area in 2050.

Using a PPHH factor of 3.31[5] (increased by the growth rate from 3.11 PPHH in year 2000), assumed constant over the projection period, projections of population for years out to 2050 were calculated. The results of these calculations are shown in Table 2-9.

Based on these results, population in the CLWA service area is projected to grow at an average annual rate of approximately 1.5 percent per year over the 40-year planning period to 2050.

[5] The PPHH of 3.31 was projected forward from the year 2000 PPHH of 3.11, using the calculated growth rate.

TABLE 2-9
PROJECTED POPULATION

Year	NCWD[(a)]	SCWD[(b)]	VWC[(a)]	LACWWD 36[(a)]	Total CLWA Service Area
2010	44,316	124,192	113,296	4,947	**286,750**
2015	49,933	133,868	127,241	7,157	**318,199**
2020	54,559	143,544	138,862	8,908	**345,873**
2025	58,612	153,220	150,477	10,658	**372,967**
2030	63,824	162,896	162,098	12,405	**401,223**
2035	68,450	172,572	173,716	14,159	**428,897**
2040	73,079	182,248	185,330	15,906	**456,564**
2045	77,715	191,924	196,952	17,657	**484,248**
2050	82,341	201,600	208,570	19,407	**511,918**

Notes:
(a) Based on average household size calculated over the census decade to 3.31 persons per household, and remaining fixed through 2050.
(b) SCWD data based on SCWD Water Master Plan (2008).

2.5.3 Comparison to City and County Planning

One Valley, One Vision (OVOV) is a joint planning effort by the City of Santa Clarita and Los Angeles County representing the build-out of the entire Santa Clarita Valley, including Canyon Country, Newhall, Saugus and Valencia and the County communities of Stevenson Ranch, Castaic, Val Verde, Agua Dulce and the future Newhall Ranch. The OVOV includes both City and County jurisdictions in its planning effort which are the development of a General Plan and associated EIR. Both the OVOV area and the Santa Clarita Valley planning area (defined by SCAG) are slightly larger than the CLWA service area and factors into the modest differences in population projections. As the overwhelming majority of the OVOV population is located in the CLWA service area, it is appropriate to compare the CLWA service area population projections to the OVOV projections, as shown in Table 2-10.

TABLE 2-10
POPULATION COMPARISON

Year	Total CLWA Service Area[a]	OVOV[b]	Santa Clarita Valley Planning Area
2010	286,750	252,000[c]	267,299[d]
2015	318,199	278,000 - 280,750	319,715[d]
2020	345,873	304,000 - 309,500	352,336[d]
2025	372,967	330,000 - 338,250	384,217[d]
2030	401,223	356,000 - 367,000	397,112[d][e]
2035	428,897	382,000 - 395,750	410,008[d]
2040	456,564	408,000 - 424,500	448,228[f]
2045	484,248	434,000 - 453,250	490,011[f]
2050	511,918	460,000 - 482,000	535,689[f]

Notes:
(a) See Table 2-9.
(b) OVOV General Plan EIR.
(c) The OVOV estimated population in 2008 was 252,000 which, for this analysis, was assumed to occur in 2010.
(d) 2010 and 2035 Projection for Santa Clarita Valley Planning Area are the sums of the City of Santa Clarita and unincorporated Los Angeles area. The unincorporated area provided by the County of Los Angeles Department of Planning from adjusted GIS data from U.S. Census Bureau & SCAG data provided by email communication, April 5, 2011.
(e) Year 2030 value adjusted. Actual GIS data had 2030 value of 414,612 which was higher than 2035 value. Used growth rate assumptions to correct.
(f) Years 2040-2050 assumed 2010-2035 growth rates.

In Table 2-10, the OVOV projections and SCAG projections indicate a 1.6 to 1.8 percent annual growth rate of population for the Santa Clarita Valley. The purveyor projections of population growth are just slightly below that with a 1.5 percent annual growth rate. These population growth rates align with the annual rate of increase in the purveyors' projected water demands of 1.8 percent, as shown in Table 2-2.

Based on a detailed analysis of the OVOV Planning Area conducted by traffic analysis zones, County and City staff have determined that population of the Santa Clarita Valley at full build-out of the uses shown on the land use map of the Area Plan will be approximately 460,000 to 482,000 residents.

County staff has also provided updated and adjusted 2010 and 2035 population projections using SCAG data for the unincorporated areas of CLWA's service area (using year 2000 Census base data). Based on these projections for the unincorporated area and SCAG's projections for the City, projections for the Santa Clarita Valley at full build-out are about 535,700 persons.

The total population projected in this UWMP for the CLWA service area in 2050 is approximately 512,000 residents. The difference between this and OVOV projections may be due to some purveyors' master planning efforts taking a more conservative approach to ensure an adequate supply of water for all future uses.

2.6 Existing and Targeted Per Capita Water Use

2.6.1 Base Daily Per Capita Water Use for SBX7-7 Reduction

As described in Senate Bill 7 of Special Extended Session 7 (SBX7-7), it is the intent of the California legislature to increase water use efficiency and the legislature has set a goal of a twenty percent per capita reduction in urban water use statewide by 2020. As SBX7-7 applies to retail water suppliers, NCWD, SCWD and VWC must comport with its requirements. Consistent with SBX7-7, the 2010 UWMP must provide an estimate of Base Daily Per Capita Water Use. This estimate utilizes information on population as well as base gross water use. For the purposes of this UWMP, population was estimated as described in the previous section. Base gross water use is defined as the total volume of water, treated or untreated, entering the distribution systems of the retail purveyors, excluding (1) recycled water, (2) net volume of water placed into long-term storage and (3) water conveyed to another urban water supplier. This calculation of base daily per capita water use is limited to the NCWD, SCWD and VWC retail service areas.

The UWMP Act allows urban water retailers to evaluate their base daily per capita water use using two base periods, a 10 or 15-year continuous period is used to calculate baseline per capita water use. A 5-year base period is used to determine whether the 2020 per capita water use target meets the legislation's minimum water use reduction requirements of at least a 5 percent reduction per capita water use for those suppliers with baseline water use above 100 GPCD. The legislation provided some flexibility in what actual periods of time are used to establish these baselines, to account for short-term water demand variations resulting from weather influences, as well as acknowledging the advances of water suppliers that have already begun using recycled water to reduce potable demands. The 15-year base period within the range January 1, 1990 to December 31, 2010 is allowed if recycled water made up ten percent or more of 2008 retail water deliveries. If recycled water did not make up ten percent or more of the 2008 retail water deliveries, then a retailer must use a 10-year base period within the range January 1, 1995 to December 31, 2010. Recycled water did not make up ten percent of 2008 deliveries by NCWD, SCWD or VWC, and for this reason base daily per capita water use has been based on a 10-year period. The 5-year period required by SBX7-7 must be within the range January 1, 2003 to December 31, 2010.

Tables 2-11 to 2-13 provide the data used to calculate the base daily per capita water use in GPCD, and the 10-year and 5-year base periods for each purveyor. Tables 2-15, 2-17 and 2-19 provide the data used to determine whether the purveyor's 2015 and 2020 per capita water use targets meet the legislation's minimum water use reduction requirement of five percent. If the 2020 target is greater than the 5-year value, the target is reduced to this value. These tables show that the 2020 targets do not exceed these minimum values. Per SBX7-7 requirements, the 2015 interim targets were therefore set to the mid-point between the 10-year baseline per capita water use and the 2020 target.

TABLE 2-11
NEWHALL COUNTY WATER DISTRICT - BASE DAILY PER CAPITA WATER USE

Base Period Year		Distribution System Population	Annual System Gross Water Use (AFY)	Annual Daily Per Capita Water Use (GPCD)	10-Year Average (GPCD)	5-Year Average (GPCD)
Sequence Year	*Calendar Year*					
1	1995	30,898	7,755	224		
2	1996	31,323	7,887	225		
3	1997	32,533	8,801	242		
4	1998	32,764	8,087	220		
5	1999	33,561	9,348	249		
6	2000	34,121	9,718	254		
7	2001	35,041	9,525	243		
8	2002	36,526	10,362	253		
9	2003	38,178	10,351	242		
10	2004	40,618	11,217	247	240	
11	2005	41,814	10,756	230	240	
12	2006	42,490	11,470	241	242	
13	2007	43,206	11,975	247	243	241
14	2008	43,539	11,340	233	244	239
15	2009	43,951	10,560	214	240	233
				Period Selected	**244**	**241**

Note: Shaded cells show calendar years used in selected 5-year average.

TABLE 2-12
SANTA CLARITA WATER DIVISION - BASE DAILY PER CAPITA WATER USE

Base Period Year		Distribution System Population	Annual System Gross Water Use (AFY)	Annual Daily Per Capita Water Use (GPCD)	10-Year Average (GPCD)	5-Year Average (GPCD)
Sequence Year	*Calendar Year*					
1	1995	83,628	19,898	212		
2	1996	84,784	22,006	232		
3	1997	84,634	22,456	237		
4	1998	86,394	20,319	210		
5	1999	88,642	24,513	247		
6	2000	93,128	25,280	242		
7	2001	97,430	25,544	234		
8	2002	101,230	28,434	251		
9	2003	104,427	27,092	232		
10	2004	109,189	29,191	239	234	
11	2005	113,897	28,921	227	235	
12	2006	118,385	30,302	229	235	
13	2007	121,903	31,355	230	234	231
14	2008	122,631	30,476	222	235	229
15	2009	123,302	27,816	201	231	222
				Period Selected	**235**	**231**

Note: Shaded cells show calendar years used in selected 5-year average.

TABLE 2-13
VALENCIA WATER COMPANY - BASE DAILY PER CAPITA WATER USE

Base Period Year		Distribution System Population	Annual System Gross Water Use (AFY)[(a)]	Annual Daily Per Capita Water Use (GPCD)	10-Year Average (GPCD)	5-Year Average (GPCD)
Sequence Year	*Calendar Year*					
1	1995	57,012	17,543	275		
2	1996	59,895	19,721	294		
3	1997	62,826	22,131	314		
4	1998	69,168	19,874	257		
5	1999	73,353	22,735	277		
6	2000	77,476	25,190	290		
7	2001	84,420	24,715	261		
8	2002	90,556	28,360	280		
9	2003	96,618	28,779	266		
10	2004	102,451	30,234	263	278	
11	2005	106,983	29,473	246	275	
12	2006	108,043	30,646	253	271	
13	2007	109,324	32,286	264	266	258
14	2008	110,443	32,419	262	266	258
15	2009	111,876	30,027	240	263	253
				Period Selected	**278**	**258**

Notes: Shaded cells show calendar years used in selected 5-year average.

(a) Excludes recycled water use in years 2003-2009.

2.6.2 Urban Water Use Targets for SBX7-7 Reduction

In addition to calculating base gross water use, SBX7-7 requires that NCWC, SCWD and VWC, as retail purveyors, identify their demand reduction targets for year 2015 and 2020 by utilizing one of four options:

- Option 1. 80 percent of baseline GPCD water use (i.e., a 20 percent reduction).
- Option 2. The sum of the following performance standards: indoor residential use (provisional standard set at 55 GPCD); plus landscape use, including dedicated and residential meters or connections equivalent to the State Model Landscape Ordinance (80 percent ETo existing landscapes, 70 percent of ETo for future landscapes); plus 10 percent reduction in baseline commercial, industrial institutional use by 2020.
- Option 3. 95 percent of the applicable state hydrologic region target as set in the DWR "20x2020 Water Conservation Plan" (February, 2010) (20x2020 Plan).
- Option 4. Savings by Water Sector: this provisional method developed by DWR, identifies water savings obtained through identified practices and subtracts them from the base daily per capita water use value identified for the water supplier.

Option 2 and Option 4 were considered and not selected because they required data not currently being collected within the purveyors service areas.

The CLWA service area is within the South Coast Hydrologic Region (#4) as defined by DWR and this hydrologic region has been assigned a 2020 water use target of 149 GPCD per the DWR 20x2020 Plan. Therefore, in order to use Option 3, each purveyor's daily per capita water use for the 5-year base period would have to be close to 95 percent of the 149 GPCD target, or 142 GPCD. Since none of the purveyors 5-year base period is within this limit, as shown in Table 2-14, none of the purveyors chose this option as the target method.

TABLE 2-14
OPTION 3 – 95 PERCENT OF STATE HYDROLOGIC REGION TARGET

Purveyor	5-Year Base Period	95% of 5-Year Base Period (149 GPCD)
NCWD	241	229 > 149
SCWD	231	219 > 149
VWC	258	245 > 149

Option 1 is the simplest of the options provided and requires reduction to 80 percent of baseline per capita water use. Option 1 is also the most conservative of the four Options provided. Each of the purveyors selected Option 1 to calculate its SBX7-7 target.

This results in the 2020 GPCD targets for the purveyors as shown in Tables 2-15, 2-17, and 2-19. Each purveyor plans to meet the proposed 20X2020 water use targets implementing conservation methods that are discussed in Chapter 7 Demand Management Measures, as well as with recycled water as described in Chapter 4, Recycled Water. Tables 2-16, 2-18, and 2-20, show the calculation of reduction in demand required by each purveyor. SBX7-7 allows for both conservation and recycled water supply to assist in meeting these SBX7-7 conservation requirements.

The 2015 and 2020 projected consumption without additional reduction shown in Tables 2-16, 2-18, to 2-20 are calculated in accordance with SBX7-7 and, therefore, do not match the projected deliveries in Tables 2-4, 2-5 and 2-6 which are based on purveyors' master planning documents.

TABLE 2-15
NCWD - COMPONENTS OF TARGET DAILY PER CAPITA WATER USE

Period	Value		Unit	
10-year period selected for baseline GPCD	First Year	1999	Last Year	2008
5-year period selected for maximum allowable GPCD	First Year	2003	Last Year	2007
Highest 10-year Average	244		GPCD	
Highest 5-year Average	241		GPCD	
Compliance Water Use Target (20% Reduction on 10yr)	195		GPCD	
Minimum Water Use Reduction Requirement (5% Reduction 5yr)	229		GPCD	
2020 Target	**195**		GPCD	
2015 Interim Target	**219**		GPCD	
Methodology Used	**Option #1**			

TABLE 2-16
NCWD - SBX7-7 CONSERVATION SAVINGS SUMMARY

Description	Units	2015 Interim Target	2020 Compliance Target
Base Daily Water Use	GPCD	244	244
Population	GPCD	49,933	54,559
Method 1 Compliance Target	GPCD	219	195
GPCD Reduction		24	49
% Reduction		10%	20%
Projected Consumption w/out additional Reduction	AFY	13,647	14,912
Projected Consumption at Goal	AFY	12,283	11,929
Reduction to Meet Target	AFY	1,365	2,982

TABLE 2-17
SCWD - COMPONENTS OF TARGET DAILY PER CAPITA WATER USE

Period	Value		Unit	
10-year period selected for baseline GPCD	First Year	1997	Last Year	2006
5-year period selected for maximum allowable GPCD	First Year	2003	Last Year	2007
Highest 10-year Average	235		GPCD	
Highest 5-year Average	231		GPCD	
Compliance Water Use Target (20% Reduction on 10yr)	188		GPCD	
Minimum Water Use Reduction Requirement (5% Requirement 5yr)	219		GPCD	
2020 Target	**188**		GPCD	
2015 Interim Target	**212**		GPCD	
Methodology Used	**Option #1**			

TABLE 2-18
SCWD - SBX7-7 CONSERVATION SAVINGS SUMMARY

Description	Units	2015 Interim Target	2020 Compliance Target
Base Daily Water Use	GPCD	235	235
Population	GPCD	133,868	143,544
Method 1 Compliance Target	GPCD	212	188
GPCD Reduction		24	47
% Reduction		10%	20%
Projected Consumption w/out additional Reduction	AFY	35,239	37,786
Projected Consumption at Goal	AFY	31,715	30,229
Reduction to Meet Target	AFY	3,524	7,557

TABLE 2-19
VWC - COMPONENTS OF TARGET DAILY PER CAPITA WATER USE

Period	Value		Unit	
10-year period selected for baseline GPCD	First Year	1995	Last Year	2004
5-year period selected for maximum allowable GPCD	First Year	2003	Last Year	2007
Highest 10-year Average	278		GPCD	
Highest 5-year Average	258		GPCD	
Compliance Water Use Target (20% Reduction on 10yr)	222		GPCD	
Minimum Water Use Reduction Requirement (5% Reduction 5yr)	245		GPCD	
2020 Target	**222**		GPCD	
2015 Interim Target	**250**		GPCD	
Methodology Used	**Option #1**			

TABLE 2-20
VWC – SBX7-7 CONSERVATION SAVINGS SUMMARY

Description	Units	2015 Interim Target	2020 Compliance Target
Base Daily Water Use	GPCD	278	278
Population	GPCD	127,241	138,862
Method 1 Compliance Target	GPCD	250	222
GPCD Reduction		28	56
% Reduction		10%	20%
Projected Consumption w/out additional Reduction	AFY	39,623	43,242
Projected Consumption at Goal	AFY	35,661	34,593
Reduction to Meet Target	AFY	3,962	8,648

LACWWD 36 is not required to comport with the requirements of SBX7-7. However the District does implement conservation measures and will contribute to the conservation savings as indicated in Table 2-21.

TABLE 2-21
LACWWD 36 – CONSERVATION SAVINGS

Description	Units	2015	2020
Projected Consumption w/out additional Reduction	AFY	1,759	2,189
Projected Consumption at Goal	AFY	1,583	1,751
Reduction to Meet Target	AFY	176	438

2.6.3 Purveyor Projections and SBX7-7 Objectives

Table 2-22 summarizes the retail purveyors' projected water demands through 2050. This summary includes demands without conservation, based on the purveyors' projected water demands shown in Table 2-2, and with conservation, using the SBX7-7 requirements discussed previously in Section 2.6.2. Appendix C includes demand projections for a single-dry water year and a multiple-dry year period, assuming a ten percent increase in demand without conservation in dry years. It should be noted that the SBX7-7 conservation requirements do not change for different year types, so those requirements in the dry years shown in Appendix C are the same as SBX7-7 requirements shown in Table 2-22.

The demand reductions required to comply with SBX7-7 may be achieved through a combination of water conservation measures and the use of recycled water. The anticipated increase in recycled water use after 2020 could potentially reduce the quantity of water conservation needed to achieve the SBX7-7 goals. However, the water conservation amounts achieved by 2020 are assumed in this Plan to be maintained through 2050. These amounts plus planned recycled water use will exceed the SBX7-7 water reduction requirements for the period 2020-2050. Thus potable water reductions shown in Table 2-22 exceed the requirements of SBX7-7.

TABLE 2-22
NORMAL YEAR SBX7-7 DEMAND CALCULATIONS (AF)

	2015	2020	2025	2030	2035	2040	2045	2050
Water Demands w/ and w/o Conservation[a]								
LACWWD 36[b]								
Demand w/o Conservation[c]	1,759	2,189	2,619	3,048	3,478	3,908	4,338	4,768
Anticipated Conservation Objective[d]	176	438	524	610	696	782	868	954
Reduction from Recycled Water[e]	0	50	50	50	50	50	50	50
Net Anticipated Water Conservation[f]	176	388	474	560	646	732	818	904
Demand w/ Conservation[g]	1,583	1,801	2,145	2,489	2,833	3,177	3,520	3,864
SBX7-7 Compliance Calculations								
NCWD								
Demand w/o Conservation[c]	12,571	14,246	15,922	17,598	19,273	20,949	22,624	24,300
20x2020 Reduction[h]	1,365	2,982	3,204	3,489	3,742	3,995	4,248	4,501
Reduction from Recycled Water[e]	200	500	1,000	1,275	1,775	2,275	2,775	3,275
Reduction from Water Conservation[i]	1,165	2,482	2,482	2,482	2,482	2,482	2,482	2,482
Demand w/ Conservation[j]	11,406	11,764	13,440	15,115	16,791	18,466	20,142	21,818
SCWD								
Demand w/o Conservation[c]	31,633	34,814	37,995	41,176	44,357	47,538	50,719	53,900
20x2020 Reduction[k]	3,524	7,557	8,067	8,576	9,085	9,595	10,104	10,614
Reduction from Recycled Water[e]	100	500	1,500	2,275	2,775	3,775	4,775	5,775
Reduction from Water Conservation[i]	3,424	7,057	7,057	7,057	7,057	7,057	7,057	7,057
Demand w/ Conservation[j]	28,209	27,757	30,938	34,119	37,300	40,481	43,662	46,843
VWC								
Demand w/o Conservation[c]	34,107	37,235	40,362	43,490	46,617	49,745	52,872	56,000
20x2020 Reduction[l]	3,962	8,648	9,372	10,095	10,819	11,542	12,266	12,990
Reduction from Recycled Water[e]	1,000	2,000	3,000	4,500	6,000	8,000	10,000	12,200
Reduction from Water Conservation[i]	2,962	6,648	6,648	6,648	6,648	6,648	6,648	6,648
Demand w/ Conservation[j]	31,145	30,586	33,714	36,841	39,969	43,097	46,224	49,352
Regional Summary								
Demand w/o Conservation[c]	80,070	88,484	96,898	105,312	113,726	122,140	130,554	138,968
20x2020 Reduction	9,027	19,626	21,166	22,770	24,342	25,914	27,486	29,058
Reduction from Recycled Water[m]	1,300	3,050	5,550	8,100	10,600	14,100	17,600	21,300
Reduction from Water Conservation	7,727	16,576	16,662	16,748	16,833	16,919	17,005	17,091
Demand w/ Conservation	72,343	71,908	80,236	88,564	96,892	105,220	113,549	121,877

Notes:

(a) Reflects existing and projected demands in CLWA service area only. CLWA's Annexation Policy requires annexing parties to provide additional fully reliable supplies. Known parties potentially seeking annexation include Legacy/Stevenson Ranch Phase 5, Tapia Canyon and Tesoro Del Valle.
(b) LACWWD 36 included for purposes of providing regional completeness; however, it is not required to prepare an UWMP.
(c) Demand w/o Conservation from Table 2-2.
(d) LACWWD 36 conservation objective estimated at 20% of projected demand commencing 2020; see Table 2-21.
(e) Recycled water projections from Table 4-3.
(f) Net Anticipated Conservation for LACWWD 36 is Anticipated Conservation Objective minus Reduction from Recycled Water.
(g) Demand w/ Conservation for LACWWD 36 is Demand w/o Conservation minus Net Anticipated Conservation.
(h) NCWD 20x2020 Reduction from Table 2-16. The 20 percent conservation requirement is assumed to continue through 2050 and continue to be met with a mixture of recycled water and conservation.
(i) Reduction from Water Conservation is 20x2020 Reduction minus Reduction from Recycled Water for 2015 and 2020; the quantity of water conservation remains at least at 2020 amounts through 2050.
(j) Demand w/ Conservation is Demand w/o Conservation minus Reduction from Water Conservation.
(k) SCWD 20x2020 Reduction from Table 2-18. The 20 percent conservation requirement is assumed to continue through 2050 and continue to be met with a mixture of recycled water and conservation.
(l) VWC 20x2020 Reduction from Table 2-20. The 20 percent conservation requirement is assumed to continue through 2050 and continue to be met with a mixture of recycled water and conservation.
(m) Recycled water reductions do not include demands from Honor Rancho.

2.6.3.1 Low Income Projected Water Demands

Senate Bill 1087 requires that water use projections of a UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county general plan in the service area of the supplier.

Housing elements rely on the Regional Housing Needs Allocation (RHNA) generated by the State Department of Housing and Community Development (HCD) to allocate the regional need for housing to the regional Council of Governments (COG) (or a HCD for cities and counties not covered by a COG) for incorporation into housing element updates. Before the housing element is due, the HCD determines the total regional housing need for the next planning period for each region in the state and allocates that need. The COGs then allocate to each local jurisdiction its "fair share" of the RHNA, broken down by income categories – very low, low, moderate and above moderate – over the housing element's planning period.

Jurisdictions located within the region covered by the Southern California Association of Governments (SCAG), including the County of Los Angeles, were required to submit their adopted Housing Elements to the State Department of Housing and Community Development by July 1, 2008.

The City of Santa Clarita and the County last updated their housing elements in 2008, and it covers the planning period 2008-2014. These elements incorporate the formally transmitted Los Angeles County housing allocation that was incorporated into the Final RHNA approved by the SCAG Regional Council on July 12, 2007[6]. The allocation for very low and low income classes as defined by the California Health and Safety Code were the following for the City of Santa Clarita:

- Very Low – 26.0%
- Low – 16.2%

Neither the SCAG RHNA nor the City of Santa Clarita and County housing elements further classify the allocation of low income households into single-family and multi-family residential housing units. For this reason, it is not possible to project water use for lower income households by this specific land use category. However, to remain consistent with the intent of the SB 1087 legislation and also to comply with the UWMP Planning Act, the water use projections for very low and low residential income households based on the income category were identified and their classification percentage was applied to the purveyor's calculated demand projections as shown in Table 2-23 on the following page.

Note that the current planning period for the RHNA is January 1, 2006 to June 30, 2014. The next RHNA planning cycle will cover January 1, 2011 to September 30, 2021. Thus, the 2015 UWMP update will need to be updated with the next RHNA planning cycle and classification percentages.

[6] Final Regional Housing Need Allocation Plan - Planning Period (January 1, 2006 - June 30, 2014) for Jurisdictions within the Six-County SCAG Region (approved by the SCAG Regional Council on July 12, 2007); http://www.scag.ca.gov/housing/pdfs/rhna/RHNA_FinalAllocationPlan071207.pdf

The City of Santa Clarita and/or County will not deny or condition approval of water services, or reduce the amount of services applied for by any proposed development unless one of the following occurs:

- City of Santa Clarita and the County specifically finds that it does not have sufficient water supply.
- City of Santa Clarita and the County is subject to a compliance order issued by the State Department of Public Health (DPH) that prohibits new water connections.
- The applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

TABLE 2-23
LOW INCOME DEMANDS[(a)(b)]

	2015	2020	2025	2030	2035	2040	2045	2050
LACWWD 36								
Demand w/ Conservation[(c)]	1,583	1,801	2,145	2,489	2,833	3,177	3,520	3,864
Very Low[(d)]	412	468	558	647	737	826	915	1,005
Low[(e)]	256	292	347	403	459	515	570	626
Subtotal	*668*	*760*	*905*	*1,050*	*1,195*	*1,341*	*1,486*	*1,631*
NWCD								
Demand w/ Conservation[(c)]	11,406	11,764	13,440	15,115	16,791	18,466	20,142	21,818
Very Low[(d)]	2,966	3,059	3,494	3,930	4,366	4,801	5,237	5,673
Low[(e)]	1,848	1,906	2,177	2,449	2,720	2,992	3,263	3,534
Subtotal	*4,813*	*4,964*	*5,672*	*6,379*	*7,086*	*7,793*	*8,500*	*9,207*
SCWD								
Demand w/ Conservation[(c)]	28,209	27,757	30,938	34,119	37,300	40,481	43,662	46,843
Very Low[(d)]	7,334	7,217	8,044	8,871	9,698	10,525	11,352	12,179
Low[(e)]	4,570	4,497	5,012	5,527	6,043	6,558	7,073	7,589
Subtotal	*11,904*	*11,713*	*13,056*	*14,398*	*15,741*	*17,083*	*18,425*	*19,768*
VWC								
Demand w/ Conservation[(c)]	31,145	30,586	33,714	36,841	39,969	43,097	46,224	49,352
Very Low[(d)]	8,098	7,952	8,766	9,579	10,392	11,205	12,018	12,831
Low[(e)]	5,045	4,955	5,462	5,968	6,475	6,982	7,488	7,995
Subtotal	*13,143*	*12,907*	*14,227*	*15,547*	*16,867*	*18,187*	*19,507*	*20,826*
Total	**30,529**	**30,345**	**33,860**	**37,374**	**40,889**	**44,403**	**47,917**	**51,432**

Notes:
(a) Demands already included within purveyor projections.
(b) 2007 Adopted SCAG RHNA; allocation for very low income (26.0%) and low income (16.2%).
(c) From Table 2-22.
(d) 26.0% of total purveyor Demand w/ Conservation.
(e) 16.2% of total purveyor Demand w/ Conservation.

2.7 Other Factors Affecting Water Usage

A major factor that affects water usage is weather. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool, wet years, historical water usage has decreased, reflecting less water usage for exterior landscaping. This factor is discussed below in detail.

2.7.1 Weather Effects on Water Usage

California faces the prospect of significant water management challenges due to a variety of issues including population growth, regulatory restrictions and climate change. Climate change is of special concern because of the range of possibilities and their potential impacts on essential operations, particularly operations of the SWP. The most likely scenarios involve increased temperatures, which will reduce the Sierra Nevada snowpack and shift more runoff to winter months, and accelerated sea level rise. These changes can cause major problems for the maintenance of the present water export system since water supplies are conveyed through the fragile levee system of the Sacramento-San Joaquin Delta. The other much-discussed climate scenario or impact is an increase in precipitation variability, with more extreme drought and flood events posing additional challenges to water managers[7].

Figure 2-2 shows the purveyors overall water use since 2000 as well as total precipitation occurring over the same time period. Past studies have indicated that during dry years within the Santa Clarita Valley, demands can increase from between five to ten percent. This analysis assumes a conservative ten percent increase in per capita demands during dry periods.

Figure 2-3 shows the purveyors average annual monthly water use since 2002. In the Santa Clarita Valley, the largest amount of water use occurs during the end of summer and in the beginning of fall months (July, August and September). Water is used least in the cooler months leading into spring (February, March). This variation gives some indication about how weather affects water demands in the CLWA service area.

2.7.2 Conservation Effects on Water Usage

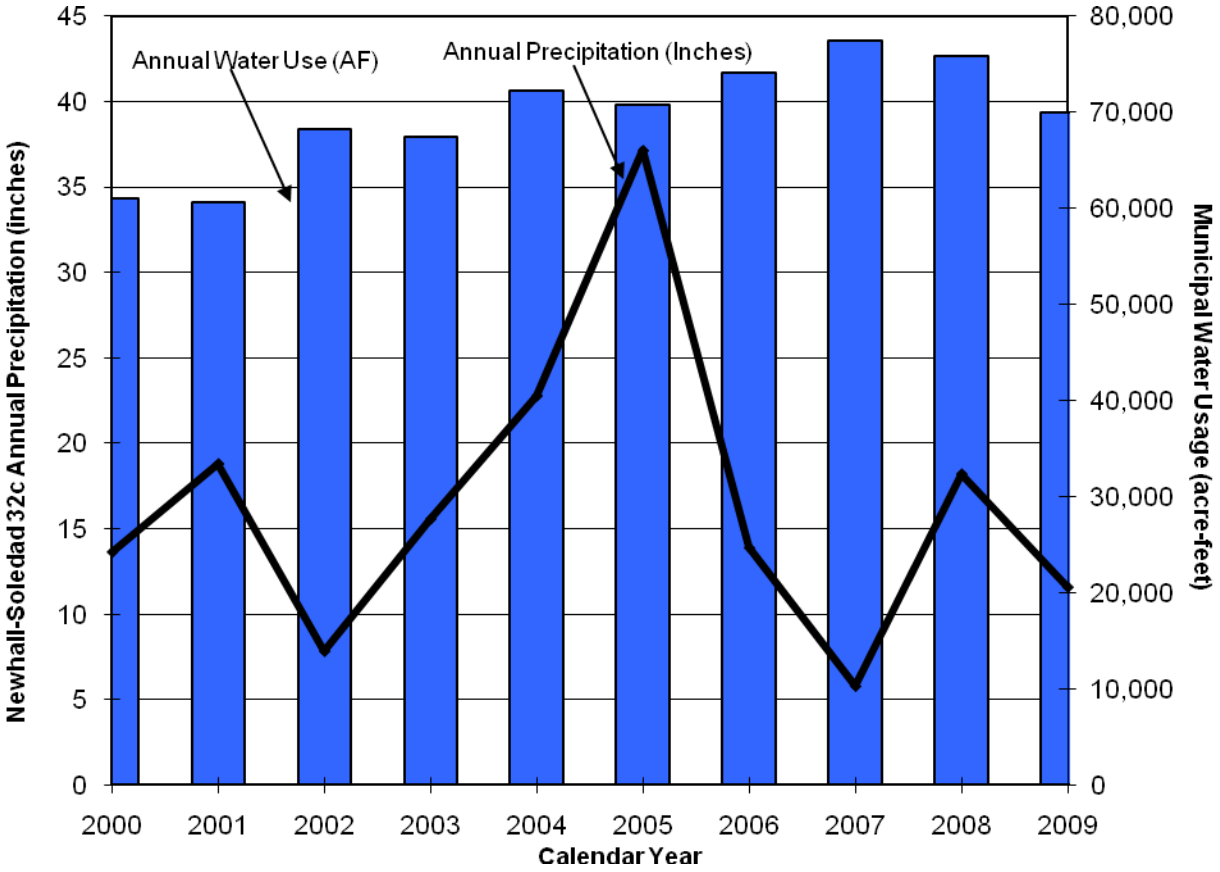
In recent years, water conservation has become an increasingly important factor in water supply planning in California. Since the 2005 UWMP there have been a number of regulatory changes related to conservation including new standards for plumbing fixtures, a new landscape ordinance, a state universal retrofit ordinance, new Green Building standards, demand reduction goals and more. The California plumbing code has also instituted requirements for new construction that mandate the installation of ultra low-flow toilets and low-flow showerheads.

During the 1987 to 1992 drought period, overall water requirements due to the effects of hot, dry weather were projected to increase by approximately ten percent. As a result of extraordinary conservation measures enacted during the period, the overall water requirements actually decreased by more than ten percent.

[7] Final California Water Plan Update 2009 Integrated Water Management: Bulletin 160.

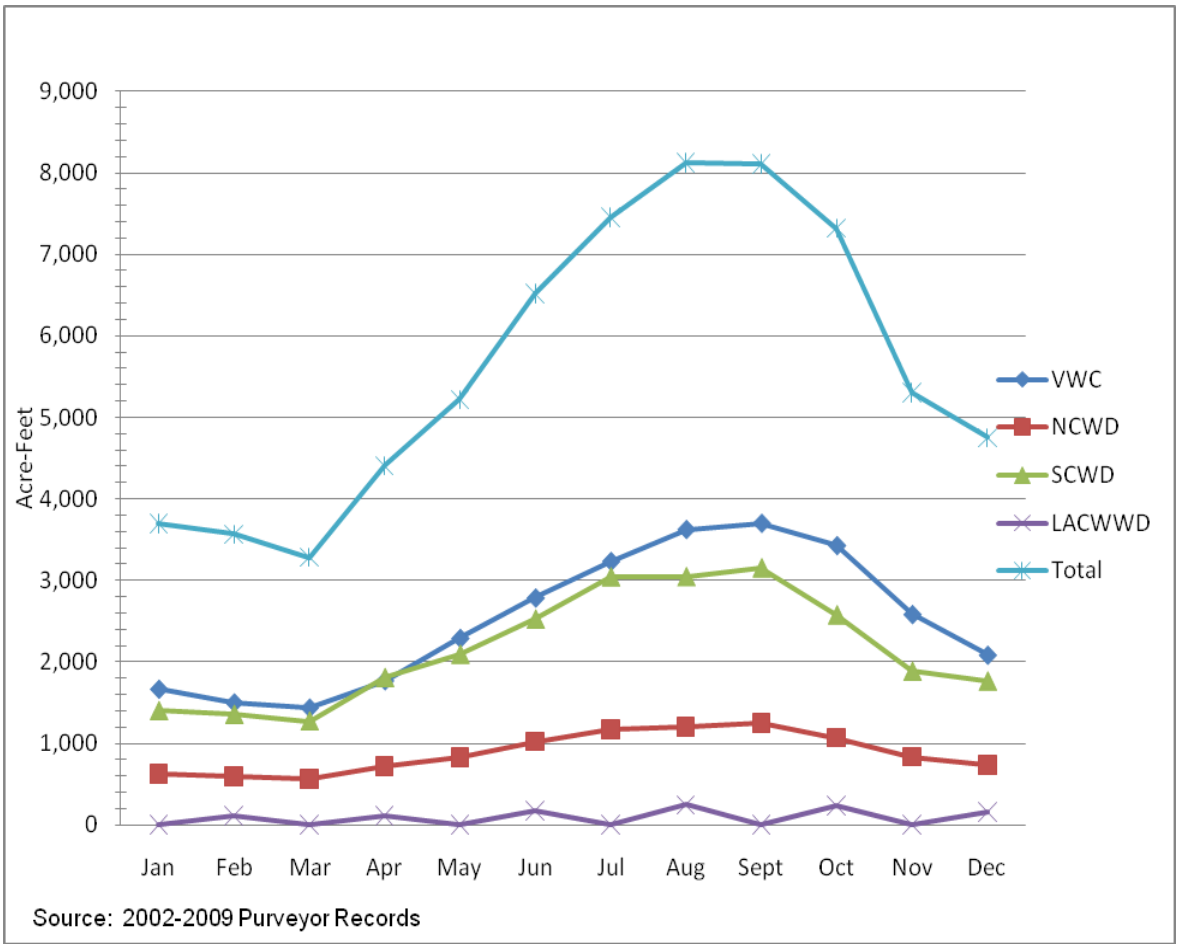
Residential, commercial, and industrial usage can be expected to decrease as a result of the implementation of more aggressive water conservation practices. In southern California, the greatest opportunity for conservation is in developing greater efficiency and reduction in landscape irrigation. The irrigation demand can typically represent as much as seventy percent of the water demand for residential customers depending on lot size and amount of irrigated turf and plants. Conservation efforts will increasingly target this component of water demand.

FIGURE 2-2
HISTORICAL WATER USE AND PRECIPITATION



Sources: Precipitation data provided from rain gage Newhall-Soledad 32c. Total water use from Table 2-1.

FIGURE 2-3
AVERAGE MONTHLY RETAIL CONSUMPTION



Section 3: Water Resources

3.1 Overview

This section describes the water resources available to CLWA and the purveyors for the next forty years. The suppliers' existing water resources include wholesale (imported) supplies, local groundwater, recycled water and water from existing groundwater banking programs. Planned supplies include new groundwater production as well as additional banking programs. These existing and planned supplies are summarized in Table 3-1 and discussed in more detail in this section.

The distribution of water supplies presented in this UWMP does not represent an allocation of water rights among the retail water purveyors. Local and imported water resources in the Santa Clarita Valley are managed cooperatively between CLWA and the purveyors. Just as the demands on the sources of supply were identified on an individual purveyor basis in Section 2, the existing and planned sources of supply have also been broken down by source on an individual purveyor basis. These tables have been included in Appendix C.

TABLE 3-1
SUMMARY OF CURRENT AND PLANNED WATER SUPPLIES AND BANKING PROGRAMS[a]

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Existing Supplies									
Existing Groundwater[b]									
Alluvial Aquifer	24,385	24,000	24,000	24,000	25,000	25,000	25,000	25,000	25,000
Saugus Formation[c]	6,725	9,225	10,225	10,225	10,225	10,225	10,225	10,225	10,225
Total Groundwater	**31,110**	**33,225**	**34,225**	**34,225**	**35,225**	**35,225**	**35,225**	**35,225**	**35,225**
Recycled Water[d] **Total Recycled**	**325**	**325**	**325**	**325**	**325**	**325**	**325**	**325**	**325**
Imported Water									
State Water Project[e]	58,300	58,100	57,900	57,600	57,400	57,400	57,400	57,400	57,400
Flexible Storage Accounts[f]	6,060	6,060	4,680	4,680	4,680	4,680	4,680	4,680	4,680
Buena Vista-Rosedale	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Nickel Water - Newhall Land	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607
Total Imported	**76,967**	**76,767**	**75,187**	**74,887**	**74,687**	**74,687**	**74,687**	**74,687**	**74,687**
Existing Banking Programs[g]									
Rosedale Rio-Bravo	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Semitropic	15,000	15,000	15,000	-	-	-	-	-	-
Semitropic - Newhall Land	4,950	4,950	4,950	4,950	4,950	4,950	4,950	4,950	4,950
Total Banking	**39,950**	**39,950**	**39,950**	**24,950**	**24,950**	**24,950**	**24,950**	**24,950**	**24,950**
Planned Supplies									
Future Groundwater[h]									
Alluvial Aquifer	-	-	1,000	2,000	3,000	4,000	5,000	6,000	7,000
Saugus Formation	-	1,375	1,375	1,375	1,375	1,375	1,375	1,375	1,375
Total Groundwater	**-**	**1,375**	**2,375**	**3,375**	**4,375**	**5,375**	**6,375**	**7,375**	**8,375**
Recycled Water[i] Total Recycled	**-**	**975**	**2,725**	**5,225**	**7,775**	**10,275**	**13,775**	**17,275**	**20,975**
Banking Programs Total Banking Programs	**-**	**-**	**-**	**10,000**	**10,000**	**20,000**	**20,000**	**20,000**	**20,000**

Notes:

(a) The values shown under "Existing Supplies" and "Planned Supplies" are projected to be available in average/normal years. The values shown under "Existing Banking Programs" and "Planned Banking Programs" are the maximum capacity of program withdrawals.

(b) Existing groundwater supplies represent the quantity of groundwater anticipated to be pumped with existing wells. As indicated in Tables 3-8 and 3-9 and Tables 3-4 and 3-5 of the 2009 Groundwater Basin Yield Analysis, individual purveyors may have well capacity in excess of quantities shown in this table. As indicated in Table 3-10, existing and planned groundwater pumping remain within the groundwater operating plan shown on Table 3-5.

(c) SCWD's existing Saugus 1 and Saugus 2 wells resumed production in 2011 with the completion of the perchlorate treatment facility.

(d) Represents recycled water being delivered in 2010 with existing facilities. CLWA currently has 1,700 AFY under contract.

(e) SWP supplies are based on the Department of Water Resources "*2009 State Water Project Delivery Reliability Report*."

(f) Includes both CLWA and Ventura County entities flexible storage accounts. Initial term of agreement with Ventura County entities expires after 2015.

(g) Supplies shown are annual amounts that can be withdrawn and would typically be used only during dry years.

(h) Planned groundwater supplies represent new groundwater well capacity that may be required by an individual purveyor's production objectives in the Alluvial Aquifer and the Saugus Formation. When combined with existing purveyor and non-purveyor groundwater supplies, total groundwater production remains within the sustainable ranges identified in Table 3-8 of 2009 Groundwater Basin Yield Analysis. As indicated in Table 3-10, existing and planned groundwater pumping remain within the basin operating plan shown on Table 3- 5.

(i) See Table 4-3. Total Purveyor Recycled Water less Existing Recycled Supply.

The term "dry" is used throughout this chapter and in subsequent chapters concerning water resources and reliability as a measure of supply availability. As used in this Plan, dry years are those years when supplies are the lowest, which occurs primarily when precipitation is lower than the long-term average precipitation. The impact of low precipitation in a given year on a particular source of supply may differ based on how low the precipitation is, or whether the year follows a high-precipitation year or another low-precipitation year. For the SWP, a low-precipitation year may or may not affect supplies, depending on how much water is in SWP storage at the beginning of the year. Also, dry conditions can differ geographically. For example, a dry year can be local to the Valley area (thereby affecting local groundwater replenishment and production), local to northern California (thereby affecting SWP water deliveries), or statewide (thereby affecting both local groundwater and the SWP). When the term "dry" is used in this Plan, statewide drought conditions are assumed, affecting both local groundwater and SWP supplies at the same time.

3.2 Wholesale (Imported) Water Supplies

CLWA's imported water supplies consist primarily of SWP supplies, which were first delivered to CLWA in 1980. From the SWP, CLWA also has access to water from Flexible Storage Accounts in Castaic Lake, which are planned for dry-year use, but are not strictly limited as such. More detail on SWP supplies is provided in Section 3.2.1. In addition to its SWP supplies, CLWA has an imported surface supply from the Buena Vista Water Storage District (BVWSD) and Rosedale Rio-Bravo Water Storage District (RRBWSD) in Kern County, which was first delivered to CLWA in 2007. More information on this supply is provided in Section 3.2.2. CLWA wholesales both these imported supplies to each of the local retail water purveyors. Additionally, Newhall Land has acquired a water transfer supply from a source in Kern County. This supply, referred to as Nickel water, would be made available to VWC through CLWA.

3.2.1 State Water Project Supplies

3.2.1.1 Background

3.2.1.1.1 SWP Facilities

The SWP is the largest state-built, multi-purpose water project in the country. It was authorized by the California State Legislature in 1959, with the construction of most initial facilities completed by 1973. Today, the SWP includes 28 dams and reservoirs, 26 pumping and generating plants and approximately 660 miles of aqueducts. The primary water source for the SWP is the Feather River, a tributary of the Sacramento River. Storage released from Oroville Dam on the Feather River flows down natural river channels to the Sacramento-San Joaquin River Delta (Delta). While some SWP supplies are pumped from the northern Delta into the North Bay Aqueduct, the vast majority of SWP supplies are pumped from the southern Delta into the 444-mile-long California Aqueduct. The California Aqueduct conveys water along the west side of the San Joaquin Valley to Edmonston Pumping Plant, where water is pumped over the Tehachapi Mountains and the aqueduct then divides into the East and West Branches. CLWA takes delivery of its SWP water at Castaic Lake, a terminal reservoir of the West Branch. From Castaic Lake, CLWA delivers its SWP supplies to the local retail water purveyors through an extensive transmission pipeline system.

3.2.1.1.2 SWP Water Supply Contracts

SWP Water Supplies

In the early 1960s, DWR entered into individual SWP Water Supply Contracts with urban and agricultural public water supply agencies located throughout northern, central and southern California for SWP water supplies. CLWA is one of 29 water agencies (commonly referred to as "contractors") that have an SWP Water Supply Contract with DWR. Each SWP contractor's SWP Water Supply Contract contains a "Table A," which lists the maximum amount of contract water supply, or "Table A water," an agency may request each year throughout the life of the contract. The Table A Amounts in each contractor's SWP Water Supply Contract ramped up over time, based on projections at the time the contracts were signed of future increases in population and water demand, until they reached a maximum Table A Amount. Most contractor's Table A Amounts reached their maximum levels in the early to mid 1990s. Table A Amounts are used in determining each contractor's proportionate share, or "allocation," of the total SWP water supply DWR determines to be available each year.

The total planned annual delivery capability of the SWP and the sum of all contractors' maximum Table A amounts was originally 4.23 MAF. The initial SWP storage facilities were designed to meet contractors' water demands in the early years of the SWP, with the construction of additional storage facilities planned as demands increased. However, essentially no additional SWP storage facilities have been constructed since the early 1970s. SWP conveyance facilities were generally designed and have been constructed to deliver maximum Table A amounts to all contractors. After the permanent retirement of some Table A amount by two agricultural contractors in 1996, the maximum Table A amounts of all SWP contractors now totals about 4.17 MAF. Currently, CLWA's annual Table A Amount is 95,200 AF[8].

The primary supply of SWP water made available under the SWP Water Supply Contracts is allocated Table A supply. An estimation of Table A supply availability is provided in Section 3.2.1.2. Each contractor has some flexibility in managing the Table A supply allocated to it in a given year. A contractor may take delivery of that supply for direct use or storage within its service area, store that water outside its service area for later withdrawal and use within its service area, or carry over a portion of that supply for storage on an as-available-basis in SWP reservoirs, for delivery the following year.

[8] CLWA's original SWP Water Supply Contract with DWR was amended in 1966 for a maximum annual Table A Amount of 41,500 AF. In 1991, CLWA purchased 12,700 AF of annual Table A Amount from a Kern County water district, and in 1999 purchased an additional 41,000 AF of annual Table A Amount ("41K transfer") from another Kern County water district, for a current total annual Table A Amount of 95,200 AF. Later in 1999 legal action was filed challenging the sufficiency of the Environmental Impact Report ("EIR") prepared in connection with the 41K transfer. (*Friends of the Santa Clara River v. Castaic Lake Water Agency*, LASC Case No. BS 056954.) In late 2004, CLWA approved a revised EIR for the 41K transfer ("2004 EIR"). In 2005, new legal actions were filed (and subsequently consolidated) in the Los Angeles County Superior Court (LASC) challenging the sufficiency of the 2004 EIR. (*Planning & Conservation League v. Castaic Lake Water Agency*, LASC Consolidated Case No. BS 098724.) On December 17, 2009, the Court of Appeal, Second District, issued a published decision upholding the sufficiency of the 2004 EIR under the California Environmental Quality Act ("CEQA"). (*Planning & Conservation League v. Castaic Lake Water Agency* (2009) 180 Cal.App.4th 210) Remittitur was issued on March 19, 2010, and final Judgment was entered on July 12, 2010. The entry of final Judgment by the LASC concluded eleven years of legal challenges concerning the sufficiency of the 41K transfer EIRs prepared by CLWA, and it resolved all issues that may have remained concerning the adequacy of the 2004 EIR and the finality of the 41K transfer.

In addition to Table A supplies, the SWP Water Supply Contracts provide for additional types of water that may periodically be available, including "Article 21" water and Turnback Pool water. Article 21 water (which refers to the SWP contract provision defining this supply) is water that may be made available by DWR when excess flows are available in the Delta (i.e., when Delta outflow requirements have been met, SWP storage south of the Delta is full and conveyance capacity is available beyond that being used for SWP operations and delivery of allocated and scheduled Table A supplies). Article 21 water is made available on an unscheduled and interruptible basis and is typically available only in average to wet years, generally only for a limited time in the late winter. The Turnback Pool is a program through which contractors with allocated Table A supplies in excess of their needs in a given year may "turn back" that excess supply for purchase by other contractors who need additional supplies that year. The Turnback Pool can make water available in all types of hydrologic years, although generally less excess water is turned back in dry years. As urban contractor demands have increased, the amount of water turned back and available for purchase has diminished.

The availability of Article 21 water and Turnback Pool water is uncertain. When available, these supplies provide additional water that CLWA may be able to use, either directly to meet demands or for later use after storage in its groundwater banking programs. Due to the uncertainty in availability of Article 21 water and Turnback Pool water, supplies of these types of SWP water are not included in this report. However, to the extent CLWA is able to make use of these supplies when available, CLWA may be able to improve the reliability of its SWP supplies beyond the values used throughout this Plan.

While not specifically provided for in the SWP Water Supply Contracts, DWR has in critically dry years created Dry Year Water Purchase Programs for contractors needing additional supplies. Through these programs, water is purchased by DWR from willing sellers in areas that have available supplies and is then sold by DWR to contractors willing to purchase those supplies. The availability of these supplies is uncertain, and are therefore not included in this report. However, CLWA's access to these supplies when they are available would enable it to improve the reliability of its dry-year supplies beyond the values used throughout this report.

Flexible Storage Account

As part of its water supply contract with DWR, CLWA has access to a portion of the storage capacity of Castaic Lake. This Flexible Storage Account allows CLWA to utilize up to 4,684 AF of the storage in Castaic Lake. Any of this amount that CLWA borrows must be replaced by CLWA within five years of its withdrawal. CLWA manages this storage by keeping the account full in normal and wet years and then delivering that stored amount (or a portion of it) during dry periods. The account is refilled during the next year that adequate SWP supplies are available to CLWA to do so. In 2005, CLWA negotiated with Ventura County SWP contractor agencies to obtain the use of their Flexible Storage Account. This allows CLWA access to another 1,376 AF of storage in Castaic Lake. CLWA access to this additional storage is available on a year-to-year basis through 2015. While it is expected that CLWA and Ventura County will extend the existing flexible storage agreement beyond the 2015 term, it is not assumed to be available beyond 2015 in this Plan.

3.2.1.1.3 Factors Affecting SWP Table A Supplies

While Table A identifies the maximum annual amount of Table A water a SWP contractor may request, the amount of SWP water actually available and allocated to SWP contractors each

year is dependent on a number of factors and can vary significantly from year to year. The primary factors affecting SWP supply availability include: the availability of water at the source of supply in northern California, the ability to transport that water from the source to the primary SWP diversion point in the southern Delta and the magnitude of total contractor demand for that water.

Availability of SWP Source Water

SWP supplies originate in northern California, primarily from the Feather River watershed. The availability of these supplies is dependent on the amount of precipitation in the watershed, the amount of that precipitation that runs off into the Feather River, water use by others in the watershed and the amount of water in storage in the SWP's Lake Oroville at the beginning of the year. Variability in the location, timing, amount and form (rain or snow) of precipitation, as well as how wet or dry the previous year was, produces variability from year to year in the amount of water that flows into Lake Oroville. However, Lake Oroville acts to regulate some of that variability, storing high inflows in wetter years that can be used to supplement supplies in dry years with lower inflows.

As discussed in Section 1.6 and in DWR's *2009 Reliability Report*, climate change adds another layer of uncertainty in estimating the future availability of SWP source water. Current literature suggests that global warming may change precipitation patterns in California from the patterns that occurred historically. While different climate change models show differing effects, potential changes could include more precipitation falling in the form of rain rather than snow and earlier snowmelt, which would result in more runoff occurring in the winter rather than spread out over the winter and spring.

Ability to Convey SWP Source Water

As discussed previously, water released from Lake Oroville flows down natural river channels into the Delta. The Delta is a network of channels and reclaimed islands at the confluence of the Sacramento and San Joaquin rivers. The SWP and the federal Central Valley Project (CVP) use Delta channels to convey water to the southern Delta for diversion, making the Delta a focal point for water distribution throughout the state.

A number of issues affecting the Delta can impact the ability to divert water supplies from the Delta, including water quality, fishery protection and levee system integrity. Water quality in the Delta can be adversely affected by both SWP and CVP diversions, which primarily affect salinity, as well as by urban discharge and agricultural runoff that flows into the Delta, which can increase concentrations of constituents such as mercury, organic carbon, selenium, pesticides, toxic pollutants and reduce dissolved oxygen. The Delta also provides a unique estuarine habitat for many resident and migratory fish species, some of which are listed as threatened or endangered. The decline in some fish populations is likely the result of a number of factors, including water diversions, habitat destruction, degraded water quality and the introduction of non-native species. Delta islands are protected from flooding by an extensive levee system. Levee failure and subsequent island flooding can lead to increased salinity requiring the temporary shut down of SWP pumps.

In order to address some of these issues, SWP and CVP operations in the Delta are limited by a number of regulatory and operational constraints. These constraints are primarily incorporated

into the State Water Resources Control Board's (SWRCB) Water Rights Decision 1641 (D-1641), which establishes Delta water quality standards and outflow requirements that the SWP and CVP must comply with. In addition, SWP and CVP operations are further constrained by requirements included in Biological Opinions (BOs) for the protection of threatened and endangered fish species in the Delta, issued by the United States Fish and Wildlife Service (FWS) in December 2008 and the National Marine Fishery Service (NMFS) in June 2009. The requirements in the BOs are based on real-time physical and biological phenomena (such as turbidity, water temperature and location of fish), which results in uncertainty in estimating potential impacts on supply of the additional constraints imposed by the BOs.

Demand for SWP Water

The reliability of SWP supplies is affected by the total amount of water requested and used by SWP contractors, since an increase in total requests increases the competition for limited SWP supplies. As previously mentioned, contractor Table A Amounts in the SWP Water Supply Contracts ramped up over time, based on projected increases in population and water demand at the time the contracts were signed. Urban SWP contractors' requests for SWP water were low in the early years of the SWP, but have increased steadily over time, although more slowly than the ramp-up in their Table A Amounts, which reached a maximum for most contractors in the early to mid 1990s. Since that time, urban contractors' requests for SWP water have continued to increase until recent years when nearly all SWP contractors are requesting their maximum Table A Amounts.

Consistent with other urban SWP contractors, SWP deliveries to CLWA have increased as its requests for SWP water have increased. Historical total SWP deliveries to CLWA are shown at the end of this Section 3.2 in Table 3-3. The table shows deliveries to the service area for supply to the purveyors, as well as delivery to storage programs outside the service area. A breakdown of Table 3-3 showing how much imported supply was delivered to each purveyor is provided in Appendix H. SWP demand projections provided by CLWA to DWR are shown at the end of this Section 3.2 in Table 3-4. CLWA demand projections provided to DWR are typically conservative in order to maximize water deliveries available to CLWA in any given year for both deliveries to purveyors and current and future storage programs.

3.2.1.2 SWP Table A Supply Assessment

The "*State Water Project Delivery Reliability Report"* (*Reliability Report*), prepared biennially by DWR, assists SWP contractors and local planners in assessing the reliability of the SWP component of their overall supplies. In its 2009 update of the *Reliability Report*, DWR provides SWP supply estimates for SWP contractors to use in their planning efforts, including for preparing their 2010 Urban Water Management Plans. The 2009 *Reliability Report* includes DWR's estimates of SWP water delivery reliability under both current (2009) and future (2029) conditions.

3.2.1.2.1 Analysis Assumptions

DWR's estimates of SWP deliveries are based on a computer model that simulates monthly operations of the SWP and CVP systems. Key inputs to the model include the facilities included in the system, hydrologic inflows to the system, regulatory and operational constraints on system operations and contractor demands for SWP water. In conducting its model studies, DWR must make assumptions regarding each of these key inputs.

In the model studies for the 2009 *Reliability Report*, DWR assumed existing facilities for the analyses of both current and future conditions, with no additional storage or significant improvements to convey water through or past the Delta. Hydrologic inflows to the model are based on 82 years of historical inflows (1922 through 2003), adjusted to reflect current and future levels of development in the source areas. Hydrologic inflows for the future conditions analysis were further adjusted to reflect potential impacts due to climate change and accompanying sea level rise. The 2009 *Reliability Report* model studies include current regulatory and operational constraints in the analyses of both current and future conditions, including D-1641, the 2008 FWS BO and the 2009 NMFS BO. Contractor demands for SWP water used in the analysis of current conditions are derived from recent historical data and information from the contractors. Contractor demands for the future conditions analysis are assumed at maximum Table A Amounts in all 82 years of the simulation.

3.2.1.2.2 Analysis Results

DWR's 2009 *Reliability Report* estimates that for all contractors combined, the SWP can deliver a total Table A supply of 60 percent of total maximum Table A Amounts on a long-term average basis, under both current and future conditions. In the worst-case single critically dry year, DWR estimates the SWP can deliver a total Table A supply of seven percent of total maximum Table A Amounts under current conditions and eleven percent under future conditions. During multiple-year dry periods, DWR estimates the SWP can deliver a total Table A supply averaging 34 to 36 percent of total maximum Table A Amounts under current conditions and 28 to 32 percent under future conditions.

The results DWR presents in its 2009 *Reliability Report* are of total SWP Table A deliveries, which it also expresses as a percentage of total maximum Table A Amounts. However, these percentages are SWP-wide averages and do not reflect the differences among contractors in assumed SWP requests and use, and the differing allocations to individual contractors that result. For this reason, DWR also made available on its website more detailed results from the same model studies presented in the 2009 *Reliability Report*, showing SWP deliveries to each contractor (http://baydeltaoffice.water.ca.gov/swpreliability/index.cfm).

For this Plan, SWP Table A supplies to CLWA were taken from DWR's more detailed, contractor-specific delivery data from its analyses for the 2009 *Reliability Report*. DWR's analysis of current (2009) conditions is used in this Plan to estimate 2010 SWP supplies and its analysis of future (2029) conditions is used to estimate 2030-2050 SWP supplies. As suggested by DWR, SWP supplies for the five-year increments between 2010 and 2030 are interpolated between these values. Since SWP demands cannot increase beyond the maximum demands assumed in the future conditions analysis, SWP supplies for years beyond 2030 are assumed to be the same as for 2030.

Table 3-2 shows CLWA's contractor-specific SWP supplies projected to be available in average/normal years (based on the average delivery over the study's historic hydrologic period from 1922 through 2003). Table 3-2 also summarizes estimated SWP supply availability in a single dry year (based on a repeat of the worst-case historic hydrologic conditions of 1977) and over a multiple dry year period (based on a repeat of the historic four-year drought of 1931 through 1934).

TABLE 3-2
SWP TABLE A SUPPLY RELIABILITY (AF)[(a)(b)]

Wholesaler (Supply Source)	2010	2015	2020	2025	2030-2050
Average Water Year[(c)]					
DWR (SWP)					
Table A Supply	58,300	58,100	57,900	57,600	57,400
% of Table A Amount[(d)]	61%	61%	61%	61%	60%
Single Dry Year[(e)]					
DWR (SWP)					
Table A Supply	12,800	11,900	11,000	10,000	9,100
% of Table A Amount	13%	12%	12%	11%	10%
Multi-Dry Year[(f)]					
DWR (SWP)					
Table A Supply	32,800	32,900	32,900	33,000	33,000
% of Table A Amount	34%	35%	35%	35%	35%

Notes:
(a) Supplies to CLWA provided by DWR from detailed delivery results from the analyses presented in DWR's "*2009 SWP Delivery Reliability Report*." As indicated in the 2009 *Reliability Report*, the supplies are based on existing SWP facilities and current regulatory and operational constraints.
(b) Table A supplies include supplies allocated in one year that are carried over for delivery the following year.
(c) Based on average deliveries over the study's historic hydrologic period of 1922 through 2003.
(d) Supply as a percentage of CLWA's Table A Amount of 95,200 AF.
(e) Based on the worst case historic single dry year of 1977.
(f) Supplies shown are annual averages over four consecutive dry years, based on the historic four-year dry period of 1931-1934.

3.2.1.2.3 Potential Future SWP Supplies

An ongoing planning effort to increase long-term supply reliability for both the SWP and CVP is taking place through the Bay Delta Conservation Plan (BDCP) process. The co-equal goals of the BDCP are to improve water supply and restore habitat in the Delta. The BDCP is being prepared through a collaboration of state, federal and local water agencies, state and federal fish agencies environmental organizations and other interested parties. Several "isolated conveyance system" alternatives are being considered in the plan that would divert water from the north Delta to the south Delta where water is pumped into the south-of-Delta stretches of the SWP and CVP. The new conveyance facilities would allow for greater flexibility in balancing the needs of the estuary with reliable water supplies.

In December 2010, DWR released a "Highlights of the BDCP" document that summarizes the activities and expected outcomes of the BDCP. The results of preliminary analysis included in the document indicate the proposed conveyance facilities may increase the combined average long-term water supply to the SWP and CVP from 4.7 MAF per year to 5.9 MAF/year. This would represent an increase in SWP supply reliability from 60 to 75 percent. Planned completion of the BDCP and corresponding environmental analysis documents is early 2013.

DWR estimates of SWP supply reliability in its 2009 *Reliability Report* are based on existing facilities, and so do not include the proposed conveyance facilities that are part of the BDCP. Since this Plan uses DWR's 2009 *Reliability Report* to estimate SWP supplies to CLWA, the improvements in SWP supply reliability that would result from the proposed facilities are not included in this Plan. Any of the proposed facilities that are completed would increase SWP reliability beyond the values used throughout this Plan.

3.2.1.3 Recent Changes to Factors Affecting SWP Supplies

Since the last round of UWMPs were prepared in 2005, DWR has twice updated its *Reliability Report*. In each of its updates, DWR has projected further reductions in average SWP water deliveries than were projected in 2005. The 2009 *Reliability Report* is the most recent update, and identifies several emerging factors that have the potential to affect the availability and reliability of SWP supplies. Although the 2009 *Reliability Report* presents a conservative projection of SWP delivery reliability, particularly in light of events occurring since its release, it remains the best available information concerning the SWP. Following is information and a brief summary of several factors identified in the 2009 *Reliability Report* having the potential to affect the availability and reliability of SWP supplies. A more detailed discussion of the factors discussed below is attached as Appendix D.

A. <u>FWS and NMFS Biological Opinions</u>

As discussed previously in Subsection 3.2.1.1.3, in December 2008 and June 2009, respectively, the FWS and NMFS issued BOs, with each agency concluding that the operation of the SWP and CVP as proposed by DWR and the Bureau of Reclamation would jeopardize the continued existence of protected species.[9] As required by the Endangered Species Act (ESA), FWS and NMFS each developed a Reasonable and Prudent Alternative (RPA) to the proposed SWP and CVP operations, and included that RPA in its respective BO. If the RPA terms are fully implemented, the resulting SWP and CVP operations are deemed to be in compliance with the ESA.

The RPAs developed and adopted by FWS and NMFS impose many new restrictions and requirements on SWP and CVP operations which can result in substantially reduced water exports from the Delta. Preliminary estimates prepared by DWR indicate that implementation of the RPAs in both BOs could reduce SWP deliveries by 28 to 39 percent during average and dry conditions, respectively. Supply impacts resulting from the BO RPAs can vary from year to year, since the operating restrictions in them are dependent upon highly variable factors such as hydrologic and flow conditions in the Delta, migratory and reproductive patterns of the protected species and numerous other non-SWP and non-CVP factors that impact the abundance of the species. Moreover and as further discussed below, legal challenges have been filed against the FWS and NMFS BOs and, should a court conclude the RPA restrictions are invalid, SWP exports could return to higher levels.

1. <u>FWS BO Litigation</u>

In early 2009, the State Water Contractors, the San Luis Delta-Mendota Water Authority and several individual State and Federal contractor water agencies filed legal challenges against the FWS Delta smelt BO (*The Consolidated Delta Smelt Cases*, E.D. Cal. 1:09-CV-00407-OWW-GSA). Plaintiffs claim that the federal defendants violated the National Environmental Policy Act (NEPA) by failing to perform NEPA analysis prior to provisionally adopting and implementing the FWS BO and RPA and that FWS violated the ESA and the Administrative Procedure Act (APA) in adopting the BO's RPA. In December 2010, the court issued a memorandum decision that invalidated the BO and RPA in several respects and remanded the matter to FWS. Further proceedings are expected to address interim operations of the SWP and CVP while the BO and RPA are revised by FWS.

[9] The December 15, 2008 FWS B.O. evaluated impacts to the Delta smelt. The June 4, 2009 NMFS B.O. evaluated impacts to winter-run and spring-run Chinook salmon, steelhead, green sturgeon and resident killer whales.

2. NMFS BO Litigation

After issuance of the NMFS BO in June 2009, the State Water Contractors and other water agencies filed legal challenges against the NMFS salmonid BO (*The Consolidated Salmon Cases*, E.D. Cal. 1:09-CV-1053-OWW-DLB). In May 2010, the court ruled that the federal defendants violated NEPA by failing to analyze the impact of the BO and RPA on humans and the human environment and authorized the SWP and CVP to operate in accordance with D-1641 until the end of June 2010, unless there was a showing of jeopardy to the species or adverse modification of its critical habitat. Motions for summary judgment to obtain a final ruling in the cases were heard in mid-December 2010 and a decision is expected in 2011.

B. Consistency Determination Litigation

Because the Delta smelt and salmon species are also protected under California's ESA (CESA), the SWP and CVP are required to obtain take authorization for SWP and CVP operations from the California Department of Fish and Game (DFG). In July 2009 and September 2009, respectively, DFG issued "consistency determinations" pursuant to CESA and determined that SWP and CVP operations do not violate that statute to the extent the operations are in compliance with the RPAs set forth in the FWS and NMFS BOs. Because the consistency determinations pose a risk that the SWP could remain bound to the terms of the RPAs even if the BOs are overturned by a federal court, DFG's decisions were challenged in state court by the State Water Contractors and Kern County Water Agency. The cases are currently stayed pending the outcome of *The Consolidated Delta Smelt Cases* and *The Consolidated Salmon Cases* (above).[10]

C. Longfin Smelt Protections

Regulatory actions related to longfin smelt also have the potential to affect the availability and reliability of SWP supplies. In February 2008, longfin smelt were listed as a "candidate" species under CESA and DFG imposed certain interim restrictions on the SWP for protection of the longfin smelt and its critical habitat. In February 2009, shortly before longfin smelt were officially listed as a "threatened" species under CESA, DFG issued Incidental Take Permit No. 2081-2009-001-03 (the Permit) to DWR, which imposes terms and conditions on the ongoing and long-term operations of SWP facilities in the Delta. The operating restrictions under the Permit are based in large part on the restrictions imposed on the SWP by the new FWS BO for Delta smelt (see above). The resulting water supply reductions under the Permit depend on several variable factors, such as Delta hydrology, migratory and reproductive patterns of longfin smelt and other factors affecting species abundance in the Delta. Notably, DWR has not indicated whether any particular reductions in SWP exports are likely to result from the Permit. In March 2009, a legal challenge was filed against the Permit.[11] Although that litigation is currently stayed pursuant to a stipulation of the parties, the challenge puts DFG's ability to enforce the Permit into question.

[10] See, e.g., State Water Contractors v. Cal. Dept. of Fish and Game, Sac. Sup. Ct. Case No. 34-2010-80000552; State Water Contractors v. Cal. Dept. of Fish and Game, Sac. Sup. Ct. Case No. 34-2010-80000560.
[11] See State Water Contractors v. California Dept. of Fish and Game, et al., Sac. Sup. Ct. Case No. 34-2009-80000203.

D. Development of Delta Plan and Delta Flow Criteria Pursuant to New State Laws

In November 2009, the California Legislature enacted SBX7-1 as part of a multi-pronged water package related to water supply reliability, ecosystem health and the Delta.[12] Among other things, SBX7-1 creates the Delta Stewardship Council (Council) and directs the Council to develop a comprehensive management plan for the Delta by January 1, 2012 (the Delta Plan). In addition, the State Water Resources Control Board (SWRCB) was directed to develop flow criteria for the Delta to protect public trust resources, including fish, wildlife, recreation and scenic enjoyment and DFG was required to identify quantifiable biological objectives and flow criteria for species of concern in the Delta.

In August 2010, the SWRCB adopted Resolution No. 2010-0039 approving its report entitled "Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem" (Flow Criteria). The SWRCB report concludes that substantially higher flows are needed through the Delta than in have occurred in previous decades in order to benefit zooplankton and various fish species.[13] Separately, in September 2010, DFG issued a draft report entitled "Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta" (DFG Report). The DFG Report is based on similar biological objectives and recommends Delta flows similar to those set forth in the SWRCB's Flow Criteria.[14] Notably, both the SWRCB and DFG recognize that their recommended flow criteria for the Delta do *not* balance the public interest or the need to provide an adequate and reliable water supply.[15] Also of importance, both the SWRCB and DFG acknowledge that their recommended flow criteria do not have any regulatory or adjudicatory effect; however, they may be used to inform the Council as it prepares the Delta Plan and may be considered as the BDCP process moves forward.[16]

E. Resulting Effect on SWP Supplies

DWR's latest published report on SWP supply reliability, the 2009 *Reliability Report*, includes assumptions to account for the institutional, environmental, regulatory and legal factors affecting SWP supplies, including but not limited to water quality constraints, fishery protections, other D-1641 requirements and the operational limitations imposed by the FWS and NMFS BOs. The *Reliability Report* assumes that all of these restrictions and limitations will remain in place over the next twenty-year period and that no actions to improve the Delta will occur, even though numerous legal challenges, various Delta restoration processes and new legal requirements for Delta improvements are currently underway (i.e., BDCP, Delta Vision, Delta Plan, etc.). Further, DWR's future conditions analysis incorporates assumptions to account for potential supply impacts related to global climate change.[17] These and other factors result in DWR presenting a conservative projection of SWP delivery reliability in its 2009 *Reliability Report*.

[12] SBX7-1 became effective February 3, 2010 and adds Division 35 to the California Water Code (commencing with Section 85300). Division 35 is referred to as the Sacramento-San Joaquin Delta Reform Act of 2009.
[13] (Flow Criteria at 5-8.)
[14] (DFG Report at 13.)
[15] (Flow Criteria at 4; DFG Report at 16.)
[16] (Flow Criteria at 3, 10; DFG Report at ES-4.)
[17] (*See*, *e.g.*, DWR Report at 19, 29-30, Appendices A-B.)

Conservative projections are useful from a long-range urban water supply planning perspective.[18] But it is noted that recent rulings in various legal actions and other factors described above, among others, support higher estimates of average annual SWP deliveries than projected in DWR's 2009 *Reliability Report*. While this may lead DWR to increase its projections in its next update of the *Reliability Report*, the 2009 *Reliability Report* remains the best available information concerning the long-term delivery reliability of SWP supplies. Therefore, the conservative estimates from the 2009 *Reliability Report* are used in this Plan.

3.2.2 Other Imported Supplies

The following supplies are now available to CLWA and the purveyors through transfers that have been executed since 2005. These supplies are now part of the imported supplies available to the service area.

3.2.2.1 Buena Vista-Rosedale

CLWA has executed a long-term transfer agreement for 11,000 AFY with BVWSD and RRBWSD. These two districts, both located in Kern County, joined together to develop a program that provides both a firm water supply and a water banking component. Both districts are member agencies of the Kern County Water Agency (KCWA), a SWP contractor and both districts have contracts with KCWA for SWP Table A Amounts. The supply is based on existing long-standing Kern River water rights held by BVWSD, and is delivered by exchange of the two districts' SWP Table A supplies. This water supply is firm; that is, the total amount of 11,000 AFY is available in all water year types based on the Kern River water right. CLWA began taking delivery of this supply in 2007 as shown in Table 3-3.

3.2.2.2 Nickel Water - Newhall Land

Newhall Land has acquired a water transfer from Kern County sources known as the Nickel water. This source of supply totals 1,607 AFY. The Nickel water comes from a firm source of supply. This source of supply was acquired in anticipation of the Newhall Ranch Specific Plan development. In this UWMP it is anticipated that the water supply will be available to the VWC.

[18] *See*, *e.g.*, *Sonoma County Water Coalition v. Sonoma County Water Agency* (2010) 189 Cal.App.4th 33; *Watsonville Pilots Association v. City of Watsonville* (2010) 183 Cal.App.4th 1059; *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova* (2007) 40 Cal.4th 412.

TABLE 3-3
HISTORICAL IMPORTED SUPPLY DELIVERIES (AF)

Year	SWP Deliveries to CLWA Service Area[a]	SWP Deliveries to Out-of-Service Area Storage[b]	Withdrawals from Out-of-Service Area Storage[b]	Other Imported Deliveries to CLWA Service Area[c]	Total Imported Supplies to CLWA Service Area
1980	1,210	-	-	-	1,210
1981	5,761	-	-	-	5,761
1982	9,516	-	-	-	9,516
1983	9,476	-	-	-	9,476
1984	11,477	-	-	-	11,477
1985	12,401	-	-	-	12,401
1986	13,928	-	-	-	13,928
1987	16,167	-	-	-	16,167
1988	18,904	-	-	-	18,904
1989	21,719	-	-	-	21,719
1990	22,139	-	-	-	22,139
1991	7,357	-	-	-	7,357
1992	14,812	-	-	-	14,812
1993	13,787	-	-	-	13,787
1994	14,919	-	-	-	14,919
1995	17,747	-	-	-	17,747
1996	18,448	-	1,256	-	19,704
1997	21,586	1,256	-	-	21,586
1998	19,782	-	-	-	19,782
1999	28,813	-	-	-	28,813
2000	31,085	-	2,589	-	33,674
2001	35,632	2,589	-	-	35,632
2002	42,080	24,000	395	-	42,475
2003	44,967	-	-	-	44,967
2004	47,463	32,522	-	-	47,463
2005	36,747	20,000	-	-	36,747
2006	39,622	20,395	-	-	39,622
2007	34,919	8,200	-	11,000	45,919
2008	31,878	-	-	11,000	42,878
2009	26,096	-	1,650	11,000	38,746

Sources: DWR Bulletin 132, Management of the California State Water Project; and DWR delivery files.
Notes:
(a) Includes deliveries of Table A supplies, carryover water, Article 21 water, Turnback Pool water, local supply (from West Branch reservoirs) and water purchased through DWR.
(b) Out-of-service area storage includes flexible storage in Castaic Lake, the Semitropic Banking Program and the Rosedale-Rio Bravo Banking Program.
(c) Deliveries from Buena Vista-Rosedale.

TABLE 3-4
CLWA DEMAND PROJECTIONS PROVIDED TO WHOLESALE SUPPLIERS[(a)] (AF)

Wholesaler (Supply Source)	2015	2020	2025	2030	2035	2040	2045	2050
DWR (SWP)[(b)]	95,200	95,200	95,200	95,200	95,200	95,200	95,200	95,200
BVWSD/RRBWSD (Kern River)[(c)]	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000

Notes:
(a) Nickel Water is excluded from this table because it is not contractually a CLWA supply. It is a Newhall Land supply that would be conveyed by CLWA and made available to VWC. Under Newhall Land's agreement for this fixed water supply, the provider is required to provide the amount contracted for every year.
(b) CLWA has provided demand projections to DWR through 2035 based on its maximum Table A Amount and anticipates that its demands beyond 2035 will also be at maximum Table A Amounts.
(c) Under the agreement for this fixed water supply, the wholesale provider is required to provide the amount contracted for every year. Therefore, no demand projections are actually provided to BVWSD and RRBWSD.

3.3 Groundwater

This section presents information about the purveyors groundwater supplies, including a summary of the adopted groundwater management plan (GWMP).

3.3.1 Santa Clara River Groundwater Basin – East Subbasin

The sole source of local groundwater for urban water supply in the Valley is the groundwater Basin identified in the DWR Bulletin 118, 2003 Update as the Santa Clara River Valley Groundwater Basin, East Subbasin (Basin) (Basin No. 4-4.07). The Basin is comprised of two aquifer systems, the Alluvium and the Saugus Formation. The Alluvium generally underlies the Santa Clara River and its several tributaries, to maximum depths of about 200 feet; and the Saugus Formation underlies practically the entire Upper Santa Clara River area, to depths of at least 2,000 feet. There are also some scattered outcrops of Terrace deposits in the Basin that likely contain limited amounts of groundwater. However, since these deposits are located in limited areas situated at elevations above the regional water table and are also of limited thickness, they are of no practical significance as aquifers for municipal water supply; consequently they have not been developed for any significant water supply in the Basin and are not included as part of the existing or planned groundwater supplies described in this UWMP. Figure 3-1 illustrates the mapped extent of the Santa Clara River Valley East Subbasin in DWR Bulletin 118 (2003), which approximately coincides with the outer extent of the Alluvium and Saugus Formation. The CLWA service area is also shown on Figure 3-1.

3.3.2 Adopted Groundwater Management Plan

As part of legislation authorizing CLWA to provide retail water service to individual municipal customers, Assembly Bill (AB) 134 (2001) included a requirement that CLWA prepare a GWMP in accordance with the provisions of Water Code Section 10753, which was originally enacted by AB 3030. The general contents of CLWA's GWMP were outlined in 2002, and a detailed plan was adopted in 2003 to satisfy the requirements of AB 134. The plan both complements and formalizes a number of existing water supply and water resource planning and management activities in CLWA's service area, which effectively encompasses the East Subbasin of the Santa Clara River Valley Groundwater Basin. Notably, CLWA's GWMP (provided on CD as Appendix G) also includes a basin-wide monitoring program, the results of which provide input to annual reporting on water supplies and water resources in the Basin, as well as input to assessment of Basin yield for water supply as described herein. The existing

groundwater monitoring program will be reflected in the upcoming groundwater reporting to DWR as part of SBX7-6 implementation.

The GWMP contains four management objectives, or goals, for the Basin including (1) development of an integrated surface water, groundwater and recycled water supply to meet existing and projected demands for municipal, agricultural and other water uses; (2) assessment of groundwater basin conditions to determine a range of operational yield values that use local groundwater conjunctively with supplemental SWP supplies and recycled water to avoid groundwater overdraft; (3) preservation of groundwater quality, including active characterization and resolution of any groundwater contamination problems and (4) preservation of interrelated surface water resources, which includes managing groundwater to not adversely impact surface and groundwater discharges or quality to downstream basin(s).

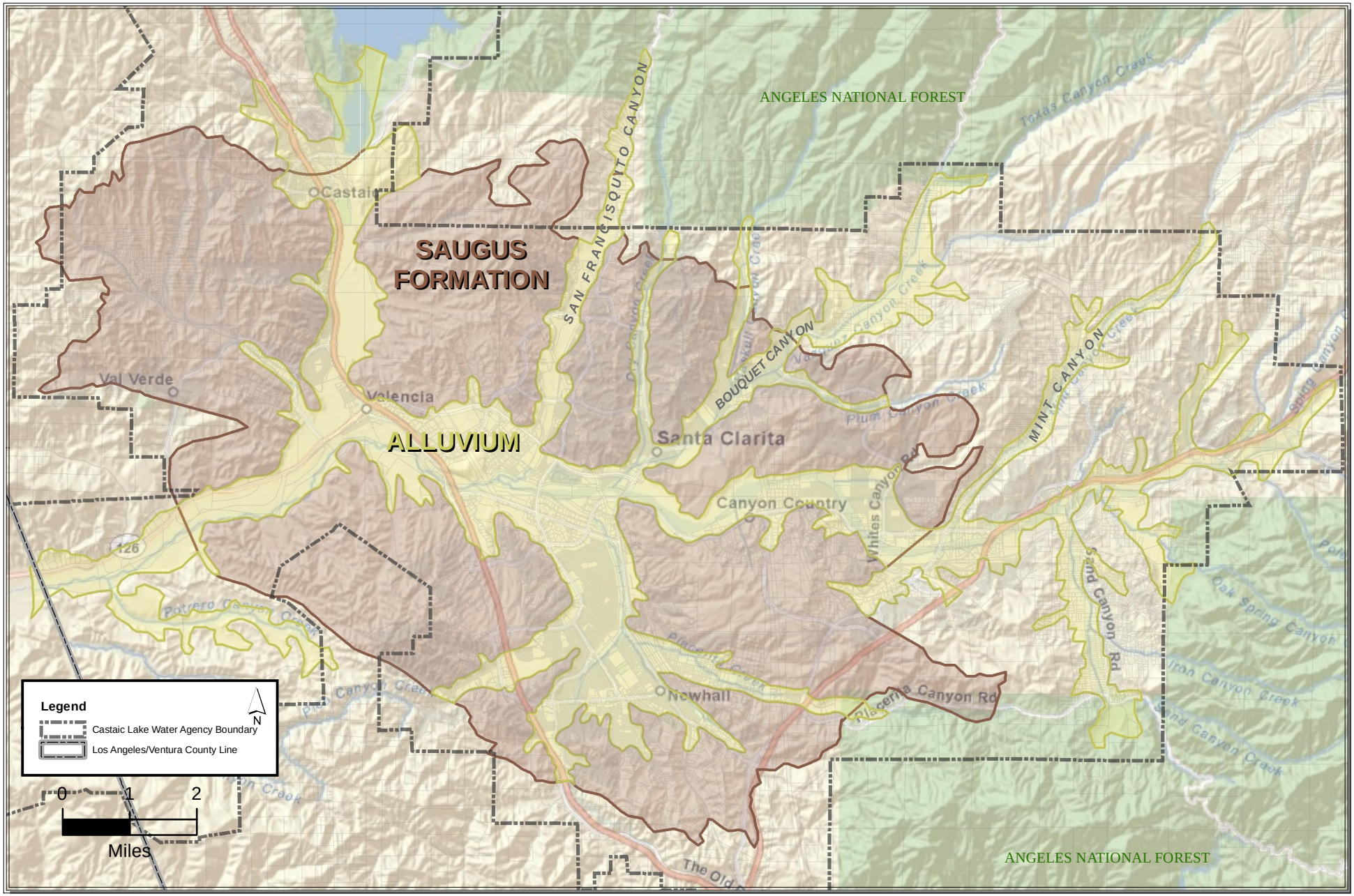


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Figure 3-1
Santa Clara River Valley, East Groundwater Subbasin

Prior to preparation and adoption of the GWMP, a local Memorandum of Understanding (MOU) process among CLWA, the retail water purveyors and United Water Conservation District (UWCD) in neighboring Ventura County, downstream of the East Subbasin of the Santa Clara River Valley, had produced the beginning of local groundwater management, now embodied in the GWMP. Prepared and implemented in 2001, the MOU was a collaborative and integrated approach to several of the aspects of water resource management included in the GWMP. As a result of the MOU, the cooperating agencies integrated their respective database management efforts and continued to monitor and report on the status of Basin conditions, as well as on geologic and hydrologic aspects of their respective parts of the overall stream-aquifer system. Following adoption of the GWMP, the water suppliers developed and utilized a numerical groundwater flow model for analysis of groundwater basin yield and for analysis of extraction and containment of groundwater contamination. The results of those basin yield and contamination analyses, most recently updated in 2009 (Basin Yield Analysis, 2009), are bases for the amounts and allocations of groundwater supplies in this UWMP.

The adopted GWMP includes 14 elements intended to accomplish the Basin management objectives listed above. In summary, the plan elements include:

- Monitoring of groundwater levels, quality, production and subsidence
- Monitoring and management of surface water flows and quality
- Determination of Basin yield and avoidance of overdraft
- Development of regular and dry-year emergency water supply
- Continuation of conjunctive use operations
- Long-term salinity management
- Integration of recycled water
- Identification and mitigation of soil and groundwater contamination, including involvement with other local agencies in investigation, cleanup and closure
- Development and continuation of local, state and federal agency relationships
- Groundwater management reports
- Continuation of public education and water conservation programs
- Identification and management of recharge areas and wellhead protection areas
- Identification of well construction, abandonment and destruction policies
- Provisions to update the groundwater management plan

Work on a number of the GWMP elements had been ongoing for some time prior to the formal adoption of the GWMP, and expanded work on implementation of the GWMP continues on an ongoing basis. The results of some of that work were incorporated in the last UWMP, and subsequent analyses of the groundwater basin are reflected in this current UWMP. Notable in the implementation of the GWMP has been the annual preparation of a Santa Clarita Valley Water Report that summarizes (1) water requirements, (2) all three sources of water supply (groundwater, imported surface water and recycled water, all as part of the GWMP's overall management objectives) and (3) projected water supply availability to meet the following year's projected water requirements.

3.3.2.1 Available Groundwater Supplies

The groundwater component of overall water supply in the Valley derives from a groundwater operating plan developed and analyzed over the last 25 years to meet water requirements (municipal, agricultural, small domestic) while maintaining the Basin in a sustainable condition, specifically no long-term depletion of groundwater or interrelated surface water. The operating plan also addresses groundwater contamination issues in the Basin, all consistent with the GWMP described above. The groundwater operating plan is based on the concept that pumping can vary from year to year to allow increased groundwater use in dry periods and increased recharge during wet periods to collectively assure that the groundwater Basin is adequately replenished through various wet/dry cycles. As ultimately formalized in the GWMP, the operating yield concept has been quantified as ranges of annual pumping volumes to capture year-to-year pumping fluctuations in response to both hydrologic conditions and customer demand.

Ongoing work through implementation of the GWMP has produced three detailed technical reports in addition to the annual Water Reports (the most recent of which, for 2009, was the twelfth annual report). The first report (CH2M Hill, April 2004) documents the construction and calibration of the groundwater flow model for the Valley. The second report (CH2M Hill and LSCE, August 2005) presents the initial modeling analysis of the purveyors' original groundwater operating plan. The most recent report, an updated analysis of the basin (LSCE and GSI, August, 2009) presents the modeling analysis of the current groundwater operating plan, including restoration of contaminated wells for municipal supply after treatment and also presents a range of potential impacts deriving from climate change considerations. All those results are reflected in this UWMP. The primary conclusion of the modeling analysis is that the groundwater operating plan will not cause detrimental short or long term effects to the groundwater and surface water resources in the Valley and is therefore sustainable. The analysis of sustainability for groundwater and interrelated surface water is described in detail in "Analysis of Groundwater Supplies and Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin," prepared by Luhdorff and Scalmanini, Consulting Engineers and GSI Water Solutions, Inc. August 2009 (Basin Yield Analysis, 2009).

The updated groundwater operating plan, summarized in Table 3-5, is as follows:

- **Alluvium:** Pumping from the Alluvial Aquifer in a given year is governed by local hydrologic conditions in the eastern Santa Clara River watershed. Pumping ranges between 30,000 and 40,000 AFY during normal and above-normal rainfall years. However, due to hydrogeologic constraints in the eastern part of the Basin, pumping is reduced to between 30,000 and 35,000 AFY during locally dry years.

- **Saugus Formation:** Pumping from the Saugus Formation in a given year is tied directly to the availability of other water supplies, particularly from the SWP. During average-year conditions within the SWP system, Saugus pumping ranges between 7,500 and 15,000 AFY. Planned dry-year pumping from the Saugus Formation ranges between 15,000 and 25,000 AFY during a drought year and can increase to between 21,000 and 25,000 AFY if SWP deliveries are reduced for two consecutive years and between 21,000 and 35,000 AFY if SWP deliveries are reduced for three consecutive years. Such high pumping would be followed by periods of reduced (average-year) pumping, at rates between 7,500 and 15,000 AFY, to further enhance the effectiveness of natural recharge processes that would recover water levels and groundwater storage volumes after the higher pumping during dry years.

TABLE 3-5
GROUNDWATER OPERATING PLAN FOR THE SANTA CLARITA VALLEY

	Groundwater Production (AF)			
Aquifer	**Normal Years**	**Dry Year 1**	**Dry Year 2**	**Dry Year 3**
Alluvium	30,000 to 40,000	30,000 to 35,000	30,000 to 35,000	30,000 to 35,000
Saugus Formation	7,500 to 15,000	15,500 to 25,000	21,000 to 25,000	21,000 to 35,000
Total	**37,500 to 55,000**	**45,000 to 60,000**	**51,000 to 60,000**	**51,000 to 70,000**

Within the groundwater operating plan, three factors affect the availability of groundwater supplies: sufficient source capacity (wells and pumps), sustainability of the groundwater resource to meet pumping demand on a renewable basis and protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. The first two factors are briefly discussed below, and more completely addressed in the 2009 Annual Water Report and the aforenoted Basin Yield Analysis (2009).

Protection of groundwater sources and provisions for treatment in the event of contamination are discussed further in Chapter 5.

Recent historical groundwater pumping by the retail water purveyors and other groundwater users is summarized in Table 3-6. Planned future groundwater pumping in normal years, by the retail water purveyors as well as by other groundwater users, is summarized in Table 3-7. Existing and planned groundwater pumping by the retail water purveyors as well as by other groundwater users, for normal, single-dry and multiple-dry years, are summarized in Section 3.3.3.4 and in Tables 3-10 through 3-12 below.

TABLE 3-6
RECENT HISTORICAL GROUNDWATER PRODUCTION[a]

Basin Name	Groundwater Pumped (AF)				
	2005	2006	2007	2008	2009
Santa Clara River Valley East Subbasin					
SCWD	12,408	13,156	10,686	11,878	10,077
Alluvium	12,408	13,156	10,686	11,878	10,077
Saugus Formation	0	0	0	0	0
LACWWD 36	343	0	0	0	0
Alluvium	343	0	0	0	0
Saugus Formation	0	0	0	0	0
NCWD	4,824	5,572	5,497	5,912	5,728
Alluvium	1,389	2,149	1,806	1,717	1,860
Saugus Formation	3,435	3,423	3,691	4,195	3,868
VWC	14,741	14,333	15,570	16,094	15,295
Alluvium	12,228	11,884	13,140	14,324	12,459
Saugus Formation	2,513	2,449	2,367	1,770	2,836
Total Purveyor	**32,316**	**33,061**	**31,690**	**33,884**	**31,100**
Alluvium	**26,368**	**27,189**	**25,632**	**27,919**	**24,396**
Saugus Formation	**5,948**	**5,872**	**6,058**	**5,965**	**6,704**
Agricultural and Other[b]	12,785	17,312	14,768	14,750	16,564
Alluvium	12,280	15,872	13,141	13,797	15,590
Saugus Formation	505	1,440	1,627	953	974
Total Basin	**45,101**	**50,373**	**46,458**	**48,634**	**47,664**
Alluvium	**38,648**	**43,061**	**38,773**	**41,716**	**39,986**
Saugus Formation	**6,453**	**7,312**	**7,685**	**6,918**	**7,678**
Groundwater Fraction of Total Municipal Water Supply	**46%**	**45%**	**41%**	**45%**	**44%**

Notes:
(a) From 2009 Santa Clarita Valley Water Report (May 2010).
(b) Includes agricultural and other small private well pumping.

TABLE 3-7
PROJECTED GROUNDWATER PRODUCTION (NORMAL YEAR)[a]

	Groundwater Pumping (AF)							
Basin Name	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Santa Clara River Valley								
East Subbasin								
LACWWD 36								
Alluvium	0	0	0	0	0	0	0	0
Saugus Formation	500	500	500	500	500	500	500	500
NCWD								
Alluvium	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825
Saugus Formation	4,400	4,400	4,400	4,400	4,400	4,400	4,400	4,400
SCWD								
Alluvium	10,500	10,500	10,500	11,500	11,500	11,500	11,500	11,500
Saugus Formation	2,850	3,350	3,350	3,350	3,350	3,350	3,350	3,350
VWC								
Alluvium	11,675	12,675	13,675	14,675	15,675	16,675	17,675	18,675
Saugus Formation	2,850	3,350	3,350	3,350	3,350	3,350	3,350	3,350
Total Purveyor								
Alluvium	**24,000**	**25,000**	**26,000**	**28,000**	**29,000**	**30,000**	**31,000**	**32,000**
Saugus Formation	**10,600**	**11,600**	**11,600**	**11,600**	**11,600**	**11,600**	**11,600**	**11,600**
Agricultural and Other[b]								
Alluvium	14,500	13,500	12,500	10,100	9,100	8,100	7,100	6,600
Saugus Formation	900	900	900	900	900	900	900	900
Total Basin								
Alluvium	**38,500**	**38,500**	**38,500**	**38,100**	**38,100**	**38,100**	**38,100**	**38,600**
Saugus Formation	**11,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**

Notes:
(a) Existing and planned pumping by individual purveyors is shown in Appendix C. The distribution of pumping does not represent a formal allocation of water resources among the retail purveyors.
(b) Agricultural and other small private well pumping, including Newhall Land, Robinson Ranch Golf Course, Wayside Honor Rancho, Valencia Golf Course and proposed Palmer Golf Course.

As reflected in Table 3-7, the groundwater operating plan recognizes ongoing pumping for the two major uses of groundwater in the Basin, municipal and agricultural water supply. Consistent with the groundwater operating plan, projected groundwater pumping includes an ongoing conversion of pumping, coincident with planned land-use changes, from agricultural to municipal water supply. This is shown in Table 3-7, with projected pumping by agricultural and other users decreasing as purveyor pumping increases by a similar amount, resulting in total pumping remaining essentially constant through 2050. The groundwater operating plan and projected pumping also includes other small private domestic and related pumping (discussed further below). As shown in Table 3-7, total projected groundwater pumping by all users within each aquifer is within the ranges for normal year pumping identified in the groundwater operating plan (Table 3-5).

During preparation of the 2005 Plan, the Santa Clarita Valley Well Owners' Association submitted some limited information about the nature and magnitude of private well pumping. This included a detailed estimate of private well pumping in the San Francisquito Canyon portion of the Basin – a total of 85 AFY by 73 individual private pumpers, or nearly 1.2 AFY per private well pumper. As a result of that input, it continues to be recognized that total private pumping is likely well within the 500 AFY estimates of small private well pumping in recent annual Water Reports, or about 1 percent of typical Alluvial Aquifer pumping by the purveyors

and other known private well owners, e.g. agricultural pumpers, combined. Thus, while the small private wells are not explicitly modeled in the Basin yield analysis described herein because their locations and operations are not known, their operation creates a pumping stress that is essentially negligible at the scale of the regional model. Ultimately, implementation of the GWMP to maintain overall pumping within the operating plan, including private pumping, will result in sustainable groundwater conditions to support the combination of municipal (purveyor), agricultural and small private groundwater use on an ongoing basis.

Another change that has affected the UWMP is the requirement by DWR pursuant to the UWMP Act to provide estimates of the projected groundwater use of each of the purveyors. For the purposes of this report and compliance with the UWMP Act, the retail water purveyors have each set forth their estimates of projected groundwater use. The Agency and the retail water purveyors recognize that these estimates of projected groundwater use are subject to adjustment based on various factors and conditions occurring from time to time. These estimates are provided for the planning purposes of this report and the UWMP, and do not constitute an allocation of groundwater from the local groundwater basins.

3.3.2.2 Alluvium

Based on a combination of historical operating experience and recent (2005 and 2009) groundwater modeling analyses, the Alluvial Aquifer can supply groundwater on a long-term sustainable basis in the overall range of 30,000 to 40,000 AFY, with a probable reduction in dry years to a range of 30,000 to 35,000 AFY. Both of those ranges include about 15,000 AFY of Alluvial pumping for current agricultural and other non-municipal water uses. The dry year reduction is a result of practical constraints in the eastern part of the Basin, where lowered groundwater levels in dry periods have the effect of reducing pumping capacities in that shallower portion of the aquifer. Over time, directly related to the rate of suburban development and corresponding decrease in agricultural land use the amount of Alluvial pumping for agricultural water supply is expected to decrease, with an equivalent increase in the amount of Alluvial pumping for municipal water supply. On an overall basis, Alluvial pumping is intended to remain within the sustainable ranges in the groundwater operating plan.

Adequacy of Supply

For municipal water supply, with existing wells and pumps, the three retail water purveyors with Alluvial wells (NCWD, SCWD and VWC) have a combined pumping capacity from active wells of nearly 42,000 gallons per minute (gpm), which translates into a current full-time Alluvial source capacity of approximately 67,000 AFY. Alluvial pumping capacity from all the active municipal supply wells is summarized in Table 3-8. The locations of the various municipal Alluvial wells throughout the Basin are illustrated on Figure 3-2.

In terms of adequacy and availability, the combined active Alluvial groundwater source capacity of municipal wells, approximately 67,000 AFY, is more than sufficient to meet the current and potential future municipal, or urban, component of groundwater supply from the Alluvium, which in the near term is about 24,000 to 26,000 AFY of the total planned Alluvial pumping of 30,000 to 40,000 AFY. The higher individual and cumulative pumping capacities are, of course, primarily for operational reasons (i.e., to meet daily and other fluctuations from average day to maximum day and peak hour system demands). As noted above, the balance of Alluvial pumping in the operating plan is for agricultural and other non-municipal, including small private, pumping.

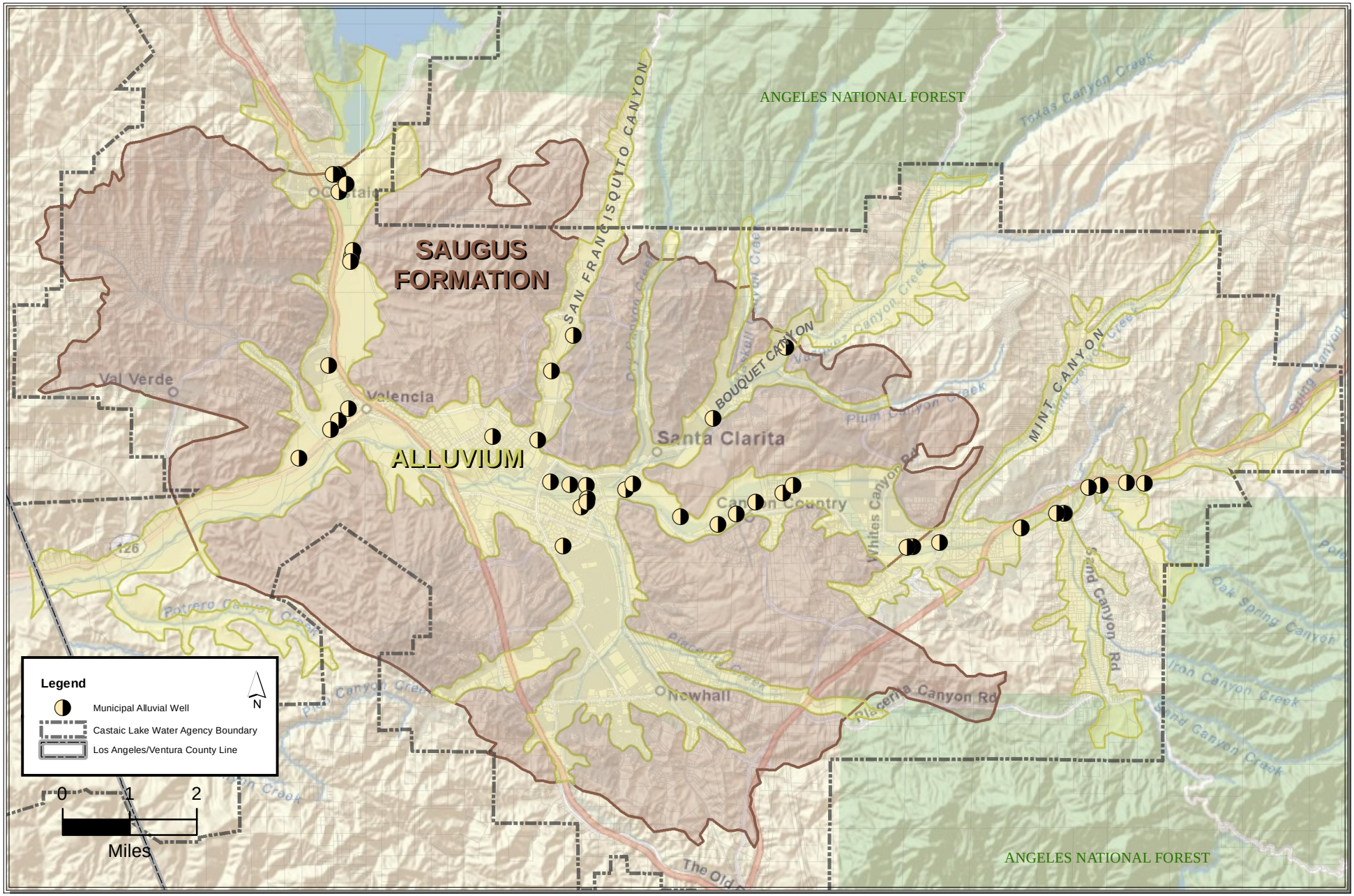

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Figure 3-2
Municipal Alluvial Well Locations
Santa Clara River Valley, East Groundwater Subbasin

TABLE 3-8
ACTIVE MUNICIPAL GROUNDWATER SOURCE CAPACITY — ALLUVIAL AQUIFER WELLS

	Well	Pump Capacity (gpm)	Max. Annual Capacity (AF)	Normal Year Production[(a)] (AF)	Dry-Year Production[(a)] (AF)
NCWD					
	Castaic 1	650	1,040	350	250
	Castaic 2	450	720	100	100
	Castaic 4	270	430	100	0
	Castaic 7	1,450	2,330	300	200
	Pinetree 1	300	480	150	0
	Pinetree 3	550	880	350	300
	Pinetree 4	400	640	300	200
	Pinetree 5	550	880	300	200
	NCWD Subtotal	*4,620*	*7,400*	*1,950*	*1,250*
SCWD					
	Clark	600	960	700	700
	Guida	1,000	1,610	1,300	1,200
	Honby	950	1,530	1,000	700
	Lost Canyon 2	850	1,370	300	0
	Lost Canyon 2A	825	1,330	300	0
	Mitchell 5A	950	1,530	500	200
	Mitchell 5B	700	1,120	800	300
	N. Oaks Central	1,275	2,050	850	700
	N. Oaks East	950	1,530	800	700
	N. Oaks West	1,300	2,290	800	700
	Sand Canyon	1,050	1,690	200	0
	Santa Clara	1,500	2,420	1,200	1,200
	Sierra	1,500	2,420	1,100	700
	Valley Center	1,200	1,930	1,200	1,200
	SCWD Subtotal	*14,650*	*23,580*	*11,050*	*8,300*
VWC					
	Well D	1,050	1,690	880	880
	Well E-15	1,400	2,250	800	800
	Well N	1,250	2,010	650	650
	Well N7	2,500	4,030	1,160	1,160
	Well N8	2,500	4,030	1,160	1,160
	Well Q2	1,200	1,930	1,100	1,100
	Well S6	2,000	3,220	1,000	1,000
	Well S7	2,000	3,220	500	500
	Well S8	2,000	3,220	500	500
	Well T7	1,200	1,930	750	750
	Well U4	1,000	1,610	800	800
	Well U6	1,250	2,010	800	800
	Well W9	800	1,290	1,000	1,000
	Well W10	1,500	2,420	800	800
	Well W11	1,000	1,610	950	950
	VWC Subtotal	*22,650*	*36,470*	*12,850*	*12,850*
Total Purveyors		**41,920**	**67,450**	**25,850**	**22,400**

Note:
(a) Production amounts simulated in the updated Basin Yield analysis (LSCE & GSI, 2009).

Sustainability

Until 2003, the long-term renewability of Alluvial groundwater was empirically determined from approximately 60 years of pumping and groundwater level records. Generally, those long-term observations included stability in groundwater levels and storage, with some dry-period fluctuations in the eastern part of the Basin, over a historical range of total Alluvial pumpage from as low as about 20,000 AFY to as high as about 43,000 AFY. Those empirical observations have since been complemented by the development and application of a numerical groundwater flow model, which has been used to simulate aquifer response to the planned operating ranges of pumping. The numerical groundwater flow model has also been used to analyze the control of perchlorate contaminant migration under selected pumping conditions that have now been implemented to restore, with treatment, pumping capacity that was formerly inactivated due to perchlorate contamination detected in some wells in the Basin. To examine the yield of the Alluvium, or the sustainability of the Alluvium on a renewable basis, the original groundwater flow model was used to examine the long-term projected response of the aquifer to pumping for municipal and agricultural uses in the 30,000 to 40,000 AFY range under average/normal and wet conditions and in the 30,000 to 35,000 AFY range under locally dry conditions, documented in the "Analysis of Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin, Los Angeles County, California, prepared for the Upper Basin Water Purveyors" (2005 Basin Yield Analysis), prepared by CH2M Hill & LSCE, 2005). To examine the response of the entire aquifer system, the original model also incorporated pumping from the Saugus Formation in accordance with the normal (7,500 to 15,000 AFY) and dry year (15,000 to 35,000 AFY) operating plan for that aquifer. The model was run over a synthetic 78-year hydrologic period, which was selected from actual historical precipitation to examine a number of hydrologic conditions expected to affect both groundwater pumping and groundwater recharge.

Simulated Alluvial Aquifer response to the range of hydrologic conditions and pumping stresses was essentially a long-term repeat of the historical conditions that have resulted from similar pumping over the last several decades. The resultant response included (1) generally constant groundwater levels in the middle to western portion of the Alluvium, and fluctuating groundwater levels in the eastern portion as a function of wet and dry hydrologic conditions, (2) variations in recharge that directly correlate with wet and dry hydrologic conditions and (3) no long-term decline in groundwater levels or storage. Consequently, the Alluvial Aquifer was considered in the 2005 UWMP to be a sustainable water supply source to meet the Alluvial portion of the operating plan for the groundwater Basin.

In 2008, partly in preparation for this 2010 UWMP, and partly in response to concerns about events expected to impact the future reliability of supplemental water supply from the SWP, an updated analysis was undertaken to assess groundwater development potential and possible augmentation of the groundwater operating plan. In addition to extending the model's calibration, the updated analysis simulated the historical record of climate and incorporated SWP deliveries for those climatic conditions for an 86-year period from 1922 through 2007, in place of the original model's synthetic 78-year hydrologic period that had been developed prior to the availability of combined climate and SWP deliveries since 1922. While the overall operating plan ranges in the updated basin yield analysis did not change from the original operating plan, prevailing land-use conditions and the specific distributions of pumping reflected in Tables 3-8 and 3-9 were found to produce the same kinds of resultant Alluvial groundwater conditions as concluded to be sustainable in 2005 – (1) no long-term declines in Alluvial groundwater levels and storage; (2) multi-year periods of locally declining, or locally increasing, groundwater levels in response to cycles of below-normal and above-normal precipitation and

(3) short-term impacts on pumping capacities in eastern parts of the basin due to declining groundwater levels during dry periods, mitigable by some redistribution of pumping (reflected in pumping volumes included in this UWMP) and by conformance with the dry-period reduction in Alluvial pumping in the operating plan (Table 3-5). Based on the results of the updated basin yield analysis (LSCE & GSI, 2009), the operating plan is considered to reflect ongoing sustainable groundwater supply rates. In the Alluvium, sustainability was found via explicit simulation of pumping in wet/normal years near the upper end of the operating plan range. In dry years, sustainability was found via explicit simulation of pumping throughout the dry-year operating plan range, with the additional consideration that some pumping redistribution (reflected in this UWMP) be implemented to achieve pumping rates near the upper end of the dry-period range.

3.3.2.3 Saugus Formation

Based on historical operating experience and recent (2005 and 2009) groundwater modeling analysis, the Saugus Formation can supply water on a long-term sustainable basis in a normal range of 7,500 to 15,000 AFY, with intermittent increases to 25,000 to 35,000 AF in dry years. The dry-year increases, based on limited historical observation and modeled projections, demonstrate that a small amount of the large groundwater storage in the Saugus Formation can be pumped over a relatively short (dry) period. This would be followed by recharge (replenishment) of that storage during a subsequent normal-to-wet period when pumping would be reduced.

Adequacy of Supply

For municipal water supply with existing wells, the three retail water purveyors with Saugus wells (NCWD, SCWD and VWC) have a combined pumping capacity from active wells of nearly 17,000 gpm, which translates into a full-time Saugus source capacity of about 27,000 AFY. Saugus pumping capacity from all the active municipal supply wells is summarized in Table 3-9; the locations of the various active municipal Saugus wells are illustrated on Figure 3-3. These capacities include two Saugus wells contaminated by perchlorate (Saugus 1 and 2), which have now been returned to service with treatment facilities for use of the treated water for municipal supply under permit from the State Department of Public Health. They also reflect the most recent replacement well, VWC's Well 207, in a non-impacted part of the basin. Excluded from these capacities is VWC Well 201 that was recently impacted by the detection of perchlorate. The well represents a total of 2,400 gpm of pumping capacity (for a dry-year production capacity of 3,777 AFY). VWC has removed Well 201 from service.

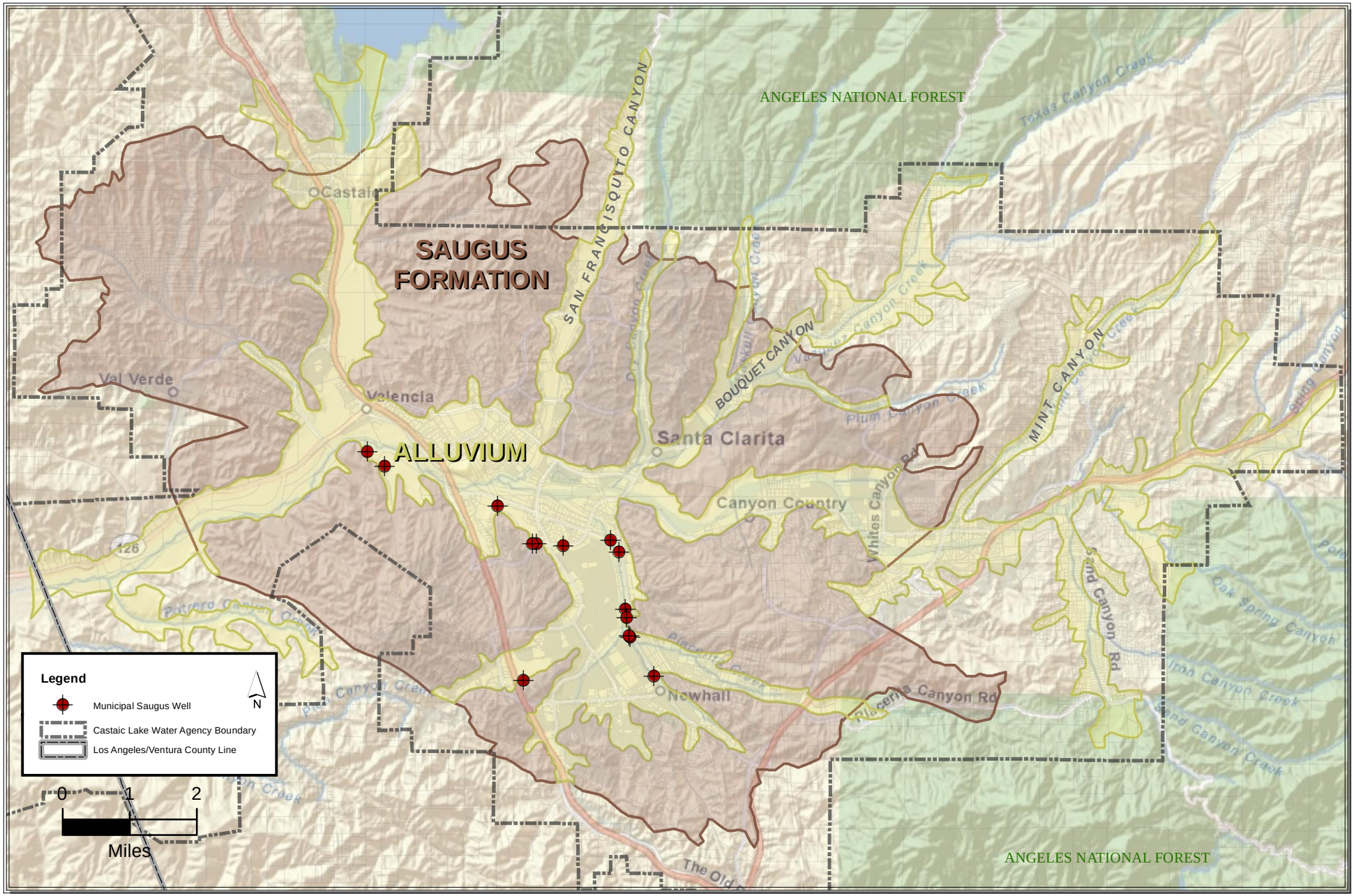
TABLE 3-9
MUNICIPAL GROUNDWATER SOURCE CAPACITY—SAUGUS FORMATION WELLS

Well	Pump Capacity (gpm)	Max. Annual Capacity (AF)	Normal Year Production[(a)] (AF)	Dry-Year Production[(a)] (AF)
NCWD				
12	2,400	3,870	1,765	2,494
13	2,250	3,630	1,765	2,494
NCWD Subtotal	*4,650*	*7,500*	*3,530*	*4,988*
VWC				
159	500	800	50	50
160	2,000	3,220	500	830
205	2,700	4,350	1,211	4,038
206	2,500	4,030	1,175	3,500
207	2,500	4,030	1,175	3,500
VWC Subtotal	*10,200*	*16,430*	*4,111*	*11,918*
SCWD				
Saugus 1	1,100	1,770	1,772	1,772
Saugus 2	1,100	1,770	1,772	1,772
SCWD Subtotal	*2,200*	*3,540*	*3,544*	*3,544*
Total Purveyors	**17,050**	**27,470**	**11,185**	**20,450**

Note:
(a) Production amounts simulated in the updated Basin Yield analysis (LSCE & GSI, 2009).

In terms of adequacy and availability, the combined active Saugus groundwater source capacity of municipal wells of 27,000 AFY is more than sufficient to meet the planned use of Saugus groundwater in normal years of 7,500 to 15,000 AFY. This currently active capacity is more than sufficient to meet water demands, in combination with other sources. In order to supplement near term dry-year supplies, VWC Well 201 could be brought back into service within two years utilizing treatment technologies currently being used in the Santa Clarita Valley (See Section 5). This estimate is conservative because, in 2005, VWC Well Q2 was restored to service in October 2005, six months after perchlorate was detected in the well in April 2005. In addition, in 2005 there was no third-party funding initially available to pay for the cost of putting the well back into service; VWC negotiated a separate agreement with the Whittaker-Bermite property owners to pay for the cost. Also in May 2007, the perchlorate litigation settlement agreement was executed, which established a "Rapid Response Fund" to immediately treat any additional wells that could be become impacted by perchlorate.

With the restored capacity of the VWC Well 201, the Saugus Formation groundwater source capacity of municipal wells would be increased to 31,000 AFY. In order to accommodate longer-term dry-year needs, additional Saugus wells are planned by 2020 and expected to have a combined capacity of 10,000 AFY.



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CONSULTING ENGINEERS

Figure 3-3
Saugus Well Locations
Santa Clara River Valley, East Groundwater Subbasin

Sustainability

Until 2003, the long-term sustainability of Saugus groundwater was empirically estimated from limited historical experience. Historically (and continuing to the present), pumping from the Saugus has been fairly low in most years, with one four-year period of increased pumping up to about 15,000 AFY that had short-term water level impacts but produced no long-term depletion of the substantial groundwater storage in the Saugus. Those empirical observations have now been complemented by the development and application of the numerical groundwater flow model, which has been used to examine aquifer response to the operating plan for pumping from both the Alluvium and the Saugus and also to examine the effectiveness of pumping for both contaminant extraction and control of contaminant migration within the Saugus Formation. The latter aspects of Saugus pumping were being studied at the time of the 2005 UWMP, and were thus reflected at that time as groundwater extraction capacity to be restored. As discussed in Section 3.3.3 those restoration efforts have been undertaken and that pumping is thus reflected in this UWMP as part of the Saugus operating plan (Table 3-5) and pumping distribution (Table 3-9).

To examine the yield of the Saugus Formation, or its sustainability on a renewable basis, the original groundwater flow model was used to examine long-term projected response to pumping from both the Alluvium and the Saugus over the synthetic 78-year period of hydrologic conditions that incorporated alternating wet and dry periods as have historically occurred (CH2M Hill and LSCE, 2005). The pumping simulated in the model was in accordance with the then-current operating plan for the Basin. For the Saugus, simulated pumping included the then-planned restoration of historic pumping from the perchlorate-impacted wells.

The originally simulated Saugus Formation response to the ranges of operating plan pumping under assumed recurrent historical hydrologic conditions was consistent with actual experience under smaller pumping rates: (1) short-term declines in groundwater levels and storage near pumped wells during dry-period pumping, (2) recovery of groundwater levels and storage after cessation of dry-period pumping and (3) no long-term decreases or depletion of groundwater levels or storage. The combination of actual experience with Saugus recharge and pumping up to about 15,000 AFY, complemented by modeled projections of aquifer response that showed long-term utility of the Saugus at 7,500 to 15,000 AFY in normal years and rapid recovery from higher pumping rates during intermittent dry periods, was the basis for concluding that the Saugus Formation could be considered a sustainable water supply source to meet the Saugus portion of the operating plan for the groundwater Basin.

As discussed under Sustainability of the Alluvium above, an updated basin yield analysis was undertaken in 2008 to assess groundwater development potential and possible augmentation of the groundwater operating plan. After extended and updated model calibration and incorporation of extended historical records, the overall operating plan (Table 3-5) and specific distribution of Saugus pumping (Table 3-9) were found to produce the same kinds of resultant Saugus groundwater conditions as concluded to be sustainable in 2005 – (1) long-term stability of groundwater levels, with no sustained declines; (2) groundwater levels slightly below historic Saugus levels, in response to greater long-term utilization of the Saugus and (3) maintenance of sufficiently high Saugus groundwater levels to ensure achievement of planned individual pumping capacities (Table 3-9). Thus, the operating plan for the Saugus, with fairly low pumping in wet/normal years and increased pumping through dry periods, is concluded to reflect sustainable groundwater supply rates.

3.3.3 Existing and Planned Groundwater Pumping

3.3.3.1 Impacted Well Capacity

As discussed in the 2000 UWMP Perchlorate Contamination Amendment, and again in the 2005 UWMP, certain wells in the Basin were impacted by perchlorate contamination and thus represented a temporary loss of well capacity within CLWA's service area. Six wells were ultimately taken out of service upon the detection of perchlorate including four Saugus wells and two Alluvial wells. All have either been (1) abandoned and replaced, (2) returned to service with the addition of treatment facilities that allow the wells to be used for municipal water supply as part of the overall water supply systems permitted by the State Department of Public Health (DPH) or (3) will be replaced under an existing perchlorate litigation settlement agreement (See Section 5). The restored wells (two Saugus wells and one Alluvial well) and the replacement wells (one Saugus and one Alluvial well), which collectively restore much of the temporarily lost well capacity, are now included as parts of the active municipal groundwater source capacities delineated in Tables 3-8 and 3-9. An additional two wells will be drilled to fully restore 4,200 gpm (6,776 AFY) of the impacted well capacity, thus restoring the operational flexibility that existed prior to the perchlorate being discovered. The cost of drilling the remaining two wells will be fully reimbursed under the terms of the perchlorate litigation settlement agreement. Additional information concerning water quality issues and maintenance of pumping capacity is provided in Section 5.

Most recently, in August 2010, VWC's Well 201, located downgradient from the Whittaker-Bermite site and downgradient from the initially impacted Saugus 1, Saugus 2 and V157 wells, had detectable concentrations of perchlorate and the well was taken out of service. Water sampling tests from August 2010 through April 2011 also confirmed the presence of perchlorate over the adopted regulatory standard. This well was immediately taken out of service in August 2010 and its capacity is not included in active groundwater sources delineated in Table 3-9. VWC plans to actively seek remediation under the settlement agreement and restore the impacted well capacity in the near term.

3.3.3.2 Alluvium

In terms of adequacy and availability, the combined active Alluvial Aquifer groundwater sources of municipal wells, approximately 67,000 AFY, are more than sufficient to meet the current and potential future urban component of the groundwater supply from the Alluvium. The potential future urban component of groundwater from the Alluvium in the near-term is about 24,000 to 26,000 AFY of the total planned Alluvial pumping of 30,000 to 40,000 AFY. The higher individual and cumulative pumping capacities of the purveyors are for operational reasons (i.e., to meet daily and other fluctuations from average day to maximum day and peak hour system demands).

Tables 6-2, 6-3 and 6-4 as well as Tables C-2, C-5 and C-8 include planned Alluvial Aquifer supplies. These planned supplies do not increase the quantity of water being withdrawn from Alluvial Aquifer, but represent anticipated or potential shifts in pumping involving different or new wells.

For example, VWC's planned Alluvial Aquifer supplies represent a shifting of pumping from Newhall Land agricultural uses to VWC for the anticipated Newhall Ranch project. While new or improved wells would be required, no net change in Alluvial Production would be anticipated. There is also a potential that SCWD may require additional well capacity to meet the total

anticipated pumping for a single dry year as described in Tables C-4 and C-5. Overall purveyor and non-purveyor supplies remain consistent with the operating plan shown on Table 3-5.

3.3.3.3 Saugus Formation

In terms of adequacy and availability, the combined active Saugus groundwater source municipal well capacity of 27,000 AFY is more than sufficient to meet the planned use of Saugus groundwater in normal years of 7,500 to 15,000 AFY. This current active capacity is also more than sufficient to meet water demands, in combination with other sources. In order to supplement near term dry-year supplies, VWC Well 201 could conservatively be brought back into service within two years utilizing treatment technologies currently being used in the Santa Clarita Valley (see Section 5). In order to accommodate the longer-term demands, additional Saugus wells would be required to meet the planned use of 35,000 AFY of Saugus groundwater during a multiple-dry year period.

Tables 6-2, 6-3 and 6-4 as well as Tables C-2, C-5 and C-8 include planned Saugus Formation supplies. Planned Saugus Formation pumping would only increase the quantity of water being withdrawn from Saugus Formation to levels consistent with the operating plan shown on Table 3-5. To obtain full Saugus Formation supplies of 35,000 AFY in certain dry years, restoration of the perchlorate impacted well (VWC Well 201) along with additional wells with a collective combined total production of approximately 14,000 AFY would be required.

LACWWD 36 anticipates planned Saugus Formation supplies of 500 AFY to be available beginning in 2011. This planned supply included in Tables C-2, C-5 and C-8 is incorporated into Tables 6-2, 6-3 and 6-4; however, the total purveyor and non-purveyor Saugus Formation supplies remain consistent with the operating plan shown on Table 3-5.

There is also a potential that NCWD may require additional well capacity to meet anticipated pumping levels included in Tables C-2, C-5 and C-8 and incorporated into Tables 6-2, 6-3 and 6-4. Overall NCWD existing and planned Saugus Formation supplies, along with the supplies of the other purveyors and non-purveyors, are consistent with the operating plan shown on Table 3-5.

As previously discussed in this section, VWC expects to remediate the capacity from its recently impacted Well 201 in the near term under conservative projections (i.e., within two years utilizing replacement well construction and/or treatment technologies currently being used in the Santa Clarita Valley; see Section 5).

The need for additional new Saugus Formation wells to achieve full dry-year pumping has been planned for some time. Most notably, as part of the 2009 Updated Basin Yield Analysis, three new Saugus wells were simulated in the western part of the basin, remote from the Whittaker-Bermite site and perchlorate-impacted Saugus wells. The conclusion of the analysis that Saugus pumping is sustainable included multiple dry-year pumping at a combined capacity for the three wells of 9,750 AFY.

3.3.3.4 Summary

Overall, the total municipal supply in this Plan includes a groundwater component that is, in turn, part of the overall groundwater supply of the Valley. As such, the municipal groundwater supply, distributed among the retail purveyors, recognizes the existing and projected future uses of groundwater by overlying interests in the Valley such that the combination of municipal and

all other groundwater pumping remains within the groundwater operating plan (Table 3-5) that has been analyzed for sustainability. The distribution of groundwater among the purveyors are detailed in Appendix C and aggregated for all the purveyors in Chapter 6 for normal years, single dry years and multiple dry years. Relative to the 2009 Groundwater Basin Yield Analysis, total groundwater pumping, by all other pumpers as well as by the purveyors from their existing and planned wells, is summarized in Tables 3-10 through 3-12 for normal, single-dry and multiple-dry years.

TABLE 3-10
AVERAGE/NORMAL YEAR EXISTING AND PLANNED GROUNDWATER USAGE IN UPPER SANTA CLARA RIVER BASIN (AF)

Alluvium Supplies	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Purveyors Existing	24,000	24,000	24,000	25,000	25,000	25,000	25,000	25,000
Purveyors Planned	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000
Purveyors Existing and Planned	24,000	25,000	26,000	28,000	29,000	30,000	31,000	32,000
Non purveyors	14,500	13,500	12,500	10,100	9,100	8,100	7,100	6,600
Total Alluvium Production	**38,500**	**38,500**	**38,500**	**38,100**	**38,100**	**38,100**	**38,100**	**38,600**
Alluvium Yield	*38,600*	*38,600*	*38,600*	*38,600*	*38,600*	*38,600*	*38,600*	*38,600*

Saugus Formation Supplies	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Purveyors Existing	9,225	10,225	10,225	10,225	10,225	10,225	10,225	10,225
Purveyors Planned	1375	1375	1375	1375	1375	1375	1375	1375
Purveyors Existing and Planned	10,600	11,600	11,600	11,600	11,600	11,600	11,600	11,600
Non Purveyors	900	900	900	900	900	900	900	900
Total Saugus	**11,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**
Saugus Yield	*12,500*	*12,500*	*12,500*	*12,500*	*12,500*	*12,500*	*12,500*	*12,500*

TABLE 3-11
SINGLE-DRY YEAR EXISTING AND PLANNED GROUNDWATER USAGE IN UPPER SANTA CLARA RIVER BASIN (AF)

Alluvium Supplies	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Purveyors Existing	20,300	20,250	20,200	21,050	21,050	21,025	21,000	20,650
Purveyors Planned	200	1,250	2,300	3,850	4,850	5,875	6,900	7,750
Purveyors Existing and Planned	20,500	21,500	22,500	24,900	25,900	26,900	27,900	28,400
Non purveyors	14,350	13,350	12,350	9,950	8,950	7,950	6,950	6,450
Total Alluvium Production	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**
Alluvium Yield	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*

Saugus Formation Supplies	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Purveyors Existing	20,400	20,400	20,400	20,400	20,400	20,400	20,400	20,400
Purveyors Planned (Restored Well)	825	3,777	3,777	3,777	3,777	3,777	3,777	3,750
Purveyors Planned (New Wells)	2,875	9,923	9,923	9,923	9,923	9,923	9,923	9,950
Purveyors Existing and Planned	24,100	34,100	34,100	34,100	34,100	34,100	34,100	34,100
Non purveyors	900	900	900	900	900	900	900	900
Total Saugus	**25,000**	**35,000**	**35,000**	**35,000**	**35,000**	**35,000**	**35,000**	**35,000**
Saugus Yield	*25,000*	*35,000*	*35,000*	*35,000*	*35,000*	*35,000*	*35,000*	*35,000*

TABLE 3-12
MULTIPLE-DRY YEAR EXISTING AND PLANNED GROUNDWATER USAGE IN UPPER SANTA CLARA RIVER BASIN (AF)

Alluvium Supplies	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Purveyors Existing	20,425	20,425	20,425	21,825	21,825	21,825	21,825	21,325
Purveyors Planned	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000
Purveyors Existing and Planned	20,425	21,425	22,425	24,825	25,825	26,825	27,825	28,325
Non purveyors	14,425	13,425	12,425	10,025	9,025	8,025	7,025	6,525
Total Alluvium Production	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**	**34,850**
Alluvium Yield	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*	*34,850*

Saugus Formation Supplies	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Purveyors Existing	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700
Purveyors Planned (Restored Well)	2,375	1,625	1,500	1,400	1,275	1,125	1,000	875
Purveyors Planned (New Wells)	2,250	10,325	10,450	10,550	10,675	10,825	10,950	11,075
Purveyors Existing and Planned	24,325	31,650	31,650	31,650	31,650	31,650	31,650	31,650
Non purveyors	900	900	900	900	900	900	900	900
Total Saugus	**25,225**	**32,550**	**32,550**	**32,550**	**32,550**	**32,550**	**32,550**	**32,550**
Saugus Yield	*25,225*	*32,550*	*32,550*	*32,550*	*32,550*	*32,550*	*32,550*	*32,550*

3.4 Transfers and Exchanges

An opportunity available to CLWA to increase water supplies is to participate in voluntary water transfer programs. Since the drought of 1987-1992, the concept of water transfer has evolved into a viable supplemental source to improve supply reliability. The initial concept for water transfers was codified into law in 1986 when the California Legislature adopted the “Katz” Law (California Water Code, Sections 1810-1814) and the Costa-Isenberg Water Transfer Law of 1986 (California Water Code, Sections 470, 475, 480-483). These laws help define parameters for water transfers and set up a variety of approaches through which water or water rights can be transferred among individuals or agencies.

Up to 27 MAF of water are delivered for agricultural use every year. Over half of this water use is in the Central Valley, and much of it is delivered by, or adjacent to, SWP and CVP conveyance facilities. This proximity to existing water conveyance facilities could allow for the voluntary transfer of water to many urban areas, including CLWA, via the SWP. Such water transfers can involve water sales, conjunctive use and groundwater substitution and water sharing. They usually occur as a form of spot, option or core transfers agreements. The costs of a water transfer would vary depending on the type, term and location of the transfer. The most likely voluntary water transfer programs would probably involve the Sacramento or southern San Joaquin Valley areas.

One of the most important aspects of any resource planning process is flexibility. A flexible strategy minimizes unnecessary or redundant investments (or stranded costs). The voluntary transfer of water between willing sellers and buyers can be an effective means of achieving flexibility. However, not all water transfers have the same effectiveness in meeting resource

needs. Through the resource planning process and ultimate implementation, several different types of water transfers could be undertaken.

3.4.1 Core Transfers

Core transfers are agreements to purchase a defined quantity of water every year. These transfers have the benefit of more certainty in costs and supply, but in some years can be surplus to imported water (available in most years) that is already paid for.

3.4.2 Spot Market Transfers

Spot market transfers involve water purchased only during the time of need (usually a drought). Payments for these transfers occur only when water is actually requested and delivered, but there is usually greater uncertainty in terms of costs and availability of supply. Examples of such transfers were the Drought Water Banks of 1991, 1992 and 1994 and DWR Dry Year Water Purchase Programs in 2001 through 2004 and 2008. An additional risk of spot market transfers is that the purchases may be subject to institutional limits or restricted access (e.g., requiring the purchasing agency to institute rationing before it is eligible to participate in the program).

3.4.3 Option Contracts

Option contracts are agreements that specify the amount of water needed and the frequency or probability that the supply will be called upon (an option). Typically, a relatively low up-front option payment is required and, if the option is actually called upon, a subsequent payment would be made for the amount called. These transfers have the best characteristics of both core and spot transfers. With option contracts, the potential for redundant supply is minimized, as are the risks associated with cost and supply availability.

3.4.4 Future Market Transfers

The most viable types of water transfers are core and option transfers and, as such, represent CLWA's long-term strategy. The most recent costs for this type of transfer is estimated to be about $300 per AFY (equivalent to $5,500 per AF for Table A Amount) for core transfers.

3.5 Groundwater Banking Programs

With recent developments in conjunctive use and groundwater banking, significant opportunities exist to improve water supply reliability for CLWA. Conjunctive use is the coordinated operation of multiple water supplies to achieve improved supply reliability. Most conjunctive use concepts are based on storing surface supplies in groundwater basins in times of surplus for withdrawal and use during dry periods and drought when surface water supplies would likely be reduced.

Groundwater banking programs involve storing available SWP surface water supplies during wet years in groundwater basins in, for example, the San Joaquin Valley. Water would be stored either directly by surface spreading or injection, or indirectly by supplying surface water to farmers for their use in lieu of their intended groundwater pumping. During water shortages, the stored water could be pumped out and conveyed through the California Aqueduct to CLWA

as the banking partner, or used by the farmers in exchange for their surface water allocations, which would be delivered to CLWA as the banking partner through the California Aqueduct.

CLWA is a partner in two existing groundwater banking programs, the Semitropic Banking Program and RRBWSD Banking Program, discussed below in Sections 3.5.1 and 3.5.2, respectively. Newhall Land is also a partner in the Semitropic Banking Program, as discussed in Section 3.5.3, with its supplies assumed to be available to VWC. In addition, CLWA has updated its plan to enhance its overall supply reliability, including the need for additional banking programs, as discussed in Section 3.5.4.

3.5.1 Semitropic Banking Program

Semitropic Water Storage District (Semitropic) provides SWP water to farmers for irrigation. Semitropic is located in the San Joaquin Valley in the northern part of Kern County immediately east of the California Aqueduct. Using its available groundwater storage capacity (approximately one MAF), Semitropic has developed a groundwater banking program, that takes available SWP supplies in wet years and returns the water in dry years. As part of this dry-year return, Semitropic can leave its SWP water in the Aqueduct for delivery to a banking partner and increase its groundwater production for its farmers. Semitropic constructed facilities so that groundwater can be pumped into a Semitropic canal and, through reverse pumping plants, be delivered to the California Aqueduct. Semitropic currently has six long-term first priority banking partners: the Metropolitan Water District of Southern California (Metropolitan), Santa Clara Valley Water District, Alameda County Water District, Alameda County Flood Control and Water Conservation District Zone 7, Vidler Water Company and Newhall Land and Farming. The total amount of storage under contract is approximately one MAF.

In 2002, CLWA entered into a temporary storage agreement with Semitropic, and stored an available portion of its Table A supply (24,000 AF) in an account in Semitropic's program. In 2004, 32,522 AF of available 2003 Table A supply was stored in a second temporary Semitropic account. In accordance with the terms of CLWA's storage agreements with Semitropic, 90 percent of the banked amount, or a total of 50,870 AF, was recoverable through 2013 to meet CLWA water demands when needed. Each account had a term of ten years for the water to be withdrawn and delivered to CLWA.[19] Of this recoverable storage, 4,950 AF has been withdrawn, with 1,650 AF delivered in 2009 and 3,300 AF delivered in 2010, leaving a balance of 45,920 AF in storage available to meet future CLWA needs. CLWA executed an amendment for a ten-year extension of each banking agreement with Semitropic in April 2010. A negative declaration for the program extension was approved by CLWA's Board of Directors on January 19, 2011 and by the Semitropic Board of Directors on April 6, 2011.

Current operational planning includes use of the water stored in Semitropic for dry-year supply. Accordingly, it is reflected in the available supplies delineated in this section, and it is also reflected as contributing only to dry-year supply reliability in Chapter 6, through 2023.

3.5.2 Rosedale-Rio Bravo Banking Program

Also located in Kern County, immediately adjacent to the Kern Water Bank, RRBWSD has developed a Water Banking and Exchange Program. CLWA has entered into a long-term agreement with RRBWSD that provides it with storage and pumpback capacity of 20,000 AFY,

[19] Thereafter, the remaining amount of project water would be forfeited from the account.

with up to 100,000 AF of storage capacity. CLWA began storing water in this program in 2005 and has since reached the program's maximum storage capacity, with 100,000 AF currently available for withdrawal.

This project is a water management program to improve the reliability of CLWA's existing dry-year supplies; it is not an annual supply that could support growth. Accordingly, it is reflected in the available supplies delineated in this section and it is also reflected as contributing only to dry-year supply reliability in Chapter 6.

3.5.3 Semitropic Banking Program – Newhall Land

As mentioned above, one of Semtropic's long-term groundwater banking partners is Newhall Land. In its agreement with Semitropic, Newhall Land has available to it a pumpback capacity of 4,950 AFY and a storage capacity of 55,000 AF. Newhall Land has a current storage balance of 18,828 AF. This supply is assumed to be available to VWC and is planned to be used only in dry years. Accordingly, it is reflected in the available supplies delineated in this section, and it is also reflected as contributing only to dry-year supply reliability in Chapter 6.

3.5.4 Other Opportunities

In 2003, CLWA produced a Water Supply Reliability Plan (Reliability Plan), and updated it in 2009. The Reliability Plan outlines primary elements that CLWA should include in its water supply mix to obtain maximum overall supply reliability enhancement. These elements include both conjunctive use and groundwater banking programs, which enhance the reliability of both the existing and future supplies, as well as water acquisitions. The Reliability Plan recommends water banking storage and pumpback capacity north and south of Tehachapi Mountains, the latter of which would provide an emergency supply in case of catastrophic outage along the California Aqueduct. The Reliability Plan also contains a recommended implementation plan and schedule. CLWA has made significant progress on its water supply reliability program, obtaining storage capacity in two banking programs north of the Tehachapi Mountains, with approximately 146,000 AF of water currently banked in those programs and available for withdrawal. Negotiations with one program south of the Tehachapis were initiated, but identification of a program for emergency outage storage remains ongoing.

The 2009 update of the Reliability Plan presents the implementation schedule recommended for both storage and pumpback capacity beginning in 2010 and incrementally increasing through 2050. CLWA's plans call for development of additional groundwater banking programs, with pumpback capacity of at least an additional 10,000 AF by 2025, and a second additional 10,000 AF by 2035. Table 3-13 summarizes CLWA's future reliability enhancement programs.

TABLE 3-13
FUTURE RELIABILITY ENHANCEMENT PROGRAMS

		Proposed Quantities (AF)		
Project Name	**Year Available**	**Average/ Normal Year**	**Single Dry Year[(a)]**	**Multiple Dry Years[(b)]**
Additional Planned Banking Programs	2025	0	10,000	7,500
	2035	0	20,000	15,000

Notes:
(a) Supplies shown are maximum annual withdrawal capacity.
(b) Supplies shown are average withdrawals during four consecutive dry years.

3.6 Planned Water Supply Projects and Programs

The Reliability Plan also discusses the potential for acquiring additional water supplies to meet future demands (the plan refers to these as "water transfer opportunities"). CLWA has been participating in the initial planning stages of the Garden Bar Water and Power Supply Project. This north-of-Delta water supply project is sponsored by the South Sutter Water District (SSWD). The project consists of a new dam and associated hydroelectric facilities. SSWD is investigating a reservoir with a storage capacity of between 245,000 and 350,000 AF. Table 3-14 summarizes CLWA's transfer and exchange opportunities.

TABLE 3-14
TRANSFER AND EXCHANGE OPPORTUNITIES

Source Transfer Agency	Transfer/ Exchange	Year Available	Short/Long Term	Proposed Quantity (AFY)
South Sutter Water District	Transfer	2020-2025	Long Term	TBD

3.7 Development of Desalination

The California UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). CLWA has explored such opportunities, and they are described in the following section, including opportunities for desalination of brackish water, groundwater and seawater. However, at this time, none of these opportunities are practical or economically feasible for CLWA and CLWA has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this Plan (e.g., Tables 3-1, 6-2, 6-3 and 6-4).

3.7.1 Opportunities for Brackish Water and/or Groundwater Desalination

As discussed in Chapter 3, the two sources of groundwater in the Santa Clarita Valley are drawn from the Alluvial Aquifer and from the Saugus Formation. Neither of these supplies can be considered brackish in nature, and desalination is not required.

However, CLWA and the retail water purveyors could team with other SWP contractors and provide financial assistance in construction of other regional groundwater desalination facilities in exchange for SWP supplies. The desalinated water would be supplied to users in communities near the desalination plant, and a similar amount of SWP supplies would be exchanged and allocated to CLWA from the SWP contractor. A list summarizing the groundwater desalination plans of other SWP contractors is not available; however, CLWA would begin this planning effort should the need arise.

In addition, should an opportunity emerge with a local agency other than a SWP contractor, an exchange of SWP deliveries would most likely involve a third party, such as Metropolitan. Most local groundwater desalination facilities would be projects implemented by retailers of SWP contractors and, if an exchange program was implemented, would involve coordination and wheeling of water through the contractor's facilities to CLWA.

3.7.2 Opportunities for Seawater Desalination

Because the Santa Clarita Valley is not in a coastal area, it is neither practical nor economically feasible for CLWA and its purveyors to implement a seawater desalination program. However, similar to the brackish water and groundwater desalination opportunities described above, CLWA and the purveyors could provide financial assistance to other SWP contractors in the construction of their seawater desalination facilities in exchange for SWP supplies.

CLWA and the purveyors have been following the existing and proposed seawater desalination projects along California's coast. Table 3-15 provides a summary of the status of several of California's municipal/domestic seawater desalination facilities.

As shown Table 3-15, most of the existing and proposed seawater desalination facilities are/would be operated by agencies that are not SWP contractors. However, in these cases as described above, an exchange for SWP deliveries would most likely involve a third party (SWP contractor), the local water agency and CLWA.

TABLE 3-15
EXISTING AND PROPOSED SEAWATER DESALINATION FACILITIES ALONG THE CALIFORNIA COAST

Project	Member Agency Service Area	AF per Year	Status
Long Beach Seawater Desalination Project	Long Beach Water Department	10,000	Pilot study
South Orange Coastal Ocean Desalination Project	Municipal Water District of Orange County	16,000-28,000	Pilot study
Carlsbad Seawater Desalination Project	San Diego County Water Authority	56,000	Permitting
West Basin Seawater Desalination Project	West Basin Municipal Water District	20,000	Pilot study
Huntington Beach Seawater Desalination Project	Municipal Water District of Orange County	56,000	Permitting
Camp Pendleton Seawater Desalination Project	San Diego County Water Authority	56,000 to 168,000	Planning
Rosarito Beach Seawater Desalination Feasibility Study	San Diego County Water Authority	28,000 to 56,000	Feasibility study
	Total AFY	**102,000-280,000**	

Source: MWD 2010 UWMP

Although not listed in Table 3-15, the Bay Area Regional Desalination Partnership, comprised of five agencies collaborating on a Regional Desalination Project in the San Francisco Bay area, is working to develop desalination as a water supply for the region. The agencies are the San Francisco Public Utilities Commission, Santa Clara Valley Water District, East Bay Municipal Utilities District, Contra Costa Water District and Alameda County Flood Control and Water Conservation District Zone 7. This regional desalination project is an example of the type of project that CLWA could participate in on an exchange basis.

To date the Partnership has completed a feasibility study to refine the institutional, technical, environmental and scientific merits of developing a regional facility and are planning to build and test a pilot plant in Contra Costa County. Construction is planned for 2012.

Section 4: Recycled Water

This section of the Plan describes the existing and future recycled water opportunities available to the CLWA service area. The description includes estimates of potential recycled water supply and demand for 2010 to 2050 in five year increments, as well as CLWA's proposed incentives and implementation plan for recycled water.

4.1 Recycled Water Master Plan

In normal years, approximately 55 percent of the demands within CLWA's service area is met with imported water. However, the reliability of the imported SWP supply is variable (due in part to its dependence on current year hydrology in northern California and prior year storage in SWP reservoirs). When sufficient imported water is not available, the balance is met with local groundwater provided by the purveyors and from water banking programs.

It is anticipated that water demands will continue to increase. Accordingly, additional reliable sources of water are necessary to meet projected water demands. CLWA recognizes that recycled water is an important and reliable source of additional water. Recycled water enhances reliability in that it provides an additional source of supply and allows for more efficient utilization of CLWA's groundwater and imported water supplies. Draft Recycled Water System Master Plans for the CLWA service area were completed in 1993 and 2002. These master plans considered significant developments affecting recycled water sources, supplies, users and demands so that CLWA could develop a cost-effective recycled water system within its service area. In 2007, CLWA completed California Environmental Quality Act (CEQA) analysis of the 2002 Recycled Water Master Plan (Recycled Plan). This analysis consisted of a Program Environmental Impact Report (EIR) covering the various phases for a recycled water system as outlined in the Recycled Plan. The Program EIR was certified by the CLWA Board in March 2007.

Table 4-1 provides a list of the agencies that participate in the implementation of the Recycled Plan.

CLWA has constructed Phase I of the Recycled Plan, which can deliver 1,700 AFY of water to the VWC service area. Deliveries of recycled water began in 2003 for irrigation water supply at a golf course and in roadway median strips. In 2009, recycled water deliveries were 328 AF.

TABLE 4-1
PARTICIPATING AGENCIES

Participating Agencies	Role in Plan Development
Castaic Lake Water Agency	Wholesale water provider
Newhall County Water District	Retail water purveyor
Santa Clarita Water Division	Retail water purveyor
Valencia Water Company	Retail water purveyor
Los Angeles County Waterworks District No. 36	Retail water purveyor
Los Angeles County Sanitation District No. 26[20]	Recycled water supplier
Los Angeles County Sanitation District No. 32[21]	Recycled water supplier
Berry Petroleum	Potential recycled water supplier

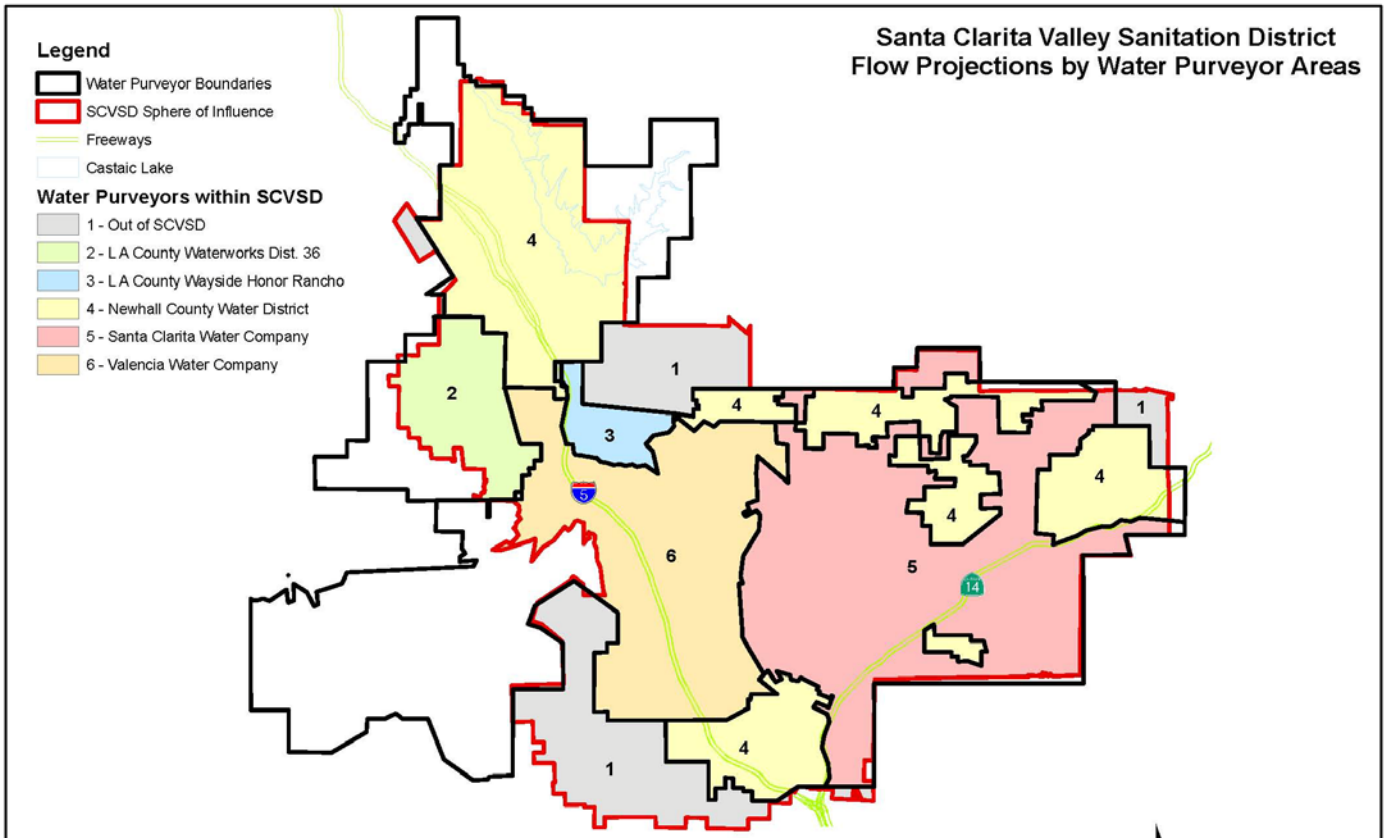
Overall, the Recycled Plan along with the Newhall Ranch development is expected to ultimately recycle up to 22,800 AF of treated (tertiary) wastewater suitable for reuse on golf courses, landscaping and other non-potable uses.

CLWA completed a preliminary design report in 2009 on the second phase of the Recycled Plan (Phase 2A) that will take water from the Saugus Water Reclamation Plant (WRP) and distribute it to identified users to the north, across the Santa Clara River and then to the west and east. Customers included in the Phase 2A expansion will be Santa Clarita Central Park and the Bridgeport and River Village developments. Large irrigation customers will be served with this expansion with a collective design that will increase recycled water deliveries by 500 AFY.

Recycled water will be further expanded with the South End Recycled Water project (Phase 2C). VWC has initiated project design expanding the existing recycled water transmission and distribution system southerly to supply recycled water to additional customers as well as to potentially supply a source of recycled water to customers of adjacent water agencies. Phase 2C of the Recycled Plan will result in the use of 910 AFY of recycled water.

[20] Los Angeles County Sanitation District No. 26 and No. 32, the majority of which serve the City of Santa Clarita, have been consolidated into the Santa Clarita Valley Sanitation District.
[21] Ibid.

FIGURE 4-1
SANTA CLARITA VALLEY SANITATION DISTRICT FLOW PROJECTIONS BY WATER PURVEYOR SERVICE AREA



		Wastewater Flow Projection (MGD)					
Map ID	Water Purveyor	2010	2015	2020	2025	2030	2035
1	Out	0.3	1.2	1.5	1.7	1.9	2.4
2	L A County Waterworks Dist. 36	0.6	1.2	1.3	1.5	1.6	1.9
3	L A County Wayside Honor Rancho	0.0	0.0	0.0	0.1	0.1	0.1
4	Newhall County Water District	2.8	4.0	4.4	4.8	5.2	5.6
5	Santa Clarita Water Company	8.4	9.2	9.8	10.5	11.1	12.4
6	Valencia Water Company	9.3	9.7	10.5	11.2	12.0	12.7
	Total	**21.6**	**25.4**	**27.6**	**29.8**	**31.9**	**35.1**

4.2 Existing Wastewater Treatment Facilities

The Santa Clarita Valley Sanitation District (SCVSD) of Los Angeles County owns and operates two Water Reclamation Plants (WRPs), the Saugus WRP and the Valencia WRP, within the CLWA service area. The water is treated to tertiary levels and, with the exception of water used in Phase I of the Recycled Plan, is discharged to the Santa Clara River. The Newhall Ranch development is also planning to construct a WRP, and non-potable recycled water from this source may be incorporated into CLWA's recycled water system.

The Valencia WRP, completed in 1967, is located on The Old Road near Magic Mountain Amusement Park. The Valencia WRP has a current treatment capacity of 21.6 million gallons per day (MGD), equivalent to 24,192 AFY, developed over time in stages. In 2010, the Valencia WRP produced an average of 15.17 MGD (16,993 AFY) of tertiary recycled water. Use of recycled water from the Valencia WRP is permitted under Los Angeles Regional Water Quality Control Board (RWQCB) Order Nos. 87-48 and 97-072.

The Saugus WRP, completed in 1962, is located southeast of the intersection of Bouquet Canyon Road and Soledad Canyon Road. The Saugus WRP has a current treatment capacity of 6.5 MGD (7,280 AFY). No future expansions are possible at the plant due to space limitations at the site. In 2010, the Saugus WRP produced an average of 5.02 MGD (5,623 AFY) of tertiary recycled water. Use of recycled water from this facility is permitted under Los Angeles RWQCB Order Nos. 87-49 and 97-072.

The Saugus and Valencia WRPs operated independently until 1980, at which time the two plants were linked by a bypass interceptor. The interceptor was installed to transfer a portion of flows received at the Saugus WRP to the Valencia WRP. Together, the Valencia and Saugus WRPs have a design capacity of 28.1 MGD (31,472 AFY). In 2008 they produced an average of 20.9 MGD (23,422 AFY). The primary sources of wastewater to the Saugus and Valencia WRPs are domestic. Both plants are tertiary treatment facilities and produce high quality effluent. Historically, the effluent from the two WRPs has been discharged to the Santa Clara River. The Saugus WRP effluent outfall is located approximately 400 feet downstream (west) of Bouquet Canyon Road. Effluent from the Valencia WRP is discharged to the Santa Clara River at a point approximately 2,000 feet downstream (west) of The Old Road Bridge.

Phase 1 of the Recycled Plan has been constructed and begins with a 4,000 gpm pump station at the Valencia Water Reclamation Plant that connects to a 1.5 mg reservoir in the Westridge area with 15,600 linear feet of 24- and 20-inch pipeline. It serves landscape customers along The Old Road and the Tournament Players Club golf course, all of which are VWC customers. Phase 2C of the Recycled Plan (the South End project) would use this existing system and connect at The Old Road and Valencia Boulevard. From there it would cross the freeway and run south in Rockwell Canyon Road, ultimately reaching the intersection of Orchard Village Road and Lyons Avenue. The proposed Recycled Plan Phase 2A project would start at the Saugus WRP and cross the Santa Clara River through an existing pipeline. It would then serve customers on the north side of the river, generally along Newhall Ranch Road both west and east of Bouquet Canyon Road (Figure 4-2).

FIGURE 4-2
RECYCLED WATER MASTER PLAN PHASES 2A, 2B, 2C

4.3 Wastewater Treatment Facility Improvements and Expansions

To accommodate anticipated growth in the Santa Clarita Valley, a 6 MGD expansion of the Valencia WRP is planned as indicated in the 2015 Joint Sewerage System Facilities Plan and EIR (Los Angeles County Sanitation District [LACSD] 1998). With this expansion, the capacity of the Valencia WRP would be 27.6 MGD (30,912 AFY), a need the SCVSD projects by 2035. No expansion is planned at the Saugus WRP. The total current planned capacity for both WRPs is 34.1 MGD (38,197 AFY). Based on the Recycled Plan, reuse of the tertiary treated water from these two plants is anticipated at 15.5 MGD (17,400 AFY) by year 2030. As this UWMP plans to 2050, supplies in the Recycled Plan projected to be available by year 2030 have similarly been assumed to be available through 2050 and beyond.

A third Valley reclamation plant, the Newhall Ranch WRP, is proposed as part of the Newhall Ranch project. This proposed facility would be located near the western edge of the development project along the south side of State Route 126. The plant would be constructed in stages, with an ultimate capacity of 6.8 MGD (7,616 AFY) as stated in the RWQCB's Order R4-2007-0046. According to the Draft Newhall Ranch Resource Management and Development Plan/Spineflower Conservation Plan EIS/EIR, April 2009, approximately 5,400 AFY of the tertiary treated water from this plant is projected to be used by the Newhall Ranch Project. The WRP will serve the Newhall Ranch Specific Plan and a new County Sanitation District has been created to operate and maintain the Newhall Ranch WRP.

Table 4-2 provides the projected wastewater flows in each purveyor's service area from the combined Valencia and Saugus WRP planning area and from the proposed Newhall Ranch WRP. Projected wastewater flow for the Valencia and Saugus WRPs was determined using projected populations from Table 2-9 and the wastewater generation factor SCVSD uses for planning of 86 GPCD, and for the Newhall Ranch WRP based on its projections of production capacity.

Table 4-2 does not reflect Newhall Ranch WRP production capacity from 2010 through 2024. During this interim period, Newhall Ranch-generated wastewater would be temporarily treated at the Valencia WRP based on the need to build-up an adequate, steady flow of wastewater until construction of the Newhall Ranch WRP. The Valencia WRP has sufficient capacity to tertiary-treat wastewater from Newhall Ranch during this interim period, consistent with the Interconnection Agreement approved by SCVSD in 2002.

TABLE 4-2
PROJECTED WASTEWATER FLOWS

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Projected Populations									
LACWWD 36	4,947	7,157	8,908	10,658	12,405	14,159	15,906	17,657	19,407
NCWD	44,316	49,933	54,559	58,612	63,824	68,450	73,079	77,715	82,341
SCWD	124,192	133,868	143,544	153,220	162,896	172,572	182,248	191,924	201,600
VWC	113,296	127,241	138,862	150,477	162,098	173,716	185,330	196,952	208,570
Total Projected Populations[a]	**286,751**	**318,199**	**345,873**	**372,967**	**401,223**	**428,897**	**456,563**	**484,248**	**511,918**
Wastewater Generation									
LACWWD 36	476	689	858	1,027	1,195	1,364	1,532	1,701	1,869
NCWD	4,269	4,810	5,255	5,646	6,148	6,593	7,039	7,486	7,931
SCWD	11,962	12,894	13,826	14,758	15,690	16,622	17,554	18,486	19,418
VWC	10,913	12,256	13,375	14,494	15,613	16,732	17,851	18,970	20,089
Total Wastewater Generated (AF)[b]	**27,620**	**30,649**	**33,314**	**35,924**	**38,646**	**41,311**	**43,976**	**46,643**	**49,308**
WRP Production Capacity									
Saugus and Valencia WRPs									
Treatment Capacity (MGD)[c]	28.1	28.1	28.1	28.1	28.1	34.1	34.1	34.1	34.1
Treatment Capacity (AF)	31,472	31,472	31,472	31,472	31,472	38,192	38,192	38,192	38,192
Newhall Ranch WRP (MGD)[d]	-	-	-	2.0	2.0	4.0	4.0	6.8	6.8
Newhall Ranch WRP (AF)	-	-	-	2,240	2.240	4,480	4,480	7,616	7,616
Total WRP Production Capacity (AF)	**31,472**	**31,472**	**31,472**	**33,712**	**33,712**	**42,672**	**42,672**	**45,808**	**45,808**
Wastewater Treated (AF)[e]	**27,620**	**30,649**	**31,472**	**33,712**	**33,712**	**41,311**	**42,672**	**45,808**	**45,808**

Notes:
(a) From Table 2-9.
(b) Based on projected populations and SCVSD's wastewater generation planning factor of 86 GPCD.
(c) Existing WRP capacity of 28.1 MGD, plus planned Valencia WRP expansion assumed on line by 2035, for total planned capacity of 34.1 MGD. Timing for increase in WRP treatment capacity is based on SCVSD's population projections, which are lower than those presented in this table. SCVSD will continue to monitor sewer flows and expand Valencia WRP when available capacity becomes limited.
(d) Per RWQCB Order No. R4-2007-0046, the Newhall Ranch WRP will incrementally increase its design capacity to accommodate the development project as completed (2.0 MGD in Phase I, 4.0 MGD in Phase II and 6.8 MGD in Phase III). For the purposes of this analysis, Phase I begins in 2025 commensurate with increased planned recycled water demand.
(e) Lesser of Wastewater Generated and Total WRP Production Capacity.

4.4 Recycled Water Supply

The use of wastewater effluent is limited by various state water laws, codes and court decisions. These regulatory limitations are described in greater detail in the Recycled Plan.

CLWA is currently approved to use 1,700 AFY. Any additional ultimate use of existing wastewater for recycled water use is governed by, among other things, the availability of native versus foreign water as shown in Table 4-3 and the impacts to legal users of water. Native water is water that under natural conditions would contribute to a given stream or other body of water (i.e., surface water or upwelling groundwater). ”Foreign” water is water that is not natural to a watercourse and occurs in the watercourse through human efforts. Foreign water can be removed from a watercourse without infringing on the water rights of downstream water users. Use may also be restricted to protect biological resources in the river. The Santa Clarita Valley Sanitation District will need to assess the issues of water rights and protection of biological resources relative to Sections 1210 and 1211 of the Water Code as CLWA’s recycled water program expands.

In 2010, the Valley’s potable water supply was approximately less than one percent recycled water, 44 percent groundwater (native water) and 55 percent imported water (foreign water)[22]. Projected potable water demand less recycled water for 2050 is 99,077 with conservation, 56 percent derived from foreign water and 44 percent derived from native sources, in a normal year. Accordingly, the potential recycled water component would consist of approximately 56 percent (55,477 AF foreign/99,077 AF total) of projected wastewater generation. This volume is determined by multiplying the percentage of foreign water by the wastewater flow. The future foreign water portion of wastewater is 27,609 AFY (56 percent times 49,308 AFY). It is important to note that these percentages are of potable water demand only (i.e., they do not include the use of recycled water in the calculation) and as such are not percentages of total water demand. The demand numbers used for the calculation reflect the implementation of SBX7-7, which requires retailers to reduce demand by 20 percent by 2020. Although the foreign water percentage of potable water demand only increases by one percent from 2010 to 2050, actual use of foreign water increases by nearly 50 percent.

Assuming the capacities and recycled water demand (as discussed in Section 4.3), the existing and projected wastewater flows and potential recycled water use are as summarized in Table 4-3. These numbers differ slightly from those presented in the Recycled Plan and are more conservative in terms of wastewater flows. Table 4-3 also shows the associated wastewater generation through 2050.

[22] Demand for foreign water is calculated as demand with conservation, less recycled water use, less local groundwater pumping.

TABLE 4-3
PROJECTED WASTEWATER GENERATION AVAILABLE FOR RECYCLED WATER USE (AF)

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Projected Wastewater Generation[a]	**27,620**	**30,649**	**33,314**	**35,924**	**38,646**	**41,311**	**43,976**	**46,643**	**49,308**
Demand w/ Conservation[b]	69,673	72,343	71,908	80,236	88,564	96,892	105,220	113,549	121,877
Recycled Water									
LACWWD 36	0	0	50	50	50	50	50	50	50
NCWD	0	200	500	1,000	1,275	1,775	2,275	2,775	3,275
SCWD	0	100	500	1,500	2,275	2,775	3,775	4,775	5,775
VWC	325	1,000	2,000	3,000	4,500	6,000	8,000	10,000	12,200
Total Purveyor	325	1,300	3,050	5,550	8,100	10,600	14,100	17,600	21,300
Non-Purveyor (Honor Rancho)	0	0	0	0	1,500	1,500	1,500	1,500	1,500
Total Purveyor and Non-Purveyor Recycled Water[c]	**325**	**1,300**	**3,050**	**5,550**	**9,600**	**12,100**	**15,600**	**19,100**	**22,800**
Potable Demand[d]	69,348	71,043	68,858	74,686	78,964	84,792	89,620	94,449	99,077
Supplies to Meet Potable Demand									
Groundwater[e]	31,100	34,600	36,600	37,600	39,600	40,600	41,600	42,600	43,600
Imported (foreign) water[f]	38,248	36,443	32,258	37,086	39,364	44,192	48,020	51,849	55,477
Foreign % of Potable Demand	55%	51%	47%	50%	50%	52%	54%	55%	56%
Potentially Available for Recycled Water Use[g]	**15,233**	**15,722**	**15,607**	**17,838**	**19,265**	**21,531**	**23,563**	**25,605**	**27,609**

Notes:
(a) From Table 4-2.
(b) From Table 2-22.
(c) Projected recycled water demand based on implementation of complete build-out of Recycled Water Master Plan.
(d) Demand w/ Conservation minus Recycled Water.
(e) From Table 3-7.
(f) Potable Demand minus Groundwater.
(g) Projected Wastewater Generation multiplied by Foreign Percent of Potable Demand.

4.4.1 Alternative Water Resources Management Program

Salinity and nutrient management concerns in the Upper Santa Clara River Watershed are primarily driven by salt sensitive crops located downstream. High chloride levels are of particular concern since high value, chloride sensitive crops like strawberries and avocados grown in the lower watershed utilize surface waters or ground water influenced by surface water for irrigation. Findings from previous reports cite the sources of chloride as source waters and residential self-regenerating water-softeners (SRWS). In 2003, SCVSD passed an ordinance banning the installation of all new SRWSs, and by passage of Senate Bill 475, the District has authority to remove all SRWSs remaining in the Santa Clarita Valley that were installed prior to 2003.

A Total Maximum Daily Load (TMDL) for chloride in the Upper Santa Clara River (Reaches 5 and 6) was adopted by the Los Angeles RWQCB and became effective on May 5, 2005. The Basin Plan Amendment for the chloride TMDL in the Upper Santa Clara River was unanimously adopted by the RWQCB on December 11, 2008. The TMDL established waste load allocations of 100 mg/L for the Saugus and Valencia WRPs. The TMDL implementation schedule allows for several special studies to determine whether existing Water Quality Objectives (WQOs) and waste-load allocations for chloride can be revised, and provides for an 11-year schedule to attain compliance with the final water quality objectives and waste-load allocations for chloride.

In 2008, the SCVSD evaluated the Alternative Water Resources Management (AWRM) Program. This program was developed jointly between Upper Basin Water Purveyors, Ventura County agricultural and water interests and the SCVSD to comply with the chloride WQOs established by the TMDL. Stakeholders along the Los Angeles County and Ventura County stretches of the Santa Clara River collaboratively developed an alternative approach to water resources management that will achieve TMDL compliance. The AWRM uses a basin water supply management approach to achieve the final water quality objectives and waste-load allocation for chloride determined through the TMDL collaborative process. AWRM permits a TMDL for the Santa Clara River that diverges from the Basin Plan, but protects beneficial uses while establishing feasible site specific objectives (SSOs). The program requires studies that showed the alternative WQO was protective of threatened and endangered species, sensitive agriculture and groundwater under the influence of surface water. AWRM, in comparison with the conventional approach, would have a number of benefits in terms of economics, public acceptance, feasibility and environmental quality.

A groundwater and surface water interaction model (GSWI) was developed (March 2008) to evaluate the impact of WRP effluent discharges to the Santa Clara River on downstream surface water and groundwater in the Los Angeles and Ventura County portion of the watershed. The same model is now being used by the AWRM Program to study the link between imported water quality, chloride and total dissolved solids (TDS) in the Upper Santa Clara River. In the model, historical water levels, flows, concentrations and movements within the time period of 1975 through 2005 were simulated and then calibrated to assess the assimilative capacity of surface water in Reaches 4 through 6 and the underlying groundwater basins in these areas. Additional assessments were made regarding (1) the gradient of chloride concentrations from the Saugus and Valencia WRP outfalls to receiving water stations located downstream, (2) the impacts of the WRP effluent in the USCR's groundwater and (3) simulations of potential chloride impacts projected for 2007 through 2030. These findings[23]

[23] The results of the initial GSWI Study are presented in a report entitled “Task 2B-1 Numerical Model Development and Scenario Results” (CH2M Hill, 2008; Geomatrix, 2008a).

resulted in the development of the AWRM Program where chloride WQOs would be increased in select groundwater basins and reaches of the USCR watershed while being decreased in the eastern Piru Basin where the ultimate objective would be an overall reduction in chloride loading and benefits to the water supply.

Given the benefits of chloride reduction and in the context of achieving a salt balance for the watershed, RWQCB staff proposed conditional SSOs that support the AWRM, while still being protective of beneficial uses. When implemented with the AWRM Program, the conditional SSOs of 117 mg/L during normal conditions and 130 mg/L during drought conditions in Reach 4B and the underlying groundwater will protect agricultural uses in the area (USCR Chloride TMDL Conditional SSOs Staff Report, Los Angeles RWQCB 2008). These conditional SSOs apply and supersede the existing regional water quality objectives of 100 mg/L only when chloride load reductions and/or chloride export projects are in operation by the SCVSD according to the implementation provisions provided in the RWQCB's Staff Report (RWQCB 2008).

Special studies were required for the implementation of AWRM and to evaluate whether the SSOs were protective of beneficial uses. The GSWI model was used to evaluate the effectiveness of the AWRM after the program was implemented. A study using the model showed that the AWRM WQOs could meet SSOs for chloride under drought and non-drought conditions. Based on the Final Staff Report from the Los Angeles RWQCB, the additional studies showed the chloride level protective of the most chloride-sensitive organisms for which data are available and is below the U.S. Environmental Protection Agency aquatic life chloride criteria. The conditional SSOs are not expected to harm in-stream or riparian species or habitat.

Due to ratepayer concerns regarding the perceived high cost of the AWRM Program, the recommended wastewater rate increases to implement AWRM were not approved by the SCVSD Board. In response, SCVSD and the water suppliers have been exploring alternative approaches that could result in revisions to the TMDL. These evaluations are ongoing.

4.5 Other Potential Sources of Recycled Water

Oilfield produced water is a by-product of oil production generated when oil is extracted from the oil reservoir. It is generally of poor quality and unsuitable for potable, industrial or irrigation use without treatment. Because of the poor water quality, reinjection has often been the most cost-effective disposal option. Treatment processes can produce potable quality water; yet, because of the poor initial water quality and the organic constituents, it is often more appropriate for treated oilfield produced water to be used for irrigation or industrial purposes to offset potable water demand. The economics of oil production are market-driven and are different from those of drinking water supplies. As oil prices rise or drop, oilfield production is increased or decreased as dictated by economics. Also, oilfields are eventually depleted of supply and abandoned. Therefore, while oilfield produced water should be considered as long-term, it is not a completely firm supply and is not permanent.

Berry Petroleum has expressed interest in treating oilfield produced water from the Placerita Oilfield for sale to CLWA for non-potable uses. Studies of the potential reuse of treated oilfield produced water from the Placerita Oilfield have indicated that approximately 44,000 barrels per day (1.8 MGD or 2,016 AFY) of treated oilfield produced water may be available. Pilot studies performed at the Placerita Oilfield have indicated that, even with reverse osmosis (RO) treatment, some organic compounds such as naphthalene, 2-butanone and ethylbenzene can

be detected in the RO effluent. For irrigation reuse, the produced water would need to be cooled and treated to remove hardness, silica, total dissolved solids (TDS), boron, ammonia and total organic carbon (TOC).

4.6 Recycled Water Demand

Currently, recycled water is served to landscape irrigation customers, including the TPC Golf Course. Potential recycled water users have been identified through a number of sources including:

- 1993 Recycled Water Master Plan
- Water consumption records for LACWWD 36, NCWD, SCWD and VWC
- Land use maps
- General Plans and Specific Plans for the City of Santa Clarita and County of Los Angeles
- Discussions with City, County, water purveyor and land developer staff
- On-site surveys of the CLWA service area
- 2002 Recycled Water Master Plan

In order to be considered as a potential recycled water user, the user has to be located within CLWA's service area and have a potential non-potable water demand of at least 4 AFY. A total potential demand for existing and future recycled water users is 34,500 AFY for 2015 as identified in the Recycled Plan. As this volume is already greater than the anticipated source of recycled water supply, additional future recycled users were not identified at this time. However, CLWA reevaluates the list of recycled users as conditions change or during the designing of projects under the Recycled Plan including users not identified in 2002. For example, the Los Angeles County Sheriff's Honor Rancho has undertaken sod farming operations. CLWA has therefore identified it as a potential future customer for 1,500 AFY of recycled water.

The initial list of potential recycled water users was reduced by evaluating the potential users that would be most expensive to serve until potential users totaled approximately 17,400 AF. The unit cost to serve each user was calculated using the capital costs for pipelines, reservoirs and pump stations as well as operational costs for pumping. The areas retained for recycled water service have costs ranging from $120 to $5,000 per AFY. Areas eliminated from service had costs as high as $13,000 per AFY. However, only two of the proposed phases in the Recycled Plan had costs above $1,000 per AFY. In addition, the Newhall Ranch project will require about 5,400 AFY. The resulting proposed recycled water service area encompasses a large portion of CLWA's western service area.

The total potential annual recycled water demand identified in the Recycled Plan and for the Newhall Ranch project that is cost effective to serve is approximately 22,800 AFY. Of this total 21,300 AFY is projected use by purveyor customers. Implementation of the recycled water system is expected to occur over the next 40 years.

4.7 Recycled Water Comparison

The 2005 Santa Clarita Valley UWMP projected a total recycled water demand of 1,600 AFY by the year 2010. Although it did not specifically state a projected 2005 demand, CLWA had approval for 1,700 AFY of recycled water use and was in the process of constructing the necessary facilities to deliver this amount at the time the 2005 UWMP was written. Approximately 325 AFY was served in 2010 to landscape irrigation customers, including the TPC Golf Course. Current demand is lower than originally predicted due to lack of funding available to expand the recycled water distribution system. Table 4-4 provides a comparison of the 2005 projected demand versus the actual 2010 demand.

TABLE 4-4
RECYCLED WATER USES - 2005 PROJECTION COMPARED WITH 2010 USE

User Type	2005 Projection for 2010 (AF)	2010 Use (AF)
Landscape	1,600	325
Total	**1,600**	**325**

Table 4-5 provides the comparison of anticipated demands and supplies. As shown in the table, potential demand for recycled water is equal to supplies.

TABLE 4-5
POTENTIAL RECYCLED WATER SUPPLIES AND DEMANDS

Demand	Supply (AF)	Adjusted Demands (AF)
Recycled Plan	17,400	
Newhall Ranch Project	5,400	
Total	**22,800**	**22,800**

4.8 Methods to Encourage Recycled Water Use

In order to provide an incentive to recycled water users, it was recommended in the Recycled Plan that CLWA issue a monthly rebate directly to each recycled water user. CLWA plans on making recycled water available at a reduced rate relative to the cost of potable water. CLWA may consider providing financial assistance to retail water providers to offset the costs of extending the recycled water conveyance system or to existing customers to cover all or a portion of the costs to convert their potable water systems to receive recycled water.

4.9 Implementation Plan for the Recycled Water Plan

Production from the WRPs is not anticipated to be adequate to meet the total demands of the existing system. However, as potable water demands increase and, consequently, recycled water production increases, the water available to meet system demands would also increase. Therefore, it is recommended that construction of the recycled water system be phased to utilize the increases in plant production.

Oilfield produced water would also not be available immediately, nor would it be available as a permanent source of supply. Instead, this alternative water source could be used as an interim long-term supply when the field is in operation and inadequate recycled water is available from

the Valencia and Saugus WRPs. Oilfield produced water is anticipated to be available for approximately the next twenty years. Implementation phasing considers when this water source would be available. A detailed discussion of the recommended phasing plan is provided in the Recycled Plan.

Phasing implementation of the recycled water system is recommended for the following reasons:

- A number of the potential recycled water users are future users that do not yet need recycled water.
- The current flow of the Valencia WRP is not adequate to meet the total demands of the recycled water users.
- Capital funding requirements would be spread over CLWA's current planning period through 2050.
- Oilfield produced water is not immediately (nor permanently) available.
- Demand is increasing due to development of Newhall Ranch.

The recycled water system is divided into implementation phases based primarily on service zone boundaries.

In general, the following factors were considered in developing a phasing plan:

- Ease or willingness of customers to connect to recycled water
- Retrofit costs
- Regulatory requirements
- Community impacts and development requirements
- Water utility involvement/cooperation
- Funding availability
- Reliability and operational costs considerations
- System flexibility

The implementation phases are prioritized based on the status of the users (existing or future), the anticipated construction schedule of future users and the proximity of the users to the non-potable water source (e.g., Valencia WRP, Saugus WRP or Placerita Oilfield).

4.10 Additional Considerations Relating to the Use of Recycled Water

4.10.1 Salt and Nutrient Management Plan

The SWRCB adopted a statewide Recycled Water Policy (Policy) on February 3, 2009 to establish uniform requirements for the use of recycled water. The purpose of this Policy is to increase the use of recycled water from municipal wastewater sources that meet the definition in Water Code Section 13050, subdivision (n), in a manner that implements state and federal

water quality laws. As part of this Policy, the preparation of a salt and nutrient management plan for each basin/subbasin in California, including compliance with CEQA and participation by Los Angeles RWQCB staff, is required by 2014. The Policy states that salts and nutrients from all sources should be managed on a basin wide or watershed wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses.

The SWRCB finds that the appropriate way to address salt and nutrient issues is through the development of regional or sub-regional salt and nutrient management plans rather than through imposing requirements solely on individual recycled water projects. These plans shall be consistent with the DWR Bulletin 160 as appropriate and shall be locally developed. The salt and nutrient plan should include a basin/sub basin wide monitoring plan that specifies an appropriate network of monitoring locations. The monitoring plan should be site specific and must be adequate to provide a reasonable, cost-effective means of determining whether the concentrations of salt, nutrients and other constituents of concern as identified in the salt and nutrient plans are consistent with applicable water quality objectives.

CLWA, along with other Upper Santa Clara River Integrated Regional Water Management Plan participants, applied for a Proposition 84 Planning Grant that would update the IRWMP including preparation of a salt and nutrient management plan. In January 2011 CLWA was notified that its proposal was placed on the list of proposals recommended for funding. CLWA anticipates completing the study in 2012 at which time its impacts on the proposed recycled water supply and costs would be assessed.

4.10.2 Basin Plan

The Santa Clara River watershed has basin objectives established by the Regional Water Quality Control Board Los Angeles Region (Region 4). Water quality objectives were established to protect the various beneficial uses for that particular water body or reach. Table 4-6 shows the water quality objectives for salt and nutrients for the Santa Clara River watershed.

TABLE 4-6
WATER QUALITY OBJECTIVES FOR WATERS IN THE SANTA CLARA RIVER WATERSHED

	TDS (mg/L)	Chloride (mg/L)[a]	Sulfate (mg/L)	Nitrogen (mg/L)	SAR (mg/L)[b]	Boron (mg/L)
Inland Surface Waters						
Above Lang gaging station	500	50	100	5	5	0.5
Between Lang gaging station and Bouquest Canyon Road Bridge	800	100	150	5	5	1.0
Between Bouquet Canyon Road Bridge and West Pier Highway 99	1000	100	300	10	5	1.5
Between West Pier Highway 99 and Blue Cut gaging station	1000	100	400	5	10	1.5
Between Piru Creek and A Street, Fillmore[c]	1300	100	600	5	5	1.5
Between Blue Cut gaging station and Piru Creek, Fillmore[c]	1300	100	600	5	5	1.5
Between A Street, Fillmore and Freeman Diversion “Dam” near Saticoy[d]	1300	100	650	5	5	1.5
Between Freeman Diversion “Dam” near Saticoy and Highway 101 Bridge	1200	150	600	-	-	1.5
Between Highway 101 Bridge and Santa Clara River Estuary[e]	See basin plan					
Santa Paula Creek above Santa Paula Water Works diversion Dam	600	45	250	5	5	1.0
Sespe Creek above gaging station 500’ downstream from Little Sespe Creek	800	60	320	5	5	1.5
Piru Creek above gaging station below Santa Felicia Dam	800	60	400	5	5	1.0
Groundwater Basins						
Acton Valley	550	100	150	10;45;10;1[f]	NA	1.0
Sierra Pelona Valley (Agua Dulce)	600	100	100	10;45;10;1[f]	NA	0.5
Upper Mint Canyon	700	100	150	10;45;10;1[f]	NA	0.5
Upper Bouquet Canyon	400	30	50	10;45;10;1[f]	NA	0.5
Green Valley	400	25	50	10;45;10;1[f]	NA	-
Lake Elizabeth-Lake Hughes area	500	50	100	10;45;10;1[f]	NA	0.5
Santa Clara-Mint Canyon	800	150	150	10;45;10;1[f]	NA	1.0
South Fork	700	100	200	10;45;10;1[f]	NA	0.5
Placerita Canyon	700	100	150	10;45;10;1[f]	NA	0.5
Santa Clara-Bouquet and San Francisquito Canyons	700	100	250	10;45;10;1[f]	NA	1.0
Castaic Valley	1000	150	350	10;45;10;1[f]	NA	1.0
Saugus Formation	-	-	-		NA	-

Notes:
(a) The RWQCB has adopted revised SSOs for chloride. See Section 4.4.1 and RWQCB Order No. R4-2008-012,
(b) SAR = Sodium adsorption ratio.
(c) The reach of the Santa Clara River between Blue Cut gaging station and A Street, Fillmore has been split into two reaches, between the confluence of Piru Creek and A Street, Fillmore and between the Blue Cut gaging station and the confluence of Piru Creek under RWQCB Resolution No. R4-2007-018.
(d) The chloride objective for this reach has been revised from 80 mg/L to 100 mg/L under RWQCB Resolution No. 2003-015.
(e) The reach between Highway 101 bridge and the Santa Clara River Estuary have not be designated with specific water quality objectives. In this case general objectives to protect specific beneficial uses are assigned in the basin plan.
(f) 10 mg/L nitrogen (as nitrate + nitrite); 45 mg/L nitrate (as NO_3); 10 mg/L nitrate-nitrogen; 1 mg/L nitrite-nitrogen

4.10.3 Nutrients

The LARWQCB found that the Santa Clara River was being impacted by ammonia and nitrate plus nitrite (nitrogen compounds) with the primary source being wastewater discharge into the river. Nitrogen compounds can cause or contribute to eutrophic effects such as low dissolved oxygen, algae blooms and reduced benthic macro invertebrates. Three reaches in the Santa Clara River have been identified as impaired due to ammonia (Reaches 3, 7 and 8), two of which exceed Basin Plan water quality objectives. These findings lead to a Basin Plan Amendment for a nitrogen compounds TMDL for the Santa Clara River that was adopted on March 23, 2004. The TMDL includes numeric targets for ammonia as listed in Table 4-7, and also for nitrate plus nitrite as shown in Table 4-8.

In 2005 the SCVSD upgraded the treatment processes at the Valencia and Saugus WRPs to include nitrification/denitrification to address nutrients. The 2010 average ammonia levels in the Valencia and Saugus WRP recycled water were 1.05 and 1.16 mg/L, respectively (SCVSD Industrial Waste Pretreatment Program, 2011). The 2010 average nitrate plus nitrite levels in Valencia and Saugus WRP recycled water were 2.41 and 4.08 mg/L, respectively (SCVSD Industrial Waste Pretreatment Program, 2011).

TABLE 4-7
TMDL FOR AMMONIA ON THE SANTA CLARA RIVER

Reach	One-hour NT (mg-N/L)	Thirty-day NT (mg-N/L)
Reach 8	14.8	3.2
Reach 7 above Valencia	4.8	2.0
Reach 7 below Valencia	5.5	2.0
Reach 7 at County Line	3.4	1.2
Reach 3 above Santa Paula	2.4	1.9
Reach 3 at Santa Paula	2.4	1.9
Reach 3 below Santa Paula	2.2	1.7

Source: LARWQCB Santa Clara River TMDL for Nitrogen Compounds Staff Report, June 2003

TABLE 4-8
TMDL FOR NITRATE PLUS NITRITE ON THE SANTA CLARA RIVER

Reach	Thirty-day Average (mg-N/L)
Reach 8	9.0
Reaches 3 and 7 above Valencia	4.5

Source: LARWQCB Santa Clara River TMDL for Nitrogen Compounds Staff Report, June 2003

4.10.4 Projected Salt Levels from Recycled Water

Salt balances depend on the amount imported and the amount exported. The total salt and nutrient loads in waste water discharges primarily depend on the levels in source waters and the type of treatment process that the water agency employs. Recycled water does not import additional salt into the watershed; instead the salt is transferred and cycled within the watershed. Recycled water generally contains salt levels 150 to 400 mg/L above potable water levels and 15 to 50 mg/L of ammonia.

Within California, agricultural irrigation is the largest consumer of recycled water followed by landscape irrigation, which are also typical uses in the Santa Clara River watershed. However, in the Los Angeles region, which is governed by RWQCB Region 4, groundwater recharge is the largest use of recycled water.

Table 4-9 represents the amount of salt above baseline levels that will need management. These levels are projected and may vary due to regulatory changes or changes in the source waters. The amounts do not represent the total loading but represent salt that will not be exported from the watershed through discharge into surface waters Management of salts and nutrients within the watershed is anticipated to be addressed through development of Salt and Nutrient Management Plans discussed in Section 4.10.1.

TABLE 4-9
ESTIMATED SALT ABOVE POTABLE LEVELS BY RECYCLED WATER USERS

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Projected recycled water use (AF)[(a)]	325	1,300	3,050	5,550	9,600	12,100	15,600	19,100	22,800
Non-exported salt levels (tons/yr)[(b)(c)(d)]	121	486	1,140	2,075	3,589	4,524	5,833	7,142	8,525

Notes:
(a) From Table 4-3.
(b) Amounts are in addition to baseline levels.
(c) Assumes average salt in recycled water is 275 mg/L based on Salt Management Guide for Landscape Irrigation with Recycled Water in Coastal Southern California, A Comprehensive Literature Review. The range cited for most recycled water is 150-400 mg/L.
(d) Based on the following conversions: 456,592 mg/lb; 0.0006063 lb/L; 1,233,481 L/AF; 747.82 lb/AF; 2,000 lb/ton.

Section 5: Water Quality

5.1 Overview

The quality of any natural water is dynamic in nature. This is true for the SWP and the local groundwater of the Basin. During periods of intense rainfall or snowmelt, routes of surface water movement are changed and new constituents are mobilized and enter the water while other constituents are diluted or eliminated. The quality of water changes over the course of a year. These same basic principles apply to groundwater. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water depth is a function of local rainfall and snowmelt. During periods of drought, the mineral content of groundwater increases. Water quality is not a static feature of water, and these dynamic variables must be recognized.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology and the introduction of new treatment technology. All water suppliers are subject to drinking water standards set by the United States Environmental Protection Agency (EPA) and DPH. Additionally, investor-owned water utilities, such as VWC, are subject to water quality regulation by the PUC. CLWA provides imported water from the SWP and other sources, while local retail water purveyors combine local groundwater with treated imported water from CLWA for delivery to their customers. (While LACWWD 36 currently exclusively takes imported water from CLWA, it anticipates bringing a groundwater well into production soon). An annual Consumer Confidence Report (CCR) or Water Quality Report is provided to all Valley residents who receive water from CLWA and one of the four retail water purveyors. That report includes detailed information about the results of quality testing of the water supplied during the preceding year (Water Quality Report 2010). Water quality is also addressed in the annual Santa Clarita Valley Water Report (CLWA et. al., 2009), which describes the current water supply conditions in the Valley and provides information about the water requirements and water supplies of the Santa Clarita Valley.

The quality of water received by individual customers will vary depending on whether they receive imported water, groundwater or a blend. Some will receive only imported water at all times, while others will receive only groundwater. Others may receive water from one well at one time, water from another well at a different time, different blends of well and imported water at other times, and only imported water at yet other times. These times may vary over the course of a day, a week, or a year.

This section provides a general description of the water quality of the supplies within the Valley, aquifer protection and a discussion of potential water quality impacts on the reliability of these supplies.

5.2 Water Quality Constituents of Interest

The Santa Clarita Valley's water suppliers (Section 1.4) are committed to providing their customers with high quality water that meets all federal and state primary drinking water standards. Some contaminants are naturally-occurring minerals and radioactive material. In some cases the presence of animals or human activity can contribute to the constituents in the

source waters. The following sections address constituents reported in the 2010 CCR that may impact water quality.

5.2.1 Perchlorate

Perchlorate, a chemical used in making rocket and ammunitions propellants, has been a water quality concern in the Santa Clarita Valley since 1997 when it was originally detected in four wells operated by the purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite facility. In late 2002, the contaminant was detected in a fifth well, an Alluvial well (SCWD's Stadium Well) also located near the former Whittaker-Bermite site, which was immediately taken out of service. Perchlorate was detected again in early 2005 in a second Alluvial well (VWC's Well Q2) near the former Whittaker-Bermite site, and in 2006 in very low concentrations (below the detection limit for reporting) in a Saugus well (NCWD's NC-13) near one of the originally impacted wells. The maximum contaminant level (MCL) of 6 µg/L was adopted by DPH in 2007.

In August 2010, perchlorate was detected VWC's Saugus Well 201. Confirmation sampling in the months that followed confirmed the detection of perchlorate at concentrations that ranged from 5.7 to 12 micrograms per liter (µg/L). VWC removed Well 201 from service when perchlorate was first detected and is currently evaluating remediation alternatives including wellhead treatment in order to return the well to service and restore impacted well capacity. To date, perchlorate has been detected in a total of 8 wells, in both the Saugus Formation and the Alluvium. Table 5-1 summarizes the current remediation status of all wells where perchlorate has been detected.

The following is a summary of the status of perchlorate remediation and restoration of perchlorate-impacted groundwater supply. A more detailed discussion of pertinent events related to perchlorate contamination, containment, remediation and water supply restoration is included in Appendix I. As part of the evaluation of the containment system's effectiveness, the groundwater model is being updated and recalibrated using actual pumping data. These discussions are provided to illustrate that work toward the reactivation of impacted groundwater supply wells has progressed on several integrated fronts over the last ten years and is being expanded to include VWC Well 201. With the updated model VWC will be evaluating response actions to the contamination in Well 201.

TABLE 5-1
STATUS OF IMPACTED WELLS

Year Perchlorate Detected	Purveyor Well	Groundwater Aquifer	Status
1997	SCWD Saugus 1	Saugus	DPH approved well return to service in January 2011; well in active service utilizing approved perchlorate treatment.
1997	SCWD Saugus 2	Saugus	DPH approved wells return to service in January 2011; well in active service utilizing approved perchlorate treatment.
1997	VWC Well 157	Saugus	Sealed and capacity replaced by new well.
1997	NCWD Well 11	Saugus	Out of service.
2002	SCWD Stadium Well	Alluvium	Sealed and capacity replaced by new well.
2005	VWC Well Q2	Alluvium	DPH approved perchlorate treatment removal in 2007; treatment was installed in 2005 and relocated for potential future use; well remains in service.
2006	NCWD Well NC-13	Saugus	DPH approved annual monitoring, results have always been below the detection limit for reporting; well remains in service.
2010	VWC Well 201	Saugus	Out of service pending additional monitoring and evaluation of remediation alternatives.

In 2002 CLWA and the U.S. Army Corps of Engineers (ACOE) signed a cost-sharing agreement for a feasibility study of the area. Under federal and state law, the owners of the Whittaker-Bermite property have the responsibility for the groundwater cleanup. CLWA, the purveyors, and the Department of Toxic Substances Control (DTSC) signed an oversight agreement in 2003 regarding studies of treatment technologies for removing perchlorate from water supplies, and have also been working with DPH to obtain the necessary permits for these treatment processes. Treatment method pilot studies were conducted during 2003, and in 2004 CLWA and the purveyors selected ion exchange as the preferred treatment method for removing perchlorate.

Although that agreement expired in January 2005 the parties, under DTSC oversight, jointly developed a plan to “pump and treat” contaminated water from two of the purveyors’ impacted wells to stop migration of the contaminant plume and to partially restore the municipal well capacity that has been impacted by perchlorate. The containment plan specifies that wells Saugus 1 and Saugus 2 operate at a continuous pumping rate of 1,100 gpm at each well, for a combined total of 2,200 gpm from the two wells. The annual pumping volume of 1,772 AFY per well assumes that pumping will occur continuously, except for occasional maintenance purposes.

A final settlement to fund, remediate and treat the contaminated water was completed and executed by the parties in April 2007. Design of the CLWA treatment facilities and related pipelines was completed in 2007. Construction of the treatment facility and pipelines began in

November 2007 and treatment of the water began in 2010. Since January 2011 when DPH issued a permit for CLWA to serve this water, CLWA has included this water as part of its supply and has been delivering this water to purveyors. This water is shown as part of the regional supply in Section 3, and as part of NCWD's and SCWD's supply in the detailed supply tables by purveyor in Appendix C.

VWC and CLWA are pursuing the funding for evaluating remediation alternatives, including wellhead treatment of contaminated water from VWC Well 201 through the final settlement agreement. The schedule for restoring service to Well 201 is in development but is projected to be less than two years. During that time, however, the removal from service of Well 201 will not limit the ability to meet dry year target production levels from the Saugus Formation since there is sufficient capacity in the remaining, non-impacted Saugus production facilities to make up for the temporary loss of capacity from VWC Well 201 through the first two years of a multiple dry-year period. Restoration of VWC Well 201 and new Saugus well construction are planned to achieve full Saugus Formation capacity through a third year or longer dry period as discussed in Section 3.

Returning the impacted Saugus well (VWC Well 201) to municipal water supply service by installing treatment requires DPH approval before the water can be considered potable and safe for delivery to customers. The permit requirements are contained in DPH Policy Memo 97-005 for direct domestic use of impaired water sources.

Before issuing a permit to a water utility for use of an impaired source as part of the utility's overall water supply permit, DPH requires that studies and engineering work be performed to demonstrate that pumping the well and treating the water will be protective of public health for users of the water. The Policy Memo 97-005 requires that DPH review the local retail water purveyor's plan, establish appropriate permit conditions for the wells and treatment system, and provide overall approval of returning the impacted wells to service for potable use. Ultimately, VWC's plan and the DPH requirements are intended to ensure that the water introduced to the potable water distribution system has no detectable concentration of perchlorate.

The DPH Policy Memo 97-005 requires, among other things, the completion of a source water assessment for the impacted well intended to be returned to service. The purpose of the assessment is to determine the extent to which the aquifer is vulnerable to continued migration of perchlorate and other contaminants of interest from the Whittaker-Bermite site. The assessment includes the following:

- Delineation of the groundwater capture zone caused by operating the impacted wells.
- Identification of contaminants found in the groundwater at or near the impacted wells.
- Identification of chemicals or contaminants used or generated at the Whittaker-Bermite facility.
- Determination of the vulnerability of pumping the impacted wells to these contaminant sources.

The groundwater model that was developed for use in analyzing the operating yield and sustainability of groundwater in the Basin was also used for simulating the capture and control of perchlorate contamination in the originally impacted Saugus wells. The results of that work are summarized in "Analysis of Perchlorate Containment in Groundwater Near the Whittaker-Bermite Property, Santa Clarita, California" (CH2M Hill, December 2004). The recent detection

of perchlorate in VWC Well 201 was not totally unexpected in light of the previously identified gradient for groundwater flow (westerly) from the source location and previously impacted wells. That gradient is now being controlled by the containment and extraction program that is in operation for the originally impacted wells, as discussed in this section and in Appendix I. The analysis is expected to be used in the development of the source water assessment of VWC Well 201.

All proceedings and data are available to the public through a DTSC information repository as well as public meetings.

5.2.2 Metals and Salts

Metals and salts are tested in wells at least every three years and in Castaic Lake water every month. Small quantities of naturally occurring arsenic are found in Castaic Lake and in a few wells. Inorganic compounds such as salts and metals can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming. Arsenic levels in the Santa Clarita Valley are below the MCL (Luhdorff & Scalmanini, 2010).

Nitrate in drinking water at levels above 45 mg/L is a health risk for infants less than six months of age due to the possibility of methemoglobinemia. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. Principal sources of nitrogen to a watershed typically include discharges from water reclamation plants and runoff from agricultural activities. Elevated nitrogen concentrations (ammonia, nitrate and nitrite) can cause impairments in warm water fish and wildlife habitat, along with contributing to eutrophic effects such as algae growth and low dissolved oxygen. Nitrates are tested at least annually and the drinking water meets federal and state MCL standards (CCR, 2010).

A chloride TMDL was established in 1998 due to the listing of Reaches 5 and 6 of the Upper Santa Clara River for chloride on the 303(d) list. Sources of chloride include water softeners, SWP and other imported water and wastewater effluent. The chloride TMDL includes a number of special studies to provide scientific certainty over the appropriate waste load allocations and objectives for chloride that are necessary to support various beneficial uses, including salt-sensitive agriculture, groundwater and endangered species. The special studies performed for the TMDL found that the WQO of 100 mg/L could not be achieved as adopted in 2005. As a result, conditional site specific objectives were adopted in 2008 as described by the Los Angeles RWQCB Staff Report on the Upper Santa Clara River Chloride TMDL Reconsideration and Conditional Site-Specific Objectives. To comply with the chloride TMDL, a stakeholder-driven group developed the Alternative Water Resources Management (AWRM) Plan that provides multiple benefits for stakeholders in Los Angeles and Ventura Counties. These benefits include the revision of water quality objectives that will support water recycling and thereby increase water supplies in the CLWA service area. In addition, the AWRM will implement water supply facilities in Ventura County that will allow for the conjunctive use of groundwater and surface water resources to increase water supplies and improve water quality in groundwater and surface waters of the Santa Clara River watershed. As part of the agreement, the SCVSD and CLWA plan to amend the existing recycled water agreement to expand the quantity of recycled water that can be purchased by the water suppliers from the SVCSD. The AWRM also calls for accelerated expansion of CLWA's Recycled Plan, which would reduce chloride mass loading in the Santa Clara River, particularly during dry seasons, additional information provided in Chapter 4.

SCVSD, CLWA and the retail water purveyors have been exploring alternative approaches towards developing an adaptive management strategy that could reduce the cost of implementing the AWRM.

5.2.3 Disinfection By-Products

CLWA uses ozone and chloramines to disinfect its water. Disinfection By-Products (DBPs), which include Trihalomethanes (THMs) and Haloacetic Acids (HAA5), are generated by the interaction between naturally occurring organic matter and disinfectants such as chlorine and ozone. THMs and HAA5 are measured at several points in each system and averaged once per quarter and reported as a running annual average.

Ozone is a very powerful disinfectant that not only kills organisms that no other disinfectant can, but also destroys organic chemicals that causes unpleasant tastes and odors. However, ozone can also interact with bromide, a naturally occurring salt, to produce bromate. As a result, CLWA is required to analyze the water leaving its two treatment plants for bromate once a month under federal regulations and the State's adopted Disinfectants and Disinfection Byproducts Rule (D/DBP Rule).

5.2.4 Hardness

In 2008, the VWC began a demonstration project delivering pre-softened groundwater from one of its wells to approximately 420 residents located in the Copperhill Community of Valencia. Hard water is the primary complaint from Valley customers and it is estimated that more than 50 percent have installed individual water softening units in their homes. In addition to having high operating costs, many of these units are designed to discharge a brine (salt) solution to the sanitary sewer system that is eventually discharged to the Santa Clara River. The environmental impact of such discharges was the subject of the chloride TMDL investigation which concluded with a commitment by the purveyors to achieve surface water quality goals for instream discharge from the basin. VWC's project is aimed at improving the quality of water for its customers to eliminate the need for home softening devices and to achieve the environmental benefits of reduced chloride discharge to the river.

The demonstration project utilizes softening technology that removes calcium and produces small calcium carbonate pellets that can be reused in a variety of industries. The demonstration project has now been operated for over two years and provides VWC with customer feedback and technical/financial information to assess potential future expansion of treatment to other well sites.

5.2.5 Microbiological

Microbial contaminants, such as viruses and bacteria, can be naturally occurring or result from urban storm water runoff, sewage treatment plants, septic systems, agricultural livestock operations and wildlife. Water is tested throughout the systems weekly for Total Coliform bacteria and testing for *Escherichia coli* (*E. coli*) occurs when coliform testing is positive. No *E. coli* was detected in any drinking waters in 2010. The MCL for total coliforms is 5 percent of all monthly tests showing positives for larger systems. Bacteriological tests met federal and state requirements. Additional microbiological tests for the water-borne parasites *Cryptosporidium parvum* and *Giardia lamblia* were performed on Castaic Lake water, and none were detected.

5.2.6 Radiological Tests

Radioactive compounds can be found in both ground and surface waters, and can be naturally occurring or be the result of oil and gas production and mining activities. Testing is conducted for two types of radioactivity; alpha and beta. If none is detected at concentrations above five picoCuries per liter no further testing is required. If it is detected, the water must be checked for uranium and radium. Although naturally occurring radioactivity can be detected, the levels meet the federal and state MCL standards.

5.2.7 Organic Compounds

Organic chemical contaminants, including synthetic and volatile organic chemicals, are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems. Organic compounds also include pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses. Water is tested for two types of organic compounds, volatile organic compounds (VOCs) and non-volatile synthetic organic compounds (SOCs). These organic compounds are synthetic chemicals produced from industrial and agricultural uses. Castaic Lake water is checked annually for VOCs and SOCs. Tetrachloroethylene (TCE) was found in trace levels below the MCL in groundwater in the Valley. Local wells are tested at least annually for VOCs and periodically for SOCs.

5.3 Imported Water Quality

CLWA provides SWP and other imported water to the Valley. The source of SWP water is rain and snow of the Sierra Nevada, Cascade and Coastal mountain ranges. This water travels to the Delta through a series of rivers and various SWP structures. From there it is pumped into a series of canals and reservoirs, which provide water to urban and agricultural users throughout the San Francisco Bay Area and central and southern California. The most southern reservoir on the West Branch of the SWP California Aqueduct is Castaic Lake. CLWA receives water from Castaic Lake and distributes it to the purveyors following treatment.

CLWA operates two water treatment plants, the Earl Schmidt Filtration Plant located near Castaic Lake and the Rio Vista Water Treatment Plant located in Saugus. CLWA produces water that meets drinking water standards set by the U.S. EPA and DPH. SWP water has different aesthetic characteristics than groundwater, with lower dissolved mineral concentrations (total dissolved solids) of approximately 250 to 360 mg/L, and lower hardness (as calcium carbonate) of about 105 to 135 mg/L. Historically, the chloride content of SWP water varies widely from over 100 milligrams per liter (mg/L) to below 40 mg/L, depending on Delta conditions; however as discussed below, SWP operations have changed significantly since historic levels of chloride were experienced.

Historically, the SWP delivered only surface water from the Sacramento-San Joaquin River Delta. However, CLWA and other SWP users, in anticipation of increased demand and dry periods, began “water banking” programs where SWP water could be stored or exchanged during wet years and withdrawn in dry years. The last three years have seen severe statewide drought. As a result, water has been withdrawn from the banking programs. This withdrawn water can either be delivered by exchange with SWP supplies allocated to others, or by pumping it into the SWP system. During the period of 2008 through 2010, a greater portion of water in the SWP has been this “pumped-in” water. The “pumped-in” water has met all water

quality standards established by DWR under its anti-degradation policy for the SWP. In particular, the pumped-in water serves to reduce the chloride concentration in SWP water. CLWA, on behalf of the SCVSD, is currently developing a SWP water quality model to quantify potential chloride reductions in SWP water due to "pumped-in" water. The results of this modeling will inform potential modifications to the AWRM Plan.

The SWP water chemistry may fluctuate and is influenced by its passage through the Delta in which large amounts of organic material are present and salt water from San Francisco Bay that contributes bromide and chlorides. Chloride levels from the Delta elevate chloride locally resulting in concern for local agriculture that grows chloride sensitive crops. Additionally, bromide and total organic carbon (TOC) may react with disinfectants such as ozone, chlorine, or DBPs. All constituents meet the federal and state MCL levels as reported in the CCR but remain a management concern in the watershed.

5.4 Surface Water Quality

CLWA does not deliver and treat water from the Santa Clara River as a source of supply; however, this source is a continual source of recharge to the underlying groundwater basin.

Surface water quality data for the Upper Santa Clara River in the County is based on the DWR investigation of water quality and beneficial uses conducted for the Upper Santa Clara River Hydrologic Area (DWR 1993). The investigation found that Castaic Lake and Castaic Lagoon water are influenced by thermal stratification and biochemical processes. Castaic Lake contains a high level of sodium chloride from SWP deliveries to the system; while sodium-calcium bicarbonate to sodium bicarbonate dominates Bouquet Canyon due to water deliveries from the Los Angeles Aqueduct (Mono-Owens water) that is stored in Bouquet Reservoir.

The surface water quality data in the Upper Santa Clara River are obtained from continuous sampling records at two gaging stations at the Old Highway Bridge and at the Los Angeles - Ventura County Line and historical records at two stations near Ravenna and Lang. The period of water quality records for these stations is from 1951 to 1990 (UWCD and CLWA 1996). These data have shown increasing concentrations of TDS and sulfate downstream and an overall general decrease, respectively, over the studied time period.

Nitrate ranged from 9 to 35 milligrams per liter (mg/L) nitrate at the Blue Cut gaging station near the County line but it generally occurs in very low concentrations in the undeveloped drainages north of the Santa Clara River. Chloride concentrations tend to also be relatively low in undeveloped portions of the watershed and higher in developed areas. Sources of chloride include water softeners, SWP water and wastewater effluent. Salt loading during 2001-2007 from the Saugus and Valencia WRP ranged from 23,500 pounds per day (ppd) to 28,500 ppd. SWP chloride contributions measured between 28 mg/L to 128 mg/L based on records from the past thirty years (Los Angeles RWQCB 2008) and have averaged just over 70 mg/L for the past few years.

5.5 Groundwater Quality

The groundwater basin has two sources of groundwater, the Alluvial Aquifer whose quality is primarily influenced by rainfall and stream flow, and the Saugus Formation which is a much deeper aquifer and recharged primarily by a combination of rainfall and deep percolation from the partially overlying Alluvium. A larger part of the Valley's groundwater supply is from the

Alluvial Aquifer, between 30,000 to 40,000 AFY; and a smaller portion of the Valley's water supply is drawn from the Saugus Formation, between 7,500 and 15,000 AFY in normal water years.

Local groundwater does not have microbial water quality problems. Parasites, bacteria and viruses are filtered out as the water percolates through the soil, sand and rock on its way to the aquifer. Even so, disinfectants are added to local groundwater when it is pumped by wells to protect public health. Local groundwater has very little TOC and generally has very low concentrations of bromide, minimizing potential for DPB formation. Taste and odor problems from algae are not an issue with groundwater.

The mineral content of local groundwater is very different from SWP water. The groundwater is very "hard," and it has high concentrations of calcium and magnesium (approximately 250 to 600 mg/L total hardness as $CaCO_3$). Groundwater may also contain higher concentrations of nitrates and chlorides when compared to SWP water. However, all groundwater meets drinking water standards.

5.5.1 Water Quality - Alluvium

Groundwater quality is a key factor in assessing the Alluvial Aquifer as a municipal and agricultural water supply. Groundwater quality details and long-term conditions, examined by integration of individual records from several wells completed in the same aquifer materials and in close proximity to each other, have been discussed in the annual Water Reports and in the 2005 UWMP. There were some changes in groundwater quality in 2009 that reflect fluctuations, trends or other groundwater quality conditions. Most of the trends show a significant lowering of the specific conductance values by half following the wet years of 2004-2005. Since then, those trends have returned to 2004 levels but do not exceed historical levels. In summary, those conditions include no long-term overall trend and, most notably, no long-term decline in Alluvial groundwater quality; a general groundwater quality "gradient" from east to west, with lowest dissolved mineral content to the east, increasing in a westerly direction; and periodic fluctuations in some parts of the basin, where groundwater quality has inversely varied with precipitation and stream flow. Those variations are typically characterized by increased mineral concentrations through dry periods of lower stream flow and lower groundwater recharge, followed by lower mineral concentrations through wetter periods of higher stream flow and higher groundwater recharge.

Specific conductance throughout the Alluvium is currently below the Secondary (aesthetic) MCL of 1,600 micromhos per centimeter (µmhos/cm). The presence of long-term consistent water quality patterns, although intermittently affected by wet and dry cycles, supports the conclusion that the Alluvial aquifer is a viable ongoing water supply source in terms of groundwater quality.

The most notable groundwater quality issue in the Alluvium is perchlorate contamination. Section 5.2.1 describes this issue in detail.

5.5.2 Water Quality - Saugus Formation

Water quality in the Saugus Formation has not historically exhibited the precipitation-related fluctuations seen in the Alluvium. As discussed above for the Alluvium, groundwater quality is a key factor in also assessing the Saugus Formation as a municipal and agricultural water supply. Long-term Saugus groundwater quality data are not sufficiently extensive to permit any sort of

basin-wide analysis or assessment of pumping-related impacts on quality. However, integration of individual records from several wells has been used to examine general water quality trends. Based on those records, water quality in the Saugus Formation had not historically exhibited the precipitation-related fluctuations seen in the Alluvium. Based on available data over the last fifty years, groundwater quality in the Saugus had exhibited a slight overall increase in dissolved mineral content. More recently, several wells within the Saugus Formation exhibited an additional increase in dissolved mineral content, similar to short term changes in the Alluvium, possibly as a result of recharge to the Saugus Formation from the Alluvium. Since 2005, however, these levels have been steadily dropping or remaining constant.

Dissolved mineral concentrations in the Saugus Formation remain below the Secondary (aesthetic) MCL. Groundwater quality within the Saugus will continue to be monitored to ensure that degradation that presents concern relative to the long-term viability of the Saugus as an agricultural or municipal water supply does not occur.

As with the Alluvium, the most notable groundwater quality issue in the Saugus Formation is perchlorate contamination. Perchlorate was originally detected in four Saugus wells operated by the retail water purveyors in the eastern part of the Saugus Formation in 1997, near the former Whittaker-Bermite facility. Two of those impacted wells have now been “restored” and returned to municipal water supply service as described in Section 5.2.1. A third impacted well has been abandoned and replaced by a new well, distant from the perchlorate-impacted part of the Saugus Formation. The fourth impacted well remains out of service, with its capacity made up from the restored and other non-impacted Saugus wells. The inactivation of that well does not limit the ability of the purveyors to meet water requirements. The local retail water purveyors continue to test for perchlorate in active water supply wells near the Whittaker-Bermite site. While perchlorate was detected in a fifth Saugus well nearby, the concentration was very low and below the detection limit for reporting. The sixth Saugus well with recently detected perchlorate concentrations that exceed the maximum contaminant levels for drinking water has been taken out of service pending evaluation of remediation alternatives including wellhead treatment and reactivation. There has been no additional detection of perchlorate above the detection limit for reporting in any other municipal Saugus well.

5.6 Aquifer Protection

There has been extensive investigation of the extent of perchlorate contamination which, in combination with the groundwater modeling previously described in Section 3.3.2.1, has led to the now-implemented plan for integrated control of contamination migration and restoration of impacted pumping (well) capacity. While most of the perchlorate contamination control and restoration plan is focused on the Saugus Formation, part of that plan includes potential capture of contaminated groundwater in the Alluvium by pumping of selected Saugus wells. Specific long-term resolution of perchlorate contamination in the Alluvium, which impacted two water supply wells, had focused on a combination of temporary wellhead treatment at one well, VWC’s Well Q2, replacement of the second impacted well, SCWD’s Stadium well, and several source control methods such as on-site pumping and treatment in the northern Alluvium (at the northerly portion of the former Whittaker-Bermite site). An ongoing challenge is protection of active Alluvial wells that could be impacted, including what effect that might have on adequacy of Alluvial groundwater pumping capacity and what response will be taken.

In April 2005, perchlorate was detected in VWC’s Well Q2. VWC’s response was to remove the well from active water supply service and to rapidly seek approval for installation of wellhead

treatment and return of the well to service. As part of outlining its plan for treatment and return of the well to service, VWC analyzed the impact of the temporary inactivation of the well on its water supply capability; the analysis determined that VWC's other sources are sufficient to meet demand and that the inactivation of Well Q2 had no impact on VWC's water supply capability (LSCE, 2005). VWC proceeded through mid-2005 to gain approval for installation of wellhead treatment (ion-exchange as described below), including environmental review and completed the installation of the wellhead treatment facilities in September 2005. Well Q2 was returned to active water supply service in October 2005.

After nearly two years of operation with wellhead treatment, including regular monitoring specified by DPH, all of which resulted in no detection of perchlorate in Well Q2, Valencia requested that DPH allow treatment to be discontinued. DPH approved that request in August 2007, and treatment was subsequently discontinued. DPH-specified monitoring for perchlorate continues at Well Q2, which remains in service; there has been no detection of perchlorate since discontinuation of wellhead treatment.

Ongoing monitoring of all active municipal wells near the Whittaker-Bermite site has shown no detections of perchlorate in any active Alluvial wells. However, based on a combination of proximity to the Whittaker-Bermite site and prevailing groundwater flow directions, complemented by findings in the ongoing on-site and off-site investigations by Whittaker-Bermite and the ACOE, there is logical concern that perchlorate could impact nearby, downgradient Alluvial wells. As a result, provisions are in place to respond to perchlorate contamination if it should occur. The groundwater model was used to examine capture zones around Alluvial wells under planned operating conditions (pumping capacities and volumes) (Technical Memorandum "*Analysis of Near-Term Groundwater Capture Areas for Production Wells Located Near the Whittaker-Bermite Property (Santa Clarita, California)*", CH2M Hill, December 2004). The capture zone analysis of Alluvial wells generally near the Whittaker-Bermite site suggests that inflow to those wells will either be upgradient of the contamination site, or will be from the Alluvium beyond where perchlorate is most likely to be transported, with the possible exception of the VWC's Pardee wellfield (which includes Wells N, N7 and N8). Although the capture zone analysis does not show the Pardee wells to be impacted, they are considered to be at some potential risk due to the proximity of their capture zone to the Whittaker-Bermite site.

The combined pumping capacity of VWC's Pardee wells is 6,200 gpm, which equates to about 10,000 AF of maximum annual capacity. However, in the operating plan for both normal and dry-year Alluvial pumping, the planned use of those wells represents 2,940 AFY of the total 30,000 to 40,000 AFY Alluvial groundwater supply. Thus, if the wells were to become contaminated with perchlorate, they would represent an amount of the total Alluvial supply that could be readily replaced on a short-term interim basis by utilizing an equivalent amount of imported water from CLWA or by utilizing existing capacity from other Alluvial wells. However, if the Pardee wells were to become contaminated by perchlorate contamination, VWC has made site provisions at its Pardee wellfield for installation of wellhead treatment. Such treatment would be the same methodology as installed at its Well Q2.

On the Whittaker-Bermite site, soil remediation activities in operating unit subareas started in 2005. Groundwater "pump and treat" operations in the Northern Alluvium also started in 2005 and is ongoing. Expanded pumping, intended to effect perchlorate containment as well as to treat 'hot spots' in the Northern Alluvium, became operational in October 2007.

In addition, on-site remediation, a Work Plan for a Pilot Remediation Pumping Program in the Northern Alluvium and certain on-site sub-areas east/southeast, or generally upgradient of the impacted Stadium Well, was completed in June 2005. The pilot program began sustained operation in October 2007. That program involves the establishment of containment, generally along the northern boundary of the Whittaker-Bermite site, upgradient of the Stadium Well, by continuous pumping of a former Whittaker-Bermite facility well, complemented by pumping at several groundwater "hot spots" also generally upgradient of the Stadium Well. Due to the low conductivity of the aquifer materials at the various "hot spots," pumping for containment at those locations would be from several wells at low pumping capacities. Extracted water would be treated at Whittaker-Bermite's existing on-site treatment system. Generally consistent with the Saugus restoration concept, the Northern Alluvium pumping program would have the concurrent objectives of preventing site-related contaminants from leaving the site and removing some contamination from groundwater such that it can be removed in the on-site treatment process prior to discharge of the water back to the groundwater Basin.

In February 2003, DTSC and the impacted purveyors entered into a voluntary cleanup agreement entitled *Environmental Oversight Agreement*. Under the Agreement, DTSC is providing review and oversight of the response activities being undertaken by CLWA and the purveyors related to the detection of perchlorate in the impacted wells. Under the Agreement's Scope of Work, CLWA and impacted purveyors prepared a Work Plan for sampling the production wells, a report on the results and findings of the production well sampling, a draft Human Health Risk Assessment, a draft Remedial Action Work Plan, an evaluation of treatment technologies and an analysis showing the integrated effectiveness of a project to restore impacted pumping capacity, extract perchlorate-impacted groundwater from two Saugus wells for treatment, and control the migration of perchlorate in the Saugus Formation. Environmental review of that project was completed in 2005 with adoption of a mitigated Negative Declaration. The Final Interim Remedial Action Plan for containment and extraction of perchlorate was completed and approved by DTSC in January 2006. Design and construction of the treatment facilities and related pipelines to implement the pump and treat program and to also restore inactivated municipal well capacity has been completed and the restored wells are now returned to service as part of the operational Saugus groundwater supply (see Section 3.3).

A Rapid Response Fund has also been established under the terms of the CLWA Litigation Settlement Agreement. The fund will be used if the remedy to contain perchlorate contamination in the Alluvial Aquifer and portions of the Saugus Formation does not prevent migration of the perchlorate plume towards downgradient threatened wells (VWC Wells N, N-7, N-8, S6, S7, S8, 201 and 205 and NCWD Wells NC-10, NC-12 and NC-13). The Rapid Response Fund provides up to $10 million for any additional costs of providing replacement water, associated operations and maintenance costs of treatment equipment and resin under the terms of the Agreement. As noted, VWC Well 201 was a downgradient threatened well, so it is anticipated that the fund will be used for evaluating remediation alternatives, including wellhead treatment, of perchlorate recently detected in Well 201.

5.7 Water Quality Impacts on Reliability

Three factors affecting the availability of groundwater are sufficient source capacity (wells and pumps),sustainability of the groundwater resource to meet pumping demand on a renewable basis and protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. The first two of those factors are addressed in Section 3. The resolution of contamination for aquifer protection is addressed below.

Perchlorate has been a water quality concern in the Valley since 1997 when it was originally detected in four wells operated by the purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite facility. Subsequent monitoring well installation has been completed; and a focused study of the Saugus Formation has ultimately been incorporated into the overall groundwater remediation and perchlorate containment. All remedial action has been reviewed by the DTSC.

Overall, the plans developed for groundwater operation will allow CLWA and the retail purveyors to meet near term and long term demand within the CLWA service area. Any well impacted by perchlorate will be removed from service in the near term and the loss of capacity will be met by near-term excess capacity in non-impacted wells or through the installation of replacement well(s), if necessary, until remediation alternatives, including wellhead treatment, and DPH approval is obtained for restoration of the impacted supply. The current removal of VWC Well 201 from service does not limit the reliability of the water supply since there is sufficient excess capacity in Saugus wells to meet water supply projections during the period required for its restoration. Therefore, no anticipated change in reliability or supply due to water quality is anticipated based on the present data, as is shown in Table 5-2.

TABLE 5-2
CURRENT AND PROJECTED WATER SUPPLY CHANGES DUE TO WATER QUALITY - PERCENTAGE CHANGE

Water source	2010	2015	2020	2025	2030	2035	2040	2045	2050
Groundwater									
Alluvial	0%	0%	0%	0%	0%	0%	0%	0%	0%
Saugus	16%[(a)]	0%	0%	0%	0%	0%	0%	0%	0%
Imported Water	0%	0%	0%	0%	0%	0%	0%	0%	0%
Recycled Water	0%	0%	0%	0%	0%	0%	0%	0%	0%
Banking Programs	0%	0%	0%	0%	0%	0%	0%	0%	0%

Note:
(a) The removal of VWC Well 201 would on a temporary basis reduce the quantity of water available from the Saugus Formation by 3,777 AFY in certain dry years. The 16% water supply impact shown in this table represents the percentage of VWC Well 201 capacity to the total 24,100 AFY single dry year well capacity from the Saugus Formation as indicated in Table 3-11. Table 8-3 illustrates that the removal of VWC Well 201 would not result in inadequate well capacity should a multi-year dry period occur in the near term. Further, Tables 6-4 and 6-5 illustrate that, for a single dry year, existing and planned water supplies exceed demand by more than 28,000 AFY and 36,000 AFY assuming 2015 levels of demand. In conclusion, the temporary loss of capacity from VWC Well 201, as discussed in Sections 3, 5, 6 and 8 and Appendices C and I, does not result in a shortage to the water suppliers.

Section 6: Reliability Planning

6.1 Overview

The Act requires urban water suppliers to assess water supply reliability that compares total projected water use with the expected water supply over the next twenty years in five year increments. The Act also requires an assessment for a single dry year and multiple dry years. This chapter presents the reliability assessment for CLWA's service area.

It is the stated goal of CLWA and the retail water purveyors to deliver a reliable and high quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions over the next forty years in combination with conservation of non-essential demand during certain dry years, the Plan successfully achieves this goal.

6.2 Reliability of Water Supplies

Each water supply source has its own reliability characteristics. In any given year, the variability in weather patterns around the state may affect the availability of supplies to the Valley differently. For example, from 2000 through 2002, southern California experienced dry conditions in all three years. During the same period, northern California experienced one dry year and two normal years. The Valley is typical in terms of water management in southern California; local groundwater supplies are used to a greater extent when imported supplies are less available due to dry conditions in the north, and larger amounts of imported water supplies are used during periods when northern California has wetter conditions. This pattern of "conjunctive use" has been in effect since SWP supplies first came to the Valley in 1980. SWP and other imported water supplies have supplemented the overall supply of the Valley, which previously depended solely on local groundwater supplies.

To supplement these local groundwater supplies, CLWA contracted with DWR for delivery of SWP water, providing an imported water supply to the Valley. However, the variability in SWP supplies affects the ability of the purveyors to meet the overall water supply needs for the service area. While each of the Valley's available supply sources has some variability, the variability in SWP supplies has the largest effect on overall supply reliability.

As discussed in Section 3.2, each SWP contractor's Water Supply Contract contains a Table A Amount that identifies the maximum amount of Table A water that contractor may request each year. However, the amount of SWP water actually allocated to contractors each year is dependent on a number of factors than can vary significantly from year to year. The primary factors affecting SWP supply availability include the availability of water at the source of supply in northern California, the ability to transport that water from the source to the primary SWP diversion point in the southern Delta and the magnitude of total contractor demand for that water. In many years, the availability of SWP supplies to CLWA and the other SWP contractors is less than their maximum Table A Amounts, and can be significantly less in very dry years.

DWR's *Reliability Report*, prepared biennially assists SWP contractors and local planners in assessing the reliability of the SWP component of their overall supplies. In its Reliability Reports, DWR presents the results of its analysis of the reliability of SWP supplies, based on

model studies of SWP operations. In general, DWR model studies show the anticipated amount of SWP supply that would be available for a given SWP water demand, given an assumed set of physical facilities and operating constraints, based on 82 years of historic hydrology. The results are interpreted as the capability of the SWP to meet the assumed SWP demand, over a range of hydrologic conditions, for that assumed set of physical facilities and operating constraints.

DWR's 2009 update of the *Reliability Report* presents the results of model studies for years 2009 and 2029. In these model studies, DWR assumed existing SWP facilities and operating constraints for both the 2009 and 2029 studies. The primary differences between the two studies are an increase in projected SWP contractor demands, an increase in projected upstream demands (which affects SWP supplies by reducing the amount of inflows available for the SWP), and the inclusion in the 2029 study of potential impacts on historic hydrology of the effects of climate change and accompanying sea level rise. In the report, DWR presents the SWP delivery capability resulting from these studies as a percent of maximum contractor Table A Amounts. To estimate supply capability in intermediate years between 2009 and 2029, DWR interpolates between the results of those studies.

6.3 Normal, Single-Dry, and Multiple-Dry Year Planning

The water suppliers have various water supplies available to meet demands during normal, single-dry, and multiple-dry years. The following sections elaborate on the different supplies available to the water suppliers including groundwater, recycled water and imported supplies.

6.3.1 Groundwater

In accordance with the groundwater operating plan for the basin, groundwater supplies for all uses from the Alluvial Aquifer are planned to be in the range 30,000 to 40,000 AFY in average years and 30,000 to 35,000 AFY in dry years; supplies from the Saugus Formation are projected to be 7,500 to 15,000 AFY in average years and 15,000 to 35,000 AFY in dry years. The updated Basin Yield analysis (LSCE and GSI, 2009) concluded pumping in those ranges to be sustainable. While there is sufficient Alluvial pumping capacity to achieve the Alluvial groundwater supply (Table 3-8), it is planned that VWC will develop some future capacity as it constructs municipal supply wells to replace existing agricultural wells when planned development converts existing agricultural land use to municipal land use. Existing Saugus pumping capacity is sufficient to achieve about 27,000 AFY (Table 3-9), or about 77 percent of the upper end of the Saugus operating plan. Hence, it is planned that restored capacity (VWC Well 201) and future Saugus pumping capacity (new wells) will be added to achieve the full range of the Saugus operating plan.

The existing and planned groundwater supplies used in this Plan are generally the pumping rates, within the operating plan ranges, that were analyzed in the Basin Yield update. As such, they tend toward the upper ends of the respective ranges except for normal year Saugus pumping, which is closer to mid-range of the Saugus operating plan. For the multiple-dry year period, it was assumed that pumping from the Saugus Formation would be governed by the groundwater operating plan summarized in Table 3-5, with average pumping over the 4-year dry period of about 21,500 AFY. Total projected Alluvial and Saugus pumping, including pumping by the purveyors and by agricultural and other users, is shown by year type in Tables 3-7 to

3-12 in Section 3. As shown there, total pumping in each year type remains within the pumping ranges in the groundwater operating plan.

6.3.2 Recycled Water

Recycled water is available from the Saugus WRP and Valencia WRP. Recycled water is also anticipated to be produced by the Newhall WRP for the Newhall Ranch Specific Plan development, as described in Section 4.

CLWA has completed construction of Phase I of its Recycled Plan, a multi-phased program to deliver recycled water in the Valley. Phase 1 can deliver 1,700 AFY of water through the VWC system. Deliveries of recycled water began in 2003 for irrigation water supply at a golf course and in roadway median strips. In 2010, recycled water deliveries were approximately 325 AF.

CLWA completed a preliminary design report in 2009 on the second phase of the Recycled Plan (Phase 2A), which will take water from the Saugus WRP and distribute it to identified users to the north, across the Santa Clara River and then to the west and east. Large irrigation customers will be served with this expansion with a collective design that will increase recycled water deliveries by 500 AFY.

Recycled water will be further expanded within the region with the South End Recycled Water project (Phase 2C), which will expand the existing recycled water transmission and distribution system southerly to supply recycled water to additional VWC customers, as well as some customers served by NCWD and the SCWD. The Project includes the planning, designing and construction of Phase 2C of the region's Recycled Plan, with recycled water improvements including various recycled water pipelines and pumping stations resulting in the use of an estimated 910 AFY of recycled water.

Overall, the recycled water program is expected to ultimately deliver up to 22,800 AFY of treated (tertiary) wastewater suitable for reuse on golf courses, landscaping and other non-potable uses. Of this total, 21,300 AFY is projected use by purveyor customers. This supply is assumed to be available in an average year, a single-dry year, and in each year of a multiple-dry year period.

6.3.3 State Water Project Table A Supply

For this Plan, the availability of SWP supplies to CLWA was based on DWR's 2009 *Reliability Report*, taken from more detailed results provided by DWR from the model studies presented in the 2009 *Reliability Report*. For the three hydrologic conditions evaluated here, the SWP deliveries to CLWA were taken from DWR's analyses based on the following: average/normal year based on the average deliveries over the studies' 82-year historical hydrologic study period (1922-2003), single-dry year based on a repeat of the worst-case historical hydrologic conditions of 1977, and multiple-dry year period based on a repeat of the historical four-year drought of 1931-1934.

As discussed in more detail in Section 3 (see Section 3.2.1.2.3), a planning effort to increase long-term supply reliability for both the SWP and CVP is taking place through the Bay Delta Conservation Plan (BDCP). While the proposed conveyance facilities that are part of the BDCP would increase SWP supply reliability, that increase is not included here. Any of the proposed

facilities that are completed would increase SWP reliability beyond the values used throughout this Plan.

6.3.3.1 Flexible Storage Account

Under the Water Supply Contracts with DWR for SWP water, the contractors that share in the repayment of Castaic Lake may access a portion of the storage in that reservoir. This accessible storage is referred to as "flexible storage." The contractors may withdraw water from flexible storage, in addition to their allocated Table A supplies, on an as-needed basis. A contractor must replace any water it withdraws from this storage within five years. As one of the three contractors sharing in the repayment of Castaic Lake, CLWA has access to this flexible storage. Its share of the total flexible storage is currently 4,684 AF. After negotiations with Ventura County water agencies in 2005, CLWA gained access to their 1,376 AF of flexible storage for ten years through 2015. While it is expected that CLWA and Ventura County will extend the existing flexible storage agreement beyond the 2015 term, in this Plan it is not assumed to be available beyond 2015.

CLWA plans to use this supply only in dry years. For the single-dry year condition, it was assumed the entire amount would be used. For the multiple-dry year condition, it was assumed that the entire amount would be used sometime during the four-year period, so the average annual supply during that period would be one fourth of the total. Any water withdrawn was assumed to be replaced in intervening average and wet years and would be available again for use in the next dry year.

6.3.4 Buena Vista-Rosedale

BVWSD and RRBWSD, both member districts of KCWA, have jointly developed a program that provides both a firm water supply of 11,000 AFY and a water banking component. This supply program provides a firm annual water supply available every year based on existing and long-standing Kern River water rights, which is delivered by exchange of Buena Vista's and Rosedale's SWP Table A supplies.

6.3.5 Nickel Water - Newhall Land

This supply is similar to Buena Vista-Rosedale supply both in regard to its source (Kern River water rights) and level of reliability. The supply from this program is up to 1,607 AFY of firm supply, which is available in every year. It was acquired by the developer of the Newhall Ranch project to supplement groundwater and recycled water sources of supply for that project, which is in the CLWA service area. In this Plan, it is anticipated that this water supply will be available to VWC.

6.3.6 Semitropic Banking Program

In 2002, CLWA stored 24,000 AF of its allocated SWP Table A supply through a groundwater banking agreement with Semitropic. In 2004, CLWA stored 32,522 AF of its 2003 allocated SWP Table A supply in a second Semitropic storage account. Under the terms of those agreements, and after consideration for losses within the groundwater basin, CLWA could withdraw up to 50,870 AF when needed within ten years of when the water was stored. Of this storage, CLWA withdrew 4,950 AF in 2009 and 2010, leaving 45,920 AF currently available for

withdrawal. CLWA executed an amendment for a ten-year extension of each banking agreement with Semitropic in April 2010.

In addition to this short-term storage for CLWA, Semitropic has a long-term groundwater banking program with several other partners. The facilities that Semitropic may use in the return of CLWA's banked water supply are the same facilities that Semitropic may use to return banked water to its long-term banking program partners. As a result, there may be competition for use of those facilities in a particularly dry year, which could limit CLWA's ability to access the water in that year.

CLWA plans to use this supply only in dry years. For the single dry year, it was assumed that competition among Semitropic's banking partners for use of return facilities would limit CLWA's supply to about one third of the storage available, or about 15,000 AF. For the multiple-dry year period, it was assumed that the entire amount would be accessible and used sometime during the four-year period, so the average annual supply during that period would be one fourth of the total available, or about 11,500 AF. Under the agreements for this program, including the agreement for the ten-year time extension, the stored water must be withdrawn within twenty years of when it was stored. Therefore, it was assumed that this supply is available only through 2023.

6.3.7 Semitropic Banking Program - Newhall Land

As was the case for the Nickel water, the banking program was entered into by the developer of the Newhall Ranch project to firm up the reliability of the water supply for the project, which is in the CLWA service area. The storage capacity of this program is 55,000 AF. Newhall Land currently has 18,892 AF stored in this program. It is anticipated that this supply will be available to VWC.

VWC plans to use this supply only in dry years. For the single-dry year, supplies were assumed at the program's maximum withdrawal capacity of 4,950 AFY. For the multiple-dry year period, supplies in each year of the dry period were assumed at the program's maximum withdrawal capacity of 4,950 AFY and that additional supplies would be banked during wetter years to allow withdrawal of this amount.

6.3.8 Rosedale-Rio Bravo Banking Program

RRBWSD has also developed a water banking and exchange program. CLWA has entered into a long-term agreement with RRBWSD which provides it with storage and withdrawal capacity of 20,000 AFY and up to 100,000 AF of storage capacity. Withdrawals from the program can be made by exchange of Rosedale's SWP Table A supply, or by pumpback into the California Aqueduct. CLWA began storing water in this program in 2005 and has since reached the program's maximum storage capacity, with 100,000 AF currently available for withdrawal.

CLWA plans to use this supply only in dry years. For the single-dry year, supplies were assumed at the program's maximum withdrawal capacity of 20,000 AF. For the multiple-dry year period, it was assumed that supplies would average at least 15,000 AFY over the dry period and that additional supplies would be banked during wetter years to allow withdrawal of at least this amount.

6.3.9 Additional Planned Banking

CLWA's 2009 update of its Reliability Plan identifies a need for additional banking programs to firm up the dry-year reliability of service area supplies, and includes an implementation schedule to increase both storage and pumpback capacity beginning in 2010 and incrementally increasing through 2050. While a specific banking program has not yet been identified, CLWA's plans call for development of additional groundwater banking programs with pumpback capacity of at least an additional 10,000 AF by 2025, and a second additional 10,000 AF by 2035. For the single-dry year, supplies were assumed at the programs' pumpback capacity. For the multiple-dry year period, it was assumed that supplies would average at least 75 percent of the pumpback capacity over the dry period.

6.4 Supply and Demand Comparisons

The available supplies and water demands for CLWA's service area were analyzed to assess the region's ability to satisfy demands during three scenarios: a normal water year, single-dry year and multiple-dry years. The tables in this section present the supplies and demands for the various drought scenarios for the projected planning period of 2015-2050 in five year increments. The available supplies and water demands broken down by purveyor during the same three scenarios were also analyzed over the project planning period, and these tables are provided in Appendix C. Table 6-1 presents the base years for the development of water year data. Tables 6-2, 6-3 and 6-4 at the end of this section summarize, respectively, Normal Water Year, Single-Dry Water Year and Multiple-Dry Year supplies.

The reader is referred to Chapter 2 for development of retail purveyor demands and current and projected water supplies are developed in Chapters 3 and 4.

TABLE 6-1
BASIS OF WATER YEAR DATA

Water Year Type	Base Years	Historical Sequence
Normal Water Year	Average	1922-2003
Single-Dry Water Year	1977	--
Multiple-Dry Water Years	1931-1934	--

6.4.1 Normal Water Year

Table 6-2 summarizes the water suppliers' supplies available to meet demands over the 40-year planning period during an average/normal year. As presented in the table, the water suppliers' water supply is broken down into existing and planned water supply sources, including wholesale (imported) water, local supplies and banking programs. Demands are shown with and without the urban demand reduction resulting from SBX7-7 conservation objectives.

See Appendix C for the breakdown by purveyor of supplies available to meet demands over the 40-year planning period during an average/normal year.

TABLE 6-2
PROJECTED AVERAGE/NORMAL YEAR SUPPLIES AND DEMANDS

	2015	2020	2025	2030	2035	2040	2045	2050
Existing Supplies								
Existing Groundwater[a]								
Alluvial Aquifer	24,000	24,000	24,000	25,000	25,000	25,000	25,000	25,000
Saugus Formation[b]	9,225	10,225	10,225	10,225	10,225	10,225	10,225	10,225
Total Groundwater	**33,225**	**34,225**	**34,225**	**35,225**	**35,225**	**35,225**	**35,225**	**35,225**
Recycled Water[c]	325	325	325	325	325	325	325	325
Imported Water								
State Water Project[d]	58,100	57,900	57,600	57,400	57,400	57,400	57,400	57,400
Flexible Storage Accounts	-	-	-	-	-	-	-	-
Buena Vista-Rosedale	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Nickel Water - Newhall Land	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607
Total Imported	**70,707**	**70,507**	**70,207**	**70,007**	**70,007**	**70,007**	**70,007**	**70,007**
Banking Programs[e]								
Rosedale Rio-Bravo	-	-	-	-	-	-	-	-
Semitropic	-	-	-	-	-	-	-	-
Semitropic - Newhall Land	-	-	-	-	-	-	-	-
Total Banking	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Existing Supplies	**104,257**	**105,057**	**104,757**	**105,557**	**105,557**	**105,557**	**105,557**	**105,557**
Planned Supplies								
Future Groundwater[f]								
Alluvial Aquifer	-	1,000	2,000	3,000	4,000	5,000	6,000	7,000
Saugus Formation	1,375	1,375	1,375	1,375	1,375	1,375	1,375	1,375
Total Groundwater	**1,375**	**2,375**	**3,375**	**4,375**	**5,375**	**6,375**	**7,375**	**8,375**
Recycled Water[c]	975	2,725	5,225	7,775	10,275	13,775	17,275	20,975

	2015	2020	2025	2030	2035	2040	2045	2050
Banking Programs[e]	-	-	-	-	-	-	-	-
Total Planned Supplies	**2,350**	**5,100**	**8,600**	**12,150**	**15,650**	**20,150**	**24,650**	**29,350**
Total Existing and Planned Supplies	**106,607**	**110,157**	**113,357**	**117,707**	**121,207**	**125,707**	**130,207**	**134,907**
Demand w/o Conservation[g]	80,070	88,484	96,898	105,312	113,726	122,140	130,554	138,968
20x2020 Reduction[h]	9,027	19,626	21,166	22,770	24,342	25,914	27,486	29,058
Reduction from Recycled Water[i]	1,300	3,050	5,550	8,100	10,600	14,100	17,600	21,300
Reduction from Water Conservation[j]	7,727	16,576	16,662	16,748	16,833	16,919	17,005	17,091
Demand w/ Conservation[k]	**72,343**	**71,908**	**80,236**	**88,564**	**96,892**	**105,220**	**113,549**	**121,877**

Notes:

(a) Existing groundwater supplies represent the quantity of groundwater anticipated to be pumped with existing wells. As indicated in Tables 3-8 and 3-9 and Tables 3-4 and 3-5 of the 2009 Groundwater Basin Yield Analysis, individual purveyors may have well capacity in excess of quantities shown in this table. As indicated in Table 3-10, existing and planned groundwater pumping remain within the groundwater operating plan shown on Table 3-5.
(b) SCWD's existing Saugus 1 and Saugus 2 wells resumed production in 2011 with the completion of the perchlorate treatment facility.
(c) Recycled water projections from Table 4-3.
(d) SWP supplies are based on the Department of Water Resources "2009 State Water Project Delivery Reliability Report."
(e) Not needed in average/normal years.
(f) Planned groundwater supplies represent new groundwater well capacity that may be required by an individual purveyor's production objectives in the Alluvial Aquifer and the Saugus Formation. As indicated in Table 3-10, existing and planned groundwater pumping remain within the groundwater operating plan shown on Table 3- 5.
(g) Demand w/o Conservation data from Table 2-2.
(h) 20x2020 Reduction for the Region from Table 2-22.
(i) Recycled Water Reduction for the Region from Table 2-22; does not include demands from Honor Rancho.
(j) Reduction from Water Conservation calculation for Region from Table 2-22.
(k) Demand w/ Conservation is Demand w/o Conservation minus Reduction from Water Conservation.

6.4.2 Single-Dry Year

The water supplies and demands for the water suppliers over the 40-year planning period were analyzed in the event that a single-dry year occurs, similar to the drought that occurred in California in 1977. Table 6-3 summarizes the existing and planned supplies available to meet demands during a single-dry year. Base demand (demand without conservation) during dry years was assumed to increase by 10 percent. Demands are also shown with the urban demand reduction resulting from SBX7-7 conservation objectives.

See Appendix C for the breakdown by purveyor of supplies available to meet demands over the 40-year planning period during a single-dry year.

TABLE 6-3
PROJECTED SINGLE-DRY YEAR SUPPLIES AND DEMANDS

	2015	2020	2025	2030	2035	2040	2045	2050
Existing Supplies								
Existing Groundwater[a]								
Alluvial Aquifer	20,300	20,250	20,200	21,050	21,050	21,025	21,000	20,650
Saugus Formation	20,400	20,400	20,400	20,400	20,400	20,400	20,400	20,400
Total Groundwater	**40,700**	**40,650**	**40,600**	**41,450**	**41,450**	**41,425**	**41,400**	**41,050**
Recycled Water[b]	325	325	325	325	325	325	325	325
Imported Water								
State Water Project[c]	11,900	11,000	10,000	9,100	9,100	9,100	9,100	9,100
Flexible Storage Accounts[d]	6,060	4,680	4,680	4,680	4,680	4,680	4,680	4,680
Buena Vista-Rosedale	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Nickel Water - Newhall Land	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607
Total Imported	**30,567**	**28,287**	**27,287**	**26,387**	**26,387**	**26,387**	**26,387**	**26,387**
Banking Programs								
Rosedale Rio-Bravo[e]	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Semitropic[f]	15,000	15,000	-	-	-	-	-	-
Semitropic - Newhall Land[g]	4,950	4,950	4,950	4,950	4,950	4,950	4,950	4,950
Total Banking	**39,950**	**39,950**	**24,950**	**24,950**	**24,950**	**24,950**	**24,950**	**24,950**
Total Existing Supplies	**111,542**	**109,212**	**93,162**	**93,112**	**93,112**	**93,087**	**93,062**	**92,712**
Planned Supplies								
Future Groundwater[h]								
Alluvial Aquifer	200	1,250	2,300	3,850	4,850	5,875	6,900	7,750
Saugus Formation (Restored Well)	825	3,777	3,777	3,777	3,777	3,777	3,777	3,750
Saugus Formation (New Wells)	2,875	9,923	9,923	9,923	9,923	9,923	9,923	9,950
Total Groundwater	**3,900**	**14,950**	**16,000**	**17,550**	**18,550**	**19,575**	**20,600**	**21,450**
Recycled Water[b]	975	2,725	5,225	7,775	10,275	13,775	17,275	20,975

	2015	2020	2025	2030	2035	2040	2045	2050
Banking Programs[i]	-	-	10,000	10,000	20,000	20,000	20,000	20,000
Total Planned Supplies	**4,875**	**17,675**	**31,225**	**35,325**	**48,825**	**53,350**	**57,875**	**62,425**
Total Existing and Planned Supplies	**116,417**	**126,887**	**124,387**	**128,437**	**141,937**	**146,437**	**150,937**	**155,137**
Demand w/o Conservation[j]	88,077	97,333	106,588	115,843	125,099	134,354	143,609	152,865
20x2020 Reduction[k]	9,027	19,626	21,166	22,770	24,342	25,914	27,486	29,058
Reduction from Recycled Water[l]	1,300	3,050	5,550	8,100	10,600	14,100	17,600	21,300
Reduction from Water Conservation[m]	7,727	16,576	16,662	16,748	16,833	16,919	17,005	17,091
Demand w/ Conservation[n]	**80,350**	**80,757**	**89,926**	**99,096**	**108,265**	**117,434**	**126,604**	**135,773**

Notes:

(a) Existing groundwater supplies represent the quantity of groundwater anticipated to be pumped with existing wells. As indicated in Tables 3-8 and 3-9 and Tables 3-4 and 3-5 of the 2009 Groundwater Basin Yield Analysis, individual purveyors may have well capacity in excess of quantities shown in this table. As indicated in Table 3-11, existing and planned groundwater pumping remain within the groundwater operating plan shown on Table 3-5. SCWD's existing Saugus 1 and Saugus 2 wells resumed production in 2011 with the completion of the perchlorate treatment facility.

(b) Recycled water projections from Table 4-3.

(c) SWP supplies are based on the Department of Water Resources "*2009 State Water Project Delivery Reliability Report*."

(d) Includes both CLWA and Ventura County entities flexible storage accounts. Initial Term of agreement with Ventura County entities expires after 2015.

(e) CLWA has a maximum withdrawal capacity of 20,000 AFY and a storage capacity of 100,000 AF. As of 6/1/2011, there is 100,000 AF of recoverable water.

(f) CLWA has 45,920 AF of recoverable water as of 6/1/2011.

(g) Newhall Land has a maximum withdrawal capacity of 4,950 AFY and a storage capacity of 55,000 AF. As of 6/1/2011 there is 18,892 AF of recoverable water. Delivery of stored water from the Newhall Land's Semitropic Water Banking and Exchange Program is assumed available to VWC.

(h) Planned groundwater supplies represent new groundwater well capacity that may be required by an individual purveyor's production objectives in the Alluvial Aquifer and the Saugus Formation, including 3,777 AFY of restored capacity from VWC Well 201 and approximately 10,000 AFY of new Saugus Formation well capacity. When combined with existing purveyor and non-purveyor groundwater supplies, total groundwater production is consistent with the 1977 single dry-year levels identified in Table 3-8 of the 2009 Groundwater Basin Yield Analysis. As indicated in Table 3-11, existing and planned groundwater pumping remain within the groundwater operating plan shown on Table 3-5.

(i) Includes banking programs with 10,000 AF of additional pumpback capacity by 2025 and a second additional 10,000 AF by 2035.

(j) Demand w/o Conservation data from Table 2-2. Includes a 10 percent increase in demand during dry years.

(k) 20x2020 Reduction for the Region from Table 2-22.

(l) Recycled Water Reduction for the Region from Table 2-22; does not include demands from Honor Rancho.

(m) Reduction from Water Conservation calculation for Region from Table 2-22.

(n) Demand w/ Conservation is Demand w/o Conservation minus Reduction from Water Conservation.

6.4.3 Multiple-Dry Year

The water supplies and demands for the water suppliers' water supply over the 40-year planning period were analyzed in the event that a four-year multiple-dry year event occurs, similar to the drought that occurred during the years 1931 to 1934. Table 6-4 summarizes the existing and planned supplies available to meet demands during multiple-dry years. Base demand during dry years was assumed to increase by 10 percent. Demands are also shown with the urban demand reduction resulting from SBX7-7 conservation objectives.

See Appendix C for the breakdown by purveyor of supplies available to meet demands over the 40-year planning period during a multiple-dry year.

TABLE 6-4
PROJECTED MULTIPLE-DRY YEAR SUPPLIES AND DEMANDS

	2015	2020	2025	2030	2035	2040	2045	2050
Existing Supplies								
Existing Groundwater[a]								
Alluvial Aquifer	20,425	20,425	20,425	21,825	21,825	21,825	21,825	21,325
Saugus Formation	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700
Total Groundwater	**40,125**	**40,125**	**40,125**	**41,525**	**41,525**	**41,525**	**41,525**	**41,025**
Recycled Water[b]	325	325	325	325	325	325	325	325
Imported Water								
State Water Project[c]	32,900	32,900	33,000	33,000	33,000	33,000	33,000	33,000
Flexible Storage Accounts[d]	1,510	1,170	1,170	1,170	1,170	1,170	1,170	1,170
Buena Vista-Rosedale	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Nickel Water - Newhall Land	1,607	1,607	1,607	1,607	1,607	1,607	1,607	1,607
Total Imported	**47,017**	**46,677**	**46,777**	**46,777**	**46,777**	**46,777**	**46,777**	**46,777**
Banking Programs								
Rosedale Rio-Bravo[e]	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Semitropic[f]	11,500	11,500	-	-	-	-	-	-
Semitropic - Newhall Land[g]	4,950	4,950	4,950	4,950	4,950	4,950	4,950	4,950
Total Banking	**31,450**	**31,450**	**19,950**	**19,950**	**19,950**	**19,950**	**19,950**	**19,950**
Total Existing Supplies	**118,917**	**118,577**	**107,177**	**108,577**	**108,577**	**108,577**	**108,577**	**108,077**
Planned Supplies								
Future Groundwater[h]								
Alluvial Aquifer	-	1,000	2,000	3,000	4,000	5,000	6,000	7,000
Saugus Formation (Restored Well)	2,375	1,625	1,500	1,400	1,275	1,125	1,000	875
Saugus Formation (New Wells)	2,250	10,325	10,450	10,550	10,675	10,825	10,950	11,075
Total Groundwater	**4,625**	**12,950**	**13,950**	**14,950**	**15,950**	**16,950**	**17,950**	**18,950**
Recycled Water[b]	975	2,725	5,225	7,775	10,275	13,775	17,275	20,975

	2015	2020	2025	2030	2035	2040	2045	2050
Banking Programs[i]	-	-	7,500	7,500	15,000	15,000	15,000	15,000
Total Planned Supplies	**5,600**	**15,675**	**26,675**	**30,225**	**41,225**	**45,725**	**50,225**	**54,925**
Total Existing and Planned Supplies	**124,517**	**134,252**	**133,852**	**138,802**	**149,802**	**154,302**	**158,802**	**163,002**
Demand w/o Conservation[j]	88,077	97,333	106,588	115,843	125,099	134,354	143,609	152,865
20x2020 Reduction[k]	9,027	19,626	21,166	22,770	24,342	25,914	27,486	29,058
Reduction from Recycled Water[l]	1,300	3,050	5,550	8,100	10,600	14,100	17,600	21,300
Reduction from Water Conservation[m]	7,727	16,576	16,662	16,748	16,833	16,919	17,005	17,091
Demand w/ Conservation[n]	**80,350**	**80,757**	**89,926**	**99,096**	**108,265**	**117,434**	**126,604**	**135,773**

Notes:

(a) Existing groundwater supplies represent the quantity of groundwater anticipated to be pumped with existing wells. As indicated in Tables 3-8 and 3-9 and Tables 3-4 and 3-5 of the 2009 Groundwater Basin Yield Analysis, individual purveyors may have well capacity in excess of quantities shown in this table. As indicated in Table 3-12, existing and planned groundwater pumping remain within the groundwater operating plan shown on Table 3-5. SCWD's existing Saugus 1 and Saugus 2 wells resumed production in 2011 with the completion of the perchlorate treatment facility.

(b) Recycled water projections from Table 4-3.

(c) SWP supplies are based on the Department of Water Resources "*2009 State Water Project Delivery Reliability Report*."

(d) Includes both CLWA and Ventura County entities flexible storage accounts. Initial Term of agreement with Ventura County entities expires after 2015.

(e) CLWA has a maximum withdrawal capacity of 20,000 AFY and a storage capacity of 100,000 AF. As of 6/1/2011, there is 100,000 AF of recoverable water.

(f) CLWA has 45,920 AF of recoverable water as of 6/1/2011.

(g) Newhall Land has a maximum withdrawal capacity of 4,950 AFY and a storage capacity of 55,000 AF. As of 6/1/2011 there is 18,892 AF of recoverable water. Delivery of stored water from the Newhall Land's Semitropic Water Banking and Exchange Program is assumed available to VWC.

(h) Planned groundwater supplies represent new groundwater well capacity that may be required by an individual purveyor's production objectives in the Alluvial Aquifer and the Saugus Formation, including 3,777 AFY of restored capacity from VWC Well 201 and approximately 10,000 AFY of new Saugus Formation well capacity. When combined with existing purveyor and non-purveyor groundwater supplies, total groundwater production is consistent with the 1931-1934 multiple dry-year levels identified in Table 3-8 of the 2009 Groundwater Basin Yield Analysis. As indicated in Table 3-12, existing and planned groundwater pumping remain within the groundwater operating plan shown on Table 3-5.

(i) Includes banking programs with 10,000 AF of additional pumpback capacity by 2025 and a second additional 10,000 AF by 2035.

(j) Demand w/o Conservation data from Table 2-2. Includes a 10 percent increase in demand during dry years.

(k) 20x2020 Reduction for the Region from Table 2-22.

(l) Recycled Water Reduction for the Region from Table 2-22; does not include demands from Honor Rancho.

(m) Reduction from Water Conservation calculation for Region from Table 2-22.

(n) Demand w/ Conservation is Demand w/o Conservation minus Reduction from Water Conservation.

6.4.4 Summary of Comparisons

As shown in the analyses above, CLWA and the retail purveyors have adequate supplies to meet CLWA service area demands during normal, single-dry, and multiple-dry years throughout the 40-year planning period.

Section 7: Water Demand Management Measures

This section describes the water Demand Management Measures (DMMs) implemented by CLWA and the retail purveyors as a part of the effort to reduce water demand in the Valley.

7.1 Overview

CLWA and the retail purveyors are subject to the Urban Water Management Planning Act, AB1420 and SBX7-7 requirements, in addition to the commitment of compliance with the Best Management Practices (BMPs) as signatories to the Memorandum of Understanding Regarding Water Conservation in California (MOU). In the CLWA service area, demand management is addressed at both the local (retail agency) and regional (Santa Clarita Valley-wide) levels.

The MOU and BMPs were revised by the California Urban Water Conservation Council (CUWCC) in 2008. The revised BMPs now contain a category of "Foundational BMPs" that signatories are expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs and water waste ordinances) and Public Education (public outreach and school education programs). The remaining "Programmatic" BMPs have been placed into three categories: Residential, Large Landscape, and Commercial, Industrial, Institutional (CII) Programs and are similar to the original quantifiable BMPs. These revisions are reflected in the CUWCC reporting database starting with reporting year 2009 and the 2010 UWMP's DMM compliance requirements. The new category of foundational BMPs is a significant shift in the revised MOU. For CLWA and other wholesalers however, these changes do not represent a substantive shift in requirements.

A key intent of the recent MOU revision was to provide retail water agencies with more flexibility in meeting requirements and allow them to choose program options most suitable to their specific needs. Therefore, as alternatives to the traditional Programmatic BMP requirements, agencies may also implement the MOU Flex Track or GPCD options.

Under the Flex Track option, an agency is responsible for achieving water savings greater than or equal to those it would have achieved using only the BMP list items. The CUWCC has developed three Flex Track Menus – Residential, CII, and Landscape – and each provides a list of program options that may be implemented in part or any combination to meet the water savings goal of that BMP. Custom measures can also be developed and require documentation on how savings were realized and the method and calculations for estimating savings.

The GPCD option sets a water use reduction goal of 18 percent reduction by 2018. The MOU defines the variables involved in setting the baseline and determining final and interim targets. The GPCD option and requirements track well with the requirements of SBX7-7. All three retail suppliers – SCWD, VWC and NCWD – have chosen to implement the GPCD compliance option.

Signatories to the urban MOU are allowed by Water Code Section 10631(j) to include their biennial CUWCC BMP reports in an UWMP to meet the requirements of the DMM sections of the UWMP Act. The retail suppliers have chosen to comply with the requirements of the Act by providing the information required by the DMMs in this section of the Plan instead of attaching the 2009 and 2010 BMP Reports. CLWA has filed its 2009 and 2010 BMP reports (attached as Appendix E).

As a wholesaler MOU signatory, CLWA assists SCWD, VWC and NCWD with BMP implementation and reporting, although CLWA files BMP reports only for itself. LACWWD 36 BMP implementation and reporting is done by the County of Los Angeles on behalf of all its Waterworks Districts.

As the water wholesaler for the region, CLWA is responsible for the implementation of a subset of the BMPs. However, CLWA in partnership with the water purveyors has taken a leadership role in the implementation and support of a number of the BMPs that extend beyond a wholesaler's responsibilities in the MOU. The following sections provide more detail on the water suppliers' conservation programs and compliance with the BMPs.

7.2 Castaic Lake Water Agency

In 2001 CLWA became a signatory to the MOU and a member of the CUWCC, establishing a firm commitment to the implementation of the BMPs or DMMs. The CUWCC is a consensus-based partnership of agencies and organizations concerned with water supply and conservation of natural resources in California. By becoming a signatory, CLWA committed to implement a specific set of locally cost-effective conservation practices in its service area.

In addition to meeting its MOU commitments, CLWA is working with its retail purveyors to identify and implement water use efficiency programs that meet long-term reduction goals. In 2007, CLWA and the retail water purveyors entered into an MOU to prepare a Santa Clarita Valley Water Use Efficiency Strategic Plan (SCVWUESP). The purpose of the effort was to prepare a comprehensive long-term conservation plan for the Santa Clarita Valley by adopting objectives, policies and programs designed to promote proven and cost-effective conservation practices. A consultant was hired to prepare the SCVWUESP, which included input from stakeholders and the community at large. The SCVWUESP was completed in 2008 and provides a detailed study of existing residential and commercial water use, and recommends programs designed to reduce overall Valley-wide water demand by ten percent by 2030. The programs are designed to provide Valley residents with the tools and education to use water more efficiently. The seven programs identified in the SCVWUESP are:

1. HET Rebates (Single and Multi-Family)
2. Large Landscape Audits (with incentives)
3. CII Audits and Customized Incentives
4. Landscape Contractor Certification
5. HE Clothes Washer Rebates
6. New Construction Building Code
7. Valley-Wide Marketing

In addition to these seven programs, the SCVWUESP also identifies other key factors that will help reduce the Valley's overall water demand including passive conservation and new, more water efficient building ordinances. By 2009, CLWA and the water purveyors were implementing the majority of the programs identified in the SCVWUESP in some form.

Finally, the SCVWUESP includes an Appendix with more aggressive water use efficiency measures designed to meet a potential twenty percent reduction in water use by 2020. This

includes funding more active conservation programs, retrofit on resale ordinances, water rate reform, water budget based rates and a more aggressive recycled water program.

By implementing a portfolio of water use efficiency programs, Santa Clarita Valley water suppliers and their customers benefit in a number of ways:

- **Cost Avoidance for Purchased Water:** Although the Santa Clarita Valley has projected adequate water supply for the near future, the cost of water has risen dramatically and is expected to continue to rise. The best way to avoid purchasing expensive imported water is to use less through efficiency. Programs are an effective efficiency mechanism.
- **Limited State Resources:** California's water resources are becoming increasingly stretched due to population, housing growth and decreased water supply from state water projects. Agencies need to stretch water supplies and increase efficiencies.
- **Drought Preparedness:** It is inevitable that southern California, as well as the state, will experience another drought. The big question is when and how severe the next one will be. One way to lessen the severity of a drought's effect on Santa Clarita Valley is to prepare in advance for this event by creating a community that operates at a high level of efficiency.
- **Reduced Carbon Footprint:** The production and delivery of water requires a tremendous amount of energy on both a statewide and local level. The Santa Clarita Valley can do its part to reduce green house gases by using water more efficiently.
- **Reduced Waste Water Flows:** Sanitation plants and systems must be sized to meet historic and planned wastewater flows. Increasing the efficient use of water will result in a reduction of wastewater into the system.
- **Reduced Urban Runoff:** Achieving increased water use efficiency outdoors means less water running off landscaped areas into the streets, storm drains and ultimately into the Santa Clara River. Education efforts and installation of efficient technologies will ensure that more of our valuable water is delivered to appropriate landscaping and less of it as urban runoff.

The water suppliers are administering, managing and financing the SCVWUESP programs. Since the adoption of the SCVWUESP, SBX7-7 was enacted, which requires a more aggressive demand reduction target of 20 percent by 2020. CLWA and the purveyors are currently developing an implementation plan that builds on the SCVWUESP while accelerating and expanding its goals to identify other opportunities that will help meet long-term goals such as those required by SBX7-7. This UWMP provides an overview of the programs proposed for implementation to meet the SBX7-7 requirements.

7.2.1 Utility Operations

7.2.1.1 Conservation Coordinator

CLWA has one full time staff person that works in collaboration with its retail purveyors and exclusively on conservation programs. CLWA also employs a number of consultants to work on program development and implementation.

7.2.1.2 Wholesale Agency Assistance Programs

CLWA provides both technical and financial assistance to the retail purveyors. In addition to the requirements specified in the BMPs, CLWA provides the following support to its retail purveyors:

- **Program Planning:** CLWA hired consultants and worked closely with the purveyors to implement the programs in the SCVWUESP. CLWA is currently providing a similar service in developing implementation options for meeting SBX7-7 requirements.
- **Residential Landscape Program:** This program targets residential landscape maintenance providers in the Santa Clarita Valley and individual homeowners eligible to participate. It is primarily designed to provide gardeners incentives to install residential water efficiency devices such as weather-based irrigation controllers (WBIC). The program offers homeowners and gardeners free landscape classes. After completing the landscape class, a resident receives one free WBIC and gardeners can keep receiving WBICs after confirmation that the previous WBIC was installed properly on a property within CLWA service area. The program is projected to save 50 AF in the first year.
- **Large Landscape Program:** This program offers homeowners associations, parks and landscape maintenance divisions the opportunity for a CLWA representative to visit the site and develop a customized plan and offer rebates for items to further water conservation.
- **Commercial, Industrial and Institutional (CII) Audit and Customized Incentive Program:** The CII Program offers businesses and institutions the opportunity to save money and water by signing up for free water use check-ups. As part of the check-up, a CLWA representative visits the site and develops a customized plan and offers rebates for the items to further water conservation.
- **High Efficiency Toilet (HET) Replacement Program:** HET toilet replacement vouchers are provided to retail purveyors for distribution. Homes older than 1992 are eligible for up to $115 per toilet.
- **Landscape Education Program:** Free monthly workshops are provided in a classroom and garden setting for residents who want to learn more about gardening and conservation.
- **School and Public Information Programs:** See Section 7.2.2.

7.2.1.3 Water Loss Control

CLWA has completed AWWA's M36 Water Loss analysis, which consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. Pre-screen results range from 99.5 to 100 percent. CLWA's M36 'Reporting Worksheet' for 2010 is provided in Appendix E.

7.2.2 Education

7.2.2.1 Public Information

In 2008 CLWA hired a social marketing firm to develop a Valley-wide conservation outreach plan. The "What's your water number?" campaign had its kick-off that summer and focused on proper irrigation and landscape maintenance. The campaign utilizes radio, billboards, television

and print. CLWA also distributes a monthly electronic community newsletter that addresses water conservation.

In October 2010, CLWA conducted a phone survey to measure the response to the campaign's messages to determine the most successful outlets used to deliver the messages among Santa Clarita Valley residents. Results indicated that overall campaign messaging was effective, with more than one-third of respondents stating the conservation tips made them re-think their current water use. Respondents also reported a substantial decrease in their total outdoor water use versus 2008. Eighty-seven percent of single-family home respondents said they reduced outdoor water usage already or are likely to do so in the near future. Respondents also reported a strong recall of the campaign. The majority of respondents recalled seeing or hearing conservation tips in the past six months. Results suggest that residents who previously watered every day, water every other day post-campaign.

In addition to its conservation outreach campaign, CLWA has a water-efficient landscape demonstration garden open to the public and which hosts about 60 school classes each year. CLWA also maintains an active website and Facebook page with water saving tips for residents and businesses, conservation checklists and program and incentive information.

7.2.2.2 School Education

Started in 1993, CLWA's award-winning Education Program is dedicated to helping students in school learn through age-appropriate programs, from kindergarten all the way through high school. The program provides hands-on field trips and in-class presentations for elementary and junior high school students at public and private schools in the Santa Clarita Valley (Table 7-1). In 2008, CLWA provided almost 350 class presentations and hosted 14 teacher workshops. In addition to the presentations and field trips, CLWA's Education Department administers the local high school Water Challenge scholarship program, which is open to students in grades 9 through 12. Through 2010, the Education Program has educated more than 104,000 students about the importance of efficient water use.

TABLE 7-1
SCHOOL EDUCATION (NUMBER OF STUDENTS)

Grade Level	2006	2007	2008	2009	2010
K - 3	5,677	7,320	6,290	6,686	7,296
4 - 6	3,753	4,872	4,195	4,768	5,212
7 - 8	798	1,102	1,345	1,210	315
9 - 12	0	223	141	40	491
Totals	**10,228**	**13,517**	**11,971**	**12,704**	**13,314**

7.3 Regional BMP Implementation

In 2001, the CLWA Board approved signing the CUWCC's MOU on behalf of both the wholesale and retail service areas (CLWA and SCWD), thus meeting one of the recommendations of the 2000 UWMP. Los Angeles County signed the MOU prior to the 2000 UWMP on behalf of all its Waterworks Districts; NCWD signed the MOU on its own behalf in September 2002 and VWC signed in 2006. In 2009, the CUWCC changed its policy to specify that each signatory had to join individually and that a wholesaler could no longer be a signatory on behalf of its retailers.

The following sections provide a summary of the BMP status of the retail purveyors, in addition to the SCVWUESP activities.

7.4 Santa Clarita Water Division

Programs and planning efforts that focus on demand management have increased significantly since the 2005 UWMP. These efforts have been both by SCWD individually as well as regional approaches that involve CLWA and the retailers.

In 2001, the CLWA Board approved signing the CUWCC's MOU for both the wholesale and retail service areas (CLWA and SCWD). Since that time, SCWD has been reporting and filing BMP reports as a signatory. SCWD filed BMP reports through 2008. In 2009, the CUWCC changed its policy to specify that each signatory had to join individually and that a wholesaler could no longer be a signatory on behalf of its retailers. As a result, SCWD is no longer included as member of the CUWCC.

SCWD developed a Water Conservation Plan (WCP) in April 2009 to complement the SCVWUESP adopted by the CLWA Board of Directors in February 2009. In its WCP, SCWD recognizes the need to implement the urban water conservation BMPs as described by the CUWCC and identify additional conservation measures that could accelerate savings in the SCWD service area. The WCP identified the elements, processes, costs, staff resources and activities to further promote conservation and further complement the SCVWUESP. The WCP also identified activities not addressed in the regional plan.

SCWD is implementing all of the Foundational BMPs as required in the revised MOU and UWMP Act. The Programmatic BMPs are being implemented through a GPCD approach. The BMP and SBX7-7 goals and implementation plan are discussed further in Sections 7.4.2 and 7.4.3.

The following sections describe the various programs and conservation activities currently being implemented by SCWD.

7.4.1 Foundational BMPs

7.4.1.1 Utility Operations

<u>Conservation Coordinator</u>

SCWD's conservation program is staffed in various ways. Internally, management, administration and oversight are the responsibility of the Associate Water Resources Planner. In addition, SCWD has helped fund a conservation coordinator position at CLWA since 2004; this position supports regional planning and implementation. SCWD also utilizes consultant services to support program planning and management as well as to implement the various programs including residential landscape training as well as residential, CII and large landscape audits.

<u>Water Waste Prevention</u>

SCWD supports water waste prevention activities through both direct Board activities and in collaboration with the City of Santa Clarita.

On September 10, 2008, the CLWA Board of Directors signed Resolution No. 2605 declaring an Agency-wide water supply and conservation alert. The resolution encourages residents to follow the Voluntary Water Conservation Action Plan (Plan) and achieve a ten percent overall reduction in water demand. The Plan establishes voluntary water conservation measures to be taken by residents and businesses and includes a set of guidelines and recommendations for both indoor and outdoor water use improvements.

SCWD is also actively supporting the City and County in establishing terms of service for water efficient design in new development, complaint with AB 1881. SCWD participates in compliance review of new water efficient landscaping requirements, reviewing the Water Efficient Landscape Worksheet (WELW) and, after a project is completed, conducting periodic audits and tracking consumption to ensure the project remains in compliance with the water allowance requirements.

SCWD also has a Water Shortage Contingency Plan (see Appendix F) and works closely with the City and County in supporting all local ordinances that prohibit water waste.

Water Loss Control

SCWD monitors its water losses on a monthly basis. Production losses in 2008 and 2009 were estimated at 7.9 and 6.0 percent, respectively. SCWD has completed AWWA's M36 Water Loss analysis, which consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. SCWD's M36 'Reporting Worksheet' for 2009 is provided in Appendix E.

Results of the preliminary analysis show a water audit data validity score of 64 and an Infrastructure Leakage Index (ILI) of 3.79. A validity score between 51 and 70 indicates that the validity of the data is reasonable, with opportunity for improvement. According to general guidelines, an ILI between 3 and 5 is appropriate when water resources can be developed or purchased at a reasonable expense; existing water supply capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place; and water resources are believed to be sufficient but demand management measures are included in long-term planning. The audit highlights some strengths and weaknesses of the system. SCWD is evaluating the preliminary results and recommendations of the audit.

Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections

All of SCWD's customers are metered and billed volumetrically. Commercial, industrial and institutional accounts and parks are encouraged to have dedicated irrigation meters, and many do. In addition, SCWD has identified the Automated Meter Reading (AMR)/ Advanced Metering Infrastructure (AMI) technologies as a conservation priority. This technology is being implemented and will be very helpful in identifying leaks, mitigating losses, and monitoring customer usage.

Retail Conservation Pricing

All of SCWD's customers are metered and billed monthly. On January 1, 2010, SCWD migrated its residential customers to a tiered rate structure and its landscape customers to a fixed rate set at the highest tier rate.

Since 2007 the proportion of revenue from fixed charge has met the BMP requirement of not to exceed 30 percent. Table 7-2 shows the portion of revenues that come from fixed charges. Total revenue includes meter, consumption, energy, purchased water and other small miscellaneous charges. Note that 2010 data are only through September and do not reflect a full year's revenue; SCWD expects to meet the threshold requirements once a full year's data is incorporated.

TABLE 7-2
REVENUE

Operating Revenues	2007	2008	2009	2010[(a)]
Fixed Charges	$ 5,880,400	$ 6,282,400	$ 6,354,900	$ 5,500,100
Volumetric Charges	$ 13,629,600	$14,401,100	$ 15,516,300	$12,261,800
% Fixed Charges	**30%**	**30%**	**29%**	**31%**

Note:
(a) Reflects revenues only through September 2010. BMP requirement anticipated to be met with complete 2010 revenue accounted for.

7.4.1.2 Education

Public Information Programs

SCWD provides informational materials to customers through media events, neighborhood expos and other activities (Table 7-3). SCWD also communicates with its customers in coordination with CLWA through a variety of media outlets including Santa Clarita Valley TV, billboards, newspapers, magazines, radio, paid advertising, bill inserts, its website (http://www.scwater.org/) and public service announcements. Conservation messages are also included on customers' monthly bills. Two tips ran in October and December 2008 and one ran on every bill issued in 2009. In 2009 SCWD instituted an automatic calling campaign to alert its customers of dry conditions and the importance of conservation. Almost 70,000 calls were made between December 2009 and October 2010.

TABLE 7-3
SCWD OUTREACH EVENTS

2009	2010
Earth Day	Earth Day
Home and Garden Expo	Water Awareness
Water Awareness	River Rally
River Rally	Make a Difference Day
Neighborhood Expo (3): Canyon County, Saugus, Newhall	Realtors' Breakfast
Emergency Expo	

School Education Programs

SCWD implements its school programs in coordination with the CLWA, reaching almost 6,400 students a year since 2007 (Table 7-4). The CLWA's award winning program is available to grades K through 8 and includes in class presentations and field trips. See Section 7.2.2.2 for more information on CLWA's school programs.

TABLE 7-4
SCHOOL EDUCATION (NUMBER OF STUDENTS)

Grade Level	2007	2008	2009	2010
K - 3	2,474	2,694	3,300	2,947
4 - 6	2,656	1,600	2,412	2,063
7 - 8	335	860	605	94
9 - 12	63	141	40	348
Totals	**5,528**	**5,295**	**6,357**	**5,452**

7.4.2 Programmatic BMPs

Prior to 2007, SCWD focused most of its conservation programs on the Foundational type of activities. In 2007, SCWD starting expanding its programs by incorporating incentives and other elements. In 2009, the SCVWUESP was adopted by the CLWA Board of Directors in February and SCWD developed its own Water Conservation Plan (WCP) in April. These documents set, for the first time, water savings goals, identified activities to meet the goals and developed a long-term conservation program. In its WCP, SCWD recognizes the need to implement the BMPs and identify additional conservation measures that could accelerate savings in the SCWD service area.

The majority of SCWD's programmatic BMPs are being implemented in collaboration with CLWA. In order to maintain consistency the SBX7-7 planning process, SCWD has chosen the GPCD alternative for complying with the MOU.

The following sections describe the programs being implemented in the service area.

7.4.2.1 Residential Programs

The largest customer class in the SCWD service area is residential, accounting for approximately 90 percent of customers and 70 percent of total use. SCWD has about 21,200 SF and 4,700 MF residential accounts. SCWD is focusing the majority of its conservation efforts on residential use.

1) **Residential Audit Program**
   SCWD's indoor residential audit program is structured to respond to customer requests but does not currently actively promote indoor audits. SCWD provides water conservation items that include low-flow showerheads, conservation materials, hose nozzles and aerators. These items are provided at festivals, fairs and other events, and are available for pick up at the SCWD office. This distribution program started in 2008; SCWD distributed about 600 conservation items in 2009 and 2010.

2) **Landscape Training and Incentive Program**
   Residential landscapes are a significant use in SCWD's service area. SCWD is working with CLWA to offer a program that combines training and fixtures in the form of landscape classes and WBICs to its residential customers. The program offers homeowners and gardeners free landscape classes; after residents or their gardeners complete the training, they receive free WBICs. They also receive free inspections of their WBIC installations and programming to ensure they are properly installed and programmed. The classes are offered in both English and Spanish and have been very

popular with residents. At the end of 2010, six classes were held and 70 WBICs have been installed and inspected within the SCWD service area.

SCWD has focused its landscape surveys on its largest users, although all customers are welcome. These are typically homeowners associations (HOAs). HOA customers with dedicated irrigation meters are classified as "irrigation" customers rather than "residential" and the program is designed to develop an appropriate water budget and help them implement it. The program is further described in Section 7.4.2.3.

3) High Efficiency Toilet Rebate Program

The SCVWUESP estimates that in 2008 about 62 percent of residential toilets used 1.6 gallons per flush or less. A program at least as effective as a retrofit on resale, which is the BMP threshold, requires SCWD to provide about 200 rebates per year. SCWD is currently participating in CLWA's HET voucher rebate program and has provided 900 rebates since 2007, almost 70 percent of which were rebated in 2010. The program has been ramping up steadily and the goal is to provide 600 rebates a year. Incentives valued at $115 are provided for HETs replacing models that flush at 3.5 gpf or more.

In addition, SCWD will be realizing the benefits of SB 407, effective January 1, 2014. SB 407 requires that all pre-1994 residential, multi-family and commercial customers replace non-compliant plumbing fixtures (including toilets, faucets, and showerheads) with water-conserving fixtures when making certain improvements or alterations to a building. By 2017, all single-family homes must replace non-compliant plumbing fixtures and by 2019 all multifamily and commercial buildings must have compliant water-conserving plumbing fixtures in place.

4) WaterSense Specification for New Residential Development

SCWD is working closely with the City of Santa Clarita's response in its development and implementation of landscape requirements that comply with AB 1881.

SCWD is supporting adoption of the 2010 California Green Building Standards Code, which went into effect January 2011. The Code sets mandatory green building measures, including a twenty percent reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design. Local jurisdictions, at a minimum, must adopt the mandatory measures; the Code also identifies voluntary measures that set a higher standard of efficiency, which can also be adopted. SCWD will review the proposed standards and determine the most appropriate approach.

7.4.2.2 Commercial, Industrial, and Institutional (CII) BMPs

CII use does not account for a large portion of consumption in SCWD's service area. SCWD has about 840 CII accounts which use about 1,900 AFY, or 7 percent of total use.

In FY 2010/11 the CLWA began implementing a CII Audit and Customized Incentive Program which offers comprehensive water audits with follow-up reports that provide recommendations, information on costs, savings, payback and other implementation-oriented information. The program targets high use and high savings potential customers such as amusement parks, colleges and universities, hotels and hospitals. Recommendations include both site-specific and general opportunities. The key decision makers are identified and contacted to enlist

participation. The goal is to tailor the amount of incentive to the water savings based upon the findings of the audit. Customers are eligible to receive financial incentives to offset any investments in water use efficiency in the amount of up to $300 per AF of water saved.

To date forty large water users have been contacted and twenty within SCWD service area are moving forward.

7.4.2.3 Landscape

SCWD encourages installation of dedicated irrigation meters on all commercial, industrial and institutional accounts, parks and city landscaping. SCWD has 864 dedicated irrigation accounts, the majority of which are HOAs.

SCWD is working on developing water budgets for all its dedicated irrigation accounts; to date 188 accounts have water budgets. The budgets are developed based on historical water use data, landscape acreage and the Maximum Applied Water Allowance as defined by DWR. If the accounts exceed their budgets, SCWD contacts the customer with offers of a free audit, nozzles and/or WBICs (when available) as well as a free walk-through with the landscape contractor followed up with a report containing findings and recommendations.

SCWD is also participating in the CLWA-sponsored large landscape program which offers audits to its large landscape customers. Currently forty sites are enrolled; eighteen are within the SCWD service area where the focus is on HOA customers. The program offers large landscape customers such as HOAs, parks and landscape maintenance districts the opportunity to receive free water-use and cost-benefit analysis reports, free workshops for property management and landscapers and rebates for water-saving measures and devices. Customers are also eligible to receive financial incentives to offset any investments in landscape efficiency in the amount of up to $300 per AF of water saved. CLWA works with its retailers to select sites that meet the large landscape specifications.

To date, five sites have final reports; one site has completed recommended infrastructure modifications and has received the rebate based on an estimated potential savings of 4.21 AFY. The others will complete modifications throughout 2011 and 2012.

7.4.3 SCWD DMM and SBX7-7 Implementation Plan

SCWD recognizes the need to expand conservation programs and efforts in order to meet both its SBX7-7 and DMM requirements.

The SBX7-7 baseline and target calculations are addressed in Chapter 2. The DMM GPCD goals, shown in Table 7-5 are determined by calculating the following:

1. *Baseline GPCD = average annual Potable Water GPCD for the years 1997 through 2006*

2. *2018 GPCD Target = Baseline GPCD multiplied by 0.82 (an 18% reduction)*

3. *Biennial GPCD Targets = Baseline GPCD multiplied by that year's Target (% Baseline). A retail water agency may choose a starting point as either its Baseline GPCD or its 2006 Potable Water GPCD.*

TABLE 7-5
DMM GPCD TARGET CALCULATIONS

Year	Per Capita Water Use (GPCD)
1997	237
1998	210
1999	247
2000	242
2001	234
2002	251
2003	232
2004	239
2005	227
2006	229
Baseline	**234**
Target (2018)	**192**

Compliance is evaluated in relation to the Compliance Table below (Table7-6) and relative progress toward the goal will be acknowledged in Council Compliance Reports. The compliance tables are read as five increments with reporting goals relative to their first through fifth Compliance reports.

TABLE 7-6
ANNUAL COMPLIANCE TARGETS (IN GPCD)

Year	Compliance Report	Target	Highest Acceptable Bound
2010	1	220	234
2012	2	217	225
2014	3	209	217
2016	4	200	209
2018	5	192	192

The GPCD option for MOU compliance and the SBX7-7 targets are consistent with one another (Table 7-7) and SCWD is utilizing the SCVWUESP as well as its own WCP to implement programs that meet these goals.

TABLE 7-7
COMPLIANCE TARGETS

		Target GPCP		
	Baseline GPCD	**2015**	**2018**	**2020**
MOU/AB 1420	234		192	
SBX7-7	235	211		188

In the 2008 SCVWUESP, a comprehensive assessment of SCWD's demographics, levels of past conservation, age of housing, natural turnover, the effects of plumbing codes and more was completed to determine the potential of future conservation activities and programs.

SCWD has already begun implementing five of the seven programs identified in the SCVWUESP: HET rebates (Single family), large landscape audits (with incentives), CII audits and customized incentives, landscape contractor certification and valley-wide marketing; HET clothes washer rebates and multi-family HET rebates are planned for implementation in 2011.

Both the regional SCVWUESP and SCWD's WCP recognize the need to expand conservation programs and efforts. The adoption of SBX7-7 has increased the urgency for implementation. CLWA is in the process of reviewing its incentive programs and SCWD is currently working with CLWA as well as the other purveyors to identify programs that could be implemented regionally.

The programs identified to meet future requirements combine financial incentives, regulation and information elements, and building onto existing activities. Included in the programs being considered for implementation are the following:

Financial Incentives

1) High-Efficiency Clothes Washers (HECWs): Clothes washer rebates are on the list of programs identified for implementation in the SCVWUESP. CLWA will be expanding its program to include clothes washer rebates in FY 2011/12 and SCWD will participate.

2) Zero and Low-Flow Urinal Rebates: Rebates will include CII fixtures such as zero consumption and ultra low volume urinals as well as CII specific HETs. This program will launch in FY 2011/12.

3) Expansion of fixture rebates to CII and Multi-family customers: Currently the toilet rebate program is only available to single-family residential customers. Starting 2011, the programs will be expanded to all customers and there will be increased focus on marketing to large HOA accounts.

4) Expand rebates to include a larger variety of fixtures: Being considered for inclusion are hot water distribution tanks, pressurized water brooms and high-pressure spray nozzles.

5) Cash for Grass Rebate: Customers will be provided with an incentive of up to $1 per acre-foot of turf removed and replaced with landscape appropriate plants. The program is being considered for both residential and CII customers.

6) Expansion of large landscape program: The purveyors will be evaluating the effectiveness of the current landscape program in FY 2011/12 and adjusting depending on the results. If the program is found to be successful at meeting reduction targets, the program will be accelerated and more devices will be offered, such as Precision Nozzles.

Building Code/New Standards

The SCVWUESP developed a comprehensive list of new building standards, beyond those currently in code. Code changes that improve the efficiency of fixtures and design account for about 60 percent of the expected reduction in demand, and will therefore be a significant program priority. Some of the changes proposed will be captured in the State Model Efficient Landscape Ordinance effective January 2010, CAL Green Building Code adopted January 2011, and SB 407 and standard updates for toilets and washers that are being phased in.

Information/Tracking

Information and tracking represents a new element to the existing programs focusing on collecting and processing information and ensuring that the programs are on track to meet the goals. These activities will also help in program design by providing more robust information about customers and their water use patterns. The immediate priorities include:

1) Automatic Meter Reading (AMR): SCWD has identified AMR as a priority in its WCP and critical to obtaining real time data for water usage and utilizing it to identify customer-side leaks. This information can also help SCWD monitor the impacts of existing programs, make adjustments where necessary and develop new programs.

2) Water Use Tracking Tools: Another WCP priority, SCWD plans to design and develop database tracking tools for water savings associated with its conservation plans and increase flexibility by adding or changing program elements.

SCWD is developing a plan that includes accelerating the current programs, adding additional elements that include programmatic, regulatory and information-based activities to meet the requirements of SBX7-7. This planning process was started in 2010 and implementation will begin in 2011.

Evaluating Effectiveness of the DMMs

SCWD will continue to track all program activities including outreach activities, rebate distribution and audits. Program effectiveness and per capita use will be monitored through the billing and consumption system.

Impacts of Conservation

It is not expected that, at this time, the conservation programs currently being implemented or scheduled for implementation will have any significant negative effect on water use within SCWD's service area or affect SCWD's ability to further reduce demand. The funding for current and future programs is being identified.

Economic Impacts

Analysis of the requirements for BMP compliance yields program costs of roughly $500,000.

7.5 Valencia Water Company

VWC recognizes that conserving water is an integral component of a responsible water strategy and is committed to providing education, tools and incentives to help its customers reduce the amount of water they use. VWC is implementing programs locally as well as leveraging the conservation resources available through CLWA. In 2006, VWC became a signatory to the CUWCC MOU, establishing a firm commitment to the implementation of the BMPs or DMMs. Prior to signing the MOU, VWC had been actively engaged in conservation and implemented several of the CUWCC recommended conservation programs.

In 2007, VWC coordinated the development and execution of a MOU with the other retail water purveyors and CLWA to prepare the SCVWUESP. VWC served as the project administrator for

the Santa Clarita Valley water suppliers in developing the SCVWUESP. The SCVWUESP recommended programs to reduce the overall valley wide water demand by ten percent by 2030 (see Section 7.2 for more information), but also included more aggressive programs to achieve greater demand reductions at an accelerated pace. These programs were designed to provide Valley residents and businesses with the tools and education to use water more efficiently.

Since 2002, VWC's focus on demand management has continued to increase. In addition to the activities identified in the SCVWUESP, VWC has implemented a number of other conservation activities to meet the requirements of the MOU and SBX7-7 goals. VWC has an internal Water Use and Energy Efficiency Plan (WUEEP). The WUEEP provides a broad framework defining VWC's conservation policies as well as detailed conservation programs. The WUEEP is reviewed annually and updated every three years.

VWC is implementing all of the Foundational BMPs as required in the revised MOU and UWMP Act. The Programmatic BMPs are being implemented through a GPCD approach. The BMP and SBX7-7 goals and implementation plans are discussed further in Section 7.5.2 and 7.5.3.

The following sections describe the various programs and conservation activities implemented by VWC.

7.5.1 Foundational BMPs

7.5.1.1 Utility Operations

Conservation Coordinator

VWC has had a full-time conservation coordinator since 2005 and added a second in 2009; there are currently two full-time equivalent (FTE) positions dedicated to conservation. The coordinators manage BMP implementation and other water conservation implementation and planning activities. VWC also utilizes consultant services to implement the various programs including water audits, landscape training and public outreach. In the future, VWC plans to establish a third conservation position to focus on CII activities.

Water Waste Prohibition

VWC operates under CPUC-approved rules that include Rule No. 14.1, the Water Conservation and Rationing Plan, and Rule 11, Discontinuance and Restoration of Service.

Rule 11, Discontinuance and Restoration of Service, allows the company to restrict and/or disconnect water service for customers using water in a wasteful manner.

The PUC's methodology for water utilities to implement water conservation plans is documented in Standard Practice U-40-W, "Instructions for Water Conservation, Rationing, and Service Connection Moratoria." Water shortage contingency plans must be approved by the PUC prior to implementation by VWC. As stated in the Standard Practice U-40-W, the PUC shall authorize mandatory conservation and rationing by approving Schedule No. 14.1, Mandatory Water Conservation and Rationing. Schedule No. 14.1 sets forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect.

Water Loss Control

VWC's overall water delivery system is relatively new with a weighted average plant in service life of 11 years. As a newer system, VWC doesn't experience a significant amount of water loss. Nonetheless, VWC conducts quarterly pre-screening system audits which calculate verifiable use as a percent of total production. VWC's historic annual water loss since 2000, as a percent of total production, ranged from one to seven percent.

VWC has completed AWWA's M36 Water Loss analysis, which consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. VWC's M36 'Reporting Worksheet' for 2009 and 2010 are provided in Appendix E. Results of the preliminary audits show a water audit validity score of 89 for both 2009 and 2010 and ILI of 0.62 and 0.20 for 2009 and 2010, respectively. VWC intends to refine and improve its assumptions used per M36 manual as its system expands and matures.

VWC's maintenance program also helps minimize water losses. This program helps keep the VWC production system in optimal condition, thus reducing water losses. This program includes, among other things, daily inspections of water wells and pumping equipment, weekly inspections of water tanks and exercising critical system valves. VWC also calibrates its production meters annually.

When a leak occurs, VWC responds quickly to isolate the leak and repair it. VWC tracks leaks in its GIS system, which gives it the ability to visually monitor leak locations and identify potential problem areas or trends.

VWC's meter change-out program replaces its older water meters on a regular basis to ensure metering accuracy. Based on AWWA standards and VWC's experience, this program targets change-outs at 15 years or less.

Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections

All of VWC's customers are metered and billed volumetrically on a monthly basis.

Monthly water allocations (i.e., water budgets) were introduced in late 2009 under the new WaterSMART Allocation program, in which individually metered residential customers receive their monthly allocations on billing statements. In, 2011 a tiered pricing structure based on WaterSMART allocations was implemented.

Retail Conservation Pricing

On February 1, 2011 VWC changed its single volumetric rate structure to a tiered structure (Table 7-8). The tiered system was designed to support the WaterSMART Allocation (WSA) program, which sets customer specific allocations for all individually metered residential customers. Starting in 2009, customer bills included information on their allocation, allowing time for acclimation to the new approach before it was fully implemented with tiered rates in 2011.

The rate structure is designed to provide support and encourage appropriate use. If a customer's water use is within the designated "efficient" range for their allocated volume, the customer is charged standard rates. If the customer uses less than the efficient limit, the

customer is charged at a lower rate and, conversely, if the customer uses more, the customer is charged at the higher rates. There are five (5) tiers, ranging from Super Efficient at $1.144/CCF to Wasteful at $2.878/CCF. Customers are encouraged to access their allocation and billing information on the company's website.

Residential class customers were the first to be placed on WSA and the tiered rate structure as this group represents approximately 54 percent of VWC's total consumption. Dedicated landscape irrigation meters, including those at CII customer locations will be placed on WSA with a tiered rate structure in 2012. VWC will evaluate the challenges of migrating the remaining customer classifications to WSA and tiered rates in the future.

TABLE 7-8
QUANTITY RATES AND SERVICE CHARGES

Tier Name	Level	Quantity rates: Rate per 100 cubic feet
Super Efficient	Tier 1: Indoor monthly water allocation	$1.144
Efficient	Tier 2: Outdoor monthly water allocation (Tiers 1+2=100% of monthly allocation)	$1.362
Inefficient	Tier 3: 101% to 150% of monthly water allocation	$1.703
Excessive	Tier 4: 151%-200% of monthly water allocation	$2.214
Wasteful	Tier 5: Use in excess of 200% of monthly water allocation	$2.878
Non-residential	(not applicable)	$1.362

The proportion of revenue from volumetric charges meets the BMP requirement at about 71 to 73 percent (Table 7-9).

TABLE 7-9
REVENUE

	2006	2007	2008	2009	2010
Fixed Charges	NR	$5,258,800	$6,122,000	$6,150,500	$6,153,500
Volumetric Charges	NR	$13,921,300	$14,788,900	$14,784,500	$15,287,500
Total Revenue	NR	$19,180,100	$20,910,900	$20,935,000	$21,441,000
% Volumetric	**NR**	**73%**	**71%**	**71%**	**71%**

7.5.1.2 Education

Public Information

VWC implements public outreach in coordination with CLWA. See Section 7.2.2.1 for detail on specific programs administered by CLWA.

In addition to the regional activities, VWC provides information on efficient water use on customer bills and on its website. Bills show current water usage in comparison with the previous year's usage for that period, and for residential customers it shows their WaterSMART allocations. VWC maintains an active website that provides information on the various programs available to customers, conservation tips, links and full details on the WaterSMART program. In addition, VWC representatives promote conservation at local special events,

including the Emergency Expo, Earth/Arbor Day, CLWA Water Awareness, River Rally and Make a Difference Day. Outreach activities are summarized in Table 7-10.

TABLE 7-10
SUMMARY OF OUTREACH ACTIVITIES

Item	2006	2007	2008	2009	2010
Bill Inserts / Newsletters / Brochures	NR	0	1	2	1
Bill showing current water usage in comparison with prior year usage	NR	Yes	Yes	Yes	Yes
Special Events	NR	4	4	3	4
Program to coordinate with other government agencies, industry, public interest groups and media	NR	Yes	Yes	Yes	Yes

School Education

VWC's school education program is implemented in coordination with CLWA at no cost to school districts. The CLWA's award winning program is available to grades K through 12 and includes in class presentations and field trips (Table 7-11). See Section 7.2.2.2 for more information on CLWA's school programs.

VWC previously contracted with Resource Action Programs, partnering with Southern California Edison (SCE) and Southern California Gas Company (SCGC) to implement the Living Wise Program. This program was designed to teach communities about conservation and increase environmental awareness. Sixth graders received Resource Action Living Wise Activity Kits, which enabled them to perform home water/energy audits. The program was active thru mid-2009.

TABLE 7-11
SCHOOL EDUCATION (NUMBER OF STUDENTS)

Grades	2006	2007	2008	2009	2010
K-3	1,984	3,501	2,372	2,115	3,016
4 - 6	1,559	1,593	1,895	1,577	2,176
7 - 8	527	737	485	350	0
9 - 12	0	160	0	0	143
Totals	**4,070**	**5,991**	**4,752**	**4,042**	**5,335**

7.5.2 Programmatic BMPs

VWC is pursuing a GPCD approach to complying with the Programmatic BMPs. The following section describes VWC program activities.

7.5.2.1 Residential Programs

Almost 54 percent of VWC's total water use is residential, the majority of which are single-family accounts.

1) Residential Survey and Retrofit Programs

VMC has two programs that address residential surveys, – a traditional audit program and a leak only audit – to best address specific customer needs, increase responsiveness and improve water use efficiency.

Since 2007, VWC has offered a free residential water audits to its residential customers, which include both an indoor and landscape element. The program is administered and implemented by a consultant. Customers are notified of the program by consultant outreach efforts, VWC referrals and advertisement on VWC's website, reception area and at community events. The goals of the program are to provide customers with a better understanding of their water use; identify inefficient uses; and offer incentives for replacement of high-water use devices such as toilets and WBICs. The number of surveys that were conducted is summarized in Table 7-12.

In addition to the full audit, VWC initiated a supplemental program in January 2011 to specifically address leaks. This program was developed to be cost-effective, and to respond quickly and mitigate unnecessary losses resulting from leaks and other unintentional water consumption. In order to better serve its customers, VWC combines smart Automated Meter Reading (AMR) and current manual read systems to notify customers when their consumption has either registered higher than normal or if continuous flow has been detected by the meter (alerts automatically occur when the meter registers continuous flow for 24 consecutive hours). VWC customers can respond to the notification by requesting a Leak Only audit or a full residential audit to assist with the identification and quantification of the abnormal water use and to provide instructions to stabilize or reduce consumption.

VWC's device distribution programs have continued over the years (Table 7-12); devices are distributed as part of the surveys as well as through community events and the Living Wise program (described below). Devices include low-flow showerheads and aerators. In addition, CLWA distributes free water-saving devices to Valley residents at community events.

VWC previously benefited from audits conducted by students through the Living Wise Program in schools (see Section 7.5.1.2). The Living Wise surveys are each counted as the equivalent of one-third of a survey in terms of BMP reporting (only indoor use is evaluated in the program). The program was active through 2009.

TABLE 7-12
RESIDENTIAL SURVEYS AND RETROFITS

	2006	2007	2008	2009	2010
Single Family Accounts					
Surveys Offered	NR	2,520	13,969	4,308	20,901
Surveys Completed	NR	542	813	528	238
Multi-Family Accounts					
Surveys Offered	NR	0	156	0	0
Surveys Completed	NR	0	126	0	0
Devices					
Showerheads	NR	1,583	2,357	1,303	460
Aerators	NR	3,154	4,610	2,473	564

Audit and retrofit program participation is tracked through a manual spreadsheet; water savings are estimated at 32 AFY.

2) **Residential Landscape Water Survey Program**
VWC has identified landscape conservation as a priority program and has developed various tools to address irrigation use. Section 1) above describes the residential water audit programs, including both the full audit and leak only programs, which are a combined indoor and landscape audit. In addition to those programs, VWC is working with CLWA to offer a program that combines training and fixtures in the form of landscape classes and WBICs to its residential customers.

The CLWA sponsored WBIC program began in 2009. It offers homeowners and gardeners free landscape classes and, after residents or their gardeners complete the training, they receive free WBICs. The classes have been very popular with Valley residents. Classes are offered in both English and Spanish and, after completing the training, attendees, as well as their gardeners, receive official certification for attending the workshop and committing to water efficient practices at their sites. VWC is working with CLWA and the other retailers to track program participation and actual water savings in this first year of the program, and will make adjustments to the program as necessary.

For VWC customers who take the CLWA class and receive a WBIC, VWC provides free installation and programming service, which is not part of the CLWA program. At the end of 2010, there have been six classes, and 70 WBICs that have been distributed to VWC customers through the CLWA WBIC program. VWC has installed four of these WBICs through this program in December 2010. VWC encourages participation in CLWA's program.

From 2007 to late 2010, VWC held landscape irrigation courses and provided free WBICs, including installation, to customers with irrigated areas greater than 2,500 square feet. VWC terminated the WBIC program during 2010 to gain efficiencies by combining this program with the CLWA WBIC program. The VWC standalone WBIC program resulted in 338 installed WBICs at customer homes over the four years of the program. Additionally, since 2007 VWC has required developers to install WBICs in all new residential homes constructed in its service area.

3) **WaterSense Specification Toilets**
VWC and CLWA both offer rebates to VWC customers for purchase and installation of high-efficiency toilets (HETs) using 1.28 gpf or less. Rebates are up to $115 for homes built before 1993, or $50 for homes built after that year.

A summary of rebates that have been issued is provided in Table 7-13.

TABLE 7-13
TOILET REBATE AND REPLACEMENT PROGRAMS

Type	2006	2007	2008	2009	2010
Single-Family					
HET Rebate	NR	33	110	477	1,200
Multi-Family					
HET Distribution	NR	0	87	0	0

Customers are notified about the program through advertising in the lobby, high bill inquiries, water audits consultants, community events, in-store promotions and through VWC website; the program is also marketed regionally by CLWA. Program participation is being tracked through VWC. VWC is exceeding the BMP requirement by about 270 retrofits per year, and estimates that the program will provide about 300 AF of water savings (cumulative) through 2020. Additionally, in 2008 VWC provided a one-time incentive at a multi-family senior center complex and replaced 87 toilets with 1.28 gallons per flush HETs.

In addition to the rebates, VWC will be realizing the benefits of SB 407, effective January 1, 2014. SB 407 requires installation of water-conserving plumbing fixtures (including toilets, faucets, and showerheads). The saturation rate of conservation fixtures will be accelerated by compliance with SB 407. This regulation requires all residential, multi-family and commercial customers with pre-1994, non-compliant fixtures to replace them with water-conserving fixtures when making certain improvements or alterations to a building. By 2017, all single-family homes must replace non-compliant plumbing fixtures and, by 2019, all multifamily and commercial buildings must have compliant water-conserving plumbing fixtures in place.

7.5.2.2 Commercial, Industrial, and Institutional (CII)

CII water use accounts for about 44 percent of VWC's total water use. These accounts have been identified and ranked by water use.

VWC has identified approximately 1,250 meters in its CII accounts that are dedicated to irrigating landscapes. During 2011, simply as an administrative procedure, VWC will move these metered accounts from CII to Landscape customers. Regardless of the current customer classification, VWC will target its Large Landscape conservation programs to all meters that are dedicated to landscape irrigation, including those currently included in CII.

VWC provides free audits for CII customers through CLWA's Water Checkup Program (Table 7-14). The audits focus on five areas: irrigation, plumbing fixtures, cooling towers (HVAC systems), manufacturing processes and other efficiency opportunities. After audits are completed, reports are created that summarize findings and suggestions and these are discussed in-person with the customers. Customers that complete and implement the recommended conservation upgrades are eligible for $300 per AF saved rebates. Five industries with the most promising opportunities to provide water savings have been targeted for the program:

- Amusement Park
- Colleges and Universities
- Hotels (Hospitality Industry)
- Hospitals
- Restaurants

Prior to the Water Checkup Program VWC provided free indoor and landscape water audits to CII customers through a program that ended in mid-2009 (Table 7-14). The audit included testing equipment, reviewing water use patterns and sharing water use efficiency information

with the customer. After the audit, the customer received a report identifying water efficiency opportunities, recommending courses of action, estimating water savings, and providing a cost benefit analysis. The recommended efficiency measures included devices such as pre-rinse spray nozzles, efficient toilets and urinals, cooling tower conductivity controllers, high-efficiency clothes washers, irrigation clock management and use of drought tolerant plants. Audits were provided to a wide variety of customers including restaurants, schools, hotels, manufacturing companies and others.

Customers are notified about the CLWA program through VWC's website, referrals by VWC and through direct contacts from the contractor. Program participation and estimated savings for 2010 are tracked by CLWA; prior to 2010, the program participation was tracked by VWC. Limited follow-up for the CII surveys occurred during the transitional years 2009 and 2010. The CLWA program includes follow-up, so VWC anticipates customers receiving surveys will be contacted thereafter.

TABLE 7-14
CII SURVEY PROGRAM

CII Surveys	2006	2007	2008	2009	2010
Surveys Offered					
Commercial	NR	62	30	15	6
Industrial	NR	61	48	5	1
Institutional	NR	0	0	0	4
Mixed Use/Landscape	NR	124/0	86/0	8/18	4/8
Surveys Completed					
Commercial	NR	0	6	15	1
Industrial	NR	7	12	5	0
Institutional	NR	0	0	0	2
Mixed Use/Landscape	NR	7/0	20/0	8/18	0/4
Follow-up within 1 year					
Commercial	NR	2	0	0	0
Industrial	NR	3	3	0	0
Institutional	NR	2	0	0	0

7.5.2.3 Large Landscape

VWC has 13 metered accounts dedicated to irrigation in 2010 that are classified as Landscape and that account for approximately two percent of total water use. This is comprised of three potable meters and ten recycled water meters. The ten recycled water users consist of one golf course and nine street medians.

Additionally, VWC has identified approximately 1,250 meters included in its CII accounts that are dedicated to irrigating landscapes. VWC will target its Large Landscape conservation programs to all meters that are dedicated to irrigating landscapes, including those currently included in CII.

VWC is participating in the CLWA-sponsored large landscape program that offers audits to its large landscape customers. Currently 40 sites are enrolled in the program, including 17 within the VWC service area, where the focus is primarily HOA customers. The program offers large landscape customers such as HOAs and parks and landscape maintenance districts the

opportunity to receive free water-use and cost/benefit analysis reports, free workshops for property management and landscapers and rebates for water-saving measures and devices.

Targeted customers, both public and private sector, are contacted by phone to solicit participation. During the audit, the efficiency of the irrigation system is assessed and leaks and repair needs may be identified. Following the site visit, irrigation system efficiency is evaluated to determine an effective watering schedule, and a water budget is developed based on the size of the landscape. The audit report includes upgrade recommendations, available incentives, new irrigation schedules, the water budget and a benefit/cost analysis. The report is delivered in person to further educate the customer.

Customers are eligible to receive financial incentives to offset investments in landscape efficiency of up to $300 per AF of water saved. CLWA works with its retailers to select sites that meet the large landscape specifications. To date, final reports have been generated for five sites; recommended infrastructure modifications have been completed and five rebates were issued. Modifications at another site will be implemented throughout 2011 and 2012.

Currently, customers are notified about the program through VWC's website, referrals or through direct contact from the contractor. Program participation and estimated savings are tracked through the contractor administering the program.

Prior to 2010, the Large Landscape Audit program was conducted and monitored by VWC. The results of these surveys are included in Table 7-14 above.

7.5.3 VWC DMM and SBX7-7 Implementation Plan

VWC recognizes the need to expand conservation programs and efforts in order to meet both its SBX7-7 and DMM requirements.

The SBX7-7 baseline and target calculations are addressed in Chapter 2. The DMM GPCD goals, shown in Table 7-15, are determined by calculating the following:

1. *Baseline GPCD = average annual Potable Water GPCD for the years 1997 through 2006*

2. *2018 GPCD Target = Baseline GPCD multiplied by 0.82 (an 18% reduction)*

3. *Biennial GPCD Targets = Baseline GPCD multiplied by that year's Target (% Baseline). A retail water agency may choose a starting point as either its Baseline GPCD or its 2006 Potable Water GPCD.*

TABLE 7-15
DMM GPCD TARGET CALCULATIONS

Year	Per Capita Water Use (GPCD)
1997	314
1998	257
1999	277
2000	290
2001	261
2002	280
2003	266
2004	263
2005	246
2006	253
Baseline	**271**
Target (2018)	**222**

Compliance is evaluated in relation to the Compliance Table below (Table 7-16) and relative progress toward the goal will be acknowledged in Council Compliance Reports. The compliance tables are read as five increments with reporting goals relative to their first through fifth Compliance reports.

TABLE 7-16
ANNUAL COMPLIANCE TARGETS (IN GPCD)

Year	Compliance Report	Target	Highest Acceptable Bound
2010	1	254	271
2012	2	251	261
2014	3	241	251
2016	4	232	241
2018	5	222	222

The GPCD option for MOU compliance and the SBX7-7 targets are consistent with one another (Table 7-17) and VWC is currently building on the SCVWUESP as well as its WUEEP to implement programs that meet these goals.

TABLE 7-17
COMPLIANCE TARGETS

		Target GPCD		
	Baseline GPCD	**2015**	**2018**	**2020**
MOU/AB 1420	271		222	
SBX7-7	278	250		222

The SCVWUESP recognizes the need to expand conservation programs and efforts. The adoption of SBX7-7 and the twenty percent reduction goal has increased the urgency for

implementation. CLWA is in the process of reviewing its incentive programs and VWC is currently working with CLWA as well as the other purveyors to identify programs that could be implemented regionally. Conservation programs identified to meet future requirements combine financial incentives, regulations and informational elements, and build on the existing activities. Included in the programs considered for implementation are the following:

Financial Incentives

1) High-Efficiency Clothes Washers (HECWs): Clothes washer rebates are on the list of programs identified for implementation in the SCVWUESP. CLWA will be expanding its program to include clothes washer rebates in FY 2011/12 and VWC will participate.

2) Zero and Low-Flow Urinal Rebates: Rebates will include CII fixtures such as zero consumption and ultra low volume urinals as well as CII specific HETs. This program will launch in FY 2011/12.

3) Expansion of Fixture Rebates to CII and Multi-family Customers: Currently the CLWA toilet rebate program is only available to single-family residential customers. Starting 2011, the programs will be expanded to all customers and there will be increased focus on marketing to large HOA accounts.

4) Expand Rebates to Include a Larger Variety of Fixtures: Being considered for inclusion are hot water storage tanks, pressurized water brooms and high-pressure spray nozzles.

5) Cash for Grass Rebate: Customers would be provided with an incentive of up to $1 per square foot of turf removed and replaced with climate appropriate plants. The program is being considered for both residential and CII customers.

6) Expansion of Large Landscape Program: The purveyors will be evaluating the effectiveness of the current landscape program in FY 2011/12 and making adjustments depending on the results. If the program is found to be successful at meeting reduction targets, the program will be accelerated and more devices will be offered, such as Precision Nozzles.

Building Code/New Standards

The SCVWUESP developed a comprehensive list of new building standards beyond those currently in the building code. Code changes that improve the efficiency of fixtures and design account for about 60 percent of the expected reduction in demand, and will therefore be a significant program priority. Some of the proposed changes will be captured in the State Model Efficient Landscape Ordinance effective January 2010, CAL Green Building Code adopted in January 2011, and SB 407 and standard updates for toilets and washers that are being phased in.

In addition to conservation programs, VWC is committed to expanding recycled water in its service area to offset potable water use for landscape irrigation. Currently recycled water provides about 325 AFY. VWC plans to expand its recycled water use to 2,000 AFY by 2020.

The near term plans to expand recycled water are discussed in Section 6. Recycled water will be further expanded with the South End Recycled Water project (Phase 2C), which will expand the existing recycled water transmission and distribution system southerly to supply recycled

water to VWC, NCWD and SCWD customers. The project will result in the use of approximately 910 AFY of recycled water.

Information/Tracking

Information and tracking represents a new element to the existing programs focusing on collecting and processing information and ensuring that the programs are on track to meet the goals. VWC has already initiated this tool with the WaterSMART Allocation program for its individually metered residential customers. VWC will be expanding the WaterSMART Allocation program to its meters that are dedicated to irrigating landscapes. These activities will help program development by providing more robust information about customers and their water use patterns.

Evaluating Effectiveness of the DMMs

VWC will continue to track all program activities including outreach activities, rebate distribution, audits and leak interventions. Program effectiveness and per capita use will be monitored through the billing and consumption system.

VWC will monitor its WaterSMART Allocation program to measure its effectiveness in assisting customers to use water more efficiently.

Impacts of Conservation

It is not expected that, at this time, the conservation programs currently being implemented or scheduled for implementation will have any significant negative effect on water use within VWC's service area or affect VWC's ability to further reduce demand. The funding for current and future programs is being identified.

Economic Impacts

Analysis of the requirements for BMP compliance yields program costs of roughly $450,000 per year.

7.6 Newhall County Water District

NCWD is implementing programs locally as well as leveraging the conservation resources available through CLWA.

In 2002, NCWD became a signatory to the CUWCC MOU, establishing a firm commitment to the implementation of the BMPs or DMMs. Many of NCWD's conservation programs have been ongoing since 2003 or earlier.

NCWD subsequently joined CLWA and the other retail water purveyors in signing a 2007 MOU to prepare the SCVWUESP. The SCVWUESP recommended programs to reduce the overall valley wide water demand by ten percent by 2030 (see Section 7.2 for more information). These programs were designed to provide Valley residents with the tools and education to use water more efficiently.

NCWD is currently implementing all of the Foundational BMPs as required in the revised MOU and UWMP Act. The Programmatic BMPs are being implemented through a BMP approach. The BMP and SBX7-7 goals and implementation plan are discussed further in Sections 7.6.2 and 7.6.3.

7.6.1 Foundational BMPs

7.6.1.1 Utility Operations

Conservation Coordinator

NCWD has had a conservation coordinator since 2002, when it was half a full-time equivalent (FTE) position. The coordinator manages BMP implementation and other water conservation implementation and planning activities. Including the coordinator, NCWD has four FTE staff positions that focus part-time on conservation.

Water Waste Prohibition

NCWD adopted a water conservation ordinance in 1991. The ordinance was revised in 2005 due to water supply conditions at that time. The ordinance provides a water conservation plan to minimize the effect of water shortages on customers. It lists prohibited uses, sets irrigation hours and schedules to optimize water efficiency and states that inspection for leaks and repairs are everyone's responsibility. In addition, State of California, County of Los Angeles, and City of Santa Clarita ordinances also apply to NCWD customers.

Water Loss Control

NCWD conducts annual pre-screening system audits which calculate verifiable use as a percent of total production. NCWD also compares production and sales records monthly to identify losses.

NCWD has completed AWWA's M36 Water Loss analysis, which consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. NCWD's M36 'Reporting Worksheet' for 2010 is provided in Appendix E. Results of the preliminary analysis show an Infrastructure Leakage Index (ILI) of 1.8 and a score of 96, which indicates appropriate loss control. NCWD will continue its water loss practices and review the recommendations, which include annual audits and other incremental improvements.

Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections

All of NCWD's customers are metered and billed volumetrically on a monthly basis. All meters have been replaced in the past ten years and NCWD is currently updating its maintenance plans.

Retail Conservation Pricing

Since 2005, NCWD has employed a four-tier increasing block rate structure for individually three-quarter inch metered residential accounts that is designed to promote water use efficiency and conservation. Rates range from $0.80 per CCF in the first tier to $1.456 per CCF in the fourth tier. The tiers are structured differently depending on meter size.

Non-residential accounts are charged for consumption at a uniform volumetric rate. All accounts are charged a flat fee for water availability, plus variable charges based on usage for energy, infrastructure and purchased water form CLWA. The proportion of revenue from variable charges meets the BMP requirement of 70 percent Table 7-18.

TABLE 7-18
REVENUE

	2006	2007	2008	2009	2010
Fixed: Service Charge	$2,160,400	$2,619,900	$2,808,100	$2,831,100	$2,834,600
Variable	$6,056,900	$7,166,200	$7,202,900	$6,982,900	$6,656,800
Total Revenue	$8,217,300	$9,786,100	$10,011,000	$9,814,000	$9,491,300
Percentage Variable	**74%**	**73%**	**72%**	**71%**	**70%**

7.6.1.2 Education

Public Information

NCWD has had a public information program since the late 1990s. Activities are summarized in Table 7-19. NCWD distributes conservation information to new residential customers as part of a welcome package and to children through free activity books. NCWD participates in community outreach events, mails its customers quarterly newsletters that include conservation tips and provide information on available rebate programs, conservation tips and links to other conservation resources on its website. Water bills were redesigned in 2010 to show water usage for the prior 13 months and suggest potential conservation actions.

Further outreach is implemented in coordination with CLWA. Refer to the Public Information section of CLWA's DMM summary for information on specific programs administered by CLWA.

TABLE 7-19
SUMMARY OF OUTREACH ACTIVITIES

Item	2006	2007	2008	2009	2010
Paid advertising	0	0	5	2	2
Bill Inserts / Newsletters / Brochures	4	4	4	4	4
Bill showing current water usage in comparison with prior year usage	Yes	Yes	Yes	Yes	Yes
Demonstration gardens	1	1	1	1	1
Special Events	3	3	3	4	4
Program to coordinate with other government agencies, industry, public interest groups and media	Yes	Yes	Yes	Yes	Yes

School Education

NCWD's school education program is implemented by CLWA at no cost to school districts and has reached over 10,000 students in NCWD's service area since 2006 (Table 7-20). Refer to the Section 7.2.2 for CLWA's DMM summary of detailed information on age-appropriate presentations, activities and field trips offered to schools, as well as the Water Challenge scholarship program.

TABLE 7-20
SCHOOL EDUCATION (NUMBER OF STUDENTS)

Grade Level	2006	2007	2008	2009	2010
K-3	1,325	1,345	1,224	1,271	1,333
4 - 6	954	623	700	779	973
7 - 8	100	30	0	255	221
9 - 12	0	0	0	0	0
Totals	**2,379**	**1,998**	**1,924**	**2,305**	**2,527**

7.6.2 Programmatic BMPs

The Programmatic BMPs are described below. NCWD is pursuing a GPCD approach to complying with the Programmatic BMPs. The following section describes NCWD program activities.

7.6.2.1 Residential Programs

The largest customer class in the NCWD service area is residential users, accounting for approximately 72 percent of total use.

1) **Residential Survey and Retrofit Programs**
In 2007, NCWD sent all of its single family residential customers a water use self survey that reflected the information requirements of BMPs 1 and 2. Each customer that returned a completed survey received $10 (Table 7-21). NCWD tracked the survey results with a database developed for that purpose.

TABLE 7-21
RESIDENTIAL SURVEYS AND RETROFITS

	2006	2007	2008	2009	2010
Accounts					
Surveys Offered	0	7,000	0	0	0
Surveys Completed	0	375	216	0	0
Devices					
Showerheads	105	400	171	263	312
Aerators	122	184	184	148	173

Water-saving devices are distributed by mail following surveys, or picked up at local events and from the District office; recipients of these devices are tracked in a database. NCWD customers

also receive devices from CLWA, which distributes free water-saving devices to Santa Clarita Valley residents at community events.

2) Residential Landscape Water Survey Program

NCWD's residential landscape water survey program was combined with the indoor water surveys described in Section 1), which are a combined indoor and landscape audit. NCWD has identified landscape conservation as a priority program and has developed various tools to address irrigation use.

NCWD offers its residential customers an ET Controller (Smart Sprinkler) Rebate Program, which started in 2006. The program is available to single family homeowners with a minimum of 1,200 square feet of irrigated landscapes and working in-ground irrigation systems operated by working timers and controllers. The rebate is $40 per active valve, up to a maximum of $480 per residence. NCWD also pays up to $120 for standard installation. At the end of 2010 there have been 48 WBICs installed and inspected within the NCWD service area.

NCWD also provides a free nozzle for each purchased spray head to replace all the sprinklers in a residential front yard turf area. These nozzles have 1/3 the flow of a conventional sprinkler and reduce irrigation application rates to less than 1 inch per hour. This reduces both water use and runoff losses. At the end of 2010 there have been 182 nozzles installed within the NCWD service area.

NCWD is also working with CLWA to offer a program that combines training and fixtures in the form of landscape classes and WBICs give-aways to its residential customers. The program offers homeowners and gardeners free landscape classes; after residents or their gardeners complete the training, they receive free WBICs. They also receive free inspections of their WBIC installations and programming to ensure they are properly installed. The classes are offered in both English and Spanish and have been very popular with residents. At the end of 2010, there have been six classes, and 13 WBICs have been installed and inspected within the NCWD service area.

After completing the training, attendees, as well as their gardeners, receive official certification for attending the workshop and committing to water efficient practices at their sites.

3) WaterSense Specification Toilets

NCWD participates in toilet rebate program sponsored by CLWA, which provides $50 per qualifying toilet. NCWD is also offering HET rebates of up to $115 for single family homes built prior to 1993. The EPA's list of WaterSense labeled products is used to identify qualifying equipment. As of 2008, NCWD had achieved about 65 percent saturation of ULFTs in single family homes and 48 percent in multi-family homes. A summary of rebates that have been issued is provided in Table 7-22. In 2006 NCWD stopped offering ULFT rebates and migrated its incentive program towards HETs.

Compliance with the BMP requires that NCWD rebate about 700 toilets over 10 years, for a total water savings of about 78 AF by 2020. Since 2008, NCWD rebates have been on track to meet the coverage requirement.

TABLE 7-22
TOILET REBATE PROGRAMS

Toilet Type	2006	2007	2008	2009	2010
HET (1.28 gal/flush)				126	227
ULFT Rebates (1.6 gal/flush)	26	13	126		

In addition, NCWD will be realizing the benefits SB 407, effective January 1, 2014. SB 407 requires that all pre-1994 residential, multi-family and commercial customers replace non-compliant plumbing fixtures (including toilets, faucets, and showerheads) with water-conserving fixtures when making certain improvements or alterations to a building. By 2017, all single-family homes must replace non-compliant plumbing fixtures, and by 2019, all multifamily and commercial buildings must have compliant water-conserving plumbing fixtures in place.

7.6.2.2 Commercial, Industrial, and Institutional (CII)

NCWD has about 470 CII accounts, which use about 1,300 AFY, or about 12 percent of NCWD's total water use. These accounts have been identified and ranked by water use.

NCWD provides free audits for CII customers through CLWA's Water Checkup Program. The audits focus on five areas: irrigation, plumbing fixtures, cooling towers (HVAC systems), manufacturing processes and other efficiency opportunities. After the audit is complete, a report is created that summarizes findings and suggestions, and these are discussed with the customer in-person. The report also identifies rebates that are available to provide motivation for implementing the recommended retrofits. Customers are eligible to receive financial incentives to offset any investment in efficiency opportunities in the amount of up to $300 per AF of water saved.

Customers are notified about the CLWA program through bill inserts, the District's website and direct contact from the contractor. Program participation and estimated savings are tracked by CLWA. To date two audits within the NCWD's service have been completed, both for schools.

7.6.2.3 Large Landscape

NCWD has about 230 dedicated irrigation meter accounts that use almost 1,700 AFY, or 15 percent of total use. NCWD customers can take advantage of CLWA's Water Use Efficiency Program for Large Landscapes. Currently 40 sites are enrolled in the program, including four within the NCWD service area where the focus is primarily HOA customers. The program offers large landscape customers such as HOAs, parks and landscape maintenance districts the opportunity to receive free water-use and cost-benefit analysis reports, free workshops for property management and landscapers, and rebates for water-saving measures and devices.

Targeted customers are contacted via phone to solicit participation. During the audit, the efficiency of the irrigation system is assessed and leaks and repair needs may be identified. Following the site visit, irrigation system efficiency is evaluated to determine an effective watering schedule, and a water budget is developed based on the size of the landscape. The audit report includes upgrade recommendations, available incentives, new irrigation schedules, the water budget and a benefit/cost analysis. The report is delivered in person to further educate the customer.

Customers are eligible to receive financial incentives to offset any investment in landscape efficiency in the amount of up to $300 per AF of water saved. CLWA works with its retailers to select sites that meet the large landscape specifications. To date, final reports have been generated for two sites.

Customers are notified about the program through bill inserts, the website and direct contact from the contractor. Program participation and estimated savings are tracked through the contractor administering the program.

7.6.3 NCWD DMM and SBX7-7 Implementation Plan

NCWD recognizes the need to expand conservation programs and efforts in order to meet both its SBX7-7 and DMM requirements.

The SBX7-7 baseline and target calculations are addressed in Chapter 2. The DMM GPCD goals, shown in Table 7-23 are determined by calculating the following:

1. *Baseline GPCD = average annual Potable Water GPCD for the years 1997 through 2006*

2. *2018 GPCD Target = Baseline GPCD multiplied by 0.82 (an 18% reduction)*

3. *Biennial GPCD Targets = Baseline GPCD multiplied by that year's Target (% Baseline). A retail water agency may choose a starting point as either its Baseline GPCD or its 2006 Potable Water GPCD.*

TABLE 7-23
DMM GPCD TARGET CALCULATIONS

Year	Per Capita Water Use (GPCD)
1997	242
1998	220
1999	249
2000	254
2001	243
2002	253
2003	242
2004	247
2005	230
2006	241
Baseline	**242**
Target (2018)	**199**

Compliance is evaluated in relation to the Compliance Table below (Table 7-24) and relative progress toward the goal will be acknowledged in Council Compliance Reports. The compliance tables are read as five increments with reporting goals relative to their first through fifth Compliance reports.

TABLE 7-24
ANNUAL COMPLIANCE TARGETS (GPCD)

Year	Compliance Report	Target	Highest Acceptable Bound
2010	1	228	242
2012	2	225	233
2014	3	216	225
2016	4	207	216
2018	5	199	199

The GPCD option for MOU compliance and the SBX7-7 targets are consistent with one another (Table 7-25).

TABLE 7-25
COMPLIANCE TARGETS

		Target GPCD		
	Baseline GPCD	2015	2018	2020
MOU/AB 1420	242		199	
SBX7-7	244	220		195

The regional plan, the SCVWUESP, recognizes the need to expand conservation programs and efforts. The adoption of SBX7-7 and the twenty percent reduction goal has increased the urgency for implementation. CLWA is in the process of reviewing its incentive programs, and NCWD is currently working with CLWA as well as the other purveyors to identify programs that could be implemented regionally.

Programs that NCWD has identified to meet future requirements combine financial incentives, advances in building codes and improved implementation tracking. NCWD is considering implementing of the following:

Financial Incentives

1) High-Efficiency Clothes Washers (HECWs): Clothes washer rebates are on the list of programs identified for implementation in the SCVWUESP. CLWA will be expanding its program to include clothes washer rebates in FY 2011/12 and NCWD will participate.

2) Zero and Low-Flow Urinal Rebates: Rebates will include CII fixtures such as zero consumption and ultra low volume urinals as well as CII specific HETs. This program will launch in FY 2011/12.

3) Expansion of Fixture Rebates to CII and Multi-family Customers: Currently the toilet rebate program is only available to single-family residential customers. Starting 2011, the programs will be expanded to all customers and there will be increased focus on marketing to large HOA accounts.

4) Expand Rebates to Include a Larger Variety of Fixtures: Being considered for inclusion are hot water distribution tanks, pressurized water brooms and high-pressure spray nozzles.

5) Cash for Grass Rebate: Customers will be provided with an incentive of up to $1 per acre-foot of turf removed and replaced with landscape appropriate plants. The program is being considered for both residential and CII customers.

6) Expansion of Large Landscape Program: The purveyors will be evaluating the effectiveness of the current landscape program in FY 2011/12 and adjusting depending on the results. If the program is found to be successful at meeting reduction targets, the program will be accelerated and more devices will be offered, such as Precision Nozzles.

Building Codes/New Standards

The SCVWUESP developed a comprehensive list of new building standards beyond those currently in the building code. Code changes that improve the efficiency of fixtures and design account for about 60 percent of the expected reduction in demand, and will therefore be a significant program priority. Some of the proposed changes will be captured in the State Model Efficient Landscape Ordinance effective January 2010, CAL Green Building Code, adopted in January 2011 and SB 407 and standard updates for toilets and washers that are being phased in.

Implementation Tracking

Tracking is intended to bring new accountability to existing programs. This is implemented by collecting and processing information to ensure that the programs are on track to meet the defined goals.

Evaluating Effectiveness of the DMMs

NCWD will continue to track all program activities including outreach activities, rebate distribution, audits, water-saving device distribution and ET controller distribution. Program effectiveness and per capita use will be monitored through the billing and consumption system.

Impacts of Conservation

It is not expected, at this time, that conservation programs that are currently being implemented or are scheduled for implementation will have any significant negative impact on water use within NCWD's service area or will affect NCWD's ability to further reduce demand. The funding for current and future programs is being identified.

Economic Impacts

Analysis of the requirements for BMP compliance yields program costs of roughly $430,000.

Section 8: Water Shortage Contingency Planning

8.1 Overview

Water supplies may be interrupted or reduced significantly in a number of ways, such as a drought that limits supplies, an earthquake that damages water delivery or storage facilities, a regional power outage or a toxic spill that affects water quality. This chapter of the Plan describes how CLWA and the retail water purveyors plan to respond to such emergencies promptly and equitably.

To date, both a Water Shortage Contingency Plan and a Drought Emergency Water Sharing Agreement have been prepared by CLWA and the retail purveyors. Prohibitions, penalties and financial impacts of shortages have been developed by SCWD, NCWD, and VWC and are summarized in this chapter.

8.2 Coordinated Planning

CLWA and the purveyors have coordinated efforts in the past to meet water shortages. During 1991 (the fifth year of a six-year drought), the purveyors and CLWA prepared a Water Shortage Contingency Plan. Since this plan was first prepared, the Valley has experienced two water shortages: in 1991-1992 due to the continuation of the 1987-1992 drought and in 1994 due to the January 17, 1994 Northridge earthquake. The plan worked extremely well in both instances, and minor updates were made to incorporate actual experience during these two periods. It is envisioned that the Water Shortage Contingency Plan will be implemented whenever needed in the future.

8.2.1 CLWA and the Retail Water Purveyors

During times of normal supply, the local water suppliers meet periodically to review total water supply and demand in the Valley and any new regulations affecting the water industry.

During the drought year of 1991, the local purveyors met more frequently (about once per month). Monthly water production and demand reports were produced and shared with the City of Santa Clarita Drought Committee. After the 1987-1992 drought, CLWA and the retail purveyors cooperated in sharing available water from all sources without regard to contractual or other water rights for the duration of the emergency, and to facilitate among themselves water transfers, exchanges and arrangements to use each others' distribution facilities. During the recent 2007 to 2009 drought period, the purveyors resumed the monthly meetings and monitored valley-wide water demand, and strengthened conservation planning and response planning.

8.3 Stages of Action to Respond to Water Shortages

The Saugus Formation has underground storage of approximately 1.65 MAF. In times of continued drought, the Saugus Formation can be pumped for temporary periods above its normal year production. During a dry year or an extended drought, the purveyors would temporarily increase pumping in the Saugus Formation above the normal-year production of 7,500 to 15,000 AFY, and plan to upgrade the pumping capacity of their wells, restore lost

capacity and drill additional wells to enable this increased pumping. As developed in the Valley's groundwater operating plan and presented in Table 3-5 in Section 3, production in the Saugus Formation can be as high as 25,000 to 35,000 AFY during multiple-dry year periods.

The Alluvium would be most affected by a continued local drought. As developed in the Valley's groundwater operating plan and further presented in Table 3-5, sustainable production during normal years can range from 30,000 to 40,000 AFY. However, due to operational constraints in the eastern part of the Basin, production would be reduced to approximately 30,000 to 35,000 AFY during locally dry years.

Table 8-1 presents the four-stage rationing and demand reduction goals for the Valley[24].

TABLE 8-1
RATIONING AND REDUCTION GOALS

Deficiency	Stage	Demand Reduction Goal	Type of Program
Up to 15%	1	15% reduction	Voluntary
15-25%	2	25% reduction	Mandatory
25-35%	3	35% reduction	Mandatory
35-50%	4	50+% reduction	Mandatory

Priorities for use of available water, based on Chapter 3 of the California Water Code, are:

- Health and Safety: Interior residential, sanitation and fire protection
- Commercial, Industrial, and Governmental: Maintain jobs and economic base
- Existing Landscaping: Especially trees and shrubs
- New Demand: Projects with permits when shortage declared

Water quantity calculations used to determine the interior household GPCD requirements for health and safety are provided in Table 8-2. As developed in Table 8-2, the California Water Code Stage 2, 3, and 4 health and safety allotments are 68 GPCD, or 33 CCF (100 cubic feet) per person per year. When considering this allotment and the Valley population of 286,750 in 2010 as presented in Section 2 (Table 2-8), the total annual water supply required to meet the first priority use during a water shortage is approximately 21,839 AFY.

[24] LACWWD has a nine-stage rationing and demand reduction method plan. Anticipated shortages that trigger the phases of action range from 10 percent to 50 percent, while associated conservation target reductions similarly range from 10 percent to 50 percent, with mandatory rationing after Stage 2.

TABLE 8-2
PER CAPITA HEALTH AND SAFETY WATER QUANTITY CALCULATIONS

	Non-Conserving Fixtures		Habit Changes		Conserving Fixtures	
Toilets	5 flushes x 5.5 gpf =	27.5	3 flushes x 5.5 gpf =	16.5	5 flushes x 1.6 gpf =	8.0
Showers	5 min x 4.0 gpm =	20.0	4 min x 3.0 gpm =	12.0	5 min x 2.0 gpm =	10.0
Washers	12.5 GPCD (1/3 load) =	12.5	11.5 GPCD (1/3 load) =	11.5	11.5 GPCD (1/3 load) =	11.5
Kitchens	4 GPCD =	4.0	4 GPCD =	4.0	4 GPCD =	4.0
Other	4 GPCD =	4.0	4 GPCD =	4.0	4 GPCD =	4.0
Total GPCD		68.0		48.0		37.5
CCF per capita per year		33.0		23.0		18.0

8.4 Minimum Water Supply Available During Next Three Years

The minimum water supply available during the next three years would occur during a three-year multiple-dry year event between the years 2011 and 2013. As shown in Table 8-3, the total water supply available during each of the next three years is about 128,400 AFY. When comparing these supplies to the demand projections provided in Chapter 2 of this Plan, CLWA and the purveyors have adequate supplies available to meet projected demands should a multiple-dry year period occur during the next three years.

TABLE 8-3
ESTIMATE OF MINIMUM SUPPLY FOR THE NEXT THREE YEARS

	Supply (AF)		
Source	**2011**	**2012**	**2013**
Wholesale (Imported)			
SWP Table A Supply[(a)]	30,700	30,700	30,700
Buena Vista-Rosedale	11,000	11,000	11,000
Nickel Water - Newhall Land	1,607	1,607	1,607
Flexible Storage Account (CLWA)[(b)]	1,560	1,560	1,560
Flexible Storage Account (Ventura County)[(b)]	460	460	460
Total Imported Supplies	*45,327*	*45,327*	*45,327*
Local Supplies			
Groundwater Supplies			
Alluvial Aquifer[(c)]	20,425	20,425	20,425
Saugus Formation[(c)]	19,700	19,700	19,700
Recycled Water	325	325	325
Total Local Supplies	*40,450*	*40,450*	*40,450*
Banking Programs			
Semitropic Water Bank[(d)]	15,300	15,300	15,300
Rosedale-Rio Bravo[(e)]	20,000	20,000	20,000
Semitropic Water Bank - Newhall Land[(e)]	4,950	4,950	4,950
Total Banking Programs	*40,250*	*40,250*	*40,250*
Total Supplies	**126,027**	**126,027**	**126,027**

Notes:
(a) SWP supplies to CLWA based on detailed delivery results provided by DWR from the analyses presented in DWR's *2009 SWP Delivery Reliability Report*, for the worst case three-year dry period of 1990-1992. SWP deliveries to CLWA over this three year period average 32% of CLWA's 95,200 AF of Table A Amount.
(b) Based on total amount of storage available divided by 3 (3-year dry period).
(c) Based on existing groundwater supplies available during a multiple-dry year period.
(d) Based on total amount of water currently in storage (45,920 AF) divided by 3 (3-year dry period).
(e) Based on maximum annual pumpback capacity.

8.5 Actions to Prepare for Catastrophic Interruption

8.5.1 General

The Valley is located approximately 20 miles southwest of the San Andreas Fault, which traverses the length of the southern San Joaquin Valley. A major earthquake along this portion of the San Andreas Fault would affect the Valley. The California Division of Mines and Geology has stated that two of the aqueduct systems that import water to southern California (including the California Aqueduct) could be ruptured by displacement on the San Andreas Fault. The situation would be further complicated by physical damage to pumping equipment and local loss of electrical power.

DWR has an Aqueduct Outage Plan for restoring the California Aqueduct to service should a major break occur, which it estimates would take approximately four months to repair.

Limitations on supplies of groundwater and/or imported water for an extended period, due to power outages and/or equipment damage, could result in severe water shortages until the supplies could be restored.

Combined water storage of the local water suppliers totals approximately 190 MG of water in storage tanks, which can be gravity fed to Valley businesses and residences, even if there is a power outage. The public would be asked to reduce consumption to minimum health and safety levels, extending the supply to a minimum of seven days. This would provide sufficient time to restore a significant amount of groundwater production. After the groundwater supply is restored, the pumping capacity of the four retail purveyors could meet the reduced demand until such time that the imported water supply was reestablished. Updates on the water situation would be made as often as necessary.

The Valley's water sources are generally of good quality, and no insurmountable problems resulting from industrial or agricultural contamination are foreseen. If contamination did result from a toxic spill or similar accident, the contamination would be isolated and should not significantly impact the total water supply. In addition, such an event would be covered by the purveyors Emergency Response Plan.

8.5.2 SWP Emergency Outage Scenarios

In addition to earthquakes, the SWP could experience other emergency outage scenarios. Past examples include slippage of aqueduct side panels into the California Aqueduct near Patterson in the mid-1990s, the Arroyo Pasajero flood event in 1995 (which also destroyed part of Interstate 5 near Los Banos) and various subsidence repairs needed along the East Branch of the Aqueduct since the 1980s. All these outages were short-term in nature (on the order of weeks), and DWR's Operations and Maintenance Division worked diligently to devise methods to keep the Aqueduct in operation while repairs were made. Thus, the SWP contractors experienced no interruption in deliveries.

One of the SWP's important design engineering features is the ability to isolate parts of the system. The Aqueduct is divided into "pools." Thus, if one reservoir or portion of the California Aqueduct is damaged in some way, other portions of the system can still remain in operation. The principal SWP facilities are shown on Figure 8-1.

FIGURE 8-1
PRIMARY SWP FACILITIES

Other events could result in significant outages and potential interruption of service. Examples of possible nature-caused events include a levee breach in the Delta near the Harvey O. Banks Pumping Plant, a flood or earthquake event that severely damages the Aqueduct along its San Joaquin Valley traverse, or an earthquake event along either the West or East Branches. Such events could impact some or all SWP contractors south of the Delta.

The response of DWR, CLWA and other SWP contractors to such events would be highly dependent on the type and location of any such events. In typical SWP operations, water flowing through the Delta is diverted at the SWP's main pumping facility, located in the southern Delta, and is pumped into the California Aqueduct. During the relatively heavier runoff period in the winter and early spring, Delta diversions generally exceed SWP contractor demands and the excess is stored in San Luis Reservoir. Storage in SWP aqueduct terminal reservoirs, such as Pyramid and Castaic Lakes, is also refilled during this period. During the summer and fall, when diversions from the Delta are generally more limited and less than contractor demands, releases from San Luis Reservoir are used to make up the difference in deliveries to contractors. The SWP share of maximum storage capacity at San Luis Reservoir is 1,062,000 AF.

CLWA receives its SWP deliveries through the West Branch of the California Aqueduct at Castaic Lake. The only other contractors receiving deliveries from the West Branch are Metropolitan and Ventura County Watershed Protection District (formerly known as the Ventura County Flood Control District). The West Branch has two terminal reservoirs, Pyramid Lake and Castaic Lake, which were designed to provide emergency storage and regulatory storage (i.e., storage to help meet peak summer deliveries) for CLWA and the other two West Branch contractors. Maximum operating capacity at Pyramid and Castaic lakes is 169,900 and 323,700 AF, respectively.

In addition to SWP storage south of the Delta in San Luis and the terminal reservoirs, a number of contractors have stored water in groundwater banking programs in the San Joaquin Valley, and many also have surface and groundwater storage within their own service areas.

Three scenarios that could impact the delivery to CLWA of its SWP supply, previously banked supplies or other supplies delivered to it through the California Aqueduct are described below. For each of these scenarios, it was assumed that an outage of six months could occur. CLWA's ability to meet demands during the worst of these scenarios is presented following the scenario descriptions.

8.5.2.1 Scenario 1: Levee Breach Near Banks Pumping Plant

As demonstrated by the June 2004 Jones Tract levee breach and previous levee breaks, the Delta's levee system is fragile. The SWP's main pumping facility, Banks Pumping Plant, is located in the southern Delta. Should a major levee in the Delta near these facilities fail catastrophically, salt water from the eastern portions of San Francisco Bay would flow into the Delta, displacing the fresh water runoff that supplies the SWP. All pumping from the Delta would be disrupted until water quality conditions stabilized and returned to pre-breach conditions. The re-freshening of Delta water quality would require large amounts of additional Delta inflows, which might not be immediately available, depending on the time of year of the levee breach. The Jones Tract repairs took several weeks to accomplish and months to complete; a more severe breach could take much longer, during which time pumping from the Delta might not be available on a regular basis.

Assuming that the Banks Pumping Plant would be out of service for six months, DWR could continue making at least some SWP deliveries to all southern California contractors from water stored in San Luis Reservoir. The water available for such deliveries would be dependent on the storage in San Luis Reservoir at the time the outage occurred and could be minimal if it occurred in the late summer or early fall when San Luis Reservoir storage is typically low. In addition to supplies from San Luis Reservoir, water from the West Branch terminal reservoirs would also be available to the three West Branch contractors, including CLWA. CLWA water stored in groundwater banking programs in the San Joaquin Valley may also be available for withdrawal and delivery to CLWA.

8.5.2.2 Scenario 2: Complete Disruption of the California Aqueduct in the San Joaquin Valley

The 1995 flood event at Arroyo Pasajero demonstrated vulnerabilities of the California Aqueduct (the portion that traverses the San Joaquin Valley from San Luis Reservoir to Edmonston Pumping Plant). Should a similar flood event or an earthquake damage this portion of the aqueduct, deliveries from San Luis Reservoir could be interrupted for a period of time. DWR has informed the SWP contractors that a four-month outage could be expected in such an event. CLWA's assumption for this Plan is a more conservative six-month outage.

Arroyo Pasajero is located downstream of San Luis Reservoir and upstream of the primary groundwater banking programs in the San Joaquin Valley. Assuming an outage at a location near Arroyo Pasajero that takes the California Aqueduct out of service for six months, supplies from San Luis Reservoir would not be available to those SWP contractors located downstream of that point. However, CLWA water stored in groundwater banking programs in the San Joaquin Valley could be withdrawn and delivered to CLWA, and water from the West Branch terminal reservoirs would also be available to the three West Branch contractors, including CLWA. Assuming an outage at a location on the California Aqueduct south of the groundwater banking programs in the San Joaquin Valley, these supplies would not be available to CLWA, but water from the West Branch terminal reservoirs would be available to the three West Branch contractors, including CLWA.

8.5.2.3 Scenario 3: Complete Disruption of the West Branch of the California Aqueduct

The West Branch of the California Aqueduct begins at a bifurcation of the Aqueduct south of Edmonston Pumping Plant, which pumps SWP water through and across the Tehachapi Mountains. From the point of bifurcation, the West Branch is an open canal through Quail Lake, a small flow regulation reservoir, to the Peace Valley Pipeline, which conveys water into Pyramid Lake. From Pyramid Lake, water is released into the Angeles Tunnel, through Castaic Powerplant into Elderberry Forebay, and then into Castaic Lake.

If a major earthquake (an event similar to or greater than the 1994 Northridge earthquake) were to damage a portion of the West Branch, deliveries could be interrupted. The exact location of such damage along the West Branch would be key to determining emergency operations by DWR and the three West Branch SWP contractors. For this scenario, it was assumed that the West Branch would suffer a single-location break and deliveries of SWP water from north of the Tehachapi Mountains or of CLWA water stored in groundwater banking programs in the San Joaquin Valley would not be available. It was also assumed that Pyramid and Castaic dams would not be damaged by the event and that water in Pyramid and Castaic Lakes would be available to the three West Branch SWP contractors, including CLWA.

In any of these three SWP emergency outage scenarios, DWR and the SWP contractors would coordinate operations to minimize supply disruptions. Depending on the particular outage scenario or outage location, some or all of the SWP contractors south of the Delta might be affected. But even among those contractors, potential impacts would differ given each contractor's specific mix of other supplies and available storage. During past SWP outages, the SWP contractors have worked cooperatively to minimize supply impacts among all contractors. Past examples of such cooperation have included certain SWP contractors agreeing to rely more heavily on alternate supplies, allowing more of the outage-limited SWP supply to be delivered to other contractors, and exchanges among SWP contractors, allowing delivery of one contractor's SWP or other water to another contractor, with that water being returned after the outage was over.

8.5.2.4 Assessment of Worst-Case Scenario

Of these three SWP outage scenarios, the West Branch outage scenario presents the worst-case scenario for the CLWA service area. In this scenario, the water suppliers would rely on local supplies and water available to CLWA from Pyramid and Castaic Lakes. See Section 8.5.3 below regarding recommendations for emergency outage storage using co-agreements with other SWP contractors and individual groundwater banking programs. An assessment of the supplies available to meet demands in CLWA's service area during a six-month West Branch outage and the additional levels of conservation projected to be needed are presented in Table 8-4 for 2010 through 2050.

During an outage, the local supplies available would consist of groundwater from the Alluvial Aquifer and the Saugus Formation, as well as recycled water. It was assumed that local well production would be unimpaired by the outage and that the outage would occur during a year when average/normal supplies would be available from the Alluvial Aquifer. Pumping from the Saugus was assumed to be one-half of the single-dry year supplies. Note that adequate well and aquifer capacity exists to pump at levels higher than those assumed in this assessment, particularly during a temporary period such as an outage. However, to be conservative, groundwater production was assumed to be one-half of annual supplies. Based on the assumption that additional voluntary conservation could reduce the amount of waste discharge, and therefore the amount of recycled water available, the amount of recycled water available is assumed to be available 25 percent less than average/normal year supplies.

The water available to CLWA from Pyramid and Castaic Lakes includes flexible storage available to CLWA at Castaic Lake and emergency and potentially regulatory storage available in both Pyramid and Castaic Lakes. Regulatory storage, which is used to help meet high peak summer deliveries, may or may not be available depending on what time of year an outage occurs. For this assessment, regulatory storage was assumed to be unavailable. The amount of emergency storage assumed to be available to CLWA was based on CLWA's proportionate share of usable storage in each reservoir, where usable storage is maximum operating storage, less regulatory and dead pool storage. At Castaic Lake, this usable storage determination also excludes the three West Branch contractors' total Flexible Storage Accounts. CLWA's proportionate share of usable storage was assumed to be slightly less than three percent, based on its share of capital cost repayment at each reservoir. On this cost repayment basis, the proportionate shares of the Metropolitan and Ventura County Watershed Protection District are about 96 percent and one percent, respectively.

Table 8-4 shows that, for a six-month emergency outage, additional conservation beyond SBX7-7 conservation objectives described in Chapter 2 would be required, with the additional

demand reductions ranging from one to 11 percent of total demand beginning in 2035. It is likely that potential cooperation among SWP contractors and/or temporarily increased purveyor groundwater production during such an outage could increase supplies so that lower amounts, or even no amount, of additional conservation would be needed. Further, the acquisition of emergency storage, as discussed in Section 8.5.3, could reduce or eliminate the need for additional conservation. However, even without such supply increases, these levels of additional conservation would be readily achievable. In an emergency such as this, these levels of additional conservation would likely be achieved through voluntary conservation, but mandatory measures would be enacted if needed.

TABLE 8-4
PROJECTED SUPPLIES AND DEMANDS DURING SIX MONTH DISRUPTION OF IMPORTED SUPPLY (AF)[a]

Water Supply Sources	2015	2020	2025	2030	2035	2040	2045	2050
Existing Supplies								
Groundwater								
Alluvial Aquifer[b]	12,000	12,000	12,000	12,500	12,500	12,500	12,500	12,500
Saugus Formation[c]	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200
Recycled Water[d][e]	120	120	120	120	120	120	120	120
Planned Supplies								
Future Groundwater								
Alluvial Aquifer[b]	-	500	1,000	1,500	2,000	2,500	3,000	3,500
Saugus Formation (Restored Well)[c]	425	1,900	1,900	1,900	1,900	1,900	1,900	1,875
Saugus Formation (New Wells)[c]	1,475	4,950	4,950	4,950	4,950	4,950	4,950	4,975
Recycled Water[d]	370	1,020	1,960	2,920	3,850	5,170	6,480	7,870
Total Existing and Planned Supplies	***24,590***	***30,690***	***32,130***	***34,090***	***35,520***	***37,340***	***39,150***	***41,040***
SWP West Branch Storage Available								
SWP Flexible Storage Accounts [f]	6,060	4,680	4,680	4,680	4,680	4,680	4,680	4,680
Emergency Storage								
Pyramid Lake[g]	4,370	4,370	4,370	4,370	4,370	4,370	4,370	4,370
Castaic Lake[h]	3,370	3,370	3,370	3,370	3,370	3,370	3,370	3,370
Total West Branch Storage	***13,800***	***12,420***	***12,420***	***12,420***	***12,420***	***12,420***	***12,420***	***12,420***
Total Local Supplies and West Branch Storage	**38,390**	**43,110**	**44,550**	**46,510**	**47,940**	**49,760**	**51,570**	**53,460**
Demands[i]								
Total Demand w/o Conservation	40,035	44,242	48,449	52,656	56,863	61,070	65,277	69,484
20x2020 Reduction	4,514	9,813	10,583	11,385	12,171	12,957	13,743	14,529
Reduction from Recycled Water	650	1,525	2,775	4,050	5,300	7,050	8,800	10,650
Reduction from Water Conservation	3,864	8,288	8,331	8,374	8,417	8,460	8,503	8,546
Total Demand w/ Conservation	**36,172**	**35,954**	**40,118**	**44,282**	**48,447**	**52,611**	**56,775**	**60,939**
Additional Conservation Required[j]	0	0	0	0	507	2,851	5,205	7,479
Additional Conservation as Percent of Demand[k]	0%	0%	0%	0%	1%	5%	8%	11%

Notes:
(a) Assumes complete disruption in SWP supplies and in deliveries through the California Aqueduct for six months.
(b) Pumping from the Alluvial Aquifer is assumed to be one-half of the average normal year supplies (see Table 6-2).
(c) Pumping from the Saugus Formation is assumed to be one-half of the single-dry year supplies (see Table 6-3).
(d) Recycled water supply is based on one-half of projected use.
(e) Assumes 25% reduction in waste discharge, and therefore in recycled water availability, due to additional voluntary conservation.
(f) Includes both CLWA and Ventura County entities flexible storage accounts. Initial term of agreement with the Ventura County entities expires after 2015.
(g) CLWA's share of usable storage at Pyramid Lake, based on its 2.817% proportionate share of capital cost repayment of the reservoir, and assumed usable storage of 155,100 AF.
(h) CLWA's share of usable storage at Castaic Lake, based on its 2.927% proportionate share of capital cost repayment of the reservoir, and assumed usable storage of 115,100 AF.
(i) All demand data are assumed to be one-half of average/normal year Regional Summary demands from Table 2-22.
(j) Additional Conservation Required is difference between Total Demand w/ Conservation and Total Local Supplies and West Branch Storage. A portion or all of this could be met with the acquisition of emergency storage (see Section 8.5.3).
(k) Expressed as percent of Total Demand w/o Conservation.

8.5.3 Recommendations for Emergency Storage

The various outage scenarios described in Section 8.5.2 highlight the benefit of CLWA having water stored in multiple banking programs south of the Delta. Banking programs located in Kern County, which have access to the California Aqueduct, are ideally suited to meet at least part of CLWA's emergency needs. The worst-case scenario described above (a complete disruption on the West Branch of the aqueduct) demonstrates the desirability that CLWA also has water stored in at least one water banking program geographically located south of the Tehachapi Mountains.

Storage located south of the Tehachapi Mountains may necessitate an exchange agreement with another West Branch contractor so that the contractor could be served from CLWA's banked water, and CLWA could be served by a portion of the contractor's water in Pyramid or Castaic Lake (this worst case scenario also assumes that CLWA has access to its full Flexible Storage Account in Castaic Lake, in addition to emergency storage).

The most likely and utilizable arrangement would be with the Metropolitan Water District, which retains a significant portion of the storage capacity in Castaic Lake. CLWA could store varying amounts of its water in groundwater storage or banking programs within or adjacent to Metropolitan's service area. In the event of an outage or other emergency, Metropolitan would serve its customers with CLWA's stored water and CLWA would serve its customers with a like amount of Metropolitan's water in Castaic Lake. Amounts of storage required and locations of potential banking programs are as follows:

- Emergency outage storage capacity: 5,000 AF of storage capacity in 2010, increasing to approximately 14,000 AF by 2050.
- Emergency pumpback capacity: approximately 1,000 AF per month of pumpback capacity in 2010, increasing to 2,300 AF per month by 2050.

Potential banking programs, where CLWA could be served by a portion of the contractor's water in Pyramid or Castaic Lake for a potential exchange of emergency outage storage include the following locations:

- **Semitropic-Rosamond Water Bank Authority**
  - This project is located in eastern Kern County, in the northern portion of the Antelope Valley. It is adjacent to both the East Branch of the California Aqueduct and the Los Angeles Aqueduct. This program is active and is seeking participants.
- **Antelope Valley-East Kern Water Agency Water Supply Stabilization Program and Groundwater Recharge Project**
  - This is a project proposed by the Antelope Valley-East Kern Water Agency (AVEK), a SWP wholesaler located in the Antelope Valley area of southeastern Kern County and northern Los Angeles County. The project is adjacent to the East Branch of the California Aqueduct. AVEK is conducting the environmental analysis for the proposed project.
- **Calleguas Municipal Water District Las Posas Groundwater Recharge Project**
  - This project is an in-lieu and Aquifer Storage and Recovery project located in central Ventura County, within the service area of Metropolitan. CLWA could purchase or store water in the program and in the event of an emergency outage, would

exchange the water for use in Metropolitan's service area. CLWA would then utilize a like amount of Metropolitan's water stored in Castaic Lake. This is a conceptual project.

8.5.4 Regional Power Outage Scenarios

For a major emergency such as an earthquake, Southern California Edison (Edison) has declared that in the event of an outage, power would be restored within a 24 hour period. Following the Northridge earthquake, Edison was able to restore power within 19 hours. Edison experienced extensive damage to several key power stations, yet was still able to recover within a 24-hour timeframe.

8.5.4.1 CLWA

To specifically address the concern of water outages due to loss of power, CLWA has equipped its two treatment plants with generators to produce power for treating water to comply with the California Safe Drinking Water Act and the Health and Safety Code. The Rio Vista Water Treatment Plant and Intake Pump Station emergency generator system provides electrical power to treat 30 MGD for 72 hours without fuel replacement. The Earl Schmidt Filtration Plant emergency generator system provides electrical power to treat 33 MGD for 72 hours without fuel replacement.

8.5.4.2 SCWD

SCWD has prepared emergency operations procedures for the effective use of resources during various emergency situations. Emergency situations include but are not limited to earthquakes, major fire emergencies, water outages due to loss of power, localized flooding, water contamination and acts of sabotage.

To specifically address the concerns of water outages due to loss of power, SCWD has purchased and maintains five mobile generators and has the ability to obtain emergency access to others. The current generators are trailer mounted and have the capability of supplying up to 450 Kilovolt-Amperes (KVA). This capacity provides the capability to run any facility within its service area. Most primary pumping facilities are equipped with emergency transfer switches and SCWD employees are trained regularly to install and operate the generators. The generator's run time is only limited by the amount of available diesel fuel.

SCWD has an above-ground diesel fuel storage tank with a capacity of 1,000 gallons located at its warehouse in the City of Santa Clarita. SCWD also has the assistance of a commercial fuel supplier when needed. SCWD maintains a trailer-mounted 100-gallon diesel tank that will be deployed as required to preserve services. SCWD would respond to power outages on a prioritized basis and would continue its response to the power emergency as long as necessary. In addition to the generators, SCWD has a gas driven pump capable of delivering a maximum 2,000 gpm. This pump can be installed at select facilities and run as required.

8.5.4.3 NCWD

NCWD has procedures for earthquakes, major fire emergencies, water outages due to loss of power, localized flooding, water contamination and acts of sabotage. To specifically address the concerns of water outages due to loss of power, NCWD has purchased and maintains three

mobile generators. The generators are trailer mounted and have the following capacities: 600 KVA; 300 KVA; and 180 KVA.

These capacities provide the capability to run any facility within NCWD's service area. All primary pumping facilities are equipped with emergency transfer switches, and NCWD employees are trained regularly to maximize the speed to install and operate the generators. The generator run time is only limited by the amount of available diesel fuel.

NCWD has an above ground diesel fuel storage tank with a capacity of 1,000 gallons located at its main office in the City of Santa Clarita. Multiple crew trucks are equipped with 100 gallon diesel tanks and the necessary fueling equipment to refill the generators. NCWD would respond to power outages on a prioritized basis and would continue its response to the power emergency as long as necessary. In addition to the generators, NCWD has one gas driven pump and one diesel driven pump capable of delivering 600 gpm and 1,200 gpm, respectively. All NCWD pumping facilities have been equipped with the necessary appurtenances to quickly connect the portable pumps to restore pumping operations.

8.5.4.4 VWC

In the event that a power outage occurs, VWC has two mobile generators capable of powering any of VWC's wells, turnouts or booster stations. VWC would use the generators as back-up to ensure water service remained until Edison was able to restore power. Besides the significant fuel storage capacity of each generator, VWC has access multiple sources for fuel as needed. For regional power outages, VWC would rely on Edison's reliability criteria for restoring service with the longest outage assumed not to exceed 24 hours. This length of outage would not have a significant impact on water service.

8.6 Mandatory Prohibitions During Shortages

All Valley residents live within the boundaries of the City of Santa Clarita or Los Angeles County. Several ordinances were passed in 1991, during the last long-term drought, by the various governmental entities in the Santa Clarita Valley outlawing wasteful water practices. It is expected that, if the Valley experienced another dry-year period, the same ordinances passed in 1991 would be reactivated, as follows:

- On February 14, 1991, the NCWD Board of Directors adopted Resolution No. 101 outlawing wasteful water practices. The ordinance was amended on October 15, 1991, with the adoption of Ordinance No. 102, and further amended on July 14, 2005, with the adoption of Ordinance No. 112.

- On March 13, 1991, the City of Santa Clarita adopted Ordinance No. 91-16 outlawing wasteful water practices and calling for voluntary water conservation. The ordinance was amended on October 8, 1991 by the adoption of Ordinance No. 91-48.

- On March 21, 1991, the Los Angeles County Board of Supervisors adopted Ordinance No. 91-0046U, which prohibits wasteful water practices. The Water Conservation Requirements (Ordinance No. 2008-00052U) was amended by the Los Angeles County Board of Supervisors on October 7, 2008.

Most of the ordinances mentioned above had sunset provisions that were effective January 1, 1992; however, these ordinances could be reinstituted as needed. During more recent conditions of limited supply, in 2008, CLWA adopted Resolution No. 2605 mandating a voluntary program of water conservation in the Santa Clarita Valley.

8.7 Consumptive Reduction Methods During Restrictions

8.7.1 Supply Shortage Triggering Levels

The Santa Clarita Valley water suppliers will manage water supplies to minimize the social and economic impact of water shortages. The supply shortage strategy is designed to provide a minimum 50 percent of normal supply during a severe or extended water shortage.

Demand reduction stages may be triggered by a shortage in any one of the water sources in the Valley or by shortages in a combination of supplies. The guidelines for triggering the stages are listed in Table 8-5. However, circumstances may arise where the purveyors may deviate from these guidelines, such as in a case where the Governor declares a water shortage emergency and/or institutes a statewide rationing program.

TABLE 8-5
WATER DEFICIENCY TRIGGERING LEVELS

Stage	Percent Shortage
1	Up to 15% water deficiency
2	15 to 25% water deficiency
3	25 to 35% water deficiency
4	35 to 50+% water deficiency

8.7.2 Consumption Limits

The Valley-wide consumption allocation method for each customer type is as follows:

- Single Family Hybrid of Per-capita and Percentage Reduction
- Multi Family Hybrid of Per-capita and Percentage Reduction
- Commercial Percentage Reduction
- Industrial Percentage Reduction
- Governmental Percentage Reduction
- Recreational Percentage Reduction
- Irrigation Percentage Reduction

The percentage reductions at each stage and for each customer type correspond to the figures listed in Table 8-5. In a drought situation (multiple-dry year period), individual customer allotments will be based on a normal year consumption table. The water purveyors will classify each customer and calculate each customer's allotment according to Table 8-5. Each customer will be notified of its classification and allotment by mail before the implementation of a mandatory program. New customers and connections will be notified at the time service

commences if a mandatory program is in effect. Any customer may appeal its classification on the basis of use or the allotment on the basis of incorrect calculation.

In a disaster, prior notice of allotment may not be possible. Notice will be provided by the most efficient means available, if necessary, through the terms of the water suppliers' emergency response plans.

8.7.3 New Demand

During any declared water shortage emergency requiring mandatory rationing, CLWA and the retail purveyors recommend that the City and County building departments continue to process applications for grading and building permits, but not issue the actual permits until mandatory rationing is rescinded. In Stages 3 and 4, it may be necessary to discontinue all use of grading water, even if permits have been issued, and consider banning all use of water for non-essential uses, such as new landscaping and pools.

8.8 Penalties for Excessive Use

The following section provides a summary of the penalties, if any, that are implemented for excessive water use for SCWD, NCWD and VWC.

8.8.1 SCWD

In September 2009, the CLWA Board of Directors adopted Resolution No. 2678 establishing retail water rates that encourage the responsible use of water resources. These rates took effect January 1, 2010. For single family residential customers, SCWD implemented a three tiered rate structure allowing every customer the choice to use water efficiently or pay a premium. Excessive water use results in higher cost per unit of water. Irrigation customers have a separate uniform water rate comparable to the highest Tier 3 (conservation) rate for the single family. All other customers have a uniform flat rate equal to the Tier 2 rate for the single family.

This rate structure is designed to minimize water waste; other than the rate structure, there are no excessive use penalties in place.

8.8.2 NCWD

In July 2005, NCWD's Board of Directors adopted Ordinance No. 112, which addresses water conservation, shortage, drought and emergency response procedures. NCWD's Water Conservation Action Plan states that no water user shall waste water or make, cause or permit the use of water for any purpose contrary to any provision of Ordinance No. 112, or in quantities in excess of the use permitted by the conservation stage in effect. If excessive use (water leaks and/or waste) is detected from any water user, the following enforcement plan will be followed:

- **Efficient Water Use and Stage 1 Enforcement:**
  - Any sign of water leaks and/or waste will be documented.
  - NCWD will then determine the appropriate level of action to inform the water user of the guidelines in Ordinance No. 112 and will encourage more efficient water use.

- **Stages 2, 3, and 4 Enforcement:**
  - First Violation: NCWD shall issue a verbal warning to the water user and recommend corrective action.
  - Second Violation: NCWD shall issue a written warning to the water user, and a fine of $40 shall be added to the water user's bill if the corrective action is not taken within 30 days after receiving the written warning.
  - Third Violation: A fine of $100 shall be added to the water user's bill if the corrective action is not taken within 30 days after receiving the written warning. In addition, the NCWD Board or General Manager may require installation of a flow-restricting device on the water user's service connection.
  - Fourth Violation: For the fourth and any additional violations, a fine of $250 shall be added to the water user's bill at the property where the violation occurred. NCWD may also discontinue the water user's water service at the property where the violation occurred. Reconnection shall be permitted only when there is reasonable protection against future violations, such as a flow-restricting device on the customer's service connection, as determined at NCWD's discretion.

- **NCWD Enforcement Costs:**
  - NCWD shall be reimbursed for its costs and expenses in enforcing the provisions of Ordinance No. 112, including costs incurred for staff to investigate and monitor the water user's compliance with the terms of the Ordinance. Charges for installation of flow-restricting devices or for discontinuing or restoring water service, as NCWD incurs those charges, shall be added to the water user's bill at the property where the enforcement costs were incurred.

8.8.3 VWC

VWC is regulated by the PUC. During times of threatened or actual water shortage, the PUC will require that VWC apportion its available water supply among its customers. In the absence of direction from the PUC, VWC will apportion the supply in the manner that appears most equitable under circumstances then prevailing and with the cooperation of the Valley water purveyors with due regard to public health and safety.

The PUC's methodology for water utilities to implement Water Conservation Plans is documented in Standard Practice U-40-W, "Instructions for Water Conservation, Rationing, and Service Connection Moratoria." Water shortage contingency plans must be approved by the PUC prior to implementation by VWC. As stated in the Standard Practice U-40-W, the PUC shall authorize mandatory conservation and rationing by approving Schedule No. 14.1, Mandatory Water Conservation and Rationing. Schedule No. 14.1 sets forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect.

8.9 Financial Impacts of Actions During Shortages

The following section addresses the financial impacts of actions during water shortages for SCWD, NCWD and VWC.

8.9.1 SCWD

SCWD's rates were developed to meet the cost of service. The retail water bill includes two components: a meter service charge and a commodity charge. For the FY 2010/11 Budget, the meter service charge accounts for 31 percent of SCWD's revenues and the commodity charge accounts for 69 percent of SCWD's revenues. The meter service charge is fixed and is based on the meter size. The commodity charge is variable and includes the cost for water consumption and pass-through charges for purchased water and electricity for pumping. Variable costs increase or decrease in direct proportion with the increase or decrease of water used by customers. Customers who use more water will pay a proportionately higher percentage of these costs.

Approximately 44 percent of SCWD's expenses are variable and will be reduced proportionately with any reduction of sales. Since 69 percent of SCWD's revenues are estimated to come from the commodity charges, a supply reduction of 25 percent or more would affect the financial stability of SCWD and impact its ability to meet payment obligations. A Rate Stabilization Fund was established in January 2004 and is to be funded over a ten year period. This fund is to be used when there are variations in water sales resulting from unusual seasons, major consumption reduction due to voluntary or mandatory conservation or to correct for a net loss of revenues in the event of a catastrophic loss of imported water supplies. The Rate Stabilization Fund is used to defer rate increases due to temporary reductions in water sales. Currently the Rate Stabilization Fund is set at 2 percent of annual revenues.

8.9.2 NCWD

NCWD's rates are designed with the intent that NCWD will generate adequate revenues to meet the costs of operating the water system. For FY 2010/11, it is expected that 28 percent of NCWD's total water revenues will come from the service charge and about 72 percent of the total revenues will come from the commodity charge. The service charge is based on meter size and the commodity charge is based on the quantity of water consumed.

The nature of NCWD's operation (as with any water utility) is that the majority of the operating costs are fixed in nature and do not increase or decrease in direct proportion with increases or decreases in water use by customers. For NCWD, fixed costs constitute about 57 percent of its total operating costs in a normal year. If water availability issues or shortages cause NCWD to request a voluntary reduction in the customer's water use, 57 percent of the operating costs will remain the same even though less water is sold. This would result in a substantial revenue shortfall.

In an effort to address this shortfall, NCWD established a reserve policy (Resolution 2009-10) that includes a "rate stabilization" fund to be used in situations where actual consumption of water is reduced as a direct result of a water shortage situation as defined in Table 8-1 of this Plan.

In the event of a declaration of a water shortage situation, NCWD's Board of Directors will consider options and actions intended to replenish the rate stabilization reserve to its ideal level. These actions may include but are not limited to rate increases or surcharges, per customer assessments and utilization of other reserve funds.

8.9.3 VWC

The PUC allows the investor owned water utilities it regulates to track and seek recovery of lost revenues and expense increases due to mandatory or voluntary water rationing during a drought. PUC regulated utilities' rates are set based on an assumed level of customer water usage during normal weather conditions. Therefore, when a drought occurs and customers conserve water, a utility's revenue declines and it is difficult for the utility to fully fund its operating expenses. In order to provide an incentive for utilities to promote water conservation during periods of drought, the PUC developed a mechanism whereby utilities can track lost revenues, net of reduced water production costs, as well as increases in expenses due to drought conditions. Utilities can then recover a portion of their lost revenues and expense increases via a surcharge to customers. This reduces the financial strain conservation programs place on investor owned utilities while furthering the statewide goal of water conservation during periods of drought.

8.10 Water Shortage Contingency Resolution

If a water shortage crisis reoccurs, such as the 1987-1992 drought, the Santa Clarita Valley water suppliers would call a public hearing to declare a water shortage pursuant to Sections 351 and 352 of the California Water Code.

The Los Angeles County Board of Supervisors (on behalf of LACWWD 36) and NCWD's and CLWA's (including SCWD) respective Boards of Directors would adopt ordinances, similar to those adopted in 1991, implementing the Water Shortage Contingency Plan. In February 1991 the CLWA Board of Directors adopted Resolution No. 804, which recognized reductions in requested delivery of SWP supply and mandated water conservation in the Valley.

VWC would file an advice letter with the CPUC implementing the Water Shortage Contingency Plan. The Water Shortage Contingency would become VWC's Schedule 14.1.

8.11 Mechanism to Determine Reductions in Water Use

8.11.1 Demand

NCWD, SCWD, and VWC bill their customers on a monthly basis. The prior year's consumption is included on most customer bills. This allows comparison of the total consumption from each billing period to the same billing period from the prior year.

8.11.2 Production

Under normal conditions, CLWA, NCWD, SCWD, and VWC prepare monthly production reports, which are reviewed and compared to production reports and pumping statistics from the same period of the prior year. Under water shortage conditions, these production reports could be prepared as often as daily.

8.11.3 Stage 1 and 2 Water Shortages

During Stages 1 and 2 Water Shortages, retail purveyors would review selected production reports on a daily basis, and CLWA would provide each retail purveyor with a copy of its daily

production report. The water suppliers would meet as frequent a basis as necessary to review water supply and demand in the Valley. Billing reports would be reviewed to identify users who are not abiding by the plan.

8.11.4 Stage 3 and 4 Water Shortages

During Stages 3 and 4 Water Shortages, the retail purveyors would review all production reports and pumping statistics on a daily basis. The water suppliers would continue to monitor the supply and demand in the Valley. Water transfers and agreements to use each other's distribution facilities would be implemented as needed. Billing reports would be reviewed to identify users who are not abiding by the plan.

8.11.5 Disaster Shortage

During a disaster shortage, the Santa Clarita Valley water suppliers would continually monitor production figures, and will work to transfer water and use each other's distribution facilities where feasible.

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Santa Clarita Water Division Water Use Efficiency Strategic Plan

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Section 1: Introduction

Growing concerns regarding the reliability of imported water supplies, increasing demand for quality water due to regional growth, and uncertain climate change impacts coupled with new regulatory requirements are driving the need for increased water use efficiency in all water-use sectors. These long-term trends will continue to challenge the efforts of California water agencies. Santa Clarita Water Division (SCWD) recognizes the implementation of conservation programs is an effective strategy to meet the future demand. Significant water savings can be achieved by providing customers with the tools, incentives and education they need to use water efficiently.

The goals of this Plan are:

1. Develop a conservation program that fulfills SCWD's SBX7-7 requirements.

2. Develop a conservation program that fulfills SCWD's requirements as a signatory to the MOU.

3. Promote programs that enable residential customers to improve water use efficiency in a cost-effective manner.

4. Promote programs that encourage CII water users to implement water efficiency improvement programs in a cost-effective manner.

5. Promote efficient use of water through appropriate incentive/disincentive programs.

6. Provide appropriate educational and informational programs to encourage conservation.

SCWD is subject to the Urban Water Management Planning Act, AB 1420 and SBX7-7 requirements, in addition to the commitment of compliance with the BMPs as a signatory to the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). SCWD has prepared this Water Use Efficiency Plan (Plan) to identify programs and projects to most effectively meet water use requirements – a 20 percent reduction by 2020 for an average use of 188 gpcd. The Plan builds on the 2010 Urban Water Management Plan (UWMP) prepared by Castaic Lake Water Agency (CLWA) in partnership with the water retailers, including SCWD, in accordance with the Urban Water Management Planning Act. Section 2: provides more detail on SCWD's regulatory requirements.

The Plan identifies and describes ten programs that will save 4,437 AF of water by 2020, at a total cost of approximately $16.5 million over a nine year period, or an average of $1.83 million a year (Section 6:). While the planning horizon for the Plan ends in the year 2020 for consistency with SBX7-7 requirements, water savings associated with the recommended programs persist well past 2020. The total estimated lifetime water savings, or the sum of all the water savings associated with each device installed or measure implemented over the lifetime of each device or measure, is 50,592 AF.

Implementation of the programs included in the Plan will reduce SCWD's use to 192 gpcd in 2018 and 188.9 gpcd by 2020. Additional savings will likely be achieved through non-

quantifiable programs, such as public outreach and education, system operations, rates and more. The Plan provides tools and details that can be used to guide implementation and monitor success.

The SCWD water use efficiency strategy is intended to start immediately with select customer groups. Implementation of the actions outlined will ramp up over the next three years. Actions include a strategic portfolio of conservation programs supported by a targeted marketing and education campaign designed to encourage SCWD's customers to take action to reduce their water use. Actions target all of SCWD's customer groups, offering water efficiency solutions and support for residents, businesses, and managers of large landscape, alike.

SCWD's Water Use Efficiency Plan is designed to be flexible, to accommodate changing supply conditions, take advantage of evolving technologies and to capitalize on available third-party funding. This Plan will be subject to review and revision based on the success of the various programs, changes in the regulatory environment, and more.

1.1 Background

1.1.1 Wholesaler Activities

CLWA is working with its retail purveyors to identify and implement water use efficiency programs that meet long-term reduction goals. In 2007, CLWA and the retail water purveyors, including SCWD, entered into an MOU to prepare a Santa Clarita Valley Water Use Efficiency Strategic Plan (SCVWUESP). The purpose of the effort was to prepare a comprehensive long-term conservation plan for the Santa Clarita Valley by adopting objectives, policies and programs designed to promote proven and cost-effective conservation practices. A consultant was hired to prepare the SCVWUESP, which included input from stakeholders and the community at large. The SCVWUESP was completed in 2008 and provides a detailed study of existing residential and commercial water use, and recommends programs designed to reduce overall Valley-wide water demand by ten percent by 2030. The programs are designed to provide Valley residents with the tools and education to use water more efficiently. The seven programs identified in the SCVWUESP are:

1. HET Rebates (Single and Multi-Family)
2. Large Landscape Audits (with incentives)
3. CII Audits and Customized Incentives
4. Landscape Contractor Certification
5. HE Clothes Washer Rebates
6. New Construction Building Code
7. Valley-Wide Marketing

In addition to these seven programs, the SCVWUESP also identifies other key factors that will help reduce the Valley's overall water demand including passive conservation and new, more

water efficient building ordinances. By 2010, CLWA and the water purveyors, including SCWD, were implementing the majority of the programs identified in the SCVWUESP in some form.

CLWA provides both technical and financial assistance to the retail purveyors. In addition to the requirements specified in the BMPs, CLWA provides the following support to its retail purveyors:

- Program Planning
- Residential Weather-Based Irrigation Controllers (WBIC) Program
- Large Landscape Program (Option 1 – controller rebates; Option 2 – landscape modification rebates)
- High Efficiency Toilet (HET) Replacement Program
- High Efficiency Clothes Washer Replacement Program
- SCV-Friendly Gardening Program
- School and Public Information Programs

1.2 Strategic Vision

Obtaining a sustainable decrease in customers' water consumption requires an array of activities. To this end, SCWD has put together an aggressive collection of customer-tailored solutions designed to achieve long-term water efficiency and change customer water use behaviors as we move into the future. These solutions fall into two key tactical approaches to effecting change:

1. **Incentive Programs:** Incentive programs are one of the most effective means to secure predictable and quantifiable water savings. The conservation measures chosen to make up SCWD's programs have a well-documented history of water savings and positive customer satisfaction and are based on "targeting" customers and implementing well-established conservation technologies. SCWD's proposed programs are designed to obtain the highest volume of water savings for the minimum cost per acre-foot, though there are other factors that influence the choice of programs (Chapter 6).

2. **Outreach and Education:** In order for SCWD to effect change, the Division must *know* the target customers and understand how to enlist each customer's support for and participation in conservation ordinances and programs. Informative and sustained outreach is the foundational tactic; it is the primary means by which the customer learns about the need for increased efficient use of water and the proposed solutions.

   SCWD will implement initiatives including general customer education and training, school education, and mass market communication. SCWD will craft and deliver the message that:

   a. Demand for high quality water has increased over time;

b. Conservation efforts and efficient use are highly effective means to stretch and extend water resources;

c. SCWD has incentive programs and support mechanisms that will increase water efficiency and benefit customers.

SCWD will develop its own messaging to support its program efforts and will also work with CLWA to coordinate outreach efforts and messaging.

SCWD does not have jurisdiction to create its own ordinances, however it can form strategic alliances and actively work to recommend and assist municipalities with the approval and implementation of new ordinances or updating their existing ordinances.

1.3 Programmatic Objectives

In creating SCWD's portfolio of water use efficiency programs, it was essential that the programs' designs address the principal objectives. These objectives are to:

- Target markets with the **Highest Water Savings** opportunity, both in immediate savings and long-term sustainability;
- Develop programs that are **Practical and Implementable**
- Select technologies are **Cost Effective;**
- Pursue all available **External Funding** to defray costs and allow for a higher number of program participants;
- Develop focused programs that, over time, can be **Expanded with New Product Offerings or with Increased Production.**

1.3.1 Highest Water Savings Opportunities

By analyzing consumption patterns, the highest water uses and water savings opportunities were identified. Key areas of focus include the residential sector, including both indoor and outdoor residential use, landscape, and the institutional sector, including schools and public facilities.

The residential customer accounts for over 70% of SCWD's total demand and is the key market to address. Traditionally the focus of residential water conservation programs has been on reducing indoor water use. While some agencies in California are now experiencing demand hardening for indoor fixtures — the need for increased effort and expenditure to achieve the next level of savings due to fixture saturation — indoor water use is still a good opportunity for SCWD. The SCVWUESP indicated that about 62 percent of residential toilets used Ultra Low Flow Toilets (ULFTs) (1.6 gallons per flush) and saturation analyses (explained in greater detail in Chapter 6 of this Plan) indicate that over 11,000 pre-1993 toilets are still in operation in the

service area.[1] SCWD started offering toilet rebates in 2007 and demand for the rebates has exceeded expectations every year since its inception. Where possible, SCWD will promote new technologies, such as toilets with flush volumes of 0.8 gallons per flush as a way of ensuring program longevity and maximizing savings.

Roughly 69 percent of total single family residential consumption is from landscape irrigation. Successful landscape programs targeting single-family residential customers are rooted in compelling messaging that educates homeowners about the benefits of appropriate landscape choices and proper irrigation. SCWD will support its customers in their water saving efforts through a combination of education (e.g., proper irrigation controller programming, water efficient landscape design, and more) and incentives such as “smart” irrigation controllers, low precipitation rate irrigation nozzles, drip irrigation and cash-for-grass programs.

Large landscape customers, including homeowner associations (HOA) and CII, account for nearly 16 percent of SCWD’s total water use. These customers are typically harder to engage because of the multiple levels of people involved—Boards of Directors, property owners and site managers can all have varying degrees of involvement in the decision-making process. Additionally, large landscape projects often involve landscape maintenance and irrigation contractors who may have motivations that can appear counter to water efficiency efforts, most notably keeping the landscape looking lush and green. All parties need to be educated and invested in water efficiency in order to achieve persistent savings. Although large landscape customers can be more complex to reach and manage, the results can be significant. Fortunately, water agencies across California are currently developing innovative approaches to reducing large landscape water use that SCWD can learn from.

Another key area is the public sector, including schools, municipal facilities, and parks. Like the large landscape customers, engaging with public sector customers presents its own unique challenges. They are often interested in reducing their water use but do not have the expertise or funding and consequently often require a high level of support from inception through project completion. SCWD will seek to engage the public sector by offering free technical support coupled with either direct installation programs or incentives.

1.3.2 Practical and Implementable

Program implementation requires resources—administrative and financial. The scheduling and complexity of the activities need to reflect SCWD’s conservation staffing, administrative and financial resources. The program was therefore developed to first take advantage of opportunities that can be managed within current staffing resources and ramped up as resources increase. These opportunities include turnkey programs that would require little management by SCWD and activities that can be added to existing programs without requiring an entirely new process to be developed. For example, adding devices or opening up the customer base of the existing rebate program could be implemented almost immediately while developing entirely new audit or landscape programs are to be phased in as the technical and administrative resources are developed.

[1] The California Single Family Water Use Efficiency Study (Aquacraft, 2011) found that many ULF toilets may be flushing at 2.0 to 3.0 gpf, or more, if they are defective or have the wrong after-market flappers installed.

1.3.3 Cost Effectiveness

The driver for this Plan is compliance with State regulations. In contrast with BMP requirements, with SBX7-7 there is no exemption for cost-effectiveness. So while cost-effectiveness is of primary concern in choosing programs and activities, meeting the water savings goal takes precedence in this effort. Despite the level of priority given to meeting the SBX7-7 targets, the portfolio of water conservation programs recommended in this plan is cost-effective as a whole. A cost-effectiveness analysis was performed on each measure included in this Plan using the AWE Conservation Tracking Tool. Results of this analysis indicate that the estimated cost to implement the Plan's ten programs is $343 per AF – nearly $150 per AF less than SCWD's cost to purchase an additional AF of water at $510 per AF.

While the overall portfolio of recommended conservation programs is cost-effective, three programs – turf removal, HET direct installation for institutional customers, and residential assistance for multi-family customers – are not individually cost-effective. SCWD has chosen to implement these programs regardless because they offer additional benefits to the agency and its customers. More detail is provided in Section 6:.

With the residential and commercial landscape water-use sector identified as a key saving opportunity, new programs and services need to be employed. Currently, "smart" weather and soil-moisture based irrigation controllers; rain shut-off sensors; and high efficiency sprinkler nozzles are the most cost effective products to yield water savings in landscaped areas. Since these products are unknown to most customers, they must be persuaded to participate by the offer of free products and, whenever cost effective, free installation. When the products are well established in the market, it will no longer be necessary to provide them at agency expense. Today, however, the customer is not likely to invest in unknown technologies unless the offer is compelling.

Turf replacement is another measure that has yielded significant water savings for many agencies in the arid southwest – starting in southern Nevada and expanding to a growing number of CA agencies. Both large and small turf area customers can participate and gain positive results. Due to the extensive work entailed in the turf replacement process and the staff intensity necessary to manage turf removal programs, these programs yield a lower response rate than "smart" controllers and nozzle retrofit programs and an overall higher implementation cost. However, many agencies are finding that, when paired with strong messaging and requirements and incentives that promote proper irrigation, turf removal programs can gain significant momentum as neighbors influence neighbors and people begin to value more climate-appropriate landscape choices.

1.3.4 External Funding

There are many funding sources available to the proactive and prepared water agency. Funding sources may include Federal grants regularly offered through the Bureau of Reclamation and occasionally through the Environmental Protection Agency and efficiency grants offered through State agencies such as the Department of Water Resources and the State Water Resources Control Board.

In addition to applying for State and Federal grants, SCWD should leverage all CLWA incentives and programs. SCWD should also keep updated on ad hoc regional or statewide programs. Past examples include the CUWCC's one stop rebate programs and spray valve

replacement program. Currently the Free Sprinkler Nozzle program offers a great opportunity to participate in a turnkey regional program. In addition to the activities recommended in this Plan, SCWD should consider participating in regional programs as they develop.

By maximizing program funding, SCWD can expand the number of program participants, open up to smaller customers, or penetrate deeper into niche markets that might have otherwise been excluded.

1.3.5 Successful Implementation and Expansion of Programs Over Time

When designing programs, it's important to identify both the success and the failures within the industry. With much discussion about opportunities, it is necessary to recognize and address reasons for disappointing results.

Often the major reason for program failure is inadequate or misdirected marketing. Time and again utilities design highly attractive offers but underestimate the need for a direct-to-customer marketing budget. Most utilities post their programs on their website and list the program on water efficiency brochures. These are in essence passive marketing attempts. Self-motivated customers will seek these programs and take the initiative to participate. Unfortunately, self-motivated customers are more often a rarity and, as a result, the participation rate for the program is less than optimal.

Successful water agencies conduct marketing campaigns that are much more aggressive in nature. They identify the ideal customers and outreach directly by phone, direct mail and site visits. This requires marketing staff, training, and perseverance. Most customers require multiple contacts prior to committing to participate in the program. Once on board, they often need time-consuming support from program staff to follow through all the steps of the program. The additional price tag for the marketing team is more than offset by water savings, if done tactfully and professionally. Organizations that are not marketing focused often find better success by outsourcing to firms with marketing expertise.

During the initial stages of a program, efficiencies run low and costs run high. With proper management, the program operations gradually smooth out and costs are reduced, thereby boosting overall project cost-effectiveness. As programs become more cost effective, it allows staff to add, test and track new and developing measures that would be too expensive to offer alone.

Additionally, once the program operations are running efficiently, it is easier to ramp production up to higher volumes should the water supply outlook warrant or product market conditions change. The operational controls will be in place and the optimum marketing formulas will be refined to their highest level of effectiveness.

1.4 Analysis Approach

The process of choosing and analyzing conservation measures and combining them into an eight-year plan consists of the following steps:

1. Gathering data for structured evaluation of each conservation measure, including saturation levels, customer base, decay factors, cost, and implementation

considerations. Professional judgment and staff input from previous experiences and the nature of the customer base will also play an important role in this assessment.

2. Calculating expected demand reductions from natural replacement.

3. Developing an initial set of all known conservation devices, practices and policies that SCWD could potentially employ.

4. Screening the list of measures developed above to identify reasonable options, and further evaluating cost-effectiveness, potential for water savings and implementation feasibility. Programs may be combined, if appropriate; for example a device giveaway program may be linked to a residential survey program. The final list of program options will consist of quantifiable measures and non-quantifiable programs.

5. Determining costs and benefits of implementing each conservation measure using the Alliance for Water Efficiency (AWE) model. For each measure, total costs will include the cost of saved water, capital, and staff resources to implement the program.

6. Combining the measures into a conservation program that is technically and economically feasible for SCWD to implement to meet 2020 goals. The programs will be tiered in a way that reflects the cost and ease of implementation, and will offer a reasonable range of conservation potential for long-range planning purposes.

1.4.1 Analysis and Monitoring Tools

In order to meet its water conservation targets in a relatively short timeframe, it is essential that SCWD closely monitor the success of its water conservation programs and make strategic adjustments as needed. SCWD has chosen to use a combination of the Alliance for Water Efficiency's (AWE) Water Conservation Tracking Tool (Version 1.2 Cal Tex Edition) and an Excel-based tracking spreadsheet to monitor and track its water conservation efforts.

The AWE Tool is a robust model that will allow SCWD to evaluate the water savings, costs, and benefits of various water conservation programs based on Agency-specific data and characteristics. It is a strong planning and analytical model and is ideal for the development and evaluation of new conservation programs.

The AWE Tool is also useful for programmatic decision-making, allowing SCWD to make choices about implementation levels over time. For example, if SCWD was sees an unanticipated low or high level of participation in one or more of its conservation programs, annual activity projections for all of its programs could be adjusted to better mimic reality and project final water savings at the end of the year. Multiple conservation program portfolios can be saved within the AWE Tool, to compare different mixes of programs and levels of implementation and understand how decisions regarding each of its conservation programs affect overall water savings, costs, and benefits. Such capabilities will allow SCWD to be financially responsible, receptive to market responses to its programs, and flexible in its approach to implementing its water conservation programs.

While the AWE Tool can also be used to track water conservation efforts of existing programs, this functionality is more limited and the information stored does not completely mirror the information SCWD must report to the CUWCC and the State regarding its progress in meeting

its targets. For this reason, SCWD has chosen to use an Excel-based tracking spreadsheet to record its ongoing water conservation efforts. This custom spreadsheet, when used in combination with the AWE Tool will provide SCWD the capability to track its conservation efforts in real-time, assess its progress toward meeting its mandated conservation targets, and make decisions regarding program implementation in order to implement the right mix of conservation programs to ensure that it meets its targets.

Section 2: Regulatory Requirements

SCWD is subject to the Urban Water Management Planning Act, AB 1420 and SBX7-7 requirements, in addition to the commitment of compliance with the BMPs as a signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU).

2.1 AB 1420 / MOU Requirements

AB 1420 amends the Urban Water Management Planning Act (CA Water Code Sections 10610-10657) and adds new requirements for eligibility for state loan and grant funding that refer to compliance with Demand Management Measures (DMMs). The CUWCC is a consensus-based partnership of agencies and organizations concerned with water supply and conservation of natural resources in California. Signatories to the CUWCC MOU are allowed by Water Code Section 10631(j) to include their biennial CUWCC BMP reports in an UWMP to meet the requirements of the DMMs sections of the UWMP Act.

In 2001, the CLWA Board approved signing the CUWCC's MOU for both the wholesale and retail service areas (CLWA and SCWD). In 2009, the CUWCC changed its policy to specify that each signatory had to join individually and that a wholesaler could no longer be a signatory on behalf of its retailers. SCWD therefore joined independently in 2011, renewing its commitment to the implementation of the BMPs.

The MOU and BMPs were revised by the CUWCC in 2008. The revised BMPs now contain a category of "Foundational BMPs" that signatories are expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs and water waste ordinances) and Public Education (public outreach and school education programs). The remaining "Programmatic" BMPs have been placed into three categories: Residential, Large Landscape, and Commercial, Industrial, Institutional (CII) Programs and are similar to the original quantifiable BMPs. The new category of foundational BMPs is a significant shift in the revised MOU. SCWD is implementing all of the Foundational BMPs as required in the revised MOU and UWMP Act.

A key intent of the recent MOU revision was to provide retail water agencies with more flexibility in meeting requirements and allow them to choose program options most suitable to their specific needs. Therefore, as alternatives to the traditional Programmatic BMP requirements, agencies may also implement the MOU Flex Track or GPCD options.

Under the Flex Track option, an agency is responsible for achieving water savings greater than or equal to those it would have achieved using only the BMP list items. The CUWCC has developed three Flex Track Menus – Residential, CII, and Landscape – and each provides a list of program options that may be implemented in part or any combination to meet the water savings goal of that BMP. Custom measures can also be developed and require documentation on how savings were realized and the method and calculations for estimating savings.

The GPCD option sets a water use reduction goal of 18 percent reduction by 2018. The MOU defines the variables involved in setting the baseline and determining final and interim targets.

In the 2010 UWMP SCWD chose a GPCD approach for complying with the MOU. The baseline was determined to be 234 gpcd and the goal 192 by 2018.

Compliance is evaluated in relation to the Compliance Table below (Table 2-1) and relative progress toward the goal will be acknowledged in future CUWCC Compliance Reports. The compliance tables are read as five increments with reporting goals relative to their first through fifth Compliance reports.

Table 2-1: Annual Compliance Targets (In GPCD)

Year	Compliance Report	Target	Highest Acceptable Bound
2010	1	220	234
2012	2	217	225
2014	3	209	217
2016	4	200	209
2018	5	192	192

SCWD is implementing all of the Foundational BMPs and developing a GPCD approach to compliance with the Programmatic BMPs which allows it to implement the programs that are best suited to the service area. For a detailed description of BMP implementation, see the 2010 Santa Clarita Valley UWMP.

Table 2-2: BMP Compliance

Type	Category	BMP #	BMP Name	Implementation Status
Foundational	Operations Practices	1.1.1	Conservation Coordinator	In Compliance
		1.1.2	Water Waste Prevention	In Compliance
		1.1.3	Wholesale Agency Assistance Programs	NA
		1.2	Water Loss Control	In Compliance
		1.3	Metering with Commodity Rates	In Compliance
		1.4	Retail Conservation Pricing	In Compliance
	Education Programs	2.1	Public Information Programs	In Compliance
		2.2	School Education Programs	In Compliance
Programmatic				GPCD Approach

2.2 SBX7-7 Requirements

The Water Conservation Bill of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Bill of 2009 provides the regulatory framework to support

the statewide reduction in urban per capita water use described in the *20 by 2020 Water Conservation Plan*. Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish future water use targets in gallons per capita per day (gpcd); reporting began with the 2010 UWMP.

An urban retail water supplier must set a 2020 water use target and a 2015 interim target. Details on the calculations are provided in the 2010 UWMP. With a Base Daily Per Capita Water Use of 235 gpcd, SCWD's goal is 188 gpcd by 2020. The GPCD option for MOU compliance and the SBX7-7 targets are consistent with one another (Table 2-3).

Table 2-3: Compliance Targets

		Target GPCD		
	Baseline GPCD	**2015**	**2018**	**2020**
MOU/AB 1420	234		192	
SBX7-7	235	211		188

Section 3: Conservation Program History

SCWD's ongoing conservation programs are consistent with the objectives of the proposed plan. To date, the primary driver has been to meet the requirements of the MOU, which were expanded in 2010 to include compliance with SBX7-7. The following sections describe SCWD's compliance requirements and programs and activities implemented to meet the requirements, as well as all other conservation programs and activities.

3.1 SCWD's Current Conservation Programs

Table 3-1 describes the conservation programs currently implemented by SCWD. Currently, SCWD is focusing mainly on residential water users, installations of high efficiency toilets (HETs), landscape water use, and public education programs while looking to expand the CII incentives.

Table 3-1: SCWD'S Current Conservation Programs

Conservation Program	Description
Conservation Coordinator	SCWD's conservation program is staffed in various ways. Internally, management, administration and oversight are the responsibility of the Associate Water Resources Planner. In addition, SCWD has helped fund a conservation coordinator position at CLWA since 2004; this position supports regional planning and implementation. SCWD funds 10 percent of this position. SCWD also utilizes consultant services to support program planning and management as well as to implement the various programs including residential landscape training as well as residential, CII and large landscape audits.
Water Waste Prevention	SCWD supports water waste prevention activities through both direct Board activities and in collaboration with the City of Santa Clarita. On September 10, 2008, the CLWA Board of Directors signed Resolution No. 2605 declaring an Agency-wide water supply and conservation alert in response to the Governor's order. The resolution encourages residents to follow the Voluntary Water Conservation Action Plan (Plan) and achieve a ten percent overall reduction in water demand. The Plan establishes voluntary water conservation measures to be taken by residents and businesses and includes a set of guidelines and recommendations for both indoor and outdoor water use improvements. SCWD is also actively supporting the City and County in establishing terms of service for water efficient design in new development, compliant with AB 1881. SCWD participates in compliance review of new water efficient landscaping requirements, reviewing the Water Efficient Landscape Worksheet (WELW) and, after a project is completed, conducting periodic audits and tracking consumption to ensure the project remains in compliance with the water allowance requirements. SCWD also has a Water Shortage Contingency Plan and works closely with the City and County in supporting all local ordinances that prohibit water waste.

Conservation Program	Description
Water Loss Control	SCWD monitors its water losses on a monthly basis. Production losses in 2010 and 2011 were estimated at 8.5 and 8.3 percent, respectively. SCWD has completed AWWA's M36 Water Loss analysis, which consists of a component analysis of leaks into "revenue" and "non-revenue" categories, among others, and an economic analysis of recoverable loss. SCWD's M36 'Reporting Worksheet' for 2009 is provided in Appendix E. Results of the preliminary analysis show a water audit data validity score of 64 and an Infrastructure Leakage Index (ILI) of 3.79. A validity score between 51 and 70 indicates that the validity of the data is reasonable, with opportunity for improvement. According to general guidelines, an ILI between 3 and 5 is appropriate when water resources can be developed or purchased at a reasonable expense; existing water supply capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place; and water resources are believed to be sufficient but demand management measures are included in long-term planning. The audit highlights some strengths and weaknesses of the system. SCWD is evaluating the preliminary results and recommendations of the audit.
Metering with Commodity Rates	All of SCWD's customers are metered and billed volumetrically. Commercial, industrial and institutional accounts and parks are encouraged to have dedicated irrigation meters, and many do. In addition, SCWD has identified the Automated Meter Reading (AMR)/ Advanced Metering Infrastructure (AMI) technologies as a conservation priority. These technologies are being implemented and will be very helpful in identifying leaks, mitigating losses, and monitoring customer usage by, among other things, providing a software interface that allows water users to track their use.
Retail Conservation Pricing	All of SCWD's customers are metered and billed monthly. On January 1, 2010, SCWD migrated its residential customers to a tiered rate structure and its landscape customers to a fixed rate set at the highest tier rate. Since 2007 the proportion of revenue from fixed charge has met the BMP requirement of not to exceed 30 percent. Details can be found in section 7.4.1 of the 2010 SCV UWMP.
Public Information	SCWD provides informational materials to customers through media events, neighborhood expos and other activities. SCWD also communicates with its customers in coordination with CLWA through a variety of media outlets including Santa Clarita Valley TV, billboards, newspapers, magazines, radio, paid advertising, bill inserts, its website (http://www.scwater.org/) and public service announcements. Conservation messages are also included on customers' monthly bills. Two tips ran in October and December 2008 and one ran on every bill issued in 2009. In 2009 SCWD instituted an automatic calling campaign to alert its customers of dry conditions and the importance of conservation.
School Education Programs	SCWD implements its school programs in coordination with the CLWA, reaching over 22,600 students since 2007. The CLWA's award winning program is available to grades K through 12 and includes in class presentations and field trips. See Section 7.2.2.2 of the 2010 SCV UWMP for more information on CLWA's school programs.

Conservation Program	Description
Residential Audit Program	SCWD's indoor residential audit program is structured to respond to customer requests but does not currently actively promote indoor audits. SCWD provides water conservation items that include low-flow showerheads, conservation materials, hose nozzles and aerators. These items are provided at festivals, fairs and other events, and are available for pick up at the SCWD office. This distribution program started in 2008; SCWD distributed approximately 2900 conservation items from 2008-2011.
Landscape Water Survey	Residential landscapes are a significant use in SCWD's service area. SCWD is working with CLWA to offer a program that combines training and fixtures in the form of landscape classes and WBICs to its residential customers. The program offers homeowners and gardeners free landscape classes; after residents or their gardeners complete the training, they receive free WBICs. They also receive free inspections of their WBIC installations and programming to ensure they are properly installed and programmed. The classes are offered in both English and Spanish and have been very popular with residents. At the end of 2011, 20 classes were held and 240 WBICs have been installed and inspected within the SCWD service area. SCWD has focused its landscape surveys on its largest users, although all customers are welcome. These are typically homeowners associations (HOAs). HOA customers with dedicated irrigation meters are classified as "irrigation" customers rather than "residential" and the program is designed to develop an appropriate water budget and help them implement it. The program is further described in Section 7.4.2.3 of the 2010 SCV UWMP.
WaterSense Specification (WSS) Toilets	The SCVWUESP estimates that in 2008 about 62 percent of residential toilets used 1.6 gallons per flush or less. A program at least as effective as a retrofit on resale, which is the BMP threshold, requires SCWD to provide about 200 rebates per year. SCWD is currently participating in CLWA's HET voucher rebate program and has provided 1780 rebates since 2008, 50 percent of which were rebated in 2011. The program has been ramping up steadily and the goal is to provide 600 rebates a year. Incentives valued at $80 are provided for HETs replacing models that flush at 3.5 gpf or more. In addition, SCWD will be realizing the benefits of SB 407, effective January 1, 2014. SB 407 requires that all pre-1994 residential, multi-family and commercial customers replace non-compliant plumbing fixtures (including toilets, faucets, and showerheads) with water-conserving fixtures when making certain improvements or alterations to a building. By 2017, all single-family homes must replace non-compliant plumbing fixtures and by 2019 all multifamily and commercial buildings must have compliant water-conserving plumbing fixtures in place.

Conservation Program	Description
Water Sense Specification for New Residential Development	SCWD is working closely with the City of Santa Clarita's response in its development and implementation of landscape requirements that comply with AB 1881. SCWD is supporting adoption of the 2010 California Green Building Standards Code, which went into effect January 2011. The Code sets mandatory green building measures, including a twenty percent reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design. Local jurisdictions, at a minimum, must adopt the mandatory measures; the Code also identifies voluntary measures that set a higher standard of efficiency, which can also be adopted. SCWD will review the proposed standards and determine the most appropriate approach
Conservation Programs for CII Accounts	CII use does not account for a large portion of consumption in SCWD's service area. SCWD has about 840 CII accounts which use about 1,900 AFY, or 7 percent of total use. In FY 2010/11 the CLWA began implementing a CII Audit and Customized Incentive Program which offers comprehensive water audits with follow-up reports that provide recommendations, information on costs, savings, payback and other implementation-oriented information. The program targets high use and high savings potential customers such as amusement parks, colleges and universities and hotels, with the focus largely being on schools. Recommendations include both site-specific and general opportunities. The key decision makers are identified and contacted to enlist participation. The goal is to tailor the amount of incentive to the water savings based upon the findings of the audit. Customers are eligible to receive financial incentives to offset any investments in water use efficiency in the amount of up to $300 per AF of water saved. To date forty-seven large water users have been contacted and twenty within SCWD service area are moving forward.

Conservation Program	Description
Landscape	SCWD encourages installation of dedicated irrigation meters on all commercial, industrial and institutional accounts, parks and city landscaping. SCWD has 864 dedicated irrigation accounts, the majority of which are HOAs. SCWD is working on developing water budgets for its dedicated irrigation accounts. The budgets are developed based on historical water use data, landscape acreage and the Maximum Applied Water Allowance as defined by DWR. If the accounts exceed their budgets, SCWD contacts the customer with offers of a free audit, nozzles and/or WBICs (when available) as well as a free walk-through with the landscape contractor followed up with a report containing findings and recommendations. SCWD is also participating in the CLWA-sponsored large landscape program which offers audits to its large landscape customers. Currently forty sites are enrolled; eighteen are within the SCWD service area where the focus is on HOA customers. The program offers large landscape customers such as HOAs, parks and landscape maintenance districts the opportunity to receive free water-use and cost-benefit analysis reports, free workshops for property management and landscapers and rebates for water-saving measures and devices. Customers are also eligible to receive financial incentives to offset any investments in landscape efficiency in the amount of up to $300 per AF of water saved. CLWA works with its retailers to select sites that meet the large landscape specifications. To date, eleven sites have final reports and have received rebates. As of May 2012, CLWA-sponsored large landscape program has been made more cost-effective by providing rebates with two options: rebates at $25/active station for weather-based irrigation controllers (Option 1) with a required pre- and post-inspection as well as educational presentation and landscape modification rebates (Option 2) with required pre- and post-inspection.

Section 4: Service Area and Water Use

This section provides an overview of SCWD's water service area, population, climate, water sources and water use, utilizing information available in SCWD's billing databases and the 2010 UWMP. Water use projections as well as current and historical water use trends are presented for SCWD's customer classes. The information presented in this section will be the foundation of the Water Use Efficiency Plan, and will provide the basis to target the most effective conservation programs available.

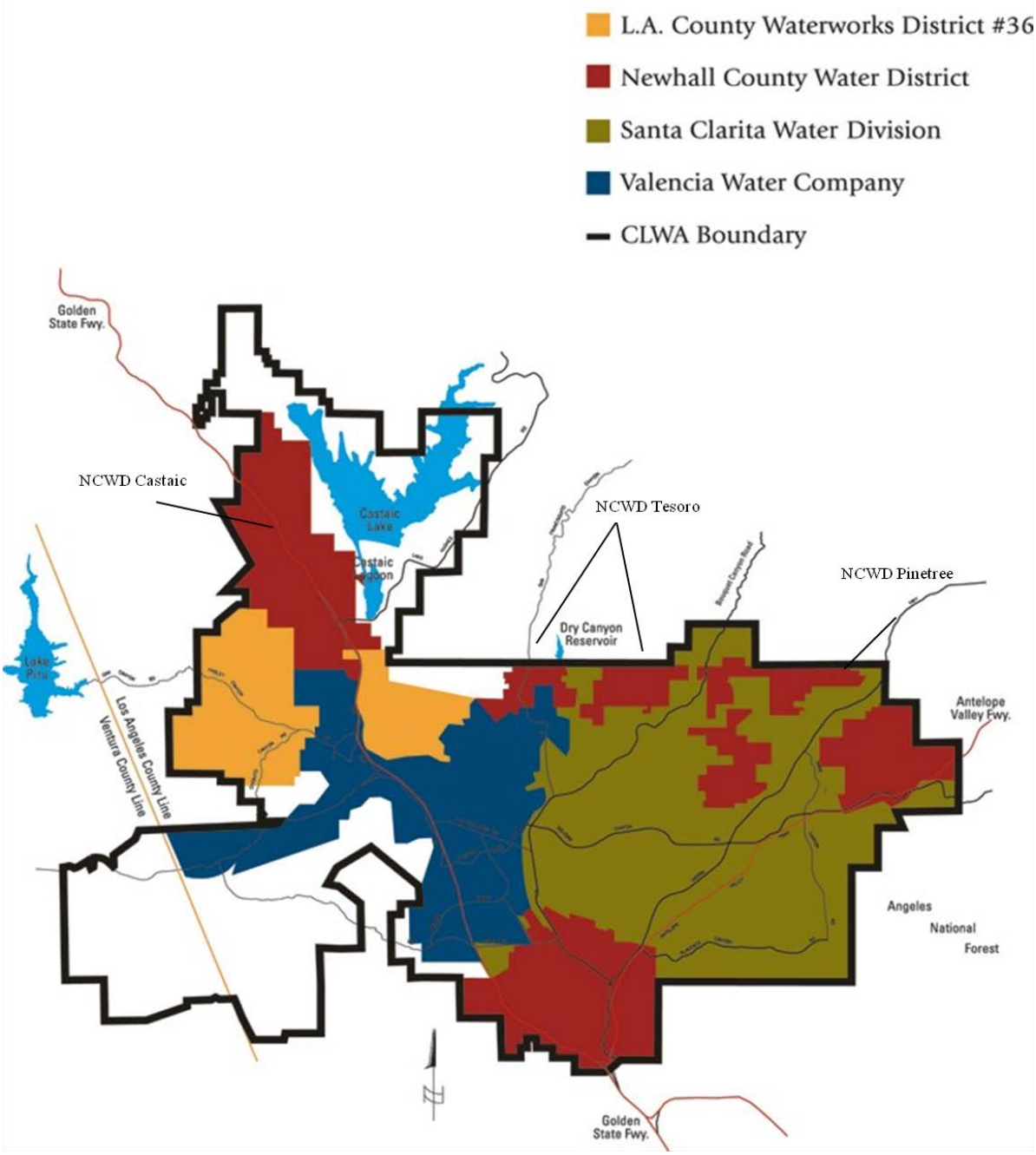
4.1 SCWD'S Water Sources

SCWD currently supplies potable water from two sources. Historically, fifty-five to seventy-five percent is purchased from Castaic Lake Water Agency's (CLWA) imported water supply and the remaining 25 to 45 percent drawn from local groundwater sources. Currently, SCWD aims to achieve a blend of 60% imported water and 40% groundwater. A more detailed description of SCWD's water supplies can be found in Section 3 of its 2010 Urban Water Management Plan.

4.2 SCWD Water's Service Area

SCWD has approximately 29,000 service connections. SCWD is a one of four retail water purveyors of the Santa Clarita Valley. The other three retail water purveyors of the Santa Clarita Valley include Newhall County Water District, Valencia Water Company and Los Angeles County Waterworks District 36. These water systems are shown on the Service Area Map (Figure 4-1).

Figure 4-1: Castaic Lake Water Agency Service Area



4.3 Population

SCWD has a current service area population of approximately 124,000, estimated to grow by about 39% by 2035 (Table 4-1).

Table 4-1: Population Estimates

Historic Population					
2005	**2006**	**2007**	**2008**	**2009**	**2010**
113,897	118,385	121,903	122,631	123,302	124,192

Projected Population				
2015	**2020**	**2025**	**2030**	**2035**
133,868	143,544	153,220	162,896	172,572

4.4 Climate

The climate in SCWD's service area is generally semi-arid and warm. Summers are dry with temperatures as high as 110°F. Winters are somewhat cool with temperatures as low as 20°F. Average rainfall since 1980 is about 17.3 inches per year in the flat areas and about 25 to 30 inches in the mountains. The region is subject to wide variations in annual precipitation and also experiences periodic wildfires. The region's average climate conditions are presented in Table 4-2.

Table 4-2: Climate Data for the SCWD

	Jan	Feb	Mar	Apr	May	Jun
Standard Monthly Average ETo	3.47	3.19	4.20	5.48	6.69	7.04
Average Rainfall (inches)	0.56	2.03	3.23	0.09	0.41	0.02
Average Max. Temperature (Fahrenheit)	66.1	62.3	68.1	72.2	74.2	79.8

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Standard Monthly Average ETo	8.32	8.53	6.37	4.87	3.08	1.91	63.15
Average Rainfall (inches)	0.00	0.00	0.01	0.37	1.41	0.88	9.01
Average Max. Temperature (Fahrenheit)	89.6	93.0	89.3	82.6	67.5	63.5	75.7

Note:
Source: Data provided by California Irrigation Management System (CIMIS) for Santa Clarita Station No. 204, Los Angeles region, December 2009 to January 2011 http://wwwcimis.water.ca.gov/cimis/welcome.jsp.

4.5 Water Use Profile

This critical step in the analysis looks to understand water use patterns overall and by customer type in order to determine trends within user classes and identify opportunities to target conservation programs towards particular users. Customer types are classified in SCWD's billing system into 'sectors' as shown in Table 4-3.

Table 4-3: Customer Types by Sector

Sector	Customer Types
Single-family Residential	Single family residences
Multi-family Residential	Multifamily residential users (townhomes, duplex, triplex, condos, apartments)
Commercial	Commercial customers (restaurants, retail and grocery stores, markets, laundromats, hotels and motels, offices and more)
Construction/Industrial	Small industrial base/manufacturers and/or processors of materials
Institutional/Government	Schools, hospitals, and public authorities
Landscape	Parks

In 2011, SCWD served 28,187 active potable water connections, all of which are metered (Table 4-4). The total number of active connections was 26,875 in 2005, with one to two percent change from year to year.

Table 4-4: Number of Active Service Connections

Customer Class	2005[(a)]	2006[(b)]	2007[(c)]	2008[(d)]	2009[(e)]	2010[(f)]	2011
Single-family	20,550	20,789	20,665	20,926	21,082	21,238	21,734
Multi-family	4,800	4,671	4,684	4,638	4,671	4,707	4713
Commercial	650	790	684	690	695	700	710
Construction/Industrial	50	331	19	28	210	392	18
Institutional/Government	125	-	101	110	111	112	110
Landscape	700	812	837	856	863	869	902
Total	**26,875**	**27,393**	**26,990**	**27,284**	**27,632**	**28,019**	**28,187**

Notes:
(a) Source: 2005 UWMP.
(b) Source: SCVWUESP; Institutional/government accounts are included in commercial.
(c) Source: 2007 CUWCC Report.
(d) Source: 2008 CUWCC Report.
(e) Source: Extrapolation from 2008 to 2010.
(f) Source: 2010 UWMP.

Figure 4-2 illustrates the number of connections by customer class in 2011. Single-family (SF) accounts make up the largest user type by far with about 62 percent of individual connections.

Figure 4-2: Service Connections In 2010

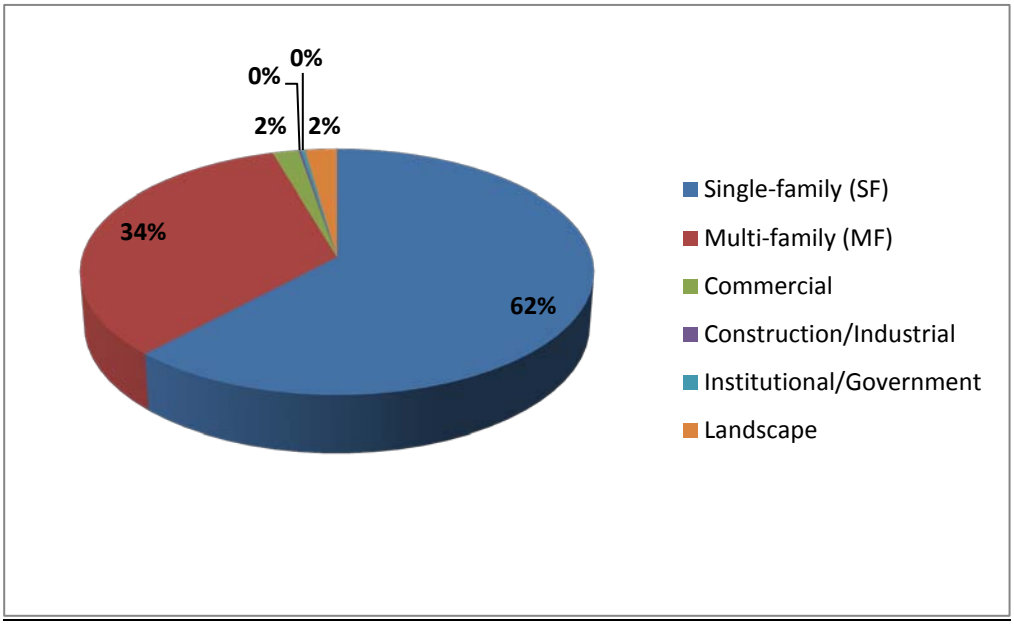


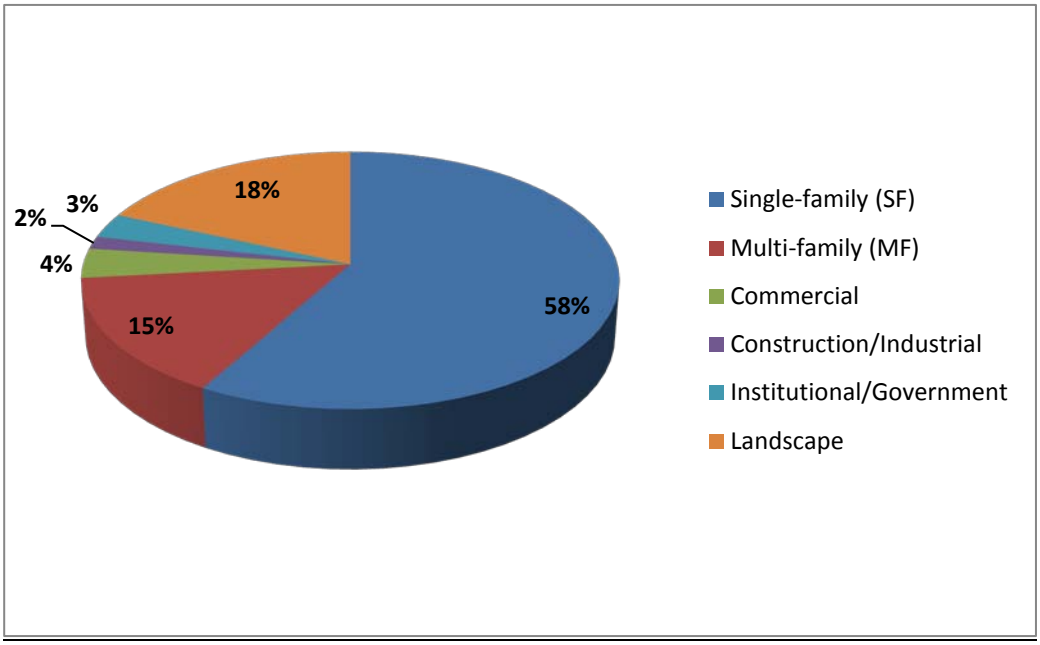
Table 4-5 and Figure 4-3 show the volume of water used by customers in each class. Land and water use in SCWD's service area are dominated by residential activities. SF customers receive more than 58 percent of SCWD's water supply, and multi-family (MF) customers account for almost 15 percent of SCWD's deliveries. The balance is used by the commercial, construction/industrial, institutional/government and landscape sectors.

Table 4-5: Water Use by Customer Class (AF)

Customer Class	2005[a]	2006[b]	2007[c]	2008[d]	2009[e]	2010[f]
Single-family	19,139	15,879	17,075	16,225	16,207	16,189
Multi-family	3,386	4,326	4,479	3,959	4,080	4,200
Commercial	1,126	1,980	1,073	975	1,002	1,029
Construction/Industrial	1,142	765	128	117	281	445
Institutional/Government	1,345	-	906	919	891	862
Landscape	4,262	4,720	5,317	5,398	5,247	5,090
Total	**30,400**	**27,670**	**28,978**	**27,593**	**27,676**	**27,816**

Notes:
(a) Source: 2005 UWMP
(b) Source: SCVWUESP; Institutional/government accounts are included in commercial
(c) Source: 2007 CUWCC Report
(d) Source: 2008 CUWCC Report
(e) Source: Average of 2008 and 2010 water use
(f) Source: 2010 UWMP

Figure 4-3: Water Use By Customer Class (2010)



SF customers make up about 60 percent in terms of number of accounts and water use. However, while MF accounts make up for 34 percent of total accounts they only make up for 15 percent of the total water use (Table 4-6). This is to be expected as landscape, commercial, construction, industrial, institutional and government customers are typically larger users.

Water use by the industrial, institutional and government sectors is relatively small compared to residential uses. However since these uses are concentrated in a small number of connections they should not be discounted for their conservation potential.

Landscape irrigation is a significant water use in SCWD's service area, estimated to be 58 percent of total water use. Except for accounts equipped with a dedicated landscape irrigation meter, outdoor water use is not directly metered and measured by SCWD. For this reason landscape water use was estimated for SCWD's SF customers using the minimum month method. The minimum month method assumes that no outdoor water use occurs in the winter and uses the month with the lowest water usage in the winter to estimate indoor water use. It is assumed that water use in this lowest use month represents the amount of water consistently used indoors throughout the year. Any SF water use above this amount each month is assumed to occur outdoors. Using this method, outdoor water use among SCWD's SF customer was estimated to be 69 percentage of total SF use. In reality, in SCWD's dry climate, some outdoor water use is likely even in the winter. Furthermore, outdoor water use was not estimated for SCWD's other customers with mixed-use (serving both indoor and outdoor uses) meters, including commercial and industrial customers. As a result, the estimate that 58 percent of SCWD's total water use occurs outdoors should be considered a lower bound for outdoor water use.

In addition to the consumptive uses described above, SCWD also has some water loss from its distribution system. SCWD monitors its water losses on a monthly basis. Losses in 2010 and

2011 were estimated to be 8.5 and 8.3 percent, respectively, of the total amount of water produced. In accordance with CUWCC BMP 1.2, SCWD has completed the American Water Works Association's M36 Water Loss analysis.

Results of the preliminary analysis show a water audit data validity score of 64 and an Infrastructure Leakage Index (ILI) of 3.79. A validity score between 51 and 70 indicates that the validity of the data is reasonable, with opportunity for improvement. According to general guidelines, an ILI between 3 and 5 is appropriate when water resources can be developed or purchased at a reasonable expense; existing water supply capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place; and water resources are believed to be sufficient but demand management measures are included in long-term planning. The audit highlights some strengths and weaknesses of the system. SCWD is evaluating the preliminary results and recommendations of the audit.

Table 4-6: Number of Service Connections and Water Use (2010)

Customer Category	Number of Accounts (Units)	Water Use (AF)	Percent of Total Use
Single-family	24,382	16,189	58.2%
Multi-family	13,151	4,200	15.1%
Commercial	726	1,029	3.7%
Construction/Industrial	71	445	1.6%
Institutional/Government	107	862	3.1%
Landscape	890	5,090	18.3%

Per capita use has been declining since its peak in 2002 and at 200 gpcd in 2010, it's at the lowest levels in the past 15 years of record (Figure 4-4). Although population growth has outpaced demand, consumption has risen fairly steadily since, with a decrease between 2006 and 2009. The decrease in water use is attributed to a combination of factors, including effects from the economic slowdown of recent years, drought conditions that raised customer awareness of water scarcity, the impact of SCWD's conservation efforts, tiered water rates, coupled with the cooler and wetter temperatures throughout California starting in 2008. The 2010 Santa Clarita Valley UWMP expands on other factors affecting water usage (UWMP Section 2.7).

Figure 4-4: Historical Per Capita Water Use

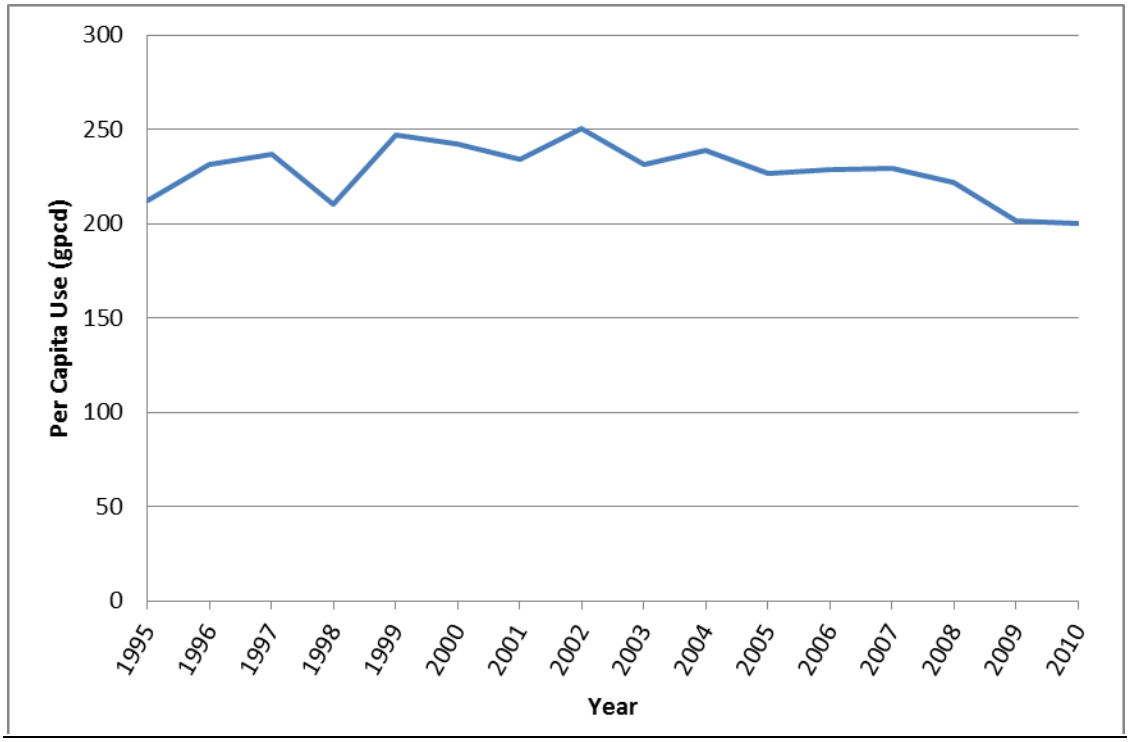
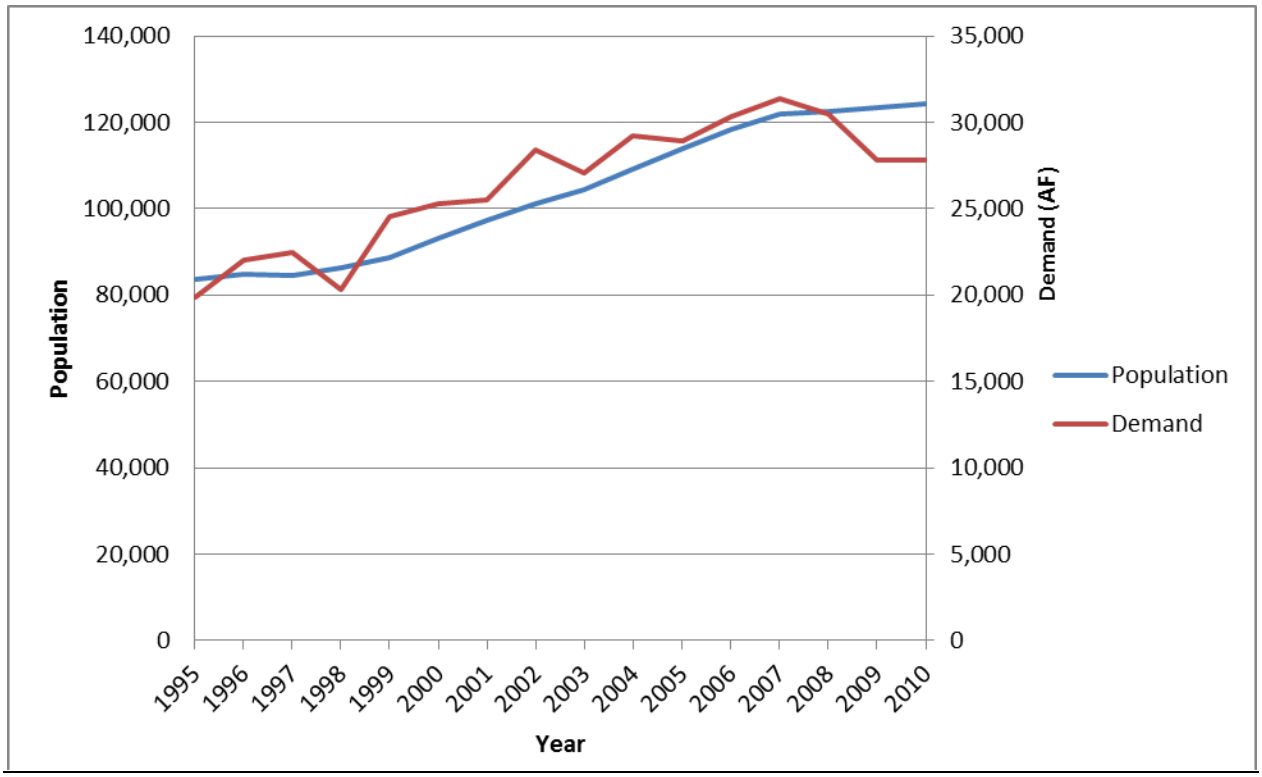


Figure 4-5: Historical Population and Water Use



Section 5: Water Consumption

In this section, the results of a detailed billing analysis are presented. Billing data from 2011 was sorted and analyzed to provide information regarding specific uses and patterns by each of SCWD's customer types with the intent of identifying specific targets for SCWD's water conservation program. The information is based on SCWD billing data standards and classifications, which classify customers into specific groups based on water use. Table 5-1 defines the different customer classifications found in SCWD's billing system and groups them into common customer sectors, including single-family residential, multi-family residential, CII, landscape irrigation, and other.

Table 5-1: SCWD Billing System Classifications

Demographic Code	Customer Type	Customer Sector	Definition
A	Apartments[(a)]	Multi-Family Residential	Master metered apartments
C	Condo Master Metered	Multi-Family Residential	Master metered condos
D	Multiple Indiv. Metered[(a)]	Multi-Family Residential	Individually metered apartments, condos, and duplexes
E	Multiple – Pool/Rec Center	Multi-Family Residential	Pools and recreation halls serving multi-family units (apartments, condos, and duplexes)
F	Single – Pool/Rec Center	Single-Family Residential	Pools and recreation centers serving single family residences
H	Business – Retail[(a)]	CII	Individually metered retail outlets open to the public, includes grocery stores
I	Business – Other[(a)]	CII	Individually metered businesses other than retail and food providers
J	Business – Food[(a)]	CII	Individually metered restaurants and fast food outlets
K	Business – Master Metered	CII	Master metered shopping centers, strip malls and business complexes
M	Mobile Home Parks	Single Family Residential	Master metered mobile home parks
N	Landscape – Multi-Family[(a)]	Landscape Irrigation	Dedicated irrigation meters serving multi-family neighborhoods, includes LMD's

Demographic Code	Customer Type	Customer Sector	Definition
O	Landscape – CII[(a)]	Landscape Irrigation	Dedicated irrigation meters serving schools, businesses and the City or County
P	Landscape – Single Family[(a)]	Landscape Irrigation	Dedicated irrigation meters serving single family neighborhoods, includes LMD's
Q	Unassigned		
R	Residential Single[(a)]	Single Family Residential	Individually metered single family residences
T	Fire Services	Other	Fire services – no consumption
W	Water Mutuals	Water Mutuals	Master metered water mutuals and home owner associations
Y	Parks[(a)]	Landscape Irrigation	Parks – mixed, may include restrooms
Z	Schools[(a)]	CII	Schools – mixed, may include restrooms
1	Public Authorities[(a)]	CII	City and County other than dedicated irrigation services and parks
2	Churches[(a)]	CII	Churches
4	Construction Meters	Other	Temporary hydrant meters used during grading and construction
7	Industrial[(a)]	CII	Manufacturers and/or processors of materials

Note: (a) Indicates customer types analyzed in the present analysis.

5.1 Summary

A summary of statistics from all demographics analyzed is shown in Table 5-2. Note that not all customer types were analyzed, and the data below represents approximately 88 percent of total use.

Table 5-2: Summary Statistics - Water Use by Customer Type

Customer Type	Total Use (AF)	Average Use (AF)	Highest Use (AF)	Number of Accounts	Use per Account (AF/Account)	Highest Use	Lowest Use
Residential - Single-Family (R)	13,420	0.62	13	21,789	1.6	Sept.	Feb.
Residential – Indiv. Metered Condo (D)	460	0.18	1	2,612	0.2	Sept.	Feb.
Residential - Apartments (A)	1,218	1.22	18	999	1.2	June	July
Commercial - Food (J)	138	2.1	10	67	2.1	Sept.	July
Commercial - Retail (H)	183	1.1	12	172	1.1	Sept.	April

Customer Type	Total Use (AF)	Average Use (AF)	Highest Use (AF)	Number of Accounts	Use per Account (AF/Account)	Highest Use	Lowest Use
Commercial - Other (I)	501	1.3	29	392	1.3	Sept.	Jan.
Institutional - Schools (Z)	692	11.2	59	62	11.2	Aug.	Jan.
Industrial (7)	98	7.0	46	14	6.1	Sept.	Jan.
Public Authorities (1)	36	1.7	11	22	1.6	Sept.	Jan.
Landscape - CII (O)	1,032	4.9	75	210	4.9	Sept.	Jan.
Landscape - MF (N)	951	3.5	25	270	3.5	Aug.	Jan.
Landscape - SF (P)	1,828	4.4	37	414	4.4	Aug.	Jan.
Parks (Y)	238	10.8	110	22	10.8	Sept.	Jan.
Institutional - Churches (2)	77	3.5	9	22	3.4	Sept.	Jan.
Total	20,872						

5.2 Key Findings and Results

Results of the analysis indicate several key findings regarding SCWD's annual water use patterns, outlying large water users, and customer types with the largest overall water use. In general:

- All customer types analyzed show narrow water use distributions, indicating that variation in the amount of water used among individual customers within a customer type is limited. However, each customer type also has a small handful of outliers whose water use is significantly higher than average. The customer types with the largest variation in the amount of water used are Commercial-Food and Schools. Conversely, water use among residential customers is the most consistent.

- The top two water using accounts are Parks.

- School accounts have the highest average water use.

- Condo accounts have lowest average water use.

Additionally, annual water use within SCWD's service area is characterized by the following seasonal patterns:

- Residential, commercial and industrial customers have the lowest seasonal variation. Water use in the highest use month represents a 40 to 60 percent increase over the lowest use month.

- Landscape, school, public authority and church customer types have the highest seasonal variation. Water use in the highest use month for these customers represents an 80 to 90 percent increase over the lowest use month.

- Landscape water use occurs year-round.

These findings provide important insight for conservation program design. To achieve the greatest water savings, SCWD will need to identify and specifically target the outlying largest water users within each its customer types. Annual water use patterns highlight the importance

of landscape water conservation programs within SCWD's service area. Water use occurs year-round in the SCWD service area and large increases in water use from the lowest use month to the highest use month indicate that overwatering is likely. Programs designed to help customers apply the appropriate amount of water to their landscape throughout the year and programs designed to reduce overall landscape demand should result in significant water savings.

The following sections examine each customer type in greater detail.

5.2.1 Residential Consumption

Residential users are the single largest use category, accounting for 75 percent of SCWD's total demand. SCWD tracks residential water use separately for single-family, apartment and condo accounts. The total residential use in 2011 was 15,098 AF. Single-family accounts consumed 89 percent of the residential consumption in 2011 while apartment accounts consumed 8 percent and condo accounts consumed 3 percent. Single-family and condo accounts are individually metered while MF accounts are typically master metered. SCWD tracks how many dwelling units are associated with each MF account.

5.2.2 Single Family Residential

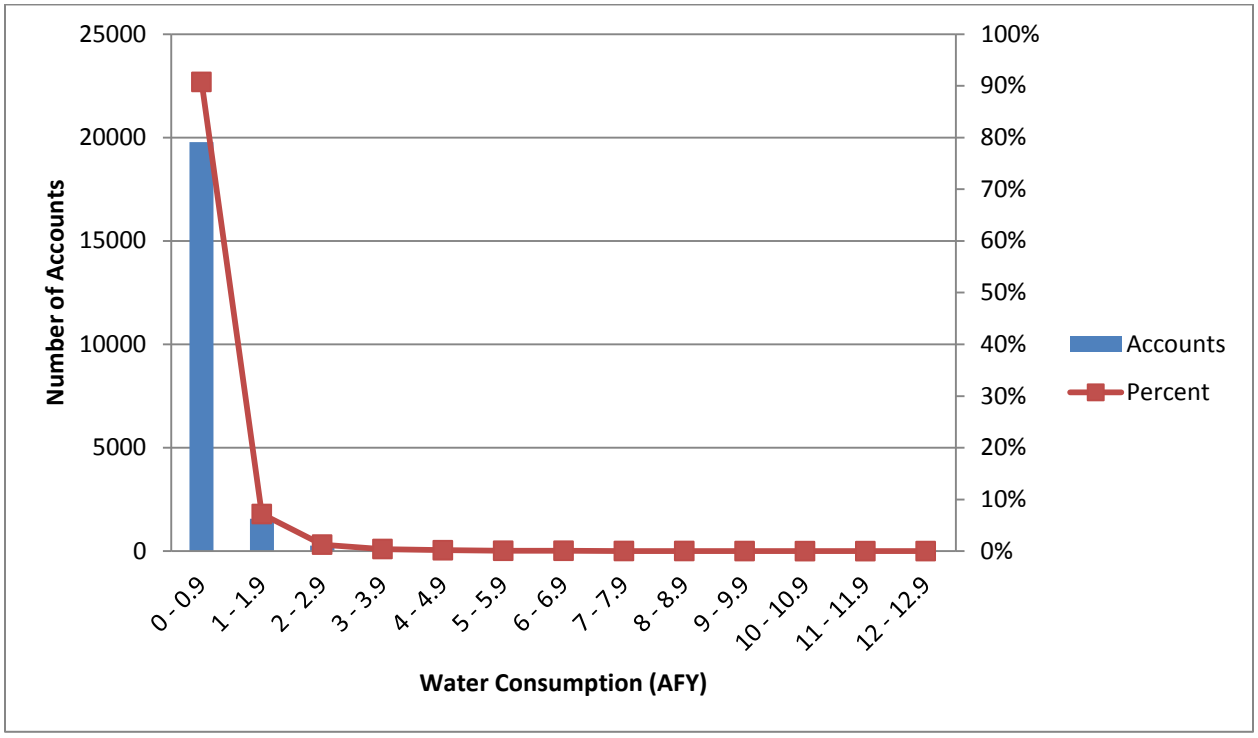
There are 21,789 single-family customer accounts in the SCWD service area; in 2011 their consumption was 13,420 AF of water, with an average of 0.62 AF per account. In 2011 SF customers alone accounted for approximately 65 percent of SCWD's use.

The distribution of single-family residential use is fairly narrow — nearly 91 percent of accounts consume less than 0.9 AF per year. Another 7 percent of single family accounts consume between 1-1.9 AF per year (Figure 5-1). Two accounts consumed over 12 AF in 2011 and eleven apartments consumed over 8 AF in 2011; Table 5-3 presents the top ten SF users in the service area.

Table 5-3: Highest Consumers - Single Family Residential

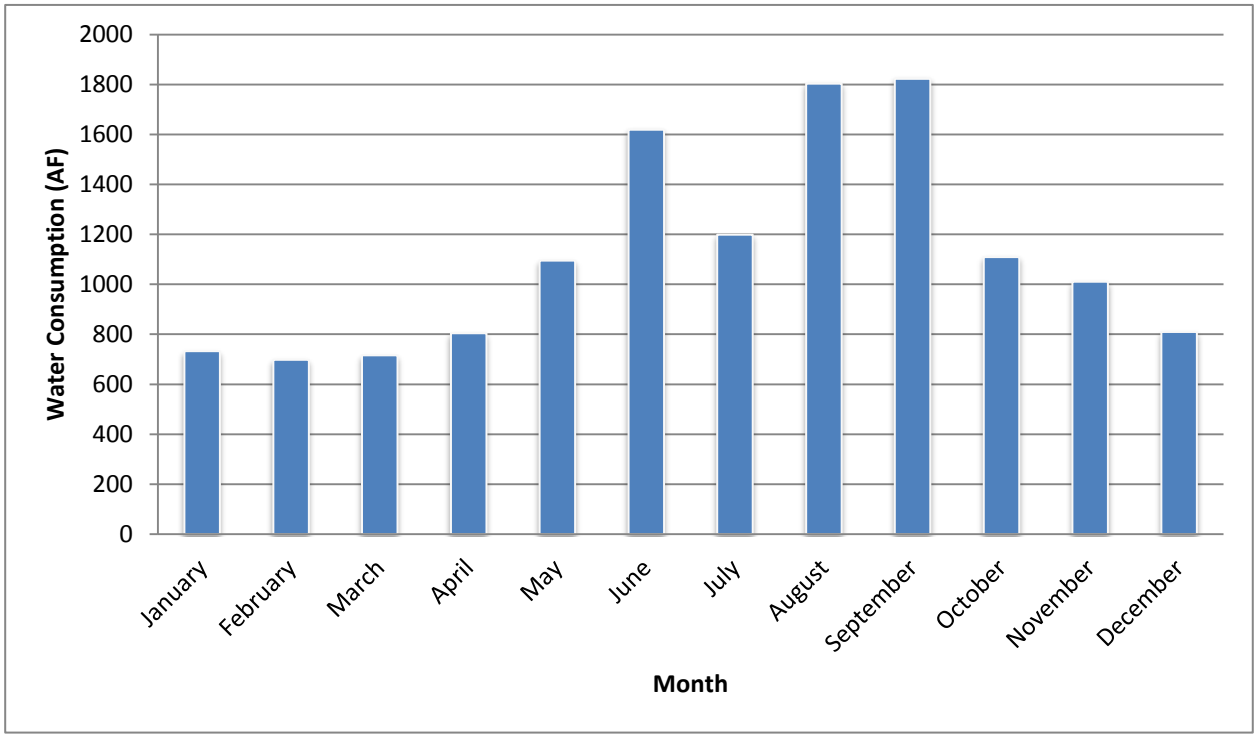
Annual Consumption (AF)	% of Total Demo R Consumption
12.89	0.10%
12.63	0.09%
9.30	0.07%
9.29	0.07%
9.03	0.07%
8.98	0.07%
8.80	0.07%
8.40	0.06%
8.25	0.06%
8.13	0.06%
95.69	0.71%

Figure 5-1: 2011 Distribution for Consumption Demographic "R" - Single Family Residential



SF customers' highest use month is September with a consumption of 1,823 AF in 2011. Use drops about 60 percent in February, the lowest use month, to 698 AF (Figure 5-2).

Figure 5-2: Single Family Residential Consumption (2011)



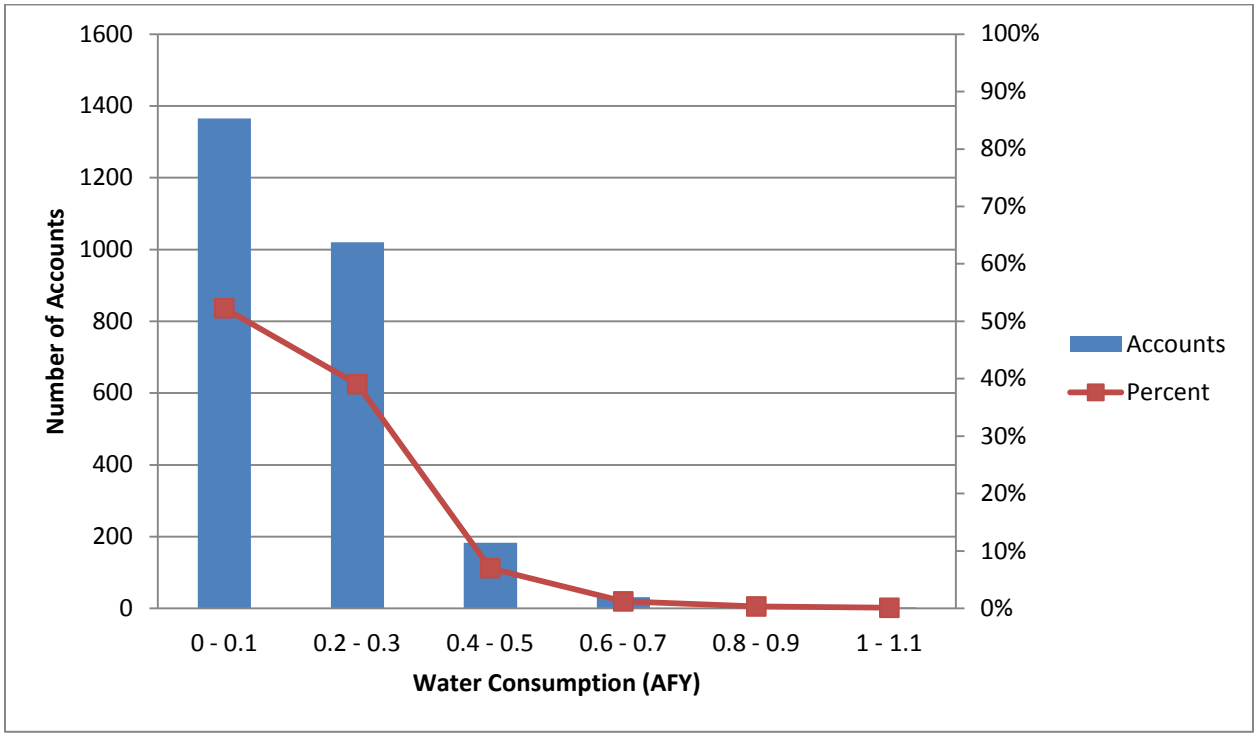
5.2.3 Residential – Condos

There are 2,612 Residential – Condo customer accounts in the SCWD service area; in 2011 their consumption was 460 AF of water, with an average of 0.18 AF per account. In 2011, the highest using three customers consumed just over 1 AF each. An additional nine customers consumed between 0.8 and 0.9 AFY. Table 5-4 provides the ten condo customers with the highest use. Contrary to these outliers, approximately 91 percent of condo accounts consumed below 0.3 AF in 2011 as shown in Figure 5-3.

Table 5-4: Highest Consumers - Condos

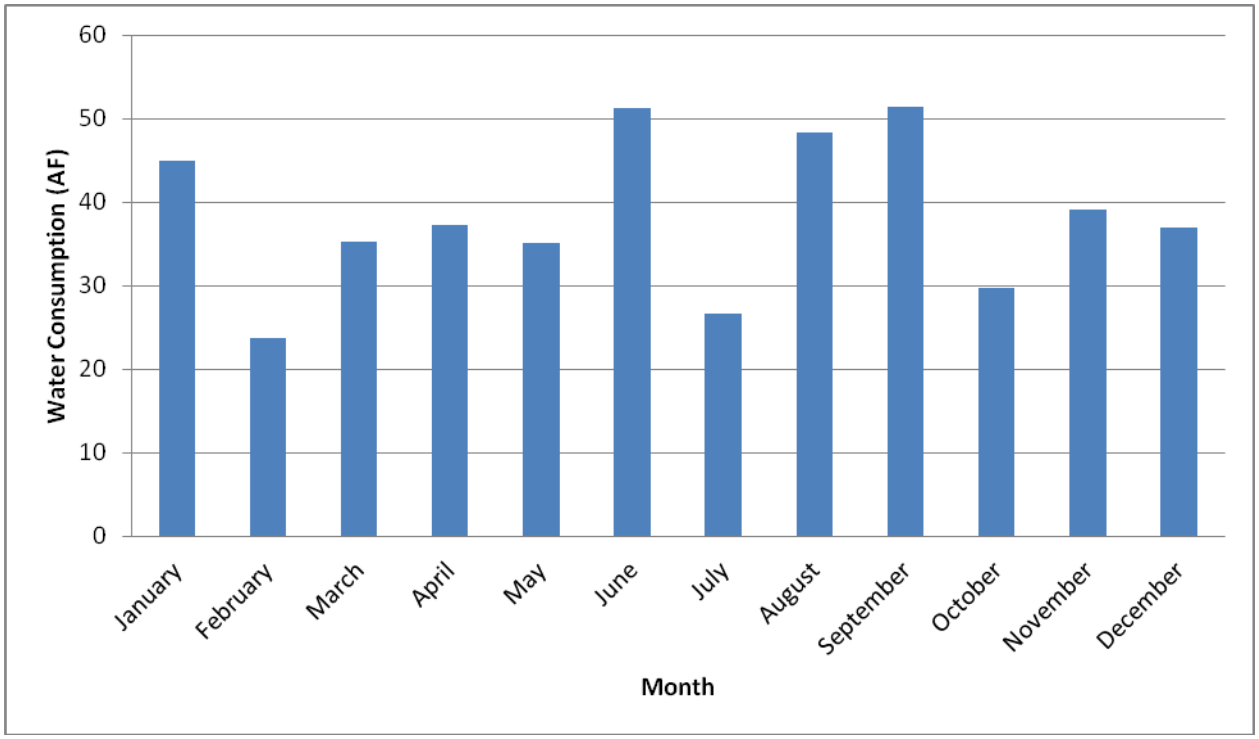
Annual Consumption (AF)	% of Total Demo D Consumption
1.04	0.23%
1.04	0.23%
1.03	0.22%
0.94	0.20%
0.93	0.20%
0.89	0.19%
0.87	0.19%
0.84	0.18%
0.82	0.18%
0.79	0.17%
9.19	2.00%

Figure 5-3: 2011 Distribution for Consumption for Demographic "D" – Condo



Condo customers' highest use months in 2011 were June and September with a consumption of 51 AF, falling about 53 percent in February, the lowest use month, to 24 AF (Figure 5-4). Although July consumption seems significantly lower than the other summer months, this data needs to be parsed further as it relates to meter read dates; there are more read dates in August than July which makes the data look like the consumption is higher in August.

Figure 5-4: 2011 Monthly Consumption for Demographic "D" - Condo



5.2.4 Multi-Family Residential – Apartments

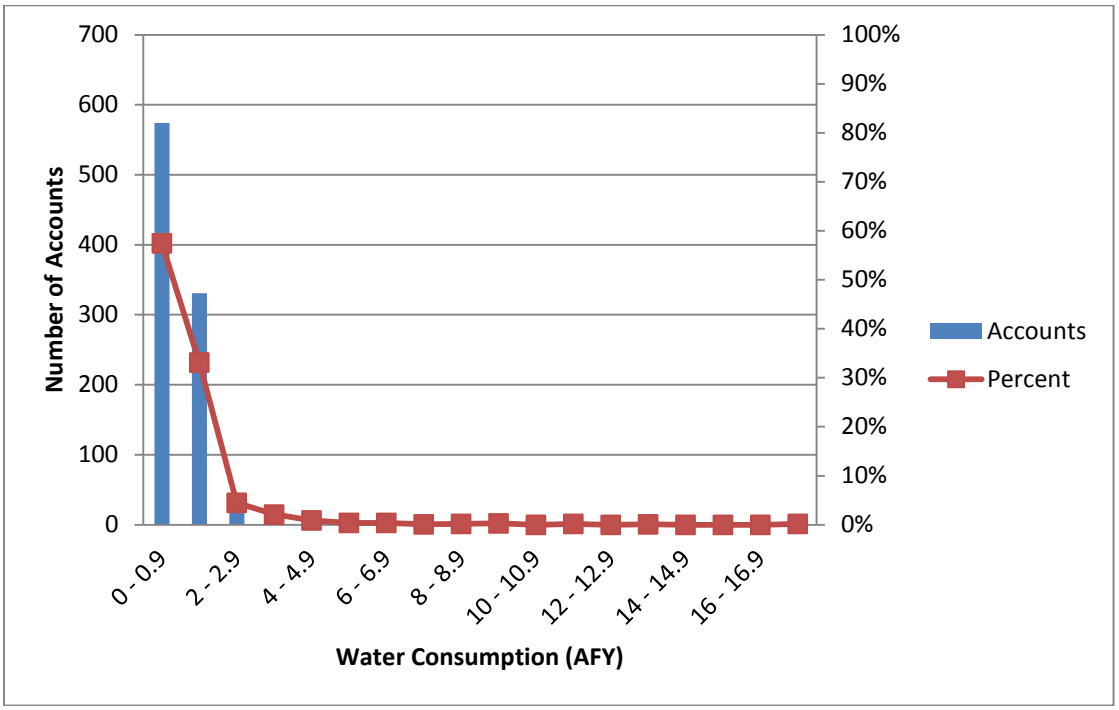
There are 999 Multi-Family Residential – Apartment accounts made up of 5,499 dwelling units in the SCWD service area; in 2011 their consumption was 1,218 AF of water, an average of 1.22 AF per account and 0.22 AF per dwelling unit and 5 percent of the total use. The distribution of apartment use is fairly narrow— nearly 60 percent of accounts consume less than 0.9 AF per year. Another 33 percent of apartment accounts consume between 1 and 1.9 AF per year (Figure 5-5). Two accounts consumed over 1 AF per dwelling unit in 2011 and ten accounts consumed over 0.6 AF per dwelling unit in 2011. Table 5-5 presents the top ten MF users in the service area.

Table 5-5: Highest Consumers - Apartments

Annual Consumption (AF)	Number of Dwelling Units	Consumption per Dwelling Unit (AF)
5	4	1.270
5	4	1.195
3	4	0.869
3	4	0.858
3	4	0.778
2	3	0.744
3	4	0.697

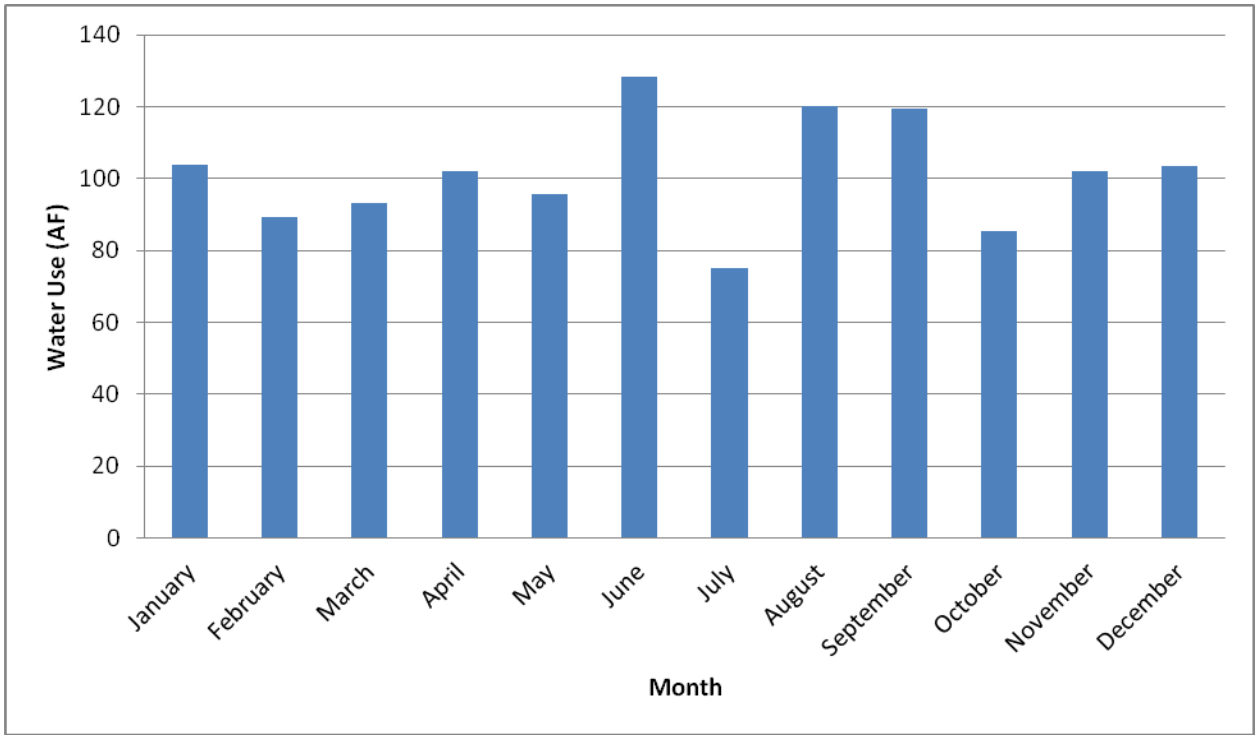
Annual Consumption (AF)	Number of Dwelling Units	Consumption per Dwelling Unit (AF)
3	4	0.642
2	4	0.604
14	23	0.601
43	58	

Figure 5-5: 2011 Distribution for Consumption for Demographic "A" – Apartments



Apartment customers' highest use month in 2011 was June with a consumption of 128 AF, falling about 40 percent in July, the lowest use month, to 75 AF (Figure 5-6).

Figure 5-6: Multi-Family Residential Apartment Consumption (2011)



5.3 Commercial Consumption

SCWD tracks commercial water use in three different categories: food, retail and other.

5.3.1 Commercial – Food

There are 67 commercial - food accounts in the SCWD service area; in 2011 their consumption was 138 AF of water, an average of 2.1 AF per account. Five customers consumed more than double that at 5 AF; 3 grocery stores and 2 restaurants. Table 5-6 provides consumption for the ten commercial-food customers with the highest use. These 10 users make up 42 percent of the use for this demographic in 2011.

Table 5-6: Highest Consumers - Commercial - Food

Annual Consumption (AF)	% of Total Demo J Consumption
9.76	7%
7.57	5%
6.38	5%
5.82	4%
5.21	4%
4.82	3%
4.81	3%

Annual Consumption (AF)	% of Total Demo J Consumption
4.79	3%
4.59	3%
4.41	3%
58.17	42%

Forty percent of commercial – food customers used between 0 and 0.9 AF in 2011 (Figure 5-7).

Figure 5-7: 2011 Distribution for Consumption for Demographic "J" - Commercial – Food

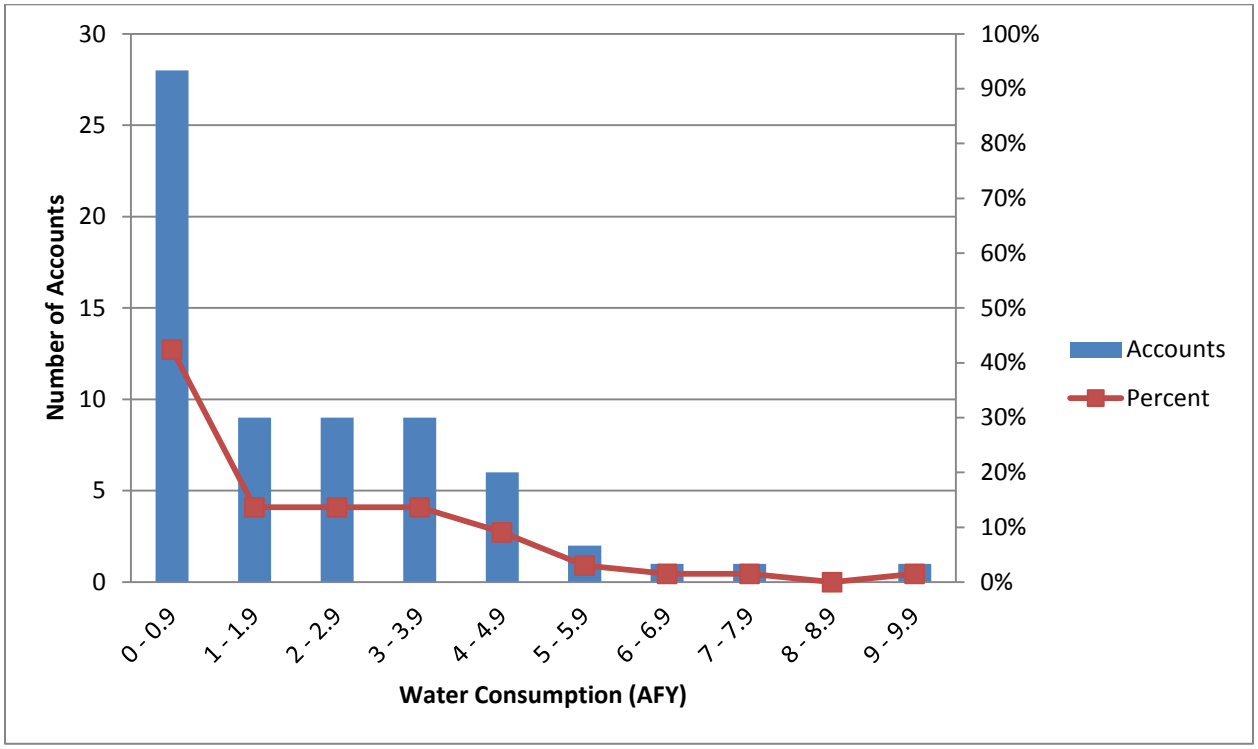
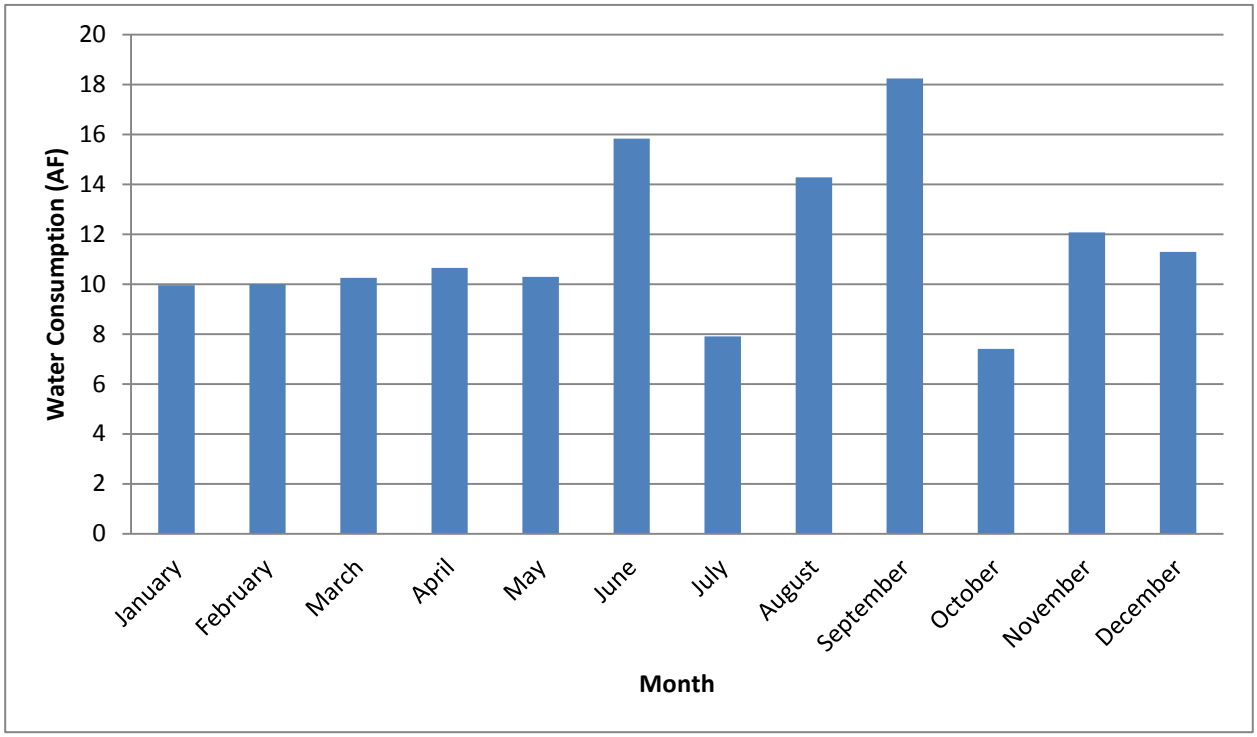


Figure 5-8 shows that commercial-food customers' highest use month in 2011 was September with a consumption of 18 AF, falling about 60 percent in October, the lowest use month, to 7 AF.

Figure 5-8: 2011 Monthly Consumption for Demographic "J" - Commercial - Food



5.3.2 Commercial – Retail

The 172 commercial - retail accounts consumed approximately 183 AF of water in 2011, an average of 1 AFY per unit.

Table 5-7 provides consumption data for the ten highest users in 2011, which were the only accounts to consume over 5 AF each in 2011. These ten accounts were responsible for 40 percent of the use in 2011, while 84 percent of customers consumed less than 2 AF of water Figure 5-9.

Table 5-7: Highest Consumers - Commercial - Retail

Annual Consumption (AF)	% of Total Demo H Consumption
11.8	6.5%
8.9	4.9%
7.8	4.3%
7.4	4.1%
7.4	4.0%
7.3	4.0%
5.6	3.1%
5.6	3.0%
5.2	2.9%
5.1	2.8%
72.1	39.5%

Figure 5-9: 2011 Distribution for Consumption for Demographic "H" - Commercial - Retail

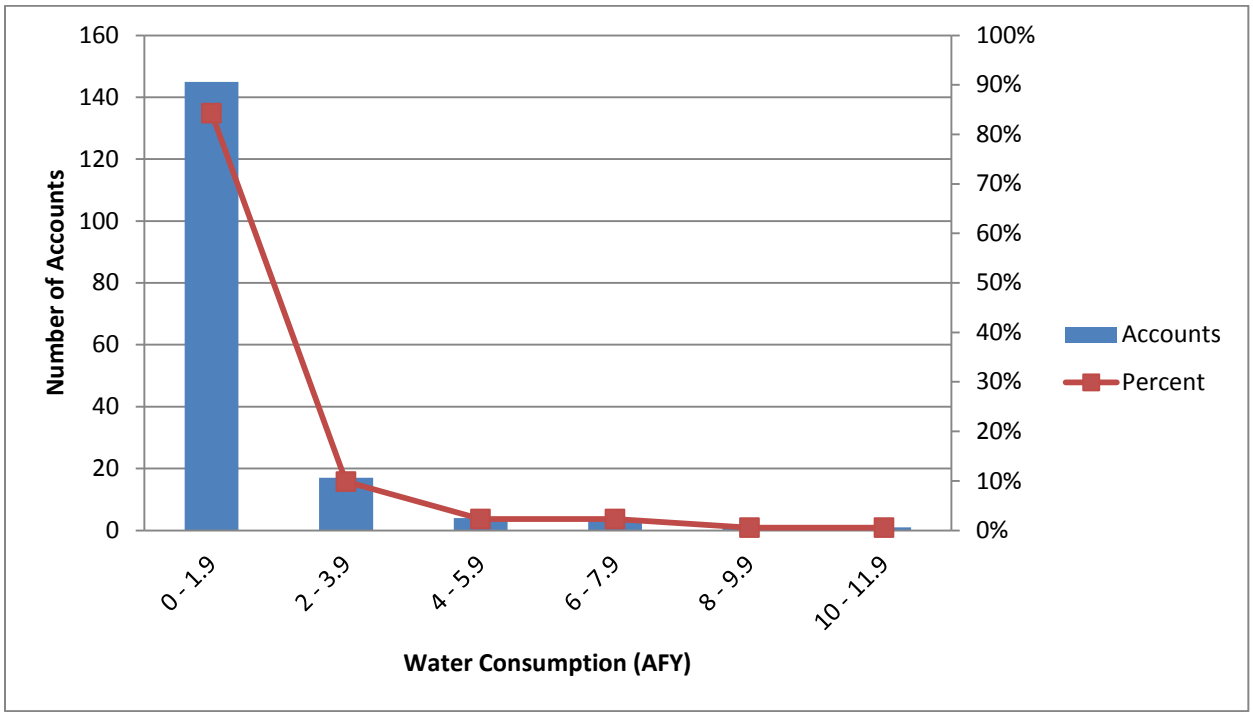
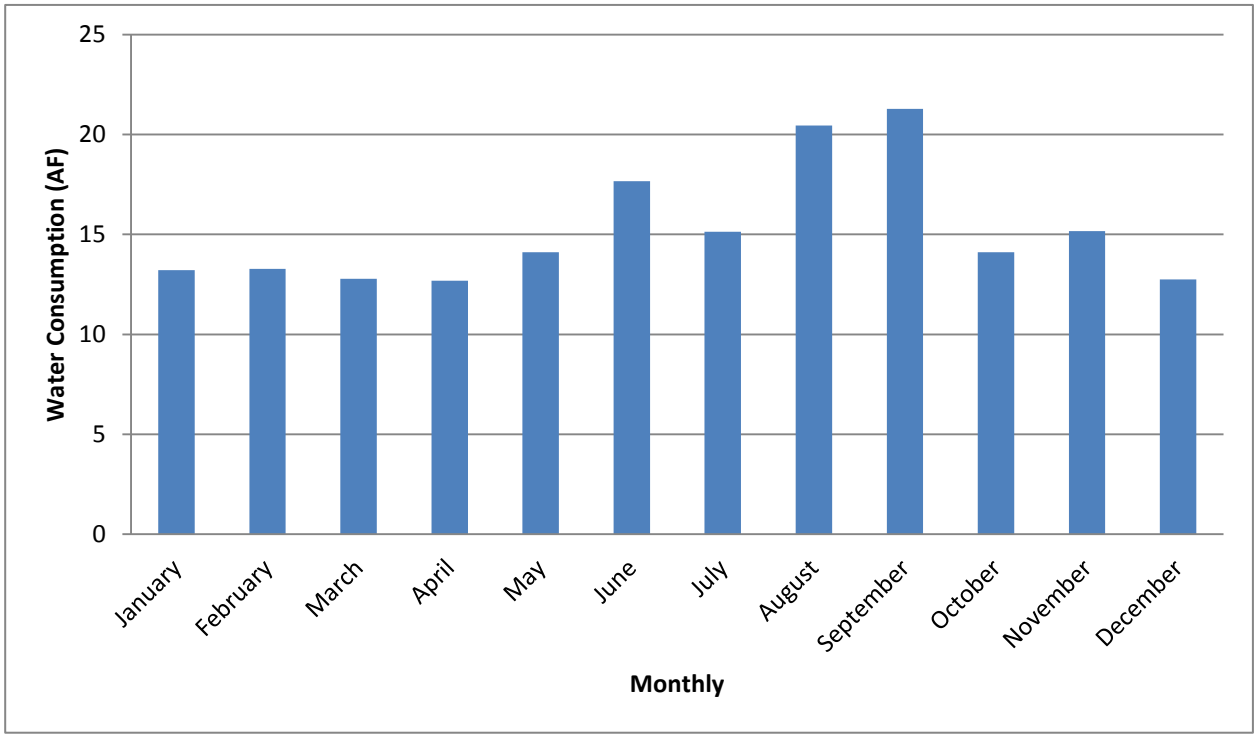


Figure 5-10 shows that the lowest use occurred in April with a consumption of 13 AF, increasing about 40 percent in September, the highest use month, to 21 AF.

Figure 5-10: 2011 Monthly Consumption for Demographic "H" - Commercial - Retail



5.3.3 Commercial – Other

The remaining commercial consumption is accounted for under Commercial – Other which includes a variety of businesses such as labs, large retail, gyms, public storage, and more. The commercial - other demographic has 392 accounts, which consumed 501 AF of water in 2011, an average of 1.28 AFY per account.

The highest user, Bocchi Laboratories, consumed more than 29 AF of water in 2011, almost double the amount of water as any other customer. Bocchi Labs alone accounted for almost 6 percent of this demographics' consumption. Table 5-8 provides information on the ten highest using commercial-other accounts. These 10 users make up 26 percent of the water consumption for this demographic in 2011. While there are several high use customers, 83 percent of commercial – other customers consumed less than 2 AF in 2011 (Figure 5-11).

Table 5-8: Highest Consumers - Commercial - Other

Annual Consumption (AF)	% of Total Demo H Consumption
29	5.8%
16	3.3%
14	2.9%
14	2.8%
13	2.6%
10	1.9%
9	1.8%
8	1.7%
8	1.5%
7	1.4%
129	25.6%

Figure 5-11: 2011 Distribution for Consumption for Demographic "I" - Commercial – Other

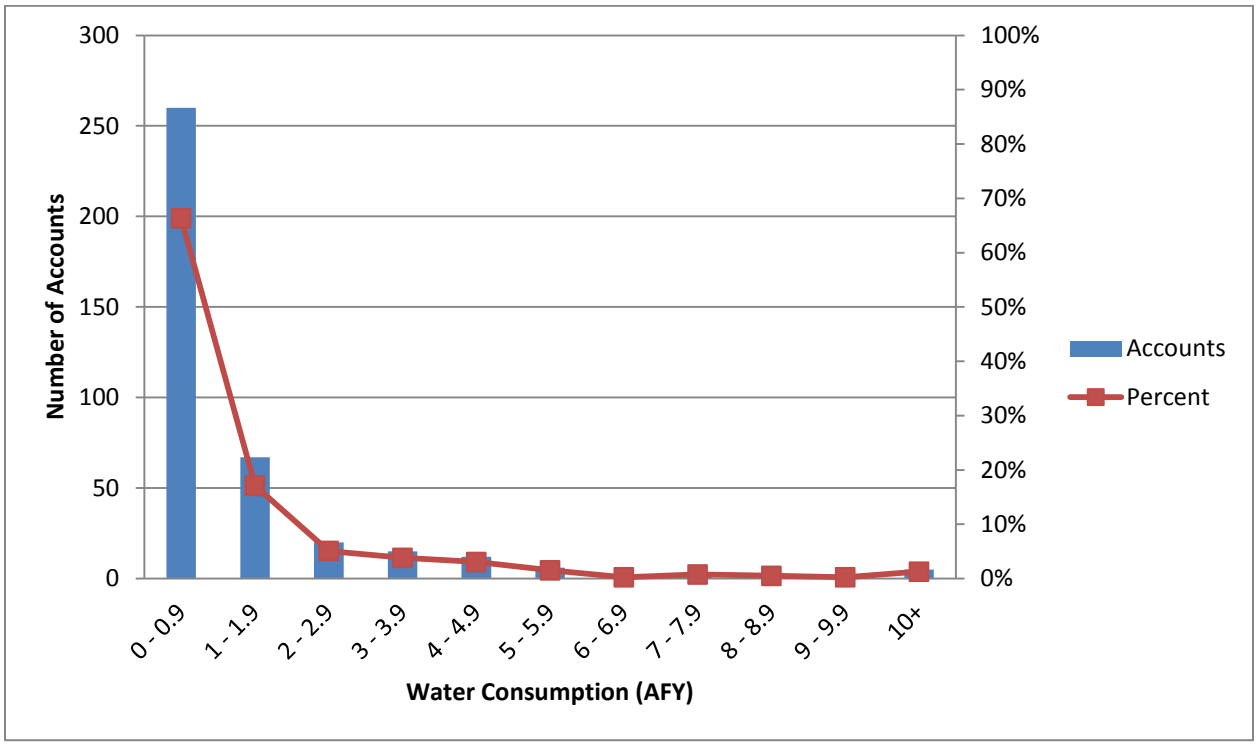
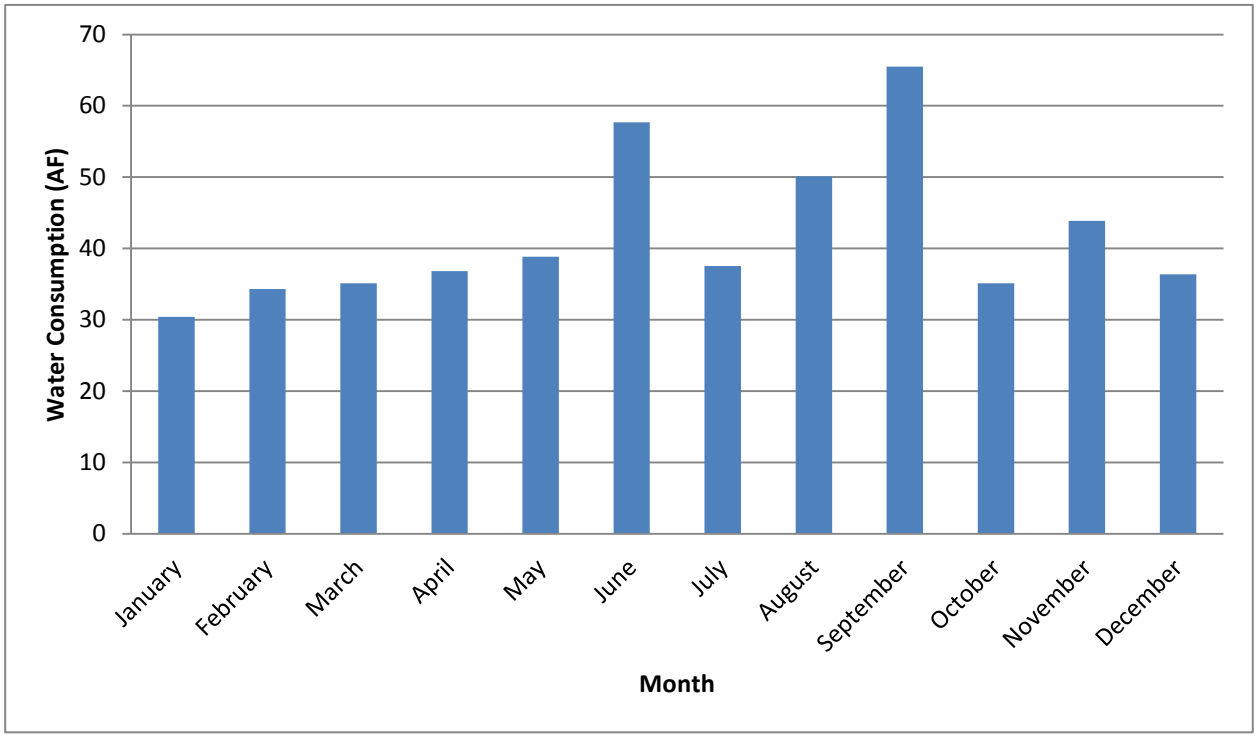


Figure 5-12 shows that commercial – other customer accounts' lowest use occurred in January with a consumption of 30 AF, increasing 54 percent in September, the highest use month, to 65 AF.

Figure 5-12: 2011 Monthly Consumption for Demographic "I" - Commercial - Other



5.4 School Consumption

SCWD has 62 School accounts belonging to 11 different school districts. A number of schools have multiple accounts, so it is estimated SCWD serves 46 schools. In 2011 schools used almost 700 AF of water, an average of 11.2 AFY per school account (though some schools have more than one service) and 64 AFY per school district, the highest use per account of all customer types.

The highest user in 2011 was Hart School District's Golden Valley High School, which consumed nearly 60 AF of water in 2011, five times the average water use for school accounts (Table 5-9). This school alone accounted for almost 9 percent of this demographics' consumption. The top 10 users constitute 22 percent of accounts but were responsible for 53 percent of the water consumed in schools in 2011. Six of the 10 highest consuming schools belong to Hart School District.

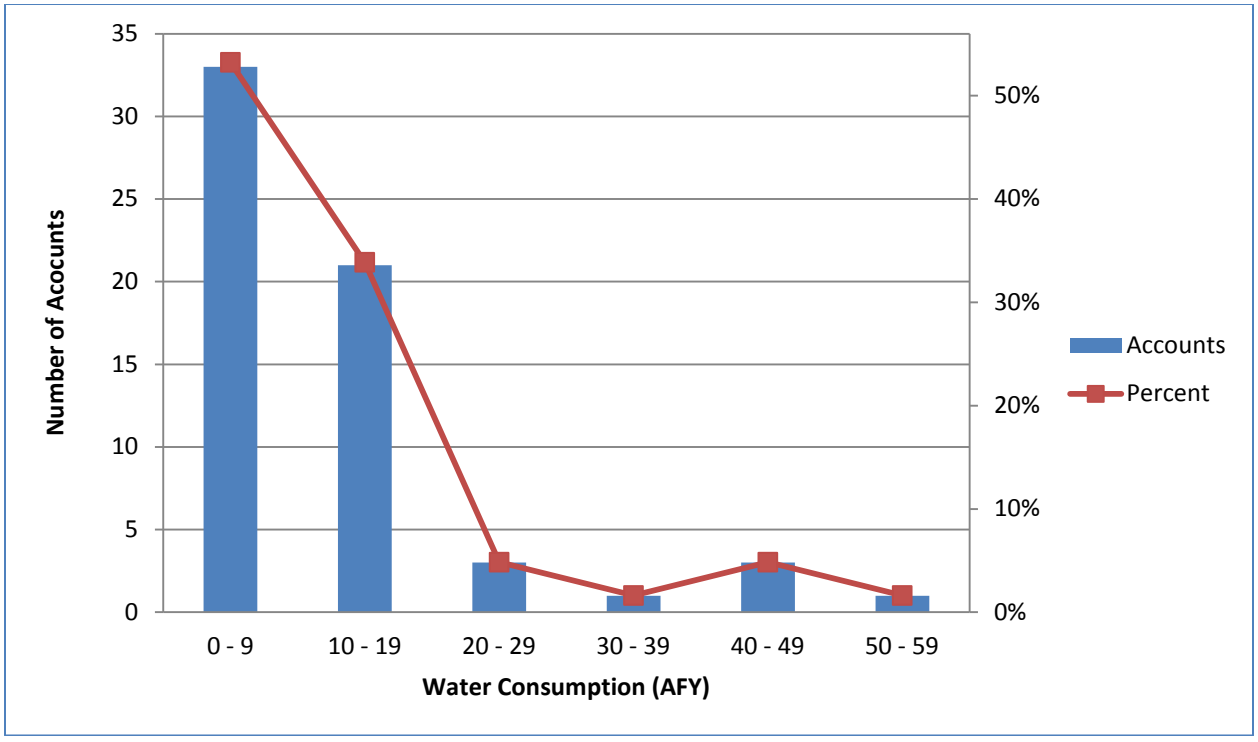
Table 5-9: Highest Consumers - School

Annual Consumption (AF)	% of Total Demo H Consumption
59	8.5%
48	6.9%
43	6.1%
41	5.9%
35	5.1%
22	3.2%
21	3.0%
21	3.0%
19	2.7%
19	2.7%
326	47.1%

Note:
(a) CLWA funded a pilot project at SSSD that included centrally controlled weather-based irrigation controllers.

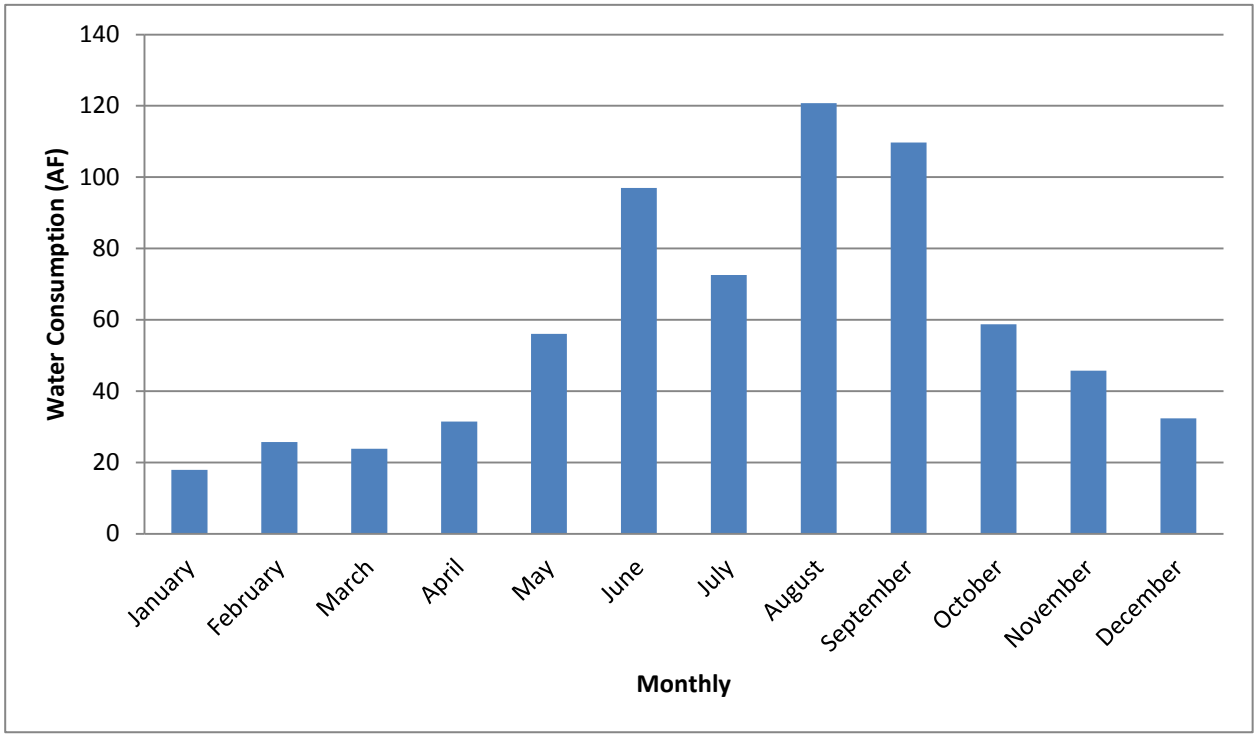
In 2011, 53 percent of School accounts consumed less than 9 AFY and another 34 percent consumed between 10 and 19 AF, which is shown in Figure 5-13.

Figure 5-13: 2011 Distribution for Consumption for Demographic "Z" – Schools



In 2011, school accounts' lowest use occurred in January with a consumption of 18 AF, increasing 85 percent in August, the highest use month, to 121 AF, which is shown in Figure 5-14.

Figure 5-14: 2011 Monthly Consumption for Demographic "Z" - Schools



5.5 Industrial Consumption

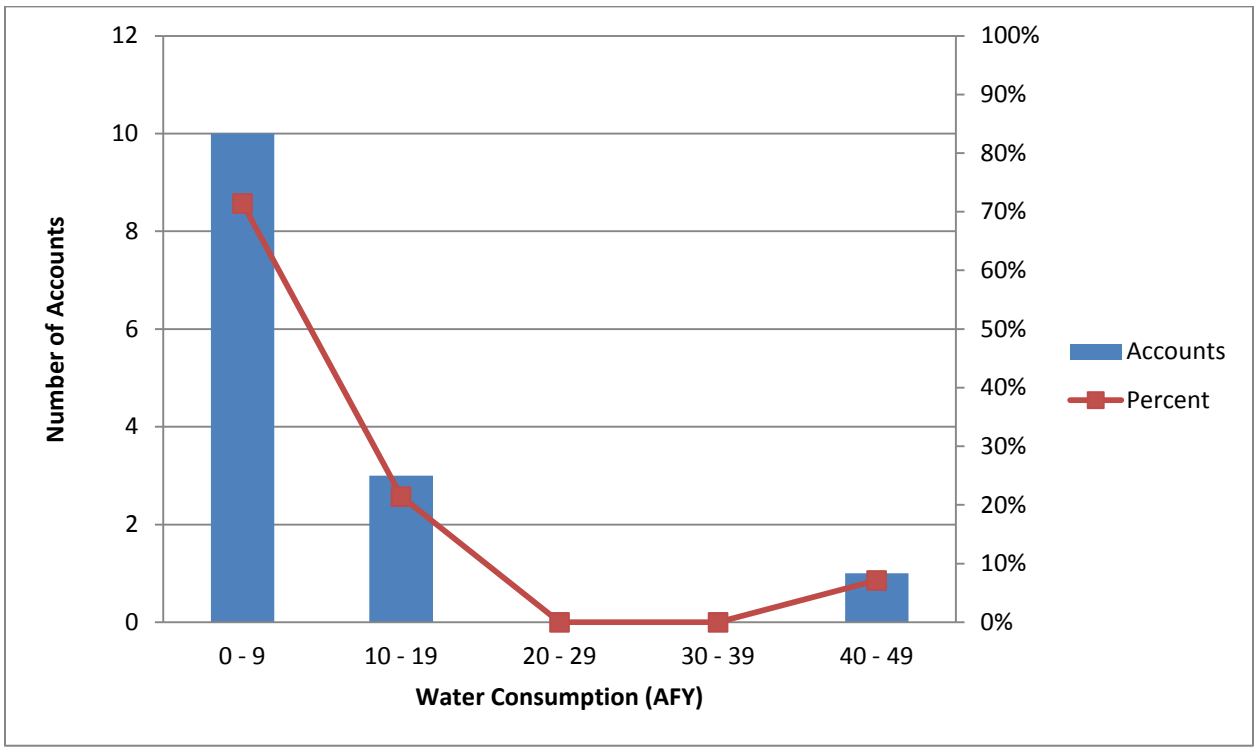
The 14 Industrial customers in the SCWD service area consumed almost 100 AF of water in 2011, with an average of 7 AF per customer. The highest user consumed almost half that total at 46 AFY (Table 5-10). The distribution pattern for industrial users was fairly narrow otherwise with 79 percent of industrial accounts using less than 10 AF in 2011 (Figure 5-15).

Table 5-10: Highest Consumers - Industrial

Annual Consumption (AF)	% of Total Demo H Consumption
46	46.4%
14	14.1%
12	12.4%
10	9.8%
7	7.1%
3	3.3%

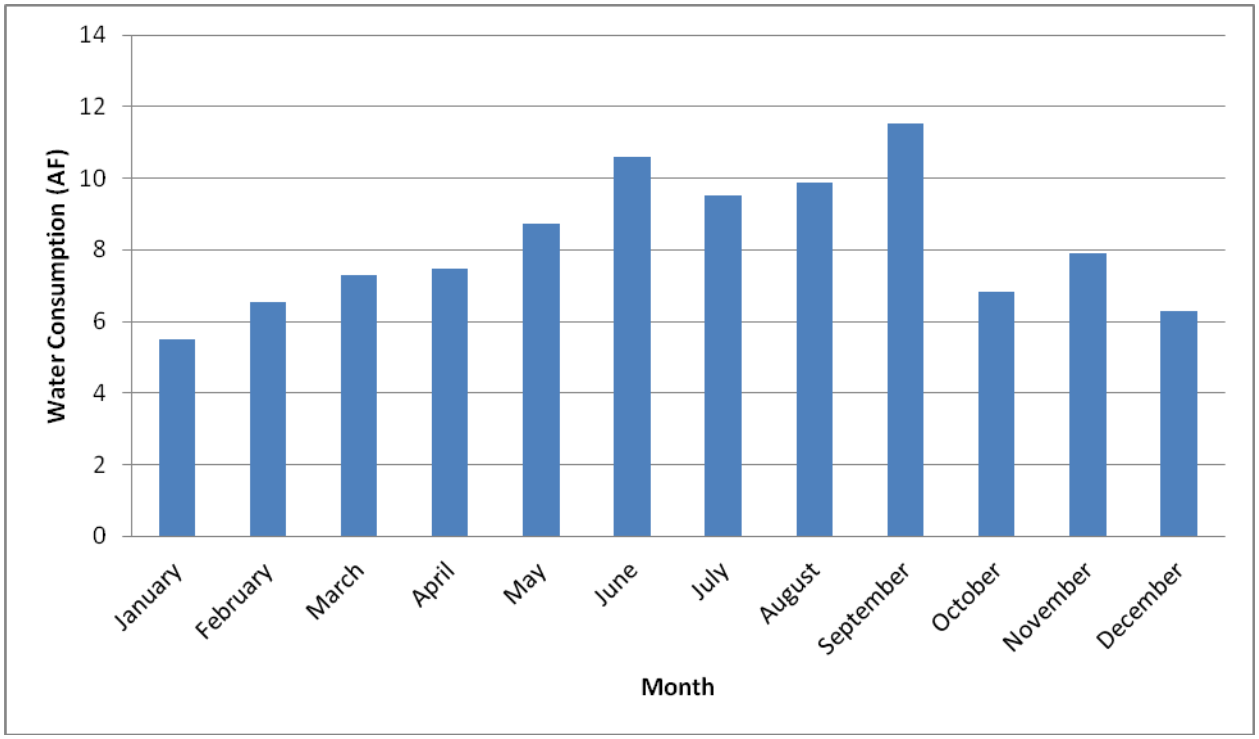
Annual Consumption (AF)	% of Total Demo H Consumption
91	89.8

Figure 5-15: 2011 Distribution for Consumption for Demographic "7" - Industrial



In 2011, industrial accounts' lowest use occurred in January with a consumption of 5 AF, increasing 58 percent in September, the highest use month, to 12 AF, which is shown in Figure 5-16.

Figure 5-16: 2011 Monthly Consumption for Demographic "7" - Industrial



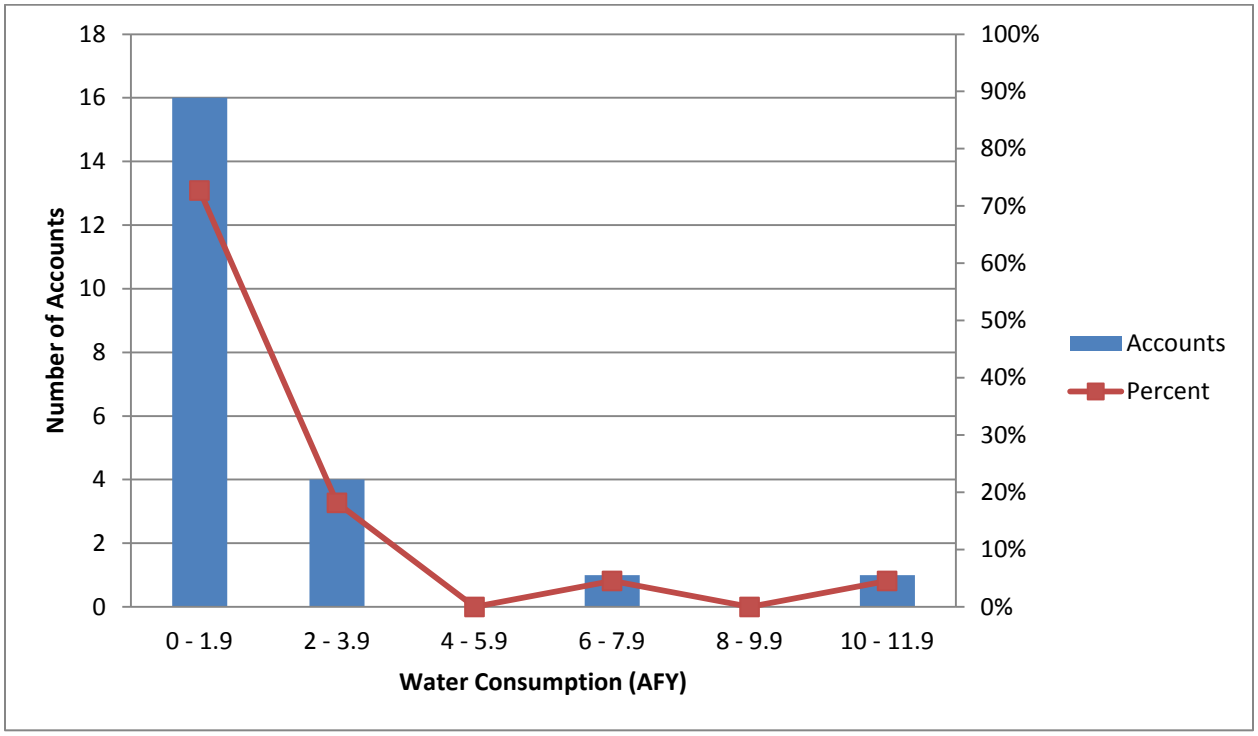
5.6 Public Authorities Consumption

The 22 Public Authorities, which are made up of city and county municipal customers, accounts in the SCWD service area consumed 36 AF of water in 2011. The average use for the public authority demographic is 1.7 AF per account. The two highest users, CC Rec Center/City of Santa Clarita and the City of Santa Clarita, consumed approximately 50 percent of that total (Table 5-11). Contrary to those two outliers, 86 percent of industrial accounts used less than 3 AF of water in 2011 (Figure 5-17).

Table 5-11: Highest Consumers - Public Authorities

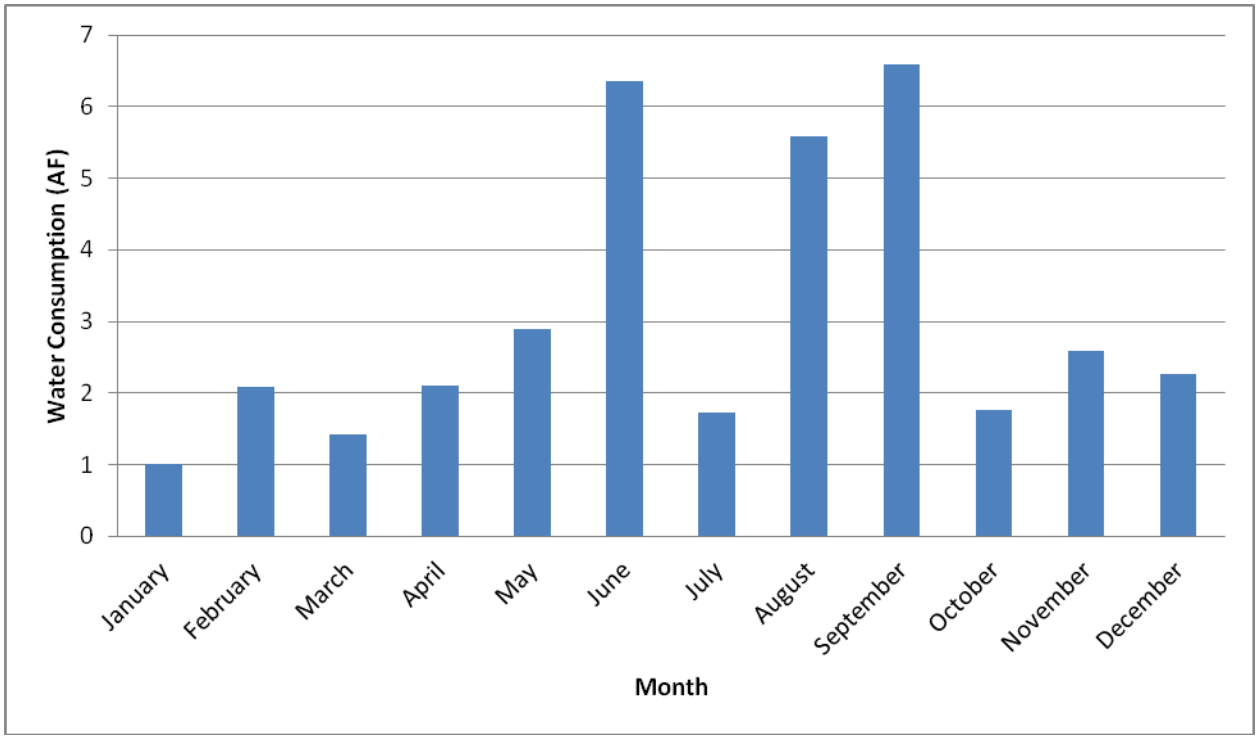
Annual Consumption (AF)	% of Total Demo H Consumption
11	29.6%
8	21.6%
3	7.2%
2	6.8%
2	6.8%
2	5.5%
28	77.5%

Figure 5-17: 2011 Distribution for Consumption for Demographic "1" - Public Authorities



In 2011, industrial accounts' lowest use occurred in January with a consumption of 1 AF, increasing 86 percent in September, the highest use month, to 7 AF, which is shown in Figure 5-18.

Figure 5-18: 2011 Monthly Consumption for Demographic "1" - Public Authorities



5.7 Landscape Consumption

SCWD tracks landscape water consumption separately for CII, multi-family and single-family accounts. CII landscape customers include schools, businesses, and City or County-owned landscapes.

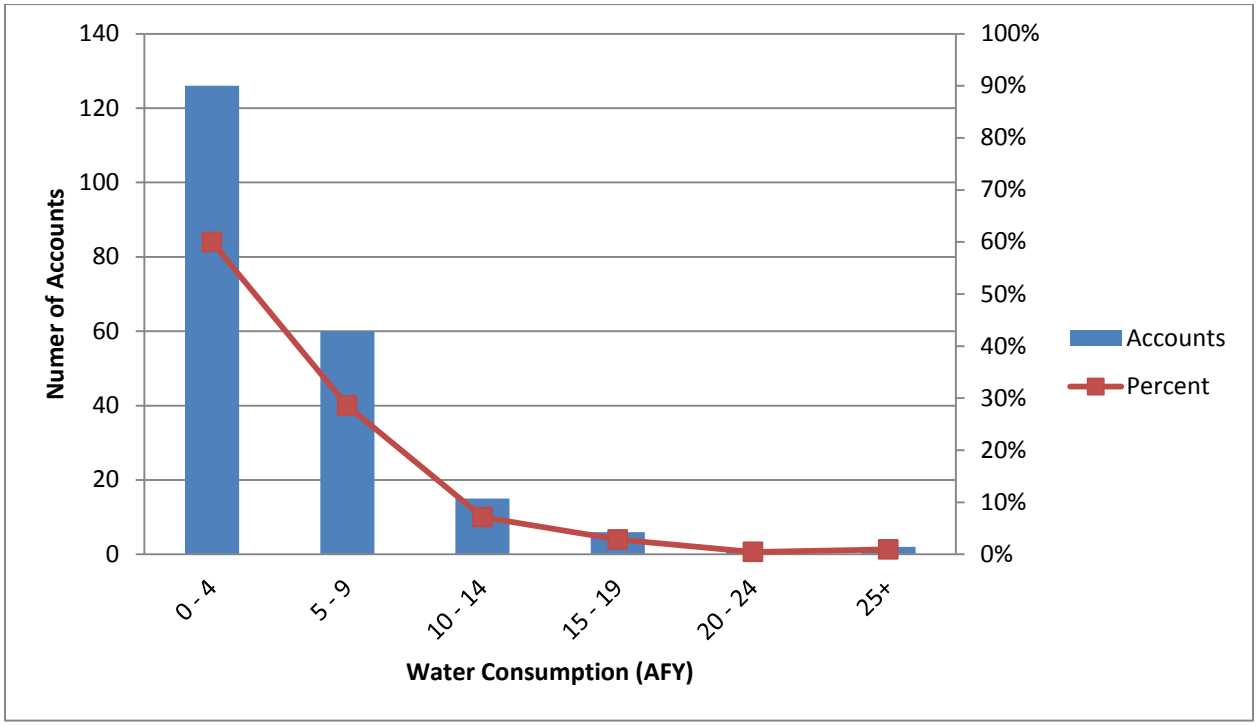
5.7.1 Landscape - CII

There are 210 Landscape CII accounts in the SCWD service area; in 2011 their consumption was 1,032 AF, an average of 5 AFY per account. The two highest using accounts in 2011 consumed over 20 times the annual average at 103 AFY. Table 5-12 shows the consumption for highest landscape CII customers. Contrary to these outliers, 91 percent of CII landscape accounts used less than 10 AF of water in 2011 (Figure 5-19).

Table 5-12: Highest Consumers - CII Landscape

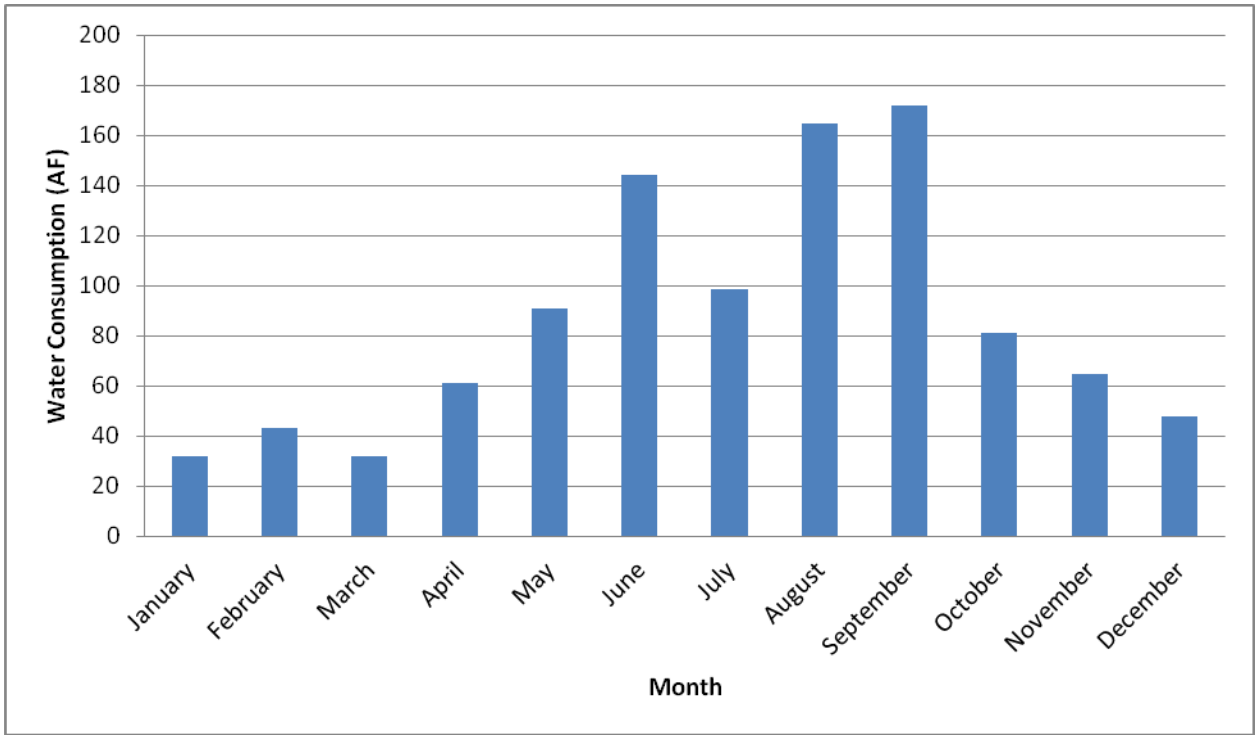
Annual Consumption (AF)	% of Total Demo D Consumption
75	7.2%
28	2.7%
21	2.1%
18	1.7%
16	1.5%
15	1.5%
15	1.5%
15	1.4%
15	1.4%
14	1.4%
231	22.4%

Figure 5-19: 2011 Distribution for Consumption for Demographic "O" - CII Landscape



CII In 2011, CII landscape accounts' lowest use occurred in January and March with a consumption of 32 AF, increasing 81 percent in September, the highest use month, to 172 AF, which is shown in Figure 5-20.

Figure 5-20: 2011 Monthly Consumption for Demographic "O" - CII Landscape



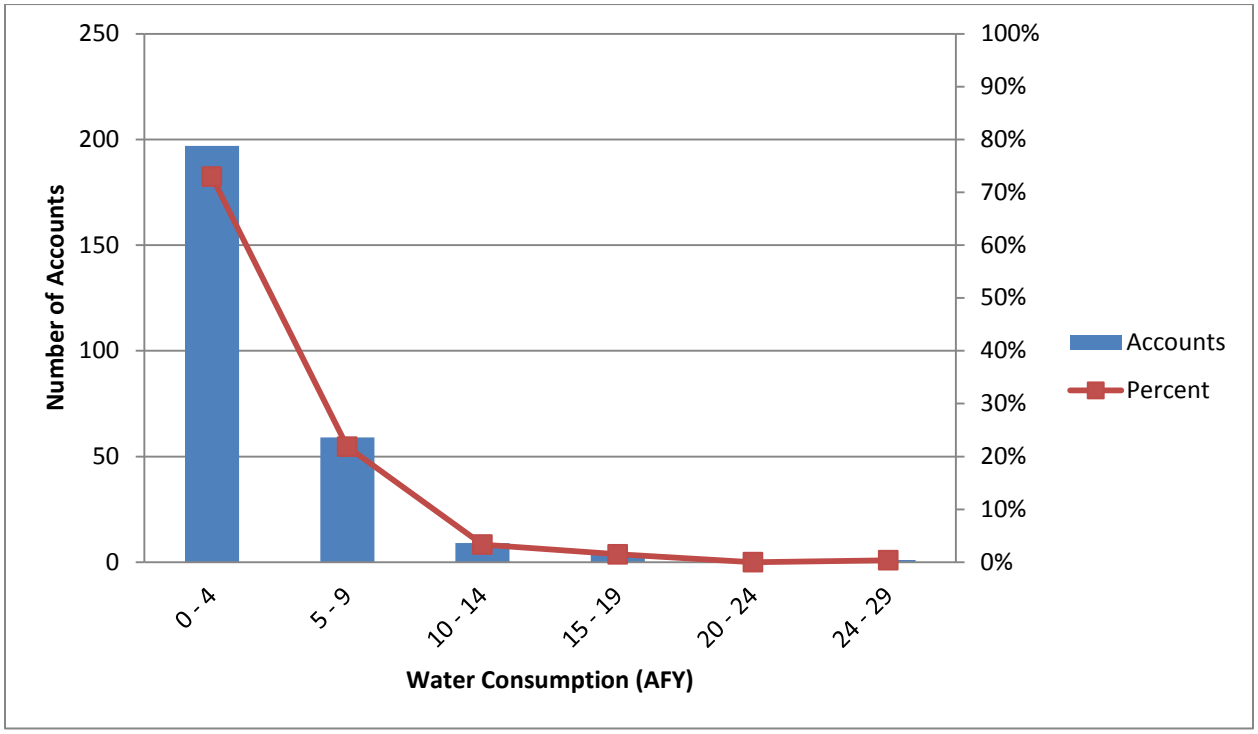
5.7.2 Landscape – Multi-family

There are 270 Landscape MF accounts in the SCWD service area including Condominiums, Apartment buildings and Homeowner Associations (HOAs); in 2011 their consumption was 951 AF of water, and average of 3.5 AF per account. The highest user consumed 25 AFY in 2011, 2.6% of the total MF landscape consumption. The ten highest consuming MF landscape accounts consumed 16 percent of the total MF landscape consumption in 2011 (Table 5-13). Contrary to outliers, approximately 73 percent of MF landscape accounts used 4 AF or less of water in 2011 (Figure 5-21).

Table 5-13: Highest Consumers - MF Landscape

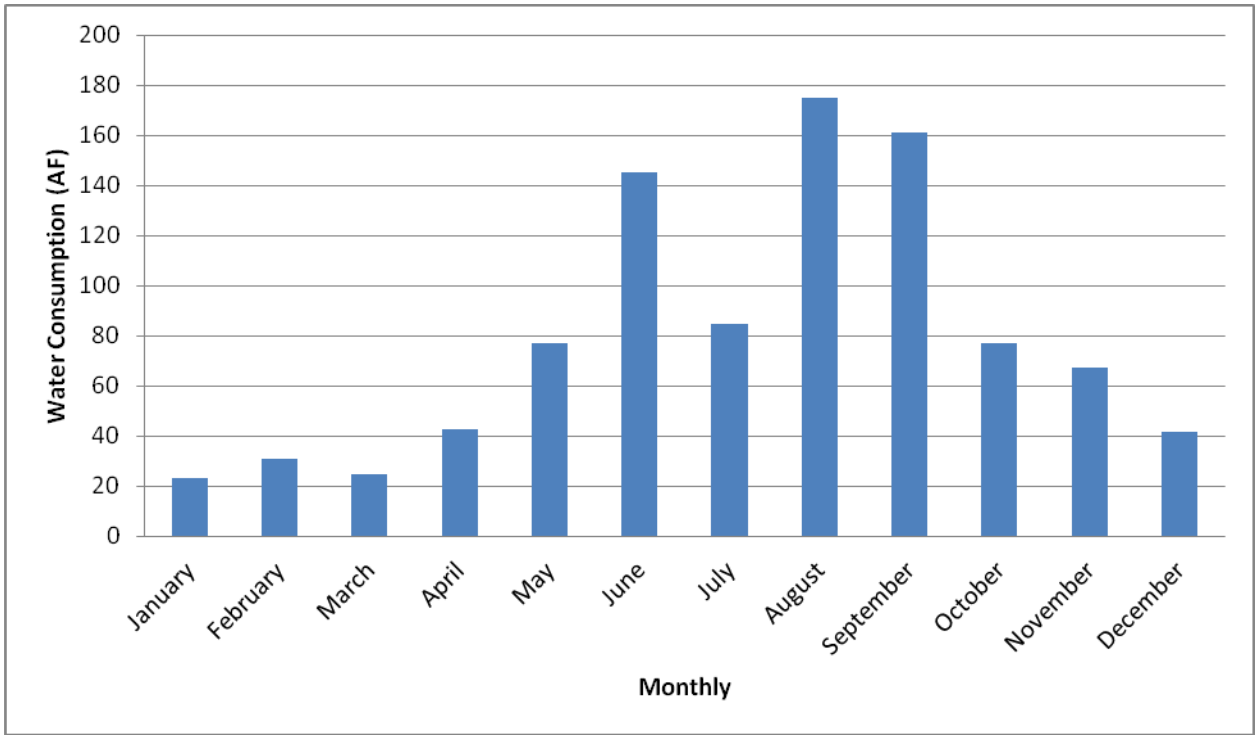
Annual Consumption (AF)	% of Total Demo D Consumption
25	2.6%
19	2.0%
18	1.9%
17	1.8%
16	1.7%
14	1.5%
11	1.2%
11	1.2%
11	1.1%
11	1.1%
154	16.2%

Figure 5-21: 2011 Distribution for Consumption for Demographic "N" - MF Landscape



In 2011, MF landscape accounts' lowest use occurred in January with a consumption of 23 AF, increasing 87 percent in August, the highest use month, to 175 AF, which is shown in Figure 5-22.

Figure 5-22: 2011 Monthly Consumption for Demographic "N" - MF Landscape



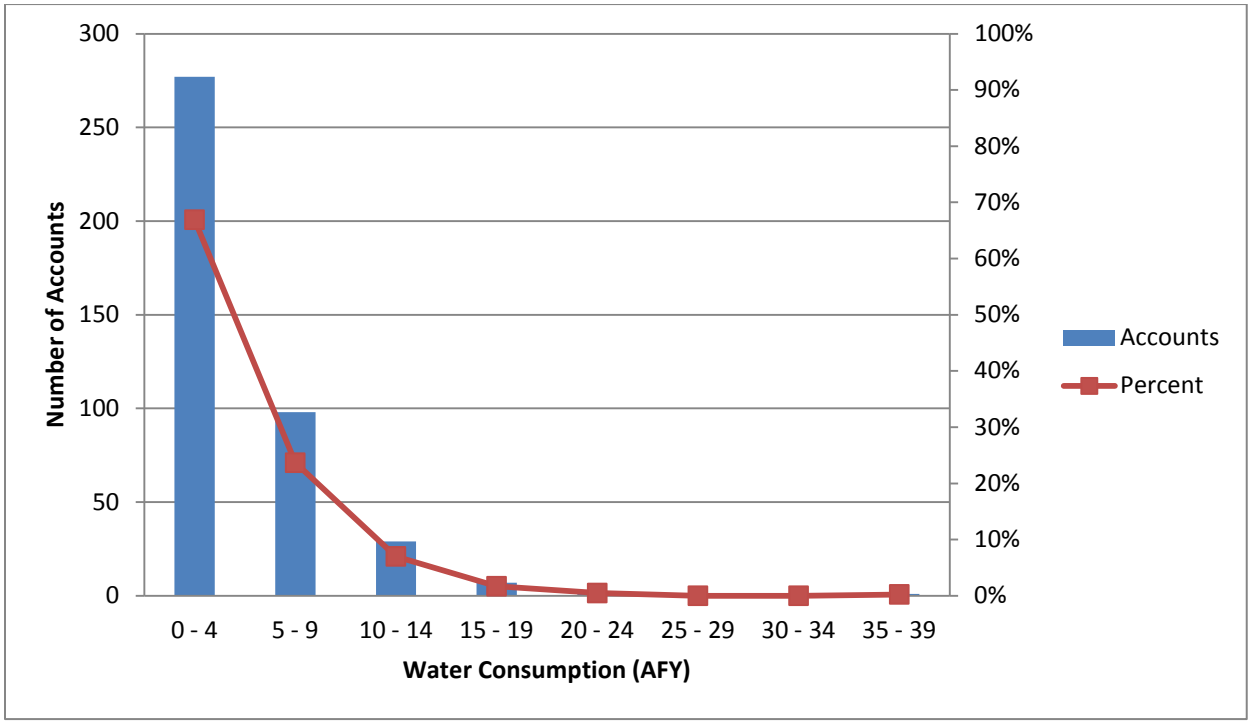
5.7.3 Landscape – Single-family

There are 414 Landscape SF accounts in the SCWD service area; in 2011 their consumption was 1,828 AF, an average of 4.4 AF per account. The majority of the Landscape SF customers are homeowner associations, community associations, and Los Angeles County Parks and Recreation Department. The highest user consumed over eight times the average at 37 AF or 2 percent of total Landscape SF consumption; the top ten customers are responsible for 11 percent of the total SF landscape use in 2011 (Table 5-14). Contrary to these outliers, nearly 70 percent of SF landscape accounts consumed 4 AFY or less in 2011 (Figure 5-23).

Table 5-14: Highest Consumers - SF Landscape

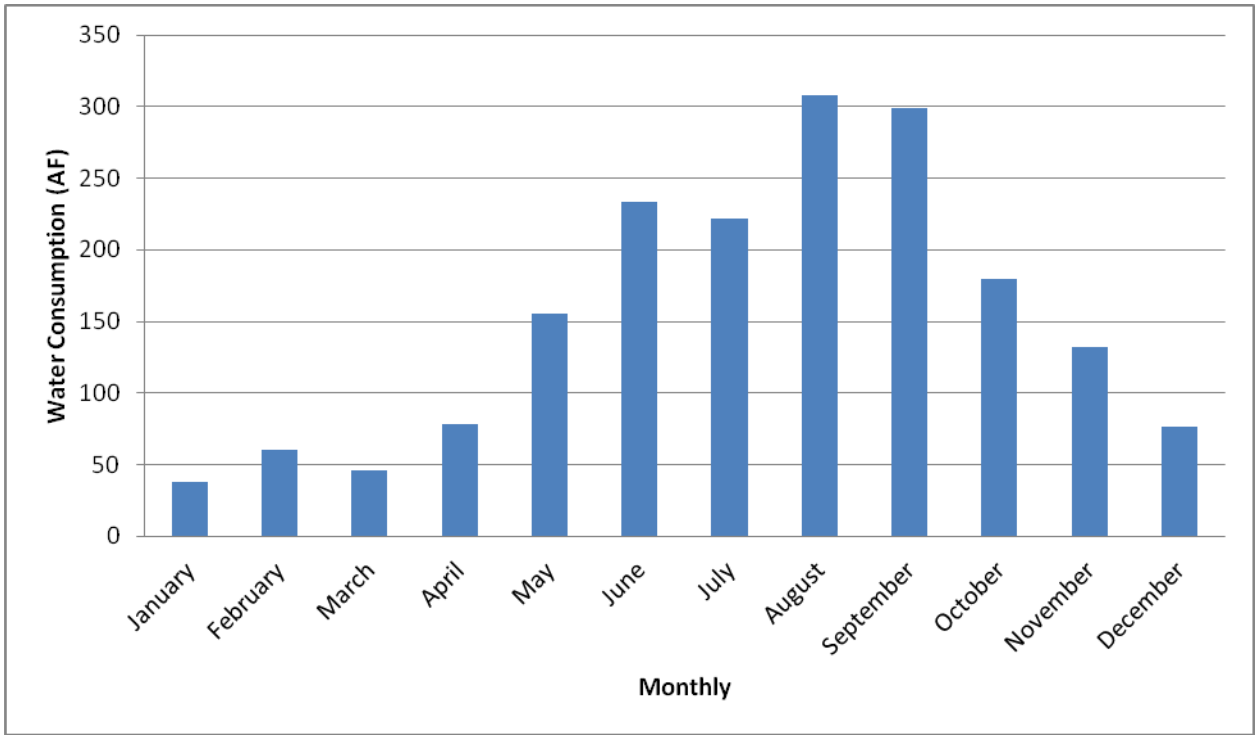
Annual Consumption (AF)	% of Total Demo D Consumption
37	2.0%
25	1.4%
20	1.1%
19	1.1%
17	1.0%
17	0.9%
17	0.9%
16	0.9%
16	0.9%
15	0.8%
199	10.9%

Figure 5-23: 2011 Distribution for Consumption for Demographic "P" - SF Landscape



In 2011, SF landscape accounts' lowest use occurred in January with a consumption of 38 AF, increasing 88 percent in August, the highest use month, to 307 AF, which is shown in Figure 5-24.

Figure 5-24: 2011 Monthly Consumption for Demographic "P" - SF Landscape



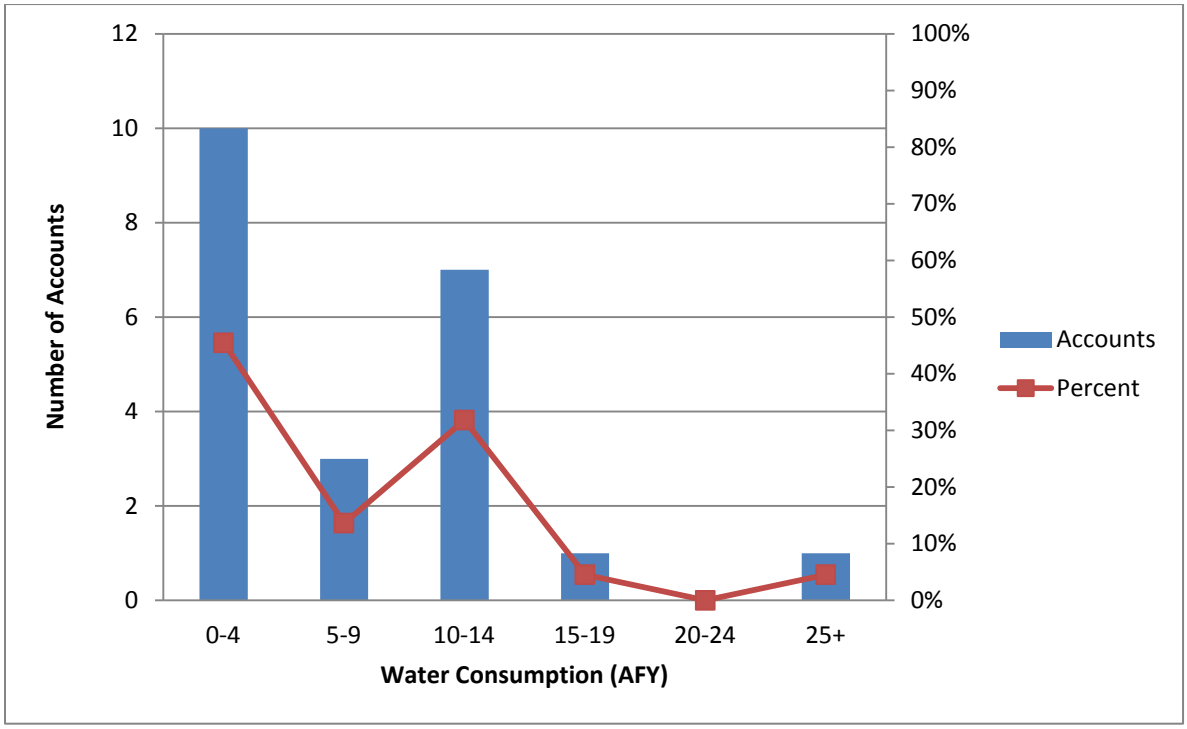
5.7.4 Parks

There are 22 Park accounts in the SCWD service area; in 2011 their consumption was 238 AF, an average of 10.8 AF per account. The majority of the park customers are City of Santa Clarita and Los Angeles County Parks and Recreation Department. The highest user, comprised of Santa Clarita's Central Park, consumed over ten times the average at 110 AF or 46.3 percent of total Park consumption; the top ten customers are responsible for 91 percent of the total Park use in 2011 (Table 5-14). Contrary to these outliers, approximately 45 percent of Park accounts consumed 4 AFY or less in 2011 (Figure 5-23).

Table 5-15: Highest Consumers - Parks

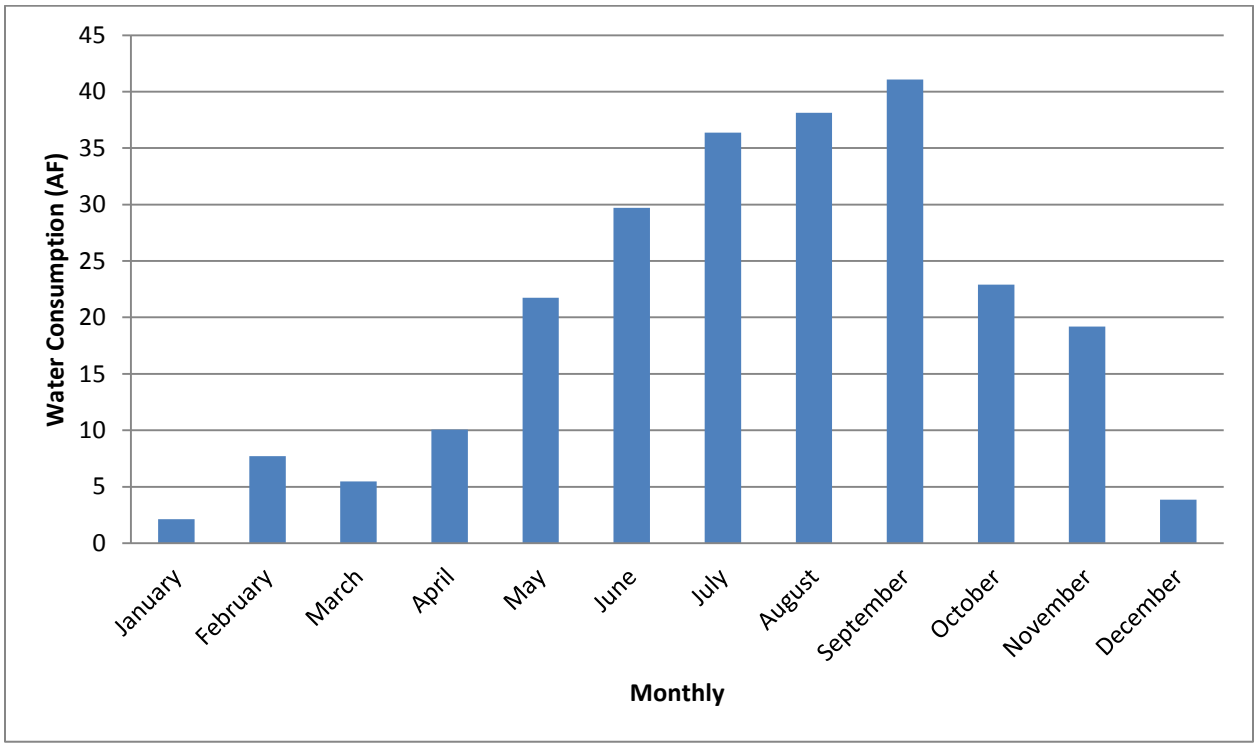
Annual Consumption (AF)	% of Total Demo D Consumption
110	46.3%
15	6.3%
14	5.8%
13	5.4%
12	4.9%
12	4.9%
11	4.7%
11	4.6%
11	4.4%
8	3.4%
216	90.8%

Figure 5-25: 2011 Distribution for Consumption for Demographic "Y" - Parks



In 2011, Park accounts' lowest use occurred in January with a consumption of 2 AF, increasing 95 percent in August, the highest use month, to 41 AF, which is shown in Figure 5-24.

Figure 5-26: 2011 Monthly Consumption for Demographic "Y" - Parks



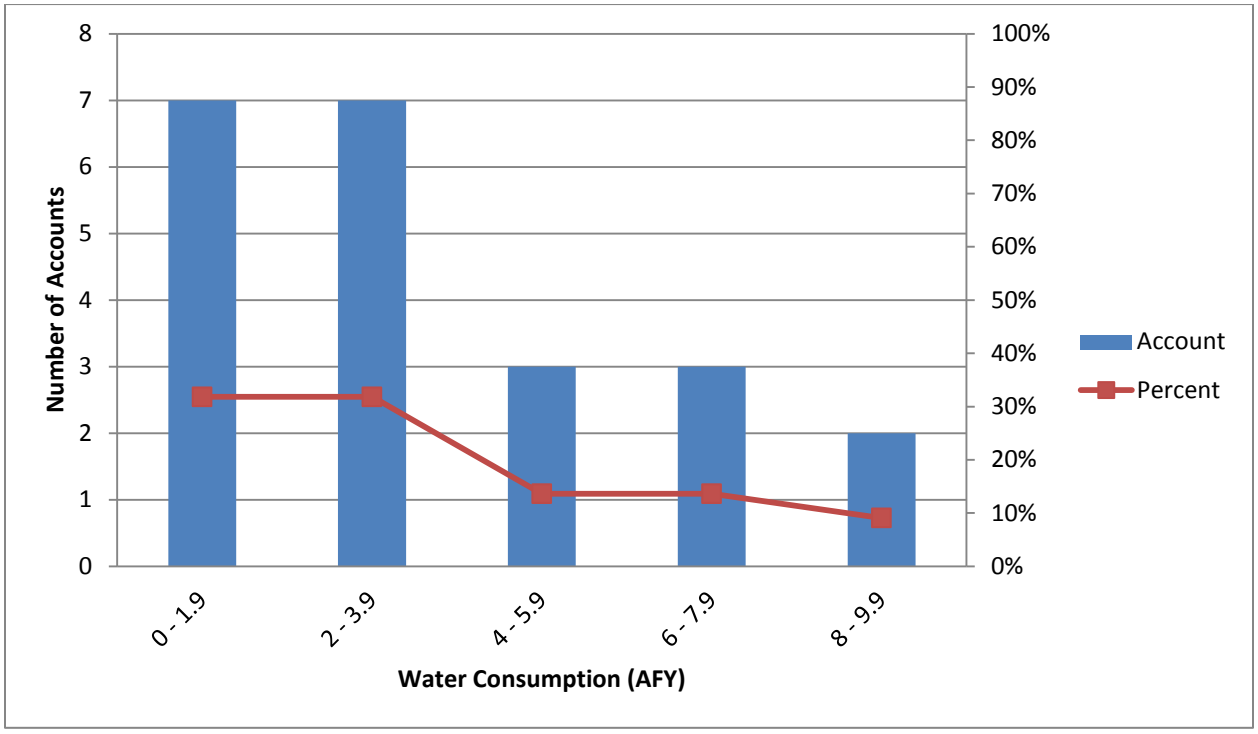
5.8 Churches

There are 22 church customer accounts in the SCWD service area; in 2011 their consumption was 77 AF of water, and average of 3 AF per account. The highest user, Saint Clare Church, consumed three times the average at 9 AF or 12 percent of total church consumption; the top ten customers are responsible for 76 percent of the total church use in 2011 (Table 5-16). Contrary to these outliers, 64 percent of churches consumed less than 3.9 AFY in 2011 (Figure 5-27).

Table 5-16: Highest Consumers - Churches

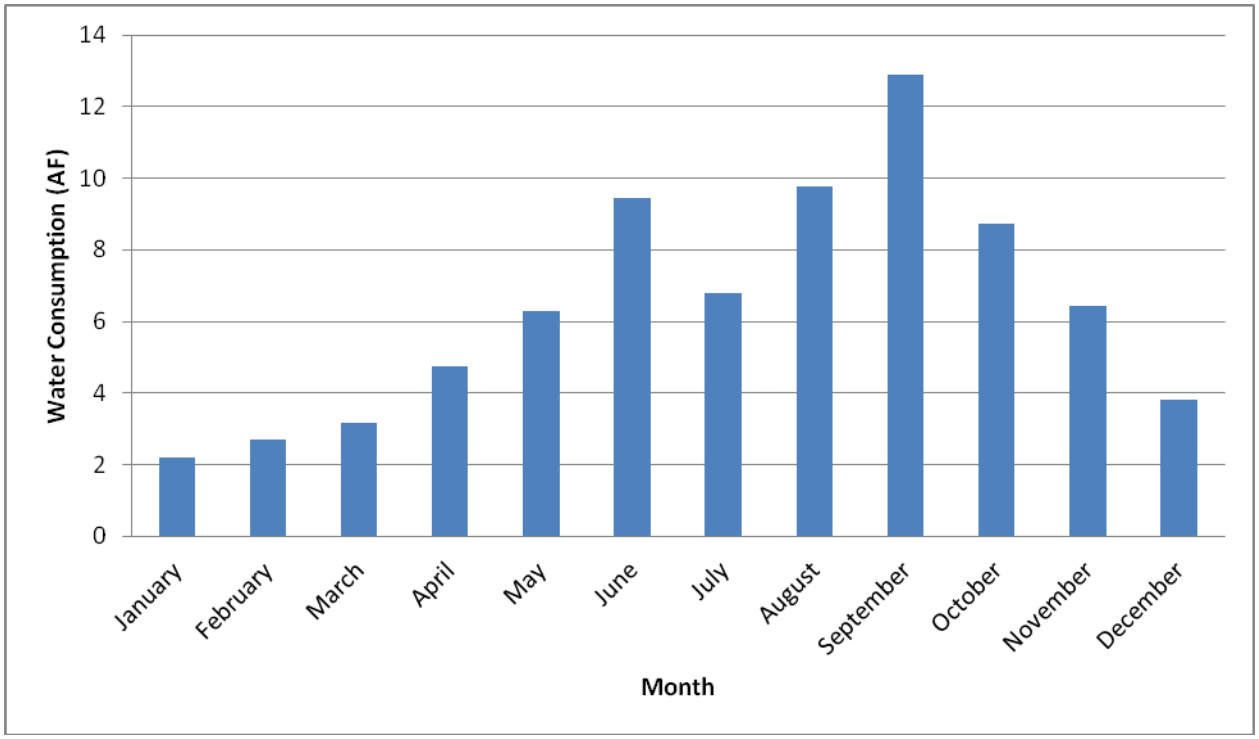
Annual Consumption (AF)	% of Total Demo 2 Consumption
9	11.7%
8	10.7%
7	9.4%
7	8.6%
6	7.9%
5	7.1%
5	6.2%
4	5.5%
4	5.1%
3	3.8%
58	76.0%

Figure 5-27: 2011 Distribution for Consumption for Demographic "2" – Churches



In 2011, church accounts' lowest use occurred in January with a consumption of 2.2 AF, increasing 83 percent in September, the highest use month, to 12.9 AF, which is shown in Figure 5-28.

Figure 5-28: 2011 Monthly Consumption for Demographic "2" – Churches



Section 6: Analysis and Recommendations

6.1 Analytical Approach

Using the following process, SCWD identified conservation programs with water savings opportunities for its service area:

1. **Compile a comprehensive list of potential conservation measures.**

   SCWD first compiled a list of potential conservation measures currently available within the industry. This list was all-inclusive and consisted of both measures with proven performance histories and emerging measures with shorter records of performance. The goal of this exercise was to develop a comprehensive list that represented the "universe" of potential water conservation measures, including measures that might initially seem infeasible within SCWD's service area.

2. **Perform a preliminary ranking of the identified conservation measures. Eliminate measures that are infeasible for SCWD's service area.**

   In this step the conservation measures were preliminarily ranked on a basis of water savings potential and feasibility/ease of implementation. Conservation measures that were infeasible for implementation within SCWD's service area were eliminated. For example, a program designed to incentivize reductions in industrial water use was eliminated since industrial use represents only 2 percent of SCWD's total water use, and the program would not be cost effective for SCWD with such low potential for savings. Similarly, a program designed to reduce hotel and motel water use was eliminated since few hotels or motels exist within SCWD's service area.

3. **Perform a saturation analysis to determine the available water savings opportunity for specific water saving devices included in the ranked list of measures.**

   A saturation analysis was performed for the water saving devices included in the ranked list to determine the number of devices available for retrofit within SCWD's service area. When planning conservation programs, it is important to know the number of target devices/fixtures available for retrofit so that realistic implementation levels can be set.

   A saturation analysis combines the number of housing units with estimates of fixtures per household in order to develop an inventory of plumbing fixtures within the service area. Next, the effects of passive conservation are estimated by applying a natural replacement rate to determine the number of fixtures that have already been retrofitted with a more efficient alternative. Passive conservation is the installation of conservation devices due to natural replacement, remodeling, or demolition in the presence of water efficiency plumbing code. Finally, the analysis accounted for active conservation that has occurred — the number of devices already distributed or installed as a result of water conservation programs was subtracted from the total number of devices available for retrofit.

The saturation analysis built on previous analysis undertaken for the SCVWUESP and also included new devices not included in that analysis, including WBICs and high efficiency irrigation nozzles. Because the WBICs and high efficiency irrigation nozzles are new technologies with low overall adoption rates statewide, it was assumed that little to no saturation has occurred within SCWD's service areas for these devices. Table 6-1 summarizes the number of devices estimated to be available for retrofit within SCWD's service area.

Table 6-1: Devices Available for Retrofit in SCWD's Service Area

Water Saving Device	Number of Devices
SF High Efficiency Toilets	11,100
MF High Efficiency Toilets	9,350
SF High Efficiency Clothes Washers	19,400
MF High Efficiency Clothes Washers	5,600
SF High Efficiency Nozzles[(a)]	5,478,460
High Efficiency Nozzles for Dedicated Landscape Irrigation Accounts[(b)]	86,400
SF Weather-Based Irrigation Controllers[(c)]	260,220

Notes:
(a) Assumes 20 irrigation nozzles per SF residence.
(b) Assumes 100 irrigation nozzles per dedicated landscape irrigation account.
(c) Assumes 95% of SF residences have irrigation controllers.

4. **Calculate the water savings potential and cost-benefit ratio for each water conservation measure using the AWE Tracking Tool.**

The AWE Tool was used to evaluate the water savings, costs, and benefits of the identified water conservation measures based on SCWD's specific characteristics. The AWE Tool is an Excel-based model that contains five data entry worksheets designed to compile data about the water agency and the conservation measures under investigation. Upon completion of the five data entry worksheets, the model generates results regarding the conservation measure's water savings potential, costs, and benefits. Detailed instructions for using the AWE Tool are available in the Water Conservation Tracking Tool User Guide Version 1.2 (AWE, 2010).

The AWE Tool's first three data entry worksheets require data on SCWD's population, housing characteristics, water demands, and the variable costs associated with producing and distributing water to its customers. Table 6-2 summarizes the data sources and assumptions made in the first three AWE Tool worksheets.

Table 6-2: AWE Tool Data Sources and Assumptions

AWE Tool Worksheet	Data Sources	Assumptions
Common Assumptions	• Service Area Population: 2010 UWMP • Persons Per Household: CUWCC Reports • Bathrooms Per Household: CUWCC Reports • Housing Units Built Before 1992: SCVWUESP	• Peak Season Start and End Date: The current analysis did not seek to evaluate the effects of conservation measures on system peaks; therefore, peak season is assumed to occur year-round • Nominal Interest Rate: Prime plus 1%
Specify Demands	• Service Area Demands: 2010 UWMP • D.W.R. Public Water System Statistics (2011)	• Service Area Demands: Because the analysis assumes that the peak season occurs year-round, all service area demands must be entered as peak season demands
Enter Utility Avoided Costs	• Variable Energy Costs for Transmission, Treatment and Distribution: Average of 2010 and 2011 energy costs divided by the average total water produced in 2010 and 2011 • Variable Chemical Costs: Average of 2010 and 2011 chlorine costs divided by the average total water produced in 2010 and 2011 • Current Peak Capacity: Maximum day demand from the SCWD's Water Master Plan	• Because SCWD does not own or operate a wastewater treatment plant, variable O&M costs for wastewater were not included in the analysis

The AWE Tool's final two data entry worksheets require data regarding the specific conservation measures being evaluated. In the first worksheet the conservation measures are defined, including their target customer, water savings potential, lifetime, and implementation costs. In the second worksheet the annual implementation levels for each conservation measure are entered. Data sources and assumptions made in these two worksheets are outlined in the Program Details section later in this chapter.

5. **Adjust annual implementation levels to achieve desired water savings.**

   Once the SCWD's specific characteristics were compiled and the conservation measures were defined in the AWE tool, annual implementation levels were adjusted to achieve the desired level of water savings. When designing conservation programs, it is important to be realistic regarding annual activity levels to ensure that the conservation programs modeled reflect actual on-the-ground potential. Some conservation measures are limited in the number of devices that can feasibly be distributed or installed in a year. For example, HET distribution programs can only reasonably distribute 500 to 800 toilets per year. Additionally, annual implementation levels must reflect saturation rates in order ensure that the number of devices modeled for retrofit does not exceed the number of devices actually available for retrofit within the service area.

6. **Evaluate conservation measures for their water savings potential and cost-effectiveness.**

   Upon completion of data entry, the AWE Tool generated information on each conservation measure's water savings potential. Total programmatic water savings, including savings associated with passive conservation, are calculated and cost-benefit ratios for each conservation measure and the program as a whole are generated.

6.2 Results – Program Summary

The analysis yielded a total of ten conservation programs targeting each of SCWD's customer sectors, with a focus on SCWD's largest water uses – residential consumption and landscape irrigation. The selected programs will build on and expand programs currently implemented by SCWD, like the residential and commercial rebate program, and will introduce new incentives and opportunities for SCWD's customers, including turf removal and ultra-high efficiency toilet distribution and installation. This combination of existing and new programs will allow SCWD to build its conservation program gradually, with the more resource intensive programs commencing in 2013 through 2014. A summary of the ten programs is provided in Table 6-3 below, and an outline of annual activity levels and budget is provided in Table 6-4. A detailed description of each program, including water savings, costs, benefits and implementation considerations can be found in the Program Details section found later in this chapter.

Table 6-3: Summary of Conservation Programs

Program	Description	Target Customer(s)	Water Savings	Cost Benefit Ratio
Residential Audits	This program will assist residential water customers in reducing their water use through leak detection, the installation of more efficient devices, and irrigation system troubleshooting and proper scheduling.	Single- and Multi-Family Residential	• Annual: 61 AF/year • Lifetime: 632 AF	• 1.3 (SF) • 0.5 (MF)
Low Flow Showerhead Distribution	Distributes low-flow showerheads free of charge.	Single- and Multi-Family Residential	• Annual: 31 AF/year • Lifetime: 1,838	• 9.3 (SF) • 8.6 (MF)
UHET Distribution	Distributes ultra-high efficiency toilets (0.8 gpf) in exchange for old toilets with flush volumes greater than 1.6 gpf.	Single-Family Residential	• Annual: 181 AF/ year • Lifetime: 4,886	• 2.1
MF/Institutional HET/UHET Direct Installation	Provides free installation of high efficiency toilets and ultra-high efficiency toilets.	Multi-Family and Institutional	• Annual: 388 AF/ year • Lifetime: 12,156	• 2.5 (MF HET) • 0.7 (Inst. HET) • 3.1 (MF UHET)
Turf Removal	Incentivizes customers to remove turf lawn and replace it with climate-appropriate landscape. Conversion of irrigation systems to low-flow alternatives is also required.	All customers with an emphasis on Single-Family Residential and Large Landscape	• Annual: 122 AF year • Lifetime: 1,960	• 0.6
FSN High Efficiency Nozzle Distribution	Distributes high efficiency irrigation nozzles through the FreeSprinklerNozzles.com website.	Single- and Multi-Family Residential, Commercial	• Annual: 368 AF/ year • Lifetime: 4,791	• 2.9 (SF) • 2.9 (CII)
High Efficiency Nozzle Direct Installation	Provides free installation of high efficiency irrigation nozzles to customers with large, complex landscape designs.	Large Landscape, Multi-Family Residential with an emphasis on HOAs	• Annual: 38 AF/year • Lifetime: 420	• 2.3

Program	Description	Target Customer(s)	Water Savings	Cost Benefit Ratio
Large Landscape WBIC Direct Installation	Provides free installation and programming of weather-based irrigation controllers.	Large Landscape, Multi-Family Residential with an emphasis on HOAs	• Annual: 64 AF/year • Lifetime: 1,019	• 2.6
Residential and Commercial Rebate Program	Provides rebate incentives for several water-saving devices, including high efficiency clothes washers, high efficiency toilets, ultra low-flow and zero-water urinals, and weather-based irrigation controllers.	Commercial, Single- and Multi-Family Residential	• Annual: 668 AF/ year • Lifetime: 17,170	• 1.2 (SF HECW) • 4.2 (SF HET) • 3.4 (SF WBIC) • 12.5 (CII Z-WU) • 7.3 (CII ULVU) • 7.3 (CII HET) • 2.8 (MF HECW)
Large Landscape Water Budgets	Creates site-specific water budgets for dedicated landscape irrigation accounts and provides periodic updates on actual water use vs. target water use to help customers understand the watering requirements of their landscape.	Dedicated Landscape Irrigation Accounts	• Annual: 336 AF/ year • Lifetime: 5,720	• 46.0

Table 6-4: Conservation Program Implementation Levels and Annual Budget

Program	Implementation Levels									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Residential Audits		375	375	375	375	375	375	375	375	3,000
Low Flow Showerhead Distribution	600	600	600	600	600	600	600	600	600	5,400
UHET Distribution		600	600	600	600	600	600	600	600	4,800
MF/Institutional HET/UHET Direct Installation		• 590 HETs • 440 UHETs	• 590 HETs • 440 UHETs	• 590 HETs • 440 UHETs	• 150 HETs • 875 UHETs	• 150 HETs • 875 UHETs	• 150 HETs • 875 UHETs	• 150 HETs • 875 UHETs	• 150 HETs • 875 UHETs	• 2,520HETs • 5,695 UHETs
Turf Removal (square feet)			99,000	99,000	198,000	198,000	297,000	297,000	297,000	1,485,000
FSN High Efficiency Nozzle Distribution	29,600	29,600	29,600	29,600	29,600	29,600	29,600	29,600	29,600	266,400
High Efficiency Nozzle Direct Installation			3,000	3,000	3,000	3,000	3,000	3,000	3,000	21,000
Large Landscape WBIC Direct Installation			30	30	30	30	30	30	30	210
Residential and Commercial Rebate Program	• 400 HECWs • 600 HETs	• 600 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 800 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 1,100 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 1,100 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 1,100 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 1,100 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 1,100 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 1,100 HECWs • 625 HETs • 25 ULV Urinals • 25 Zero-Water Urinals • 1,625 SF WBICs	• 8,400 HECWs • 5,600 HETs • 200 ULV Urinals • 200 Zero-Water Urinals • 13,000 SF WBICs
Large Landscape Water Budgets		55	55	55	55	55	55	55	55	440
Total Programmatic Annual Budget	$239,200	$1,110,492	$1,387,252	$1,481,479	$1,732,872	$1,787,631	$2,024,289	$2,088,257	$2,154,246	$14,005,718
Public Outreach Annual Budget[(a)]	$62,730	$188,784	$235,833	$251,852	$294,588	$303,897	$344,220	$355,004	$366,223	$2,403,131
Total Annual Budget	**$301,930**	**$1,299,276**	**$1,623,085**	**$1,733,331**	**$2,027,460**	**$2,091,528**	**$2,368,509**	**$2,443,261**	**$2,520,469**	**$16,408,849**

Note: (a) the annual program outreach budget is 17% of the annual programmatic budget.

6.3 Results – Water Savings

The selected programs are estimated to conserve 3,558 AF of water by the year 2020 and 50,592 AF over their lifetime, at a cost of approximately $16.5 million over the next nine years. An additional 879 AF of passive conservation savings is expected as a result of natural replacement of inefficient devices and implementation of building codes for a total savings of 4,437 AF by 2020. Implementation of the selected programs is expected to result in a per capita water use of 188.9 gpcd in the year 2020.

6.4 Results – Cost Effectiveness

The portfolio of conservation programs is expected to be highly cost effective with an average implementation cost of $292/AF of water saved ($343/AF when public outreach is included), compared to the $510/AF SCWD would pay to purchase new supplies. While the combined programs are expected to be cost-effective to implement, three programs – turf removal, HET direct installation for institutional customers, and residential audits for multi-family customers – are not cost-effective individually. SCWD has chosen to implement these programs regardless because they offer additional benefits to the agency and its customers.

Turf removal programs offer additional benefits beyond quantifiable water savings by changing customers' acceptance of climate-appropriate landscapes as a "new normal." In the past few years the number of turf rebate programs has greatly increased as water agencies have seen the impact of landscape conversions both on consumption and in changing preferences in landscape aesthetic. Assisting local schools not only reduces consumption but provides an important ancillary benefit of supporting and educating the community. Finally, the Residential Audit program provides unique opportunities for SCWD to have a direct relationship with its customers and offer specific advice on water use reduction. Residential audit programs often serve as a "gateway" to an agency's other conservation programs; customers that participate in a residential audit program are more likely to take advantage of other programs available to them to help them reduce their water use further. These three programs provide benefits that are not quantifiable in a traditional cost-benefit analysis. Recognizing this, SCWD is committed to implementing them as components of a larger cost-effective conservation program.

6.5 Program Details

The following section outlines each of the ten selected water conservation programs. Program descriptions are provided, including water savings summaries and cost-benefit ratios. In addition, detailed implementation considerations, including recommended marketing approaches and annual activity levels are provided in order to allow SCWD to begin implementing programs immediately.

6.5.1 Residential Audit Program

1. **Program Description**

   This program will assist residential water customers in reducing their water use through leak detection, the installation of more efficient devices, and irrigation system troubleshooting and proper scheduling. Programmatic savings are estimated to be 61 AF per year and 632 AF over the lifetime of the program. This program will provide the following free of charge:

- Survey of indoor water uses to identify inefficient fixtures (showerheads, faucet aerators) and check for leaks (MF and SF customers)

- Survey of landscape irrigation system to identify maintenance issues that need attention and to confirm proper controller scheduling (SF customers)

- Free high efficiency showerheads and faucet aerators on an as-needed basis (all participants)

2. **Customer**

   Residential users, both single- and multiple-family, are the single largest use category within the SCWD service area—over 70 percent of SCWD's total demand. The Residential Audit Program specifically addresses sources of water waste, including leaks, inefficient devices, and improperly programmed or poorly maintained irrigation systems for this customer base.

3. **Implementation**

   The Residential Audit Program will offer indoor and outdoor water conservation surveys to familiarize customers with their water use and provide them with information and tools to better manage it (MF customers will be provided only indoor surveys unless otherwise requested). During a water conservation survey SCWD staff (program can also be implemented through a vendor) will:

   - Review consumption history of each water account
   - Check toilets for leaks and determine flush volume
   - Determine flow rates of showerheads and faucets
   - Provide free water-saving devices and materials, as needed
   - Provide recommendations for efficient outdoor water use, including proper irrigation scheduling
   - Recommend plumbing fixture upgrades and other efficiency improvements
   - Provide information on rebates for which customers are eligible

   The participant will be shown how to read their meter and be given a report with all findings and recommendations to reduce water use.

   Any liability issues that may arise as a result of the provision of the water conservation survey will be addressed by a release of liability waiver signed by the customer prior to the start of the water conservation survey. To further reduce liability concerns staff and/or the vendor hired to implement the program can be instructed not to install any new fixtures or fix any issues discovered during the survey. Water agencies across California have been successfully implementing residential audit programs for over ten years; SCWD can take advantage of other agencies' experience and borrow program procedures and liability release language from agencies with well-established programs.

4. **Water Savings**

The Residential Audit program has an estimated average annual water savings of 61 AF a year and an estimated lifetime water savings of 632 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Audit	Measure Life	Lifetime Savings Per Audit
SF Residential Audit	20	24,054 GPY =.07 AFY[(a)]	4	96,216 gallons = 0.30 AF
MF Residential Audit	24	7,300 GPY = .002 AFY[(b)]	4	29,200 gallons = 0.09 AF

Notes:
(a) Source: CUWCC water savings estimates for flex track implementation. Assumes both an indoor and outdoor survey is performed.
(b) Source: CUWCC water savings estimates for flex track implementation. Assumes only an indoor survey is performed.

5. **Activity Levels**

The Residential Audit Program will survey 3,000 residences over a period of 8 years.

Measure	Implementation Years	Annual Installation Rate	Total Toilets Installed
SF Residential Audit	2013-2020	245	1,960
MF Residential Audit	2013-2020	440	1,040
		Total	3,000

6. **Marketing**

The Residential Audit Program should be open to all customers but the direct mail and marketing efforts should prioritize SCWD's largest residential water users.

- Develop a list of highest single-family residential water users and contact them via direct mail. Analysis performed on SCWD's 2011 billing data identified specific developments with a high proportion of high water users that can be targeted in the early stages of this program.

- Develop a list of highest MF residential locations (on a per unit basis) and contact the property manager to coordinate outreach efforts with residents. Consider providing fliers/posters for property managers to hang in common areas.

- Advertise the program in MF/apartment publications or associations/organizations.

- Direct customers calling about high water bills to the program.

- Advertise program in traditional outreach efforts – bill stuffers, newsletters, agency website, events, on-bill messaging, etc.

7. **Verification**

- Upon completion of the survey, provide customers with an optional web-based opportunity to provide feedback on the program.

- If a vendor is hired to implement the program, follow up postcards should be mailed to each participant to gauge customer satisfaction with the program. SCWD staff can consider accompanying the vendor on residential surveys periodically to ensure quality of service.

8. **Implementation Details**

- SCWD creates a list of largest residential water users from utility billing data.

- SCWD develops a hold-harmless agreement or release of liability for each participant to sign prior to having a survey conducted at his/her property. This agreement/waiver is a legal document protecting SCWD and/or its vendor while they are on the property performing the survey.

- SCWD develops a standard report to capture customer information and provide feedback to the customer after the survey is conducted. Some forms are carbon copy so the customer can be left with results at the end of the survey. In other residential audit programs, calculations are completed in the office after the survey and the report is emailed to the customer. Other reporting forms use handheld technology (smart phones, tablets, laptops) for data input and then generate an email report at the end of the survey.

- SCWD markets the program to high residential water users using the methods described in the Marketing section above.

- Surveys are scheduled as customers call to request them. It is advisable that the customer is contacted the day prior to the scheduled survey to confirm the appointment.

- Upon completion of the survey, SCWD verifies customer satisfaction using the methods described in the Verification section above.

- SCWD tracks program performance to ensure activity levels and water savings goals are being met by monitoring participants' water consumption data.

9. **Additional Benefits**

- Reduced runoff from landscape irrigation systems (Outdoor surveys)
- Reduced wastewater flows (Indoor surveys)
- Provides customer with tools to monitor their water use on their own
- Positive interaction between agency and its customers – they get free help
- Staff develops a better sense of what is going on in people's homes

10. **Costs**

The average annual budget for the Residential Audit Program is estimated to be $64,694.40 per year and total programmatic expenditures from 2013 through 2020 are estimated to be $517,555.22.

Measure	Cost per Device	Cost/Benefit Ratio	Cost Per AF
Single-Family Residential Audit (Indoor & Outdoor)	$160.00[(a)]	1.27	$550.45
Multi-Family Residential Audit (Indoor Only)	$130.00[(b)]	0.47	$1,473.66

Notes:

(a) Assumes a staff person paid within the mid-range of CLWA's Salary Range 26 takes 5 hours per site visit (includes in-office work, scheduling, reporting, etc.). Also assumes $10 worth of water saving devices are distributed per customer.

(b) Assumes a staff person paid within the mid-range of CLWA's Salary Range 26 salary takes 4 hours per site visit (includes in-office work, scheduling, reporting, etc.). Also assumes $10 worth of water saving devices are distributed per customer.

11. **Example Programs and Agency Contacts**

San Francisco Public Utilities Water Wise Evaluations
Chandra Johnson
415-554-0704
CAJohnson@sfwater.org

City of Santa Barbara Water Check-Up Program
Alison Jordan
(805) 564-5574
AJordan@SantaBarbaraCA.gov

6.5.2 Low-Flow Showerhead Distribution Program

1. **Program Description**

This program will distribute 5,400 low-flow showerheads to SCWD's residential customers. Programmatic savings are estimated to be 31 AF a year, on average, and 1,838 AF over the lifetime of the showerheads.

2. **Customers**

Residential users are the single largest use category in the SCWD service area. Residential customers consume more than any other demographic—over 70 percent of SCWD's total demand. In 2011 Single-family residential customers alone accounted for approximately 65 percent of SCWD's use.

3. **Program Implementation**

The Low-Flow Showerhead Distribution Program distributes low-flow showerheads to SCWD's residential customers to assist them in reducing their indoor water use. SCWD currently distributes low flow showerheads at various community events throughout the year. In 2011 SCWD distributed nearly 600 showerheads to its residential customers.

SCWD will continue its showerhead distribution efforts. In addition, SCWD will install low-flow showerheads in multi-family residential locations participating in the Multi-Family HET Direct Installation Program. In comparison with showerhead distribution programs in which there is no guarantee that the customer actually installs the showerhead, the direct installation of low-flow showerheads often yields greater water savings. SCWD will also distribute low-flow showerheads to customers that need them as part of the Residential Audit Program.

4. **Water Savings**

The Low-Flow Showerhead Distribution program has an estimated average annual water savings of 31 AF a year and an estimated lifetime water savings of 1,838 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Device[(a),(b)]	Measure Life	Lifetime Savings Per Device
SF Low-Flow Showerheads	17	2,062 GPY = .006 AFY	5	10,310 gallons = 0.032 AF
MF Low-Flow Showerheads	18	1898 GPY = .006 AFY	5	9,490 gallons = 0.029 AF

Notes:
(a) Source: AWE Tool, assumes a flow rate of 2.5 gallons per minute and zero savings decay
(b) Note: Water savings estimate does not include showerheads installed as part of the Residential Audit program. Water savings associated with those showerheads is included in the water savings estimate for that program.

5. **Activity Levels**

The Low-Flow Showerhead Distribution program will distribute a total of 5,400 showerheads over a period of 9 years.

Measure	Implementation Years	Annual Distribution Rate	Total Showerheads Installed
SF Low-Flow Showerheads	2012-2020	300	2,700
MF Low-Flow Showerheads	2012-2020	300	2,700
		Total	5,400

6. **Marketing**

- Distribute showerheads at community events.
- Advertise free low-flow showerheads on SCWD's website, in newsletters, in bill stuffers, and other customer contact pieces.
- Install showerheads in MF units on an as-needed basis in conjunction with the HET/UHET Direct Installation Program.

- Distribute showerheads on an as-needed basis as part of the Residential Assistance program.

7. **Implementation Details**

- SCWD purchases low-flow showerheads and keeps an inventory on hand for distribution to residential customers. Bulk ordering often results in lower prices.
- SCWD distributes showerheads at community events.
- The vendor installing toilets for the Multi-Family Residential HET Direct Installation Program also installs low-flow showerheads in residences that need them.
- SCWD distributes low-flow showerheads on an as-needed basis to residents participating in the Residential Audit Program.

8. **Additional Benefits**

- Reduced wastewater flows.

9. **Costs**

The average annual budget for the Low Flow Showerhead Distribution Program is estimated to be $2,726.82 per year and total programmatic expenditures from 2012 through 2020 are estimated to be $24,541.40.

Measure	Cost per Device[(a)]	Cost/Benefit Ratio	Cost Per AF
SF Low-Flow Showerheads	$4.00	9.34	$81.68
MF Low-Flow Showerheads	$4.00	8.59	$88.77

Note: (a) Includes the cost of the showerheads.

6.5.3 Ultra High Efficiency Toilet Distribution

1. **Program Description**

This program will distribute 4,800 Ultra High Efficiency Toilets (UHETs) to single-family residential customers in exchange for their old, high water use toilets (flush volumes greater than 3.5 gpf). Programmatic savings are estimated to be 181 AF a year, on average, and 4,886 over the lifetime of the UHETs.

2. **Customer**

Residential customers consume more than any other demographic—over 70 percent of SCWD's total demand. Saturation analysis results indicate that SCWD still has roughly 11,000 toilets with flush volumes equal to or greater than 3.5 gallons per flush located

within single family homes built prior to 1992 in its service area, making an UHET distribution program a viable option for significant water savings.

3. **Device**

This program will introduce ultra-high efficiency toilets (UHETs), which have a flush volume of 0.8 gpf, to SCWD's SF customers. Since 1992 only ultra-low flush toilets (ULFTs, 1.6 gallons per flush) can be sold in California. In 2014 only HETs will be available for sale. UHETs offer additional savings over HETs, making toilet retrofit programs viable sources of water savings for many agencies despite legislation requiring increasingly more efficient fixtures.

While UHETs have only been available since 2009, they have already met performance standards. For example, the Niagara Stealth toilet has been MaP Test rated at 600 grams, indicating a high level of performance with just one flush. The maximum performance testing, or MaP testing, protocol was cooperatively developed by water-efficiency and plumbing fixture specialists in the U.S. and Canada and incorporates the use of soybean paste as a test media, closely replicating the "real world demand" upon toilets. The MaP testing protocol considers a rating of 350 grams or better adequate performance; however, many water agencies require higher MaP scores (usually between 500 and 800 grams) for toilets distributed through their conservation programs as a safeguard against customer dissatisfaction with the performance of the toilet. Several water agencies are currently installing the Stealth through their water efficiency programs with very high levels of customer satisfaction.

4. **Program Implementation**

Distribution programs are an effective method for reaching SF customers. Large volumes of toilets, usually 600 to 800, but sometimes up to 1,000, can be distributed in a single day event. While direct installation programs are cost-effective in a MF setting, where large numbers of toilets can be retrofitted in a single location, distribution programs are cost effective for SF customers who usually retrofit only one or two toilets at a time.

The UHET Distribution Program will offer free UHETs to single family customers through single day distribution events. Customers will be responsible for installing their new toilet(s); they can either hire a plumber or do it themselves. Customers will then be required to return their old high water use toilet(s) (3.5 gpf or more) at a recycling event held two weeks after the initial distribution event. Requiring customers to return their old inefficient toilets increases installation rates and the program's overall water savings. To encourage customers to bring back their old toilets participants will be responsible for the cost of the new UHET if they do not bring back their old toilet(s) for recycling.

Because distribution events require a significant amount of resources and are only offered a couple of times a year and usually on Saturdays, a private vendor will be hired to implement the program. The vendor will market the program, purchase the UHETs, conduct the distribution and recycling events, and provide programmatic reporting. There are several vendors currently operating in southern California with significant experience implementing toilet distribution programs. These vendors can leverage bulk purchasing to provide the lowest cost option and offer a turn-key approach to toilet distribution

programs, including marketing, customer pre-screening and enrollment, toilet distribution, and recycling.

5. **Water Savings**

The UHET Distribution program has an estimated average water savings of 181 AF a year and an estimated lifetime water savings of 4,886 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Device	Measure Life	Lifetime Savings Per Device
UHETs, 0.8 gpf	8	16,586 GPY = .05 AFY[(a)]	20	331,720 gallons = 1.02 AF

Note:
(a) Source: Elsinore Valley Municipal Water District Stealth Direct Installation Program, Rob Whipple, personal communication.

6. **Activity Levels**

The UHET Distribution Program will distribute a total of 4,800 UHETs over a period of 8 years.

Measure	Implementation Years	Annual Distribution Rate	Total Toilets Distributed
UHETs, 0.8 gpf	2013-2020	600	4,800

7. **Marketing**

SCWD will identify neighborhoods where the majority of homes were built prior to 1992. City planning departments should be a good source for this information. Marketing efforts will target residences in these neighborhoods, since the objective of the program is to replace toilets with flush volumes equal to or greater than 3.5 gpf.

- Direct mail program fliers to pre-1992 homes.
- Alternatively, deliver fliers/door hangers door-to-door in pre-1992 neighborhoods.
- Target pre-1992 neighborhoods through local community groups, churches, markets, etc.

8. **Implementation Details**

- SCWD generates a RFP for the marketing, toilet purchasing, distribution event implementation, recycling event implementation, recycling of old fixtures, and program reporting.

- SCWD works with the vendor to determine an appropriate event location. Locations with adequate space and easy entrance and exit are required. Schools and event centers often work well.

- The vendor markets the program, targeting neighborhoods built prior to 1992. It is recommended that initial outreach materials do not include the event location. Once customers complete the phone- or web-based pre-registration process, they will be given the event location. This discourages customers that have not pre-registered from appearing unexpectedly at the distribution event and helps the distribution event operate smoothly.

- The selected vendor coordinates the event, including securing the location, conducting outreach, pre-registering customers, purchasing the new toilets, generating installation instructions for participants, developing program tracking system and paperwork, facilitating the toilet delivery, holding the distribution event, holding the recycling event, recycling the old toilets, and creating a participant database.

- SCWD staff verifies toilet installations, as described below in the Verification section.

- SCWD mails a postcard survey or emails an online survey to 100% of participating customers to assess customer satisfaction.

- SCWD tracks program performance and provides program oversight and management to ensure activity levels and water savings goals are being met and customers are satisfied with the program.

9. **Verification**

- Customers must pre-register to participate in the one day toilet distribution event. The vendor hired to implement the program will qualify program participants by asking them a series of questions to ensure their current fixtures have a flush volume of 3.5 gallons or more.

- All participants sign a waiver when picking up their toilet at the distribution event making them responsible for the cost of the new toilet if they do not return their old toilet with a flush volume of 3.5 or more at the recycling event.

- SCWD staff will conduct random installation verification inspections for 2-5% of customers that return their old high water use toilets to ensure that the UHETs were actually installed and 100% of customers that do not return an old toilet to determine whether or not the customer is responsible for the cost of the new toilet.

10. **Additional Benefits**

Reduced wastewater flows.

11. **Costs**

The average annual budget for the UHET Distribution Program is estimated to be $207,575.62 per year and total programmatic expenditures from 2013 through 2020 are estimated to be $1,660,604.98.

Measure	Cost per Device[(a)]	Cost/Benefit Ratio	Cost Per AF
UHETs, 0.8 gpf	$300.00	2.06	$383.08

Note:
(a) Includes the cost of a vendor-implemented distribution program, including marketing by the vendor, and staff time to verify 10% of the toilets distributed. Assumes a staff person paid a mid-level Range 26 salary takes 1 hour per toilet verification.

12. **Example Programs and Agency Contacts**

Elsinore Valley Municipal Water District
Stealth Direct Installation Program
Rob Whipple
(951) 674-3146 x8247
rwhipple@evmwd.net

Upper San Gabriel Valley Municipal Water District HET Distribution Program
Elena Layugan
(626) 443-2297
Elena@usgvmwd.org

6.5.4 Multi-Family and Institutional HET/UHET Direct Installation Program

1. **Program Description**

This program will replace 7,015 multi-family (MF) and 1,200 Institutional toilets with flush volumes greater than 1.6 gpf with HETs and UHETs. Programmatic savings are estimated to be 388 AF a year, on average, and 12,156 AF over the lifetime of the toilets. This program will provide the following free of charge:

- Toilets
- Toilet installation
- Removal and recycling of old fixtures
- Installation of showerheads and aerators
- Check for faucet leaks

2. **Background**

MF customers are ideal candidates for direct installation programs because they contain a large number of fixtures available for retrofit in a single location, because residents have less financial incentive to reduce water use since they generally do not see or pay a water bill and possibly because property owners have more limited resources to purchase and install new fixtures. Saturation analyses suggest that there are still over 9,000 toilets with a flush volume greater than 1.6 gallons per flush within SCWD's MF sector.

SCWD's MF residential apartment customer classification accounts for 6 percent of total annual water use, with an average use of 0.22 AF per dwelling unit. However, the highest users within this customer classification use over 0.6 AF per dwelling unit annually, with a small handful using up to 1 AF per dwelling unit annually. The direct installation program will first target these highest users (identified in Chapter 5).

Institutional customers, such as schools or municipal facilities, have similar characteristics and challenges to MF customers in that they are also often lacking in resources and less likely to have the capacity retrofit their high-water using fixtures on their own.

Initially the program will target pre-1992 construction for both MF and Institutional sites. 1992 is when the Energy Policy Act (EPAct) was enacted, specifying low flow toilets and shower fixtures. However, the California Single Family Water Use Efficiency Study (2011) found that many of the first low flow toilets installed after the passage of the Act do not perform well and flush with volumes greater than 1.6 gpf. The program could be modified to also target poorly performing 1.6 gpf toilets for retrofit using utility billing data to identify potential sites.

3. **Device**

This program will introduce ultra-high efficiency toilets (UHETs), which have a flush volume of 0.8 gpf, to SCWD's MF customers. First available in 2009, UHETs are a relatively recent technology. Results of MaP (maximum performance) testing indicate that UHETs perform as well as current 1.28 gpf models, and other agencies are successfully implementing large-scale residential retrofit programs featuring them. SCWD may want to introduce the technology slowly to build customer buy-in and trust and to get a sense of how the device functions. In the early years of the program (2013-2015) both HETs and UHETs will be installed. As the technology becomes more widespread and SCWD becomes more familiar with it, the program can transition to the distribution of solely UHETs.

While the UHETs perform well in residential settings, they are not recommended for light commercial or institutional uses. Accordingly, the program will retrofit only MF sites with UHETs. Commercial grade HETs, tank- or valve-type depending on site requirements, will be installed in institutional settings.

To achieve additional savings the program will also retrofit MF and Institutional sites with efficient showerheads and faucet aerators on an as needed basis. The program will install showerheads and aerators with flow ratings of 1.5 gpm in sites where the fixtures currently have greater flow rates. Installing the showerheads and aerators at the same time as the toilets reduces installation costs since all fixtures can be installed in one visit.

4. **Program Implementation**

The marketing and installation will be contracted to a private vendor who will also manage purchasing and removal and recycling of old toilets. Numerous vendors now offer a turn-key approach to program implementation and administration that has multiple benefits including: reduced costs through bulk purchasing, licensed and experienced plumbers, scheduling, customer follow-up and more. There are several

vendors currently operating in southern California that specialize in direct install programs for MF and institutional customers.

SCWD can benefit from similar programs implemented by other utilities. For example, many vendors have worked with energy providers to implement energy efficiency retrofit programs and, as a result, have extensive client lists that include large MF housing firms, small to medium sized MF building owners, and institutional contacts that they can reference to assist water agencies quickly identify water efficiency program participants. SCWD should look for a vendor with experience and market connections to make the program more effective and efficient.

Institutional customers will require a different approach than MF customers. While MF customers can often implement direct installation programs fairly quickly upon receiving an invitation to participate, Institutional customers, especially schools, often require additional time and support to get the program approved and to schedule the retrofit. While MF customers can largely be managed by an experienced vendor, Institutional customers often require a significant level of attention and assistance to complete a direct installation program. SCWD should be prepared to form supportive relationships with its Institutional customer's key decision-makers.

5. **Water Savings**[2]

The MF/Institutional HET/UHET Direct Installation program has an estimated average annual water savings of 388 AF a year and an estimated lifetime water savings of 12,156 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Device	Measure Life	Lifetime Savings Per Device
MF HETs , 1.28 gpf	1	23,610 GPY = .072 AFY	20	472,200 gallons = 1.45 AF
MF UHETs, 0.8 gpf	21	37,078 GPY = .114 AFY[(a)]	20	741,560 GPY = 2.26 AFY
Institutional HETs, 1.28 gpf	2	11,504 GPY = .035 AFY	20	230,080 gallons = .71 AF

Note:
(a) Water savings estimate assumes a 37% increase in water savings by replacing a 1.6+ gpf toilet with a 0.8 gpf UHET instead of a 1.28 HET.

6. **Activity Levels**

The MF/Institutional HET/UHET Direct Installation program will install a total of 8,215 HETs and UHETs over a period of 8 years.

[2] All water savings assumptions are from the Alliance for Water Efficiency's Conservation Tracking Tool Version 1.2 CalTex Edition unless otherwise noted.

Measure	Implementation Years	Annual Installation Rate	Total Toilets Installed
MF HETs , 1.28 gpf	2013-2015	440	1,320
MF UHETs, 0.8 gpf	2013-2015	440	1,320
MF UHETs, 0.8 gpf	2016-2020	875	4,375
Institutional HETs, 1.28 gpf	2013-2020	150	1,200
Total			8,215

7. **Marketing**

A list of potential participants will be generated from SCWD billing data and the vendor's client list identifying MF and institutional water users with pre-1992 structures. The list will be ranked by usage (per unit where appropriate) to prioritize the highest water users. SCWD will mail an introductory letter to all potential participants informing them of the program and its benefits.

MF property owners and managers will then be directly contacted (by phone or face to face, as appropriate) by the vendor to follow up and enroll MF sites in the program. SCWD should also consider marketing the program through any MF/apartment publications or associations/organizations that may exist within its service area.

SCWD will directly contact the facility managers or other decision-makers for pre-identified institutional customers to encourage them to enroll in the program. Institutional customers may require additional information and support prior to enrollment and installation scheduling, including presentations to Board members, coordination with facility managers, and other assistance. Once participation in the program has been authorized, SCWD can work with the customer and the vendor to schedule the installation.

Note: The Hart School District in particular should be evaluated for inclusion in the HET Direct Installation program, as seven of the ten largest water using schools are located within this district.

8. **Implementation Details**

- SCWD staff generates an RFP for the marketing, purchasing, installation and removal/recycling of the HETs. SCWD could also consider including the installation of low-flow showerheads and faucet aerators in the scope of work.

- SCWD works with the selected vendor to generate a list of target customers. SCWD will provide the vendor with a list of its highest MF and institutional water users, while the vendor provides a list of past clients within SCWD's service area.

- SCWD sends a letter to all identified target customers to introduce the program.

- The vendor provides outreach to these customers via vendor-to-business calls and on-site visits.

- The vendor schedules the appointments, conducts the installation, removes and recycles the old fixtures, and completes program paperwork.

- Vendor provides program participants with all product warranty information and provides a customer support phone line and/or visit for any customer concerns that may arise post-installation.

- Vendor provides participation data to SCWD monthly.

- SCWD verifies the installations at 10% of the participating sites using follow up phone calls and on-site inspections.

- SCWD mails a postcard survey or emails an online survey to 100% of participating customers to assess customer satisfaction.

- SCWD tracks program performance and provides program oversight and management to ensure activity levels and water savings goals are being met and customers are satisfied with the program.

- Vendor provides customer support for one year following each installation to address any installation or product performance issues that may arise.

9. **Verification**

- Pre-installation: Assessments should be conducted by the vendor at all potential sites to ensure that the fixtures being replaced exceed 1.6 gpf (or 1.28 gpf if SCWD expands the program to replace existing 1.6 gpf toilets at a future date).

- Post-installation: SCWD staff should conduct random installation verification phone calls and on-site inspections for 10% of participating sites to ensure customer satisfaction and proper installation. Also, a postcard and/or on-line survey should be sent to all participants to solicit program feedback.

10. **Additional Benefits**

- Reduced wastewater flows.

11. **Costs**

The average annual budget for the MF/Institutional HET/UHET Direct Installation Program is estimated to be $415,957.31 per year and total programmatic expenditures from 2012 through 2020 are estimated to be $3,743,615.81.

Measure	Cost per Device[(a)]	Cost/Benefit Ratio	Cost Per AF
MF HETs , 1.28 gpf	$295.00	2.52	$1,1171.10
MF UHETs, 0.8 gpf	$370.00	3.11	$253.51
Institutional HETs, 1.28 gpf	$525.00	0.72	$319.48

Note:
(a) Includes the cost of the toilet, installation, marketing by the vendor, and staff time to verify 10% of the toilets installed. Assumes a staff person paid a mid-level Range 26 salary takes 1 hour per toilet verification.

12. **Example Programs and Agency Contacts**

Elsinore Valley Municipal Water District Stealth (0.8 gpf) Direct Installation Program
Rob Whipple
(951) 674-3146 X8247
rwhipple@evmwd.net

West Basin Municipal Water District MF Direct Installation Program
Gus Meza
(310) 660-6209
gusm@westbasin.org

6.5.5 Turf Removal Program

1. **Program Description**

This program will replace 1,485,000 square feet of turf with climate-appropriate landscaping. In addition, the irrigation systems for all landscapes enrolled in the program will be retrofitted with low volume irrigation components. Programmatic savings are estimated to be 122 AF a year and 1,960 AF total.

2. **Customer**

There is significant potential for water savings in landscape water use within SCWD's service area. Residential water use is the single largest use in SCWD's service area, accounting for 70 percent of SCWD's total demand. An estimated 69 percent of single family residential use occurs outdoors as landscape irrigation. Accordingly, SCWD's single-family residential customers' monthly water use patterns (Chapter 5) show signs of significant outdoor water use. The highest water use occurs in the months of August and September when water consumption is nearly three times higher than that of the lowest month, February. Incentivizing customers to remove their water-thirsty turf landscapes and replace them with climate-appropriate plants is an effective means to reduce outdoor water use in Santa Clarita.

3. **Incentive**

Turfgrass, which originates in cool, wet climates, uses significantly more water than plants adapted to southern California's warm, dry climate. Turf removal programs incentivize water customers to remove their established turf lawns and replace them with climate-appropriate plants in order to reduce outdoor water demand. Not only do turf removal programs reduce outdoor water use, but they also reduce non-point source

pollution created when urban runoff from poorly designed and maintained sprinkler systems carries pollutants to storm drain systems and on to local waterways.

4. **Program Implementation**

Turf removal programs can be labor intensive but can also yield significant water savings. Many agencies choose to implement the programs using in-house staff, because a high level of customer interfacing is required; however, vendors with experience implementing turf removal programs are also available for program implementation.

Generally, turf removal programs are implemented through a series of several steps:

a. Pre-application: The customer applies to participate in the program. Basic customer information is reviewed to confirm that the customer qualifies for a rebate under the program's general guidelines. Program staff verifies the information contained in the application, either through a site visit or through the use of aerial photography (Google Earth, etc.).

b. Notice to proceed: Upon review of the customer's application, the water agency issues a notice to proceed with turf removal and replacement and irrigation system retrofit. Turf removed prior to the issuance of the notice to proceed is not eligible for rebate funds. The customer is allowed a specific timeframe to complete their landscape project.

c. Installation verification: When the installation is complete, the customer notifies the water agency and a post-installation site visit is scheduled. Program staff verifies that the landscape was installed in accordance with the program guidelines and that the existing irrigation system was converted to a low flow system.

d. Rebate: Upon successful completion of the post-installation verification, program staff authorizes payment of the customer's rebate.

While turf removal programs generally emphasize the replacement of turf with climate-appropriate landscape as the key to reducing outdoor water use, programs that generate consistent water savings also stress the importance of irrigation system retrofits. To guarantee water savings, irrigation system retrofits from traditional overhead spray systems to low-flow or drip systems must be required as a condition of the rebate program. Requiring irrigation system conversions ensures a reduction in water use, even if customers continue to overwater their new landscapes.

5. **Water Savings**

The Turf Removal Program has an estimated average annual water savings of 122 AF a year and an estimated lifetime water savings of 1,960 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Square Foot of Turf Removed[(a)]	Measure Life	Lifetime Savings Per Square Foot of Turf Removed
Turf Removal (per square foot of turf removed)	22	43 GPY = .00013 AFY	10	430 gallons = 0.0013 AF

Note:
(a) Source: Metropolitan Water District of Southern California (based on an analysis of the Southern Nevada Water Authority and Marin programs).

6. **Activity Levels**

The Turf Removal Program will remove a total of 1,485,000 square feet (34 acres) of turf over a period of 7 years.

Measure	Implementation Years	Annual Rate of Turf Removal (square feet)	Total Turf Removed (square feet)
Turf Removal	2014-2015	99,000[(a)]	198,000
Turf Removal	2016-2017	198,000[(b)]	396,000
Turf Removal	2018-2020	297,000[(c)]	891,000
		Total	1,485,000

Notes:
(a) Assumes 100 landscapes a year replacing an average of 990 square feet of turf each.
(b) Assumes 200 landscapes a year replacing an average of 990 square feet of turf each.
(c) Assumes 300 landscapes a year replacing an average of 990 square feet of turf each.

7. **Marketing Method**

- Consider an initial marketing strategy designed to “hype up” the program and help people understand why removing turf is a good idea. Examples of efforts implemented by other agencies include replacing turf in visible public locations like medians, schools or public buildings, installation of a new demonstration garden, and a drawing to win a free “landscape makeover.”

- Consider a yard sign recognition program, in which customers that successfully install a climate-appropriate landscape receive an attractive yard sign promoting their efforts to save valuable water resources. The goal of these programs is to recognize early-adopting customers and to create a “snowball effect” that inspires neighbors to follow their neighbor’s lead. The Surfrider Foundation’s Ocean Friendly Gardens Program is successfully implementing this marketing approach, as is the National Wildlife Federation’s Certified Wildlife Habitat program.

- Partner with local nurseries/irrigation supply stores that sell climate-appropriate plants and low-flow irrigation equipment to advertise the program.

- Market the program through traditional means, including bill stuffers, SCWD’s website, newspaper or radio ads, etc.

- Produce application that is easy, short, and consistent between customers. May or may not include plant list

8. **Implementation Details**

The following list of recommended program elements is compiled as a result of our review of several successful turf removal programs.

- SCWD develops program guidelines. Many agencies include the following requirements to maximize water savings:
    - Only the replacement of healthy turf will qualify for a rebate. Lawns that have already been killed or removed are excluded.
    - A minimum and maximum area of turf that can qualify for a rebate
    - Plant coverage requirements (i.e., at maturity 50 or 60 percent of the project area will be covered by plants),
    - Ground coverage requirements (2 to 3 inches of mulch on areas not covered by plants),
    - A requirement that the existing irrigation system is converted to a low flow or drip system
    - Project completion time frames (amount of time allowed to complete the project after notice to proceed is issued).
    - A requirement that the climate-appropriate landscape is not removed and replaced by turf with a contract signed by the customer stating that they will pay back the rebate if the climate-appropriate landscape is removed.
- SCWD develops a pre-application process to gather preliminary project information. The pre-application should require:
    - Customer information (address, water account number, etc.)
    - Proposed project information (amount of turf to be removed). SCWD can consider requiring project designs and/or a proposed plant list as part of the pre-application.
    - Photographs of the project site, including the irrigation system.
- SCWD conducts a pre-installation site visit for 100% of project participants to determine whether or not the site meets program requirements, including healthy, green turf and any project size requirements.
- Participants that meet pre-inspection requirements are issued a notice to proceed. Participants are assigned a date by which they must complete their project in order

to receive a rebate (this will help SCWD track expenditures and stay within the program budget).

- When completed, the customer notifies SCWD that the project is finished and schedules a post-installation inspection.

- Upon completion of the post-installation inspection, SCWD issues the rebate to the customer.

- In addition to the basic operating procedures described above, SCWD should consider:

  - Lists of approved/recommended plants. SCWD could consider allowing plants found on the *Santa Clarita Gardening and Landscaping* website: www.santaclaritagardens.com .

  - Sample designs. These could be generic landscape designs drawn by a landscape architect that could meet the needs of the majority of single-family residential customers and/or photographs of completed projects.

  - Classes for program participants addressing landscape design, turf removal techniques, planting techniques, how to convert a traditional irrigation system to a low flow system, and/or care and maintenance of the new landscapes. Some agencies require participants to take at least one class prior to being issued a notice to proceed on their project. These classes are often available online for participants to complete at their convenience.

  - List of landscape professionals trained to remove turf and design and install climate-appropriate landscapes. Many agencies have developed programs to certify or otherwise label professionals (landscape contractors, gardeners, designers, etc.) that have some level of basic training in the design, installation and care of climate-appropriate landscapes.

  - A SCWD-contracted landscape designer that can assist property owners in designing their new landscapes at a SCWD-subsidized rate. Many turf removal program participants become overwhelmed when trying to design their new landscape and give up. Offering subsidized design assistance can increase project completion rates and increase the number of aesthetically pleasing landscapes installed (which is important for fostering widespread interest in the program).

9. **Verification**

- Pre-program verification: Program participants must pre-register for the program by submitting photographs and measurements of current turf areas they plan to remove. Only participants with green, healthy turf at the time of application are eligible to participate, with SCWD conducting site visits to qualify participants and confirm the existence of healthy turf at the proposed location.

- Post-plant installation: Prior to paying out the rebate, finished landscapes should be surveyed to ensure that plants installed are climate appropriate, that the irrigation system is properly retrofitted, and that all plant coverage requirements are met.

- Random site inspections years after the turf has been replaced to ensure that the climate-appropriate landscape is not removed and replaced by turf. These inspections can be either conducted in-person or using aerial photography.

10. **Additional Benefits**

- Reduced runoff from landscape irrigation systems - pollution prevention

- Greater acceptance of climate-appropriate landscapes as the new norm for southern California

11. **Costs**

The average annual budget for the Turf Removal Program is estimated to be $383,486.13 per year and total programmatic expenditures from 2014 through 2020 are estimated to be $2,684,402.90.

Measure	Cost per ft$^{2(a)}$	Cost/Benefit Ratio$^{(b)}$	Cost Per AF
Turf Removal (per square foot of turf removed)	$1.51	0.63	$1,199.14

Notes:

(a) Assumes a rebate amount of $1.50/square foot plus 3 staff hours (staff person paid a mid-level Range 26 salary) per landscape for application review and pre- and post-installation verifications.

(b) While the Turf Removal Program is not estimated to be cost-effective for SCWD at this time, SCWD can choose to implement the Turf Removal Program anyway because of the important messaging the program will send regarding climate-appropriate landscaping and efficient landscape water use. Many agencies that have implemented turf removal programs did not project the programs would be cost-effective prior to implementing them; however, once the programs were implemented they found them to be cost-effective. This fact can be attributed to a number of reasons, one of which is that participants often remove turf in amounts greater than the maximum amount of turf that they will receive a rebate for. SCWD will track the Turf Removal Program and evaluate its cost-effectiveness to determine if it should be continued until 2020.

12. **Example Programs and Agency Contacts**

Southern Nevada Water Authority Water Smart Landscape Rebates
Doug Bennett
702-862-3777
doug.bennett@snwa.com

Beautiful Long Beach Lawn-to-Garden Program, www.lblawntogarden.com
Rachel Davis
562-570-2313
rachel.davis@lbwater.org

City of Roseville Cash for Grass Program
Lisa Brown
916-746-1710
lbrown@roseville.ca.us

City of Santa Rosa Green Exchange Program
Daniel Muelrath
dmuelrath@srcity.org

6.5.6 FreeSprinklerNozzles.com High Efficiency Irrigation Nozzle Distribution

1. **Program Description**

   This program will distribute 266,400 high efficiency irrigation nozzles to SCWD's customers through the FreeSprinklerNozzles.com (FSN) program. SCWD will partner with Western Municipal Water District (Western) to offer the FSN program to its customers. Programmatic savings are estimated to be 368 AF a year, on average, and 4,791 AF over the lifetime of the nozzles.

2. **Customer**

   There is significant potential for water savings in landscape water use within SCWD's service area. Residential water use is the single largest use in SCWD's service area, accounting for 70 percent of SCWD's total demand. An estimated 69 percent of single family residential use occurs outdoors as landscape irrigation. Accordingly, SCWD's single-family residential customers' monthly water use patterns (Chapter 5) show signs of significant outdoor water use. The highest water use occurs in the months of August and September when water consumption is nearly three times higher than that of the lowest month, February.

   In addition to its single-family residential customers, SCWD's commercial and dedicated landscape irrigation customers can also benefit from the water savings associated with high efficiency nozzles. In fact, high efficiency spray nozzles can improve the efficiency of any irrigation system outfitted with traditional pop-up spray nozzles. High efficiency sprinkler nozzles are a recent technology, and, as a result, most irrigation systems have not yet been retrofitted with these water saving devices. It is estimated that there are over 430,000 nozzles available for retrofit among SCWD's single family residential accounts and an additional 174,000 nozzles available within SCWD's dedicated irrigation and commercial accounts.

3. **Device**

   The FreeSprinklerNozzles.com program solely distributes Toro Precision™ Series Spray Nozzles. The nozzles were specifically chosen for the FSN program because of their unique water saving design. The nozzles are compatible with most existing irrigation systems. Customers can easily install the nozzles and immediately save water without making adjustments to their irrigation controller programming. This is because the reduced flow and application rate of the Precision™ Series Spray Nozzle is counterbalanced by increased irrigation performance, including improved uniformity, better defined edges, and more consistent size and velocity of water droplets. Together, these benefits eliminate the need to double irrigation runtimes as is required when retrofitting conventional spray nozzles with comparable low-precipitation rate rotating nozzles.

4. **Program Implementation**

By pairing web-based ease of access with easy-to-install, proven water saving technology, Western's FSN program has successfully and cost-effectively engaged the landscape market, yielding impressive results. Western recently began allowing other water agencies to offer the FSN program to their customers after signing a simple MOU, and SCWD currently offers the FSN program in its service area. Participating in Western's FSN Program offers several advantages to SCWD:

- The Precision ™ Series Spray Nozzles are a retrofit for existing standard pop up sprinkler nozzles. There are millions of standard pop up sprinkler nozzles located within SCWD's service area.

- The retrofit is a simple process, and the FSN website has been designed to teach participants how to successfully retrofit their irrigation system.

- The nozzles are low cost and, because of its web-based design, the FSN program is highly cost effective to implement.

- The program can be offered to all types of customers, including single-family residential, multi-family residential, CII, and dedicated landscape customers.

Under the FSN Program model, water customers are directed to the FSN website in order to obtain a voucher for free Toro Precision™ Series Spray Nozzles, redeemable at local irrigation supply stores. Residential water customers are eligible to receive up to 25 nozzles, while the cap for commercial water customers, who usually have larger landscapes, is 100 nozzles. Vouchers for free nozzles are delivered to customers via email only after the customer has reviewed a series of short, targeted educational online videos. The videos explain how the nozzles work, describe the installation process, and teach the customer how to perform an irrigation system survey prior to redeeming their free nozzle voucher and installing their new nozzles.

SCWD will need to significantly increase the amount of nozzles it currently distributes through the FSN Program in order to meet the water savings goals outlined in this plan. The challenge for SCWD in implementing the FSN Program will be to effectively encourage large numbers of customers to participate. The FSN Program has the capacity to distribute large numbers of nozzles in a short amount of time, as indicated by its success in Western's service area. The limiting factor for the program's success is therefore marketing. It is recommended that SCWD markets the program heavily with the goal of developing significant "hype" about the program. The experience of other FSN participating water agencies has shown that direct mailings, bill stuffers, and radio and newspaper ads are effective marketing strategies for residential customers, while informing and partnering with local landscape maintenance companies and property managers is an effective strategy to get the nozzles to HOA's, commercial properties, and multi-family customers.

5. **Water Savings**

The FSN High Efficiency Irrigation Nozzle Distribution program has an estimated average annual water savings of 368 AF a year and an estimated lifetime water savings of 4,791 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Device	Measure Life	Lifetime Savings Per Device
Toro Precision ™ Series Spray Nozzles - SF	4	1,172 GPY = .0035 AFY[(a)]	5	1,172 GPY = .0035 AFY[(a)]
Toro Precision ™ Series Spray Nozzles - CII	5	1,172 GPY = .0035 AFY[(a)]	5	1,172 GPY = .0035 AFY[(a)]

Note: (a) Source: Western Municipal Water District FSN Program (assumes 90% installation rate).

6. **Activity Levels**

The FSN High Efficiency Irrigation Nozzle Distribution program will distribute 266,400 high efficiency sprinkler nozzles over a period of 9 years.

Measure	Implementation Years	Annual Distribution Rate	Total Nozzles Distributed
Toro Precision ™ Series Spray Nozzles - SF	2012-2020	25,000	225,000
Toro Precision ™ Series Spray Nozzles - CII	2012-2020	4,600	41,400
		Total	266,400

7. Marketing

- Bill stuffers and/or direct mail for single-family residential customers.
- Direct mail to landscape maintenance professionals to encourage them to enroll their customers in the program. Landscape maintenance professionals can assist their customers in applying for the free nozzles and receive a special bypass code so they only have to watch the online videos one time (rather than each time they apply on behalf of a customer).
- Work with local irrigation supply houses distributing the nozzles to inform landscape maintenance professionals of the program.
- Direct mail to dedicated landscape customers. The direct mailing should target property managers/owners.

- Contact municipal parks departments or landscape maintenance districts to encourage them to participate in the program. Free nozzles, reduced water bills, and the opportunity to showcase good stewardship of the community's water resources are all strong motivators for municipal landscape managers.

- Promote the program at landscaping classes offered to customers.

- Include a highly visible link to the FSN website on SCWD's website.

- Consider a media-blitz to hype up the program when it is launched, including radio and newspaper ads.

8. **Implementation Details**

- SCWD sets its annual nozzle distribution targets and signs an MOU with Western to participate in the project.

- SCWD provides the FSN program administrator with basic customer information so customers can be verified and tracked through the FSN web-based interface.

- The FSN program administrator partners with irrigation supply stores located within SCWD's service area and trains them on how to distribute nozzles through the program.

- SCWD markets the program.

- Western provides SCWD with monthly invoices and a database of participant information.

- SCWD verifies nozzle installation rates and customer satisfaction through phone calls and site visits.

- SCWD tracks program performance and provides program oversight and management to ensure activity levels and water savings goals are being met and customers are satisfied with the program.

9. **Verification**

SCWD is responsible for installation verification. On occasion, the FSN Program Administrator surveys customers regarding installation of the nozzles using an online survey; however, SCWD staff should conduct installation verification site visits to 10% of participating sites.

10. **Additional Benefits**

- Reduced runoff from landscape irrigation systems – pollution prevention

- Customers become more educated about landscape water efficiency through the FSN Program's required videos

11. **Costs**

The average annual budget for the FSN HE Nozzle Distribution Program is estimated to be $142,930.93 per year and total programmatic expenditures from 2012 through 2020 are estimated to be $1,286,378.37.

Measure	Cost per Device[(a)]	Cost/Benefit Ratio	Cost Per AF
Toro Precision ™ Series Spray Nozzles - SF	$4.25	2.90	$241.32
Toro Precision ™ Series Spray Nozzles - CII	$4.25	2.90	$241.32

Note:
(a) Includes the cost to participate in the FSN program ($3.25/nozzle) and staff time to verify 10% of the sites receiving nozzles through the FSN program. Assumes a staff person paid a mid-level Range 26 salary takes 1 hour per verification.

12. **Example Programs and Agency Contacts**

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6.5.7 High Efficiency Irrigation Nozzle Direct Installation Program

1. **Program Description**

This program will install 21,000 high efficiency irrigation nozzles in commercial and dedicated landscape irrigation sites. Programmatic savings are estimated to be 38 AF a year, on average, and 420 AF over the lifetime of the nozzles.

2. **Customer**

The goal of the High Efficiency Nozzle Distribution Program is to install a large number of nozzles in commercial and dedicated landscape irrigation sites that may require significantly more nozzles than are available to commercial customers through the FreeSprinklerNozzles.com program. A direct installation approach is especially well suited for property managers of HOA's and multi-family housing, who often have limited man-hour resources, tight budgets for landscape maintenance, and are used to relying on landscape maintenance professionals for the management of their landscaping needs. Schools may also be good candidates for direct installation.

High efficiency sprinkler nozzles are a recent technology, and, as a result, most irrigation systems have not yet been retrofitted with these water saving devices. It is estimated that there are 174,000 nozzles available for retrofit within SCWD's dedicated irrigation and commercial accounts. Analysis of 2011 water use data for SCWD's dedicated landscape customers shows significant outliers among water users. These high water users should be targeted for the High Efficiency Irrigation Nozzle Direct Installation

Program. Additionally, customers with dedicated landscape water budgets should be targeted when they are consistently over their water use budget. The water budgets can then be used to demonstrate water savings to the customer post-nozzle installation.

3. **Device**

High efficiency nozzles are a retrofit for standard pop up sprinkler nozzles. The nozzles apply water at a slower rate and in a more uniform pattern than traditional pop up sprinkler nozzles, thereby reducing water use. The nozzles can be adjusted, which ensures all the water is applied to the irrigated area and not the surrounding hardscape. Additional water saving-benefits may include better wind resistance, less misting, and reduced run-off.

There are several models of high efficiency nozzles currently on the market. While the Toro Precision TM Series Spray Nozzles do not require an adjustment of the irrigation controller's irrigation schedule, other models do.

4. **Program Implementation**

While the programmatic costs are higher, a direct installation approach insures the nozzles are installed properly to guarantee water savings. Proper nozzle installations require knowledge of irrigation systems, including nozzle types, configuration, pressure, spacing, radius and arc patterns, and precipitation rates. Additionally, more complex landscapes like those found at HOAs and some commercial complexes do require knowledge of the nozzles and their various configurations to ensure proper spray patterns and irrigation coverage. C-27 licensed contractors, or landscape contractors that have been licensed by the California Contractors State License Board, will have this expertise. For this reason, SCWD will utilize an outside vendor (or possibly multiple contractors) to perform the direct installation of the high efficiency nozzles.

SCWD could benefit by contracting with some of the area's well established landscape maintenance contractors, as these contractors could then enroll their existing clients in the program. Contractors would also be incentivized to reach out to potential new clients, using the nozzle direct installation program as a reason to initiate contact. In addition to installing the nozzles, the contractor would be responsible for making sure the nozzles are adjusted properly and any changes that need to be made to the irrigation schedule are completed.

5. **Water Savings**

The High Efficiency Irrigation Nozzle Direct Installation Program has an estimated annual water savings of 38 AF a year and an estimated lifetime water savings of 420 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Device	Measure Life	Lifetime Savings Per Device
High Efficiency Irrigation Nozzles	6	1,303 GPY = .004 AFY[(a)]	5	6,515 gallons = .02 AF

Note: (a) Source: Western Municipal Water District FSN Program (100% installation rate).

6. **Activity Levels**

The High Efficiency Irrigation Nozzle Direct Installation Program will install a total of 21,000 high efficiency nozzles over a period of 7 years.

Measure	Implementation Years	Annual Installation Rate	Total Nozzles Installed
High Efficiency Irrigation Nozzles	2014-2020	3,000	21,000

7. **Marketing**

- Using customer billing data, identify high water using HOAs and commercial accounts. Directly market to property owners and managers via mail and/or phone.
- Contract with landscape maintenance contractors to market the program to their customers and complete the nozzle installations and adjustments

8. **Implementation Details**

- SCWD generates a standard RFP for the high efficiency nozzles and their installation. The RFP is sent to all local C-27 contractors.
- Based on RFP responses and contractor experience, SCWD generates a list of eligible contractors.
- SCWD develops program guidelines and sets standard prices for nozzles and installation labor that contractors agree to when they enter into an agreement to participate in the program.
- Eligible contractors are required to attend a half day training on proper installation, customer eligibility, and accurate program tracking and invoicing. SCWD can likely gain assistance with this workshop through local irrigation supply stores and/or nozzle distributors. These professionals can provide information on high efficiency nozzle technology and proper installation.
- SCWD works with the selected contractors to generate a list of target customers. SCWD provides a list of its highest HOA and commercial water users as well as customers that are consistently over their water budgets. The contractors provide a list of current customers that may benefit from the program.
- SCWD contacts targeted customers via direct mail to introduce the program.
- Contractors follow up with the targeted customers and schedule an on-site evaluation to identify the equipment needs for the site.
- After the site visit, the contractor installs the nozzles.

- Each month participating contractors provide SCWD with documentation on all nozzles installed over the past month, along with monthly invoices.

- SCWD manages contractors and conducts verification inspections.

- SCWD tracks program performance and provides program oversight and management to ensure activity levels and water savings goals are being met and customers are satisfied with the program.

9. **Verification**

SCWD will conduct on-site installation verifications to ensure nozzles are installed and adjusted properly:

- For 50% of a contractor's total installations over the first month of the contractor's participation in the program

- For 10% of a contractors total installations after the contractor passes the initial screening

- 100% of participating customers should be called to verify installation and survey customers for satisfaction with the program prior to paying a contractor invoice

10. **Additional Benefits**

- Reduced runoff from landscape irrigation systems

11. **Costs**

The average annual budget for the HE Nozzle Direct Installation Program is estimated to be $21,070.24 per year and total programmatic expenditures from 2014 through 2020 are estimated to be $147,491.70.

Measure	Cost per Device[(a)]	Cost/Benefit Ratio	Cost Per AF
High Efficiency Irrigation Nozzles	$6.00	2.32	$306.43

Note: (a) Includes the cost of the nozzles, installation, and staff time to verify 10% of the sites receiving nozzles through the nozzle direct installation program. Assumes a staff person paid a mid-level Range 26 salary takes 1 hour per verification.

12. **Example Programs and Agency Contacts**

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6.5.8 Large Landscape Weather-Based Irrigation Controller Direct Installation Program

1. **Program Description**

   This program will replace 210 large landscape (area greater than 1.5 acres) irrigation controllers with Weather-Based Irrigation Controllers (WBICs). Programmatic savings are estimated to be 64 AF annually and 1,019 AF over the lifetime of the WBICs. This program will provide the following free of charge:

   - WBICs
   - WBIC installation and programming
   - Removal of existing irrigation controllers

2. **Customer**

   There is significant potential for water savings in landscape water use within SCWD's service area. An inland community, Santa Clarita has high evapotranspiration rates, and a significant amount of water use occurs outdoors to irrigate landscapes. Distribution analysis of SCWD's single-family landscape and multi-family landscape accounts, which include HOAs, community associations, and apartment complexes, indicates that in each customer classification, just a few customers account for a large amount of total water use. For example, the ten highest multi-family landscape accounts consumed almost 40 percent of the total multi-family landscape consumption in 2011.

   The Weather Based Irrigation Controller (WBIC) Direct Installation program will target these highest consuming large landscape customers in order to achieve the greatest water savings. Customers enrolled in the Large Landscape Water Budget Program that are consistently over budget will be invited to participate in the program. HOAs are also a particularly good customer group to target as they have limited staff resources, tight budgets for landscape maintenance, and are used to relying on landscape maintenance professionals for the management of their landscaping needs. SCWD should also consider targeting the few neighborhoods within its service area with large landscape areas such as Sand Canyon. These large residential locations often offer significant potential for water savings and can be easy to target since many sites are located within the same geographic area.

   It should be noted that direct installation of WBICs is usually not cost effective for landscapes with less than 1.5 acres of irrigated landscape. SCWD customers with smaller lots can benefit from the water saving WBIC technology by participating in the rebate program.

3. **Device**

   WBICs, also commonly referred to as "smart" controllers, automatically adjust landscape irrigation schedules in response to changes in weather so the water applied is always appropriate for the needs of the landscape. A WBIC automatically reduces watering times as the weather gets cooler and less water is needed. Then, as the weather begins

to warm up, the controller will add more watering time. WBICs can result in significant water savings (20-30%) for residential customers who tend to set their controller and then forget about it without making any adjustments to the schedule as the weather and watering demands change throughout the year.

4. **Program Implementation**

It is recommended that SCWD utilize an outside vendor (or possibly multiple contractors) to perform the direct installation of the WBICs. Professional controller installation is preferred because the initial programming of the controller is paramount to achieving water savings. A licensed landscape contractor can install the controller to specifications and program the controller for the individual site's soil, plant-type, and micro-climate characteristics to ensure the controller performs accurately. SCWD can benefit by contracting with some of the area's well established landscape maintenance contractors, as these contractors can enroll their existing clients in the program. Contractors would also be incentivized to reach out to potential new clients, using the direct installation program as a reason to initiate contact. It may be beneficial administratively to utilize the same contractors contracted for the High Efficiency Nozzle Direct Installation Program, since the target customers are the same and many customers could likely benefit from both technologies.

To maximize water savings and program cost-effectiveness, only customers that meet the following requirements will be qualified for a WBIC installation:

- a minimum of 1.5 acres of irrigated landscape
- an irrigation system that is properly functioning and in good condition
- no existing WBIC at the site

5. **Water Savings**

The Large Landscape WBIC Direct Installation Program has an estimated average annual water savings of 64 AF a year and an estimated lifetime water savings of 1,019 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Device	Measure Life	Lifetime Savings Per Device
WBICs for Large Landscapes	10, 11	158,152 GPY = .49 AFY[(a)]	10	1,581,520 gallons = 4.85 AF

Note: (a) Source of water savings assumption is Metropolitan Water District of Southern California (assumes 10,590 gallons of water saved per acre and sites with a size of 1.5 acres.

6. **Activity Levels**

The Large Landscape Weather-Based Irrigation Controller Direct Installation Program will install a total of 210 WBICs over a period of 7 years.

Measure	Implementation Years	Annual Installation Rate	Total WBICs Installed
WBICs for Large Landscapes	2014-2020	30	210
		Total	210

7. **Marketing**

A list of potential participants will be generated from SCWD billing data. The list should also include customers enrolled in the Large Landscape Water Budget Program that are consistently over their water budget. The list will be ranked by usage (per unit area, if possible) to prioritize the highest water users. SCWD will mail an introductory letter to all potential participants informing them of the program and its benefits.

The landscape contractor(s) contracted to implement the program will then directly contact (by phone or in person) the pre-identified customers to follow up and enroll customers in the program. The contractor(s) should be encouraged to market the program to any of their existing large landscape customers that are qualified to participate in the program.

Door hangers and or direct mail can be used to market the program specifically to single-family residential neighborhoods that predominantly have lots larger than 1.5 acres. Follow up phone calls can then be conducted by the contractor(s) to enroll customers in the program.

8. **Verification**

- Pre-installation site visits should be conducted for 100% of the potential sites. Customers should meet program requirements in order to qualify for the direct installation.

- Follow up contact should be made to 100% of the customers that receive the WBICs in order to ensure customer satisfaction and proper programming/understanding of the new controller.

- Post-installation site-visits should be conducted on approximately 25% of participating customers' sites to provide additional customer education and follow up, to fine-tune the controller programming, and to resolve any issues the customer might have.

- Pre- and post-installation customer billing data is compared to track water savings and program effectiveness.

9. **Implementation Details**

- SCWD staff generates an RFP for the marketing, purchasing, installation of the WBICs and removal of the existing controllers. SCWD could consider developing one

RFP for a contractor or contractors to implement both the WBIC Direct Installation Program and the High Efficiency Nozzle Direct Installation Program.

- The RFP requires the contractor to be responsible for both the product and the installation so SCWD does not have to manage inventory. The pricing structure from the contractor is on a per unit basis for the WBIC, WBIC installation, and nozzles and nozzle installation (if combining this program with the nozzle direct installation program). Other costs, including marketing, site evaluations, customer service follow up calls, administration and reporting will be included in the contractor's per unit fees. This will allow SCWD to manage the budget and program activity levels.

- SCWD hires a C-27 licensed contractor or contractor(s) to implement the program.

- SCWD develops program guidelines. Eligible contractors are required to attend a half-day training on proper installation, customer eligibility, and accurate program tracking and invoicing. SCWD can likely gain assistance with this workshop through local irrigation supply stores and/or WBIC distributors. These professionals can provide information on WBIC technology and proper installation.

- SCWD works with the selected contractor(s) to generate a list of target customers. SCWD provides a list of its highest MF large landscape water users, customers that are consistently over their water budgets, and customers living in neighborhoods with large lot sizes, while the vendor provides a list of current clients that may qualify for the program.

- SCWD sends a letter to all identified target customers to introduce the program.

- Contractor(s) follow up with the targeted customers and schedule an on-site evaluation to determine the condition of the existing irrigation system and landscape, as well as identify equipment needs for the site. If the irrigation system is in poor working order (broken, not properly adjusted, poor distribution uniformity), customers will be required to repair the system prior to being eligible for the controller installation.

- After the site visit the contractor installs and programs the WBIC (and nozzles, if applicable). The contractor also explains controller operation to the property owner and/or the landscape maintenance professional.

- Two to four weeks after the installation the contractor follows up with the customer via phone (or on-site if necessary) to ensure the customer understands how to use the new controller and everything is working properly.

- SCWD manages contractors and conducts verification inspections.

10. **Additional Benefits**

- Reduced runoff from landscape irrigation systems, which, in turn, reduces pollution and pavement damage.

11. **Costs**

The average annual budget for the Large Landscape WBIC Direct Installation Program is estimated to be $45,652.19 per year and total programmatic expenditures from 2014 through 2020 are estimated to be $319,565.35.

Measure	Cost per Device[(a)]	Cost/Benefit Ratio	Cost Per AF
WBICs for Large Landscapes	$1300.00	2.64	$280.69

Note: (a) Includes the cost of the WBIC, installation, and staff time to verify 10% of the sites receiving WBICs through the WBIC direct installation program. Assumes a staff person paid a mid-level Range 26 salary takes 1 hour per verification.

12. **Example Programs and Agency Contacts**

Western Municipal Water District's Smart Yard Program
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6.5.9 Residential and Commercial Rebate Program

1. **Program Description**

This program will incentivize customers to purchase water saving devices to reduce indoor and outdoor water use. Programmatic savings are estimated to be 668 AF a year and 17,170 AF over the lifetime of the water saving devices. In total, the program will rebate 27,400 water saving devices, including:

- 7,500 SF High Efficiency Clothes Washers
- 900 MF High Efficiency Clothes Washers
- 4,500 SF HETs
- 900 MF HETs
- 200 Commercial HETs
- 200 Ultra-Low Volume Urinals
- 200 Zero-Water Urinals
- 13,000 WBICs

2. **Incentive**

Rebate programs incentivize customers to purchase and install water saving devices and fixtures through cash rebates that effectively lower the overall cost of purchasing and installing the device. The goal of a rebate program is to provide a large enough rebate to incentivize the customer to purchase the more expensive efficient device over the less expensive non-efficient device. The Commercial and Residential Rebate

program will offer customers a menu of rebate incentives for indoor and outdoor water saving devices.

3. **Program Implementation**

SCWD currently offers rebates for high efficiency toilets in partnership with Castaic Lake Water Agency (CLWA). The goal of this program is to expand the list of rebated water saving devices available to SCWD customers in order to reach a wider audience of customers and achieve greater water savings while not incurring large initial start-up costs associated with the implementation of a brand new program. By continuing its partnership with CLWA, SCWD will benefit from regional messaging, economies of scale, and shared expenses. It is likely that SCWD customers shop for appliances and fixtures in stores located outside of SCWD's service area but still within the Santa Clarita Valley, or the greater CLWA service area. A regional program can be marketed through partnerships with vendors throughout the Santa Clarita Valley to ensure that more customers become aware of and participate in the program.

Successful rebate programs are well advertised, consistent (they don't start and stop or change participation procedures often), and easy to understand and participate in. SCWD currently implements its rebate program using agency staff. SCWD may want to consider contracting with a vendor to implement the rebate program in future years due to the volume of rebates needed to meet its water savings goals. There are several vendors experienced in rebate program implementation and management in California. These vendors develop marketing plans, administer the rebate program, provide customer service to program participants, and process rebate applications.

4. **AWE Tool Water Savings Assumptions**

The Residential and Commercial Rebate program has an estimated average annual water savings of 668 AF a year and an estimated lifetime water savings of 17,170 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Device[(a)]	Measure Life	Lifetime Savings Per Device
SF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	7	7,043 GPY = .02 AFY	12	84,516 gallons = .26 AF
MF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	19	25,310 GPY = .08 AFY	8	202,480 gallons = .62 AF
SF HET	8	10,561 GPY = .03 AFY	20	211,220 gallons = .65 AF
MF HET	23	23,610 GPY = .07 AFY	20	472,200 gallons = 1.45 AF
Commercial HET	16	11,503 GPY = .035 AFY	20	230,060 gallons = .71 AF

Measure	AWE Tool Activity Number	Annual Water Savings Per Device[(a)]	Measure Life	Lifetime Savings Per Device
Ultra-Low Volume Urinals	13	26,394 GPY = .08 AF[(b)] *Source: CUWCC*	25	659,850 gallons = 2.03 AF
Zero-Water Urinals	12	45,000 GPY = .14 AF[(c)]	25	1,125,000 gallons = 3.45 AF
WBIC (for lots less than one acre)	9	16,260 GPY = .05 AF	10	162,600 gallons = .50 AF

Notes:
(a) All water savings assumptions are from the Alliance for Water Efficiency's Conservation Tracking Tool Version 1.2 CalTex Edition unless otherwise noted.
(b) Source: CUWCC.
(c) Source Metropolitan Water District of Southern California.

5. **Activity Levels**

The Residential and Commercial Rebate program will issue a total of 27,400 rebates over a period of 9 years.

Measure	Implementation Years	Annual Activity Level	Total Rebates Issued
SF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	2012	300	300
SF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	2013	500	500
SF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	2014	700	700
SF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	2015-2020	1,000	6,000
MF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	2012-2020	100	900
SF Residential HET	2012-2020	500	4,500
MF Residential HET	2012-2020	100	900
Commercial HET	2013-2020	25	200
Ultra-Low Volume Urinals	2013-2020	25	200
Zero-Water Urinals	2013-2020	25	200
WBIC (lots less than one acre)	2013-2020	1,625	13,000
		Total	27,400

6. **Marketing**

- A significant amount of marketing energy and resources should be dedicated to educating local retailers that sell the rebated products. The goal is to create buy-in with local retailers and encourage them to use the rebate program as a selling point for their merchandize. Retailers to focus on include household appliance stores (Sears, World Appliance, etc.), home improvement stores (Home Depot, Lowes),

plumbing stores, and landscape irrigation supply stores. SCWD can provide these retail locations with program training for sales staff, lists of qualifying products, merchandizing pieces to make rebated products easy for the customer to identify, FAQ sheets for customers and the salespeople, simple how to instructions for the rebate application process. Retail locations often have frequent staff turnover, so SCWD will need to periodically check in with retailers and make sure they have the tools they need to drive customers to the rebate program.

- Direct market WBIC rebate to gardeners and landscape contractors and encourage them to market the program to their customers.

- Traditional program marketing, including website, bill stuffers, hand-outs for community events, etc.

7. **Implementation Details**

- SCWD generates an online application for its rebate program to increase customer accessibility and to develop the capacity to process the large number of rebates necessary to meet its water savings targets. The application process should be simple and it should be easy for customers to locate qualifying products locally.

- SCWD generates a list of qualifying products for the rebate program. For toilets, many agencies use the Environmental Protection Agency's WaterSense approved products. Washing machines often qualify for rebate programs based on their water factor (the number of gallons used per cubic foot of laundry, a measure of water use efficiency). Qualifying washers should have a water factor of 4.0 or less. For irrigation controllers, a common qualifying standard is that the controller is Smart Water Application Technology (SWAT) tested and approved. The lists will need to be updated periodically as new products enter the market.

- SCWD markets the program to its customers.

- SCWD will conduct on-site installation verifications for a minimum of 10% of participating customers.

- SCWD will need to continuously monitor program activity levels and adjust marketing efforts and rebate amounts as necessary to achieve the target level of participation in each rebate type.

- SCWD will track program performance and provide program oversight and management to ensure activity levels and water savings goals are being met and customers are satisfied with the program.

8. **Verification**

- SCWD will conduct on-site installation verifications for 10% of participating customers.

9. **Additional Benefits**

- Reduced runoff from landscape irrigation systems (WBIC rebates).
- Reduced wastewater flows (rebates for indoor fixtures).

10. **Costs**

The average annual budget for the Residential and Commercial Rebate Program is estimated to be $405,805.59 per year and total programmatic expenditures from 2012 through 2020 are estimated to be $3,652,250.34.

Measure	Cost per Device[(a)]	Cost/Benefit Ratio	Cost Per AF
SF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	$153.00	1.20	$624.59
MF High Efficiency Clothes Washer (Water Factor of 4.0 or better)	$153.00	2.81	$255.38
SF Residential HET	$83.00	4.15	$201.55
MF Residential HET	$83.00	19.37	$49.19
Commercial HET	$83.00	7.25	$124.90
Ultra-Low Volume Urinals	$203.00	7.33	$113.40
Zero-Water Urinals	$203.00	12.50	$66.51
WBIC (lots less than one acre)	$103.00	3.40	$216.00

Note:
(a) Includes the rebate amount and staff time to verify 10% of the rebated devices. Assumes a staff person paid a mid-level Range 26 salary takes 1 hour per verification.

6.5.10 Large Landscape Water Budgets

1. **Program Description**

This program will create 440 landscape water budgets for SCWD's dedicated landscape irrigation customers. Programmatic savings are estimated to be 336 AF a year and 5,720 AF over the lifetime of the water budget.

2. **Water Budgets**

Large landscape water budgets are the calculated amount of water a landscape needs based on site-specific information, including landscape area, plant type, and local weather data. Water budgets are mailed or emailed to customers and provide them with site-specific watering targets for each month. Customer billing data is incorporated into the water budget to provide customers with a comparison of their actual water usage to the target water budget. The budgets are most effective when they are provided to the customer monthly in order to provide continuous feedback on how the customer's watering practices are performing in comparison to the target budget.

As a stand-alone information piece, water budgets result in water savings as customers begin to understand the watering requirement of their landscape and adjust their watering practices accordingly. The Dedicated Landscape Water Budget Program can

also be used to drive customers to SCWD's other water use efficiency programs, including the rebate program and the nozzle and WBIC direct installation program, resulting in additional water savings.

3. **Program Implementation**

Under this program SCWD would establish water budgets for a minimum of 90% of its dedicated landscape irrigation accounts. The water budgets would provide information and guidance to customers regarding reasonable water use for their site, as well as recommendations on how to reduce water use if the customer is watering over budget. The primary purpose of water budgets is to raise awareness on the proper amount of water a landscape requires and give customers the tools to maintain their water use within the target budget.

There are two primary approaches to implementing landscape water budget programs. The budgets can either be created in-house using free online aerial photography tools like Google Earth to measure customers' landscape and create the water budget or, a vendor can be hired to use GIS to measure the sites and create the budgets. A vendor can also create an online interface for customers to access their budgets and receive notifications when new budget data is available each month. If the budgets are created in house, SCWD will need to work with utility billing and/or information systems staff to incorporate customer's actual water consumption into the budget for comparison against the monthly watering targets. Budgets can either be direct mailed to customers or made available in an online format.

The greatest challenge with water budget programs is getting the budgets to the appropriate decision-maker for a property. Successful programs generally ensure several people receive the water budget – the property owner, the property manager (if different from the owner), and the landscape manager or landscape maintenance professional. Some of this contact information is likely available in SCWD's billing database; however, follow up phone calls will be necessary, particularly in the beginning of the program, to ensure that the appropriate person is receiving the budget and that they understand its purpose.

4. **Water Savings**

While the creation of a water budget for a customer does not directly result in reduced water usage in and of itself, water budget programs implemented throughout southern California have demonstrated that the information contained in water budgets, when presented to the right decision-makers (property owners and property managers), can motivate customers to take action to reduce their water use. Customers learn the appropriate amount of water to apply to their landscapes, and begin to recognize that they can save money on their water bill and maintain a healthy landscape by watering within their water budget. The Large Landscape Water Budget program has an estimated average annual water savings of 336 AF a year and an estimated lifetime water savings of 5,720 AF.

Measure	AWE Tool Activity Number	Annual Water Savings Per Budget	Measure Life	Lifetime Savings Per Budget
Large Landscape Water Budgets for Dedicated Landscape Accounts	14	423,606 GPY = 1.30 AFY[(a)]	10	4,236,060 gallons = 13.0 AF

Note:
(a) Source: 15% of average annual consumption of dedicated landscape irrigation accounts (2011 billing data).

5. **Activity Levels**

The Large Landscape Water Budget program will create a total of 440 water budgets for SCWD's dedicated landscape irrigation customers over a period of 8 years. When the budgets are complete, 95% of SCWD's dedicated landscape irrigation customers will have water budgets.

Measure	Implementation Years	Annual Budget Creation Rate	Total Budgets Created
Large Landscape Water Budgets for Dedicated Landscape Accounts	2013-2020	55	440

6. **Marketing**

- Utilize information in SCWD's billing system to identify property owners and/or managers for dedicated landscape accounts.
- Contact property owners via phone to determine who should receive the water budgets.
- Direct mail the budgets to the person(s) identified above or provide online access to the budgets with email notification when new budget information is available.
- Work with contractors implementing the WBIC and High Efficiency Nozzle Distribution Programs to identify appropriate contacts for dedicated landscape sites and enroll those contacts in the programs.

7. **Implementation Details**

- SCWD develops landscape water budgets for 95 percent of its dedicated landscape irrigation accounts. SCWD can either develop the budgets in-house or hire a vendor to create the budgets. One advantage of hiring a vendor is the vendor can develop all of the budgets in a short amount of time so customers can start receiving them immediately and begin reducing their water use.
- SCWD identifies the appropriate contact for each site and ensure that they understand the program.

- Budgets are mailed, emailed, or made available online monthly. The budgets will include the monthly water use target in comparison to actual monthly water consumption so the customer can understand how their watering practices compare to their water budget. Each budget should also include general information on how customers can reduce their water use to meet their water use targets and information on other programs available to customers to help them reduce their water use.

- SCWD monitors customer's budgets and follows up via phone with customers that are consistently watering over budget to offer them assistance in reducing their water use.

- SCWD creates budgets for any new dedicated landscape accounts that are created.

8. **Verification**

- SCWD will follow up with customers that are consistently watering over budget and inform them of the other water use efficiency programs available to help them reduce their water use.

- It may be necessary to perform a site visit to verify landscape area for some sites that are hard to measure using aerial photography. If the landscape area information is incorrect in a water budget, the budget will not provide an accurate watering target.

9. **Additional Benefits**

- Reduced runoff from landscape irrigation systems – pollution prevention.

10. **Costs**

The average annual budget for the Large Landscape Water Budget Program is estimated to be $12,389.03 per year and total programmatic expenditures from 2013 through 2020 are estimated to be $99,112.24.

Measure	Cost per Budget[(a)]	Cost/Benefit Ratio	Cost Per AF
Dedicated Landscape Water Budgets	$175.00	45.96	$16.00

Note:
(a) Assumes budgets are created by an outside vendor. Includes the cost to create each budget. Note that the Large Landscape Water Budget Program also has initial start-up costs estimated to be $10,000.00 (Source = Alliance for Water Efficiency Tracking Tool).

11. **Example Programs and Agency Contacts**

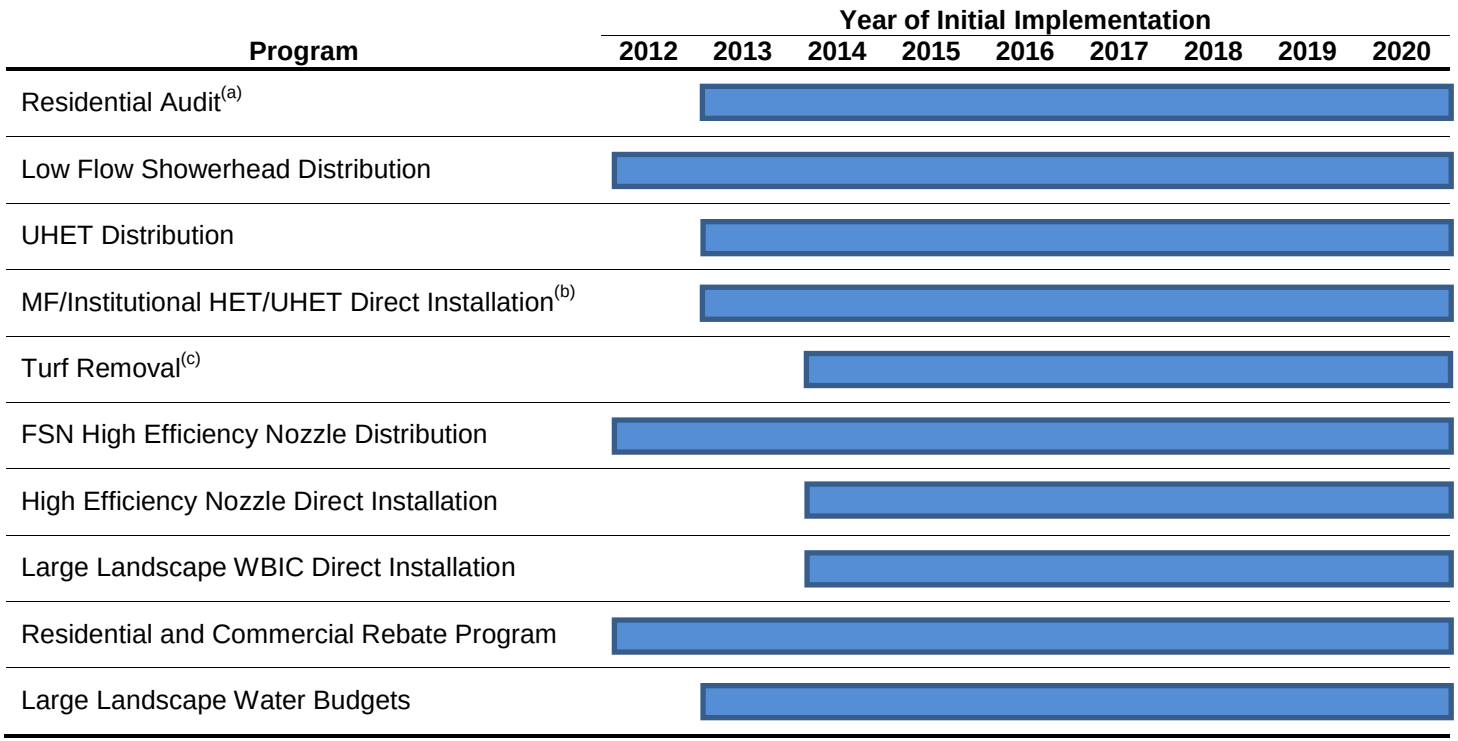
Municipal Water District of Orange County's
Water Smart Landscape Program
Joe Berg
714-593-5008
jberg@mwdoc.com

City of Oxnard
Diego Zabala
(805) 385-7968
Diego.Zabala@ci.oxnard.ca.us

Section 7: Implementation Schedule

The following implementation schedule was designed to balance the practical requirements of conservation program start-up with the relatively short timeline – eight years until 2020 – SCWD has to meet its water conservation targets. With the influence of these two factors in mind, programs to be implemented immediately are either programs that are currently being implemented by SCWD and need to be expanded in their offerings, including making additional rebates available through the residential and commercial rebate program, or ramped up in their current activity level like the FreeSprinklerNozzles.com High Efficiency Irrigation Nozzle Distribution Program. Similarly, programs that can quickly be outsourced to an experienced vendor are scheduled to begin within the next year. Programs that require additional staffing resources and/or advanced planning prior to implementation are scheduled to commence in 2013, with all programs scheduled to be up and running by 2014.

Figure 7-1: Implementation Schedule



Notes:

(a) 300 SF HECW in year 2013, 500 in 2014, 700 in 2015, and 1,000 in years 2015 - 2020.

(b) 440 MF HETs/year in years 2013 - 2015. 440 MF UHETs/year in years 2013 - 2015 and 875 UHETs/year in years 2015 - 2020.

(c) 99,000 square feet of turf replaced/year in years 2014 & 2015. 198,000 square feet/year in 2016 & 2017. 297,000 square feet/year in years 2018 - 2020.

Section 8: Staffing Plan

To successfully implement the water conservation programs contained in this Water Use Efficiency Master Plan, SCWD will need to increase water conservation staffing. The expanded staffing will both implement programs and manage programs outsourced to consultants and companies with specific implementation expertise.

Successful program implementation and management will require knowledge and proficiency in four unique disciplines:

1. Indoor fixtures and plumbing codes
2. Landscape efficiency and plant-soil-water relationships
3. Marketing and customer communication
4. Program tracking, analysis and reporting

The following staffing plan provides an overview of the staffing needed to implement the water conservation programs contained in this Water Use Efficiency Master Plan. The staffing plan contains position descriptions, including primary responsibilities for each position, education and certification requirements, and general salary ranges. The staffing plan considers the staffing resources needed to both oversee conservation programs that will be implemented by an outside vendor and the resources needed to implement programs in-house as detailed in the Chapter 6.

To successfully implement these water conservation programs the following positions are required:

Water Conservation Program Manager

Number of positions: 1

Time: 10% Field / 90% Office

Requirements: 4 year college degree in water resources planning or related field plus 5 years experience, including supervisory/management experience; master's degree preferred or possible substitute for relevant experience

Certifications: AWWA Water Conservation Practitioner Grade II (Grade III when it becomes available)

Salary Range: $62,400 - $110,000 annually

Roles and Responsibilities: The Water Conservation Program Manager will oversee all aspects of the Water Conservation Program, including program implementation, staffing, budget, and reporting. Primary responsibilities for this position include:

- Oversees compliance with water conservation-related regulatory requirements, including SB7x-7 (Urban Water Management Planning) and CUWCC Reporting.
- Tracks Water Conservation Program effectiveness and adjusts programs as necessary to meet regulatory targets
- Evaluates effectiveness of conservation program in terms of cost/benefit & behavioral changes
- Coordinates with regional partners, including CLWA
- Develops and monitors Water Conservation budget
- Oversees Water Conservation staff
- Oversees the selection of vendors hired to implement conservation programs
- Oversees Water Conservation public outreach efforts
- Tracks water conservation-related regulation for applicability to SCWD
- Coordinates with municipalities to draft ordinances and polices that support and/or incentivize water conservation within SCWD's service area

Water Conservation Program Coordinator

Number of positions: 1

Time: 40% Field / 60% Office

Requirements: 4 year college degree + 2-3 years professional experience or appropriate level of relevant professional experience

Certifications: AWWA Water Conservation Practitioner Grade I, Irrigation Association Certified Landscape Irrigation Auditor and/or California Landscape Contractors Association Water Management

Salary Range: $55,000 - $79,000

Roles and Responsibilities: The primary responsibility of the Water Conservation Program Coordinator is to oversee the day-to-day operations of the water conservation program, including staff oversight and program implementation. The Water Conservation Program Coordinator answers to the Water Conservation Program Manager and provides reporting and program management support. Primary responsibilities for the Water Conservation Program Coordinator position include:

- Responsible for day-to-day program implementation and coordination
- Assists Water Conservation Program Manager with water conservation reporting

- Supervises Water-Conservation Specialists/Technicians
- Coordinates and manages vendors hired to implement water conservation programs. Participates in vendor selection process
- Oversees/participates in community events
- Prepares and presents public outreach for local community groups
- Plans and coordinates youth education programs

Water Conservation Specialists/Technicians

Number of positions: 2-3, depending on program needs

Time: 75% Field / 25% Office

Requirements: Combination of education/experience leading to a well-qualified candidate

Certifications: Irrigation Association Certified Landscape Irrigation Auditor and/or California Landscape Contractors Association Water Management within one year of employment

Salary Range: $44,500 - $65,000

Roles and Responsibilities: The Water Conservation Specialists or Technicians are responsible for specific tasks necessary to implement SCWD's water conservation programs. Customer service is an important aspect of this position, as the Water Conservation Specialists/Technicians interact with customers regularly as they help them participate in SCWD's water conservation programs. Specific responsibilities for the Water Conservation Specialist/Technician position include:

- Conducts indoor and outdoor water use surveys and prepares water use reports for the Residential Audit Program
- Responsible for application processing, customer support, and pre- and post-project inspections for the Turf Replacement Program
- Processes rebates for the Residential and Commercial Rebate Program (if implemented in-house by SCWD)
- Verifies device installation for the following programs:
    - Multi-family HET/UHET Direct Installation
    - Turf Replacement
    - FreeSprinklerNozzles.com High Efficiency Nozzle Distribution
    - High Efficiency Nozzle Direct Installation

- WBIC Direct Installation
- Residential and Commercial Rebate Program

- Provides customer assistance for the Large Landscape Water Budget Program
- Prepares for, sets up & attends community events and exhibits
- Provides school education and outreach (if not implemented by the Education Coordinator)

8.1 Staffing Schedule

It is not necessary for SCWD to hire all Water Conservation Program Staff immediately. SCWD will ramp up staffing levels as conservation program activity ramps up. Table 8-1 shows the number of each position necessary for the years 2012 through 2020 based on program needs. Note that fewer Water Conservation Specialists/Technicians are required if SCWD chooses to hire a vendor to process rebates for the Residential and Commercial Rebate Program.

Table 8-1: Water Conservation Staffing Levels Over Time

Position	2012	2013	2014	2015	2016	2017	2018	2019	2020
Program Manager	1	1	1	1	1	1	1	1	1
Program Coordinator	1	1	1	1	1	1	1	1	1
Specialist/Technicians (Rebates processed in-house)	1	2	2	2	2	2	2.5	2.5	2.5
Specialist/Technicians (Rebates processed by an outside vendor)	0.5	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Valencia Water Company

Water Conservation (Plan)

October 2012

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EXECUTIVE SUMMARY

Valencia Water Company ("Valencia") recognizes that the efficient use of water and energy are essential components to a long term sustainable water supply for our customers. Valencia has developed the Water Conservation Plan to show our progress to date in meeting our conservation goals and to outline the path to reaching our per capita water usage goals through 2020[1]. It includes detailed information about past performance and future programs for the years 2013-2016[2].

Implementation of the Water Conservation Plan will have the following results on total water savings and contribute to the Valencia's comprehensive water use reduction strategy. The elements of Valencia's water use reduction strategy are summarized below and explained in section II.

Source	2015	2020
	Ac-ft	Ac-ft
Passive	1,176.0	1,302.0
SCV WUE Plan	672.0	966.0
Recycled Water	1,000.0	2,000.0
Foundational	-	-
Programmatic	***917.4***	***1,548.4***
Undefined Conservation Savings	196.6	2,831.6
Total	**3,962.0**	**8,648.0**

[1] 2015-2020 Water Use Goals (reductions from water conservation) itemized on page C-5, Appendix C of the 2010 UWMP.

[2] Calendar years 2013-2016 include the remainder of Valencia's current General Rate Case Cycle, and the following General Rate Case years 2014-2016.

The Water Conservation Plan is organized into the following sections plus attachments:

Section I. Background and Purpose

This section explains the benefits of water use efficiency to our community, the legal and regulatory environment in which we operate, and our progress to date in implementing cost effective conservation programs. It includes the primary planning and regulatory documents that guide our programs and the accountability standards for those programs.

The conclusion to be drawn from Section I is the need to shift from focusing on programs and processes to an emphasis on outcomes. The political and regulatory climate is such that we are increasingly expected to become more accountable and demonstrate the cost benefit of our programs as a measure of success.

Section II. Valencia's Comprehensive Water Use Reduction Strategy

This section focuses on Valencia's comprehensive water use reduction strategy and demonstrates how the water savings identified in the Water Conservation Plan relate to the state mandated water use reduction targets. Valencia's strategy incorporates water use savings that have been identified in the Santa Clarita Valley Water Use Efficiency Strategic Plan completed in 2008 and the 2010 Urban Water Management Plan.

Section III. Current Conservation Programs

This section lists the specific programs we have implemented, annual expenditures historically for each program, and the quantity or scope of the program for the latest full year which is 2011. There is a chart which shows the total number of each type of rebate offered, residential and commercial water surveys conducted that year, and estimates for expenditures in the current calendar year.

Following the budget information is a brief explanation of each program including the target customers, general methodology and future plans for program continuation.

To summarize Section III, Valencia has increased our budget, our staff and our accountability for program outcomes, with excellent results. Our per capita usage has declined and will continue to do so as we focus on those programs with the best return on investment for our customers and with the highest levels of customer satisfaction and appeal.

Section IV. Planned Conservation Programs

The first part of this section is an explanation of our approach to planning for conservation programs and some strategic changes in direction we are making to better serve our community. This is followed by a Gantt chart of each program for the years 2013-2016 and which programs will be offered each year, color coded to distinguish those that are continuations from previous years and those that are new. There is also a detailed description of each program, similar to the descriptions of current programs in Section III.

Our planned programs show our increased emphasis on outdoor water use and the need to reach out to our commercial, industrial and institutional[3] customers more fully than we have in the past. Large landscapes, found primarily with Dedicated Irrigation Meters will be one of our key targets for water reduction.

Section V. Cost Benefit Analysis

The cost benefit analysis was done for each program for which we can reasonably determine the assumptions necessary to determine the cost benefit. There are

[3] Commercial/Industrial/Institutional ("CII") is a technical term used by the CUWCC and other conservation professionals to categorize non-residential and non-irrigation water use customers. The CPUC refers to these groups as Commercial, Industrial and Public Authority. Valencia has further refined the Public Authority customer class as Public Authority-Parks and Public Authority (Non-Parks) in the Water SMART Allocation and Tiered Rates Program Exhibit #4 of this 2014-2016 General Rate Case application.

educational and administrative programs whose impact cannot be measured in the same way that the replacement of a showerhead with a lower flow rate can be measured. There are numerous studies and sources available for cost benefit analysis that were used to develop the Cost Benefit Model included in the Water Conservation Plan (See Attachment 6). The model helps Valencia meet its need to have a measure of expected programmatic cost benefit to ensure that both customers and investors are receiving an acceptable return on investment for their conservation programs.

Our cost benefit analysis shows that the only one of our programs that does not have a positive return on investment is one that we had already planned to phase out after calendar year 2013. This is our Ultra Low Flow Toilet rebate program which is being replaced with the Ultra High Efficiency Toilet rebate program.

Section VI. Requested Conservation Expenses 2014-2016

This section explains the conservation expenses projected for 2013, and requested for each program for the years 2014-2016. The total costs requested are:

2013: $343,500

2014: $496,000

2015: $564,500

2016: $593,000

Attachments

The attachments provide the basis for the decisions in the Water Conservation Plan and how we arrived at our water and dollar savings for each year.

Attachment 1: The Santa Clarita Valley Water Use Efficiency Strategic Plan is provided on CD and shows the expected per unit water savings that have been calculated for many of our programs and the conservation goals and programs for our combined water agencies.

Attachment 2: Valencia's 2009-2010 CUWCC BMP Coverage Reports that show that Valencia is currently on track for its Foundational and Programmatic BMPs.

Attachment 3: Valencia's 2009-2010 AWWA Water Loss Reports.

Attachment 4: Valencia's WaterSmart Allocation and Tiered Rates Program as presented at the 2012 Water Smart Innovations Conference.

Attachment 5: Press release and promotional materials for Valencia's conservation programs.

Attachment 6: Cost benefits analysis for current and planned conservation programs.

Attachment 7: Applicable Valencia Water Company Conservation Tariffs.

Attachment 8: 2012 Residential Water Survey- Service Cost Table.

Attachment 9: Free Sprinkler Nozzles Memorandum of Understanding.

Attachment 10: Commercial/Industrial Water Survey Proposal.

VALENCIA WATER COMPANY WATER CONSERVATION (PLAN)

PREPARED TESTIMONY FOR GENERAL RATE CASE

Conservation Mission Statement

We support supply and demand-side conservation of water and energy to meet our customers' current and future needs, to assist with their conservation goals, and to maintain and enhance the overall quality of life and comfort thus achieving the highest level of customer satisfaction.

SECTION I. BACKGROUND

Water Utility business practices have changed dramatically over the last twenty years with an increased emphasis on the responsible stewardship of water as a precious resource. Water use efficiency provides multiple benefits for our community including, but not limited to, lowering demand, ensuring the availability of long term water supplies, saving energy[4], and reducing water and wastewater treatment costs.

The regulatory environment has also changed in response to growing demands for water and extreme drought conditions throughout the Western United States that limit new supplies of water. Valencia is working with regulators, customers and other stakeholders to implement programs with both proven results and customer acceptance and satisfaction.

Valencia has responded with a positive and aggressive commitment to reducing consumption as measured in gallons per capita day ("GPCD"), which we believe is the fairest way to measure the results of our efforts and set new conservation goals for the future. This methodology is

[4] California's water energy relationship, water-related energy use consumes 19 percent of the state's electricity, 30 percent of its natural gas, and 88 billion gallons of diesel fuel every year, and this demand is growing. (California Energy Commission: California's Water – Energy Relationship (Final Report), November 2005).

also supported by the regulatory agencies and statewide partnership organizations to which we are accountable, including the State of California ("State"), the California Public Utilities Commission ("CPUC"), and the California Urban Water Conservation Council ("CUWCC"). As of 2012, Valencia's baseline GPCD is 278[5]. Below is a chart showing the total amount of water usage expected based on the baseline, versus what was actually used each year, with a total savings of over 14 billion gallons of water since 2002.

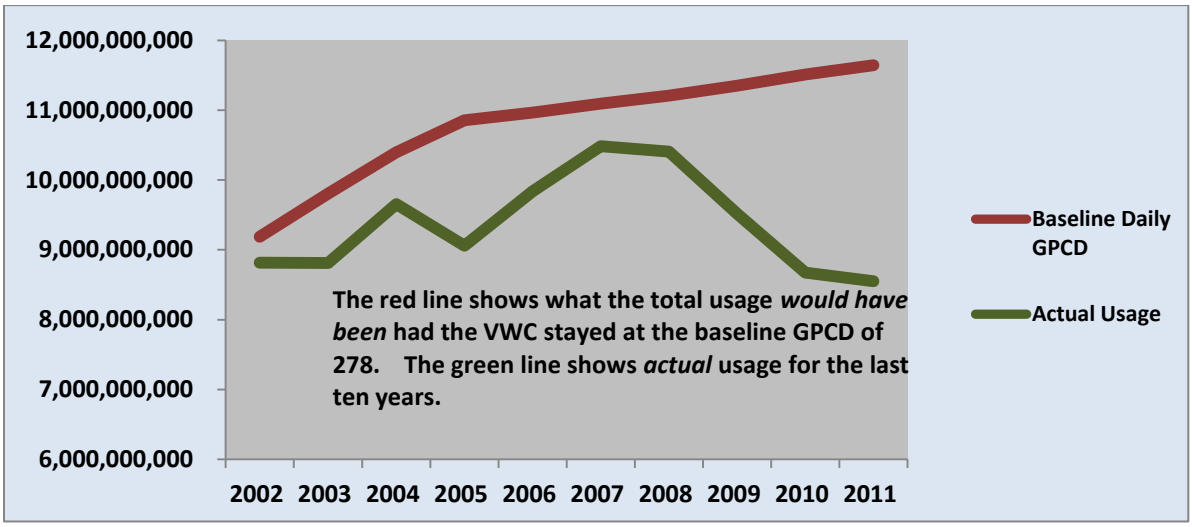


Figure 1. Valencia Water Company – Actual Water Consumption v. Baseline Daily Per Capita Water Use (2002-2011)

[5] GPCD is a metric established by SBx7-7 via the State of California, as well as for the CUWCC. SBx7-7 was enacted in November 2009 and required all water suppliers to increase water use efficiency. Urban water retailers are required to include in their Urban Water Management Plans the baseline daily per capita water use, water use target, interim water use target, and compliance daily per capita water use. Valencia's Baseline GPCD includes the average annual Potable Water GPCD for the years 1997 through 2006.

These reductions in usage happened despite a steady increase in our population of over 26% since 2002.

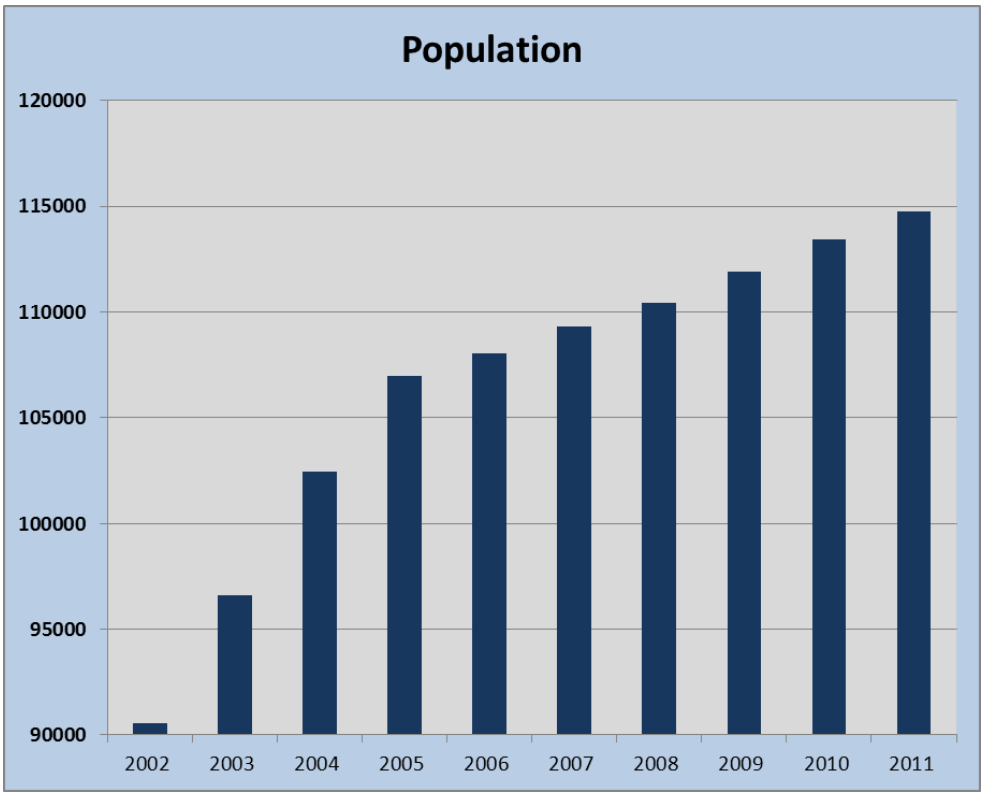


Figure 2. Valencia Water Company – Population Growth (2002-2011)

Hierarchy of Regulations, Legislation and Planning Documents

Included in this section is a synopsis of the current regulatory and voluntary conservation policy environment in the State of California. The hierarchy of Legislation and Planning Documents (Figure 3) provide a view of the many policy pieces that have been considered in Valencia's Water Conservation Plan.

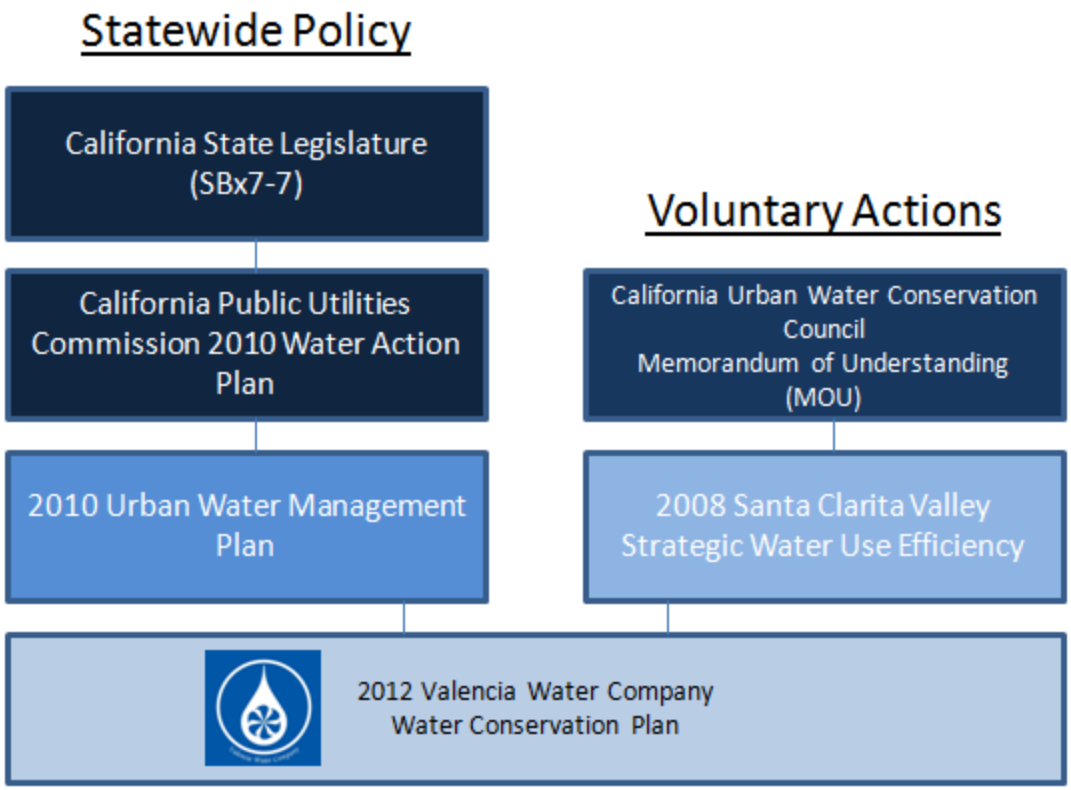


Figure 3. Valencia Water Company – Hierarchy of Legislation and Planning Documents

State of California Legislation SBx7-7

In November of 2009, the Governor and California State Legislature reached an historic agreement to require water utilities to reduce per capita consumption by 20% by December 31, 2020. This legislation also mandates incremental progress towards this goal by reducing per capita consumption 10% by 2015.

As noted above, Valencia Water Company's baseline per capita is 278 GPCD with a goal of 250 in 2015, and a final goal of 222 GCPD by the end of 2020.

California Public Utilities Commission

In December of 2005 the California Public Utilities Commission ("CPUC") adopted a Water Action Plan to apply regulatory best practices from the energy utilities to the water utilities and to place water conservation at the top of the loading order as the lowest-cost supply of new water. This plan was updated in 2010 and reflects the growing sense of urgency to make the

regulatory and reporting changes necessary to create incentives for investor-owned water utilities to aggressively pursue water efficiency measures.

The 2010 Plan has six objectives, each with a series of actions designed to help achieve their objectives. These objectives reflect the need to:

- Maintain highest standards of water quality.
- Promote water infrastructure investment.
- **Strengthen water conservation programs to a level comparable to those of energy utilities.**
- Streamline CPUC decision making.
- Set rates that balance investment, conservation and affordability.
- Assist low income ratepayers.

Additionally, in Phase II of the Conservation OII, Commission Decision D.11-05-004 ordered "the conservation goal of a 1-2% annual reduction in consumption per service connection per customer class in one hundred cubic feet, through price and non-price programs."

Urban Water Management Plan

The Urban Water Management Plan ("UWMP") is a long-term planning tool that guides the actions of urban water suppliers and is prepared every five years. It provides managers and the public with a broad perspective on a number of water supply issues. The most recent UWMP was prepared in 2010 by Castaic Lake Water Agency ("CLWA"), Newhall County Water District, Santa Clarita Water Division of CLWA, Valencia Water Company, and Los Angeles County Waterworks District 36. The UWMP also describes the water Demand Management Measures ("DMMs") implemented by CLWA and the retail purveyors as part of the effort to reduce water demand in the Valley. Under SBx7-7, Valencia is required to submit its progress towards the GPCD baseline reduction goals in the 2015 UWMP.

California Urban Water Conservation Council

The California Urban Water Conversation Council ("CUWCC") is charged with promoting conservative and efficient water use for California. To accomplish this, CUWCC developed a Memorandum of Understanding ("MOU") regarding urban water conservation based on a list of Best Management Practices ("BMPs") that water companies will adopt in order to use water efficiently. The BMPs have continually evolved over time, as has the mechanism for evaluating and reporting the impact of the BMPs. Valencia signed the MOU in 2006, although the company had proactively implemented many of the BMPs long before becoming a signatory member of the CUWCC.

In 2008 the CUWCC revised the MOU and BMPs when it was recognized that a single implementation method would not be appropriate for all water agencies. The revised BMPs now contains two categories of BMPs.

The first category is "Foundational BMPs," which include:

Utility Operations

- Metering
- Water loss control
- Pricing
- Conservation coordinator
- Wholesale agency assistance programs
- Water waste ordinances

Public Education

- Public outreach
- Public school education programs.

These are measures that each agency is expected to implement on an on-going basis as part of their normal operations.

The second category of BMPs is "Programmatic BMPs," which include:

- Single and Multi-Family Residential Programs
- Industrial, Commercial and Institutional Programs
- Landscape Programs

Valencia Water Company is actively engaged in water efficiency programs in each of the BMP categories, and has been conducting most of these programs for several years. For CUWCC's GPCD methodology, Valencia current baseline is 271 GPCD and a 2018 target of 222 GPCD[6].

Santa Clarita Valley Water Use Efficiency Strategic Plan

The Family joined together to develop a plan to improve water use efficiency in the Santa Clarita Valley ("SCV"). The Water Use Efficiency Strategic Plan ("WUE Plan") includes projects that will most effectively reduce the per capita water use in the SCV. The WUE Plan also provides a framework that establishes conservation program responsibilities by agency, activity, and cost benefit. The WUE Plan was approved in 2008 and is scheduled to be updated in 2013. The WUE Plan is included in this exhibit as Attachment 1.

Valencia Water Company's Progress in Water Efficiency

Over the last five years, Valencia has taken a number of steps to decrease GPCD and to support the more efficient use of water in our community, in a manner that customers understand and support. Collectively these water efficiency steps have successfully decreased the Valencia GPCD water use by significant amounts. Here are some of the major ways we have supported water efficiency efforts:

[6] The 2010 UWMP, Chapter 7, provides additional information on Valencia's CUWCC GPCD baseline and targets.

Valencia's budget and staffing levels have increased for conservation programs. We serve more customers with these programs, conduct more outreach, and improve community visibility of the importance of water as a highly valued resource.

From 2010 – 2012, pursuant to CPUC Decision 10-12-029 and Decision 12-01-005, Valencia initiated the Water Smart Allocation and Tiered Rates program that provided water allocations for all residential accounts and more recently for all dedicated irrigation meters. This project was a major undertaking. It required the use of new software to accurately map the irrigated square footage, by plant type of all irrigated areas for each account (over 26,000 residential, and 1,290 dedicated irrigation accounts/meters), determine the water needed for these plants using area evapotranspiration (ET) factors, and apply a reasonable efficiency factor for irrigation water delivery. Finally, a water allocation was assigned to each account and pricing signals are presented to the customer to discourage the inefficient, excessive and wasteful use of water.

This one-time investment is maintained at a much lower annual cost than incurred in the initial program year, but yields benefits every year through customer awareness and attention to the water needs of their specific landscape and efficient indoor water use. The site specific water allocation is presented every month to customers on their water bills. The WSA Program serves as the major branding and communication piece for Valencia's Conservation Programs. The majority of Valencia's conservation activities have been developed to assist customers with their individual indoor and outdoor allocations as established by the WSA Program[7].

The CUWCC's BMP changes made in 2008 included more emphasis on operational issues such as system water losses. In response Valencia conducts annual studies of water losses and has achieved very positive results. Valencia has identified water losses of 4.93% of source water, which means we operate far more efficiently than the national average[8], and can focus our

[7] For residential customers the WSA indoor allocation is based on 55 gallons per person per day and the outdoor allocation assumes an irrigation efficiency of 71%. For dedicated irrigation customers, the outdoor allocation assumes an irrigation efficiency of 62.5%.

[8] A 1996 overview of water production and delivery statistics for 469 U.S. water utilities showed meter water ratios averaging 84%, implying unaccounted-for water ("UFW") of 16% of production, on average. The range of UFW

efforts on other priorities. This also means we are below the threshold that would require a full system water audit, thus allowing Valencia to allocate resources more directly to successful water saving programs. In addition, Valencia has undergone a large scale meter replacement program to ensure accuracy in readings, and upgraded software to improve our data analysis capabilities.

SECTION II. VALENCIA'S COMPREHENSIVE WATER USE REDUCTION STRATEGY

Valencia current water conservation targets mandated by the State's SBx7-7 legislation (20% by 2020) are 3,962 ac-ft in 2015, and 8,648 ac-ft in 2020. Water savings from many sources, programs, and activities are necessary to meet these water use reduction targets. With this in mind, Valencia is planning on reducing potable water use on multiple fronts, including the diversification of our conservation program portfolio, expansion of the current conservation marketplace and expansion of recycled water use. The elements of Valencia's water use reduction strategy are summarized in Figure 5 and explained in the paragraphs that follow.

Source	2015	2020
	Ac-ft	Ac-ft
Passive	1,176.0	1,302.0
SCV WUE Plan	672.0	966.0
Recycled Water	1,000.0	2,000.0
Foundational	-	-
Programmatic	***917.4***	***1,548.4***
Undefined Conservation Savings	196.6	2,831.6
Total	**3,962.0**	**8,648.0**

Figure 4 – Valencia Water Company – Water Conservation Targets by Source (2015 and 2020)

was very large, from over 50% down to 1%, with a 13% modal (most frequently occurring) value. Page 49. Thornton, Julian, Water Loss Control Manual (2002).

The Water Conservation Plan is designed to lead Valencia in the right direction in a manner that provides flexibility and can be adaptive to the successes, or limitations, of programs that Valencia chooses to implement.

Based on current water use efficiency/conservation plans, understanding of existing and future customers, and the rapidly changing regulatory environment, Valencia has developed a Water Conservation Plan that incorporates water use savings from the following sources:

Passive

This is the estimated water conservation by Valencia's customers that will naturally occur. The SCV WUE Plan identifies passive water conservation savings as "the installation of conservation devices due to natural replacement, remodeling, or demolition in the presence of water efficiency plumbing codes." It is important to recognized Passive conservation in a Conservation Plan to accurately estimate the future conservation savings potential from other conservation programs. It is also important to recognize the Passive conservation savings in developing a Conservation Plan to ensure customers do not bear the burden of costs for additional conservation programs that really are not needed.

For Valencia, water savings from passive sources is 1,176 ac-ft in 2015 and 1,302 ac-ft in 2020[9].

SCV WUE Plan

The SCV WUE Plan also identifies reductions in water use resulting from the implementation of specific water use efficiency programs. These programs are being implemented in the SCV by CLWA on behalf of the water retailers, including Valencia. The programs include High Efficiency Toilet and High Efficiency Washing Machine rebates, Large Landscape and CII audits with customized rebates, landscaping classes with a free Weather Based Irrigation Controller and SCV wide marketing.

[9] The savings estimate assumes that 42.6% of all passive savings will occur in Valencia's service territory, where Valencia's water use accounts for 42.6% of total water use in the Santa Clarita Valley.

For Valencia, the SCV WUE Plan identifies water use savings of 672 ac-ft in 2015, and 966 ac-ft in 2020[10].

Recycled Water

SBx7-7 provides for the use of recycled water as a means for a water company to reduce its potable water demands. Valencia plans to increase its use of recycled water to existing and future customers. The 2010 UWMP notes that Valencia will expand its deliveries of recycled water to 1,000 ac-ft in 2015, 2,000 ac-ft in 2020 and 12,200 ac-ft by 2050. The increased use of recycled water will significantly impact Valencia's total available annual potable water supplies.

Foundational BMPs

Valencia implements the Foundational BMPs identified by the CUWCC and reports their status and compliance every two years. The water use reductions resulting from the implementation of the Foundational BMPs are not specifically quantified on a practice or by action basis in the Water Conservation Plan due to the challenging nature of accounting for their actual savings. The CUWCC recognizes, and the population in general would have to agree, that educating children (one of the Foundational BMPs) that water is a precious resource that should not be wasted, will result in adults who have grown up with a water efficiency ethic. Those future adults will automatically use water more efficiently which will result in further water conservation. Attempts to quantify the water savings from Foundational BMPs would be subject to criticism. To that end, Valencia has opted to include these known, but unquantified, water savings in our discussion of the "Undefined Conservation Savings" in this section.

Programmatic Conservation Programs

Valencia's Programmatic Conservation programs are identified and discussed in detail in Sections 3 though 5 of the Water Conservation Plan. The programs detailed in the Water Conservation Plan are estimated to reduce Valencia's water use by 917.4 ac-ft in 2015, and 1,548.4 ac-ft by 2020.

[10] The savings estimate assumes that 42.6% of all SCV WUE Plan savings will occur in Valencia's service territory, where Valencia's water use accounts for 42.6% of total water use in the Santa Clarita Valley.

Undefined Conservation Savings

Water use reductions resulting from undefined water conservation programs, actions or activities total 196.6 ac-ft in 2015, and 2,831.6 ac-ft in 2020. It is appropriate for Valencia to have "Undefined Conservation Savings" estimates as part of its comprehensive water use reduction strategy based on the following rationale:

1. The Water Conservation Plan does not include water use reduction estimates resulting from Valencia's implementation of the foundational BMPs. This is due, in part, to the lack of empirical data supporting the water savings achieved via their implantation, i.e. metering, conservation rates, conservation coordinators, education, etc. However, considering that Valencia has tackled foundational BMPs through progressive approaches, significant water savings will occur and each such effort contributes to the visibility of the conservation program, and the development of a "culture of conservation".
2. The Water Conservation Plan does not include water savings resulting from Valencia's historic water conservation programs. However, the reduction in customer water use from these programs will contribute towards Valencia's water use reduction targets. CUWCC has found that Valencia has been "in compliance" with pre-GPCD reporting requirements, where program compliance was based on a specific number of completed conservation actions per year. Valencia has since amended our compliance requirements and will use the GPCD reporting method going forward.
3. The Water Conservation Plan currently does not include the water savings from the anticipated CII programs.
4. Due to the nature of the data associated with water savings and conservation programs, it is conservative to pessimistically view projected water savings for the distant future for the following reasons:
    a. Future participation rates can vary
    b. Effects of future regulations or unknown

c. Impacts of weather and economic variables are volatile and unpredictable
d. New conservation programs as a response to changing customer wants/needs, as well as new technologies are unknown and therefore subject to change

5. The Water Conservation Plan identifies conservation programs and expenses for years 2013-2016, and does not include growth for potentially needed additional conservation programs and expenses for the next GRC cycle for year 2017-2019.
6. The State has already mandated building codes that will significantly improve the efficiency (water and energy) of future residential, commercial and landscaping construction[11].

Therefore, Valencia will continue to annually monitor its progress towards the identified 2015 and 2020 water savings goals and adapt its Water Conservation Plan as appropriate. This will include assessing the effectiveness of its existing programs. It will also include Valencia's actual water savings which by default will include the hard to quantify savings that comes from the Foundational BMPs. Using this adaptive approach will ensure Valencia achieves its water reduction targets and that its conservation expenditures are appropriate based on need and future conservation programs.

[11] For additional information and discussion on the conservation impacts of future building code changes, see the WUE Plan, State Assembly Bill 1881 and DWR 2010 Model Water Efficient Landscape Ordinance

SECTION III. VALENCIA'S CURRENT WATER CONSERVATION PROGRAMS

One of our greatest challenges in water conservation planning is the changing atmosphere in which we operate and the need to respond to these changes quickly. Drought conditions create more urgency for conservation, while economic downturns often mean less willingness on the part of customers to participate in the costs of retrofits. The rapid emergence of new technologies is another factor that has greatly influenced conservation programs over the last five years. In order to take advantage of the opportunities that arise, and to continue to respond to our various stakeholder interests, it is increasingly important to maintain flexibility in our programming, always maintaining cost effectiveness of our conservation efforts as well as ensuring that our programs are designed to best meet our customer's conservation goals.

The CUWCC now allows BMP compliance under one of three methods: Traditional BMPs, Flex Track (allowing flexibility in the methods to achieve the specific BMP savings goals) and Gallons Per Capita Day (GPCD) (the CUWCC Steering Committee approved the GPCD option June 11, 2009). For the reasons noted above, Valencia has opted to follow the GCPD approach to comply with the Programmatic BMPs. Under this approach, Valencia has a base line of 271 GPCD and a 2018 target of 222 GPCD[12].

The following is a summary of Valencia's current and past conservation programs and practices, followed by a more detailed description of current programs.

[12] The CUWCC's GPCD compliance method requires participating agencies to reduce their annual GPCD by 18% by 2018, two years earlier than SBx7-7, which requires a baseline GPCD reduction of 20% by 2020.

FOUNDATIONAL BMP'S	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Estimate
Ulitity Operations Programs 1.1 - 1.4						
BMP 1.1 Conservation Coord. & Water Waste Prevention						
Resource Conservation Mgr.						
Residential Conservation Coord.						
BMP 1.2 Water Loss Control	**Expenses related to BMP 1.1, 1.2, 1.3 programs are itemized in Exhibit 1 of the GRC application.**					
BMP 1.3 Metering with Commodity						
BMP 1.4 Retail Conservation Pricing						
DCSE - Water Smart Support		$ 39,960	$ 57,859	$ 45,373	$ 14,375	$ 14,000
Total Utility Operations Programs	**$ -**	**$ 39,960**	**$ 57,859**	**$ 45,373**	**$ 14,375**	**$ 14,000**
Education Programs 2.1 2.2						
BMP 2.1 Public Information Programs						
Residential Marketing			$ 19,845	$ 13,784	$ 24,819	$ 16,000
Marketing					$ 19,816	$ 9,000
Promotional Items			$ 5,217		$ 6,205	$ 11,000
Santa Clarita Valley Family of Water Providers	$ 50,742	$ 12,242	$ 26,624			$ 5,000
BMP 2.2 School Education Programs						
School Kits	$ 45,786	$ 14,080	$ 24,791			
Total Education Programs	**$ 96,528**	**$ 26,322**	**$ 76,477**	**$ 13,784**	**$ 50,840**	**$ 41,000**

Figure 5. Valencia Water Company – History of Expenditures for Foundational BMP's.

PROGRAMMATIC BMPs	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Estimate
BMP 3 Residential Programs						
WaterWise - Residential Audits	$ 5,060	$ 58,900	$ 43,590	$ 60,140	$ 80,773	$ 185,000
HELIUM Rebates						$ 54,000
High Efficiency Washer Machines			$ 308			$ 29,000
ULFT/HET Rebate Programs		$ 15,732	$ 24,192	$ 43,875	$ 7,156	$ 8,000
UHET Rebate Programs						$ 11,000
Water Conservation Classes						$ 44,000
ET Controller Installation	$ 4,434	$ 91,606	$ 17,036	$ 40,566		$ 2,000
Total Residential Programs	**$ 9,494**	**$ 166,238**	**$ 85,126**	**$ 144,581**	**$ 87,929**	**$ 333,000**
BMP 4 CII Programs						
Comm Water Use Efficiency Master Plan						
Commercial Audits	$ 30,790	$ 36,595	$ 54,900		$ 4,950	$ -
Total CII Programs	**$ 30,790**	**$ 36,595**	**$ 54,900**	**$ -**	**$ 4,950**	**$ -**
BMP 5 Landscape Programs						
HELIUM - Submetering		$ 4,769	$ 2,740		$ 3,801	$ -
HELIUM Rebates (Dedicated Irr Meters)					$ 29,407	$ 35,000
Irrigation Assessment Programs						$ 30,000
Total Landscape Programs	$ -	$ 4,769	$ 2,740	$ -	$ 33,208	$ 65,000
Miscellaneous and Other						
Data Analysis						$ 17,000
Other	$ 6,851	$ 6,250	$ 3,341	$ 3,506	$ 4,701	$ 3,000
Total Miscellaneous	**$ 6,851**	**$ 6,250**	**$ 3,341**	**$ 3,506**	**$ 4,701**	**$ 20,000**

Figure 6. Valencia Water Company – History of Expenditures for Programmatic BMP's

All BMPs	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Estimate
Total Foundational BMPs	$ 96,528	$ 66,282	$ 134,336	$ 59,157	$ 65,215	$ 55,000
Total Programmatic BMPs	$ 47,135	$ 213,852	$ 146,107	$ 148,087	$ 130,788	$ 418,000
Total	**$ 143,663**	**$ 280,134**	**$ 280,443**	**$ 207,244**	**$ 196,003**	**$ 473,000**

Figure 7. Valencia Water Company – Combined Expenditures for All BMP's

In some cases, programs that were initially implemented by Valencia were later provided by CLWA so that Valencia's conservation dollars could be spent on programs not otherwise available, such as CII audits, school education and retrofit programs.

SUMMARY OF PROGRAMS CONDUCTED IN 2011		
PROGRAMMATIC BMPs	Quantity & Description	Funding Source
BMP 3 Residential Programs		
Prog #1: WaterWise - Residential Water Surveys & Retrofits	257 Single family surveys	Gen Rates
	239 Full surveys	
	4 Leak surveys	
	14 Lanscape surveys	
Prog #2: Low Flow Showerhead Distribution	183 Showerheads	Gen Rates & CLWA
Prog #3: High Impact Residential Outreach	62 Customer meetings	Gen Rates
	10 Surveys	
	21 WBIC installed	
	10 Landscape Assessment Rpts	
Prog #4: High Efficiency Landscape Irrigation Upgrade Measures	5 Large Landscape Customers	Gen Rates
Prog #5: WBIC	214 WBICs provided	CLWA
Prog #6: WBIC Installation	99 Controllers installed	Gen Rates
	78 CLWA provided controllers	
	21 High Impact Outreach (#3 above)	
Prog #7:ULFT/HET Rebate Programs	435 Toilet rebates	CLWA
Prog #8: HET Rebate Programs	119 Toilet rebates	Gen Rates
BMP 4 CII Programs		
Commercial Audits	8 Sites Surveyed	CLWA
BMP 5 Landscape Programs		
Prog #1: Large Landscape Conservation Program	10 Customers Surveyed with 171 metered accounts	CLWA
Prog #2: HELIUM - Submetering	1 Irrigation sub-meters installed	Gen Rates

Figure 8. Valencia Water Company – Conservation Programs Conducted in 2011

Below is a more detailed description of programs currently being implemented organized by BMPs, because this format is required for reporting to the CUWCC and is a standard for describing conservation programs in California.

Foundational BMPs (Utility Operations Programs 1.1 – 1.4)

Foundational BMPs are considered essential elements of every water conservation program and should be an on-going part of operations. Although these BMPs are required, the cost effectiveness is harder to measure for most as compared to programmatic BMPS. Educational programs for children are a good example of this phenomenon. There is consensus amongst the conservation community that education is a necessary component and contributes to the overall success of any program, however, limited empirical data exists that quantifies, in terms of gallons per unit, such a program's effectiveness. Another example is the Loss Control Program that is a cost to Valencia but currently not a cost benefit in part because it shows that there is not a loss control issue which would require Valencia to go beyond the audit. Valencia will continue to perform the water loss audit and report findings in the bi-annual reports to the CUWCC (2009-2010 CUWCC Report Provided in Attachment 3).

BMP 1.1 - Conservation Coordinator and Water Waste Prevention

Summary of Program #1 – Conservation Coordinator

Valencia has a two person conservation department that includes the Resource Conservation Manager and the Residential Conservation Coordinator. The duties of the Resource Conservation Manager include, but are not limited to, general conservation coordination and comprehensive water demand/supply conservation program management, program development and implementation, annual program review, provide benchmarking/metric analysis and development, internal resource conservation activities, compliance with the 20% reduction in GPCD as defined in SBx7-7, and community leadership/relations pertaining to water conservation.

Additionally, Valencia maintains an active residential conservation coordinator position to facilitate residential programs and educate approximately 26,000 residential customers on the benefits of conservation.

Conservation department salaries are included in Administration Salary expenses in Exhibit 1 of the GRC application.

Summary of Program #2 – Water Waste Prevention

Valencia discourages the negligent or excessive use of water. Valencia includes water waste prohibitions in its tariffs (Conservation Tariffs Provided in Attachment 7). The voluntary provisions are encouraged at all times; however; mandatory restrictions are enforced only during drought conditions.

BMP 1.2 – Water Loss Control

Valencia annually reviews water purchases and production in relation to sales to measure total system water losses. Valencia utilizes the leak detection capability of its radio meters to identify leaks and notify customers of potential problems, and identified distribution system leaks are immediately repaired. Valencia also operates an aggressive maintenance program and replaced approximately 2,747 aging water meters in 2011. As a result of this diligent maintenance program, system losses have remained below the level requiring a major system wide audit. Using a 5-year average, system water losses were 4.48% of total production. This program was conducted throughout 2009, 2010[13] and will continue throughout this rate case cycle.

BMP 1.3 – Metering with Commodity

Valencia customers are fully metered. There are no un-metered services within the customer base. The costs of meters and installation are capitalized as fixed assets in Exhibit 1 of the GRC application.

[13] CUWCC reports are compiled on an annual basis and are reported on biennially, or every two years. The next reporting period will occur in 2013 for calendar years 2011 and 2012.

BMP 1.4 – Retail Conservation Pricing

Valencia maintains a rate structure consistent with BMP 11's definition of conservation pricing. Approximately 70% of our metered service revenues are generated by the commodity charge for customers. The price per unit is constant, therefore, the greater the consumption the greater the cost to the customer. Additionally, for residential and dedicated irrigation metered customers, the price per unit is on a 5-tier increasing quantity rate based on a water allocation.

Valencia implemented its Water Smart Allocation and Tiered Rates Program ("WSA") to individually metered residential homes in December 2009 with no changes to rates. The WSA and Tiered Rates Program is a fair and equitable method of providing residents with the amount of water calculated to efficiently meet their specific needs. Using extensive national research, local weather information and property specific landscape areas (calculated using publicly available aerial images), Valencia is able to provide each residential customer with a water allocation tailored specifically for their household. The knowledge of how much water is needed, coupled with tiered rates, or increasing price signals, provides the motivation and the necessary information to use water efficiently. In 2011, Valencia continued to educate customers on the benefits of the program, and how to use the information to achieve desired conservation goals.

In 2011 Valencia worked on expanding the WSA and Tiered Rates Program to include all dedicated irrigation metered ("DIM") customers. The WSA and Tiered Rates Program became effective for DIM customers on February 1, 2012.

Foundational BMPs (Education Programs 2.1 – 2.2)

BMP 2.1 – Public Information Programs

Valencia utilizes several outreach strategies to educate the public. Information on efficient water use is posted on the company's website[14], at its main office, and directly on customer

[14] Valencia's website currently provides limited real time messaging opportunities to notify customers of conservation activities and events. However, Valencia is planning on updating its website in 2013 to enhance its customer outreach capabilities.

water bills. Additionally, Valencia representatives participate in local events, answering questions, distributing water conservation information and low-flow retrofit devices.

The Landscape Education Program is a community project provided by CLWA. The program is an effort to increase water awareness in the SCV and offers a classroom and garden setting for those who want to learn more about water efficient gardening and landscaping appropriate for the climate in the SCV. In addition, and free to the public, is a seven acre garden demonstrating irrigation systems, plants, and plant groupings that are appropriate to water-conserving landscapes in Southern California.

In 2011 CLWA implemented a social marketing campaign entitled "Know your water number." The program encouraged residents in Santa Clarita to better understand their water use in terms of gallons per capita per day. Using a computer interface, customers could determine their individual gallon per day estimate based on parameters that included water use practices, fixtures, and the plant material for their homes.

In addition to the programs cited above, Valencia is a promotional partner for the Environmental Protection Agency's ("EPA") WaterSense Program. As a promotional partner, Valencia participates in several messaging events developed by WaterSense that include 'Fix a Leak Week," "Build a Better Bathroom" and "We're for Water" campaigns. Valencia also provides rebates for WaterSense approved HET toilets as well as promotes products to its customers that carry the WaterSense label. Examples of the marketing materials for these efforts can be found in Attachment 5.

These programs were provided to Valencia's customers throughout 2011, are continuing in 2012 and will continue through 2016. Valencia estimates its expenditure for these programs will remain consistent with past expenditures, but with slightly more emphasis targeted to residential customers.

Santa Clarita Valley Family of Water Suppliers

Valencia, in partnership with the Santa Clarita Valley Family of Water Suppliers ("Family"), actively promotes water conservation and water use efficiency during community events including Earth Day, the Home and Garden Show, River Rally, Make a Difference Day, and CLWA's Open House. Valencia also works with the Family by hosting and maintaining the Family's official website (www.scvh20.com) and the www.santaclaritagardens.com website. On the latter website, customers can learn about available conservation programs, by supplier, or about water efficiency landscape materials, plants, as well as view samples of existing water efficient landscapes. In 2008, Valencia partnered with the Family to develop the SCV WUE Plan, which is scheduled to be updated in 2013. Valencia plans to remain engaged in Family activities and recognizes the many benefits provided including valley-wide marketing, consistent conservation messaging and presence, economies of scale and cooperation towards common water use efficiency goals. Valencia plans to spend $26,000 on Family activities in 2013, and $25,000 per year for years 2014 through2016.

BMP 2.2 – School Education Programs

Valencia places high priority on educating children about the importance of protecting our local water resources. As evidence of this priority, Valencia has worked in cooperation with CLWA for several years to provide an education program for school-aged children (K-8th grade). The program administered by CLWA, at the Rio Vista Water Treatment Plant, is called the School Education Program. It provides interactive student activities that present interesting and age-appropriate water treatment and conservation topics. Over 13,000 students valley wide are signed up each year, with approximately 4,278 students participating within VWC's service territory. This program was provided to school-aged children of VWC customers throughout 2011 and is continuing in 2012 and the foreseeable future.

Programmatic BMPs (Residential – BMP 3)

BMP 3.1 Water Survey Programs for Single and Multi Family Residential Customers

Summary of Program #1 - Residential Surveys

Valencia offers a Free Residential Water Audit Program that helps customers identify opportunities for using water more efficiently. To implement this program, Valencia has retained the services of the consulting firm WaterWise Consulting, Inc. WaterWise contacts Valencia's customers and offers complete indoor/outdoor water use surveys. The goal of the program is to provide customers with an understanding of where and how much water is being used on the property, identify inefficient water use, and install free low-flow devices such as kitchen and bathroom faucet aerators, showerheads, toilet displacement devices, and hose nozzles. They also explain Valencia's rebate programs for the replacement of high water use devices such as toilets and irrigation controllers. Valencia also offers these WaterWise surveys to all newly registered Low Income customers.

In 2011, Valencia contracted with WaterWise and surveyed 257 single family homes (239 Full Surveys, 4 Leak Surveys, and 14 Landscape Surveys) and 126 multi-family homes. This program began February 1, 2007, was active for all of 2011 and is continuing in 2012.

Valencia's goal is to survey approximately 500 single family and multi-family units per year. The current price per unit for the residential survey is approximately $210 per survey. However survey prices vary depending on their focus[15] (See Attachment 8). Valencia will continue this program through 2016.

Summary of Program #2 – Plumbing Retrofits

Valencia has integrated this program into the Free Residential Water Audit Program. Retrofit items will be installed by WaterWise consultants per customer request, but are otherwise

[15] Valencia customers can request full residential surveys that include indoor and outdoor water use efficiency assessments, irrigation only surveys, leak detection inspections, rebate inspections. Surveys are also offered to residential HOA, duplex type residences (condos) or to multi-family residential customers.

installed by the property owner. Additionally, retrofit items include low-flow showerheads distributed during special events such as Earth Day, and the River Rally. Valencia distributed 183 low-flow showerheads during 2011. Valencia will continue to distribute water conservation promotional materials, devices, and information during community events.

Summary of Program #3 High Impact Residential Outreach

In 2011, Valencia developed a focused outreach program for customers with irrigated areas in excess of 10,000 sq ft that included individual contact and customized conservation assistance. The outreach focused on participation in water use efficiency programs that included residential surveys, irrigation system assessments, weather based irrigation controllers, and periodic water consumption review. One major deliverable of the program included a landscape assessment report that provided customers with information on the current performance of their irrigation system, as well as information on specific system improvement opportunities and life cycle costing estimates. Valencia contracted with K2Group to provide services for the Hi Impact/Large Lot Residential Customer Landscape Survey. The program began January 1st, 2011 and was active for all of 2011. Valencia met with 62 residential customers and provided 10 single family surveys, installed 21 weather based irrigation controllers, and delivered 10 landscape assessment reports. Valencia maintains periodic contact with many of the customers that participated in this program and will continue to work with these customers to assist with their conservation goals.

Summary of Program #4 – High Efficiency Landscape Irrigation Upgrade Measures (HELIUM)

In October of 2011, Valencia released the High Efficiency Landscape Irrigation Upgrade Measures Rebate Program (HELIUM Rebates). The HELIUM program provides rebates up to 50% of the cost for high efficiency irrigation spray nozzles and pressure regulating spray heads or master pressure regulating devices. The program began October 1st, 2011 and Valencia distributed approximately 500 high efficiency irrigation spray nozzles and 500 pressure regulating spray heads or master pressure regulating devices.

In 2012, Valencia expanded the HELIUM program to include Free Sprinkler Nozzles where customers can obtain free nozzles by watching online demonstrations and print vouchers where they can receive up to 25 free nozzles from their local irrigation vendor. The current unit cost for each high efficiency irrigation spray nozzle is $3.25 (See Attachment 9). Valencia will continue this program through 2016 and plans on rebating approximately 9,000 nozzles per year.

Summary of Program #5 – Weather Based Irrigation Controllers

Valencia used to have a program where we would provide and install a WBIC at our customer's homes if they attended a 2 hour irrigation class. In 2010, CLWA began offering free WBICs to Santa Clarita residents if they attended a landscape and irrigation course of their own. Therefore, beginning in late 2010, Valencia offered Free Controller Installation for water customers that participated in the Residential Irrigation classes offered through CLWA. Valencia discontinued our current Smart Irrigation Controller Distribution Program and moved to promote CLWA's program through Free WBIC Installation incentive. This allowed our customers the benefit of the Controller and Installation while saving Valencia the cost of the controller.

Summary of Program #6 – Weather Based Irrigation Controller Installation Program

During 2011, 99 weather based irrigation controllers ("WBIC") we installed, including 78 installations for customers that participated in CLWA's WBIC Program and 21 from Valencia's Hi Impact Outreach Program (discussed in Summary of Program #3 High Impact Residential Outreach). Valencia discontinued the free WBIC installation component in October 2011. Customers are still eligible to receive the free WBIC upon completion of the accompanying class offer by CLWA.

Summary of Program #7 – Pre 1993 Home Construction Toilet Rebates (HET)

Valencia works in cooperation with CLWA to provide a highly visible toilet rebate program. The program provides rebates for the replacement of high water using toilets in homes built prior to

1992 (3.5 gallons per flush or greater) with toilets with 1.28 gallons per flush or less HETs. During 2011, 435 toilet rebates were issued to VWC customers.

Summary of Program #8 – Post 1993 Home Construction Toilet Rebates (HET)

Valencia also has its own replacement program. This program is offered to all residential customers and is designed to "fill the gaps" of the CLWA funded program. Valencia's toilet program provides rebates for the replacement of any toilet with 1.6 gallons per flush or greater with 1.28 gallons per flush HETs. This program is a supplement, and is not intended to replace CLWA's toilet rebate program. Beginning June 30th, 2010, Valencia reduced the rebate amount for ULFT replacements to a more cost effective $50.00 per installed HET. Additionally, Valencia funded a portion of CLWA's HET rebates during transition periods when CLWA reduced their applicable rebate values.

Summary of Program #9 – Water Conservation Classes

In 2012, Valencia designed and offered a workshop for residential customers that focused on basic elements of water conservation for irrigation management and overall water use efficiency. The customers that attend the one hour and fifteen minute class receive a $30 credit on their water bill. This kind of workshop has shown significant results in other communities with reported savings of 20,000-50,000 gallons per (26-67ccf) year per household, and should be relatively sustainable for future years. Valencia will hold 14 classes during the irrigation season (April – October). This is an innovative program because rebate programs are typically restricted to efficient devices while this program provides a rebate for going to class and has been shown to be more cost effective than many other rebate programs.

Valencia will continue this program through 2016. Valencia will continue to offer the $30 credit to customers for attending the class. Valencia plans on having approximately 640 new customers attend the class each year and issuing the $30 credit for approximately $19,000 in annual credits. Additionally, our consultant currently charges $1,500 per class. Valencia plans

on offering 14 classes per year for approximately $21,000 in consulting fees. Combined credits and consulting fees are $40,000 per year.

Summary of Program #10 – High Efficiency Washing Machines Rebates (HEW)

Effective March 1, 2012 Valencia and CLWA began the HEW program for residential and customers that provides a $200 rebate on their water bills for clothes washing machines that have a water factor of 4.0 or less. Valencia and CLWA will each fund $100 of the rebate expense through 2012.

Valencia will continue its portion of the $100 rebate program through 2016 and plans on 250 rebates per year.

Programmatic BMPs (Commercial/Industrial/Institutional – BMP 4)

Prior to 2011, VWC had its own CII audit program and conducted 124 CII water surveys/audits.

Summary of Program #1 – CII Audits

In 2011 CLWA started offering CII audits to businesses in the SCV on behalf of the retail water purveyors[16]. The new CII audit program offered by CLWA offers businesses and institutions the opportunity to save money and water by signing up for free water use check-ups. As part of the check-up, a CLWA representative will visit the site and develop a customized plan, including rebates for implemented water efficiency recommendations. In 2011, CLWA worked closely with 8 CII sites with water service provided by Valencia.

Programmatic BMPs (Landscape – BMP 5)

Summary of Program #1 Large Landscape Conservation Programs

Prior to 2011, Valencia had its own Large Landscape Audit program and conducted 102 mixed-use commercial and Large Landscape Audits ("LLA").

[16] From 2003 to 2009, Valencia conducted 218 commercial, industrial, institutional customers with mixed use (irrigation water and process/indoor water use) and dedicated irrigation meters.

In 2010 CLWA started offering Large Landscape audits to qualifying customers in the SCV on behalf of the retail water purveyors. CLWA offers a LLA program that SCV retailers can offer a limited number of their customers each year. In 2011 Valencia worked closely with CLWA to provide LLA for approximately 10 landscape customers with 171 irrigation metered accounts.

Summary of Program #2 – Sub-Metering

Starting in 2008, as a condition of AB 1881, Valencia began requiring separate water meters for non single family properties with landscape areas greater than 5,000 square feet as a condition of new water service. Although not required by the new law, Valencia also looks for opportunities to convert existing customers with large landscapes to separate irrigation meters.

To date, Valencia has installed 7 sub-meters to separately track irrigation use at its mixed use meter customers. This will enhance Valencia's ability to implement irrigation water allocations in the future for large landscape areas.

Conservation Partnerships

Valencia recognizes the importance of conservation partnerships to continue to share ideas, learn valuable lessons from other communities, water providers, state and federal agencies, in order to continue to seek opportunities for process and program improvement. Valencia is a partner in these progressive conservation programs.

- **WaterSense (EPA) Promotional Partner**

Valencia became an official WaterSense Promotional Partner in 2010. WaterSense seeks to protect the future of our nation's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices. WaterSense will help consumers identify water-efficient products and programs. The WaterSense label will indicate that these products and programs meet water efficiency and performance criteria. WaterSense-labeled products perform well, help save money, and encourage innovation in manufacturing.

- **Alliance for Water Efficiency Charter Member**

In August 2011, Valencia became a member of the Alliance for Water Efficiency ("AWE"), which provides comprehensive information about water-efficient products, practices, and programs. Additional services provided by AWE include the development of conservation codes and standards, coordination with green building initiatives, training for conservation professionals, and general water use education.

- **Santa Clarita Valley Family of Water Suppliers**

The Santa Clarita Valley Family of Water Suppliers consists of the Castaic Lake Water Agency, Newhall County Water District, Los Angeles County Waterworks Division No. 36, Santa Clarita Water Division, Valencia Water Company, and the City of Santa Clarita. Together, with the suppliers, the City of Santa Clarita and Los Angeles County are members of the Santa Clarita ValleyWater Committee[17] and are all committed to reducing water use in the SCV in order to create a more sustainable environment for the future.

[17] The Santa Clarita Valley Water Committee includes member agencies of the Santa Clarita Valley Family of Water Suppliers and the City of Santa Clarita and County of Los Angeles Department of Regional Planning to coordinate the management of imported water with local groundwater and recycled water to meet water requirements in the Valley.

SECTION IV. VALENCIA'S PROJECTED PROGRAMS AND SERVICES

The pace of change in the field of water conservation has been rapid in the last five years. California's historic legislation in SBx7-7 is evidence of the need to be certain that our programs achieve the intended results, and that we have a standard by which to measure our progress. The CUWCC also made sweeping changes, incorporating a similar GCPD standard as SBx7-7 as an alternative to traditional means of measuring performance. Increasingly, accountability is being viewed for the first time by all the regulatory agencies in a way that is consistent and focuses on outcomes instead of processes or services. The driving forces behind this include weather (multi-year droughts), political and economic changes, environmental demands, new technologies, shifting perceptions in public opinion on the value of water and increased support for water to be used more efficiently.

Valencia has also changed our conservation mindset from one of "how many surveys or showerheads or WBIC's did we provide?" to "how much water did we save and was it cost effective?" as well as "how can we best support our customer's specific conservation goals?"

The future will hold new challenges as resources continue to be scarce, but new opportunities will emerge as well through advancing technologies and increased efficiency of operations. Programs and services will continue to be more targeted to the highest users, as well as offered to all customers to keep their monthly water bill as low as possible.

Going forward, Valencia will organize our efforts similarly to the way it has reported in the past, which was based on the CUWCC's BMPs. However, Valencia emphasizes the need for flexibility within each BMP as well as flexibility when developing a cost benefit framework that encourages the development of a "culture of conservation". Valencia needs the flexibility to shift both dollars and staff to emerging needs and opportunities, and to avail itself of other funding sources and local partnerships in order to maximize the benefits to its customers, and to further support its efforts to benefit from economies of scale.

Strategic Changes in Water Conservation Programs

In 2010, Valencia hired a new Water Resources Manager to increase program efficiency and focus on the goals and outcomes needed to help ensure its future water supply would meet its future water needs. A comprehensive review was conducted of all of the conservation programs and new programs that Valencia might want to pursue.

During the last half of 2010 and most of 2011, Valencia's Conservation Program focused on the development and implementation of new programs. Valencia conducted research and developed potential implementation models based on best management practices and studied the cost benefit analysis of a number of programs. Based on this research, new programs were initiated in 2012 and participation increased in some programs already in place prior to 2012.

Valencia is working to expand its current conservation program portfolio to include all classes of water customers, for example, the HEW program is offered to residential and CII customers. In some programs there are some practical definition differences, quantity variations, and make and model differences recognized between residential and commercial programs. These variations in the details of design and implementation will not alter the essence and effectiveness of the programs being offered, they just make them appropriate for the customer class being served. Since Valencia CII and DIM customers use 45% of the water while residential customers use the other 55%, the expansion of programs to all customer classifications will better enable Valencia to meet the 20% reductions goals by 2020.

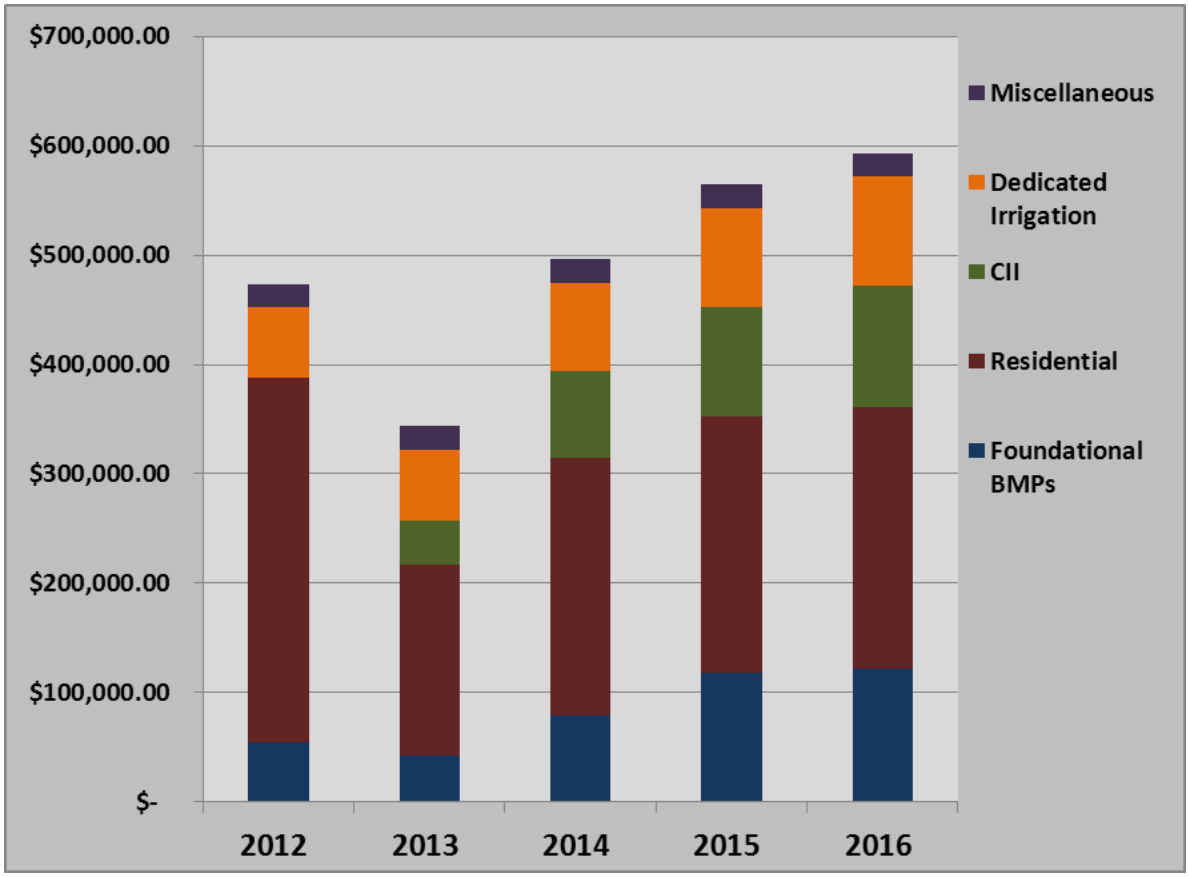


Figure 9. Valencia Water Company – Allocation of Funds by Program Type

PLANNED SCHEDULE OF WATER CONSERVATION PROGRAMS

BMP 1.1 Cons. Coord. & Water Waste Prevention
BMP 1.2 Water Loss Control
BMP 1.3 Metering with Commodity
BMP 1.4 Retail Conservation Pricing
BMP 2.1 Public Information Programs
BMP 2.2 School Education Programs
BMP 3 Residential Programs
BMP 4 Commercial/Industrial/Institutional Programs
BMP 5 Landscape Programs
N/A Miscellaneous and Other

KEY	
Continuing Program Initiated 2012 or Earlier	
Planned Initiation of New Program	
Periodic but not Continuous Program/Activity	

BMP #		FOUNDATIONAL BMP'S	2012	2013	2014	2015	2016
1.1		Resource Conservation Manager					
1.1		Residential Conservation Coordinator					
1.1		CII - DIM Conservation Coordinator					
1.2		Delivery System Leak Check					
1.3		Metering with Commodity					
1.4		DCSE - Water Smart Support					
2.1		Residential Marketing					
2.1		Marketing					
2.1		Promotional Items					
2.1		SCV Family of Water Providers					
2.2		School Kits					
BMP #	**PROGRAMMATIC BMPs**						
3		WaterWise - Residential Audits					
3		HELIUM Rebates					
3,4		High Efficiency Washer Machines					
3,4		ULFT/HET Rebate Programs					
3,4		UHET Rebate Programs					
3,4		Water Conservation Classes					
3,4		Hot Water Recirculation Rebates					
4		Cash for Grass (Landscape Conversion)					
4		Comm Water Use Efficiency Master Plan					
4		Commercial Audits					
4		Commercial Plumbing Retrofits					
5		HELIUM - Sub metering					
5		HELIUM Rebates (Dedicated Irr Meters)					
5		Irrigation Assessment Programs					
5		Cash for Grass (Dedicated Irr Meters)					
All		Annual Qualitative and Quantitative Review					

Figure 10. Valencia Water Company – Continuing Programs and Planned New Programs by Year

DESCRIPTION OF NEW PROGRAMS

Foundational BMPs (Utility Operations Programs 1.1 – 1.4)

For 2013 through 2016 Valencia intends to continue all the programs and processes related to the Foundational BMP's and to add the following discussed below. In addition, Valencia will annually conduct a comprehensive qualitative and quantitative assessment of our programs based on the previous calendar year's performance.

BMP 1.1 - Conservation Coordinator

In addition to the current staff, Valencia seeks to expand the Conservation Department to include a new position of Commercial/Industrial/Institutional ("CII") and Dedicated Irrigation Metered ("DIM") Conservation Coordinator in 2014[18]. CII-DIM accounts typically use far more water per service connection compared to our residential customers and therefore offer greater water savings per account. The CII-DIM customer base accounts for approximately 45% of Valencia's total annual water sales, but is comprised of only 9% of our total customer count.

In contrast to traditional residential customer water use profiles, CII-DIM uses are relatively complex. These studies will require support beyond the scope of the current resource conservation department's capacity. Unlike the residential sector, where generally a one-size fits all water conservation measure is applicable, Valencia's CII-DIM conservation programs will require customer-specific efforts in order to achieve success.

Due to the complexity of the water usage at each service connection, being that customers within these classes do not use water in a heterogeneous trend, Valencia will require significantly more time per account to adequately assist the customer in water use efficiency. The customer contact usually requires more explanation for the customer to be able to understand and appreciate the benefits of a water use analysis.

[18] Valencia had a Conservation Coordinator position that was dedicated to non-residential customers which vacated in 2010. The position has not been refilled.

An interview with the customer is essential to better understand the nature of the purpose of the site, their water using processes, records kept, internal sub-metering that occurs, number and gender percentages, recent water device upgrades, irrigation schedules, cooling schedules, food preparation, etc.

Once the initial contacts have been made and the interview and the specialized water use analysis takes place the Coordinator will be able to:

1. Work one-on-one with individual CII-DIM customers to tailor conservation measures to their specific business needs;
2. Assist with water conservation outreach data collection, market development, and outreach efforts;
3. Assist with the development and implementation of conservation programs, rebates, incentives, and training;
4. Oversee preparation of the CII-DIM Water Use Efficiency Plan (discussed later in this chapter);
5. Organize customer accounts using standard industrial classification codes such as the North American Industry Classification System (NAICS) which is necessary to develop equitable WSA and Tiered Rates Programs;
6. Provide coordination between service contractors, Valencia customers, and management;
7. Track water conservation program results and develop recommendations for improvement;
8. Assistance with annual report presentation including those required by the CPUC, CUWCC, and DWR;
9. Respond to customer inquiries and complaints;
10. Prepare letters, customer correspondence, reports, and presentations.

BMP 1.2 – Water Loss Control (Distribution System Leak Checks)

In addition to the annual water loss audit (Attachment 3), Valencia will implement a leak detection program to locate and correct leaks within the distribution system. Specifically, the program will work with consultants to identify unreported and undetected leaks in older portions of our service territory. Unreported and undetected leaks often flow at low levels for long periods of time, resulting in large quantities of water loss over the duration of the leak event. Valencia estimates it will spend $20,000 per year to conduct research and to detect the leaks using acoustic leak detection equipment, flow meters, data loggers or other technologies. Based on the current infrastructure leakage index (see Attachment 3), Valencia believes this is the appropriate level of investment to locate its system leaks.

BMP 1.4 – Conservation Rates

Valencia will continue Phases I and II (Residential and Dedicated Irrigation Metered Customers) of the WSA and Tiered Rates Program and implement Phase III of the program in 2015 to include Multi-Family customers and Public Authority-Parks customers. See Exhibit 4, "Water Smart Allocation and Tiered Rates Program ", of this Application for detailed information on Valencia's conservation rates.

The WSA and Tiered Rates Program is expected to play an increasingly important role in meeting our conservation goals by 2020 as we expand the program to our CII customers.

Valencia currently pays a maintenance fee of $10,000 per year for its WSA program. Valencia estimates the fee will increase in 2014 to $15,000. Additionally, starting in 2015, Valencia will incur additional costs as the WSA program is expanded to its Master Metered Multi-Family and Parks with bathrooms customers. These additional costs are estimated to be $15,000 per year for 2015 and 2016.

Foundational BMPs (Education Programs 2.1 – 2.2)

Educational programs will largely remain the same in the coming years. We will continue the rebate for the residential water efficiency workshops and modify this program as needed based on analysis of the results of the program for the first full year which was 2012.

School Kits in 2014

In 2014, Valencia plans to reemploy the water conservation school kit program. The school kit program leverages funding from Valencia with the natural gas and electric companies. The program, also known as "Living Wise", teaches the importance of water, energy, and related environmental issues in the community. Living Wise provides materials to local public and private schools, teachers and students that focus on lessons about water and energy, how they are used day to day in their lives, and the importance of conservation. Students will receive a Living Wise kit that contains water and energy saving tools and products[19], currently valued at $60.00 per kit, which enables students to actively engage in conservation activities at home. In addition to the student materials, teachers will receive instruction materials that are in line with statewide education curriculum requirements, providing additional value. Valencia plans to partner with Southern California Edison and the Southern California Gas Company and invest $10,000 per year in this program which will allow for an additional 160 school children to participate in the program.

[19] Living Wise kits currently include the following items; High-efficiency showerhead, 2 compact fluorescent lamps, kitchen aerator, digital thermostat, bathroom aerator, filter tone alarm, mini tape measure, drip/rain gauge, flow rate test bag, natural resource fact chart, toilet leak detector tablets, Teflon tape, installation instructions, cold water magnet and reminder stickers.

Programmatic BMPs (Residential – BMP 3)

Summary of Program #11– Hot Water Recirculation Rebates

Valencia will offer a $100.00 rebate for a looped and timed plumbing system whereby hot water is continuously or intermittently pumped through the loop to provide hot water at all hot water using fixtures in the home. Historically many homes have been designed with the Master Bedroom located the longest distance from the hot water heater. Faucets and showers must be on for a considerable time to bring in hot water. Evidence from other municipalities who have these rebates suggests a high level of customer satisfaction.

These new systems are considered to be energy inefficient where hot water pipes are not already insulated, therefore to ensure the best results, Valencia would recommend that pipes be insulated, or installed with a timer, in order to qualify for the rebate. This program is not anticipated to have high participation rates but free ridership is also very minimal[20]. This equipment can save up to 15,000 gallons (20ccf) per year per household, depending on current hot water use and type of current heater. Valencia plans on providing 100 rebates per year.

Summary of Program #12 - UHET Toilet Rebates

Valencia, in partnership with CLWA, has been offering toilet rebates for customers that purchase HET toilets via two main programs, a higher dollar rebate for toilet replacements for customers that have homes built before 1992, and a lower dollar rebate for those built after 1992. HET toilets are designed to use 1.28 gallons per flush ("gpf"), for a 20% savings from the 1.6gpf ULFTs installed after 1992, and 63% savings versus the 3.5gpf units installed prior to 1992. Recent advances in toilet design have enabled manufacturers to develop a new Ultra High-Efficiency Toilet ("UHET") unit that uses .8gpf, for a 38% reduction versus the HET, 50% reduction versus the ULFT, and 77% reduction versus the pre-1992 3.5gpf units.

[20] Free ridership refers to customers that would have purchased or participated in a water conservation program/activity/measure regardless of the presence of a financial incentive. Hot water recirculation devices are not widely marketed which suggests that the rebate program will act as a major driving force for customer participation.

Valencia's UHET replacement program will incorporate a blended approach that includes, but is not limited to, unit replacement rebates, direct unit installations, and participation in various distribution events. The UHET program is expected to begin in 2012. The cost per UHETsis estimated at $150.00 per unit[21] so Valencia will provide this amount as a rebate to motivate our customers to replace their existing functional toilets through direct purchase, installation, or through distribution programs.

Programmatic BMPs (Commercial/Industrial/Institutional – BMP 4)

Summary of Program #2 - Commercial Water Use Efficiency Master Plan

Valencia plans to develop a commercial consumption database using NAICS[22] codes and establishing metrics and benchmarks for future analysis. We will use the methodology of

- Learn
- Observe
- Define
- Identify
- Target

Our first task will be to study the current CII accounts to learn who are the users, how are they using water, what are the patterns and trends we see, what percent of the water use is outdoor versus indoor, etc. The plan will define goals, identify savings opportunities and target water efficiencies that will have the highest level of customer satisfaction and return on investment. The database will allow us to continuously learn from our experiences, modify our goals and activities and refine the process each year. Valencia will hire a consultant to prepare the plan. Based on the cost to prepare the SCV WUE Plan, Valencia estimates it will expend $40,000 to complete this plan.

[21] In D.12-01-005, the Commission approved Valencia's request to provide up to $175.00 per unit for its UHET program.
[22] North American Industry Classification System

Summary of Program #5 – Commercial Audits

Pursuant to the Commercial Water Use Efficiency Master Plan, Valencia will expand the water audit program to existing and new commercial/industrial/institutional customers. This program will target customers excluded from the CLWA CII Audit program. Audits will target high water use versus high water need customers, as well as to customers that have participated in previous programs, yet can potentially benefit from new/improved technologies, rebates and/or implementation of alternative best management practices[23]. Valencia plans on investing up to $40,000 per year on this program. The program costs will range between $165-$500 per site to conduct the audit and rebates of $200-$400 per acre foot of water saved. The cost of the audit is based on the price schedule listed in Attachment 8, the contracted price from CLWA's consultant, and the rebate per acre foot based on the SCV WUE Plan.

Summary of Program #6 - Commercial Plumbing Retrofits

Rebates for UHET and zero or UHE urinals will be expanded to CII sites with an emphasis on older public facilities with high usage or other commercial sites with high usage. The rebate for high efficiency clothes washers would also be offered to CII customers, primarily lodging and commercial laundry facilities. Many of the water conservation opportunities, benefits, program specifics, and potential market details will be included in the Commercial Water Use Efficiency Master Plan. Commercial plumbing retrofits will blend rebate, distribution, and customized incentive programs that will include, but not limited to, high efficiency urinals, toilets, faucets, cooling tower conductivity and pH controllers, and additional process water efficiency improvement measures. Valencia will initiate the Commercial Plumbing retrofit programs in 2014 and continue them through 2016. The plumbing retrofit rebates, installs, or units provided, will be offered to customers that participate in the Commercial Audit program, as well as to the general CII population. Cost schedules will be based on the same $200-$400 acre foot of water saved methodology stated above.

[23] SBx7-7 required DWR in conjunction with the CUWCC to develop alternative best management practices for Commercial, Industrial and Institutional water users. The CII Task Force assessed potential statewide water use efficiency improvements in CII sectors and the impacts that would result from their implementation.

Summary of Program #7 - Cash for Grass (Landscape Conversion)

The "Cash for Grass" program will be targeted to CII customers with large landscape with an estimated rebate of $1.00 for each square foot of turf removal up to a maximum that will be established in more detail during the program development phase. Valencia is targeting the removal of up to 30,000 sq-ft of turf per year. Large landscape turf removal is expensive for both the customer and the utility but has a much longer term impact and greater recurring savings that many other programs. The impetus for many CII sites is the reduced maintenance costs. Eliminating the need for fertilizers, weed and pest control, mowing and re-seeding greatly reduces costs while maintaining an attractive landscape.

As more landscapes are converted, the culture of conservation increases in the community, and the turf surrounding some businesses is no longer viewed as a positive thing for the community. Natural landscapes and low water use plants gradually become the business norm and the preferred design.

Programmatic BMPs (Landscape – BMP 5)

Summary of Program #3 - HELIUM Rebates - High Efficiency Landscape Irrigation Upgrade Measures

HELIUM rebates will be extended to all CII customers with a focus on larger Home Owner Associations and other large landscapes such as City parks, schools, golf courses, and large commercial landscapes. Most of these have dedicated irrigation meters. These rebates have an excellent cost benefit ratio and are usually done in conjunction with large landscape surveys. Customers participating in the HELIUM program will be eligible for Valencia's Free Sprinkler Nozzles program as identified in Section 3 – Residential Program #3. The current unit cost for each high efficiency irrigation spray nozzle is $3.25 (See Attachment 9). Valencia plans on rebating approximately 9,000 nozzles per year.

Summary of Program #4 – Irrigation Assessment Program

The Irrigation Assessment Program will assist customers with their conservation goals by determining their efficiency of their irrigation system, identifying best management practices, and by developing an improved understanding of their current and historical water use. The irrigation assessment program will also provide customers with a detailed report stating the impact that specific conservation measures will have on their water use, cost, and overall landscape performance. Customers will receive a cost benefit analysis for the recommended water conservation measures that includes a life cycle costing and return on investment estimates, as well as information on other applicable water conservation programs. The irrigation surveys will cost approximately $750.00 per site (See Attachment 10). Valencia plans on providing 40 irrigation assessments per year.

Summary of Program #5 - Cash for Grass (Landscape Conversion)

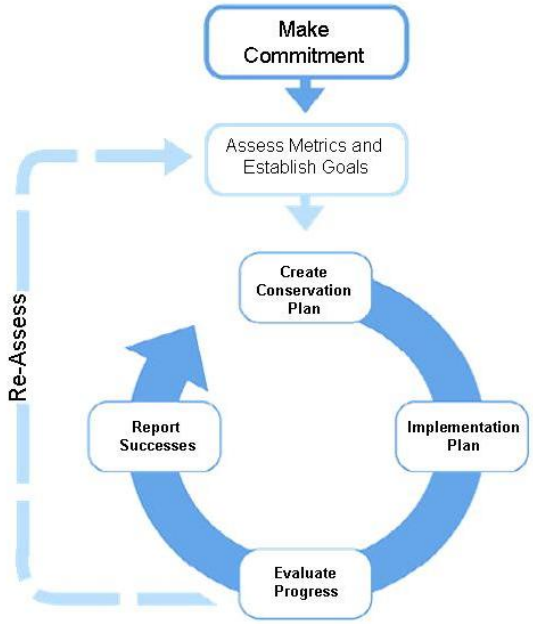
The "Cash for Grass" program will be targeted to large landscape customers with an estimated rebate of $1.00 for each square foot of turf removal up to a maximum that will be established in more detail during the program development phase. Valencia is targeting the removal of up to 40,000 sq-ft of turf per year. Large landscape turf removal is expensive for both the customer and the utility but has a much longer term impact and greater recurring savings that many other programs. The impetus for many large landscape sites is the reduced maintenance costs. Eliminating the need for fertilizers, weed and pest control, mowing and re-seeding greatly reduces costs while maintaining an attractive landscape.

As more landscapes are converted, the culture of conservation increases in the community, and the turf used in landscapes is no longer viewed as a positive thing for the community. Natural landscapes and low water use plants gradually become the new norm and the preferred design.

Annual Review and Program Evaluation Process

As part of our commitment to continuous improvement in our business practices and accountability models Valencia will implement a comprehensive qualitative and quantitative

program review annually. We will build tracking and cost benefit analysis into all of our programs to ensure sufficient return on investment and value for our customers. Resources will be allocated and shifted as needed to those programs showing the best value and customer satisfaction. Figure 11 demonstrates the annual review and program evaluation process identified by the EPA's Energy Star Program.



1. Make Commitment
2. Assess Metrics and Establish Goals
3. Implementation Plan
4. Evaluate Progress Annually and Periodically
5. *Re-Assess & Establish Goals*
6. Report Successes

Figure 11. Valencia Water Company – EPA's Energy Star Program Revision Process

Valencia currently provides this information annually, biennially, and every 5 years in the following formats:

1. Annual – CPUC Schedule E-3
2. Biennial – CUWCC BMP Compliance Reports (GPCD Option)
3. 5 Years – UWMP (SBx7-7 20% Reduction in Baseline Daily per Capita Water Use by 2020)

SECTION V. COST BENEFIT ANALYSIS

The following is a cost benefit analysis of planned conservation programs for both continuing programs and new initiatives. The expected savings for each program are based on a review of a number of sources for determining the cost savings associated with specific conservation programs. The sources include the CUWCC's cost benefit spreadsheets, Alliance for Water Efficiency, Valencia's own analysis, Santa Clarita Valley Water Use Efficiency Strategic Plan, and independent studies of cost benefit[24]. The cost of water is taken from the Santa Clarita Valley Water Use Efficiency Strategic Plan using the base year of 2007 costs and adding a 1.5%[25] inflation factor per year.

Valencia's goal is to ensure that our programs provide an overall return on investment of at least one dollar of return for every dollar spent, although some programs will yield a much better return than others. This is necessary in order to create incentives and assistance for different customer classes with varying water efficiency opportunities. For example, the HELIUM program is important because landscapes represent some of the greatest water savings opportunities, while incentives for indoor savings, such as UHET and High Efficiency Washing Machine rebates encourage the most sustainable savings over time.

As described above, cost benefit analysis is an important part in selecting conservation programs, but there are other important elements in selecting conservation programs. For example, Valencia also considers water savings potential, ease of implementation, acceptance by our customers, ability to change long term behaviors, sensitivity to the environment, ease of implementation, cross over benefits to energy conservation and other program specific factors. In essence, Valencia's conservation programs work to develop and promote a culture of conservation through comprehensive strategies that go above and beyond cost benefit such as relative customer ease and the promotion of goodwill and positive public relations. Further, the programs should meet a specific customer need, work to change inefficient water use behaviors, and ultimately deliver results.

[24] Evaluation of Cost Benefit Analysis of Municipal Water Conservation Programs (ECOBA) was conducted by the Water Conservation Alliance of Southern Arizona in 2005.
[25] 1.5% rate of inflation for 2011 v. 2010 (Consumer Price Index - US Bureau of Labor Statistics).

Figure 12 below shows each program to be implemented each year for the next four years, the total program cost, number of participants, rebates or audits, and the cost benefit of each. It also shows the other metrics utilized to determine the cost benefit ratio for each. The metrics came from the above cited source materials.

Exclusions from Cost Benefit Analysis

Foundational BMP's are required by the CUWCC's MOU but are not really measureable in terms of cost benefit so they are excluded from the analysis. These BMP's are presumed to have a positive benefit over time on the bottom line and on water savings but the savings are not easily quantified. Included in these BMP's are overall conservation management and program administration, so these costs are not added into the cost of the specific programmatic BMP's such as residential audits.

The cost benefit analysis also excludes the Commercial Water Use Efficiency Plan, CII-DIM Audits and CII Plumbing Retrofits. These items were not included in the calculations because the CII Plan will be a critical element in determining which CII-DIM customers should be targeted for audits, what types of usage offer the best opportunity for water savings, and what specific retrofits, rebates or incentives are needed in the community. The outdoor programs related to CII-DIM are already developed, but specific indoor programs for CII will not be developed until completion of the CII Plan. Therefore, it would be nearly impossible at this time to accurately assess the cost benefit of any specific CII indoor program.

Year	Description	Residential Surveys	HELIUM Rebates	High Efficiency Washer Machines	ULFT/HET Rebate	UHET Rebate	Water Conservation Classes	Hot Water Recirculation Rebates	Cash for Grass (CII)	HELIUM Rebates (DIM)	Irrigation Assessment Program (DIM)	Cash for Grass (DIM)
All Years	Useful Life (Yrs)	5	5	14	25	25	5	15	15	5	5	15
	Decay	20%	0%	0%	3%	3%	10%	3%	0%	0%	5%	0%
	Free Riders	10%	10%	10%	20%	20%	10%	0%	5%	10%	0%	5%
	Cost/Unit	$ 210.00	$ 3.25	$ 100.00	$ 50.00	$ 150.00	$ 62.26	$ 100.00	$ 1.00	$ 3.25	$ 750.00	$ 1.00
	Savings/ Unit(AF)/Yr	0.109	0.01	0.038	0.007	0.038	0.09	0.02	0.0001	0.01	0.8	0.0001
	CBA Ratio	1.15	8.46	3.1	0.93	1.61	3.87	1.62	1.29	8.46	3.49	1.29
2013	# Units	333	9,230	250	200	133	643			10,769	40	
2013	Tot Cost	$ 70,000	$ 30,000	$ 25,000	$ 10,000	$ 20,000	$ 40,000			$ 35,000	$ 30,000	
2013	Savings(AF)	36	78	9.5	1	5	58			91	32	
2014	# Units	571	9,230	250		67	643	100	20,000	9,230	40	
2014	Tot Cost	$ 120,000	$ 30,000	$ 25,000		$ 10,000	$ 40,000	$ 10,000	$ 20,000	$ 30,000	$ 30,000	
2014	Savings(AF)	62	78	9.5		3	58	2	3	78	32	
2015	# Units	571	9,230	250		67	643	100	30,000	9,230	40	30,000
2015	Tot Cost	$ 120,000	$ 30,000	$ 25,000		$ 10,000	$ 40,000	$ 10,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
2015	Savings(AF)	62	78	9.5		3	58	2	4	78	32	4
2016	# Units	571	92,350	250		67	643	100	30,000	9,230	40	40,000
2016	Tot Cost	$ 120,000	$ 30,000	$ 30,000		$ 10,000	$ 40,000	$ 10,000	$ 30,000	$ 30,000	$ 30,000	$ 40,000
2016	Savings(AF)	62	78	11.4		3	58	2	4	78	32	6
2017	# Units	571	9,230	250		67	643	100	30,000	9,230	40	40,000
2017	Tot Cost	$ 120,000	$ 30,000	$ 30,000		$ 10,000	$ 40,000	$ 10,000	$ 30,000	$ 30,000	$ 30,000	$ 40,000
2017	Savings(AF)	62	78	11.4		3	58	2	4	78	32	6
2018	# Units	571	9,230	250		67	643	100	30,000	9,230	40	40,000
2018	Tot Cost	$ 120,000	$ 30,000	$ 30,000		$ 10,000	$ 40,000	$ 10,000	$ 30,000	$ 30,000	$ 30,000	$ 40,000
2018	Savings(AF)	62	78	11.4		3	58	2	4	78	32	6
2019	# Units	571	9,230	250		67	643	100	30,000	9,230	40	40,000
2019	Tot Cost	$ 120,000	$ 30,000	$ 30,000		$ 10,000	$ 40,000	$ 10,000	$ 30,000	$ 30,000	$ 30,000	$ 40,000
2019	Savings(AF)	62	78	11.4		3	58	2	4	78	32	6
2020	# Units	571	9,230	250		67	643	100	30,000	9,230	40	40,000
2020	Tot Cost	$ 120,000	$ 30,000	$ 30,000		$ 10,000	$ 40,000	$ 10,000	$ 30,000	$ 30,000	$ 30,000	$ 40,000
2020	Savings(AF)	62	78	11.4		3	58	2	4	78	32	6

Figure 12. Valencia Water Company – Cost Benefit Analysis for Each Program, Years 2013-2016 (includes current program expenses extended to 2020)

The chart below shows the water savings in acre feet for each Programmatic BMP 2013-2020 as contained in the Water Conservation Plan and further assumes that these programs will continue at the 2016 level in order to calculate cumulative savings by the year 2020.

Cumulative Programmatic Savings by 2015	**917.4 ac-ft**
Cumulative Programmatic Savings by 2020	**1,548.4 ac-ft**

WATER SAVINGS IN ACRE FEET FOR EACH PROGRAM FOR YEARS 2013-2020									
Program	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Tot/Yr**
Residential Surveys	36.27	91.19	135.13	170.28	198.42	208.99	209.00	208.97	**1258.3**
HELIUM Rebates	77.90	155.80	233.70	311.60	389.50	389.50	389.50	389.50	**2337.0**
High Efficiency Washer Machines	9.48	18.96	28.44	39.82	51.20	62.58	73.96	85.34	**369.8**
ULFT/HET Rebate Programs	1.46	1.42	1.38	1.33	1.29	1.26	1.22	1.18	**10.5**
UHET Rebate Programs	5.06	7.43	9.74	11.98	14.15	16.25	18.29	20.27	**103.2**
Water Conservation Classes	57.57	109.39	156.02	197.99	235.76	235.76	235.76	235.76	**1464.0**
Hot Water Recirculation Rebates	0.00	2.03	4.01	5.92	7.78	9.58	11.33	13.02	**53.7**
Cash for Grass (CII)	0.00	2.82	7.05	11.25	15.45	19.65	23.85	28.05	**108.1**
HELIUM Rebates (DIM)	90.88	168.78	246.68	324.58	402.48	389.50	389.50	389.50	**2401.9**
Irrigation Assessment Programs	31.92	62.24	91.04	118.41	144.40	144.40	144.40	144.40	**881.2**
Cash for Grass (DIM)	0.00	0.00	4.23	9.87	15.52	21.16	26.80	32.45	**110.0**
Total/Year	**310.5**	**620.1**	**917.4**	**1203.0**	**1476.0**	**1498.6**	**1523.6**	**1548.4**	**9097.7**

Figure 13. Valencia Water Company – Water Savings in Acre Feet for Each Program (2013-2020)

SECTION VI. REQUESTED CONSERVATION EXPENSES 2014 – 2016

Valencia's current and planned conservation programs have already been discussed in the preceding sections of the Water Conservation Plan. Figures 14 and 15 summarize Valencia's projected conservation expenses for the years 2013 to 2016 that are carried to the Results of Operations, Revenue Requirement and Rate Design Report (Exhibit I Chapter 5). Other conservation related expenditures are also included in Exhibit 1; conservation department salaries and benefits are included with payroll in Exhibit 1, Chapter 5 and costs to purchase and install meters are included as capital assets in Exhibit 1, Chapter 6.

FOUNDATIONAL BMP'S	2013	2014	2015	2016
	Estimate	Plan	Plan	Plan
Utility Operations Programs 1.1 - 1.4				
BMP 1.1 Conservation Coord. & Water Waste Prevention				
Resource Conservation Mgr.**	The projected expenses for BMP 1.1 and 1.3 programs are included in Exhibit 1 of the GRC application.			
Residential Conservation Coord.**				
BMP 1.2 Water Loss Control			20,000	20,000
BMP 1.3 Metering with Commodity				
BMP 1.4 Retail Conservation Pricing				
DCSE - Water Smart Support	$ 10,000	$ 15,000	$ 30,000	$ 30,000
Total Utility Operations Programs	**$ 10,000**	**$ 15,000**	**$ 50,000**	**$ 50,000**
Education Programs 2.1 2.2				
BMP 2.1 Public Information Programs				
Residential Marketing	$ 10,000	$ 12,500	$ 15,000	$ 17,500
Marketing	$ 11,000	$ 12,000	$ 13,000	$ 14,000
Promotional Items	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Santa Clarita Valley Family of Water Providers	$ 26,000	$ 25,000	$ 25,000	$ 25,000
BMP 2.2 School Education Programs				
School Kits		$ 10,000	$ 10,000	$ 10,000
Total Education Programs	**$ 52,000**	**$ 64,500**	**$ 68,000**	**$ 71,500**
Total Foundational BMPs	**$ 62,000**	**$ 79,500**	**$ 118,000**	**$ 121,500**

Figure 14. Valencia Water Company – Foundational BMP Expenses (2013-2016)

PROGRAMMATIC BMPS	2013 Estimate	2014 Plan	2015 Plan	2016 Plan
BMP 3 Residential Programs				
WaterWise - Residential Audits	$ 70,000	$ 120,000	$ 120,000	$ 120,000
HELIUM Rebates	$ 30,000	$ 30,000	$ 30,000	$ 30,000
High Efficiency Washer Machines	$ 25,000	$ 25,000	$ 25,000	$ 30,000
ULFT/HET Rebate Programs	$ 10,000	$ -	$ -	$ -
UHET Rebate Programs	$ 20,000	$ 10,000	$ 10,000	$ 10,000
Water Conservation Classes	$ 40,000	$ 40,000	$ 40,000	$ 40,000
ET Controller Installation	$ -	$ -	$ -	$ -
Hot Water Recirculation Rebates*	$ -	$ 10,000	$ 10,000	$ 10,000
Total Residential Programs	**$ 195,000**	**$ 235,000**	**$ 235,000**	**$ 240,000**
BMP 4 CII Programs				
Comm Water Use Efficiency Master Plan		$ 40,000		
Commercial Audits		$ 20,000	$ 40,000	$ 40,000
Cash for Grass (CII)		$ 20,000	$ 30,000	$ 30,000
Commercial Plumbing Retrofits*		$ 20,000	$ 30,000	$ 40,000
Total CII Programs	**$ -**	**$ 100,000**	**$ 100,000**	**$ 110,000**
BMP 5 Landscape Programs				
HELIUM - Submetering	$ -	$ -		$ -
HELIUM Rebates (Dedicated Irr Meters)	$ 35,000	$ 30,000	$ 30,000	$ 30,000
Irrigation Assessment Programs	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Cash for Grass (Dedicated Irr Meters)*			$ 30,000	$ 40,000
Total Landscape Programs	**$ 65,000**	**$ 60,000**	**$ 90,000**	**$ 100,000**
Miscellaneous and Other				
Data Analysis	$ 17,500	$ 17,500	$ 17,500	$ 17,500
Other	$ 4,000	$ 4,000	$ 4,000	$ 4,000
Total Miscellaneous	**$ 21,500**	**$ 21,500**	**$ 21,500**	**$ 21,500**
Total Programmatic BMPs	**$ 281,500**	**$ 416,500**	**$ 446,500**	**$ 471,500**
Total Foundational and Programmatic BMPs	**$ 343,500**	**$ 496,000**	**$ 564,500**	**$ 593,000**

Figure 15. Valencia Water Company – Programmatic BMP Expenses (2013-2016

Valencia Water Company
Water Conservation Plan Attachments:

ATTACHMENT 1: SANTA CLARITA VALLEY WATER USE EFFICIENCY STRATEGIC PLAN 2008 (CD)

ATTACHMENT 2: 2009-2010 VALENCIA CUWCC BMP COVERAGE REPORTS

ATTACHMENT 3: AWWA WATER LOSS REPORTS

- **3.1** VALENCIA AWWA WATER LOSS REPORT 2009
- **3.2** VALENCIA AWWA WATER LOSS REPORT 2010

ATTACHMENT 4: 2012 WATERSMART ALLOCATION PRESENTATION

ATTACHMENT 5: VALENCIA WATER COMPANY PRESS RELEASES AND PROMOTIONAL MATERIALS FOR WATER CONSERVATION PROGRAMS

- **5.1** WATER SMART ALLOCATION PROGRAM
- **5.2** FREE RESIDENTIAL WATER CHECK-UP
- **5.3** HELIUM REBATE PROGRAM
- **5.4** WATER SMART IRRIGATION + GARDEN CARE WORKSHOP
- **5.5** REBATE PROGRAMS – TOILETS AND WASHING MACHINES
- **5.6** SAMPLE HIGH CONSUMPTION LETTER
- **5.7** VARIOUS WATER CONSERVATION PROMOTIONAL MATERIALS

ATTACHMENT 6: COST BENEFIT ASSESSMENT FOR EACH PROGRAM

ATTACHMENT 7: APPLICABLE VALENCIA WATER CONSERVATION TARIFFS

- **7.1** Rule No. 20 – Water Conservation
- **7.2** Rule No. 14.1 – Water Conservation and Rationing Plan

ATTACHMENT 8: 2012 RESIDENTIAL WATER SURVEY – SERVICE COST TABLE

ATTACHMENT 9: FREE SPRINKLER NOZZLES MEMORANDUM OF UNDERSTANDING

ATTACHMENT 10: COMMERCIAL/INDUSTRIAL WATER SURVEY PROPOSAL