

# **APPENDIX K**

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## **WATER SUPPLY ASSESSMENT**

Greenbriar Development Project  
Sacramento, California  
**SB 610 Water Supply Assessment**



Prepared for:  
City of Sacramento  
Environmental Planning Services



July 2006

**EDAW**

Greenbriar Development Project  
Sacramento, California  
**SB 610 Water Supply Assessment**



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# 1 EXECUTIVE SUMMARY

A water supply assessment (WSA) was prepared pursuant to Senate Bill 610 (SB 610 Water Code, Section 10910 et. seq., Chapter 643, statutes of 2001) for the proposed Greenbriar development project in Sacramento County. The Greenbriar site is located adjacent to and west of the City of Sacramento (City) City limits and outside of the City's Sphere of Influence (SOI); as such the project applicant is seeking to annex the project site to the City. The Greenbriar project is a proposed residential development centered on a common water feature including a total of 3,473 housing units and approximately 28 acres of retail and commercial space.

The water supply for Greenbriar would come from the City's water rights and a 1957 settlement contract with the United States Bureau of Reclamation (USBR). Under the contract, the City is entitled to divert up to 326,800 acre-feet per year (AFY) in 2030. As a signatory of the Water Forum Agreement (WFA), the City has agreed to limitations on diversions from the American River during certain specified conditions. During the conference year scenario, analogous to extremely dry years, the WFA limits annual withdrawal from the American River to 50,000 AFY. However, the WFA does not limit withdrawal from the Sacramento River; therefore, entitled American River water may be diverted further downstream at the Sacramento River Water Treatment Plant (WTP) below the confluence of the American and Sacramento Rivers. The resulting annual limitation is a function of the annual treatment plant capacity at the Sacramento River WTP, resulting in a total supply of 230,000 AFY, a maximum daily supply of 260 mgd. The total supply during the conference year scenario can meet the anticipated annual water demand through buildout of the City's SOI (2030).

During conference years when low flow conditions occur, the WFA limits the diversion rate from the American River to 155 cubic feet per second (cfs) during June through August when the peak demand occurs. Assuming treatment at the reduced diversion rate from the American River and maximum treatment at the Sacramento River WTP, the total surface water supply available to the City of Sacramento is 260 mgd. The projected maximum day demand within the City of Sacramento would exceed 260 mgd in 2015 by 4.6 mgd. However, groundwater sources supply 30 mgd in addition to available surface water supplies and would ensure maximum day demand in dry years is met through 2030. The additional demand from the proposed project would not significantly alter this timeline. The City is already undertaking studies to evaluate an additional Sacramento River diversion and treatment facility. While the City has sufficient water supplies through 2030, continued efforts to secure additional treatment capacity on the Sacramento River would ensure that the City has sufficient time to provide reliable delivery of water for the proposed project and future demand past 2030.

This WSA finds:

- ▶ The City has sufficient water to serve the proposed project and projected future demands over the next twenty years.
- ▶ Under normal water years, the City has sufficient capacity within its WTPs to serve the proposed project and projected future demands over the next twenty years.
- ▶ During conference years the City has sufficient supply to serve the average daily demands of the proposed project and projected future demands if the WTPs operate at maximum production capacity.
- ▶ During conference years, under a peak demand scenario, the City's peak demands would exceed available capacity of the WTPs by the year 2015 due to limitations in the summer months of the production capacity of the City's WTPs,
- ▶ Available groundwater supply (30 mgd) would provide additional supply to meet peak demands during conference years.

## 2 INTRODUCTION

This report presents the WSA prepared pursuant to Senate Bill 610 (SB 610 Water Code, Section 10910 et. seq., Chapter 643, statutes of 2001) for the proposed Greenbriar development project in Sacramento County. The Greenbriar site is located adjacent and west of the City of Sacramento (City) limits and outside of the City's Sphere of Influence (SOI); as such the project applicant is seeking to annex the project site to the City. Annexation will require approval of pre-zoning entitlements from the City, approval of an amendment to the City's SOI and annexation approval from the Sacramento County Local Formation Commission (LAFCo). The Greenbriar development is a residential development centered on a common water feature with a total of 3,473 housing units and approximately 28 acres of retail and commercial space.

The City is proceeding with environmental review of the project in conformance with the requirements of the California Environmental Quality Act (CEQA). The environmental review for the proposed project includes an assessment of the available water supply to serve the project, and a WSA is required under SB 610. Greenbriar would be annexed to the City and would be the water supplier. The City, as the water supplier is required to make a determination through the WSA whether sufficient water supplies are available to meet project demands under normal, single-dry, and multiple-dry water years over a 20-year planning horizon. Assuming that the WSA makes this determination, the City would adopt the WSA as part of the CEQA documentation prepared for the project.

### 2.1 SENATE BILL 610

SB 610 became effective January 1, 2002. The purpose of SB 610 is to strengthen the process by which local agencies determine the adequacy and sufficiency of current and future water supplies to meet current and future demands. SB 610 amended the California Public Resources Code to incorporate Water Code requirements within the CEQA process for certain types of projects. SB 610 also amended the Water Code to broaden the types of information included in Urban Water Management Plans (UWMP) (Water Code Section 10620 et. seq.).

#### 2.1.1 WATER CODE PART 2.10

Water Code Part 2.10 clarifies the roles and responsibilities of the Lead Agency under CEQA and the water supplier (i.e., public water system) with respect to describing current and future supplies compared to current and future demands, it defines the projects that are required to prepare a WSA, and the Lead Agency's responsibilities related to the WSA. A WSA is required for:

1. A proposed residential development of more than 500 dwelling units;
2. A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
3. A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
4. A proposed hotel or motel, or both, having more than 500 rooms;
5. A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
6. A mixed-use development that includes one or more of the uses described above;
7. A development that would demand an amount of water equivalent to or greater than the amount of water required by a 500-dwelling-unit project; and

8. For Lead Agencies with fewer than 5,000 water service connections, any new development that will increase the number of water service connections in the service area by 10% or more.

Under Part 2.10, the Lead Agency must identify the affected water supplier and ask the water supplier whether the new demands associated with the project are included in the suppliers' UWMP. If the UWMP includes the demands it may be incorporated by reference in the WSA (Water Code Section 10910[C][2]). If there is no public water system to serve the project, the Lead Agency must prepare the WSA itself. (Water Code Section 10910[b]).

## **2.2 THE URBAN WATER MANAGEMENT PLANNING ACT**

The Urban Water Management Planning Act requires a water supplier to document water supplies available during normal, single dry, and multiple dry water years during a 20-year projection and the existing and projected future water demand during a 20-year projection. The act requires that the projected supplies and demands be presented in 5-year increments for the 20-year projection (Water Code Section 10631).

# **3 GREENBRIAR DEVELOPMENT PROJECT**

## **3.1 PROJECT LOCATION**

The Greenbriar project site encompasses 577 acres located at the northwest intersection of State Route 99 (SR 99) and Interstate 5 (I-5) in Sacramento County. The project site is located in the unincorporated portion of Sacramento County, adjacent to and west of the City of Sacramento (City). The project site is located outside the current SOI for the City of Sacramento (Exhibit 1).

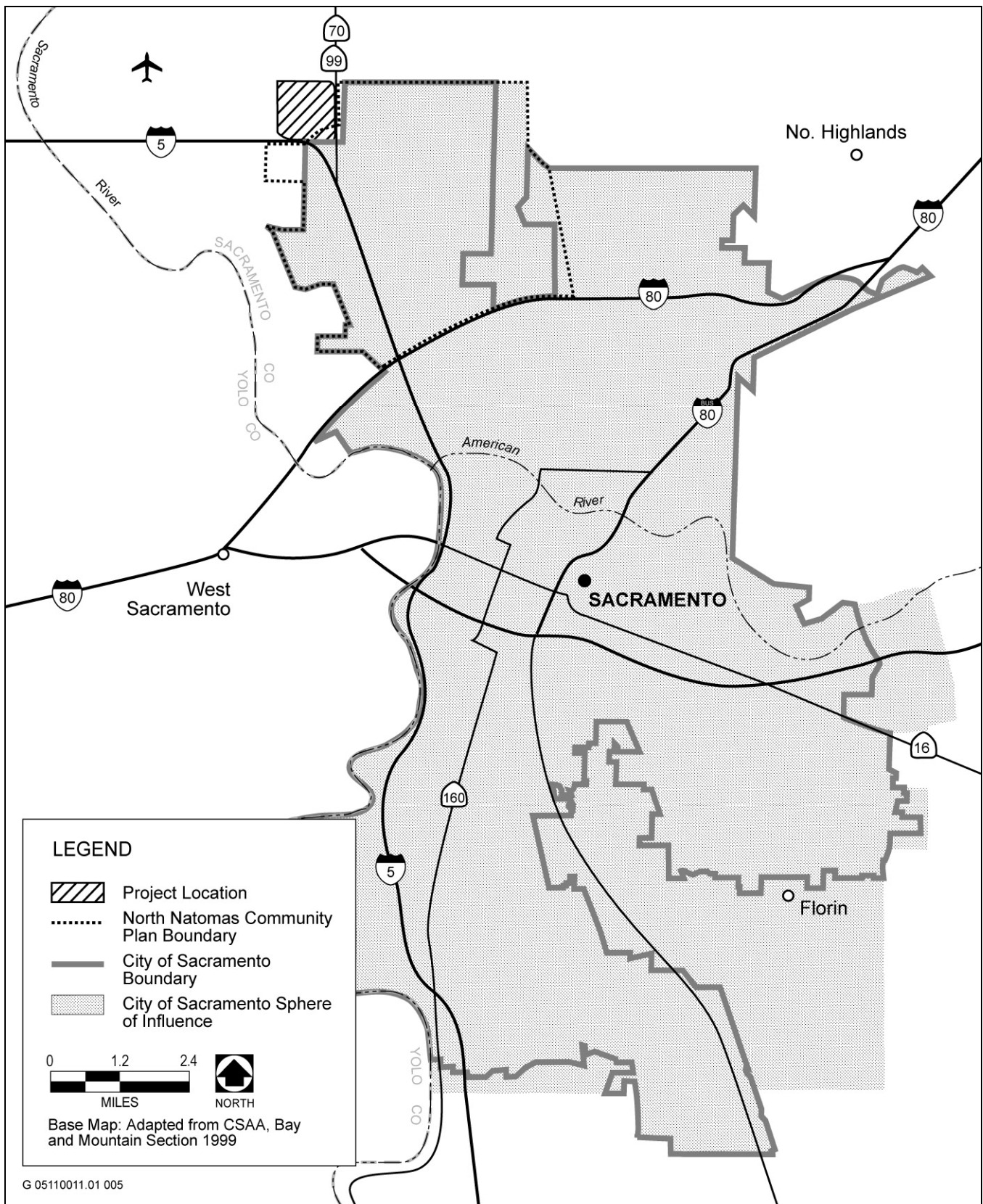
The project site is bordered by agricultural and rural residential land uses to the west and north, I-5 and agricultural lands to the south, and SR 99 and a new residential community currently under development within North Natomas to the east. The recently approved Metro Airpark development area is located adjacent to the western boundary of the project site, within Sacramento County and adjacent to the eastern boundary of the Sacramento International Airport. The Metro Airpark development area includes existing and proposed commercial, hotel, and recreational (i.e., golf course) land uses. The City's North Natomas Community Plan area is located adjacent to the eastern boundary of the project site and across SR 99.

## **3.2 EXISTING LAND USE**

The project site is currently undeveloped, fallow, and active farmlands. All farmlands on the property are irrigated with local groundwater wells. Existing water demands are limited to the water demands necessary for cross cultivating the property. Historic groundwater pumping volumes from the site are not available. There is currently no infrastructure on the property to deliver water to the property via the City's public water system.

## **3.3 PROPOSED DEVELOPMENT**

The City is considering approval of a residential mixed-use development at the project site. The project includes the construction of a range of housing types (e.g., high, medium, low density) that would be located within close proximity to public transportation systems. The proposed land use plan is predominantly a residential development centered on a common water feature (approximately 39 acres) (Exhibit 2). A total of 3,473 housing units and approximately 28 acres of retail and commercial space would be provided on site. A 10-acre (net) elementary school would be provided in the southeastern portion of the project site and would serve the school demands of the project site. A total of 8 neighborhood parks (approximately 49 acres) would be provided throughout the community and would be connected by the central lake/detention basin and pedestrian paths and trails.



Source: EDAW 2005

**Project Location Map**

**Exhibit 1**





Source: EDAW 2005

## Aerial Map of the Project

## Exhibit 2

### 3.4 WATER SUPPLY PLANNING FOR THE GREENBRIAR DEVELOPMENT PROJECT

The City’s 2000 UWMP does not incorporate water demands for Greenbriar because Greenbriar is not currently located within the City’s SOI. The City is currently in the process of preparing its 2005 UWMP, which would include demands associated with the Greenbriar project. Because the 2005 UWMP is not complete, this WSA uses the information provided in the 2000 UWMP as well as information provided by the City. Because the City’s service area and water demands have grown since the 2000 UWMP was prepared and adopted, the City provided additional information related to this growth including updated water demand data. The 2000 UWMP and updated information provided by the City are the most recent and best information available addressing existing and future water demands, supplies, and facilities within the City of Sacramento.

The City is a signatory to the Water Forum Agreement (WFA). The WFA is a plan that provides for the effective long-term management of the Sacramento region’s water resources. The WFA was developed by a diverse group of stakeholders known as the Water Forum, which consisted of water agencies, business groups, agricultural interests, environmentalists, citizen groups, and local governments and was formulated based on the two coequal objectives: 1) provide a reliable and safe water supply for the region’s economic health and planned development through the year 2030; and 2) preserve the fishery, wildlife, recreational, and aesthetic values of the Lower American River.

As a signatory party to the WFA, the City has agreed to withdrawal limitations from the American River. These limitations have been and will continue to be incorporated into water supply planning for future development in the City limits, including the Greenbriar development and are described in greater detail in Section 4.4, “Supply Reliability Analysis.”

### 3.5 EXISTING AND PROJECTED GREENBRIAR PROJECT WATER DEMANDS

Average daily water demand for the proposed Greenbriar development was calculated to be approximately 2.39 million gallons per day (mgd), or 2,680 acre-feet (AF) per year at full project build out (Table 1) (Wood Rodgers 2005). Maximum daily demand (MDD) is estimated to be 4.3 mgd. The MDD was determined by applying a factor of 1.8 to the Average Daily Demand (ADD) estimates. Buildout of the project is expected to be complete approximately 5–10 years after construction begins.

Land Use Designation	Water Demand Projections for Greenbriar						
	Total		ADD Unit Water Demand		Demand		
	Acres <sup>1</sup> (net)	Dwelling Units	gpm/ac	gpm/du	Average Daily		Average Annual (AF)
				gpm	mgd		
Low Density Residential	81	671	—	0.44	295	0.42	476
Medium Density Residential	145	2,215	—	0.44	975	1.40	1,573
High Density Residential	30	587	2.48	—	74	0.11	119
Commercial	28	—	1.86	—	52	0.07	84
Parks/Landscape	51	—	2.6	—	133	0.19	215
Schools	10	—	1.55	—	16	0.02	26
<b>Subtotal</b>	<b>345</b>	<b>3,473</b>	—	—	<b>1,545</b>	<b>2.22</b>	<b>2,493</b>
<b>7.5% System Losses</b>	—	—	—	—	<b>116</b>	<b>0.17</b>	<b>187</b>
<b>Totals</b>	—	—	—	—	<b>1,661</b>	<b>2.39</b>	<b>2,680</b>

Notes: gpm = gallons per minute, mgd = million gallons per day  
<sup>1</sup> Net acreage does not include street right of way.  
 Source: Wood Rodgers 2005

### 3.6 EXISTING AND PROJECT WATER DEMANDS FOR THE CITY OF SACRAMENTO

The City’s historical surface and groundwater deliveries for the last five years are shown in Table 2. The total water supplied by the City from June 2003 to July 2004 was 143,784 AF. Over the past seven years, 17% of the delivered water has been supplied from groundwater (i.e., average of 20,454 AFY).

Year	Surface Water			Groundwater	Total Water Delivered		
	Annual Surface Water Delivered (AFY)	Maximum Day Water Delivered (mgd)	Maximum Day to Average Day Ratio	Annual Groundwater Delivered (AFY)	Total Annual Water Delivered (AFY)	Average (mgd)	Percent Increase
1997–98	92,031	191	1.71	22,053	114,034	99.9	—
1998–99	102,180	213	1.58	24,630	126,810	111.1	11.15
1999–00	112,547	220	1.61	24,149	136,696	119.8	7.8
2000–01	114,172	213	2.10	23,578	137,750	122.7	0.77
2001–02	113,979	215	1.57	24,271	138,250	123.41	0.36
2002–03	111,539	227	2.35	23,997	135,536	120.7	-1.96
2003–04	128,412	223	2.33	15,372	143,784	128.31	6.09
2004–05	116,305	—	—	19,271	135,576	120.7	-5.71
<i>Average</i>	<i>111,396</i>	<i>214.57</i>	<i>1.89</i>	<i>22,165</i>	<i>133,561</i>	<i>117.09</i>	<i>2.64</i>

Source: City of Sacramento 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005

The City has identified current and future water demands through buildout of their service area. The demand analysis includes projects that have been recently approved but not fully constructed as well as projects that have pending development applications with the City and are within the City’s SOI. Table 3 presents the City’s projected demands through build out (2030). Average annual demands are presented to determine whether or not the City has adequate water supply to meet its demands. Peak or maximum day demand estimates are presented to determine if the WTPs have adequate capacity to handle peak day demands.

Area	Annual Demand (AFY)	Annual Demand (mgd)	Maximum Day Demand (mgd)
Development within Existing City Limits	193,497	139	250.2
SMUD Cogeneration Facility	622	0.56	1.0
Panhandle Annexation <sup>a</sup>	4,199 <sup>d</sup>	3.00	5.4
Airport/Metro Air Park Wholesale Wheeling Assessment	6,538	6.50	11.7
SSWD Wholesale <sup>b,c</sup>	26,064	16.67	30.0
Cal Am Parkway Wholesale Agreement	2,580	0.61	1.1
Zone 40 Wheeling Service	10,000	6.11	11.0
<b>Total</b>	<b>243,500</b>	<b>172</b>	<b>310</b>

Notes: <sup>a</sup> This includes the demands within the County's Northgate system and the proposed Panhandle development. <sup>b</sup> SSWD does not take City wholesale water during times of Hodge restrictions. <sup>c</sup> SSWD has the option to contract for up to 10 mgd of additional firm or non-firm capacity in addition to the 20 mgd of firm capacity under the Wholesale Agreement. <sup>d</sup> Assumes a conservation rate of 7.5%.

Source: Peifer, pers. comm., 2005

The City's projected water demands in 2030 were estimated to be 243,500 AFY with a average daily demand of 172 mgd and a maximum day demand of 310 mgd.

The 2030 projected water demands do not include the increased demand associated with the Greenbriar project. Therefore, the project would increase the City's 2030 water demands by 2,680 AFY, or approximately 1.4 % of the projected 2030 demand. The City's total 2030 water demands with the project would be 195,818 AFY with a projected average daily demand of 174.8 and a maximum day demand of 314.7 mgd.

## **4 WATER SUPPLY ASSESSMENT FOR THE GREENBRIAR PROJECT**

### **4.1 INTRODUCTION**

#### **4.1.1 RESPONSIBILITIES OF THE LEAD AGENCY**

The City of Sacramento is the CEQA Lead Agency responsible for evaluating the environmental impacts of the project in compliance with CEQA, certifying the EIR, and issuing the associated entitlements.

The City would be the retail water provider for the project and would be the agency responsible for preparation and approval of the WSA. In preparing the WSA, The City must do the following:

- ▶ Determine the sufficiency of the supply to meet the project demands under normal, single dry and multiple dry years over a 20-year projection.
- ▶ Identify existing water supply entitlements and water rights for the proposed project and quantify water received in prior years pursuant to these existing entitlements and rights.
- ▶ Describe the groundwater basin from which the proposed project will be supplied, if applicable. The description must include information regarding overdraft in the basin. The amount and location of groundwater pumped by the City must be quantified, based on reasonably available information.
- ▶ Describe and analyze the amount and location of groundwater projected to be pumped by the City from the basin from which the project will be supplied. The assessment must include an analysis of the sufficiency of groundwater from the basin to meet the projected water demand associated with the proposed project.
- ▶ Provide information related to capital outlay programs for financing delivery of water supply.
- ▶ Provide information on federal, state, and local permits for construction of necessary infrastructure and regulatory requirements associated with delivery of the water supply.

### **4.2 REQUIREMENTS OF THE WSA**

SB 610, as described in California Water Code Sections 10910–10915 requires that a WSA for a project include the following information:

- ▶ A description and quantification of the existing and planned water sources.
- ▶ A description of the reliability and vulnerability of the water supply to seasonal or climatic shortages in the average water year, single dry water year, and multiple dry water year during a 20-year projection.
- ▶ Contingency plans including demand management and conjunctive use potential.

- ▶ A description of current and projected water demands.
- ▶ A description of all water supply projects and water supply programs that may be undertaken by the City to meet the total projected water use.

In addition, because the City uses groundwater as one of its supply sources, the WSA should include:

- ▶ A description of any groundwater basin (or basins) from which the City pumps groundwater.
- ▶ Information that characterizes the condition of the groundwater basin and a description of the measures currently being taken by the City to minimize any potential for overdraft conditions to occur.
- ▶ A detailed description and analysis of the amount and location of groundwater pumped by the City for the past five years from any groundwater basin from which the proposed project will be supplied.
- ▶ An analysis of the location, amount, and sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.

The following analysis presents the WSA for the Greenbriar project in compliance with the requirements of SB 610.

### **4.3 COMPLIANCE WITH PROVISIONS OF THE WATER CODE**

#### **4.3.1 DETERMINE WHETHER PROJECT IS SUBJECT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) [WATER CODE SECTION 10910(A)]**

The City has made the determination that the Greenbriar project is subject to CEQA and is a “project” as defined by Water Code Section 10912(a) because it would result in the construction of greater than 500 dwelling units, as well as commercial and retail office space. All criteria for projects requiring a WSA apply to the project.

#### **4.3.2 IDENTIFY THE PUBLIC WATER SYSTEM THAT WILL SUPPLY WATER FOR THE PROJECT [WATER CODE SECTION 10910(B)]**

The property where the proposed Greenbriar project would be located would be annexed to the City and served by the City’s Utilities Department. The Utilities Department is a public water agency that served 131,745 connections as of June 2004. The City operates two water treatment plants (WTP). The Sacramento River WTP is located on the east bank of the Sacramento River, about one half mile downstream of the confluence of the American and Sacramento Rivers and the E.A. Fairbairn WTP (formally American River WTP) is located adjacent to the American River between the H Street and Howe Avenue bridges, approximately seven miles upstream of the confluence of the American and Sacramento Rivers. The city has 34 municipal drinking water wells; of these 23 are active and nine are on standby (Sherry, pers. comm., 2005).

#### **4.3.3 IS THERE AN ADOPTED URBAN WATER MANAGEMENT PLAN (UWMP) [WATER CODE SECTION 10910(C)]**

As described above, the City completed and adopted its 2000 UWMP (City of Sacramento 2001). Because the Greenbriar development is not currently within the City limits, the plan does not incorporate demands associated with the Greenbriar project. The City is currently preparing its 2005 UWMP, which would address water demands associated with Greenbriar. This document is anticipated to be adopted in early 2006. Because the 2005 UWMP is

not complete, this WSA relies on the information provided in the 2000 UWMP and other relevant water supply information provided by the City including, water demand data, and existing operational constraints.

#### **4.3.4 ARE THE PROJECTED WATER DEMANDS ASSOCIATED WITH THE PROPOSED PROJECT ACCOUNTED FOR IN THE MOST RECENTLY ADOPTED URBAN WATER MANAGEMENT PLAN [WATER CODE SECTION 10910(C)]**

The most recently adopted UWMP (City of Sacramento 2001) does not account for projected water demands associated with the proposed Greenbriar project because the Greenbriar property was not within the City of Sacramento’s sphere of influence (SOI) or under their planning jurisdiction at the time of preparation.

#### **4.3.5 IDENTIFY EXISTING WATER SUPPLIES FOR THE PROJECT [WATER CODE SECTION 10910(D)]**

Water Code Section 10910(d)(1) requires identification of existing water supply entitlements, water rights, or water service contracts relevant to the Greenbriar project and a description of the quantities of water obtained by the City pursuant to these water supply entitlements, water rights, or water service contracts in previous years.

The City would be the retail water purveyor for the project. The water supplies for the project have been addressed in existing City water supply plans and agreements including:

- ▶ *Water Forum Agreement* (City-County Office of Metropolitan Water Supply Planning)
- ▶ *2000 Urban Water Management Plan* (City of Sacramento 2001)

#### **CITY OF SACRAMENTO SURFACE WATER SUPPLIES**

The City has a permanent water right settlement contract with the USBR that limits the City’s annual surface water diversion to 81,800 AF from the Sacramento River, and 245,000 AF from the American River. The maximum total combined water supply from both the Sacramento and American River by the year 2030 is 326,800 AF (Table 4). The projected incremental increases are shown in Table 4.

Source	2005	2010	2015	2020	2025	2030
American River	123,200	145,700	170,200	196,200	222,200	245,000
Sacramento River	81,800	81,800	81,800	81,800	81,800	81,800
Total	205,000	227,500	252,000	278,000	304,000	326,800

#### **Sacramento and American River Diversion Rights**

The City has used surface water since 1854 and claims pre-1914 rights to divert 75 cubic feet per second (cfs) from the Sacramento River. Currently, the City holds five water right permits: one for diversion of Sacramento River water and four for diversion of American River water. The Sacramento River permit, Permit 992, has a priority date of March 20, 1920. Permits 11358 through 11361, on the American River, have priorities ranging from October 1947 to September 1954. The water right permits are on file with the City of Sacramento Utilities Engineering Department.

The Sacramento River permit and two of the American River permits (11358 and 11361) authorize direct diversion. The other two permits (11359 and 11360) authorize rediversion and consumptive uses of American River tributary water stored and released at SMUD's Upper American River Project power development reservoirs. The reservoirs (Union Valley, Ice House, Rubicon, Rockbound, Loon Lake and Gerle) are located in the Crystal Basin area of the Sierra Nevada Mountains east of Sacramento and north of U.S. Highway 50.

In 1957, USBR and the City entered into a permanent water rights settlement contract which provides, among other things, that:

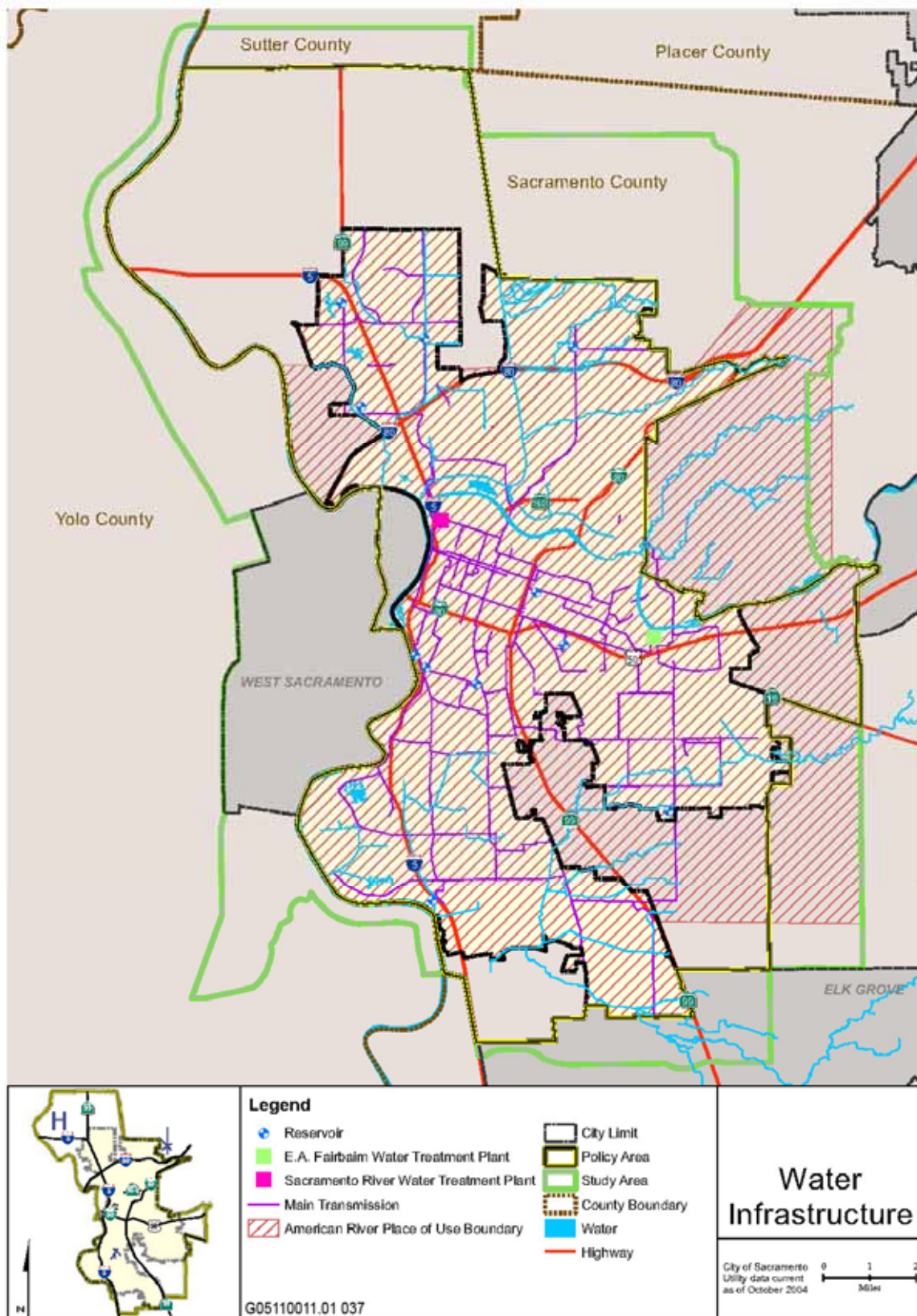
- ▶ USBR agreed to regulate flows at Folsom Reservoir to ensure the City's ability to divert up to 245,000 AFY under the City's American River water rights and to operate CVP reservoirs so that they do not interfere with the City's exercise of its Sacramento River water rights.
- The City agreed to:
  1. Limit its total diversion rates to 225 cfs of Sacramento River water and 675 cfs of American River water; and
  2. Limit its total diversion of Sacramento and American River water to 326,800 AFY (81,800 AF of Sacramento River water and 245,000 AF of American River water per year).
- The City is not required to take pro-rata reductions in dry years.

The City's water right permits allow authorized water diversions to be used within specified areas described as authorized places of use (POU). Permit 992 designates lands within the City of Sacramento as the authorized place of use. Permits 11358 and 11361 designate a 79,500 acre area within and adjacent to the City as the authorized POU. Permits 11359 and 11360 designate a 96,000-acre area within and adjacent to the City as the POU. Exhibit 3 illustrates the City's Water Service Area, showing the 96,000-acre authorized POU and current City limits. The Greenbriar project is adjacent to the City's POU, but will become part of the POU under Permit 992 if the area is annexed to the City.

As a signatory of the 2000 WFA, the City has agreed to reduce its diversions from the American River when flows are below Hodge flow criteria. Hodge flow criteria were defined as a result of *Environmental Defense Fund et al. v. East Bay Municipal Utility District (EBMUD)* which addressed the ability of EBMUD to divert water from the lower American River at the Folsom South Canal. Hodge flows are named after the judge presiding over the case and are minimum flow values in the Lower American River which must be met as a condition of EBMUD's diversion of contracted water. These flows are set at 2,000 cfs October 15–February; 3,000 cfs March–June; and 1,750 cfs July–October 14. The City agreed in the WFA to reduce its diversion from the American River during conference years and when flows bypassing the City's diversion are below the Hodge flow criteria. The City's authorized diversions with and without the WFA diversion restrictions are listed in Table 5. As shown in the table, under dry year conditions the City would not be subject to reductions in entitlement volumes only diversion rates.

**Water Code Section 10910(d)(2)(A) requires information related to written contracts or other proof of entitlements to the water supplies identified to serve the project.**

As described above, the City has existing surface water entitlements and maintains active groundwater wells which would supply the proposed project. At build-out in 2030, the USBR contract provides the City with a maximum annual diversion of 326,800 AFY. Copies of the City's permits and the USBR Contract are available for review at the City of Sacramento, Utilities Department.



Source: City of Sacramento 2005

## Water Infrastructure

## Exhibit 3



<b>Table 5 City of Sacramento Surface Water Entitlements with Water Forum Agreement</b>			
Permit	Authorized Diversion	Maximum Permitted Diversion	
		AFY	cfs
1957 USBR 2030 Contractual Maximum <sup>a</sup>	American River	245,000	675
	Sacramento River	81,800	225
	<b>Total Combined Diversion</b>	<b>326,800</b>	<b>900</b>
2000 WFA Maximum	American River	245,000	310 <sup>b</sup>
	Sacramento River	81,800	290 <sup>c</sup>
	<b>Total Combined Diversion</b>	<b>326,800</b>	<b>900</b>
Notes:			
<sup>a</sup> Based on permits 00922, 011358, 011359, 011360, and 011361.			
<sup>b</sup> 310 cfs is a maximum withdrawal rate, additional restrictions apply.			
<sup>c</sup> There is no maximum withdrawal rate from the Sacramento River in the WFA. However, the total maximum withdrawal rate from the American and Sacramento rivers can not exceed 900 cfs. The Sacramento WTP is below the confluence the American and Sacramento Rivers.			
Sources: City of Sacramento and Sacramento City-County Office of Metropolitan Water Planning			

**Water Code Section 10910(d)(2)(B) requires information related to copies of the capital outlay program for financing the delivery of the identified water supply.**

The infrastructure necessary to deliver water to the project site would be funded from the 2005–2010 Capital Improvement Program (CIP). A copy of the CIP is available for viewing at City of Sacramento Utilities Department. In summary, the 2005-2010 CIP totals \$366.8 million from all funding sources. The General Fund portion of the five-year program is \$12.4 million or 3% of the total. The first year of the CIP, the FY2005/06 CIP Budget totals \$105.4 million. These appropriations will add to currently active project appropriations of approximately \$1 billion. Expenditures are planned in the following major program areas: General Government; Public Safety; Convention, Culture and Leisure; Parks and Recreation; Transportation and Utilities. The bulk of the project budgets are for Utilities and Transportation projects supported by the Water, Sewer, Drainage, Measure A Sales Tax, Gas Tax, and Major Street Construction Funds.

The project would connect into the City’s existing water distribution network. No new water treatment or diversion structures would be required to serve the project. The project includes the preparation of the Greenbriar Finance Plan. A summary of the Greenbriar Finance Plan is provided in Appendix C of the Greenbriar EIR. This plan would ensure the project applicants pay their fair share portion of necessary infrastructure costs (e.g., water supply infrastructure) necessary for delivering water to the project.

**Water Code Section 10910(d)(2)(C) requires information related to federal, state, and local permits for construction of infrastructure necessary for delivering the water supply.**

As described above the City has sufficient water rights and entitlements to meet existing and future water demands within City over a 20-year period. All water supply infrastructure necessary to meet existing demands is constructed and all necessary approvals for the delivery and use of this water within City have been secured.

The City is pursuing construction of a new water treatment plant along the Sacramento River near Elverta Road (northeast of the project site). This treatment plant would provide additional treatment capacity to ensure the

provision of water to City customers beyond 2025. Permits and authorizations that may be required for construction of the new water treatment plant are listed below in Table 6.

<b>Table 6</b>		
<b>Possible Required Permits and Authorizations for Water Supply Infrastructure</b>		
Federal	State	Local
U.S. Army Corps of Engineers – Section 404 Permit	California Department of Fish and Game (DFG) - Streambed Alteration Agreement	Department of Health Services review and approval
U.S. Fish and Wildlife Service – Endangered Species Act Consultation	Regional Water Quality Control Board - Section 401 Water Quality Certification, National Pollutant Discharge Elimination System Construction Stormwater Permit	
U.S. Bureau of Reclamation – Review and approval	Sacramento Metropolitan Air Quality Management District – Authority to Construct	

The project would not require any additional water supply infrastructure above and beyond what is currently available or planned for by the City. The project would be required to extend water conveyance infrastructure to the site, which is being evaluated as part of the EIR. No additional permits are needed.

**Water Code Section 10910(d)(2)(D) requires information related to any regulatory approvals required for delivery of the water supply.**

No regulatory approvals would be required to deliver water to the Greenbriar project site. The City has secured all water supply entitlements and regulatory approvals necessary to distribute groundwater and surface water within its service area.

**4.3.6 IDENTIFY PARTIES DEPENDENT ON PROPOSED SUPPLY. [WATER CODE SECTION 10910(E)]**

The intent of this section is to identify any potential conflicts that may arise from the exercise of water supply entitlements, water rights, or water service contracts to serve a proposed project if such water supply entitlements, water rights, or water service contracts have not been previously exercised.

The proposed project would be served by the City through its existing water supply entitlements and groundwater supplies. The City’s surface water entitlements and contracts have all historically been exercised, and groundwater has been historically pumped. There are no unexercised water service contracts that will be used to serve the proposed project and therefore no potential conflicts would arise from supplying water to the proposed project.

**4.3.7 DOES THE SUPPLY INCLUDE GROUNDWATER AS A SOURCE? [WATER CODE SECTION 10910(F)]**

A portion of the water demand from the proposed project would be met with groundwater. Consequently, Section 10910(f) requires the following additional information.

**Water Code Section 10910(f)(1) requires a review of groundwater data contained in the UWMP.**

The City maintains 34 wells for potable and non-potable use. Of these wells, 32 potable wells are north of the American River, and two are south of the American River (Peifer, pers. comm., 2005). The current groundwater

system can supply 30 mgd and produce approximately 33,600 AFY. Historical average annual groundwater use for the period 1997-98 through 2003-04 was 20,454 AFY (Table 2).

**Water Code Section 10910(f)(2) requires a description of the groundwater basin and the efforts being taken to prevent long-term overdraft.**

The City is located in the 548-square mile North American Groundwater Subbasin (Department of Water Resources 2003). The Subbasin’s boundaries are the Feather and Sacramento Rivers on the west, the Bear River to the north, the American River on the south, and the Sierra Nevada on the east. The underlying geology of the basin consists of a variety of geologic formations that make up the water bearing units. There are two aquifer systems: an upper unconfined system consisting of the Victor, Fair Oaks, and Laguna Formations, and a lower, semi-confined system in the Mehrten Formation. These geologic formations are composed of lenses and layers of inter-bedded sand, silt, and clay with coarsegrained stream channel deposits. The groundwater contained in the upper aquifer system of the Victor, Fair Oaks and Laguna Formations is of superior quality compared to that in the lower semi-confined system, mainly because the water in the Mehrten Formation is higher in iron and manganese, and requires additional treatment. The upper unconfined system only requires chlorination treatment to be potable (Sacramento Groundwater Authority 2003).

The City is a member of the Sacramento Groundwater Authority (SGA). The SGA is a joint powers authority created in 1998 by a coordinated effort between the Sacramento Metropolitan Water Authority and the WFA to manage the region’s North Area Groundwater Basin, a sub-region of the North American Subbasin. The signatory participants are managing the basin in a cooperative fashion by allowing representatives from the local water purveyors, the agricultural community, and other groundwater pumpers to serve on the Board of the SGA. The goal of the SGA is the responsible management of the groundwater basin through a commitment to not exceed the negotiated sustainable yield of the basin, which is approximately 131,000 AFY according to the WFA. The SGA developed a Groundwater Management Plan (GMP) to ensure a safe, reliable water supply for the rapidly growing northern Sacramento County area. Within this program the SGA will continually assess the status of the groundwater basin and make appropriate management decisions to sustain the basin.

The City and other SGA members, in accordance with the WFA, have implemented a conjunctive use program to responsibly manage and use the groundwater system. The program accounts for the annual climatic variability of the region, whereby in normal or wet years of precipitation the water providers will divert more surface water and reduce or eliminate groundwater use, allowing the groundwater system to recharge. In dry years when Lower American River flows must be maintained, groundwater will be pumped and used to supplement the reduced diversions from the river systems (Sacramento Groundwater Authority 2003).

**Water Code Section 10910(f)(3) requires a description of the volume and geographic distribution of groundwater extractions from the basin for the last five years.**

The City’s historical average annual groundwater use for the period 1997-98 through 2003-04 was 20,454 AFY (Table 2). The City’s active municipal groundwater wells are located primarily in the northern areas of the City. Thirty-two of the wells are located north of the American River and the two wells are south of the river.

#### **4.4 SUPPLY RELIABILITY ANALYSIS**

The WFA is important to consider when discussing water supplies and reliability within the Sacramento region. The WFA is an agreement between multiple stakeholders of the Sacramento metropolitan area and lower foothill regions. After seven years of meetings, sub-committee negotiations and small group operations, the Water Forum members established a working agreement that provides water quality and reliability for all participants. The WFA’s coequal goals were to (1) provide a reliable and safe water supply for the region’s economic health and planned development through to the year 2030, and (2) preserve the fishery, wildlife, recreational and aesthetic values of the Lower American River (Sacramento City-County Office of Metropolitan Water Planning 2000).

From these coequal goals, the Water Forum signatories determined seven major elements that must be implemented during the next thirty years if the agreement is to be successful. The elements specific to water supply reliability include:

- ▶ Increased Surface Water Diversions,
- ▶ Actions to Meet Customers’ Needs While Reducing Diversion Impacts in Drier Years,
- ▶ Water Conservation,
- ▶ Groundwater Management and the Water Forum Successor Effort.

Each of these elements plays a vital role in the Water Forum’s coequal objectives. As a signatory of the WFA, the City’s Utilities department is actively participating in all seven elements.

The City is continuing to develop a water supply consistent with the WFA. Public Law 106-554 authorized the preparation of the Sacramento River Water Reliability Study, which includes a feasibility study for the construction of a second Sacramento River diversion. The Sacramento River Water Reliability Study includes development of water supply alternatives, an environmental evaluation, and consultation with federal and state agencies regarding potential impacts. The Draft Planning report is scheduled for review in early 2006.

The WFA places flow restrictions on diversions from the American River when flow is below the Hodge flows as defined in *Environmental Defense Fund et al. v. East Bay Municipal Utility District* (flow levels of 2,000 cfs from October 15 through February; 3,000 cfs from March through June; and 1,750 cfs from July to October 14). The City’s WFA diversion limits change seasonally and are listed in Table 7. Approximately 59% of the years will experience Hodge flow conditions during the peak months of June through August based on historic operations of Folsom Reservoir.

<b>Table 7</b>			
<b>Restricted American River Diversion Rates</b>			
Month	Diversion Limit <sup>a</sup>		
	cfs	AF	
January	120	7,400	
February	120	6,700	
March	120	7,400	
April	120	7,100	
May	120	7,400	
June	155	9,200	
July	155	9,500	
August	155	9,500	
September	120	7,100	
October	100	6,100	
November	100	6,000	
December	100	6,100	

Notes:  
<sup>a</sup> Restriction occurs when the flow passing the WTP is below the Hodge flow condition.  
 Source: Sacramento City-County Office of Metropolitan Water Planning 2000

The Sacramento River WTP has a capacity of 160 mgd (179,200 AFY). Fairbairn WTP has a treatment capacity of 200 mgd (224,000 AFY), equal to the maximum diversion rate allowed in the WFA. If both plants operated at their maximum production, the combined theoretical output would be approximately 360 mgd.

To account for future growth past 2030, and increased reliability, the City is evaluating the construction of a 145 mgd (225 cfs) WTP on the Sacramento River near Elverta Road, north of the Sacramento International Airport. The proposed water treatment plant is anticipated to be operational within the next 6 to 10 years. With the addition of the new Sacramento River WTP, the City’s combined maximum production would be 505 mgd (an additional 145 mgd) and the dry year or Hodge Flow conditions production would be 405 mgd (the 100 mgd reduction at the American River because of dry year conditions would result in an additional 45 mgd of treatment capacity). Maximum day production before and after completion of a 145 mgd Sacramento WTP is shown in Table 8.

<b>Table 8</b>			
<b>Maximum Day Production</b>			
Source	Production Limit with Flows Above Hodge Criteria (mgd)	Production Limit with Flows Below Hodge Criteria (mgd)	
Fairbairn WTP	200	100	
Sacramento WTP	160	160	
Groundwater	30	30	
<b>Total</b>	<b>390</b>	<b>290</b>	
New Sacramento WTP	145	145	
<b>Total with new WTP</b>	<b>535</b>	<b>435</b>	

Source: Sacramento City-County Office of Metropolitan Water Planning 2000

During years when the projected unimpaired inflow to Folsom Reservoir is less than 400,000 AF, the WFA limits all diversions from the American River to 50,000 AFY. The WFA has labeled the extremely low flow conditions as a “conference year” where signatories will meet to discuss water management strategies. A conference type year scenario has a 1.8% probability of occurring and did occur in 1924 and in 1977. The WFA does not restrict diversion of American River entitlements from a Sacramento River diversion point; therefore normal year and dry year supplies are identical for the City as shown in Table 9. However, annual surface water diversions are limited by the diversion capacity from the Sacramento River. Assuming 50,000 AFY from the Fairbairn WTP and a maximum production from the Sacramento WTP of 179,000 AFY, the current drought limiting scenario would allow for a theoretical maximum surface water production of 230,000 AFY.

<b>Table 9</b>				
<b>2005 Annual Surface Water Supplies During a Hypothetical Three Year Consecutive Conference Year Period (AFY)</b>				
Source	2005 City of Sacramento Surface Water Rights (AFY)	2005 to 2007 Dry Year Supply <sup>a</sup>		
		First Conference Year 2005 (AFY)	Second Conference Year 2006 (AFY)	Third Conference Year 2007 (AFY)
American River	123,200	50,000	50,000	50,000
American River diverted from Sacramento River	---	73,200	77,700	82,200
Sacramento River	81,800	81,800	81,800	81,800
<b>Total <sup>b</sup></b>	<b>205,000</b>	<b>205,000</b>	<b>209,500</b>	<b>214,000</b>

Notes:  
<sup>a</sup> Diversion capacity from Sacramento River is 180,000 AFY, allowing a drought year production of 230,000 AFY.  
<sup>b</sup> Total supply increases pursuant to USBR contract.  
Source: City of Sacramento

The theoretical maximum “conference year” production of 230,000 AFY over estimates the current drought year production, because the existing Sacramento WTP could not operate at maximum capacity of 160 mgd in the winter months. In the winter months, demand is less than the maximum treatment capacity of 160 mgd and no storage is available to store excess treated water. Therefore, the treatment plant would operate at maximum demand, which is some increment less than maximum capacity.

## COMPARISON OF AVAILABLE WATER SUPPLIES VERSUS DEMAND

### ANNUAL SUPPLY AND DEMAND

The City’s 2004 water demand of 143,764 AFY was below the current USBR contracted entitlements of 200,000 AFY. The City’s projected (2030) annual water demand remains approximately 59% of the USBR contracted annual entitlements. Water demands were estimated for the City from 2005 to 2030 by assuming a constant linear growth rate in water demands between 2005 and 2030 (Table 10). The project’s total demand of 2,680 AFY would result in an increase in total demand in 2030 equal to 195,818 AFY. The table shows that under normal year types, sufficient water supplies are available to meet the project and City projected future demands under a 25 year planning horizon.

	2005	2010	2015	2020	2025	2030
<b>Surface Water Supply</b>						
American River	123,200	145,700	170,200	196,200	222,200	245,000
Sacramento River	81,800	81,800	81,800	81,800	81,800	81,800
<b>Total Surface Water Supply</b>	<b>205,000</b>	<b>227,500</b>	<b>252,000</b>	<b>278,000</b>	<b>304,000</b>	<b>326,800</b>
Demand	161,342	167,714	174,073	180,432	186,791	193,138
Project Demand	0	2,680	2,680	2,680	2,680	2,680
<b>Total Demand</b>	<b>161,342</b>	<b>170,394</b>	<b>176,753</b>	<b>183,112</b>	<b>189,471</b>	<b>195,818</b>
<b>Additional Water Supply</b>	<b>43,658</b>	<b>57,106</b>	<b>75,247</b>	<b>94,888</b>	<b>114,529</b>	<b>130,982</b>

The WFA limits the driest year diversion to 50,000 AFY from the American River, but does not limit the diversion for the American River entitlement from the Sacramento River. Therefore, the City would not be subjected to reductions in contracted deliveries for single or multiple dry years. Annual supply is only limited by diversion and treatment capacity of the Sacramento River during dry year conditions. Current theoretical maximum production during the conference years is approximately 230,000 AFY. Table 11 shows a comparison of supply and demand during conference years. As shown in the table, at maximum production rates sufficient water is available to meet project demands during conference years (i.e., single dry and multiple dry years) in addition to existing and projected future demands over a 25-year planning period. In dry years, the City’s total water demands are reduced because the city does not supply water to Sacramento Suburban Water District (SSWD). However, because demand would not be equal to maximum production capacity and no storage is available, the conference year production estimate of 230,000 AFY may over estimate the current drought supply. Therefore, it is important that maximum day demand is also evaluated as described below.

<b>Table 11 Supply and Demand Comparison during Conference Years</b>						
	2005	2010	2015	2020	2025	2030
<b>Surface Water Supply</b>						
American River	50,000	50,000	50,000	50,000	50,000	50,000
American River diverted from the Sacramento River	73,200	95,700	120,200	146,200	172,200	179,000
Sacramento River	81,800	81,800	81,800	81,800	81,800	81,800
<b>Total Surface Water Supply<sup>a</sup></b>	<b>205,000</b>	<b>227,500</b>	<b>252,000</b>	<b>278,000</b>	<b>304,000</b>	<b>310,800</b>
<b>Demand<sup>b</sup></b>						
Project Demand	0	2,680	2,680	2,680	2,680	2,680
<b>Total Demand</b>	<b>135,576</b>	<b>159,716</b>	<b>181,176</b>	<b>202,637</b>	<b>224,097</b>	<b>245,557</b>
<b>Additional Water Supply</b>	<b>69,424</b>	<b>67,784</b>	<b>70,824</b>	<b>75,363</b>	<b>79,903</b>	<b>65,243</b>
Notes: Conference Year, as defined by the WFA, when the projected unimpaired inflow to Folsom Reservoir is less than 400,000 AF.						
<sup>a</sup> Total surface water supply shown is based on USBR contracted deliveries and not maximum dry year treatment and diversion capacity of 230,000 AFY						
<sup>b</sup> Dry/Conference year demand reduced because City does not provide water to SSWD in dry years.						
Source: City of Sacramento						

## Maximum Day Demand

Because of diversion limitations during Hodge flow conditions, the maximum peak day demand should also be considered when comparing supply to demand. Table 12 shows the maximum day surface water supply and demand under normal flow conditions. Table 13 shows the maximum day surface water supply and demand under Hodge flow conditions. Table 12 shows that the City would meet the anticipated peak day demands under normal flow conditions through the year 2030, even without the new WTP. Table 13 shows that during Hodge flow conditions, treatment capacity at Fairbairn is reduced from 200 mgd to 100 mgd, resulting in a total treatment capacity of 260 mgd. Peak day demands under Hodge flow conditions would be met through 2010 with available surface water treatment capacity. The City currently can pump up to 30 mgd of groundwater which would supplement the available surface water. The City's surface and groundwater supplies would provide adequate supplies to meet peak daily demands during a conference year through 2030.

<b>Table 12 Maximum Day Surface Water Supply and Demand Comparison during Normal Flow Conditions (mgd)</b>						
	2005	2010	2015	2020	2025	2030
<b>Surface Water Supply</b>						
American River <sup>a</sup>	200	200	200	200	200	200
Sacramento River <sup>a</sup>	160	160	160	160	160	160
<b>Total Surface Water Supply</b>	<b>360</b>	<b>360</b>	<b>360</b>	<b>360</b>	<b>360</b>	<b>360</b>
<b>Demand</b>						
Project Demand	-	4.3	4.3	4.3	4.3	4.3
<b>Total demand</b>	<b>218</b>	<b>238</b>	<b>255</b>	<b>271</b>	<b>287</b>	<b>304</b>
<b>Additional Water Supply</b>	<b>142</b>	<b>122</b>	<b>105</b>	<b>89</b>	<b>73</b>	<b>56</b>
Notes: <sup>a</sup> Surface supply is based on plant capacity.						
Source: City of Sacramento						

<b>Table 13 Peak Day Surface Water Supply and Demand Comparison during Hodge Flow Conditions (mgd)</b>						
	2005	2010	2015	2020	2025	2030
<b>Surface Water Supply</b>						
American River <sup>a</sup>	100	100	100	100	100	100
Sacramento River <sup>b</sup>	160	160	160	160	160	160
<b>Total Surface Water Supply</b>	<b>260</b>	<b>260</b>	<b>260</b>	<b>260</b>	<b>260</b>	<b>260</b>
<b>Demand <sup>c</sup></b>						
Project Demand	-	4.3	4.3	4.3	4.3	4.3
<b>Total Demand</b>	<b>239.3</b>	<b>256.2</b>	<b>264.5</b>	<b>272.7</b>	<b>280.9</b>	<b>284.7</b>
<b>Surplus</b>	<b>20.7</b>	<b>3.8</b>	<b>-4.5</b>	<b>-12.7</b>	<b>-20.9</b>	<b>-24.7</b>
Groundwater	30	30	30	30	30	30
<b>Additional Water Supply</b>	<b>50.7</b>	<b>33.8</b>	<b>25.5</b>	<b>17.3</b>	<b>9.1</b>	<b>5.3</b>
Notes:						
<sup>a</sup> American River diversion is limited to 100 mgd during Hodge flow conditions.						
<sup>b</sup> Sacramento WTP peak day supply is based on plant capacity.						
<sup>c</sup> Dry/Conference year demand reduced because City does not provide water to SSWD in dry years.						
Source: City of Sacramento						

## SUPPLY RELIABILITY ASSESSMENT

The City's has sufficient water supplies to meet their existing and projected future demands in addition to the proposed project through 2030. During normal water years, the City would be able to meet its anticipated demands by using available surface water supplies and surface water treatment capacity. During conference years, or when flows are below Hodge conditions, the City's peak daily demands, including the proposed project, could be met with available surface water treatment capacity through 2015 and through 2030 with combined use of available surface water and groundwater supplies.

The City is a partner in the Sacramento River Water Reliability Study, which is investigating alternatives for an additional diversion on the Sacramento River. The environmental documents for the alternatives analysis are scheduled to be complete in 2006. The proposed 145 mgd diversion facility and WTP included in the Sacramento River Water Reliability Study would provide additional assurance for the delivery of the entitled water for the City, as well as all wholesale and wheeling agreements past 2030.

This WSA finds:

- ▶ The City has sufficient water supplies to serve the proposed project and projected future demands over the next 25 years.
- ▶ Under normal year types, the City has sufficient capacity within its existing WTPs to serve the proposed project and projected future demands over the next 25 years.



- ▶ During conference years (analogous to dry years and multiple dry years) the City has sufficient supply to serve the proposed project and projected future demands if the WTPs operate at maximum production capacity.
- ▶ During conference years, under a peak demand scenario, with limitations in production capacity of the WTPs (whereby demands do not equal maximum capacity), the City's peak demands would exceed available capacity of the WTPs by the year 2020. However, the City's existing groundwater supplies (up to 30 mgd) would ensure peak demands would be met through 2030.
- ▶ The City's proposed 145-mgd diversion and WTP on the Sacramento River near Elverta Road would provide additional flexibility for managing water supplies, especially with respect to meeting peak demand during dry years.

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