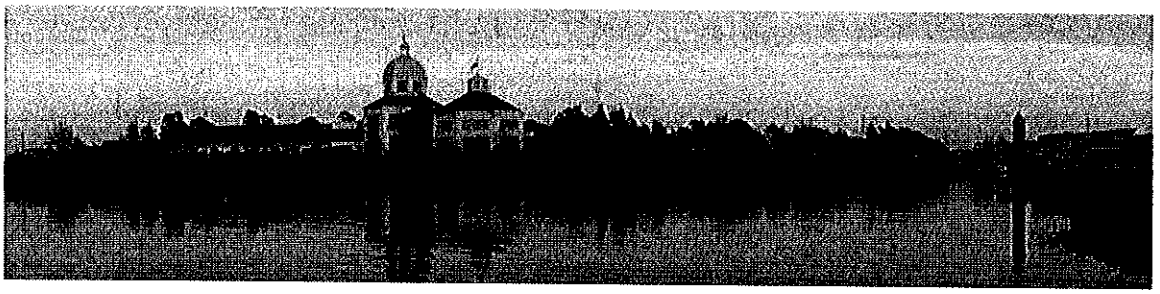

SUISUN SOLANO WATER AUTHORITY

URBAN WATER MANAGEMENT PLAN

November 2006

Prepared by:
Maddaus Water Management
and SSWA Staff

SSWA

2005 URBAN WATER MANAGEMENT PLAN

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Section 1 – Agency Coordination (Section 10620)

1.1 The Suisun Solano Water Authority as an "Urban Water Supplier"

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 more than 3,000 customers. As such, SSWA is required to complete an Urban Water Management Plan every five years and submit 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.

1.2 Urban Water Management Planning Act Requirements

Requirement for the urban water management plans include:
- Assessment of current and projected water supplies
- Evaluation of demand and customer types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan for in the event of water shortage
- Comparison of demand and supply projections

This 2005 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 Agency Coordination
- Section 2 General Information – This section contains information about SSWA and its service area including climate, demographics, and growth. Current and Planned

Water Supply Sources/Reliability – overview of SSWA's current and potential water supplies, water quality impacts, and water supply reliability. Discussion of water usage and projected demand, and the potential for recycled water, imported and desalinated water are included in this chapter.

- Section 4 Water Shortage Contingency Plan – This section discusses plan of action during a drought situation.
- Section 5 Water Demand Management Measures – This section discusses SSWA's water conservation programs. Estimated quantities of water saved and other features of each conservation program are presented.
- Section 6 Water Supply Emergency Response Plan – This section addresses SSWA's response to water supply shortages, both short and long term. Also included are estimates of the corresponding impacts.
- Section 7 Dry year demand analysis – This section analysis changes in supply and demand under drought conditions.

As shown in the Table of Contents, several appendices are included containing documents related to this UWMP.

1.3 Public Participation

A public hearing before the SSWA Board of Directors to discuss and receive comments regarding the SSWA's 2005 UWMP was held on November 8, 2006. The public hearing was advertised in the Fairfield Daily Republic. Additionally, a public hearing notice was posted on the City of Suisun's web site (http://www.ci.suisun-city.ca.us/). The 2005 UWMP was made available for public review at the Water Utilities Department at Suisun City Hall.

The SSWA Board of Directors will consider adoption of the UWMP by resolution at its November 8, 2006 Board Meeting.

1.4 Agency Coordination

During the preparation of the 2005 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 2005 Urban Water Management Plan.

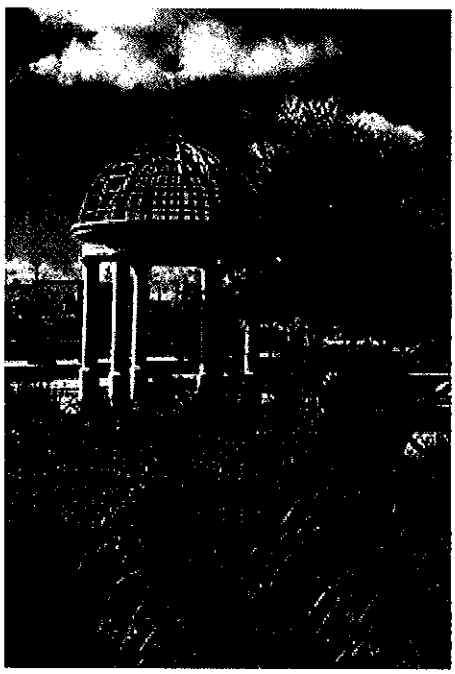
Coordination with Appropriate Agencies (Table 1)

	Participated in UWMP Development	Commented on the Draft	Attended Public Meetings	Contacted for assistance	Received a Copy of the Draft	Sent notice of intention to adopt	Not involved no information
Solano County Water Agency	X	X	X	X	X	X	
Suisun Solano Water Authority	X	X	X	X	X	X	
Solano Irrigation District	X	X	X	X	X	X	
City of Suisun	X	X	X	X	X	X	

Section 2 – Service Area Information with 20-Year Projections (Section 10631(a))

2.1 Service Area

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.



Suisun City is currently a small Californian community of 28,500 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 and surrounding municipalities is shown in **Figure 1** on the following page.

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 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.

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. 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 2000 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 7,147 accounts in 1996 to 8,025 accounts in 2003, or a change of 878 accounts in 6 years. A map showing the ultimate service area is shown in **Figure 2**.

The future of SSWA shows some growth and retrofit to existing systems as outlined in the 2004-2005 Capital Improvement Plan. Some planned changes include upgrades to the Cement Hill Water Treatment Plant, additions to the Gregory Hill Treatment Plant, multiple pipeline extensions, upgrades to pumping stations, and the construction of a few additional storage tanks.

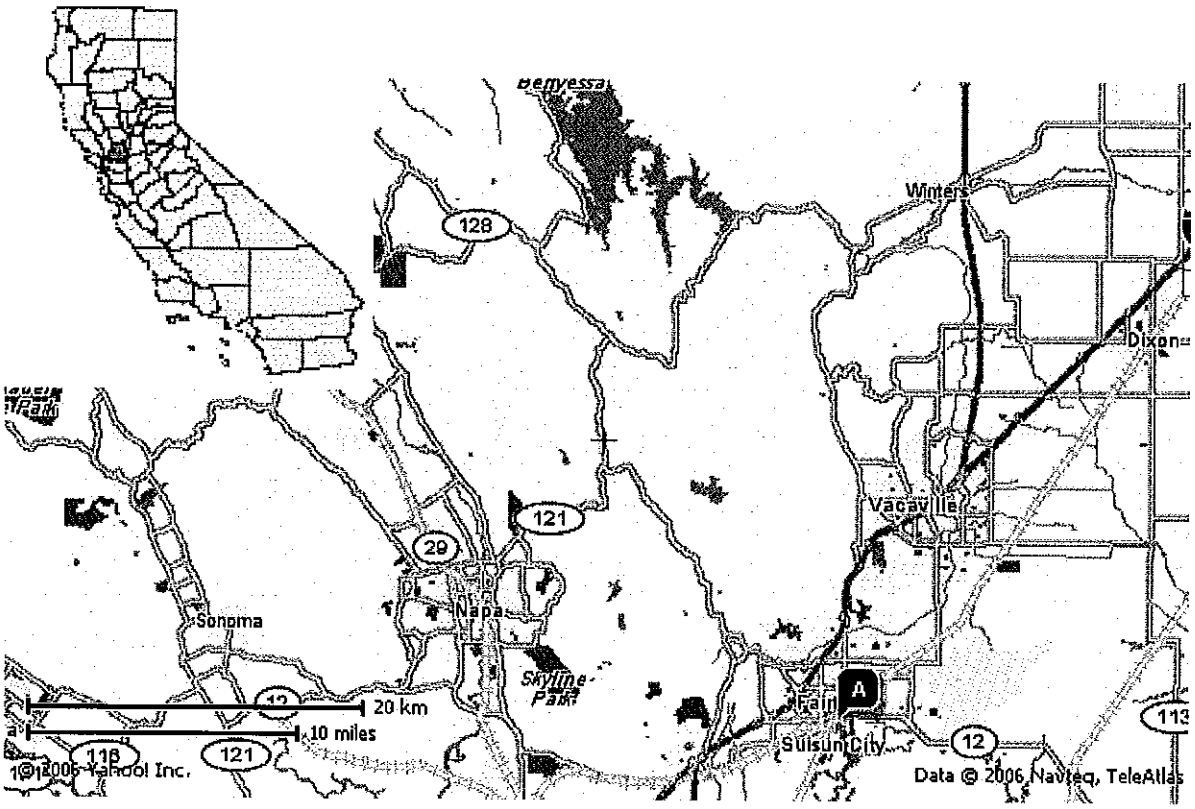


Figure 1: City of Suisun and surrounding areas

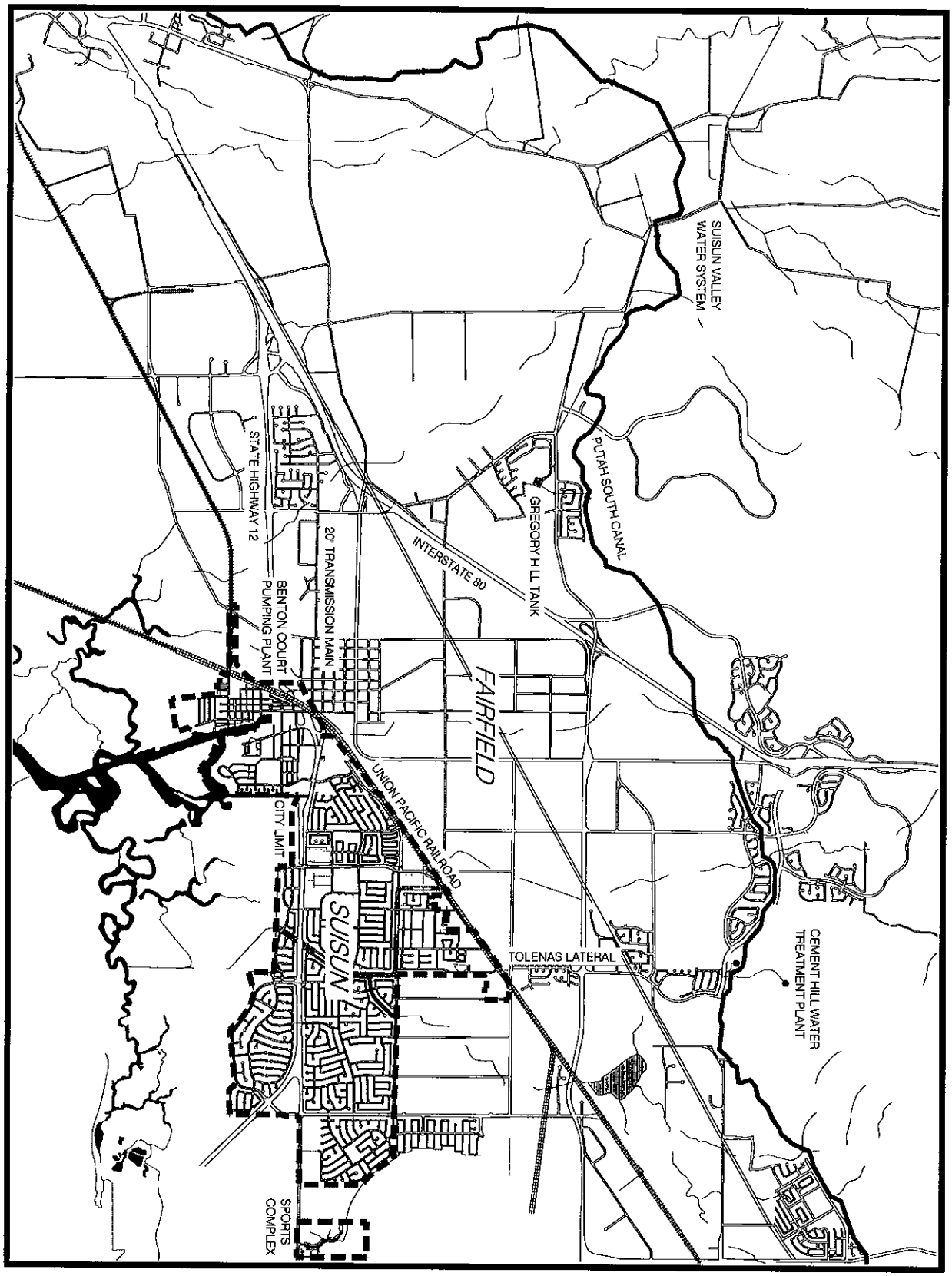


Figure 2: SSWA Service Area Map

2.2 Population and Housing

Historical and projected population for SSWA and housing characteristics are shown in **Table 2**, shown below, and on **Figure 3**. Between 1990 and 2005, SSWA service area population increased 25.6 percent. As provided from the Bay Area Association of Governments (ABAG), the City of Suisun's population is projected to increase 29.8 percent from 28,500 in 2005 to 37,000 in 2025.

The ABAG population projections disagree with the population projections developed by the City of Suisun Planning Department and the SSWA engineer of record (the SSWA population projection). The SSWA population projection assumes buildout in 2020 and no significant increase in population after that time. Since the published SSWA population projection does not conform to the requirements for UWMP purposes, the ABAG figures are used instead. SSWA should work with Suisun City to prepare revised figures in a format suitable for use in the UWMP that reflect the anticipated growth rate. The water demand based on this ABAG population projection must be reviewed before it is used for planning water supply facilities and the SSWA Capital Improvement Program.

Historical and Projected City Population and Housing (1990 - 2025) (Table 2)

	Historical			Projected[a]			
	1990	2000	2005	2010	2015	2020	2025
City of Suisun	22,686[b]	26,640	28,500	31,900	33,800	35,400	37,000
Tolenas[c]	-		625	625	625	625	625
Total Service Area Population	22,686	26,640	29,125	32,525	34,425	36,025	37,625
Annual Increase (%)	-	1.7	1.87	2.33	1.17	0.93	0.89

(a) From Bay Area Association of Governments 2005 Projections.
(b) From 1990 Census Data
(c) Additional population of 625 persons for the area of Tolenas, a single family residential area served by SSWA which has 192 dwelling units This is derived from 192 units times average household size of 3.26 from the 2000 Census

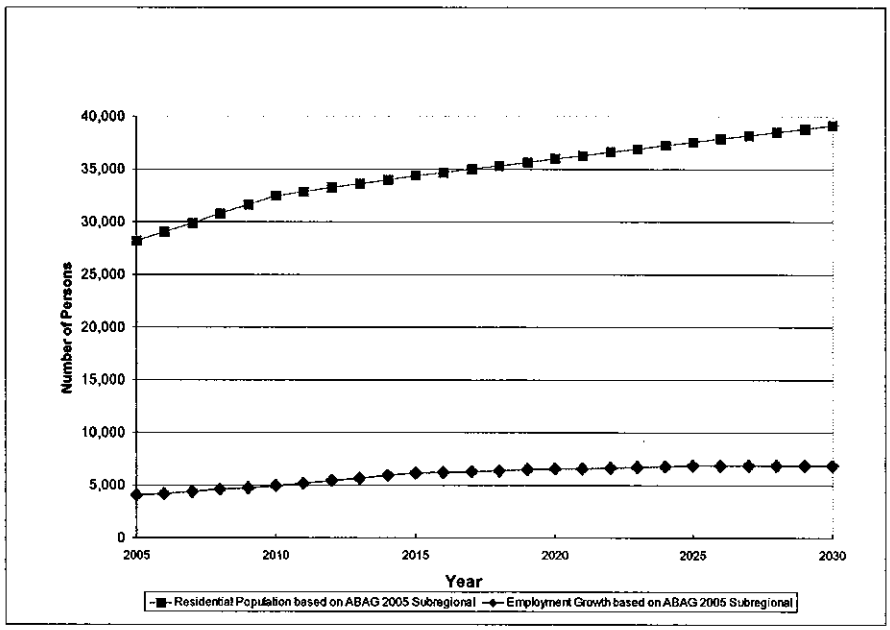


Figure 3: SSWA Population and Employment Projections

2.3 Land Use and Employment

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.

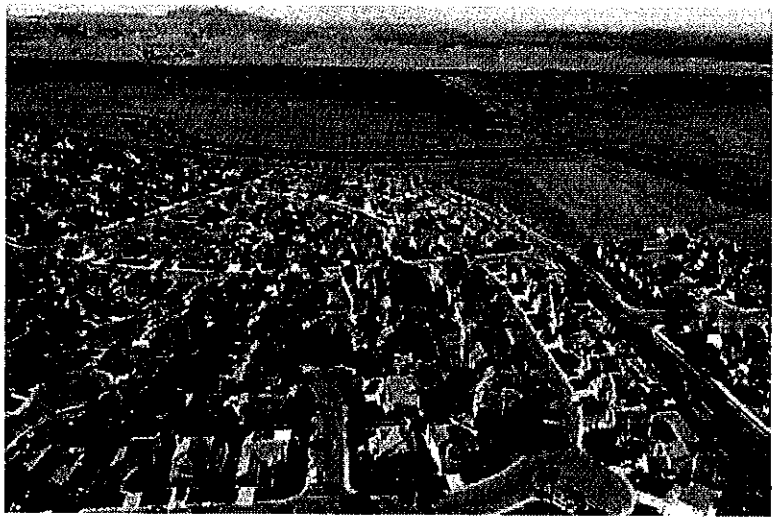


Photo courtesy of Department of Water Resources

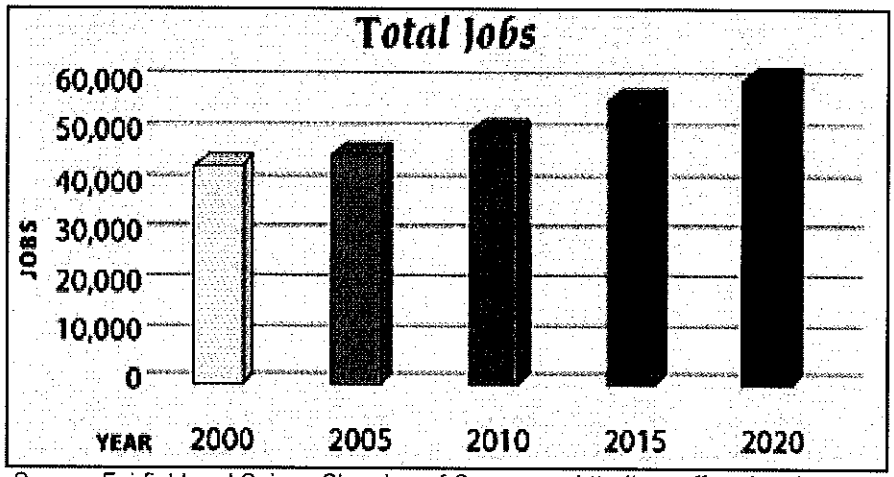
The primary land uses in the developed portions of the city of Suisun are residential and commercial. The distribution of land uses in the general plan is 2350 acres (77.8%) residential, 515 acres (17.1%) commercial/industrial, and 155 acres (5.1%) public. (City of Suisun City, 1992.)

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

	Suisun City **
Size (sq. miles)	4.0
Population (2004)	27,794
Population Growth per year	1.2% (90-04)
Median Age	31.2 (2004)
Median Income (2004)	$67,857
Employed Residents	13,500 (2005)
Population with High School Diploma or higher	85.5%
Population with College Degree	28.5%
Crime Rate (2003) per 1000 residents	26

** Source - 2000 Census, ABAG Projections 2002, 2004 DOF Estimates, EDD*
*** Source - DOF Estimates, MapInfo Corp.*

According to the Association of Bay Area Governments (ABAG) Projections 2002, Solano County is currently the fastest growing county in the Bay Area and is expected to experience the largest percentage increases in job growth over the next 20 years. Retail employment is expected to increase 42 percent between 2000 and 2020. Manufacturing and wholesale trade employment is forecasted to increase by 75 percent between 2000 and 2020. Service employment is expected to increase about 70 percent over the same period.



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

Suisun City built a Class A office and retail complex on the North Basin site. The first phase, One Harbor Plaza, consists of a three-story 62,000 square foot building which draws hundreds of people to Suisun City's waterfront each day. Phase II will add another 62,000 square foot building. One Harbor Plaza offers a desirable working environment for administrative and professional personnel in Solano County.

The City of Suisun has many planned developments identified on their current development plans. The planned developments are composed of residential, non-residential, and/or open space land uses.

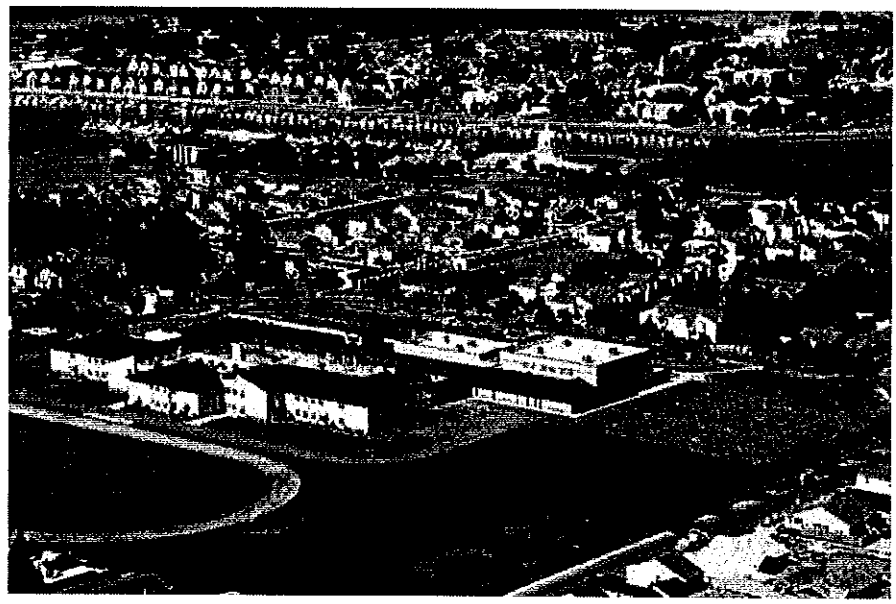
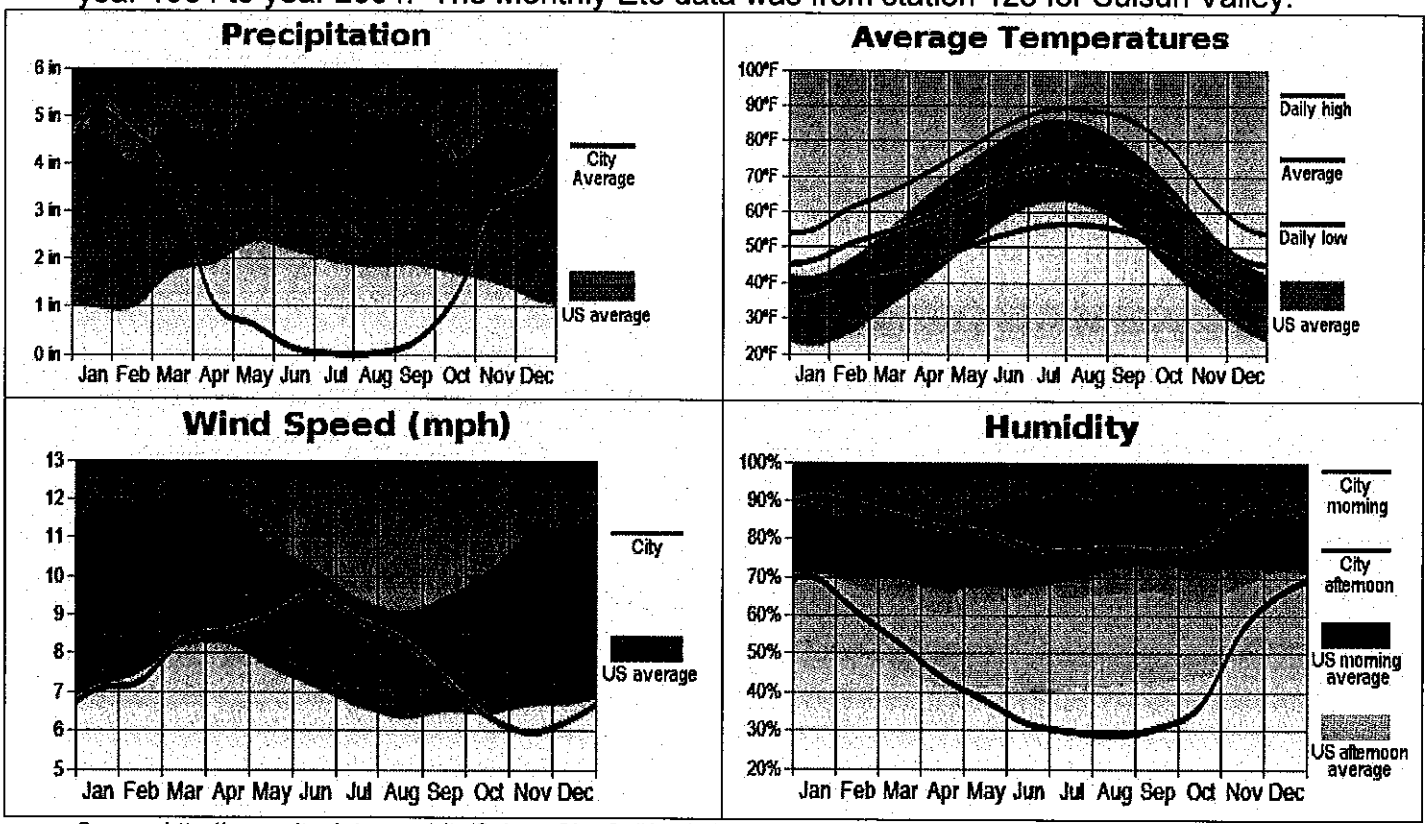


Photo courtesy of Department of Water Resources

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 Suisun-Solano. National Weather Service Western Regional Climate Center year 1954 to year 2004. The Monthly Eto data was from station 123 for Suisun Valley.



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

Climate Characteristics (Table 3)

	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	60.3

2.5 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.

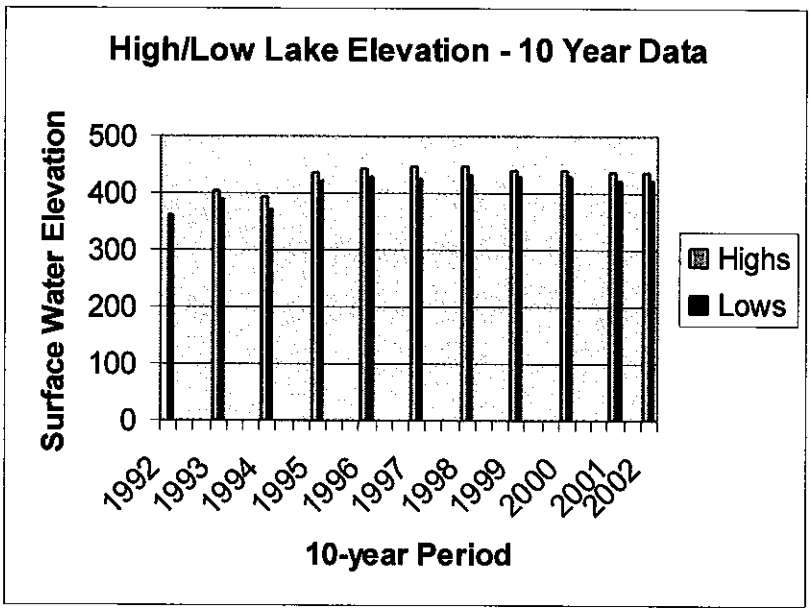
Monticello Dam and Lake Berryessa

The main water supply to SSWA is from Lake Berryessa (shown on **Figure 5**) 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 Suisun through Tolenas.

Source:http://www.usbr.gov/dataweb/html/solano.html

The **Figure 4** below shows the historical lake levels for this water source.

Figure 4: Historical Lake Berryessa Levels



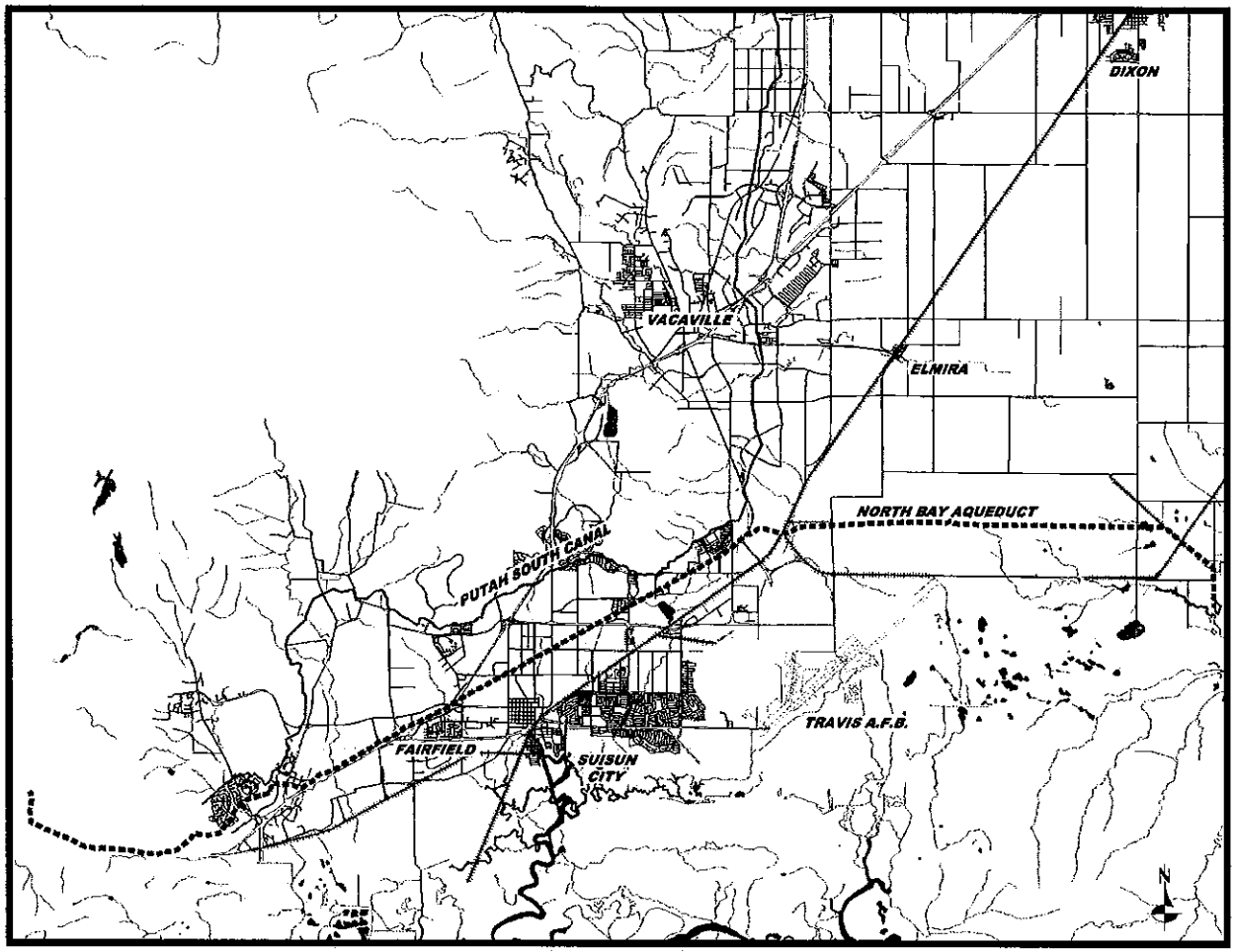


Figure 5: SSWA Water Sources

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, 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 acre feet 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.

CITY OF SUISUN was established in the 1850s as a focal point of commerce and transportation during California's Gold Rush. The City of Suisun has water rights for both the Solano Project and the State Water Project.

Historical water rights are provided in **Table 4a**.

Suisun Solano Annual Water Rights (Table 4a)

SOLANO PROJECT

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

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

STATE WATER PROJECT

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

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

State Water Project entitlement is from the North Bay Aqueduct. The State Water Project entitlement started in the year 2000 will continue to increase 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 2.14.

CONTRACT RESTRICTIONS

	AF	Source	Contract Restrictions
Urban AF/Yield (AF/Y)	M&I 1,600	USBR contract (SCWA) 1999	
	1,600	SCWA	Possible Shortage reductions
	Supplemental water purchased from SID. Annual Amount Varies. Must use 1,600 AF/Yr entitlement from USBR first.	SID (SCWA/USBR Water)	Possible Shortage reductions
	1,300	SWP (North Bay Aqueduct)	Started 1989, increases 50 AFY to 1,300

Source: Suisun Solano Water Authority Water Management Plan, April 2005

Historical water supplies are provided in **Table 4b**.

Historical Water Supplies (Table 4b)

	Supply (acre feet)							
Supply Source	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) Represent the water supplies to delivered to SSWA by Suisun City under the Solano Project Entitlement. Suisun City's SSWA's Bureau entitlement is 1,600 af each year. SSWA does have an entitlement from the SWP of 550 AF of each year 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 turned over to the City 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.

As shown in **Table 4b**, approximately 63 percent of SSWA's water supply for the period 1999 through 2004 came from imported water purchased from SID. This period is indicative of historical water supply for SSWA.

All urban customers are served on-demand from two water treatment plants:
(1) Cement Hill Water Treatment Plant (4.6 MGD constructed in 1978-79 and then upgraded to an additional 5.4 MGD in 1992-93)* and the
(2) Gregory Hill Water Treatment Plant (0.56 MGD installed in 1961-62) is not functional.* Design and construction of a new Gregory Hill WTP is proposed on the capital improvement plan as the extra capacity might be needed in as little as two years, depending on rates of development.
**Information about water treatment plants taken from 2002 SSWA Water Inventory Update*

Future water supplies include the aforementioned sources. Planned water supplies are provided in **Table 4c**.

Current and Planned Water Supplies (Table 4c)

	Current and Planned Water Supplies (afy)					
Supply Source	2005	2010	2015	2020	2025	2030
Federal Urban Water City of Suisun	1,600	1,600	1,600	1,600	1,600	1,600
USBR/SID	3,441	4,110	4,505	4,723	4,928	5,099
Supplier produced groundwater	0	0	0	0	0	0
Supplier surface diversion	0	0	0	0	0	0
Transfers in or out	0	0	0	0	0	0
Exchanges in or out	0	0	0	0	0	0
Recycled Water[(a)]	0	0	0	0	0	0
Desalination[(b)]	0	0	0	0	0	0
Total	5,041	5,710	6,105	6,323	6,528	6,699

(a) No intended plans for Recycled water system
(b) No intended plans for a Seawater Desalination Facility

Groundwater Pumping Rights (Table 5)

Basin Name	Pumping Rights (afy)
Solano Sub-basin	Not Applicable – Basin not adjuncted or overdrafted

There is one Suisun City groundwater well that was listed in the 2000 Urban Water Management Plan. This well is located in Suisun Valley, near Mankas Corner that had a production capacity of 275gpm or 443 acre-feet per year. This is a working well, however it is not connected to the SSWA system and not in use. As of 2004, Suisun City does not use any groundwater in their system.

The Solano Sub-basin has not been identified to be currently overdrafted, nor is it projected to be overdrafted in the near future. The Solano Sub-basin 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.

Historical Groundwater Pumped (Table 6)

Basin Name	2000	2001	2002	2003	2004
Solano Subbasin	87	9	0	0	0
% of Total Water Supply	2.0%	0.2%	0.0%	0.0%	0.0%

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

Projected Groundwater Pumping (Table 7)

Basin Name	2005	2010	2015	2020	2025	2030
Solano Subbasin	0	0	0	0	0	0
% of Total Water Supply	0	0	0	0	0	0

2.6 Reliability of Supply

The water supply reliability for SSWA is directly related to the Solano Project and State Water Project reliability. The Solano County Water Agency conducted a study on the reliability of these two sources. The following is an excerpt from the Solano County Water Agency 2005 UWMP.

Solano County Water Agency

"To date, there are only two water supply sources of SCWA: the USBR Solano Project and the California Department of Water Resources (DWR) State Water Project (SWP). SCWA does not provide groundwater supplies nor does it provide any other water supplies beyond the two wholesale sources.