SUISUN SOLANO WATER AUTHORITY

URBAN WATER MANAGEMENT PLAN

June 14, 2011
FINAL

Prepared by:
Maddaus Water Management
and SSWA Staff

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A. Adoption Resolution
B. Suisun City Housing Element, adopted July 7, 2009
C. Suisun City State Water Project (North Bay Aqueduct) Contract, 1985
D. Solano Project Members' Agreement as to Drought Measures and Water Allocation

E. Central Solano Dual Water Systems Master Plan 1992
F. SSWA FY 2010-11 to FY 2014-15 Capital Improvement Plan
G. Solano Project Reliability Study, November 23, 2009 and UWMP Reliability Data dated August 10, 2010.
H. SSWA Water Conservation Requirements 2009 Approved Final
I. Final State Water Project Delivery Reliability Report, 2009, Appendix B
J. School Education Pamphlet "2010-2011 Water in Your Classroom"
K. Irrigation System Water Conservation Surveys
    a. Heritage Park
    b. Montebello Vista Park
L. Public Meeting Advertisements
    a. Daily Republic April 13, 2011
    b. Daily Republic April 20, 2011

Section 1 - Plan Preparation

Introduction

This Urban Water Management Plan (UWMP) has been prepared in response to the Urban Water Management Planning Act (Act), California Water Code Sections 10610 through 10650. The Act was adopted by the California Legislature as Assembly Bill 797 during the 1983-84 session and signed into law by Governor Deukmejian on January 1, 1984. The Act has been amended and expanded since its inception to address new water related issues as they develop. The main purposes of the Act are to achieve proper water supply planning and conservation.

The Act requires that "every urban water supplier shall prepare and adopt an Urban Water Management Plan". An urban water supplier is defined as "a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually". Suisun Solano Water Authority (SSWA), as defined in the California Water Code section 10617, qualifies as an "Urban Water Supplier". SSWA is a public agency directly providing water for municipal purposes to 8,400 customers which is more than 3,000 customers so an UWMP is required to be completed for 2010 and every five years thereafter and submitted to the report to the California Department of Water Resources.

The intent of this plan is to provide the Department of Water Resources (DWR) and the public with information on present and future water sources and demands and to provide an assessment of SSWA's water resource needs. Specifically, the UWMP must provide water supply planning for a 20-year planning period in 5-year increments, identify and quantify adequate water supplies for existing and future demands during normal, dry and drought years, and assure efficient use of urban water supplies. This UWMP addresses all Water Code requirements for such a plan as shown on the completed DWR UWMP checklist provided in Section 8.

Urban Water Management Planning Act Requirements

The UWMP Act (California Water Code §10610 et seq.) requires urban water suppliers to report, describe, and evaluate:

- Water deliveries and uses
- Water supply sources
- Efficient water uses
- Demand Management Measures (Conservation Measures), including implementation strategy and schedule

In addition, the Water Conservation Bill of 2009 requires urban water suppliers to report in their UWMPs base daily per capita water use (baseline), urban water use target, interim urban water use target, and compliance daily per capita water use.

The UWMP Act directs water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies are available to meet existing and future demands (CWC 10612 (b)). Urban water suppliers are required to assess current demands and supplies over a 20-year planning horizon and consider various drought scenarios. The UWMP Act also requires water shortage contingency planning and drought response actions be included in a UWMP.

This UWMP coalesces important information on SSWA's water supply planning and studies, emergency response, and conservation activities. This report consists of the following sections:

- Section 1 - Plan Preparation
- Section 2 - System Description
- Section 3 - System Demands
- Section 4 - System Supplies
- Section 5 - Water Shortage Contingency Plan
- Section 6 - Demand Management Measures
- Section 7 - Climate Change
- Section 8 - Completed UWMP Checklist
- Section 9 - References

As shown in the Table of Contents, a number of appendices are included consisting of documents related to this UWMP.

1.1 Coordination

During the preparation of the UWMP, SSWA coordinated information with the Solano County Water Agency. A list of agencies is provided in Table 1, along with their involvement with the preparation of the SSWA Urban Water Management Plan.
The Final UWMP was submitted to both the City of Suisun City and Solano Irrigation District which comprises the two agencies areas served by SSWA. It was also sent to Solano County Water Agency, which serves as a wholesaler to SSWA.

The first public meeting was held in May 25, 2011 and was to discuss the demand reduction targets and economic impacts. The public was notified 30 days in advance of the first public meeting. The second public meeting was the plan adoption meeting held on June 14, 2011. The public was notified 60 days in advance of the adoption meeting.

Copies of the public notices are contained in Appendix L.

Table 1
Coordination with appropriate agencies

Coordinating Agencies[1,2]	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved / No information
Other water suppliers							
Fairfield	X				X	X	
City of Suisun City	X				X	X	
Benicia	X				X	X	
Vacaville	X				X	X	
Rio Vista	X				X	X	
Dixon	X				X	X	
Solano Irrigation District	X				X	X	
Vallejo	X				X	X	
Water management agencies							
Solano County Water Agency	X			X	X	X	
Relevant public agencies							
Solano County						X	
Fairfield Suisun Sewer District				X			
General public / Other							
Public Library					X		
Posted on Internet – City Website			X			X	
Local Newspaper			X			X	
Diverse Groups							
Hispanic						X	
Hmong						X	
Housing Assist.						X	
Military (Travis Air Force Base)						X	
Churches/Service						X	

NOTICE OF PUBLIC MEETINGS

SUISUN-SOLANO WATER AUTHORITY'S
URBAN WATER MANAGEMENT PLAN

Two public meetings will be held to introduce the Suisun-Solano Water Authority (SSWA) Urban Water Management Plan (UWMP). Your ideas, opinions and suggestions are invited to assist us in updating the Plan which addresses water supply and conservation for our city.

- **The first Public Meeting will be held on May 25, 2011 at 5:30 P.M. and will be an opportunity to voice any concerns or new ideas you may have.**
- **The second meeting will be a Public Hearing held on June 14, 2011 at 5:00 P.M. and will present the Plan for the SSWA Board approval.**

Meetings will be held at the Suisun City Council Chambers at 701 Civic Center Blvd., Suisun City, CA.

Please come to hear and participate in these presentations regarding the management of present and future water supplies. Water reliability, future demands, water conservation targets and drought strategies will be discussed.

This State mandated plan is a five year update for long-term water resource planning to ensure adequate water for the City of Suisun City and outlying areas served by the SSWA. Please join us to discuss these important water supply topics. Feel free to notify project manager Frank Morris at 707-455-4026 or fmorris@sidwater.org if you have any specific ideas or concerns.

1.2 Plan Adoption, Submittal and Implementation

During SSWA's update of its UWMP, public participation consisted of a two public Board meetings to discuss key plan elements.

A public hearing before the SSWA Board of Directors to discuss and receive comments regarding the SSWA's 2010 UWMP demand reduction targets, selected method and economic impacts was held on May 25, 2011. The public hearing was advertised in the Fairfield Daily Republic 30 days prior to the meeting. Additionally, a public hearing notice was posted on the City of Suisun City's web site http://www.suisun.com.

The SSWA Board of Directors held a second public meeting to adopt of the UWMP by resolution at its June 14, 2011 Board Meeting. The UWMP was made available for public review at the Water Utilities Department at the City of Suisun City Hall, the public library and at the Solano Irrigation Water District office. The public was notified 60 days prior to the adoption meeting via newspaper and following websites:

- www.suisun.com
- http://suisuncity.blogspot.com (150 subscribers receive new information via email)
- www.twitter.com/suisuncity

The notice from the website is shown on the following page.

A copy of the resolution adopting the UWMP is provided in Appendix A.

Within 30 days of adoption, a copy of the plan will be mailed to DWR, the California Library Records Hall (Sacramento), and placed on the City's website. The UWMP Plan will also be provided to cities and the County of Solano.

Suisun City, CA
Discover the Experience

City of Suisun City
701 Civic Center Blvd.
Suisun City, CA 94585
Tel: (707) 421-7300
Fax: (707) 421-7366

HOME | CITY HALL | RESIDENTS | BUSINESS | VISITORS

Pay Water Bills
Recreation Registration
Weather

United States Census 2010

Bay Area Air Quality Management District
SPARE THE AIR STATUS

Tuesday, April 26, 2011

REDEVELOPMENT SUCCESS STORY

SUISUN CITY - Since January, City staff has told the story of Suisun City's redevelopment success over and over from Sacramento to multiple local groups and all points in between. >> READ MORE >>

Friday, April 22, 2011

URBAN WATER MANAGEMENT PLAN MEETINGS SET

SUISUN CITY - Two public meetings will be held to introduce the Suisun-Solano Water Authority (SSWA) Urban Water Management Plan (UWMP). Your ideas, opinions and suggestions are invited to assist us in updating the Plan, which addresses water supply and conservation for our city.
>> READ MORE >>

Wednesday, April 13, 2011

GRIZZLY ISLAND TRAIL PROJECT COMING TOGETHER

SUISUN CITY - The Public Works Department is working on an exciting new trail along the south side of Highway 12. called the Grizzly Island Trail
>> LEARN MORE ABOUT THE PROJECT >>

Tuesday, April 12, 2011

ENGINEERING FIRM SOUGHT FOR WATER PLANT PROJECT

SUISUN CITY - The Suisun Solano Water Authority is looking for proposals from qualified engineering firms to prepare a condition assessment and rehabilitation plan for the Cement Hill Water Treatment Plant.
>> READ MORE >>

STORM PREP INFO

Homebuyer Help
We help first-time

Suisun City, CA
Discover the Experience

City of Suisun City
701 Civic Center Blvd.
Suisun City, CA 94585
Tel: (707) 421-7300
Fax: (707) 421-7366

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POSTED Tuesday, April 26, 2011

SHARE

Urban Water Management Plan Hearings Set

Meetings set for May 25 and June 14

SUISUN CITY - Two public meetings will be held to introduce the Suisun-Solano Water Authority (SSWA) Urban Water Management Plan (UWMP). Your ideas, opinions and suggestions are invited to assist us in updating the Plan, which addresses water supply and conservation for our city.

Two public meetings were scheduled to gather input and adopt the Plan:

- 5:30 p.m., Wednesday, May 25, 2011 is a public meeting to gather concerns or new ideas from residents.
- 5 p.m., Tuesday, June 14, 2011, is the Public Hearing before the SSWA Board, which will consider adoption of the Plan

Meetings will be held at the Suisun City Council Chambers at 701 Civic Center Blvd., Suisun City, CA.

Please come to hear and participate in these presentations regarding the management of present and future water supplies. Water reliability, future demands, water conservation targets and drought strategies will be discussed.

This State mandated plan is a five-year update for long-term water resource planning to ensure adequate water for the City of Suisun City and outlying areas served by the SSWA. Please join us to discuss these important water supply topics.

Feel free to notify project manager Frank Morris at 707-455-4026 or fmorris@sidwater.org if you have any specific ideas or concerns.

>> *Download the meeting notice in .pdf format* >>

Section 2 - System Description

2.1 Service Area Physical Description

The City of Suisun City and Solano Irrigation District (SID) formed a Joint Exercise of Powers Agreement in 1976 intended to provide a long-term water supply for the City. In 1990, the City and SID strengthened their partnership by becoming a full Joint Powers Authority, the Suisun-Solano Water Authority (SSWA). This change sparked a reconstruction and modernization of the old Suisun Water System which served the older neighborhoods in Old Town Suisun, the Marina and Laurel Creek.

The City of Suisun City is currently a small Californian community of 29,800 residents. Suisun City is situated midway between San Francisco and Sacramento in Central Solano County. The Old Town section of the City is located on the Suisun Channel, which empties into Suisun and Grizzly Bays, the connecting point for the Sacramento River and the San Francisco Bay. A map of the City of Suisun City and surrounding municipalities is shown in **Figure 2.1**.

The City was established in the 1850's during the California Gold Rush as a trading route between the foothills of the Sierra Nevada and the San Francisco Bay Area. The town continued to prosper with the introduction of the transcontinental railroad in 1869, linking the City of Suisun City to the East Coast. The city remained the bustling hub of agricultural Solano County until Interstate 80 opened in the 1960's, effectively

switching commercial traffic away from the railroad and the waterfront area, and into nearby Fairfield.

Since 1989, the City has implemented an aggressive redevelopment program centered on the Old Town Waterfront and Historic Main Street Shopping District. After decades of isolation, the waterfront is once again accessible to the general public via a new Public Marina, Public Promenade and Harbor Plaza. The channel has been deepened to allow boating excursions from San Francisco Bay and the Sacramento Delta.

The City of Suisun City is recreating itself as a prosperous waterfront community from a more relaxed time. Buildings along Main Street have been remodeled to reflect the hometown charm of one-of-a-kind shops and restaurants. The City of Suisun City is destined to become a thriving destination for business gatherings, family day-trips, and people looking for a singular and relaxing waterfront atmosphere.

Since the 2005 Urban Water Management Plan, SSWA has grown in all areas including single family homes, multifamily residences, commercial businesses, and schools. These new areas can be seen in the increase in number of accounts for each sector. For example, single family homes have changed from 6,994 accounts in 2000 to 7,838 accounts in 2010, or a change of 884 accounts in 10 years. A map showing the current service area is shown in **Figure 2.1**.

The future of SSWA shows some growth but the City of Suisun has geographical constraints including a marsh and a common boundary with the City of Fairfield. The 2011 Capital Improvement Plan outlines some planned changes to water infrastructure facilities including upgrades to the Cement Hill Water Treatment Plant, additional treatment capacity provided by service from the City of Fairfield water system or replacement of the Gregory Hill Treatment Plant, multiple pipeline extensions, upgrades to pumping stations, and the construction of a few additional storage tanks. Planning and studies are in progress for an asset management plan to rehabilitate the entire water system.

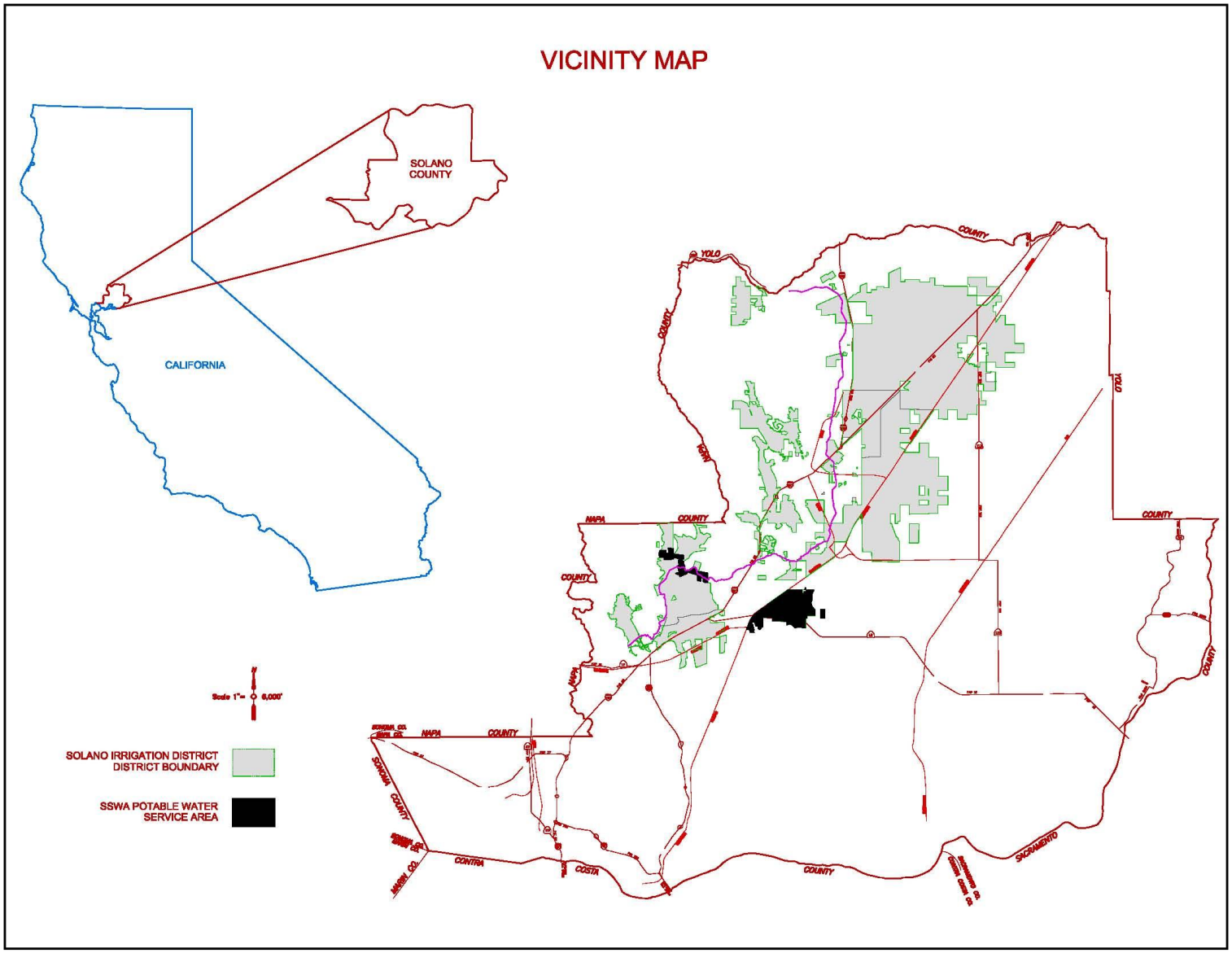


Figure 2.1: City of Suisun City and Surrounding Areas

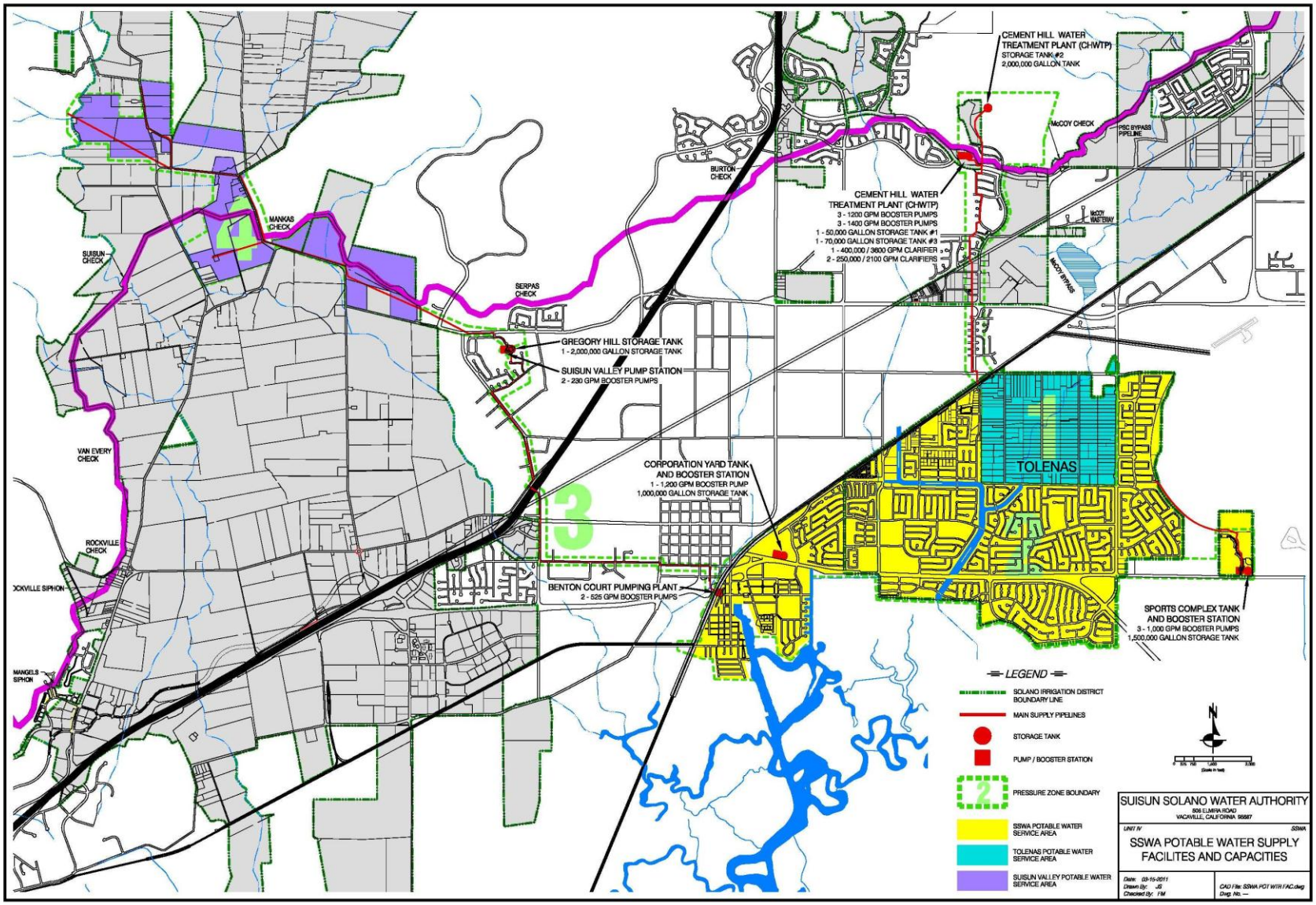


Figure 2.1: SSWA Service Area Map

2.2 Service Area Population and Employment

Historical and projected population for SSWA and housing characteristics are shown in **Table 1.1**, shown below, and on **Figure 2.2**. Between 1990 and 2010, SSWA service area population increased 31 percent. As provided from the Bay Area Association of Governments (ABAG) and shown in **Table 2**, the City of Suisun City's population is projected to increase 24 percent from 28,200 in 2005 to 35,000 in 2035. Again, geographical constraints may limit actual population growth from reaching these projections.

The City of Suisun City Planning Department is currently in the process of updating their General Plan. In the background report dated July 2009, the plan uses a population from the 2009 ABAG population projections. The plan has yet to be adopted, but is planned for adoption in late 2011 or early 2012. In order to stay in agreement with the currently published "General Plan Background Report" the population for the 2010 SSWA UWMP has also elected to use the 2009 ABAG Subregional projection.

Table 1.1: Historical, Current and Projected City Population and Housing (1990 - 2035)

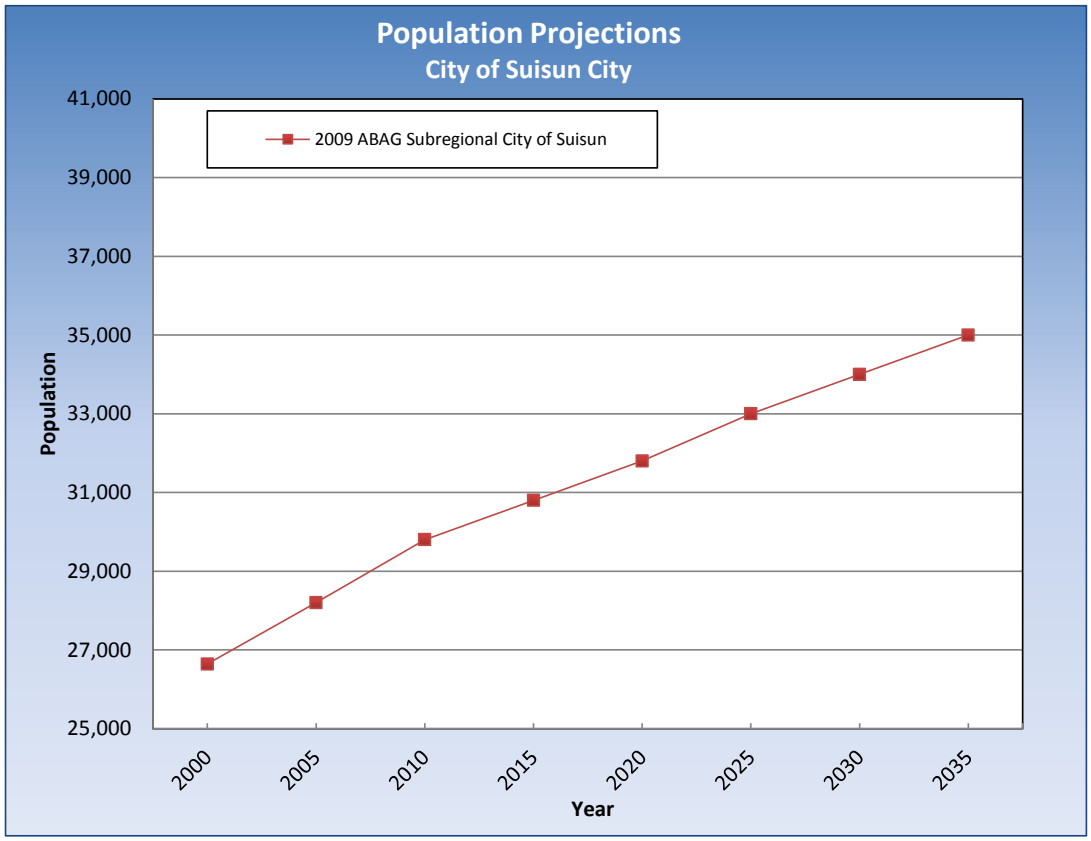
	Historical		
	1990	2000	2005
City of Suisun City	22,686[(b)]	26,640	28,200
Mankas Corner[(c)]	68	68	68
Total Service Area Population	22,754	26,708	28, 268
Annual Increase (%)	-	1.7	1.87

(a) From Bay Area Association of Governments (ABAG) 2009 Subregional Projections. The subregional area includes the area of "Tolenas" a single family residential area of 192 units that are outside the City of Suisun City limits.
(b) From 1990 Census Data
(c) Additional population of 68 persons for the area of Mankas Corner, a rural area served by SSWA which has 23 residential parcels with a 2.95 household size. The 2.95 household size is from ABAG 2009 county estimates.

Table 2
Population — current and projected

	2010	2015	2020	2025	2030	2035	Data source
Service area population[1]	29,800	30,800	31,800	33,000	34,000	35,000	2009 ABAG Subregional
Mankas Corner	68	68	68	68	68	68	23 parcels at 2.95 HHS
Total service area population[1]	29,868	30,868	31,868	33,068	34,068	35,068	2009 ABAG Subregional +Mankas Corner

[1] *Service area population is defined as the population served by the distribution system.*



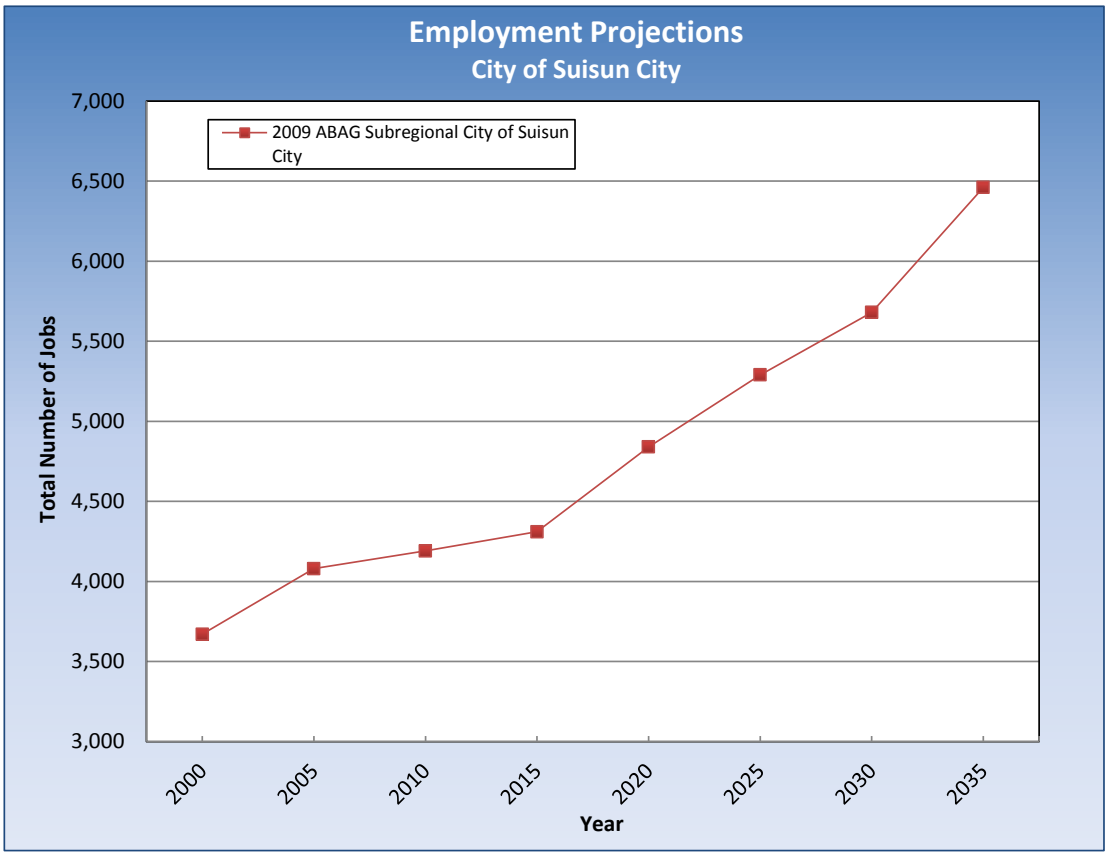


Figure 2.2: City of Suisun City Population and Employment Projections

Demographics - Source: Fairfield and Suisun Chamber of Commerce http://www.ffsc-chamber.com

	Suisun City **
Size (sq. miles)	4.0
Population*	27,073
Population Growth per year*	4.12%
Median Age	32.49
Median Income*	$72,149
Employed Residents*	13,500 (2005)
Population with High School Diploma or higher	85.5%
Population with College Degree	28.5%
Crime Rate per 1000 residents*	26

information provided by the City of Suisun City
Source - 2000 Census, 2005 ABAG Projections, 2004 DOF Estimates, EDD
Data accessed from FSCC website on April 1, 2011

2.3 Land Use

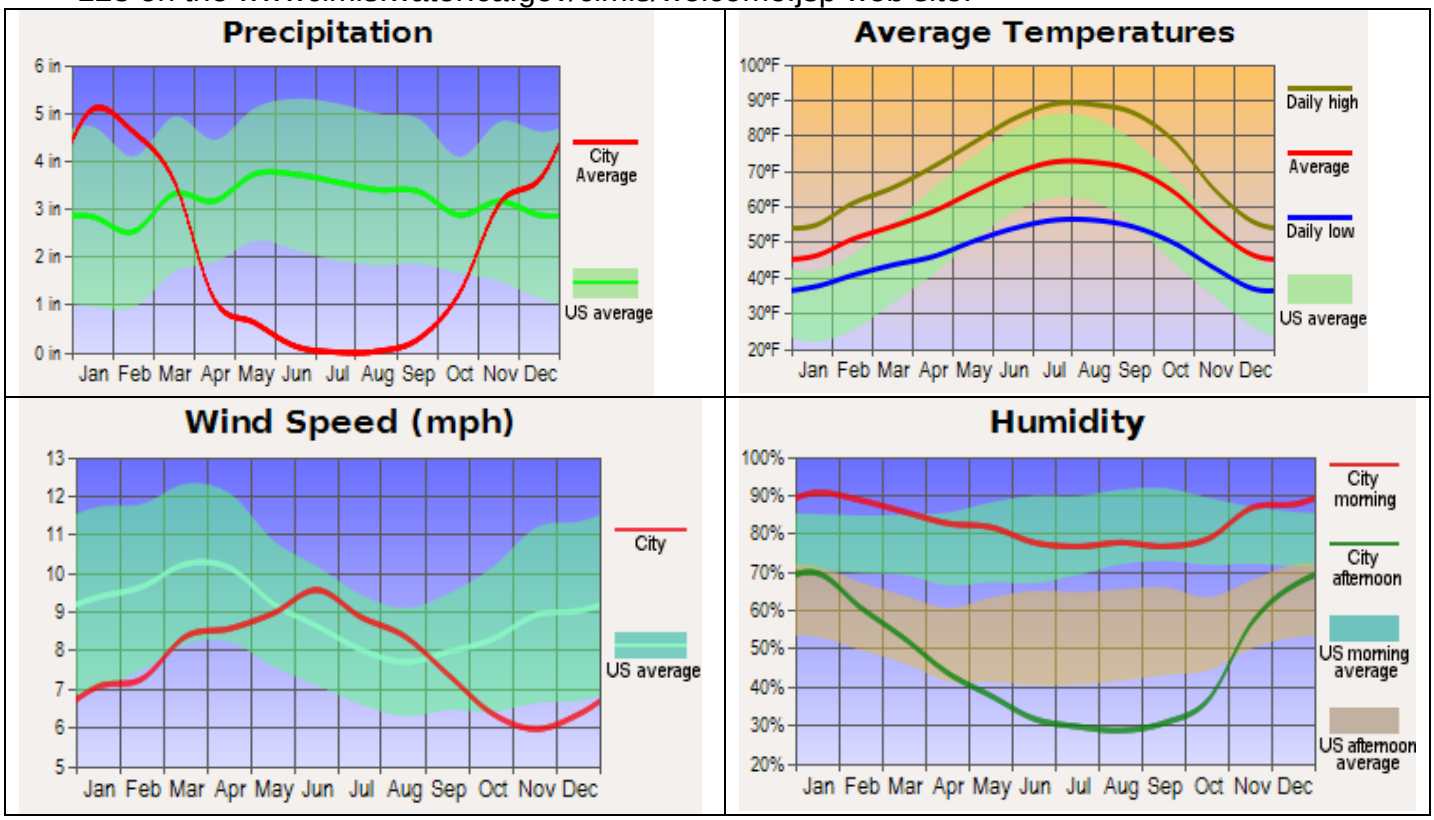
There are approximately 4 square miles of land within the City boundaries. In Solano County, an initiative (Solano County Orderly Growth Initiative, 1994) requires that any urban development be annexed to a city. There are no urban type populations in the unincorporated areas.

The primary land uses in the developed portions of the City of Suisun City are residential and commercial. The distribution of land uses provided by the City of Suisun City Planning Department consistent with the General Plan planned to be adopted in late 2011 or early 2012 are the following:

- 2368 acres (77.4%) residential,
- 492 acres (16.3%) commercial,
- 160 acres (5.3%) public.

2.4 Climate Characteristics

Solano County has a mild, temperate climate throughout the year. A prevailing wind from the west, across the bay, tempers the climate. The annual mean daily temperature is 60.3°F. Predominant wind directions are from the southwest. There is an average of 344 frost free days per year. The rainy season extends from October through April. The total annual rainfall is 23 inches. The following rainfall data is from National Weather Service Station 042934 for the City of Fairfield, which is the closest available station to the Suisun-Solano Water Authority service area for the years1954 to year 2010. The standard monthly average ET (ET is an abbreviation of evapotranspiration which is the summation of evaporation and transportation) comes from CIMIS stations 123 on the wwwcimis.water.ca.gov/cimis/welcome.jsp web site.



Source: http://www.city-data.com/city/Suisun-City-California.html

Climate Characteristics

	Jan	Feb	Mar	Apr	May	Jun	
Standard Monthly Average ETo Demand (inches)	0.60	1.34	3.01	4.67	5.84	6.96	
Average Rainfall (inches)	4.95	3.98	3.0	1.30	0.52	0.17	
Average Temperature (Fahrenheit)	46.4	51.3	54.8	58.6	64.2	69.2	
	July	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Standard Monthly Average ETo Demand (inches)	7.65	6.84	5.25	3.81	1.41	0.88	48.26
Average Rainfall (inches)	0.02	0.07	0.27	1.21	2.86	4.12	22.47
Average Temperature (Fahrenheit)	72.5	72.4	70.5	64.1	53.9	46.8	60.4

Section 3 - System Demands

This section describes the urban water system demands, including calculating its baseline (base daily per capita daily) water use and interim and urban water use targets. It quantifies the current water system demand by category and projects them over the planning horizon of the UWMP. These projections include water sales to other agencies, system water losses, and water use target compliance.

The future water demands are based on the assumed reduction in per capita daily use determined from planning for and implementing actions associated with the Water Conservation Bill of 2009.

The section also includes a detailed description of how the baseline and targets were calculated. The calculations follow the technical methods and methodologies described in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Bill of 2009) (DWR 2010a). Background information and the approach used to develop baselines and targets are also included.

3.1 Historical Water Use

Historical SSWA potable water consumption by customer type for the ten years 2001 through 2010 is shown in **Table 3.1**. Water consumption was developed from the City of Suisun City water meter and billing records.

Table 3.1 Historical SSWA Potable Water Use (2001-2010)

SSWA Billing Category	Historical SSWA Metered Potable Water Use (AF)									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Single-Family Residential	2,129	2,757	3,067	3,198	3,044	2,986	3,057	3,071	2,871	2,819
Multi-Family Residential	284	259	272	260	235	272	223	231	249	230
Commercial/Institutional	109	144	159	175	168	221	188	206	171	165
Industrial	0	0	0	0	0	0	0	0	0	0
Government/ City	0	0	0	0	0	0	0	0	0	0
Landscape Irrigation	264	318	333	325	434	431	367	358	313	188
Agricultural Irrigation	0	0	0	0	0	0	0	0	0	0
Other - Hydrants	0	0	24	22	16	14	19	18	5	5
Total Potable Water Use	2,786	3,478	3,925	4,002	3,897	3,923	3,853	3,884	3,609	3,406

*According to the City of Suisun Finance Department billing records for 2001 to 2010. This does not include data for the area of Tolenas.

3.2 Water Use by Customer Type

Past and projected City potable water uses for the various customer types metered are shown in **Table 3 to 7**. Nearly all (with exception of Fire Station) SSWA accounts are now metered and are expected to all be metered in the future. Water use for all categories is projected to increase to 3,767 AFY in 2035 before taking into account system water losses.

The water future demand and associated conservation for the years 2015 to 2035 were calculated using the Least Cost Planning Decision Support System (DSS Model). The DSS Model is an Excel-based proprietary software created by Maddaus Water Management which is endorsed by the California Urban Water Conservation Council.

The future water demands do meet the SBx7-7 reduction targets using Method 3 which is described under section 3.9. The demands assume a starting demand value similar to the year 2009, and a conservation program as described in Section 6. The key element to the water use reduction is a focus effort on water loss reduction described in Section 6.1 DMM C.

Table 3
Water deliveries — actual, 2005 in AFY

	2005				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	7,769	3,044	0	0	3,044
Multi-family	90	235	0	0	235
Commercial	134	168	0	0	168
Industrial	0	0	0	0	0
Institutional/governmental	0	0	1	0	0
Landscape	78	434	0	0	434
Agriculture	0	0	0	0	0
Other – Hydrants	4	16	0	0	16
Total	8,074	3,897	5	0	3,897

Table 4
Water deliveries — actual, 2010 in AFY

	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	7,805	2,819	0	0	2,819
Multi-family	108	230	0	0	230
Commercial	138	165	4	0	165
Industrial	0	0	0	0	0
Institutional/governmental	0	0	0	0	0
Landscape	111	188	0	0	188
Agriculture	0	0	0	0	0
Other – Hydrants	6	5	0	0	5
Total	8,168	3,406	4	0	3,406

Table 5
Water deliveries — projected, 2015 in AFY

	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	8,662	2,707	0	0	2,707
Multi-family	98	269	0	0	269
Commercial	202	213	0	0	213
Industrial	0	0	0	0	0
Institutional/governmental	0	0	0	0	0
Landscape	119	506	0	0	506
Agriculture	0	0	0	0	0
Other – Hydrants	7	12	0	0	12
Total	9,088	3,707	0	0	3,707

Table 6 Water deliveries — projected, 2020 in AFY					
	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	8,943	2,668	0	0	2,668
Multi-family	101	267	0	0	267
Commercial	214	222	0	0	222
Industrial	0	0	0	0	0
Institutional/governmental	0	0	0	0	0
Landscape	127	536	0	0	536
Agriculture	0	0	0	0	0
Other – Hydrants	7	13	0	0	13
Total	9,392	3,705	0	0	3,705

Table 7 Water deliveries — projected 2025, 2030, and 2035 in AFY						
	2025		2030		2035	
	Metered		metered		Metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Single family	9,280	2,671	9,562	2,673	9,843	2,697
Multi-family	105	267	108	267	112	268
Commercial	224	231	224	230	224	228
Industrial	0	0	0	0	0	0
Institutional/governmental	0	0	0	0	0	0
Landscape	132	561	132	561	132	561
Agriculture	0	0	0	0	0	0
Other – Hydrants	7	13	7	13	7	13
Total	9,749	3,742	10,034	3,744	10,318	3,767

The most recent source of data for low income housing units for the City of Suisun City is the 2009-2014 Housing Element Table 1.A (see Appendix B) which is part of the General Plan background report published in July 2009 The estimated number of City of Suisun City low income housing units is provided below for the years 2007 to 2014.

CITY OF SUISUN CITY 2009-2014 HOUSING ELEMENT

TABLE 1.A
REGIONAL HOUSING NEEDS DETERMINATION
2007-2014 PLANNING PERIOD ALLOCATION

Income Level	Dwelling Units	% Of Total
Very Low-Income	173	28
Low-Income	109	18
Moderate-Income	94	15
Above Moderate-Income	234	38
Total	**610**	**100**
Average Yearly Need	87	--

Source: ABAG 2007-2014 Regional Housing Needs Determination.

Data is not currently available past the year 2014, so the **Table 8** values are based on the inability to estimate the low income demand within SSWA's service area for the years 2015 to 2035.

Table 8
Low-income projected water demands

Low Income Water Demands[1]	2015	2020	2025	2030	2035
Single-family residential	NA	NA	NA	NA	NA
Multi-family residential	NA	NA	NA	NA	NA
Total	0	0	0	0	0

[1]Provide demands either as directly estimated values or as a percent of demand.

3.3 Sales to Other Agencies

SSWA does not regularly sell water to other agencies currently, and has no plans to do so in the future.

Table 9
Sales to other water agencies, AFY

Water distributed	2005	2010	2015	2020	2025	2030	2035
None sold	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

3.4 Water Loss and Total Water Use

Presented in **Table 10** "System losses" is the difference between water production and water consumption and represents "lost" water.

Table 10
Additional water uses and losses, AFY

Water use[1]	2005	2010	2015	2020	2025	2030	2035
Saline barriers							
Groundwater recharge							
Conjunctive use							
Raw water							
Recycled water							
System losses	1,144	708	755	493	493	488	484
Other (define)							
Total	1,144	708	755	493	493	488	484

[1]*Any water accounted for in Tables 3 through 7 are not included in this table.*

Total water use including water losses is projected to decrease to 484 AF in 2035 as shown in **Table 11** due to a new water loss program as described in Section 6.

The total water use in **Table 11** is the sum of water use by customer categories **(Table 3 to 7)**, sales to other agencies **(Table 9)** and additional water uses **(Table 10)**. The year 2035 demand is estimated at 4,251 AFY, which represents a 3 percent decrease relative to 2010.

Table 11 Total water use, AFY							
Water Use	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Total water deliveries (from Tables 3 to 7)	3,897	3,406	3,707	3,705	3,742	3,744	3,767
Sales to other water agencies (from Table 9)							
Additional water uses and losses (from Table 10)	1,144	708	755	493	493	488	484
Total	5,041	4,114	4,462	4,198	4,235	4,232	4,251

SSWA relies on Solano Irrigation District and Suisun City water supplies, both of which are wholesaled by the Solano County Water Agency (SCWA) as more thoroughly discussed in Section 4 of this Plan. The projected SSWA demand provided to the wholesale suppliers is presented in **Table 12**.

Table 12 Retail agency demand projections provided to wholesale suppliers							
Wholesaler	**Contracted Volume**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Solano County Water Agency under contract to City of Suisun City for Solano Project water	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Solano County Water Agency under contract to City of Suisun City for State Water Project water[1]	1,300	0	1,300	1,300	1,300	1,300	1,300
Solano County Water Agency under contract to Solano Irrigation District for Solano Project water	141,000[2]	2,514	1,562	1,298	1,335	1,332	1,351

[1]Suisun City's SWP allocation will increase to its full contractual amount in 2015.

[2]SID's contracted volume is used for other purposes than serving SSWA. See the discussion of this source in Section 4.1 of this Plan.

3.5 Baselines and Targets

Enacted in November 2009 by California lawmakers, the Water Conservation Bill of 2009 (SB7x-7) requires water suppliers throughout the state to decrease per capita urban water use by 10 percent by December 31, 2015 and by 20 percent by December 31, 2020. The methodology to determine water use baseline and the four (4) methods to determine a future water reduction target are outlined in the SB7x-7 legislation. Urban water suppliers must adopt one of four specific methods for complying with SB7. The four methods consist of the following:

- **Method 1** – This approach requires water suppliers to reduce urban water demands to 80 percent of the water supplier's baseline per capita daily water use calculated as the average gross water use over a continuous 10-year period ending no earlier than December 31, 2004 and ending no later than December 31, 2010. Gross water use is defined in SB7 as "the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier" excluding recycled water, long-term storage water, transfers to another water supplier, or water used for agriculture.
- **Method 2** – This method requires that water suppliers determine the per capita water use targets as estimated using 55 gallons per capita per day (GPCD) for indoor purposes, DWR's Model Water Efficient Landscape Ordinance for landscape irrigation, and a 10 percent reduction of baseline commercial, industrial, and institutional water use by 2020.
- **Method 3** – This approach requires that water suppliers meet a daily per capita demand of 95 percent of the applicable state hydrologic region target, as documented in the state's 20x2020 Water Conservation Plan.
- **Method 4** – This method was recently finalized by DWR in February 2011. Among other considerations, this method considers climatic differences and population density.

This section discusses the comparison of the results and presents the target defined for SSWA. The results of evaluations of the target reduction methodologies are based on information provided by SSWA on the following:

- Historical water production
- Historical water demand
- Historical connections and population

The data used is presented in the following tables:

- **Table 13** presents the base period data ranges.
- **Table 14** presents the baseline per capita water demand over a 10-year. The 15-year period was not used given no recycled water is delivered by SSWA.
- **Table 15** presents the base daily water use over a 5-year range.

Table 13
Base period ranges

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	1265.57	*see below*
	2008 total volume of delivered recycled water	0	*see below*
	2008 recycled water as a percent of total deliveries	0	percent
	Number of years in base period[1]	10	years
	Year beginning base period range	1999	
	Year ending base period range[2]	2008	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2004	
	Year ending base period range[3]	2007	

Units (circle one): *acre-feet per year* *million gallons per year* *cubic feet per year*

[1]If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.

[2]The ending year must be between December 31, 2004 and December 31, 2010.

[2]The ending year must be between December 31, 2007 and December 31, 2010.

Table 14
Base daily per capita water use — 10- to 15-year range

Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	1999	27,356	3.94	144
Year 2	2000	27,057	3.90	144
Year 3	2001	26,980	4.02	149
Year 4	2002	27,228	4.25	156
Year 5	2003	27,520	4.26	155
Year 6	2004	28,117	4.48	159
Year 7	2005	28,235	4.50	159
Year 8	2006	28,274	4.17	147
Year 9	2007	28,488	4.21	148
Year 10	2008	28,665	4.22	147
			Base Daily Per Capita Water Use[1]	151

[1]Add the values in the column and divide by the number of rows.

Table 15 Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2003	27,520	4.26	155
Year 2	2004	28,117	4.48	159
Year 3	2005	28,235	4.50	159
Year 4	2006	28,274	4.17	147
Year 5	2007	28,488	4.21	148
Base Daily Per Capita Water Use[1]				154

[1]*Add the values in the column and divide by the number of rows.*

3.6 Water Use Reduction Plan

As part of the 2010 UWMP Plan all retail water suppliers are to develop an implementation plan for compliance with the Water Conservation Bill of 2009. The plan described below includes a general description of how SSWA intends to reduce per capita water use to meet its urban water use target. In developing the implementation plan, SSWA was careful to avoid placing a disproportionate burden on any customer sector.

SBx7-7 requirements for SSWA provide the overall goal for community-wide water demand reduction. The state requirements refer to the metric on a per-person (capita) amount of water demand per day, which is based on total water demand in the service area divided by number of days in the year, divided by the total number of persons served, presented in terms of Gallons Per Capita per Day (GPCD).

The compliance with GPCD targets required by SBx7-7 is voluntary on behalf of each individual property owner. SSWA will need to proceed with more conservation measures over time if monitoring of progress of the total annual water demand in the service area indicates that targets are not forecasted to be achieved.

SSWA will be encouraging reductions in customer water demand mainly through the implementation of the 14 Demand Management Measures (DMMs) included in this plan along with focused work on reducing water loss (a key area determined to be of specific importance for the SSWA service area). Over the course of the next 9 years, the SSWA Board may also strengthen some existing policies or adopt new policies to help achieve these targets. Compliance with some of these Board policies may not be voluntary, such as requirements to avoid wasteful practices (e.g., enforcement of the SSWA Board policy imposing fines for water waste violation). Detailed descriptions of the water reduction plan elements are included in Section 6. The highest priority with the largest potential water savings is DMM C water audit and leak reduction.

3.7 Urban Water Use Target Method 1 Evaluation: 80% of Base Daily Per Capita Water Use

As part of the Urban Water Use Target Method 1 evaluation, SSWA's historic water use in terms of GPCD was evaluated using total gross treated water production for each year and estimated population in each year based on the California Department of Finance data from Table E-4. The highest 10-year average GPCD was 151 gpcd, which was for the 1999 to 2008 period. The current is 124 GPCD production of 1,341 AFY per year based on the current estimated population of 29,596 residents (year 2010). For comparison purposes, the 1998-2008 average for total water treatment plant production was 1,531 AFY per year.

The value of 151 GPCD shown in **Table 14** is considered the base daily per capita water use for Method 1.

- Based on a 10 percent reduction of the base daily per capita water use, the 2015 the interim target is 139 gpcd
- Based on a 20 percent reduction of the base daily per capita water use, the 2020 the interim target is 123 gpcd

Figure 3-1 shows the historical demand and 2015 and 2020 targets as determined using Method 1.

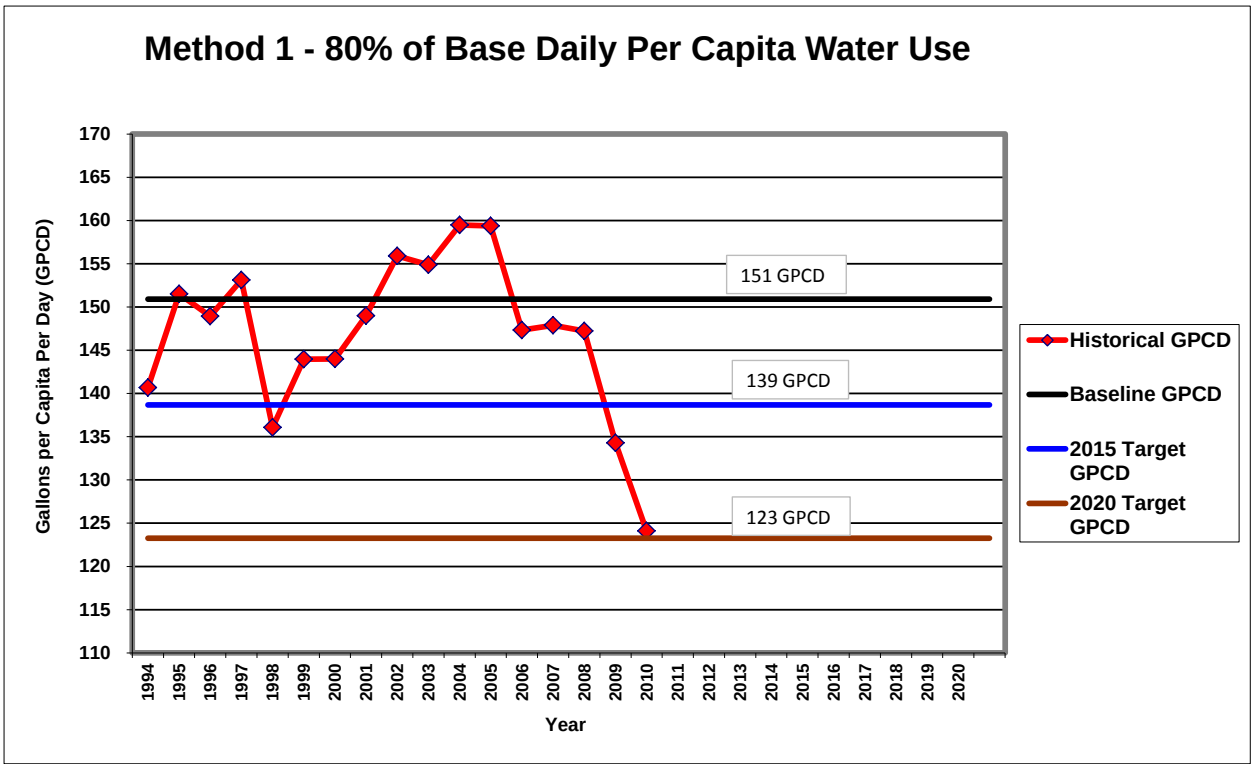


Figure 3-1. Historical GPCD Demands and Method 1 Goals

3.8 Urban Water Use Target Method 2 Evaluation: Performance Standards

Method 2 requires that per capita water use targets are determined using the performance standards requirements in SBx7-7. The law states the following parameters are used:

(1) 55 GPCD for indoor purposes,
(2) DWR's Model Water Efficient Landscape Ordinance for landscape irrigation
(3) 10 percent reduction of baseline commercial, industrial, and institutional water use by 2020.

The 2020 Performance Standard GPCD Target was determined based on data provided by SSWA, which includes the following:

- Required 55 GPCD residential indoor water use.
- 760 MG annual residential outdoor demand was calculated with the Maximum Applied Water Allowance formulas within the Water Budget Calculator as provided by DWR online: http://www.water.ca.gov/wateruseefficiency/landscapeordinance/
- Using the closest Suisun Valley CIMIS station evapotranspiration rate (ET) of 48.30 inches of water/yr included in the water budget calculator
- Using 30,930,084 square feet of estimated residential irrigated landscape area based on existing residential lot sizes (estimated by City of Fairfield staff) based on images from Google Earth and overlaid with house footprints for the entire service area. **Figure 3.3** is a screen shot showing such typical overlays in Google Earth.
- Using 40% Special Landscape Area (SLA) of 12,372,034 square feet of the estimated residential irrigated landscape area.
- 43 MG for annual Commercial and Industrial Irrigation (CII) demand based on a 10% reduction from the baseline demand.

Additional field confirmation of landscape area is needed to verify the work that has been done using Google Earth Images. The total estimated GPCD using the SBx7-7 Method 2 performance standard criteria is in the range of 115-135 GPCD in 2020.The actual demand based on 2009 data or a longer-term average was determined based on information provided by City of Suisun City staff. The SBx7-7 Method 2 evaluation results presented for comparison is shown in **Figure 3-2**.

This method was not selected at this time as the method is planned to be revised in 2014, and there are assumed to be many landscape changes throughout the service area between 2011 and 2015 which could impact the actual value and compliance with this method. As this method is directly dependent upon irrigated landscape area (which as noted is assumed to change in the future and needs additional field verification), it was not selected as the preferred target method. This method does appear promising and should be considered a possibility when reviewing targets and methods for the 2015 UWMP.

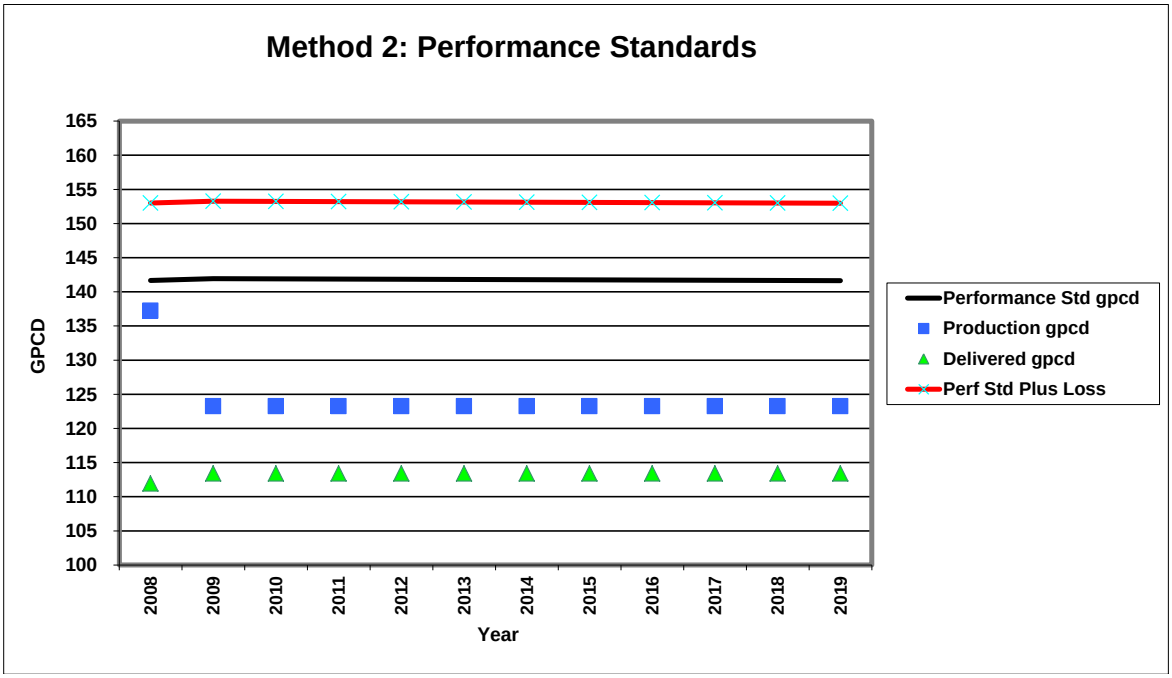


Figure 3-2. GPCD Demands and Method 2 Goals

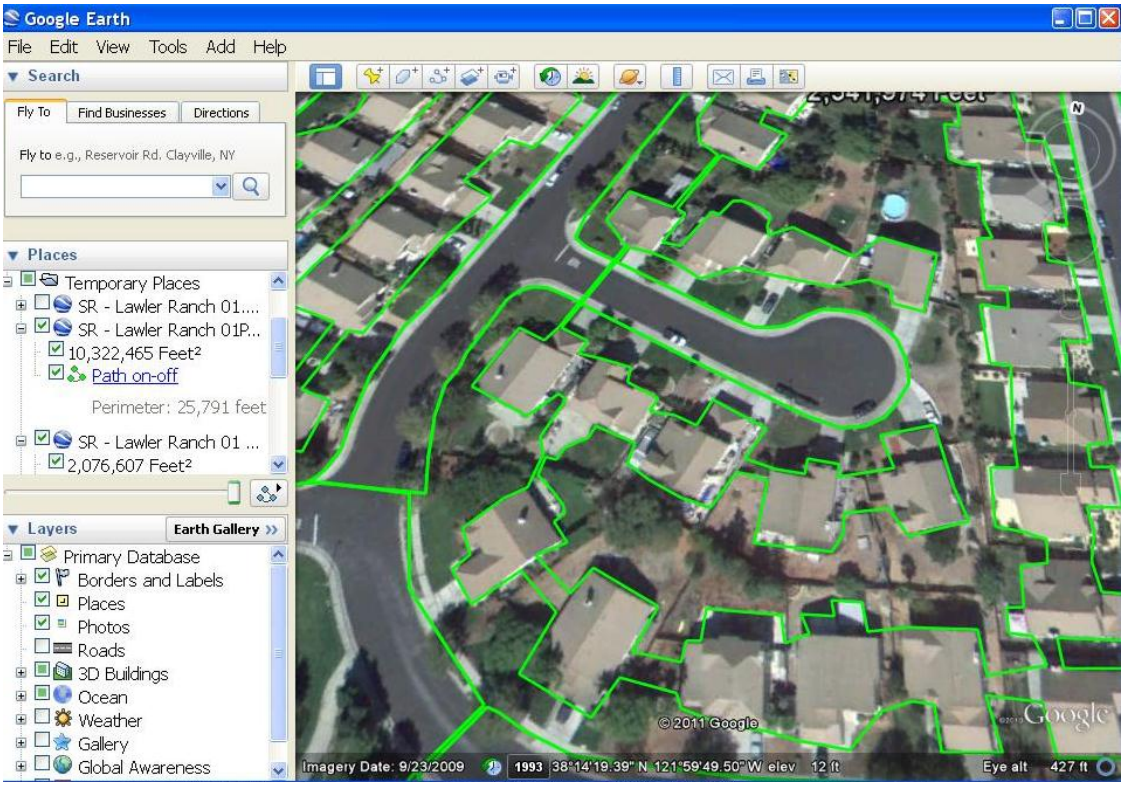


Figure 3.3 Typical house footprint overlays on Google Earth for estimating residential irrigated landscape area

3.9 Urban Water Use Target Method 3 Evaluation: 95 Percent of Hydrologic Region Target

The third method is based on the 2020 Water Conservation Plan (DWR, February 2010). The method allows the water supplier to select the hydrologic regions target as the GPCD goal. The applicable Hydrologic Region for SSWA is Region 2 – San Francisco Bay. As provide by DWR, the 2020 target for this region is 124 GPCD as shown on **Figure 3-4**.

The difference between the baseline water use of 151 GPCD (**Table 14)** and 124 GPCD is 27 GPCD. **Table 16b** presents a summary of the Method 3 2020 target and percent reduction necessary for compliance.

Table 16b. SB7 Method 3 Actual Demand GPCD 10—year Baseline Compared to 2020 Performance Standard Target

Description	Annual Average Demand (GPCD)	2020 San Francisco (Region 2) Target (GPCD)	Percent Reduction Necessary for Compliance
Total GPCD	151	124	-17.9%

For additional background information, please review the 2020 Water Conservation Plan: http://www.water.ca.gov/wateruseefficiency/sb7/docs/20x2020plan.pdf

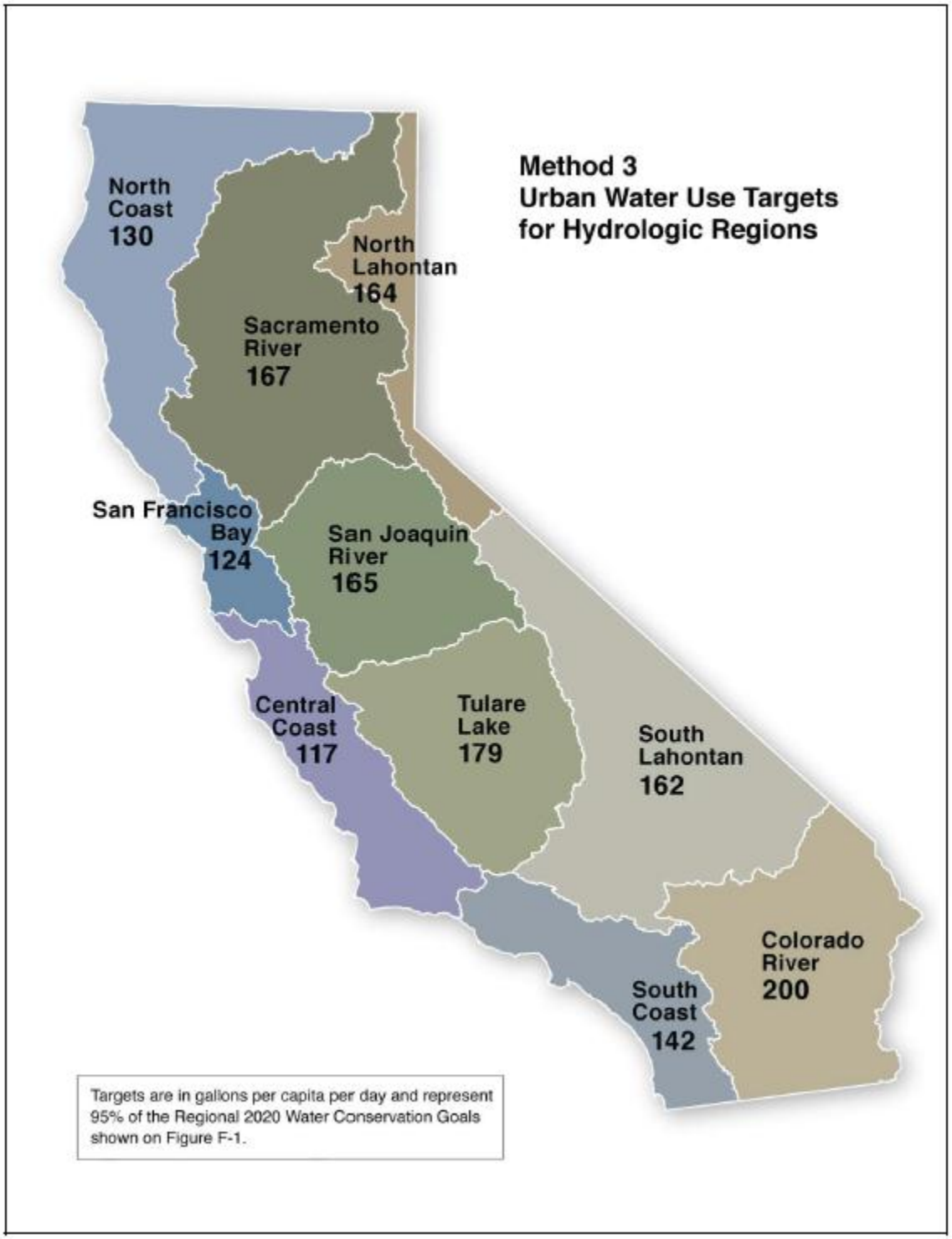


Figure 3-4. Basis of the Method 3 Demand Target – SSWA is in the San Francisco Bay Hydrologic Region

3.10 Urban Water Use Target Method 4 Evaluation: Water Savings (Provisional)

DWR developed Provisional Target Method 4 with the assistance of the California Urban Water Conservation Council, the California State Water Resources Control Board, and the Urban Stakeholder Committee, composed of technical experts and representatives of water suppliers and environmental and other organizations.

It is anticipated that improvements will be made to this target method based on new data and analytical techniques. Provisional Target Method 4 described in this UWMP will be in effect until the update by 2014. Urban retail water suppliers that adopt Target Method 4 to determine their 2020 urban water use target must use the provisional procedures provided by DWR. According to the Water Code, DWR will update Target Method 4 by December 31, 2014.

A Target Method 4 Calculator (Calculator) using an Excel spreadsheet was developed by DWR for use with Provisional Target Method 4. The Calculator will be required to accomplish some of the procedures for this method. Other procedures may be accomplished without use of the Calculator but have been incorporated into the Calculator to automate the calculation of the 2020 target.

For this target method, savings are assumed between the baseline period and 2020 due to metering of unmetered water connections and achieving water conservation measures in three water use sectors as shown below for residential, commercial and industrial and landscape. The results of the calculator for SSWA are provided in **Figure 3-5** below.

Target Calculation -- Provisional Method 4 Target

Step 1. Calculation of Landscape Water Use and System Water Loss

Urban Supplier	1999-2008 Baseline GPCD	–	Assumed Indoor Residential per Capita Water Use GPCD	–	CII per Capita Water Use GPCD	=	Estimated Landscape Water Use and System Water Loss GPCD
Suisun Solano Water Authority	150.9		70.0		1.7		79.2

Step 2. Calculation of Savings Using BMP Calculators (Alternate) STEP 2 BEING USED TO CALCULATE TARGET

Urban Supplier	Indoor Residential Savings Calculators					+	Metering Savings BMP 1.3	+	CII Savings BMP 4	+	Land-scape + Water Loss Savings 21.6%	=	Total Savings GPCD
	Single Family Toilets	Multi Family Toilets	Resi-dential Washers	Resi-dential Showers	Total IR Savings								
Suisun Solano Water Authority	XXXX	XXXX	XXXX	XXXX	XXXX		XXXX		XXXX		XXXX		XXXX

(Alternate) Step 2. Calculation of Savings Using Default Indoor Residential Savings

Urban Supplier	Default Resi-dential Indoor Savings	+	Metering Savings BMP 1.3	+	CII Savings BMP 4	+	Land-scape + Water Loss Savings 21.6%	=	(alt) Total Savings GPCD
Suisun Solano Water Authority	15.0		0.0		0.2		17.1		32.3

Step 3. Calculation of Urban Water Use Targets

Urban Supplier	1999-2008 Baseline GPCD	–	Total Savings GPCD	=	**Computed 2020 Target GPCD**	→	**Less Than 95% of 5-Year Baseline**	→	**Final 2020 Target**	→	**Final 2015 Target**
Suisun Solano Water Authority	150.9		32.3		**118.6**		**TRUE**		**118.6**		**134.8**

Figure 3-5. Results of the Target Method 4 Calculator for SSWA

3.11 Selected 2015 and 2020 GPCD Targets

Methods 1, 2, 3 and 4 were compared to determine which option was preferred by SSWA. As discussed above:

- Method 1 - the difference between the baseline 151 GPCD and the 2020 target value of 123 GPCD represents a reduction of 28 GPCD.
- Method 2 - the difference between the baseline 151 GPCD and the 2020 target value of 115-135 GPCD represented a reduction of 16 GPCD.
- Method 3 – the difference between the baseline 151 GPCD and the 2020 target value of 124 GPCD represents a reduction of 27 GPCD.

- Method 4 - the difference between the baseline 151 GPCD and the 2020 target value of 119 GPCD represents a reduction of 32 GPCD.

Reviewing the level of effort to meet either Method 1, 2, 3, or 4 approaches, it was recognized that the performance standards in Method 2 may be harder to achieve for existing residential and commercial customers. At the SSWA Board Workshop and Public Meeting on May 25, 2011, the Method 3 GPCD target of 124 GPCD was selected when compared to Method 1, 2 and Method 4 GPCD targets.

Section 4 - System Supplies

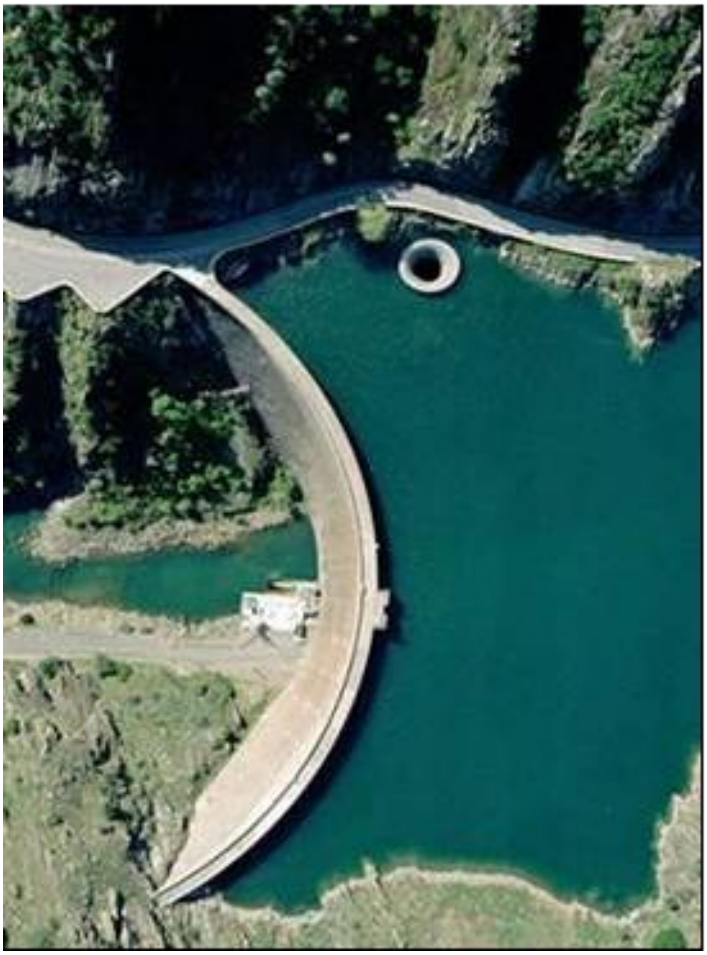
4.1 Water Sources

Water Rights, Historical and Future Water Deliveries

SSWA currently has two sources of water, the United States Bureau of Recreation (USBR) Federal Solano Project and the California Department of Water Resources (DWR) State Water Project.

The main water supply to SSWA is from Lake Berryessa (shown on **Figure 4.1**) which is owned and operated by the United States Bureau of Reclamation (USBR). Lake Berryessa has a storage capacity of 1,602,000 acre-feet. Solano Project water stored in Lake Berryessa is released down Putah Creek from Monticello Dam and re-captured by Putah Diversion Dam approximately 13 miles downstream. The water is diverted through the Putah South Canal to the Cement Hill Water Treatment Plant (CHWTP) where the water is treated and piped to the City of Suisun City through Fairfield.

Figure 4.2 shows the historical lake levels for this water source. The graphic displays the cyclical nature of the lake levels and clearly shows the droughts that occur in 1976-78 and 1990-1993



Monticello Dam and Lake Berryessa

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Figure 4.1 SSWA Water Sources

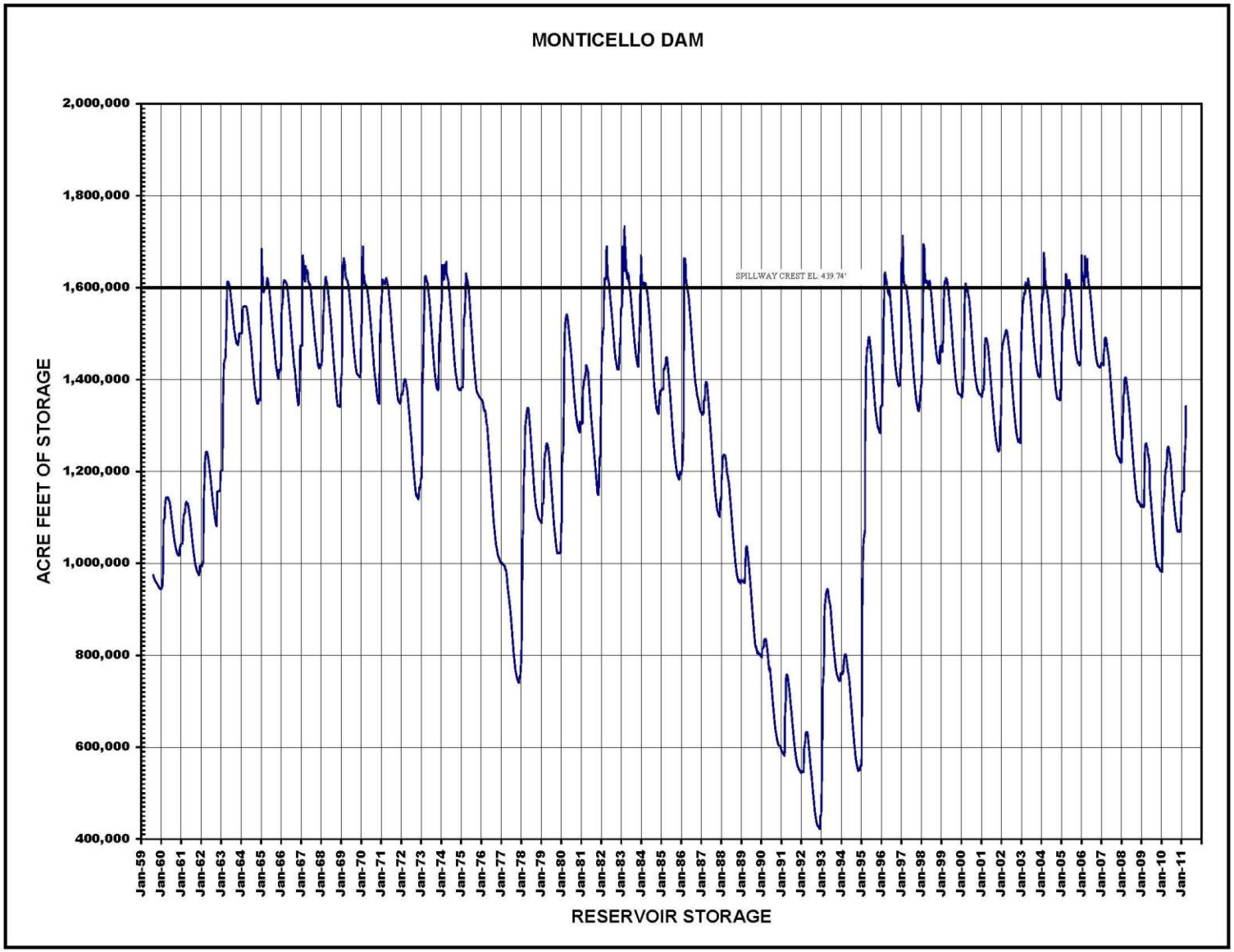


Figure 4.2: Historical Lake Berryessa Levels

According to the Water Supply Assessment for the Gentry Project: “Both Suisun City and Solano Irrigation District have contracts with Solano County Water Agency for water supplies from the Federal Solano Project. The Solano County Water Agency is the contracting agency with the United States Bureau of Reclamation (USBR) for the water supplies from the Solano Project. SSWA currently has a water treatment facility that receives surface water from the Solano Project and following treatment delivers it to the service area. At present, due to a lack of connection to the SSWA water treatment plant, the City of Suisun City is unable to directly utilize their State Water Project entitlement, but they do have the opportunity to transfer to others or exchange this entitlement with other Solano County water users with access to the North Bay Aqueduct during periods of water shortage. This would include the cities of Benicia, Fairfield, Vacaville and Vallejo. Solano Irrigation District, under their Implementation Agreement with SSWA, delivers from its Solano Project entitlement the additional water needed to provide treated water service to the SSWA service area.”

SOLANO IRRIGATION DISTRICT is an independent special district and a local governmental agency, formed in 1948. The 5-member Board of Directors is elected by registered voters within the boundaries of the District. SID has entitlements and agreements for 141,000 AF of agricultural and domestic water for service to many areas in Solano County each year. The District also is the operator of the Solano Project which delivers Lake Berryessa water to four cities and Maine Prairie Water District and the SID customers. The District owns and operates the hydroelectric power plant at the base of Monticello Dam. SID has 90 employees and operates on a $6 million annual budget of its own. SID is partners with the Cities of Dixon and Suisun City in water delivery utilizing another $6 million in revenues to accomplish the partnerships’ objectives. Note that the annual Solano Project entitlement to SID is much greater than that supplied annually to SSWA. SID uses this volume to provide agricultural irrigation water to approximately 80,000 acres, raw water for urban landscape irrigation in the Solano County cities of Fairfield and Vacaville and potable-treated surface water in several public water systems, the largest of which is SSWA.

CITY OF SUISUN CITY was established in the 1850s as a focal point of commerce and transportation during California's Gold Rush. The City of Suisun City has water rights for both the Solano Project and the State Water Project. The City of Suisun City’s State Water Project (SWP) entitlement is from the North Bay Aqueduct (NBA), see Appendix C. As shown in **Table 4.1** the SWP entitlement started in the year 1990 and increases at 50 acre-feet per year until the maximum of 1,300 acre-feet per year is reached in 2015. SSWA currently does not have the facilities to convey or treat the NBA water, but may develop such capability in the future as discussed in Section 5. The City of Suisun City is obligated to utilize the NBA allocation by contract (see 1990 SSWA Implementation Agreement), see Appendix D, as soon as a means of transfer occurs. The diversity of water resources available provides for very good reliability of supply for SSWA.

Historical water rights are provided in **Table 4.1**.

Suisun Solano Annual Water Rights (Table 4.1)
SOLANO PROJECT

Agency	Annual Entitlement (Acre-Feet)
City of Suisun City	1,600
Solano Irrigation District*	141,000

Source: Water Supply Assessment for the Gentry Gateway Project, March 2004
*NOTE – the 141,000 AFY is not for the SSWA service area alone, it is for all of SID customers.

STATE WATER PROJECT

Agency	Annual Entitlement (AFY)				
	2000	2005	2010	2015	2020
City of Suisun City	550	800	1,050	1,300	1,300

Source: Water Supply Assessment for the Gentry Gateway Project, March 2004

Historical water supplies are provided in **Table 4.2** and the breakdown of Solano Project deliveries from SID and Suisun City are in **Table 4.3**.

Historical Water Supplies (Table 4.2)

Supply Source	Supply (AFY)							
	1999[a]	2000[a]	2001[a]	2002[b]	2003[b]	2004[b]	Avg	%
Federal Urban Water – Solano Project [c]	1,600	1,600	1,600	1,600	1,600	1,600	1,600	34%
Federal agricultural water	0	0	0	0	0	0	0	0%
State Water Project	0	0	0	0	0	0	0	0%
Local/other	0	0	0	0	0	0	0	0%
Local surface water	0	0	0	0	0	0	0	0%
Upslope drain water	0	0	0	0	0	0	0	0%
District ground water[d]	0	0	0	0	0	0	0	0%
Transferred water Supplemental – SID	0	0	0	0	0	0	0	0%
Reclaimed water	0	0	0	0	0	0	0	0%
Other (USBR/SID)[e]	2,846	2,779	3,159	3,152	3,178	3,433	3,091	66%
Total	4,446	4,379	4,759	4752	4,778	5,033	4,691	100%

(a) Source: Water Supply Assessment for the Gentry Gateway Project, March 2004
(b) Source: Department of Water Resources Public Water System Statistics, 2001 to 2004

(c) Represents the water supplies delivered to SSWA by City of Suisun City under the Solano Project Entitlement. City of Suisun City's SSWA's Bureau entitlement is 1,600 AF each year. Suisun City does have an entitlement from the SWP but to date it has never been used. The transferred water is supplemental – Solano Irrigation District (SID) water is purchased directly from SID after the city entitlement of 1,600 AF federal water has been used. This is a variable amount from year to year. In 2003 it was 3,178 AF.
(d) Currently no groundwater is used. There was a small amount of groundwater used in 1996, but these wells were removed from service in 2003 and are not connected to the SSWA system and do not currently supply any water to the system.
(e) Represents the water supplies delivered to SSWA by Solano Irrigation District under the Solano Project entitlement and the 1990 SSWA Implementation Agreement. The main water supply for SSWA is from Lake Berryessa.

SSWA Historical Solano Project Water Supply Deliveries – AFY (Table 4.3)

Year	City of Suisun City	SID-Suisun	Total
1990	1,600	1,863	3,463
1991	1,600	1,318	2,918
1992	1,256	2,003	3,259
1993	1,600	1,768	3,368
1994	1,436	2,393	3,829
1995	1,600	2,261	3,861
1996	1,600	2,573	4,173
1997	1,600	2,784	4,384
1998	1,600	2,425	4,025
1999	1,600	2,846	4,446
2000	1,600	2,779	4,379
2001	1,600	3,159	4,759
2002	1,600	3,152	4,752
2003	1,600	3,178	4,778
2004	1,600	3,433	5,033
2005	1,600	3,441	5,041
2006	1,600	3,067	4,667
2007	1,600	3,121	4,721
2008	1,600	3,128	4,728
2009	1,600	2,826	4,426
2010	1,600	2,514	4,114
Average	1,576	2,668	4,244

Source: Suisun Solano Water Authority, Water Supply Assessment for the Gentry Gateway Project, City of Suisun City, California, March 2004,
Table updated for the 2010 UWMP based on data from the Cement Hill Water Treatment Plant for the years 2006-2010.

As shown in **Table 4.3** approximately 63 percent of SSWA's water supply for the period 1990 through 2010 came from imported water purchased from SID. This period is indicative of historical water supply for SSWA.

Future water supplies include the aforementioned sources. Projected water supplies are provided in **Table 16**.

Table 16
Water supplies — current and projected in AFY

Water Supply Sources		2010	2015	2020	2025	2030	2035
Water purchased from[1]:	**Wholesaler supplied volume (yes/no)**						
Solano County Water Agency under contract to City of Suisun City for Solano Project water	Yes	1,600	1,600	1,600	1,600	1,600	1,600
Solano County Water Agency under contract to City of Suisun City for State Water Project water[3]	Yes	0	1,300	1,300	1,300	1,300	1,300
Solano County Water Agency under contract to Solano Irrigation District for Solano Project water	Yes	2,514	1,577	1,939	2,375	2,737	3,100
Supplier-produced groundwater[2]		0	0	0	0	0	0
Supplier-produced surface water		0	0	0	0	0	0
Transfers in		0	0	0	0	0	0
Exchanges In		0	0	0	0	0	0
Recycled Water		0	0	0	0	0	0
Desalinated Water		0	0	0	0	0	0
Other							
Other							
Total		**4,114**	**4,477**	**4,839**	**5,275**	**5,637**	**6,000**

[1] Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.
[2] Volumes shown here should be consistent with Tables 17 and 18.
[3] Assume that by 2015 SSWA will either exchanging (through the NBA Alternate Intake pipeline running parallel to the SID Highline Canal serving the Dally Lateral service area) or treating and delivering (by agreement and interconnection with the Fairfield system) the Suisun City SWP allocation of 1300 AFY.
[4] Based SID Staff assumption that Summers Engineering 2007-projected buildout population of 34,988 (see Appendix A of the Water Supply Options report) corresponds to the ABAG-projected population of 35,000 scheduled to occur in 2035 (see Table 2 of this UWMP Plan).

4.2 Current or Projected Supply Including Wholesale Water

Approximately 100% of SSWA's water is purchased from the Solano County Water Agency. Demand projections shown in **Table 12** are the same in **Table 17**. According to the Water Supply Assessment for the Gentry Project, "Both City of Suisun City and Solano Irrigation District have contracts with Solano County Water Agency for water supplies from the federal Solano Project. The Solano County Water Agency is the contracting agency with the United States Bureau of Reclamation (USBR) for the water supplies from the Solano Project". The Solano County Water Agency is also the contracting agency for water supply from the State Water Project's North Bay Aqueduct from which City of Suisun City has an allocation.

Table 17
Wholesale supplies — existing and planned sources of water in AFY

Wholesale sources[1,2]	Contracted Volume[3]	2015	2020	2025	2030	2035
Solano County Water Agency under contract to City of Suisun City for Solano Project water	1,600	1,600	1,600	1,600	1,600	1,600
Solano County Water Agency under contract to City of Suisun City for State Water Project water	1,300	1,300	1,300	1,300	1,300	1,300
Solano County Water Agency under contract to Solano Irrigation District for Solano Project water	3,100[4]	1,577	1,939	2,375	2,737	3,100

[1]Water volumes presented here should be accounted for in Table 16.
[2]If the water supplier is a wholesaler, indicate all customers (excluding individual retail customers) to which water is sold. If the water supplier is a retailer, indicate each wholesale supplier, if more than one.
[3]Indicate the full amount of water
[4]SID is under contract with SSWA to provide Solano Project water to the Authority to meet water demands of new development after full utilization of City of Suisun City's allocated supplies.

4.3 Groundwater Supplies

SSWA delivered groundwater produced by a well owned by City of Suisun City until 2001, and it was listed in the 2000 and 2005 Urban Water Management Plans. The well is located in Suisun Valley, near Mankas Corner Road, which is in the Suisun Fairfield Valley, Subbasin 2.3 of the San Francisco Bay Hydrologic Region per DWR Bulletin 118. It had a production capacity of 275 gpm or 443 acre-feet per year. The historic pumped volumes are shown in **Tables 18.1, 18.2** and **18.3**. The water was delivered to SSWA customers in the Suisun Valley through the Suisun Valley Pipeline; the well and

pipeline are referred to as the Suisun Valley Water System which is shown on the west side of **Figure 2.2**.

The need for the well was eliminated by the installation of the Benton Court and Suisun Valley Pumping Plants in 2000-2001. The well was taken out of service due to the leaky and deteriorating pipeline connecting the well to the system, and the poor quality of water from the well, which was relatively high in iron and manganese. It is still a working well, but it is not connected to the SSWA system and not in use.

Therefore, after 2001, SSWA does not use any groundwater in its system (see **Table 18.2**). There are no plans to resume service from this well or the Suisun Valley in general due to high mineral content in the groundwater, sufficient alternative surface water supplies, and the need to replace miles of pipeline at considerable cost in order to convey water from the Suisun Valley back to the main SSWA service area. In addition, the quantity of water available from the existing well (about 275 gpm) is insufficient to meet the projected additional capacity (2250 gpm) needed to meet the projected build-out demand of the SSWA service area. The full build-out demand will be met by treated surface water by a means that is the subject of ongoing studies by the Authority. See **Table 19**.

The Suisun Fairfield Valley Subbasin has not been identified to be currently overdrafted, nor is it projected to be overdrafted in the near future. The Suisun Fairfield Valley Subbasin has not been "adjudicated", meaning that there is no appointed "water master" to resolve groundwater pumping issues, and that there are no established limits on the amounts of groundwater that can be extracted by individuals or agencies within these basins.

Table 18.1
Groundwater — volume pumped in AFY

Basin Name	Metered or Unmetered	1994	1995	1996	1997	1998	1999
Suisun Fairfield Valley Subbasin	Metered	68	161	82	89	117	126

Source" Department of Water Resources Public Water System Statistics 1994 to 1999

Table 18.2
Groundwater — volume pumped in AFY

Basin Name	Metered or Unmetered	2000	2001	2002	2003	2004	2005
Suisun Fairfield Valley Subbasin	Metered	87	9	0	0	0	0
% of Total Water Supply		2.0%	0.2%	0.0%	0.0%	0.0%	0.0%

Source" Department of Water Resources Public Water System Statistics 2000 to 2004

Table 18.3 Groundwater — volume pumped in AFY						
Basin name(s)	**Metered or Unmetered[1]**	**2006**	**2007**	**2008**	**2009**	**2010**
Suisun Fairfield Valley Subbasin	NA	0	0	0	0	0
Total groundwater pumped		0	0	0	0	0
Groundwater as a percent of total water supply		**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Table 19 Groundwater — volume projected to be pumped					
Basin name(s)	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Suisun Fairfield Valley Subbasin	0	0	0	0	0
Percent of total water supply	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Units are in acre-feet per year.
Include future planned expansion

4.4 Transfer Opportunities

SSWA uses the water supplies of its two partner agencies, City of Suisun City and Solano Irrigation District. Exchanges and transfers of water would be arranged by these partner agencies rather than through SSWA. Existing agreements between other agencies and the City and District do not affect SSWA.

According to the Water Supply Assessment Report for the Gentry Project: “At present, due to a lack of connection to the SSWA water treatment plant, City of Suisun City is unable to directly utilize their State Water Project (SWP) entitlement, but they do have the opportunity to transfer or exchange this entitlement with other Solano County water users with access to the North Bay Aqueduct during periods of water shortage. This would include the cities of Benicia, Fairfield, Vacaville and Vallejo.” The City of Suisun City could also transfer the water to other SWP contractors outside of Solano County. Such transfers would cease once the means to utilize the SWP entitlement for the benefit of SSWA became available.

There are three system interties between the SSWA and City of Fairfield water systems that SSWA can utilize in an emergency situation. These are the subject of an existing agreement between SSWA and Fairfield. Fairfield could treat and deliver SSWA supplies from the Solano Project and the State Water Project.

Water transferred from other agencies that can be delivered to Fairfield for treatment could be arranged by SSWA but these would be extraordinary arrangements in response to emergencies. As shown in **Table 20**, at this time there are no planned or identified potential future water exchanges.

Table 20
Transfer and exchange opportunities

Transfer agency	Transfer or exchange	Short term or long term	Proposed Volume
None			
Total			

4.5 Desalinated Water Opportunities

SSWA currently has no plans for desalinated water as a future water supply as shown in **Table 4.4**.

Table 4.4 Opportunities for Desalinated Water

Sources of Water	Yield AFY	Start Date	Type of Use
Ocean Water		None	
Brackish Ocean Water		None	
Brackish Groundwater		None	
Other		None	

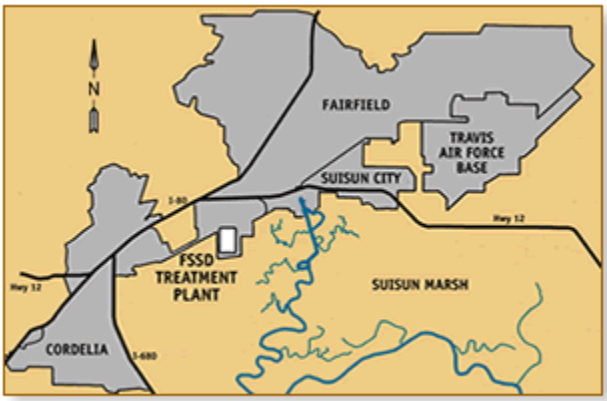
4.6 Recycled Water Opportunities and Wastewater Quantity, Quality and Current Uses

Fairfield Suisun Sewer District Headquarters

The Fairfield-Suisun Sewer District (FSSD) (http://www.fssd.com/) oversees wastewater collection and treatment, water recycling, and stormwater management services in a 41-square-mile area of Solano County, Calif. The FSSD service area encompasses the cities of Fairfield and the City of Suisun City as well as Travis Air Force Base. Wastewater from the City of Suisun City is collected and handled by the plant located at 1010 Chadbourne Road, Fairfield, California. This section was prepared with information from and the assistance of the FSSD staff.

An act of the California Legislature in 1951 created the Fairfield-Suisun Sewer District to perform wastewater collection and treatment, and water recycling services for all property within the boundaries of Fairfield, City of Suisun City and Travis Air Force Base. The District also operates a drainage maintenance utility that performs specified storm water management services in conjunction with the cities. Establishment of the District has enabled well-coordinated management of our local wastewater and storm water.

The District owns and operates a system of sanitary sewer trunk lines and pumping stations that collect wastewater from city sewer lines and transfers it to an advanced secondary wastewater treatment plant for cleansing and recycling. FSSD also operates programs to help capture and control pollutants that can be carried by rainfall runoff.



Fairfield Suisun Sewer District Service Area

At the time the District was established, the service area had fewer than 6,000 residents. Today they serve a population more than 20 times that size. The District serves more than 130,000 residential, commercial and industrial customers and government agencies in central Solano County, about 40 miles northeast of San Francisco. Households, retail businesses, major food and beverage producers, light industries, manufacturers and vital military operations get service from FSSD.

The Fairfield and Suisun City storm water drainage systems serve an area of 41 square miles. The District-operated drainage system encompasses seven pump stations to maintain flow of storm water to the natural creek system and the Suisun Marsh.

The FSSD wastewater treatment plant occupies about 150 acres. The current treatment facilities, which in 1974 replaced thee older plants, underwent major renovations and expansions in 1982, 1987, 1989 and 2010 to keep pace with population growth, economic expansion of the region and technological advancements.

The sanitary sewerage collection system consists of 12 pump stations and a 70-mile network of sewers that fan out throughout the service area. The sewer conduits range from 12 inches to 48 inches in diameter. The replacement cost for the system is estimated at $370 million—tangible evidence of the District's significant investment in infrastructure.

The Fairfield-Suisun Sewer District treats an average of about 16 million gallons per day. Solids removed during the treatment process are thickened and treated in a closed vessel, through a process called 'digestion.' Methane gas produced as a natural byproduct of the digestion process is used to produce electrical energy. A 'dewatering' process dries the solids, preparatory to proper disposal.

The wastewater collected from City of Suisun City is treated to an advanced secondary level (the secondary 23 standard) which is feasible for recycled water use; however, most of the water is discharged into Boynton Slough, southeast of the treatment plant. Approximately 10 percent of the water is recycled. The current use is for irrigation of a turf farm located immediately adjacent to the treatment facility. Please refer to Table 21 for the amount of wastewater collected and treated to recycled water standards per Title 22, and Table 22 for the current and future discharge methods and quantities of recycled water that is discharged and is available for use.

Currently there is no reclaimed water use, nor are there imminent plans to do so, within the SSWA service area because there are no pipelines to deliver recycled water from the FSSD WWTP to the SSWA service area due to economic infeasibility. Using recycled water in the City of Suisun City has been studied in the past, and was extensively documented in the Central Solano Dual Water Systems Master Plan (the Master Plan) prepared by James M. Montgomery, Consulting Engineers, for the City of Fairfield in 1992, see Appendix E.

The Master Plan defined a City of Suisun City Service Area (called Service Area 5) wherein reclaimed water could be used to irrigate parks (the largest of which is the Sports Complex), median strips and the Tolenas service area of the Solano Irrigation District where raw water is used for agricultural irrigation and stock watering. Service Area 5 would be served by a system consisting of existing and new transmission mains, pump stations and storage tanks to serve the City of Suisun City and the Tolenas area of the Solano Irrigation District. (See the Master Plan, Figure 7.6 and Table 7-2.) The system is described in Section 6 on pages 6-9 to 6-11, and Table 6-7 presents reconnaissance-level project cost estimates for three alternative distribution systems. The least-expensive system overall was Alternate 1 per Table 6-7, with a total capital cost of $5.66 million and total (O&M plus amortized capital) annual cost of $506,000, for a unit cost of $487 per acre-foot (AF) delivered (all figures in 1992 dollars). Adjusting these fees to April 2011 dollars, the capital cost is $8.37 million and the total annual cost is $747,000 for a unit cost of $719 per AF. Current (2011) potable water costs an average of $650 per AF from SSWA, and raw irrigation water costs $200 per AF from SID. The increased cost is considered infeasible to take on, therefore there are no plans to implement the Master Plan projects.

The Potrero Hills Landfill could be interested in partnering in the future to bring water to its facility as it is currently trucking water in for dust control. This additional service was not addressed in the 1992 Master Plan. Extension of service to the Landfill would require construction of a pipeline over 2 miles long southwards from the Sports Complex for an estimated construction cost of $1.2 million (2011 dollars).

Minor uses of recycled water such as dust control are also dependent upon installation of a secondary water system in the SSWA service area, and are therefore also considered to be infeasible for the foreseeable future.

These are the only two conceivably feasible projects for reclaimed water use at this time. Because of the limited accounts that could be served recycled water, it is currently not economically viable to transport and serve recycled water as the cost would far outweigh the benefits at this point in time and into the foreseeable future. This is reflected in **Table 23** and **Table 24**.

SSWA's capital improvement plans will in the future review the potential for future recycling and options for financial incentives to achieve water conservation and decreased costs for water service. Cooperation with the City of Fairfield and the Fairfield Suisun Sewer District will be essential in any such future actions, and neither of these agencies has immanent projects planned. Because the financial restraints are at this time so compelling, financial incentives such as grants and private investment are considered either inadequate or infeasible. This is reflected in **Table 25**. Depending on the timing of funding and system installation, an estimated annual recycled water use of 1,040 AFY could be realized as presented in the Master Plan, Table 7-3. At this time a value of 500 AFY is placed in Table 25 starting in 2035, assuming grants or some other funding source may become available.

Table 21
Recycled water — wastewater collection and treatment in AFY

Type of Wastewater	2005	2010	2015	2020	2025	2030	2035 - opt
Wastewater collected & treated in service area	19,600	17,500	18,700	21,500	24,500	27,600	27,600
Volume that meets recycled water standard	19,600	17,500	18,700	21,500	24,500	27,600	27,600

Units (circle one): acre-feet per year *million gallons per year* *cubic feet per year*

Source: Fairfield Suisun Sewer District

Table 22
Recycled water — non-recycled wastewater disposal, in MGY

Method of disposal	Treatment Level	2010	2015	2020	2025	2030	2035
Farm Irrigation	Secondary 23	500	500	500	500	500	500
Dust Control	Secondary 23	2	2	2	2	2	2
	Total	502	502	502	502	502	502

Units (circle one): acre-feet per year *million gallons per year* *cubic feet per year*

Table 23 Recycled water — potential future use							
User type	**Description**	**Feasibility[1]**	**2015**	**2020**	**2025**	**2030**	**2035**
Agricultural irrigation	Tolenas area	None foreseeable	0	0	0	0	0
Landscape irrigation[2]	Parks and roadway median landscaping	None foreseeable	0	0	0	0	0
Commercial irrigation[3]							
Golf course irrigation							
Wildlife habitat							
Wetlands							
Industrial reuse							
Groundwater recharge							
Seawater barrier							
Getothermal/Energy							
Indirect potable reuse							
Other (user type)							
Other (user type)							
	Total	0	0	0	0	0	0

[1]Technical and economic feasibility.

[2]Includes parks, schools, cemeteries, churches, residential, or other public facilities)

[3]Includes commercial building use such as landscaping, toilets, HVAC, etc.) and commercial uses (car washes, laundries, nurseries, etc.)

Table 24 Recycled water — 2005 UWMP use projection compared to 2010 actual		
Use type	**2010 actual use**	**2005 Projection for 2010[1]**
Agricultural irrigation	0	0
Landscape irrigation[2]	0	0
Commercial irrigation[3]	0	0
Golf course irrigation	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/Energy	0	0
Indirect potable reuse	0	0
Other (user type)		
Other (user type)		
Total	0	0

[1]From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing categories or modified to the new categories, at the discretion of the water supplier.
[2]Includes parks, schools, cemeteries, churches, residential, or other public facilities)
[3]Includes commercial building use such as landscaping, toilets, HVAC, etc.) and commercial uses (car washes, laundries, nurseries, etc.)

Table 25 Methods to encourage recycled water use, AFY						
	Projected Results					
Actions	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Financial incentives	0	0	0	0	0	500
Total	0	0	0	0	0	0

4.7 Current Water Supply Facilities

Table 4.5 below lists the significant facilities in the SSWA water system. This information is taken from the 2010 update of the SSWA System Inventory. The treatment plants are served by the Putah South Canal and treat only Solano Project water.

Table 4.5 Water Supply Facilities	
Cement Hill Water Treatment Plant	
Plant No. 1 (constructed in 1978-79)	Conventional plant, 4.6 MGD design capacity
Plant No. 2 (constructed in 1992-93)	Conventional plant, 5.4 MGD design capacity
Gregory Hill Water Treatment Plant (constructed in 1962-63)	Diatomaceous earth plant, 0.56 MGD design capacity, removed from service
Cement Hill Tank	2,000,000 gallons, welded steel
Gregory Hill Tank	2,000,000 gallons, welded steel
Sports Complex Tank	1,500,000 gallons, welded steel
Suisun City Corp Yard Tank	1,000,000 gallons, welded steel
Benton Court Pumping Plant	1,000 gpm
Sports Complex Pumping Plant	2,000 gpm
Suisun City Corp Yard Pumping Plant	1,200 gpm
Suisun Valley Pumping Plant	400 gpm
Pipelines	96 miles
Mainline Valves	1,700
Metered Services	8,100

4.8 Future Water Projects

Future Infrastructure and Treatment for North Bay Aqueduct Water

The greatest need of the SSWA water system is increased treatment capacity. Current projections are a maximum daily demand of 11.7 MGD, while the Cement Hill WTP (the sole source of treated water) has been downgraded to 8.5 MGD to comply with water quality requirements, which has been adequate to meet actual peak demand for the last several years. **Table 26** presents two options to increase treatment capacity are (a) design and construct a new Gregory Hill WTP and (b) enter into an agreement with the City of Fairfield for treatment and delivery of SSWA-supplied water through the Fairfield treatment and transmission facilities. The design capacity of both of these options is 3.2 MGD for a total of 11.7 MGD. Both options are still being studied with a selection expected in 2011. The Fairfield Option would take less than a year to implement, while the Gregory Hill WTP Option could take up to 3 years to implement.

Currently SSWA does not have any facilities to convey and treat the City of Suisun City's State Water Project (SWP) allocation delivered through the North Bay Aqueduct (NBA). This item was listed in the February 2005 Solano County Water Agency Integrated Regional Water Management Plan and Strategic Plan as a possible item to be investigated to determine when facilities would be needed in order to meet projected demand increases. The City of Suisun City has an allocation of 1,050 acre-feet/year increasing at 50 AFY up to an ultimate future allocation of 1,300 acre-feet/year. The Fairfield Option described above provides a convenient means since Fairfield treats NBA water already, and could concurrently treat the City of Suisun City's allocation. Other alternatives include the City of Suisun City exchanging the NBA water with the Solano Irrigation District in accordance with the 1990 SSWA Implementation Agreement between the two agencies. Once a means of delivering the NBA raw water to SID is in place this can occur. The most likely placed to do this will be somewhere along the proposed NBA Alternate Intake pipeline southeast of the city of Vacaville. Another alternative is extending a pipeline from the NBA to the Cement Hill WTP and modifying the plant to treat NBA water. This appears to be relatively complicated and expensive, and has not been considered seriously in light of other alternatives.

Please see the **Appendix F** for the 5-Year Capital Improvement Program adopted for FY 2010-2011. It does not include either of the water supply projects since the selection of which project to pursue is pending and a subject of negotiation with the City of Fairfield.

Table 26
Future water supply projects in MGD

Project name[1]	Projected start date	Projected completion date	Potential project constraints[2]	Normal-year supply[3]	Single-dry year supply[3]	Multiple-dry year first year supply[3]	Multiple-dry year second year supply[3]	Multiple-dry year third year supply[3]
New Gregory Hill WTP Option	2012	2015	Project selection, funding	3.2 MGD	3.2 MGD	3.2 MGD	3.2 MGD	3.2 MGD
Fairfield Supply Option	2011	2012	Project selection, agreement negotiations, funding	3.2 MGD	3.2 MGD	3.2 MGD	3.2 MGD	3.2 MGD
		Total	0	3.2 MGD	3.2 MGD	3.2 MGD	3.2 MGD	3.2 MGD

[1]*Water volumes presented here should be accounted for in Table 16.*
[2]*Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.*
[3]*Provide estimated supply benefits, if available.*

Section 5 - Water Shortage Contingency Plan

5.1 Water Supply Reliability

Introduction

As described in section 4.1 above, SSWA is supplied water from its partner agencies (Suisun City and Solano Irrigation District) through their contracts with the Solano County Water Agency (SCWA). The water supply reliability for SSWA is directly related to the reliability of deliveries of water from the Solano Project (administered by the Federal Bureau of Reclamation, or USBR) and State Water Project (administered by the State Department of Water Resources, or DWR). Reliability is quantified by the percentage of the contracted amount an agency would receive from the supplying agency. (100% reliability means delivery of a full annual allocation, and 50% reliability means delivery of half of an annual allocation.) SCWA conducted a study on the reliability of these two sources for the 2005 UWMPs of its contracted agencies. For its 2010 UWMP it plans to use the same method of calculating the reliability data of the two supplies. SCWA issued two memoranda documenting the reliability of these two sources, both of which are included in **Appendix G**.

State Water Project Supply Reliability

Description of the Supply

The amount of water that the SWP agreed to deliver to an agency is listed in Table A of Article 6 of typical SWP long-term water supply contracts. Hence this quantity is referred to as "Table A water." The contracts were structured to reflect increasing population and water demand, so Table A amounts gradually increased over time until a maximum Table A amount was reached. According to SCWA's February 2005 Integrated Regional Water Management Plan and Strategic Plan, "SCWA has contracted for an ultimate allocation of 47,756 acre-feet of water per year from the State Water Project. This amount includes 5,756 acre-feet of additional SWP water per year that SCWA purchased on behalf of the cities of Fairfield and Vacaville from Kern County Water Agency (another SWP Contractor) in 2001. The SWP contract amount is 47,206 acre-feet in 2004, and will increase each year until it reaches 47,756 acre-feet per year in 2015." SSWA's SWP allocation is included in SCWA's Table A amount, as are the allocations to the rest of the agencies contracting with SCWA for SWP water; these agencies are known as "member units."

Current DWR policy is that the SWP also makes available "Article 21 water" that is available to SWP contractors under specified conditions when the Delta is in excess (out of balance) conditions and there is pumping capacity available. SCWA receives its water from the North Bay Aqueduct (NBA) and Article 21 water is available to NBA users more frequently than SWP contractors relying upon the Banks Pumping Plant

(South Delta SWP export facility) capacity. For the purposes of this UWMP, Article 21 deliveries are not included (as addressed below) although they can be a significant additional supply most years.

SWP contractors can also “carry over” (retain) part of their allocated Table A water form one year to the next, subject to reservoir operations (levels, filling cycles and flood operations). This allows contractors to conserve their supplies by not losing it at the end of the year and saving it for future dry years.

General SWP Reliability Issues

There are numerous factors that affect the reliability of SWP supplies. The main factor is hydrologic conditions that result in extremely variable runoff conditions. The SWP has storage from Oroville Reservoir; however most of the SWP water supply comes from Sacramento Valley runoff. There are a myriad of environmental, water quality and legal constraints on the SWP that effect water supply reliability. The water rights for the SWP are conditioned upon meeting various water quality and environmental conditions including the Federal Endangered Species Act. The models used to develop the SWP reliability data incorporate these constraints.

The SWP supply is not always available at a consistent level. Plans to replace or supplement the SWP source when there are shortages are the responsibility of SCWA member agencies that contract for SWP supplies. They would typically shift to other supplies such as Solano Project and groundwater (if they have rights to these supplies) or enter into purchase or exchange agreements with other Solano County agencies. SCWA would also keep member agencies informed about any SWP collective programs for dry year water purchases, such as a drought water bank. SCWA would also coordinate any joint local efforts to secure short term water supplies under a drought conditions. Increased demand management measures are the responsibility of the member agencies to implement.

DWR Reliability Data

Specific information on the reliability of SCWA’s SWP supply comes from the DWR 2009 SWP Delivery Reliability Report. DWR did an analysis customized for each contractor, of which SCWA is one, and provided Table A Deliveries data specifically for SCWA in tables attached to the SCWA memorandum dated August 10, 2010 titled UWMP Reliability Data (the SCWA 2010 UWMP Reliability Data Memo). A copy of this Memo is in the **Appendix G.** The tables, one for 2009 and one for 2029, show Table A Deliveries in terms of a percentage of a full (100%) Table A annual delivery, with and without carryover amounts, for a repeat of water conditions in years 1922 through 2003. As noted above, this percentage is the “reliability” of the SWP delivery in that water year. The difference between the DWR 2009 and 2029 scenarios is 2029 assumes an increased level of development in the source areas and possible impacts of climate change and accompanying sea level rise.

The SCWA memorandum commented on many key aspects of the DWR data, as follows.

- "The 2009 model includes South Delta pumping restrictions based on the Biological Opinions for the Delta smelt and salmon. Some of these restrictions have been reduced since the publishing of the draft Reliability Report, but the future is uncertain as to how the restriction may change in the future. The 2009 data also includes different climate change impacts for the 2029 scenario that reduce supplies."

- "The individual contractor data, this year, are based on a model that makes some assumptions of carryover supplies. Carryover from prior years is added to the current year supply for annual allocations of Table A. Also DWR has provided data on Article 21 water for NBA contractors."

- "The addition of carryover supplies from prior years has a major impact on NBA supplies. In many years carryover makes a large amount of the overall supply. Note that the 2029 scenario assumes no carryover because they assume that demand will increase such that all Table A [water] is used each year – that may or may not be the case for us." Determination of carryover is complicated, and SCWA concludes that, "over the 1922-2003 analysis period, the average total SWP deliveries may be ok, but when you analyze a single year or short group of years, the supply may be skewed due to the carryover assumptions that, for example, may mask a short supply year."

- "Article 21 water from the NBA is not included in these figures. This is…a big part of our SWP supply. Currently we can get Article 21 [water] whenever the Delta is in excess conditions, but our use of Article 21 water is highly variable and dependent on a number of factors that would be virtually impossible to model. New for the 2009 study, DWR has modeled NBA Article 21 [water availability] separately from other contractors. They have modeled the availability of Article 21 [water] when the Delta is in excess conditions and assumed that the maximum SCWA Article 21 delivery is 1,000 AF/month….the monthly data they used...does not reflect reality so it is [not] of much use."

The question facing SSWA is how this all affects the reliability of its supplies. Referring to the results of the following analysis, SSWA still has a highly reliable supply that needs only a 15% reduction in demand to match supply.

<u>SWP Reliability Analysis by SCWA</u>

SCWA analyzed the DWR Table A Deliveries data to estimate the reliability of SWP supplies in normal, single-dry and multiple-dry water years as required by the UWMP Act. The analysis is presented in two spreadsheets titled "Appendix B State Water Project Reliability," one for 2009 data and one for 2029 data, both also attached to the

SCWA 2010 UWMP Reliability Data Memo in **Appendix G** to this Plan. Hereafter these are referred to as the SCWA SWP Reliability Tables.

For clarification please note that the UWMP Act requires analysis of reliability for an "average water year", a "single dry water year" and "multiple dry water years". On the other hand DWR UWMP Guidelines **Table 28** uses the terms "normal water year", "single dry water year", and "multiple dry water years".

In order to categorize the water year type into Dry and Normal years, SCWA used the Sacramento Valley Index (SVI), also known as the 40/30/30 index. The SVI uses 40% of April-through-July runoff, 30% of October-through-March runoff and 30% of the previous year's index. The SVI is used to determine water year types in State Water Resources Control Board Decision 1641.

SCWA has identified the year type (Normal and Dry) based on the SVI of each of the years from 1922 to 2003. Where the SVI uses the year types Above Normal and Below Normal, SCWA has combined these under the year type Normal. Likewise where the SVI uses the year types Dry and Critically Dry, SCWA has combined these under the year type Dry. SCWA uses the same year type Wet as the SVI. These relationships are shown in the SCWA SWP Reliability Tables.

Once each water year was "typed," SCWA calculated the average of the SWP delivery reliabilities for all Normal years to represent the SWP delivery reliability for a "normal water year". As shown in the SCWA SWP Reliability Tables, the DWR Study 2009 Data and the 2029 Data lead to a Normal Year reliability of 64%. In other words SCWA can expect to get an average of 64% of its full Table A allocation in a Normal water year.

Likewise for the "single dry water year" SCWA used the average of the SWP delivery reliabilities for all single Dry years and the first year of multiple Dry years. As shown in the SCWA SWP Reliability Tables, the DWR Study 2009 Data leads to a Single Dry Year reliability of 63% while the 2029 Data lead to a Single Dry Year reliability of 46%. This difference reflects the differing underlying assumptions in the DWR 2009 and 2029 scenarios.

For "multiple dry years" SCWA used a definition of "multiple" to mean three or more consecutive dry years and took the average of SWP delivery reliabilities for all such years. As shown in the SCWA SWP Reliability Tables, the DWR Study 2009 Data leads to a Multiple Dry Years reliability of 33% while the 2029 Data lead to a Multiple Dry Years reliability of 31%. The difference again reflects the differing underlying assumptions in the DWR 2009 and 2029 scenarios.

While SCWA calculated the average reliabilities of Multiple Dry Years, DWR UWMP Guidelines **Table 28** calls for reliabilities for each of the Multiple Dry Years 1 through 4. Recalculation of these figures is shown in the following tables.

UWMP Table Data

A basis for the water year data is presented in **Table 27**. Base years were selected by identifying the year of each Water Year Type within the Historical Sequence with reliability most closely matching the average reliability of the Water Year Type over the Historical Sequence. Referring to the description of the reliability analysis above, however, the basis of the water year data cannot be said to be the reliability data of any single water year. Instead the basis is the average of reliabilities of types of water years within the Historical Sequence as determined by DWR in its 2009 SWP Delivery Reliability Report and SCWA in its 2010 UWMP Reliability Data Memo.

Table 28 shows the average SWP supply reliabilities for the defined water year scenarios.

Solano Project Supply Reliability

Description of Supply

Please refer to section 4.1 for a description of the contracts in place for the Solano Project supply. The allocation process for water supplies from the Solano Project is very different than for the SWP. For the Solano Project, the contract between SCWA and USBR calls for the full contract amount to be delivered to SCWA unless it is physically impossible to deliver the water from Solano Project storage (i.e. reservoir is dry). Therefore, the full contract water supply, 207,350 AFY, is allocated until there is no water available in the reservoir (dead storage is 10,300 AF).

General Solano Project Reliability Issues

The main factor affecting Solano Project reliability is the frequency of long droughts which could result in major drawdown of Lake Berryessa. Participating agencies in the Solano Project have entered into a Drought Measures Agreement described below in the following Groundwater Supply section and in Section 5.3. Environmental issues have been addressed in a legal settlement regarding downstream flows from the Solano Project and the settlement has been ratified by the State Water Resources Control Board. Limits on upstream depletions have been established through a settlement agreement administered by a court appointed water master. These factors are listed in **Table 29** below.

SCWA Data Analysis

For the 2005 analysis of the data SCWA developed a year type index based upon procedures similar to the Sacramento Valley Index. A model exists for the Solano Project that uses hydrologic records from 1906 through 1993. Using similar assumptions as the Sacramento Valley 40/30/30 Index, year types were assigned to each of the years in the Solano Project model resulting in a Lake Berryessa Index that identified wet, normal and dry years.

Per the SCWA 2010 UWMP Reliability Data Memo in **Appendix G**, "For Solano Project we have used allocation numbers from the 2009 update of the reliability study [sent in a memo] dated November 23, 2009. In the 2005 data we used the SVI as our year type designation. For the 2009 study we used Lake Berryessa inflow data to develop our own index. We used the 66th and 35th percentiles to make the [Dry and Normal year] designations to conform to the SVI designations. There is not much of a change for the Solano Project reliability from the 2005 to the 2009 data."

Table 28 shows the average Solano Project supply reliabilities for the defined water year scenarios.

Groundwater Supply Reliability

Groundwater is extensively used in the north-central portion of Solano County near Vacaville and Dixon, and supplements the surface supply of the State Water and Solano Projects. Since these are both supplies to SSWA, drought effects on groundwater supplies may indirectly affect deliveries to SSWA

Solano County Water Agency (SCWA) prepared a "Drought Contingency Plan for 1993." This plan addressed deliveries from both the Solano Project and the North Bay Aqueduct and proposed two potential drought mitigation measures that might affect groundwater availability and therefore SSWA supplies. First, increased use of groundwater would mitigate decreased surface supplies due to a drought. However, if the aquifer is overdrawn, this might cause long-term permanent damage to the aquifer due to compaction or subsidence and water quality problems. To date there is no evidence that the aquifer is overdrawn, as noted below.

The second such drought mitigation measure proposed in the SCWA Drought Contingency Plan for 1993 was the potential sale of agricultural water from farmland taken out of production to cities in need of additional water due to drought conditions. A plan to implement such a system was later formalized in the "Solano Project Members' Agreement as to Drought Measures and Water Allocation" (the Drought Measures Agreement) in 1999. Indeed, fallowing of agricultural land might occur anyway since, per pages 5 and 6 of the SCWA Drought Contingency Plan for 1993: "For agriculture, a 25 percent or greater cut in Solano Project supplies would require taking land out of production. Local groundwater resources are not adequate to make up the difference from such a Solano Project supply deficiency." This would decrease the surface recharge of shallow aquifers, slow the recharge of the deeper aquifers that are hydraulically connected to the surface aquifers, and result in increased pumping costs for pumping from lower groundwater levels. Based on observed behavior of groundwater levels during and after the 1987-1992 drought, however, recovery from reduced summer recharge is rapid and long-term effects are not expected at this time. Therefore the actions specified in these drought contingency plans should not significantly affect the supply of surface water available to SSWA.

As described in section 4.3 Suisun City historically used groundwater underlying the Suisun Valley as a supply for the City itself, and SSWA has in the past used one of the City wells to supply its customers in that area. At the present time no groundwater is used to serve any SSWA service area, and it is unlikely that groundwater will be used in the future. Suisun Valley groundwater is not now or has ever been used in Fairfield or Vallejo service areas. Therefore drought effects on groundwater supplies in the Suisun Valley, if there should be any, should not significantly affect the supply of groundwater available to SSWA. No entry is made in **Table 28** for the groundwater supply since it is not currently used or planned to be used by SSWA.

Combined Supply Reliability

Table 28 calls for a summary figure for the reliability of the SCWA supplies expressed as a percentage of a Normal Year supply. The figures for **Table 28** are calculated as follows. Full allocations from each supply are in **Table 5.1**.

Table 5.1
Full Allocations of SCWA Supplies

Water Supply Source	Annual Full Allocation, acre-feet
State Water Project	47,756
Solano Project	207,350
Total	255,106

To combine the reliability of the two sources, reliabilities are converted into expected deliveries, combined and compared to the expected Normal Year delivery amount from both supplies. Calculation of expected deliveries from each source for water year types is done in **Table 5.2**, and combination of these to calculate combined reliability is done in **Table 5.3** which yields the figures in **Table 28**.

Table 5.2
Expected Deliveries for each Water Year Type

Water Supply Source	Average /Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
State Water Project, 2009 Data, SCWA Specific						
Reliability Percentage	64%	63%	37%	33%	36%	39%
Average Supply Volume, AF	30,564	30,086	17,670	15,759	17,192	18,625
State Water Project, 2029 Data, SCWA Specific						

Reliability Percentage	64%	46%	24%	38%	39%	29%
Average Supply Volume, AF	30,564	21,968	11,461	18,147	18,625	13,849
Solano Project Ultimate Development						
Reliability Percentage	99%	98%	100%	98%	80%	78%
Average Supply Volume, AF	205,277	203,203	207,350	203,203	165,880	161,733

Table 5.3 Combined Supply Reliability in AF						
Water Supply Sources	**Average /Normal Water Year**	**Single Dry Water Year**	**Multiple Dry Water Years**			
			Year 1	**Year 2**	**Year 3**	**Year 4**
State Water Project, 2009 Data, SCWA Specific *plus* **Solano Project Ultimate Development**						
Combined Average Supply Volume, AF	235,840	233,289	225,020	218,962	183,072	180,358
Reliability Percentage of an Average/Normal Year	100%	99%	95%	93%	78%	76%
State Water Project, 2029 Data, SCWA Specific *plus* **Solano Project Ultimate Development**						
Combined Average Supply Volume, AF	235,840	225,171	218,811	221,350	184,505	175,582
Reliability Percentage of an Average/Normal Year	100%	95%	93%	94%	78%	74%

SCWA concluded that if projected SCWA and member agency supplies are developed as planned, no shortages are anticipated within SCWA's service area under normal-year, single-dry year or multiple dry water years through 2035. However, and as a safeguard, SCWA is pursuing development of other potential supplies.

Table 27 Basis of water year data					
Water Year Type	Base Year(s)[1]			Historical Sequence	
	State Water Project SCWA Specific		Solano Project	State Water Project, SCWA Specific	Solano Project
	2009 Data	2029 Data	Ultimate		
Average Water Year	1979	1928	2005	1922-2003	1906-2007
Single-Dry Water Year	1994	1960	2001		
Multiple-Dry Water Years	1929-34	1989-1992	1931-34		

[1]Base years were selected by identifying the year of each Water Year Type within the Historical Sequence with reliability most closely matching the average reliability of the Water Year Type over the Historical Sequence. Refer to the SCWA tables attached to the August 10, 2010 Memorandum on UWMP Reliability Data for the basis of this information.

Table 28 Supply reliability — historic conditions						
Supply Source	Average / Normal Water Year	Single Dry Water Year	Multiple-Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
State Water Project (2009 Data, SCWA Specific)	64%	63%	37%	33%	36%	39%
State Water Project (2029 Data, SCWA Specific)	64%	46%	24%	38%	39%	29%
Solano Project (ultimate)	99%	98%	100%	98%	80%	78%
Percent of Average/Normal Year						
SWP 2009 Data + SP Ultimate	100%	99%	95%	93%	78%	76%
SWP 2029 Data + SP Ultimate	100%	95%	93%	94%	78%	74%

Table 29 Factors resulting in inconsistency of supply							
Water supply sources[1]	**Specific source name, if any**	**Limitation quantification**	**Legal**	**Environ mental**	**Water quality**	**Climatic**	**Additional information**
State Water Project		Hydrologic conditions				x	Results in variable runoff
State Water Project		Water rights conditions	X	x	x		Endangered Species Act requirements
Solano Project		Drought				x	Voluntary reductions coordinated by agreement between Participating Agencies
Solano Project		Downstream flow requirements	X	x			Regulated by legal settlement
Solano Project		Upstream diversions	X				Limited by settlement agreement and administrated by water master

[1]*From Table 16.*

Water Quality Impacts on Supply Reliability

As mentioned in Section 2, the water quality in the SSWA service area is very good, with the main source coming from Lake Berryessa. Very little treatment is required to ensure a safe, palatable water supply. Annual water quality reports required by the State reflect compliance with all quality standards. Chlorine is, however, added to the domestic water supply to provide residual disinfection in system pipelines. **Table 30** addresses this impact. Other potential impacts could arise from the introduction and uncontrolled spread of invasive species such as Quagga or Zebra mussels as observed in the Colorado River System at Lake Mead and the State Water Project at San Justo Reservoir. Invasive mussel species and/or aquatic plant growth with little or no natural controls could rapidly grow in number and biomass causing reliability issues by clogging intake pipes. Should SSWA start using State Project water then invasive species may become more of an operational and possibly a water quality issue. Examples of invasive species could include algae species which create toxic by-products, Geosmin or other taste and odor issues. If this change is ever planned potential impacts will be dealt with at that time.

Table 30 Water quality — current and projected water supply impacts							
Water source	**Description of condition**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
State Water Project	None	0	0	0	0	0	0
Solano Project	None	0	0	0	0	0	0

Table 31 presents the reliabilities of the combined supplies for the three years 2011 to 2013 assuming they will be multiple-dry years.

Table 31 Supply reliability — current water sources in AFY				
Water supply sources[1]	**Average / Normal Water Year Supply[2]**	**Multiple Dry Water Year Supply[2]**		
		Year 2011	**Year 2012**	**Year 2013**
Solano Project (ultimate)	4,114	4,187	4,174	3,465
Percent of normal year:	100%	100%[3]	98%[3]	80%[3]

Units (circle one): acre-feet per year million gallons per year cubic feet per year
[1]From Table 16.The only water supply available to SSWA within the table's timeframe is the Solano Project supply.
[2]See Table 27 for basis of water type years. 2010 actual supply, which is 100% of normal, is shown. 2011 to 2013 supplies are interpolated between 2010 and 2015, then reduced by Solano Project Multiple Dry Year Reliability percentages shown in the cells below them.
[3]See Table 28 for Solano Project MDY Reliability percentages.

Projected Normal Water Year Supply and Demand Comparison

Note that the following information must be provided to all cities and counties within the Suisun Solano Water Authority's service area within 60 days of submission of the UWMP to the DWR.

Comparison of the projected normal water supply to the projected normal water use over the next 20 years in 5-year increments is shown in **Table 32** below. Note that the only water supply available to SSWA within the table's timeframe is the Solano Project supply.

Table 32 Supply and demand comparison — normal year in AFY					
	2015	**2020**	**2025**	**2030**	**2035**
Supply totals (from Table 16)	4,477	4,839	5,275	5,637	6,000
Demand totals (From Table 11)	4,462	4,198	4,235	4,232	4,251
Difference	15	641	1,040	1,405	1,749
Difference as % of Supply	0.3%	13.2%	19.7%	24.9%	29.2%
Difference as % of Demand	0.3%	15.3%	24.6%	33.2%	41.1%

Units are in acre-feet per year.

Projected Single-Dry-Year Supply and Demand Comparison

Comparison of the projected single-dry-year water supply to the projected single-dry-year water use over the next 20 years, in 5-year increments is shown in **Table 33** below. The Supply figures are based on the projected water supplies as presented in **Table 16** and the "SWP 2009 plus the Solano Project Ultimate" Reliabilities as presented in **Table 28**. In this case the Single Dry Year Reliability is 99%. (On the other hand the "SWP 2029 Data with the Solano Project Ultimate" SDY Reliability is 95%.)

Table 33 Supply and demand comparison — single dry year					
	2015	**2020**	**2025**	**2030**	**2035**
Supply totals[1,2]	4,432	4,791	5,222	5,581	5,940
Demand totals[2,3,4]	4,462	4,462	4,462	4,462	4,462
Difference	-30	593	987	1,349	1,689
Difference as % of Supply	-0.7%	12.4%	18.9%	24.2%	28.4%
Difference as % of Demand	-0.7%	14.1%	23.3%	31.9%	39.7%

Units are in acre-feet per year.
[1]Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.
[2]Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.
[3]Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.
[4]The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table

Projected Multiple-Dry-Year Supply and Demand Comparison

Comparison of the projected multiple-dry-year water supplies to the projected multiple-dry-year water use over the next 20 years, in 5-year increments is shown in **Table 34** below. The Supply figures are based on the projected water supplies as presented in **Table 16** and the "SWP 2009 plus the Solano Project Ultimate" Reliabilities as

presented in **Table 28**. In this case the Multiple-Dry-Year Reliabilities are 95%, 93% and 78%. (On the other hand the "SWP 2029 Data with the Solano Project Ultimate" MDY Reliabilities are 93%, 94% and 78%.)

Table 34
Supply and demand comparison — multiple-dry-year events in AFY

		2015	2020	2025	2030	2035
Multiple-dry year first year supply	**Supply totals[1,2]**	4,253	4,597	5,011	5,355	5,700
	Demand totals[2,3,4]	4,462	4,462	4,462	4,462	4,462
	Difference	-209	399	776	1,123	1,449
	Difference as % of Supply	-4.91%	8.68%	15.49%	20.97%	25.42%
	Difference as % of Demand	-4.68%	9.50%	18.32%	26.54%	34.09%
Multiple-dry year second year supply	**Supply totals[1,2]**	4,164	4,500	4,906	5,242	5,580
	Demand totals[2,3,4]	4,462	4,198	4,235	4,232	4,251
	Difference	-298	302	671	1,010	1,329
	Difference as % of Supply	-7.16%	6.71%	13.68%	19.27%	23.82%
	Difference as % of Demand	-6.68%	7.19%	15.84%	23.87%	31.26%
Multiple-dry year third year supply	**Supply totals[1,2]**	3,492	3,774	4,115	4,397	4,680
	Demand totals[2,3,4]	4,462	4,198	4,235	4,232	4,251
	Difference	-970	-424	-120	165	429
	Difference as % of Supply	27.78%	11.23%	-2.92%	3.75%	9.17%
	Difference as % of Demand	21.74%	10.10%	-2.83%	3.90%	10.09%

Units are in acre-feet per year.
[1]Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.
[2]Provide in the text of the UWMP text that discusses how multiple-dry-year water supply volumes were determined.
[3]Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.
[4]The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.
[5]The apparent negative supply totals are a result of the methodology used for calculating supply reliability. In fact, per the joint powers agreement between SID and City of Suisun City the commitment has been made that water will be provided for the service area from the SID supply and therefore there will not in fact be a water shortage.

5.2 Estimate of Minimum Supply for Next Three Years

Water Code Section 10632(b) requires that the UWMP estimate the minimum water supply available during each of the next three water years based on the driest three year historic sequence for the agency's water supply. SSWA has two water supply sources: the State Water Project and the Solano Project. These two projects have different historic dry year sequences.

- Per DWR's Final State Water Project Delivery Reliability Report, 2009, Appendix B (a copy of which is in **Appendix I** of this Plan), the SWP dry year sequences were 1924-1926, 1929-1934 and 1987-1992. The reductions in SWP supplies are based on current-year hydrologic conditions.

- Per SCWA's Solano Project Reliability Study, 2009, the Solano Project's dry year sequences were 1931-1934, 1947-1950 and 1987-1990. The three worst years historically for the Solano Project supply are 1932-1934. The Solano Project sequence is based on reservoir levels.

For the next three years – 2011, 2012 and 2013 – the deliveries corresponding to the three worst years in the Solano Project Historical Sequence are presented in **Table 5.4** below. This analysis is limited to the Solano Project due to the expected unavailability of SWP supply until 2015, as described previously.

Table 5.4
Estimated Minimum Supply during the Driest 3-Year Historic Sequence in AFY

Estimate Year	2011	2012	2013
Full Allocation in AF[1]	4,187	4,259	4,332
Historic Year[2]	1932	1933	1934
Historic Reliability, % of Full Allocation Delivered[2]	100%	45%	45%
Estimated Supply in AF[3]	4,187	1,917	1,949

Units are in acre-feet per year.
[1]These volumes are linearly interpolated between the 2010 and 2015 supply volumes presented in Table 16.
[2]The years and reliability of deliveries are taken from the SCWA UWMP Reliability Data Memorandum dated August 10, 2010, Appendix G
[3]These figures are the product of the Full Allocation times the Historic Reliability.

5.3 Water Shortage Contingency Planning

Wholesale Supply Planning

SSWA water supplies are wholesaled through the Solano County Water Agency (SCWA). SCWA is strictly a wholesale supplier of water, not a water utility. It is the responsibility of each of the cities within Solano County to deal with water shortages. SCWA provides coordination assistance but is not responsible for making any decisions regarding water shortages. The only exception is that SCWA retains authority to change allocations of wholesale water supplies during shortages.

Solano Project Supplies

Regarding Solano Project supplies, per Section 9 of City of Suisun City's and Solano Irrigation District's Participating Agency Contracts with SCWA, "In any year in which there may occur a shortage from any cause so that the total quantity of water made available to the Agency is less thanm the total of all quantities contracted for by this Participating Agency and other Participating Agencies, the Agency shall apportion the water supply available to the Agency among all Participating Agency [sic] entitled to receive water from the Project, in proportion to their contractual entitlements to Project Water,…." This authority has never been exercised by SCWA.

SCWA and the Participating Agencies, including SSWA and SID, entered into the "Solano Project Members' Agreement as to Drought Measures and Water Allocation" (the Drought Measures Agreement) in 1999. Please see the attached copy of this Agreement in **Appendix D.** Per the Drought Measures Agreement deliveries of Solano Project water are reduced based upon storage levels in Lake Berryessa. Once the storage level drops below 800,000 AF, as measured on April 1 of each year, 95% of contract amounts are delivered with 5% being stored in the reservoir as carryover. If the reservoir drops below 550,000 AF by April 1, 90% can be delivered and 10% is stored as carryover. Participating agencies have the ability to carryover more than this amount if they desire. Once the reservoir level is below 450,000 AF on April 1, the participating agencies can use their full allocation and any stored carryover. For reference the following **Table 5.5** has been prepared to clarify the amounts of water delivered and retained in Lake Berryessa depending on the storage in the lake.

Table 5.5 Solano Project Members' Agreement as to Drought Measures and Water Allocation Table of Drought-Induced Curtailments of Solano Project Deliveries in AF					
Storage in Lake Berryessa, in acre-feet		800,000 - 1,600,000	550,000 - 800,000	450,000 - 550,000	less than 450,000
% of Annual Entitlement to be Restricted (Mandatory Curtailments)		0%	5%	10%	0%
% of Annual Entitlement Available		100%	95%	90%	100%
Annual Entitlement in acre-feet					
Solano Project Participating Agency	*Entitlements to Annual Deliveries*				
Solano Irrigation District	141,000	141,000	133,950	126,900	141,000
Fairfield	9,200	9,200	8,740	8,280	9,200
Vacaville	5,600	5,600	5,320	5,040	5,600
City of Suisun City	1,600	1,600	1,520	1,440	1,600
Maine Prairie	15,000	15,000	14,250	13,500	15,000
Vallejo	14,750	14,750	14,013	13,275	14,750
Total	187,150	187,150	177,793	168,435	187,150
Restricted Carryover in acre-feet					
Solano Irrigation District		0	7,050	14,100	0
Fairfield		0	460	920	0
Vacaville		0	280	560	0
City of Suisun City		0	80	160	0
Maine Prairie		0	750	1,500	0
Vallejo		0	738	1,475	0
Total		0	9,358	18,715	0

Finally, when the storage in Lake Berryessa is less than 400,000 AF on April 1 (this is within the last stage of curtailments described above), Solano Irrigation District will prepare to implement a voluntary agricultural water marketing program for growers to sell their next-year's allocation to cities that are party to the Drought Measures Agreement to meet M&I water needs. See section 5.8 of the Drought Measures Agreement.

State Water Project Supplies

Regarding State Water Project supplies, per Section 6 of City of Suisun City's Member Unit Contract, "If at any time there occurs a shortage from any cause in the quantity of project water made available to Agency so that the total quantity made available to Agency is less than the total of all quantities of project water contracted for by this Member Unit and other member units, Agency shall apportion the project water available among all member units in such a manner as Agency shall determine to be equitable. In making such determination, Agency shall consult with all its member units and shall be guided by, but not limited to, consideration of the following factors with respect to each member unit: other supplies of water available to the member unit; the quantities of water normally used by the member unit for domestic, municipal, industrial, commercial, and other purposes, and the relative ability of the member unit to reduce the quantity of water it uses; and the impact various reductions of water supply will have on the economy, public health, and welfare."

Although there are frequent shortages in the SWP supply, SCWA has never used its authority to allocate SWP supplies during any shortages. SCWA has delivered supplies in proportion to contract amounts. SCWA has a two-stage trigger for contingency actions. Stage 1 is if there is a 25% reduction in either SWP and/or Solano Project supplies. During Stage 1 conditions, SCWA will offer to assist member agencies in any internal exchanges or transfers and also assist in securing additional water supplies from outside sources such as drought water banks or joint efforts with other water agencies to obtain supplies in dry years.

Stage 2 is invoked if there is a 50% reduction in SWP and/or Solano Project supplies. During Stage 2 conditions SCWA will perform the same functions in Stage 1 and will also state its willingness to consider allocations of shortages in the SWP supply as specified in the member agency agreements.

Retail Demand Planning

SSWA has formally codified an ordinance establishing a water contingency plan. The current Water Conservation Requirements are dated June 16, 2009 and adopted by Resolution No. 09-11. Please see the attached copy of the resolution in **Appendix H.**

As shown in **Table 35** the Water Conservation Requirements (WCR) define four water shortage stages corresponding to water conservation conditions and are based on the water storage volume in Lake Berryessa (see WCR § 3.1).

Table 35 Water shortage contingency — rationing stages to address water supply shortages in AF		
Stage No. and Water Conservation Condition (WCR § 3.1)	**Lake Berryessa Storage Volume**	**% Reduction Goal[1] (WCR § 3.2)**
I – Minimum	At or above 800,000 AF	10 percent
II – Drought	600,000 – 800,000 AF	25 percent
III – Severe	400,000 – 600,000 AF	35 percent
IV – Critical	200,000 – 400,000 AF	50 percent

[1] Per Water Code § 10632(e) one of the stages of action must be designed to address a 50 percent reduction in water supply.

Note that these Lake Berryessa storage volumes differ from those in the Drought Measures Agreement described above. The WCR stages are meant to reduce demand while the Drought Measures Agreement stages are meant to conserve supply. **Table 5.6** compares the two reductions:

Table 5.6 Drought Response Measures Demand vs. Supply Reductions in AF				
SSWA Water Conservation Requirements (Demand Reductions)			**Solano Project Drought Measures Agreement Drought-Induced Curtailments of Deliveries (the Drought Measures Agreement) (Supply Reductions)**	
Water Shortage Stage	Water Use Reduction Target	Lake Berryessa Storage	Lake Berryessa Storage	Percentage of Annual Entitlement to be Restricted
I	10%	Greater than 800,000 AF	Greater than 800,000 AF	0%
II	25%	600,000 - 800,000 AF	550,000 - 800,000 AF	5%
III	35%	400,000 - 600,000 AF	450,000 - 550,000 AF	10%
IV	50%	200,000 - 400,000 AF	Less than 450,000 AF	0%

While tied directly to Lake Berryessa storage volumes, the Water Shortage Stages and Conservation Conditions can be declared by the SSWA Board of Directors per WCR § 3.4 in response to any Water Shortage which is defined in WCR § 2.6 as "any condition in which water supply is less than actual or projected water demand. Water Shortages can be short term such as those caused by failure of water system infrastructure, or long term, such as those caused by insufficient raw water supplies."

5.4 Prohibitions, Penalties and Consumption Reduction Methods

Mandatory Prohibitions

Table 36 lists water use restrictions (prohibitions) established by the WCR. These are enforceable by the penalties set forth in **Table 38**, below. Typically these restrictions "shall" be done. Restrictions from prior stages stay in effect when more restrictive stages are enacted.

Table 36 Water shortage contingency — mandatory prohibitions	
Examples of Prohibitions	**Stage When Prohibition Becomes Mandatory**
Watering grass, lawns, ground cover, shrubbery, open ground, crops or trees in a manner or to an extent which allows excess water to run off the area being watered or which results in overspray by spray irrigation facilities. (WCR §§ 2.1.a and 4.3.1)	Stage 1
Washing sidewalks, walkways, driveways, parking lots and all other hard surfaced areas by direct hosing, except as may be necessary to protect the public health and safety. (WCR §§ 2.1.b)	Stage 1
Causing or permitting water to escape through breaks or leaks within the water user's plumbing or distribution system for any substantial period of time within which such a break or leak should reasonably have been discovered and corrected. Up to 24 hours is presumed to be a reasonable period after discovery of a break or leak to correct the problem. (WCR §§ 2.1.c and 4.3.1)	Stage 1
All new plumbing fixtures, whether installed as part of new construction or as replacements for existing fixtures, shall comply with the requirements of Health and Safety Code Section 17921.3. (WCR § 4.3.2.a)	Stage 1
Multiple shower and lavatory installations within non-residential facilities shall be equipped with metering or self-closing valves except where necessary to protect the public health and safety. (WCR § 4.3.2.b)	Stage 1
The flow limitation device in showerheads must be a permanent and integral part of the showerhead and must not be removable to allow flow rates in excess of the limits specified herein. (WCR § 4.3.2.c)	Stage 1
Hot water pipes in all new construction shall be thermally insulated. (WCR § 4.3.2.d)	Stage 1
Outdoor Water Use Schedule Regulations shall be established by SSWA, which limits outdoor water use activities to specified days and times of day. Allowed irrigation times may be rotated among various users throughout the water system service area to equalize demands on the water system. (WCR § 4.4.1)	Stage 2

Watering of all turf areas, trees, shrubs and other vegetation shall be done in accordance with the established outdoor water use schedule. (WCR § 4.4.2)	Stage 2
All non-irrigation outdoor water use shall be done in accordance with the established outdoor water use regulations. This shall include but not be limited to washing of automobiles, trucks, boats, buildings, equipment, and structures, and refilling pools or ornamental bodies of water. (WCR § 4.4.3)	Stage 2
Only fountains which recycle at least 75% of their water may be operated, and if operated, a sign shall be posted stating that the water is recycled. (WCR § 4.4.4)	Stage 2
Water shall be served in restaurants only upon request. (WCR § 4.4.7)	Stage 2
Outdoor Water Use Schedule Regulations shall be established by SSWA which limit outdoor water use activities to specified days and times of day. These will be more restrictive than under Stage 2 (Drought) conditions. (WCR § 4.5.1)	Stage 3
All Spray Irrigation and irrigating of turf shall be severely restricted. (WCR § 4.5.2.a)	Stage 3
Watering of all trees, shrubs and other non-turf vegetation shall be done in accordance with the established outdoor water use schedule and only with a hand held hose, a hand held faucet-filled bucket of five gallons or less, or a drip irrigation system. (WCR § 4.5.2.b)	Stage 3
All non-irrigation outdoor water use shall be prohibited except as necessary to protect public health and safety. Prohibited uses shall include but not be limited to washing of automobiles, trucks, boats, buildings, equipment, and structures, and refilling of ornamental bodies of water, except by tank truck services from outside Solano County. (WCR § 4.5.3)	Stage 3
Operation of fountains shall not be permitted. (WCR § 4.5.4)	Stage 3
Drought notices approved by SSWA shall be posted in motels, hotels, and other commercial establishments offering lodgings. (WCR § 4.5.5)	Stage 3
Irrigation of landscaping in new development shall not be permitted, except for relandscaping of existing areas which results in a decrease in water consumption. (WCR § 4.5.7)	Stage 3
Outdoor Water Use Schedule Regulations shall be established by SSWA, which limit outdoor water use. These will be more restrictive than under Stage 3 (Severe) conditions. (WCR § 4.6.1)	Stage 4
All landscape irrigation shall be prohibited except with approved greywater use practices. (WCR § 4.6.2)	Stage 4

Consumption Reduction Methods

While the WCR establish restrictions (see **Table 36**) that are enforceable by penalties and charges (see **Table 38**), they also establish methods of reducing consumption that are set forth below in **Table 37**. Typically these restrictions “should” or “may” be done. Methods from prior stages stay in effect when more restrictive stages are enacted.

Table 37 Water shortage contingency — consumption reduction methods		
Consumption Reduction Methods	**Stage When Method Takes Effect**	**Projected Reduction (%)**
Increasing Block Water Pricing*	Stage 1	10%
Watering of all turf areas, shrubs, and other vegetation should be done before noon and after 6:00 p.m. (daylight savings time only). (WCR § 4.3.3)	Stage 1	10%
Increasing Block Water Pricing*	Stage 2	25%
Use of fire hydrants will be limited to fire fighting and other activities necessary for protection of public health and safety. (WCR § 4.4.5)	Stage 2	25%
Permits for construction water will only be granted if use of reclaimed wastewater or other sources of water is not feasible. (WCR § 4.4.6)	Stage 2	25%
Increasing Block Water Pricing*	Stage 3	35%
New service connections may be restricted. (WCR § 4.5.6)	Stage 3	35%
Increasing Block Water Pricing*	Stage 4	50%

***Table 5.7** presents the current Increasing Block Water Pricing. The rates shown were established in 1992 and their revision will be included in a Financial Plan Update currently in progress. The planned price structure will be percentage increases based on the Stage 1 Minimum Condition water rates

Table 5.7 Block Water Pricing					
1992 Water Rates Per Resolutions No. 91-07, 92-02 and 92-06					
					10/9/1992 Proposed
Stage		Stage I	Stage II	Stage III	Stage IV
Condition		Minimum	Drought	Severe	Critical
Water Use Reduction Target		10%	25%	35%	*50%*
Residential Rate					
Bi-monthly Service Charge		$ 19.38	$ 19.38	$ 19.38	*$ 19.38*
Block 1	0 - 13 CCF	$ 0.67	$ 0.67	$ 0.67	*$ 0.70*
Block 2	14 - 32 CCF	$ 0.83	$ 1.04	$ 1.12	*$ 1.25*
Block 3	33 - 48 CCF	$ 1.04	$ 1.30	$ 1.40	*$ 1.56*
Block 4	49+ CCF	$ 1.25	$ 1.64	$ 1.75	*$ 2.00*
Commercial Rate					
Bi-monthly Service Charge		$ 19.38	$ 19.38	$ 19.38	*$ 19.38*
Block 1	0 - 13 CCF	$ 0.67	$ 0.67	$ 0.67	*$ 0.70*
Block 2	13+ CCF	$ 0.83	$ 1.04	$ 1.12	*$ 1.25*

Penalties and Charges for Violations of Conservation Requirements

To enforce the Authority's conservation requirements, penalties and charges are established in increasing severity depending on how many offenses have occurred. These are presented in Section 3.5 of the Water Conservation Requirements and are reproduced in **Table 38**.

Table 38
Water shortage contingency — penalties and charges

Penalties or Charges	Stage When Penalty Takes Effect
Issue a written notice of the fact of a violation of a water use restriction to the Account Holder	First violation within the preceding twelve (12) calendar months
Impose a surcharge against the Account Holder for the property where the violation of a water use restriction occurred or is occurring in the amount of $50	Second violation within the preceding twelve (12) calendar months
A surcharge against the Account Holder for the property where the violation of a water use restriction occurred or is occurring, in the amount of $250	Third violation within the preceding twelve (12) calendar months (optional response)
Install a Flow Restrictor in the water service to the property where the violation of a water use restriction occurred or is occurring, at the Account Holder's cost, for a length of time to be determined by SSWA, with annual review by SSWA staff	Third violation within the preceding twelve (12) calendar months (optional response)
Install a Flow Restrictor in the water service to the property where the violation of a water use restriction occurred or is occurring, at the Account Holder's cost, for a length of time to be determined by SSWA with annual review by SSWA staff.	Fourth and any subsequent violation within the preceding twelve (12) calendar months

Exemptions to these penalties can be granted by the SSWA Board of Directors for various reasons, including medical requirements, livestock, protection of public health and safety, sever economic hardship, substantial re-plumbing to comply, commercial carwashes, golf courses and nurseries. Refer to WCR sections 4.7 and 4.8.

Section 6 - Demand Management Measures

The goal of the Demand Management Measure (DMM) section in a UWMP is to provide a comprehensive description of the water conservation programs that are currently implemented and those planned to be implemented. The section additionally provides general information on the measures SSWA plans to implement to meet its urban water use target.

6.1 DMMs

DMM A – Water survey programs for single-family and multi-family residential customers

(Old CUWCC BMP 1, New CUWCC BMP 3)

Description

Suisun-Solano Water Authority (SSWA) conducts a comprehensive water survey program, which is in place from spring through fall of each year. This program addresses both Single Family and Multi Family Accounts. A Water Conservation Representative provides on-site checks for leaks and indoor plumbing flow rates, evaluates irrigation system efficiency, and advises on irrigation scheduling and irrigation timer adjustments. In addition, water efficient plumbing devices are distributed to homeowners.

Table A1 - Actual	2001	2002	2003	2004	2005
# of single family surveys	No data	13	44	38	50
# of multifamily surveys	No data	0	0	0	0
actual expenditures - $	No data	No data	5,000	2,500	No data

Table A2 – Actual	2006	2007	2008	2009	2010
# of single family surveys	41	20	0	70	31
# of multifamily surveys	0	0	0	0	0
projected expenditures - $	No data	No data	No data	No data	No data

Steps to Implement Measure

Marketing Strategy

The program is marketed by identifying the top 10% of water users, and sending direct mail letters, promoting the program and informing customers of the scope of the surveys. Flyers are also distributed at City Hall, public events, and on the Solano County Water Agency's water conservation website at www.solanosaveswater.com. Interested customers are reached by phone to schedule appointments or answer

questions. Follow-up is made by mail or phone. Staff reviews the response rate and may re-send letters or consider expanding the mailing list to the top 20% of water users. For 2011 – 2015, staff plans to strengthen its overall marketing efforts in order to assist with meeting targets.

Tracking of participation and results of participation

A baseline has been developed to analyze annual participation, determine potential water savings, and evaluate the effectiveness of the program.

Planned Implementation Schedule and Budget

SSWA will continue to target the top 10% -20% water users and offer surveys. This will be completed during each of the next 5 years.

Table A3 – Planned Interventions	2011	2012	2013	2014	2015
# of single family surveys	40	80	130	130	130
# of multifamily surveys	1	1	1	1	1
projected expenditures - $	4,000	8,000	13,000	13,000	13,000

Method for evaluation of effectiveness of DMM

SSWA plans to evaluate the residential surveys by assessing the acceptance in the program by residents. The program's purpose is to introduce homeowners to modest water conserving practices. An analysis of cost effectiveness could be made, as well as a determination of pre-survey water use compared to post-survey water use. But factors that may affect an accurate analysis include: changes in seasons or weather patterns, a homeowner's willingness to implement the recommendations from the surveys, and the homeowner's interest in installing the water saving devices.

Estimated Water Savings

Water savings for this category is difficult to quantify. SSWA could estimate water savings by comparing pre-survey metering data with post-survey metering data but with some of the variables listed above, the total savings are not considered quantifiable at this time. Follow-up surveys might be implemented to spot-check if the devices were installed, but this may not be cost-effective.

DMM B – Residential Plumbing Retrofit to pre-1992 single-family and multi-family residences

(Old CUWCC BMP 2, New CUWCC BMP 3)

Description

The distribution of water-saving devices to single-family and multi-family homes occurs each year, on a year-round basis. The program includes the distribution of indoor plumbing kits, each containing a low-flow shower head, kitchen and bathroom faucet aerators, and a toilet leak detection dye tablet, all free-of charge.

This DMM is very popular among residents. Based on replacement rates since 2002, both single-family and multi-family residences have reached the 75% target figure for retrofit.

The following information was taken directly from the CUWCC BMP Reporting Database.

Base Year Data		
Reporting Unit: **Solano/Suisun WA**		Form Status: **CUWCC Reviewed**
	1. Your **BASE YEAR is 1999**.	
	BMPs 2 and 14	
	4. Number of single-family housing units constructed prior to 1992	6075
	5. Number of multi-family units prior to 1992	928

Table B1 - Actual	1992-2001	2002	2003	2004	2005
# of single family devices	No data	1,296	2,015	1296	0
# of multi-family devices	No data	384	2500	384	0
actual expenditures - $	No data	400	1,000	400	0

Table B2 – Actual	2006	2007	2008	2009	2010
# of single family devices	0	475	575	265	865
# of multi-family devices	0	75	116	0	0
actual expenditures - $	No data	3,000	3,500	1,500	1,500

Steps to Implement Measure

Marketing Strategy

The indoor kits are available at the City Hall's front counter, public events, and distributed as part of the residential water survey program. The kits and other devices such as hose shut-off nozzles and garden hose timers are also promoted as part of the Solano Saves Water website, and listed on flyers and cards.

Tracking of participation and results of participation

The numbers of devices are tracked, and a baseline has been developed to analyze participation. In addition, the amount of voluntary requests from residents are noted.

Planned Implementation Schedule and Budget

Due to the popularity of the program since 1992, this BMP is completed. SSWA will continue to implement the program at similar distribution and budget levels attained in 2007 – 2010, with gradual increases to meet gains in distribution and expenditures.

Table B3 – Planned Interventions	2011	2012	2013	2014	2015
# of single family devices	500	600	700	700	700
# of multi-family devices	100	100	100	100	100
projected expenditures - $	4,100	4,300	6,500	6,500	6,500

Method for evaluation of effectiveness of DMM

As previously stated, while the devices are popular, it is difficult to quantify the effectiveness of these water conservation plumbing devices. We consider this type of program to be a base of public outreach and a standard of any water conservation program to increase public awareness. The total water savings may be cumulative over time but not cost effective or practical to measure.

Estimated Water Savings

Water savings might be estimated if the total number of units distributed is multiplied by the projected water savings for the device being replaced. Total water savings might best be estimated by comparing pre-installation water use with post-installation water use, although consideration must be given for unknown factors such as the performance of the older devices being replaced, and the willingness of the homeowner to install the devices.

DMM C – System Water Audits, Leak Detection and Repair

(OId CUWCC BMP 3, New CUWCC Foundational BMP 1)

Description

SSWA has a surface leak detection and repair program that is done on a passive basis where leaks are repaired when identified by staff. Historically, SSWA has not had an active leak detection and repair program. Historic water losses have been on the order of 20% of system input volume (production), although some data inconsistencies may overstate the actual losses. A system-wide audit for leak detection and repair is needed to adequately assess the extent of leaks that may be occurring in an aging infrastructure system.

Implementing a system–wide audit program is a top priority for a first stage capital improvement program for SSWA and it will be in a phased approach over the next few years as SSWA further develops the data needed to complete a full-scale audit. Some of the initial activities planned in 2011-2012 to support this effort involve more robust data collection and management to enable an audit (e.g., source meter testing, random customer meter testing, SCADA system review, billing system analysis for missing accounts). SSWA plans to hire a contractor in 2012 to develop a full-scale water loss control program. This effort by SSWA staff and the contractor will include a more in-depth investigation in future phases conducted in 2013-2015. SSWA and the contractor will be looking into the potential sources for real (leaks, tank overflows, etc.) or apparent losses (billing errors, inaccurate meter readings, etc.), in order to determine the best course of action to address the chronic water losses. Apparent losses can be treated as an operational expense and water loss reductions as a capital expense. Following the American Water Works Association Manual of Practice M36, Water Audits and Loss Control Programs, the SSWA will have a full system audit and pursue the highest priorities for addressing the water losses. The highest priority will focus on first addressing the non-revenue water in order to recover revenue issues that will in turn assist with paying for some of the repairs and upgrades anticipated. In addition, SSWA intends to seek grant funds to support the water loss control program.

Steps to Implement Measure

Planned Implementation Schedule and Budget

The SSWA staff and contractor plan to undertake a methodical approach over the next ten years to address both the real and apparent losses in an effort to curb the historic water losses. Estimated schedule and budget will be determined as part of a work plan developed each year as the highest priorities are identified and methodically addressed. Grant opportunities to enhance the program will be explored. The work planning phase of $50,000 in 2011, will be followed by an approximate annual implementation cost of $100,000 for the first two years followed by an annual cost of $300,000. The goal will be to reduce water loss down to 10% no later than the year 2020.

Table C1 - Planned Implementation	2011	2012	2013	2014	2015
% of water loss as system input volume	20%	19%	18%	17%	16%
miles of distribution lines to be surveyed	TBD	TBD	TBD	TBD	TBD
miles of lines to be repaired	TBD	TBD	TBD	TBD	TBD
projected expenditures - $	50,000	100,000	100,000	300,000	300,000

Method for evaluation of effectiveness of DMM

According to AWWA M36's best practices in water loss control, each year, SSWA and the contractor will conduct a Water System Audit based on the production, metered demand and other appropriate data to determine the water losses. It is expected that the non-revenue water will decline as more water is accounted for and real and apparent water losses are addressed. Based on the results of the previous year's audit and available funding, SSWA will set the priorities for the coming year.

As discussed in Section 3, implementation of this DMM is a critical strategy in meeting the GPCD the interim 2015 and 2020 targets. The outcomes of efforts to reduce system losses and thus overall system production will be closely monitored along with GPCD between 2011 and 2015.

Estimated Water Savings

Actual water savings from individual leaks are difficult to measure or estimate given the leak has been running an indeterminate amount of time. The measurement of water savings for this DMM will be estimated based on the results of the annual water system audit. It is anticipated that the audit show a declining non-revenue water component that indicates real or apparent water losses have been reduced or alternatively measurements of reductions in real losses due to actions taken (e.g., leak repairs, main replacement). It is envisioned that implementation of this water loss control program could provide the greatest water savings of all the 14 DMMs.

DMM D – Metering with commodity rates for all new connections and retrofit of existing connections

(Old CUWCC BMP 4, New CUWCC Foundational BMP 1)

Description

There are currently 8,168 accounts in SSWA's service area. All of the accounts are presently metered with the exception of the Fire Department. Metering and monitoring of these municipal uses is critical to fully assessing water use within the City. SSWA should be fully metered and able to quantify water use and identify options to increase water conservation savings.

Table D1 - Actual	2001	2002	2003	2004	2005
# of unmetered accounts	No data	No data	No data	No data	No data
# of retrofit meters installed	No data	No data	No data	No data	No data
# of accounts without commodity rates	No data	No data	No data	No data	No data
actual expenditures - $	No data	No data	No data	No data	No data

Table D2 – Actual	2006	2007	2008	2009	2010
# of unmetered accounts	1	1	1	1	1
# of retrofit meters to be installed	No data	No data	No data	76	119
# of accounts without commodity rates	1	1	1	1	1
actual expenditures - $	No data	No data	No data	No data	No data

Steps to Implement Measure

Planned Implementation Schedule and Budget

All existing connections and all new connections are required to be metered.

Table D3 – Planned Interventions	2011	2012	2013	2014	2015
# of unmetered accounts	0	0	0	0	0
# of retrofit meters to be installed	0	0	0	0	0
# of accounts without commodity rates	0	0	0	0	0
projected expenditures - $	500	0	0	0	0

Method for evaluation of effectiveness of DMM

SSWA has a tiered pricing rate structure, adopted May 21, 1991. Effectiveness can be evaluated by determining the number of customers purchasing water in each tier (# of accounts), the amount of water purchased (total volume), and establishing annual trends in water purchases to gauge the actual water conservation achieved by the pricing structure. This type of pricing analysis (by reviewing actual customer billing data)

has not been done by SSWA in the past, but will be considered in the future as part of the 2010 UWMP report preparation process.

Estimated Water Savings

No significant water savings have been assumed from this DMM as there are a small number of meters.

DMM E – Large Landscape Conservation Programs and Incentives

(Old CUWCC BMP 5, New Programmatic BMP 5)

Description

SSWA offers free large landscape site surveys for accounts with dedicated irrigation meters. The surveys include an evaluation of water use and irrigation system performance, with recommendations given to improve irrigation efficiency. Landscaped areas are measured by aerial photo or by hand measurement. Water budgets are then developed by comparing actual water use with local evapotranspiration (ETo)[1] rates. As part of the program, a Smart Irrigation Controller rebate is also offered (see web site www.solanosaveswater.com). Examples of completed irrigation system water surveys are contained in Appendix K.

Table E1 - Actual	2001	2002	2003	2004	2005
# of budgets developed	No data	48	0	0	0
# of surveys completed	No data	0	0	0	0
# of follow-up visits	No data	0	0	0	0
actual expenditures - $	No data	5,000	5,000	5,000	n/d

Table E2 – Actual	2006	2007	2008	2009	2010
# of budgets to be developed	2	2	2	1	1
# of surveys to be completed	2	2	2	1	1
# of follow-up visits	0	0	0	1	1
projected expenditures - $	6,000	6,000	6,000	3,000	3,000

Steps to Implement Measure

Marketing Strategy

The program is marketed to large landscape accounts. Commercial and institutional customers are the major participants. Examples of recent municipal survey sites include city parks such as Heritage Park and Montebello Park. Promotion is by phone calls, site visits, direct mail, website, and flyers distributed at public events.

[1] ETo is defined to be the amount of water needed by well watered cool season turf grass, normally expressed as inches/week or per month or per year.

Solano Smart Irrigation Rebate Program

July 1, 2009 - June 30, 2011

Smart Irrigation Rebate

Effective July 1, 2009, the Solano County Water Agency is offering a Smart Irrigation Controller rebate for its customers. This is a great opportunity to save water and money.

Participation

This program is effective from July 1, 2009 through June 30, 2011. Funding is limited. Rebates are one-time-only per site, and will be provided on a first-come, first-served basis.

Solano County Water Agency customers that qualify for a rebate can receive 50% of the cost of the Smart Irrigation Controller up to $300 for 4-12 active stations, $700 for 13-24 active stations and $1000 for 25 or more active stations.

How to Qualify

1. Purchase a new, qualifying Smart irrigation controller between July 1, 2009 and June 30, 2011.
2. The Smart Controller must be installed within the Solano County Water Agency service area: Benicia, Fairfield, Suisun City, Vacaville, Vallejo and Dixon.
3. Receive a free landscape water survey from the Agency.
4. Please allow up to 12 weeks for your completed application to be processed.
5. Submit a copy of your dated sales receipt with your rebate application.
6. Please read the Rebate Program Guidelines for complete program details. Contact EGIA at 866-367-

INFORMATIONAL LINKS

- Print Copy of Rebate Form
- Qualified Smart Irrigation Controllers
- Program Guidelines and Conditions
- Email Us

SOLANO WATER

BE GREEN, SAVE BLUE™

Source: http://www.conservationrebates.com/programs/het/SolanoWBIC.aspx

Tracking of participation and results of participation

The number of large landscape surveys conducted is utilized to track participation, determine outcomes, and form a component of a water savings formula. The surveys performed indicate that some significant water savings could be realized.

Planned Implementation Schedule and Budget

It is recommended that the large landscape conservation programs and incentives should be continued. Implementing the program with audit recommendations should be facilitated. SSWA will increase outreach efforts to gain greater participation among its customer base. Grant opportunities to enhance the program will be explored. The budget will increase annually to correspond with the anticipated expansion of the program.

Table E3 – Planned Interventions	2011	2012	2013	2014	2015
# of budgets to be developed	60	175	300	300	300
# of surveys to be completed	3	3	3	3	3
# of follow-up visits	3	3	4	4	4
projected expenditures - $	31,000	87,000	145,000	145,000	145,000

Method for evaluation of effectiveness of DMM

SSWA plans to begin evaluating the effectiveness of large landscape audits and incentives by comparing metering data between pre-audit customer usage and post-audit usage. Consideration must be given to seasonal and weather changes, and the willingness of the owner to meet the recommendations of the audits. Cost versus benefits studies will be completed to assist with evaluating effectiveness.

Estimated Water Savings

Pre-audit metering data will be compared with post-audit data to estimate water savings. The final audit large landscape audit reports, prepared by consultants, also estimate potential water savings.

DMM F – High-efficiency Washing Machine Rebate Programs

(Old CUWCC BMP 6, New CUWCC Programmatic BMP 3)

Description

A clothes washer rebate program is in place and has been a solid program since 2007. Goals for the program include providing incentives for homeowners to replace older inefficient washers with models that use up to 70% less water and energy than conventional models. Specifications call for new models with a Modified Energy Factor (MEF) of 2.2 or greater, and a Water Factor (WF) of 4.5 or less. In 2010, (222) rebates of $125/each were awarded.

Table F1 - Actual	2001	2002	2003	2004	2005
$ per rebate	No data	No data	50	No data	No data
# of rebates paid	No data	No data	4	No data	No data
actual expenditures - $	No data	No data	750	No data	No data

Table F2 – Actual	2006	2007	2008	2009	2010
$ per rebate	No data	100	125	125	125
# of rebates to be paid	No data	39	229	233	222
projected expenditures - $	No data	No data	No data	7,300	No Data

Steps to Implement Measure

Marketing Strategy

Information for the program is posted on the Solano Saves Water website, (www.solanosaveswater.com). Flyers are posted at City Hall, public events, and articles have been published in local newspapers. SSWA is considering inserts or printed message on the water billings.

Tracking of participation and results of participation

Compile participation and rebate data annually, and develop baseline levels of participation.

Planned Implementation Schedule and Budget

Continue implementing the program, and apply for additional grant funding. Explore other High Efficiency Washer programs that could target and benefit commercial customers.

Table F3 – Planned Implementation	2011	2012	2013	2014	2015
$ per rebate	$125	$125	$125	$125	$125
# of rebates to be paid	75	75	75	75	75
projected expenditures - $	7,500	7,500	7,500	7,500	7,500

Method for evaluation of effectiveness of DMM

The program's participation (684 rebates from 2008-2010) is an intangible measurement of the public's interest in conserving water and energy, and a way to assess effectiveness.

Estimated Water Savings

Currently, water savings are not being estimated. Challenges exist as the data on the new machine's projected use compared to the replaced machines are not available. Plans are in order to study practical methodologies to determine water savings. A comparison must be made regarding the ratings of the new HEW's compared to that of the replaced washers. An assumption of the performance of the replaced washer must be made.

DMM G – Public Information

(Old CUWCC BMP 7, New CUWCC Foundational BMP 2)

Description

As a member of the Solano Urban Water Conservation Committee (UWCC), SSWA is involved in numerous public information activities. The lead agency for the UWCC is the Solano County Water Agency (SCWA) which has promoted regional collaboration for public information outreach and other water conservation efforts.

SSWA participates in various local media avenues to dispense water conservation information, including newspaper articles, public radio announcements, and the "Solano Saves Water" website. Public events include booths at numerous Fun Family Farm Days events. Water conservation pamphlets and flyers are posted at City Hall counters and water conservation booths. In addition, a Water-Wise Gardening cd is promoted, and a well-received demonstration garden is in nearby Vallejo at the Six Flags Discovery Kingdom amusement park.

Steps to Implement Measure

Marketing Strategy

The UWCC meets monthly to evaluate public information programs and to plan future water conservation activities. Announcements, flyers, newspaper ads, or website links have all been methods for marketing the program. Members of the UWCC often attend public events as exhibitors or participants, and are able to assess the effectiveness of programs.

Tracking of participation and results of participation

The numbers of attendees at public events are a gauge for tracking participation. Radio listenership, newspaper circulation, and website hits are all reviewed to assess the program's success. Furthermore, the numbers of cards, brochures, and free conservation devices distributed are tabulated to determine public interest.

Planned Implementation Schedule and Budget

Maintain the public information program with continual evaluation of the program's viability. Apply for grants if possible.

Method for evaluation of effectiveness of DMM

A study of the popularity of public programs can be a measurement of the effectiveness of the program.

Estimated Water Savings

Estimating water savings is difficult to quantify. The program's involvement by the public is a practical approach for determining the program's success.

DMM H – School Education

(CUWCC BMP 8)

Description

SSWA participates in a regional program which has hired an education consultant to administer water conservation education. State-wide curriculum teaching standards are adhered to. The consultant coordinates K-12 programs regionally for Suisun City, Fairfield, Dixon, Vacaville, and Travis Air Force Base. The consultant visits classrooms, provides in-class education, and trains educators. Activities include school assemblies, field trips, video contests, and art contests. In addition, the consultant participates in public programs such as Youth Ag Day, and Fun Family Farm Days.
The Program has been very successful and the education consultant has worked with the following schools located in Suisun City:

- Crescent Elementary
- Dan O. Root Elementary
- Suisun Valley Elementary
- Crystal Middle School
- Green Valley Middle School
- Green Valley Elementary
- Tolenas Elementary

In addition, Rodriguez High School in Fairfield is involved in the program, and is attended by Suisun City students. Major components of the program consist of educational in-school presentations, Project W.E.T. workshops, and providing marketing supplies and materials for students-and classrooms. An example of the school education material is the pamphlet titled “2010-2011 Water in Your Classroom” (see **Appendix J**).

Steps to Implement Measure

Marketing Strategy

Continue implementing the School Water Education program, and maintain the solid relationships that the Program has fostered with schools and educators. Research grants opportunities to fund or enhance programs.

Tracking of participation and results of participation

The number of students, educators, and schools are tracked to evaluate the success of programs.

Planned Implementation Schedule and Budget

Continue implementing the School Water Education program. Collaborate with other regional efforts such as *WaterWays* (an outdoor water conservation program) and educational programs sponsored by the Fairfield-Suisun Sewer District. Consider expanding regional collaborative efforts to reach more students. Increase budgets gradually each year to meet the anticipated expansion of the program

Method for evaluation of effectiveness of DMM

School response from educators is the greatest way to evaluate effectiveness. Comments from schools have been positive, with numerous invitations for the Education Consultant to return in subsequent school years, and expand the program.

Estimated Water Savings

Considering the difficulty of placing a numerical value for water savings, the effectiveness of the program can be the gauge for the program's success.

DMM I – Commercial, Industrial and Institutional Conservation Programs

(Old CUWCC BMP 9, New CUWCC Programmatic BMP 4)

Description

SSWA, in conjunction with SCWA and the Solano Urban Water Conservation Committee (UWCC), implements a water conservation program for its CII customers. The program is regionally based and a consultant is retained to manage the effort. The CII program initially consisted of indoor water use surveys, irrigation system audits, and direct installation of efficiency fixtures such as showerheads. The CII program currently has expanded to consist of several complimentary components: indoor water use surveys, irrigation system audits, installation of water saving fixtures, installation of high efficiency toilets, and efficiency rebates.

Table I1 - Actual	2001	2002	2003	2004	2005
# of on-site surveys completed	No data	No data	No data	0	1

Table I2 – Actual	2006	2007	2008	2009	2010
# of on-site surveys to be completed	n/d	0	3	1	1

Table I3 - Actual	2001	2002	2003	2004	2005
# of commercial replacements	No data	No data	No data	No data	No data
# of industrial replacements	No data	No data	No data	No data	No data
# of institutional replacements	No data	No data	No data	No data	No data
actual expenditures - $	No data	No data	No data	No data	No data

Table I4 – Actual	2006	2007	2008	2009	2010
# of commercial replacements	No data	No data	0	0	0
# of industrial replacements	No data	No data	No data	No data	No data
# of institutional replacements	No data	No data	0	0	0
actual expenditures - $ (includes landscape surveys)	No data	No data	2,400	5,700	4,400

Steps to Implement Measure

Marketing Strategy

Continue the development and implementation of the regional CII program.

SSWA staff is researching grants, outreach opportunities, and other options to strengthen its programs. Billing inserts and radio ads are being considered, Current marketing components include:

- Telephone calls and site visits to CII customers
- Marketing the program on the Solano Saves Water website
- Generate and distribute flyers that advertise the program
- Conduct audits as requested

Tracking of participation and results of participation

SSWA carefully tracks the number of customers participating in its programs. The success of the program is dependent on customer response, and its outcomes are a component of studies conducted to ascertain the program's effectiveness and water savings achieved.

Planned Implementation Schedule and Budget

Table I5 – Planned Interventions	2011	2012	2013	2014	2015
# of on-site surveys to be completed	3	3	3	3	3

Table I6 – Planned Interventions	2011	2012	2013	2014	2015
# of commercial replacements	100	100	100	100	100
# of industrial replacements	NA	NA	NA	NA	NA
# of institutional replacements	25	25	25	25	25
projected expenditures - $	15,000	16,000	16,500	17,500	18,200

Method for evaluation of effectiveness of DMM

The effectiveness of the program can be made by reviewing the numbers of participants, analyzing costs versus benefits, and estimating water savings.

Estimated Water Savings

SSWA does not currently track water savings from their CII water efficiency program. However, plans are in place to estimate water savings by calculating pre-program meter data compared to post-program use. Challenges of estimating savings are due to the many variables that affect commercial and institutional uses including the economy, or change in production. For example, if a restaurant used less water, it might not be due to the SSWA CII survey, but could be a result of a decrease in the economy (i.e., less customers visit the restaurant).

DMM J – Wholesale Agency Assistance

(Old CUWCC BMP 10, New CUWCC Foundational BMP 1)

This DMM is not applicable, as SSWA is not a wholesaler.

DMM K – Conservation Pricing

(Old UWCC BMP 11, New CUWCC Foundational BMP 1)

Description

As required by AB797, SSWA adopted an Urban Water Management Plan on April 29, 1991. The current Water Conservation Requirements were adopted by SSWA Board Resolution No. 09-11 on June 16, 2009. ***Table 5.7** presents the current Increasing Block Water Pricing. The rates shown were established in 1992 and were unchanged in the 2009 resolution. Their revision will be included in a Financial Plan Update currently in progress. The planned price structure will be percentage increases based on the Stage 1 Minimum Condition water rates

The current structure is contained in the resolution as follows:

Section 4-Specific Provisions
Subsection 4.2: Water Pricing:
Subsection 4.2.1: Definition of Rate Blocks-

> Water supplied by the SSWA water system is priced with an increasing block rate structure incorporating four blocks. Block 1 is 0 to 13 units per month (approximately 160 gallons per day), Block 2 is for 13 units per month to 32 units (approximately 375 gallons per day), Block 3 is 32 units to 48 units (600 gallons per day) and Block 4 is over 48 units.

SSWA continues to meet the criteria of this BMP. The water rate structure is increasing block for all residential customers with no minimum usage included in the bi-monthly service charge.

No sewer service is provided by SSWA.

Commercial, industrial and institutional customers with ¾" meters are billed at an increasing block rate. Larger commercial, industrial and institutional customers are billed at a flat rate.

Please see the attached copy of the current Water Conservation Requirements in **Appendix H**.

Steps to Implement Measure

Method for evaluation of effectiveness of DMM

Rates can be studied to see if they change customer water use patterns.

Estimated Water Savings

No method has been identified to determine water savings from conservation pricing at this time.

DMM L – Conservation Coordinator

(Old CUWCC BMP 12, New CUWCC Foundational BMP 1)

SSWA has had a Water Conservation Coordinator since 1992. The current water conservation coordinator is:

Paul Lum
Suisun-Solano Water Authority
810 Vaca Valley Parkway, Suite 201
Vacaville, CA 95688
Phone (707) 455-4024
Fax (707) 450-0185
e-mail lump@sidwater.org

Mr. Lum is a Solano Irrigation District (SID) employee and serves on the Solano Urban Water Conservation Committee, which manages and coordinates water conservation programs. Mr. Lum is a certified Level 1 Water Conservation Practitioner, and is assisted in BMP implementation by SID's Water Quality Technical Analyst. **Table 6.1** summarizes the activities of the Water Conservation Coordinator.

Additional internal staff and outside consultants will be added as necessary to assist SSWA in meeting our commitment in reaching our water conservation targets, goals and objectives.

Table 6.1 Activities of the Water Conservation Coordinator	
Current Activities	Method of Implementation
Communicate programs to SSWA customers	Website. Brochures and cards displayed at City Hall. Conservation devices distributed at City Hall. Information booths at public events. Newspaper articles. Presentations to city and county officials.
Stay informed of regulatory issues, CUWCC information, reports, and activities. Advise SSWA. Manage and coordinate Compliance.	Attend CUWCC meetings such as Plenary and Water Conservation Workshops. Give presentations to SSWA Board. Consult with SSWA staff.
Represent SSWA on the Solano Urban Water Conservation Committee	Attend monthly meetings, provide input, and assist with coordination of programs.
Manage and administer programs	Programs are implemented on a regional basis whenever possible. Free-of-charge programs include the distribution of water saving devices such as shower heads and timers, hose shutoffs and nozzles, faucet aerators, and leak detection dye tablets. Free residential water survey programs, CII toilet (HETs) replacements, and a school education program are available. Rebates include HETs, washers, irrigation timers, and turf replacements. Incentive programs include CII irrigation system upgrades. Funding is provided primarily by SCWA, with contributions from SSWA, Dixon, SID, Vallejo, Benicia, Fairfield, and Vacaville.
Track results and activities of programs	Collect data on individual DMMs and report to the CUWCC Best Management Practice website (BMP/DMM Reporting Database)

DMM M – Water Waste Prohibition

(Old CUWCC BMP 13, New CUWCC Foundational BMP 1)

Description

SSWA has complied with this Best Management Practice since 1992 by the adoption of Resolution 92-02, a Waste of Water Prohibition document. Resolution 92-02 was amended by Resolution 00-05 in February 2000 to prohibit new single pass through cooling systems, new non-circulating car washes, laundries, and fountains. These measures have been preserved in the current Water Conservation Requirements which were adopted by Resolution No. 09-11 on June 16, 2009. Please see the attached copy of the resolution in **Appendix H.**

Steps to Implement Measure

Method for evaluation of effectiveness of DMM

SSWA's Water Waste Prohibition ordinance is based on available water supplies, correlated to Stage I – IV water levels at Lake Berryessa. Currently, water supplies are adequate and the Water Waste Prohibition's reduction methods are not being enforced, except for the existing prohibitions listed above. . However, the DMM is considered highly effective. A considerable amount of planning was given to develop the DMM, and we consider the Prohibition to be a solid safeguard towards protecting SSWA's water supplies in the event of drought or catastrophe.

Estimated Water Savings

Considering that we are not in a drought stage at this time, quantifying water savings may not be practical. While it may be possible to quantify the water savings related to the prohibitions listed above, assumptions must be made as to the performance of the equipment and the amount of equipment and fixtures that are affected.

DMM N – Residential ULFT Replacement Program

(Old CUWCC BMP 14, New CUWCC Foundational BMP 3)

Description

SSWA offers economic incentives for the purchase and installation of high efficiency toilets (HETs). The HETs must meet the current Water Sense Specifications (WSS) or updated standards. Qualifying HETs must replace units using 3.5 gallons or more per flush (gpf), and toilets in homes built after 1992 do not qualify. Residential rebates are $125 each, with a maximum of up to 3 HETs. Commercial rebates are $125 each, with a maximum of (5) rebates to paid at the $125 level. Additional toilets up to (100) will be paid an incentive of $50.

A professional plumbing contractor, under contract with SCWA, will remove older 3.5 gpf toilets and install new HET units at no cost to the owner. See the website link below.

Table N1 – Actual	2006	2007	2008	2009	2010
$ per rebate	0	0	$125	$125	$125
# of rebates to be paid	0	0	15	35	47
actual expenditures - $	0	0	771	866	2,238

Marketing Strategy

Marketing avenues include telephone calls, direct mail, website, and flyers placed at City Hall and public events booths. For 2011 – 2015, plans are in place to strengthen and expand marketing efforts.

Solano High-Efficiency Toilet Rebate Program

March 1, 2007 - June 30, 2011

High-Efficient Toilet (HET) Rebate

Effective May 1, 2008, the Solano County Water Agency is offering a $125 rebate to residential customers who purchase and install a new High-Efficiency Toilet. This is a great opportunity to save water and money.

Participation

This program is effective from March 1, 2007 through June 30, 2011. Applications will be processed until funds are depleted, subject to funds availability.

How to Qualify

1. Purchase a new, High-Efficiency Qualifying Toilet (HET) between March 1, 2007 - June 30, 2011.
2. HET must be installed within the Solano County Water Agency service area: Benicia, Fairfield, Suisun City, Vacaville, Vallejo and Rio Vista.
3. Submit a rebate application by July 31, 2011.
4. Please allow up to 12 weeks for your completed application to be processed. Incomplete applications cannot be processed.
5. Submit a copy of your dated sales receipt with your rebate application.
6. Please read the Rebate Program Guidelines and Conditions for complete program details. Contact EGIA at 866-367-3442, ext. 376, for further details or for status of your rebate application.

INFORMATIONAL LINKS

- Print Copy of Rebate Form
- Qualified High-Efficiency Toilets
- Program Guidelines and Conditions
- Retailer List
- Email Us

SOLANO WATER · BE GREEN, SAVE BLUE™

Source: http://www.conservationrebates.com/programs/het/SolanoHET.aspx

Tracking of participation and results of participation

The amount of replacements and rebates are tracked and reviewed to gauge participation levels.

Planned Implementation Schedule and Budget

Continue to participate in the Regional SCWA High Efficiency Toilet Program. Continue to apply for grants to assist with funding.

The target goals for this measure are provided in the table below.

Table N2 – Planned Implementation	2011	2012	2013	2014	2015
$ per rebate	$125	$125	$125	$125	$125
# of rebates to be paid	55	150	220	300	300
projected expenditures - $	12,000	20,000	30,000	35,000	40,000

Note – some staff time assumed in expenditures to process rebates.

Method for evaluation of effectiveness of DMM

An analysis of cost vs. benefit can be performed, combined with estimated water savings, and the participation levels of residents and commercial accounts.

Estimated Water Savings

SSWA has not estimated water savings in the past. SSWA plans to estimate savings by comparing pre-metering data with post-metering data. As stated with other DMM's, challenges exist with estimating savings. With this DMM, for example, it is difficult to determining the performance of the older toilets being replaced.

6.2 Other Conservation Measures

SSWA recognizes the need to explore additional opportunities to increase water conservation savings. The following efforts listed below are managed on a trial basis, enabling staff time to assess the effectiveness of the programs.

TURF REPLACEMENT REBATE PROGRAM

The turf replacement program is run as a pilot program for the period 2010 -2011. Cash rebates are offered to water customers who replace turf grass with permeable hardscape, or polyethylene or nylon artificial turf products. Rebates are offered once per customer, on a first-come-first served basis, and subject to funding availability.

CII WATER SAVNGS INCENTIVE PROGRAM

This program offers CII customers financial incentives to upgrade irrigation systems, plumbing fixtures, and/or water using appliances. Customers must agree to a water survey as part of eligibility. Up to $10,000 in rebates may be available to public service

agencies, and a maximum of $5,000 is available to commercial and industrial customers.

6.3 Implementation Funding

Actual Current Year Budget

Table 6.2 is the SSWA Fiscal Year 2011-2012 budget for expenditures and staff effort to implement the DMMs.

Table 6.2 SSWA Fiscal Year 2011-2012 Budget for DMM Implementation		
DMM #	**Name**	**Estimated Budget**
A	Residential Water Audits	4,000
B	Residential Retrofit	4,100
C	System Water Audit and Leak Detection	50,000
D	Metering w/Commodity Rates	500
E	Landscape Water Audits	31,000
F	Washing Machine Rebates	7,500
G	Public Information	9,000
H	School Education Program	4,200
I	CII Conservation Programs	15,000
J	Wholesale Agency Programs	N/A
K	Conservation Pricing	500
L	Conservation Coordinator	(included in other items)
M	Water Waste Prohibition	500
N	ULFT Program	12,000
	Total	**$138,300**

Projected Next Year Budget

Table 6.3 is the SSWA Fiscal Year 2012-2013 projected budget for expenditures and staff effort to implement the DMMs.

Table 6.3 SSWA Fiscal Year 2012-2013 Budget for DMM Implementation		
DMM #	**Name**	**Estimated Budget**
A	Residential Water Audits	8,000
B	Residential Retrofit	4,300
C	System Water Audit and Leak Detection	100,000
D	Metering w/Commodity Rates	0
E	Landscape Water Audits	87,000
F	Washing Machine Rebates	7,500
G	Public Information	9,000

H	School Education Program	4,200
I	CII Conservation Programs	16,000
J	Wholesale Agency Programs	N/A
K	Conservation Pricing	500
L	Conservation Coordinator	(included in other items)
M	Water Waste Prohibition	500
N	ULFT Program	20,000
	Total	**$257,000**

* Note – budget significantly increased due to the addition of the DMM C System Water Audit and Leak Detection of $100,000 and an approximate doubling of conservation efforts from $88,000 to $157,000 in order to meet conservation targets.

6.4 Conservation Implementation

DMMs managed regionally are DMMs A, B, E, F, G, H, I, and N. DMM's implemented strictly by SSWA are DMMs C, D, J, K, L, and M. Interns and City of Fairfield staff coordinate DMM A, the residential survey program. Consultants manage DMM I, CII conservation programs. The School Water Education Program is implemented regionally through a combination of Solano cities and agencies, which provide funding independently from SCWA.

Table 6.4 summarizes the implementation schedule of the DMMs for SSWA. Note this was Table 16 in the 2005 UWMP.

Table 6.4
DMM Implementation Schedule

BMP	How Implemented	How Staffed	How Funded	5-year goal 2011-2015
DMM A	Regional w/ City of Fairfield	Interns coordinated by the City of Fairfield	SSWA Budget & SCWA Budget	On-going implementation.
DMM B	SSWA project	SSWA Staff	SSWA Budget & SCWA Budget	Multi-family & single-family completed at 75%. On-going implementation.
DMMC	SSWA project	SSWA Staff + Consultant	SSWA Budget	Study and implement water loss program.
DMM D	Completed		SSWA Budget	
DMM E	SSWA project	SSWA Staff	SSWA Budget and SSWA Budget	On-going implementation, apply for grant funding.

DMM F	SSWA project	SSWA Staff	SSWA Budget & SCWA Budget	On-going implementation, apply for grant funding.
DMM G	SSWA project	SSWA Staff	SSWA Budget & SCWA Budget	On-going implementation
DMM H	Regional project	SSWA Staff/Consultant	Regional Budget, School Water Education Program	Continue existing program. Investigate regional cost sharing options with interested agencies
DMM I	SSWA/Regional project	SSWA Staff/Consultant	SSWA Budget & SCWA Budget	On-going implementation, investigate grant funding and local cost sharing options.
DMM J	Completed			
DMM K	Completed		SSWA Budget	
DMM L	Completed		SSWA Budget	
DMM M	Completed		SSWA Budget	
DMM N	SSWA project	SSWA Staff	SSWA Budget & SCWA Budget	On-going implementation, apply for grants.

SSWA will explore additional funding opportunities in the forms of grants and cost sharing with other agencies. Currently, there is collaborative funding with W*aterWays, an* outdoor water education program, and the Fairfield-Suisun Sewer District's environmental programs. SSWA will continue to keep abreast of any federal and alternate funding sources available.

6.5 SSWA and CUWCC Reports

SSWA is not a member of the California Urban Water Conservation Council (Council). However, SSWA has submitted annual reports to the Council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, as amended.

Section 7 - Climate Change

This section was prepared at the guidance of DWR given that UWMPs are referenced in other documentation that must by law address climate change. At a minimum, SSWA's UWMP will be used as needed for compliance with the California Environmental Quality Act, County and City General Plans, and Integrated Regional Water Management Plans.

According to the National Academy of Sciences, **climate change** refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- Natural processes within the climate system (e.g. changes in ocean circulation);
- Human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.)

Potential Climate Change: As water suppliers to SSWA, consideration may be made for changes in water demands, water supply and quality, potential sea level rise and disaster preparedness due to increased climate variability.

- Water Demand: Hotter days and nights, as well as longer irrigation seasons, will have increased landscaping water needs, and power plants and industrial processes will have increased cooling water and energy needs.
- Water Supply and Quality: Reduced rainfall, shifting winter and spring storm events, increased potential for algal blooms and increased potential for seawater intrusion, each having potential to impact water supply and water quality.
- Sea Level Rise: It is expected that the sea level will continue to rise, resulting in near shore ocean changes such as stronger storm surges, more forceful wave energy, and more extreme tides. This will also affect levee stability in low-lying areas and increase flooding.
- Disaster: Disasters are expected to become more frequent as climate change brings increased climate variability, resulting in more extreme droughts and floods. This will challenge our water supply operations in several ways as wildfires are expected to become larger and hotter, droughts will become deeper and longer, and floods can become larger and more frequent.

Monitoring, Mitigation and Adaptation: SSWA's potential response to or preparation for climate change may best be addressed through monitoring, mitigation and adaptation. Monitoring serves to track trends and effectively evaluate demands on our resource supplies. Mitigation could take steps to reduce our contributions to the causes of climate change by reducing greenhouse gas emissions. If necessary, adaptation is the process of responding to the effects of climate change by modifying our systems and behaviors to function in a warmer or highly changeable weather and environmental conditions.

Current activities that are general best practices that also support mitigation for our water treatment and distribution system include reducing energy use, becoming more efficient with energy use, and/or substituting fossil fuel based energy sources for renewable energy sources. While much of the Solano Project is efficiently designed to utilize gravity to bring water to our main treatment facilities, much of the system depends on energy to move, treat and distribute municipal and industrial water. Therefore, any effort to conserve water is also energy conservation, thereby is assumed to reduce the energy demands or carbon "footprint" of the system. As we implement system-wide Demand Management Measures (DMMs) or Best Management Practices (BMPs) and determine water conservation targets, we can also calculate conserved energy resources and Greenhouse Gases (GHGs) not emitted as a side benefit.

In the future, if necessary, adaptation and responding to a changeable environment due to more extreme climatic events may not only mean preparing for increased water demands, but also increased water treatment capabilities to maintain water quality. There are also additional benefits as these adaption strategies also translate into improved disaster preparedness. As water purveyors, we are presently participating in the development of Local Hazard Management Plans in collaboration with the Association of Bay Area Governments, Solano County Water Agency and the Solano County Office of Emergency Services. These emergency preparedness plans can assist in mapping and better understanding of a wide variety of potential risks and impacts on our facilities and the City of Suisun City.

Section 8 - Completed UWMP Checklist

Table I-2 Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1 – page 2
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Section 1 – page 2
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Section 1 – page 5
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 1 – page 5
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 1 – Table 1, page 3
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Section 1 – page 5
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Appendix A

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Appendix A
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 1 – page 5
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 1 – page 5
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 2 – page 8
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 2 – page 16
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 2 – page 12
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2 – page 12
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 2 – page 14
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 3 – pages 24-34

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Section 1 – Page 4
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Section 3 – pages 24-34
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 3 – pages 18-20
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 5 – page 61
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 3 – page 21
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 4 – page 43
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 4 – page 43

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Section 4 – page 44
16	Describe the groundwater basin.	10631(b)(2)		Section 4 – page 44
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		Not Applicable
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 4 – page 43
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 4 – page 44
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 4 – page 44
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 4 – page 44
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 4 – page 45
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 4 – page 53
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 4 – page 46

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 4 – page 46-50
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 4 – page 46-50
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 4 – page 46-50
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 4 – page 46-50
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 4 – page 46-50
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 4 – page 46-50
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 4 – page 46-50
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 4 – page 46-50
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 5 – page 62

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 5 – page 63
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 5 – page 64
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5 – page 72
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5 – page 68
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5 – page 73-76
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 5 – page 73-76
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 5 – page 73-76
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5 – pg. 75
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 5 – page 75
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Appendix I

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Appendix I
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 5 – page 64
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 5 – page 66-67
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6 – pages 77-105
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 6 – pages 77-105
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)	Reduction Plan to comply with the Water Conservation Act of 2009	Section 3 – Page 26
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Section 6 – pages 77-105
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Section 6 – pages 77-105

Section 9 - References

Association of Bay Area Governments (ABAG), Projections 2005, Forecasts for the Bay Area

Association of Bay Area Governments (ABAG) Projections 2002, Forecasts for the Bay Area

Census Data 1990 and 2000 for City of Suisun City, http://factfinder.census.gov

City of Suisun City, General Plan, 1992.

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Department of Water Resources, Public Water System Statistics Annual Reports, Suisun Solano Water Authority, 1999 to 2004

Drought Contingency Plan, Solano County Water Agency, 1993

Emergency Response Plan, Solano Irrigation District, September 2006

Fairfield and Suisun Chamber of Commerce http://www.ffsc-chamber.com

Gentry Project, Environmental Impact Report , City of Suisun City, 2005

Gentry Project, Water Supply Assessment, City of Suisun City, March 2004 prepared by Summers Engineers, Inc. and Solano Irrigation District

Integrated Water Resources Plan Phase 1, Solano County Water Agency, January 8, 2004

Master Plan for Water Supply and System Delivery, Suisun Solano Water Authority, May 1996, prepared by Summers Engineers, Inc.

Northeast Quadrant Water Supply Assessment, Dixon-Solano Municipal Water Service, Dixon, California, December 24, 2003, Table 1.

Recommended Program for CII Water Conservation, Solano County Water Agency, September 2005, Prepared by Maddaus Water Management

Solano County of Emergency Services website:
http://www.solanocounty.com/Department/Department.asp?NavID=90

Solano County Orderly Growth Initiative, 1994

Solano County Water Agency Website: http://www.scwa2.com/

Solano Irrigation District Website: http://www.sidwater.org/sid_statistics.htm

System Inventory and Valuation Study for Suisun Solano Water Authority, Prepared by Solano Irrigation District Engineering Department, February 2000

Solano Transport Authority, Draft Programmatic EIR for County Transport Expenditure Plan Website:
http://www.solanolinks.com/stia/pdfs/2002%20Draft%20PEIR/Chapter%2005.pdf

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Water Management Plan 2005, Suisun Solano Water Authority, April 2005, Prepared by Maddaus Water Management and SSWA Staff

Water Shortage Contingency Plan is dated March 31, 1992 passed by Resolution No. 92-02

Water Supply Options to Meet Peak Demand, Suisun Solano Water Authority, March 9, 2005, prepared by Summers Engineers, Inc.

Western Regional Climate Center, Station 042934 http://www.wrcc.dri.edu/

Solano Project Reliability Study, a memorandum by the Solano County Water Agency dated Nov. 23, 2009

UWMP Reliability Data, a memorandum by the Solano County Water Agency dated August 10, 2010

Appendix A - Adoption Resolution

Adoption and Implementation of the UWMP

A copy of the resolution adopting the 2010 UWMP is provided on the next page.

RESOLUTION NO. 11-04
SUISUN-SOLANO WATER AUTHORITY

RESOLUTION ADOPTING THE
2010 SSWA URBAN WATER MANAGEMENT PLAN
DATED JUNE 14, 2011

At a meeting of the Board of Directors of Suisun Solano Water Authority held at the City Hall of Suisun City on the 14th day of June, 2011, the following resolution was approved and adopted:

WHEREAS, the SSWA desires to ensure that the treated water supply it produces is used and managed efficiently; and

WHEREAS, under the provisions of the Urban Water Management Planning (UWMP) Act (Division 6 Part 2.6 of the Water Code §10610 – 10656) which requires California's urban water suppliers to support and review their long-term resource planning every 5 years to ensure adequate water supplies are available to meet existing and future water demands over a 20 year planning horizon, and Senate Bill SB x7-7 (Steinberg, 2009) further requires reduction of 20 percent per capital water use by the year 2020 to support growing populations; and

WHEREAS, on May 25, 2011, at a duly noticed meeting of the SSWA Board, the public was given an opportunity to comment on the prepared Plan.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of the Authority does find, resolve and order that this plan be accepted as presented, and authorizes the President and Secretary to adopt the Plan, submit said Plan to the Department of Water Resources (DWR) and authorizes the General Manager to facilitate implementation of water conservation efforts as proposed.

PASSED AND ADOPTED THIS 14h DAY OF JUNE, 2011 AT SUISUN CITY, CALIFORNIA, THE FOLLOWING DIRECTORS VOTING THEREON:

SSWA
Resolution No. 11-04

AYES: **Hansen, Colla, Kluge, Bishop, Grant Sanchez, Derting, Segala, Hudson**

NOES:

ABSTAIN:

ABSENT: **Day**

Robert Hansen, President of the
Board of Directors of the
Suisun-Solano Water Authority

ATTEST:

I hereby certify that the foregoing Resolution was duly made, seconded and adopted by the Board of Directors of the Suisun-Solano Water Authority at a regular meeting of this Board held June 14, 2011.

James S. Daniels, Secretary to the
Board of Directors of the
Suisun-Solano Water Authority

Appendices B – L - Separately Provided

B. Suisun City Housing Element, adopted July 7, 2009
C. Suisun City State Water Project (North Bay Aqueduct) Contract, 1985
D. Solano Project Members' Agreement as to Drought Measures and Water Allocation
E. Central Solano Dual Water Systems Master Plan 1992
F. SSWA FY 2010-11 to FY 2014-15 Capital Improvement Plan
G. Solano Project Reliability Study, November 23, 2009 and UWMP Reliability Data dated August 10, 2010.
H. SSWA Water Conservation Requirements 2009 Approved Final
I. Final State Water Project Delivery Reliability Report, 2009, Appendix B
J. School Education Pamphlet "2010-2011 Water in Your Classroom"
K. Irrigation System Water Conservation Surveys
    a. Heritage Park
    b. Montebello Vista Park
L. Public Meeting Advertisements
    a. Daily Republic April 13, 2011
    b. Daily Republic April 20, 2011