

# Sacramento Central Groundwater Authority



Basin Management Report  
2007 – 2008



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## CHAPTER 1 INTRODUCTION

This State of Basin Report documents the management activities of the Sacramento Central Groundwater Authority (Authority) and its member agencies in 2007 and 2008. The intent of this first biennial report is to document basin wide hydrologic conditions and management activities that help ensure the long-term sustainability of the region's vital groundwater resources.

### SCGA BACKGROUND

The Authority was formed on August 29, 2006 through a Joint Powers Agreement (JPA) signed by the Cities of Elk Grove, Folsom, Rancho Cordova, and Sacramento and the County of Sacramento to manage the Sacramento Central Groundwater Basin (Central Basin). The Central Basin encompasses the area bounded by the American River on the north, north of the southern boundary the Omochumne-Hartnell Water District and the Cosumnes and Mokelumne rivers on the south, the Sacramento River on the west, and Sierra Foothills on the east (see **Figure 1**). The Authority is recognized as an essential part in implementing the groundwater management element of the Water Forum Agreement (WFA<sup>1</sup>).

Currently, the Authority consists of sixteen members<sup>2</sup> representing stakeholder interest groups that include agriculture, agriculture/residential users, business, environmental/community organizations, local governments/public agencies and water purveyors.

The JPA describes the roles and responsibilities of the Authority as follows:

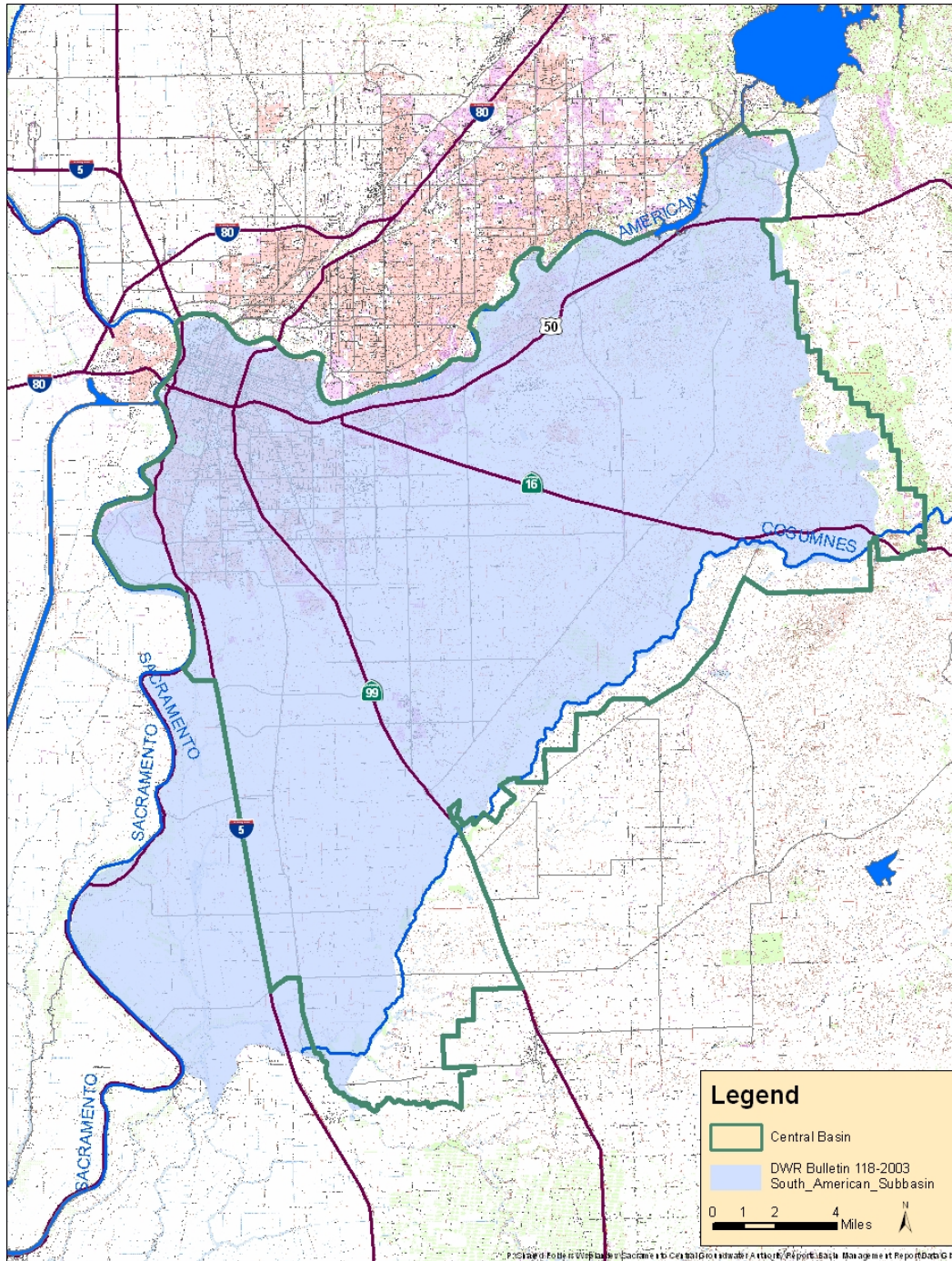
- Maintain the long-term sustainable groundwater yield of the Central Basin;
- Ensure implementation of the Basin Management Objectives (BMO) that are prescribed by the Central Sacramento County Groundwater Management Plan (GMP);
- Oversee the operation of any Well Protection Program (WPP) that may be prescribed by the GMP;
- Manage the use of groundwater in the Central Basin and facilitate implementation of an appropriate conjunctive use program by water purveyors;
- Coordinate efforts among those entities represented on the governing body of the joint powers authority to devise and implement strategies to safeguard groundwater quality; and

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<sup>1</sup> The two co-equal objectives of the WFA are: 1) to provide a reliable water supply for planned development to the year 2030, and 2) to preserve the Sacramento region's environmental crown jewel, the lower American River. For more information, please visit its website: <http://www.waterforum.org/>.

<sup>2</sup> California-American Water Company, City of Elk Grove, City of Folsom, City of Rancho Cordova, City of Sacramento, County of Sacramento, Florin Resource Conservation District/Elk Grove Water Service, Golden State Water Company, Omochumne-Hartnell Water District, Rancho Murieta Community Services District, Sacramento Regional County Sanitation District, Agricultural Representative, Agricultural-Residential Representative, Commercial/Industrial Representative, Conservation Landowners, Public Agencies/Self-Supplied Representative

- Work collaboratively with other entities, including the Sacramento Groundwater Authority (SGA), the Southeast Sacramento County Agricultural Water Authority (SSCAWA) and other groundwater management authorities that may be formed in the County of Sacramento and adjacent political jurisdictions, in order to promote coordination of policies and activities throughout the region.



**Figure 1** Location of the Central Basin

## CENTRAL SACRAMENTO COUNTY GROUNDWATER MANAGEMENT PLAN

In February 2006, the GMP was accepted by the Central Sacramento County Groundwater Forum and the Water Forum Successor Effort. This document was the result of six years of negotiation and agreements between the various stakeholders in the region. The GMP is a planning tool that assists the basin stakeholders in maintaining a safe, sustainable and high quality resource for all groundwater users within the Central Basin.

The GMP provides for the review of current and future water supply and demands and contains BMOs. Each BMO focuses on managing and monitoring the basin to benefit all groundwater users within the basin. The GMP also contains “trigger points” and remedies to ensure full implementation of the individual BMOs. The five BMOs are described below:

- Maintain the long-term average groundwater extraction rate at or below 273,000 acre-feet/year;
- Maintain specific groundwater elevations within all areas of the basin consistent with the Water Forum “solution;”
- Protect against any potential inelastic land surface subsidence by limiting subsidence to no more than 0.007 feet per one foot of drawdown in the groundwater basin;
- Protect against any adverse impacts to surface water flows in the American, Cosumnes, and Sacramento Rivers.; and
- Meet water quality objectives including:
  - Total Dissolved Solids (TDS) concentration of less than 1,000 mg/l,
  - Nitrate concentration of less than 45 mg/l, and
  - Volatile Organic Compounds (VOC).

The GMP also describes the development and implementation of the Central Basin WPP. The Central Basin WPP is designed to protect existing private domestic well and agricultural well owners from declining groundwater levels resulting from new development in the basin.

Lastly, the GMP describes the development and implementation of the Groundwater Contamination Monitoring and Collaboration Program to proactively address the groundwater contamination and remediation issues in the Central Basin. The program consists of three components:

- Use of remediated groundwater in Urbanized Areas
- Survey Private Wells for Potential Contamination
- Assistance of the Sacramento County Environmental Management Department (EMD).

## CHAPTER 2 BASIN CONDITIONS

This chapter describes current basin conditions including hydrologic conditions, groundwater pumping, groundwater elevation, and groundwater quality relative to the individual BMOs.

### BMO NO.1 – MAINTAIN THE LONG-TERM AVERAGE EXTRACTION RATE AT OR BELOW 273,000 Acre-Feet/Year

#### HYDROLOGIC CONDITIONS

Typically, three indicators are widely used to describe hydrologic conditions in the Sacramento region: 1) Sacramento Valley Water Year Type, 2) Water Forum Agreement Year Type, and 3) Precipitation Data. Each of these is described in more detail below.

#### Sacramento Valley Water Year Type

The Sacramento Valley Water Year Type is determined by the California Department of Water Resources (DWR) based on Sacramento River and tributary runoff necessary to meet Delta outflow criteria and Sacramento River system requirements (Water Year Index). Year Type classifications are based on the Index and include wet, above normal, below normal, dry, and critical. **Table 1** summarizes the water year type over the past five years (2004 to 2008). Overall, the region is experiencing a dry period with four of the last five years classified as below normal or critical.

**Table 1 Sacramento Valley Water Year Type, 2004-2008**

Water Year <sup>1</sup>	Sacramento Valley Water Year Index (Million Acre-Feet)	Sacramento Valley Water Year Type <sup>2</sup>
2004	7.7	Below Normal
2005	7.4	Below Normal
2006	13.0	Wet
2007	6.2	Dry
2008	5.1	Critical

Notes:

- For a complete view of the data for the past one hundred plus years as well as the methodology used to determine the Sacramento River Water Year Index Value, please visit the website: <http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST>.
- Sacramento River Water Year Hydrologic Classifications and determination criteria:

Year Type	Water Year Index (Million Acre-Feet)
Wet	Equal to or greater than 9.2
Above Normal	Greater than 7.8, and less than 9.2
Below Normal	Greater than 6.5, and equal to or less than 7.8
Dry	Greater than 5.4, and equal to or less than 6.5
Critical	Equal to or less than 5.4

**Water Forum Agreement Year Type**

This water year type is determined based on March-through-November total unimpaired inflow into Folsom Lake. This data dictates the amount of water that a purveyor may divert from Folsom Lake and the Lower American River as specified in their WFA purveyor specific agreement. The WFA water year classifications include wet, average, drier, and driest. **Table 2** shows the water year type for the past five years (2004 to 2008). Based on the WFA criteria, 2007 and 2008 were average and drier years, respectively.

**Table 2 Water Forum Agreement Year Type, 2004-2008**

<b>Water Year</b>	<b>Unimpaired Inflow to Folsom Lake, March- November (Thousand Acre-Feet)</b>	<b>Water Forum Agreement Year Type<sup>1</sup></b>
2004	1,502	Average
2005	2,485	Wet
2006	3,242	Wet
2007	1,121	Average
2008	914	Drier

Notes:

1. WFA water year classifications and determination criteria:

<b>WFA Water Year Type</b>	<b>Unimpaired Inflow into Folsom Lake, March through November (Thousand Acre-Feet)</b>
<i>Wet</i>	<i>Greater than 1,600</i>
<i>Average</i>	<i>Greater than 950, and less than 1,600</i>
<i>Drier</i>	<i>Greater than 400, and less than 950</i>
<i>Driest</i>	<i>Less than 400</i>

**Precipitation Data**

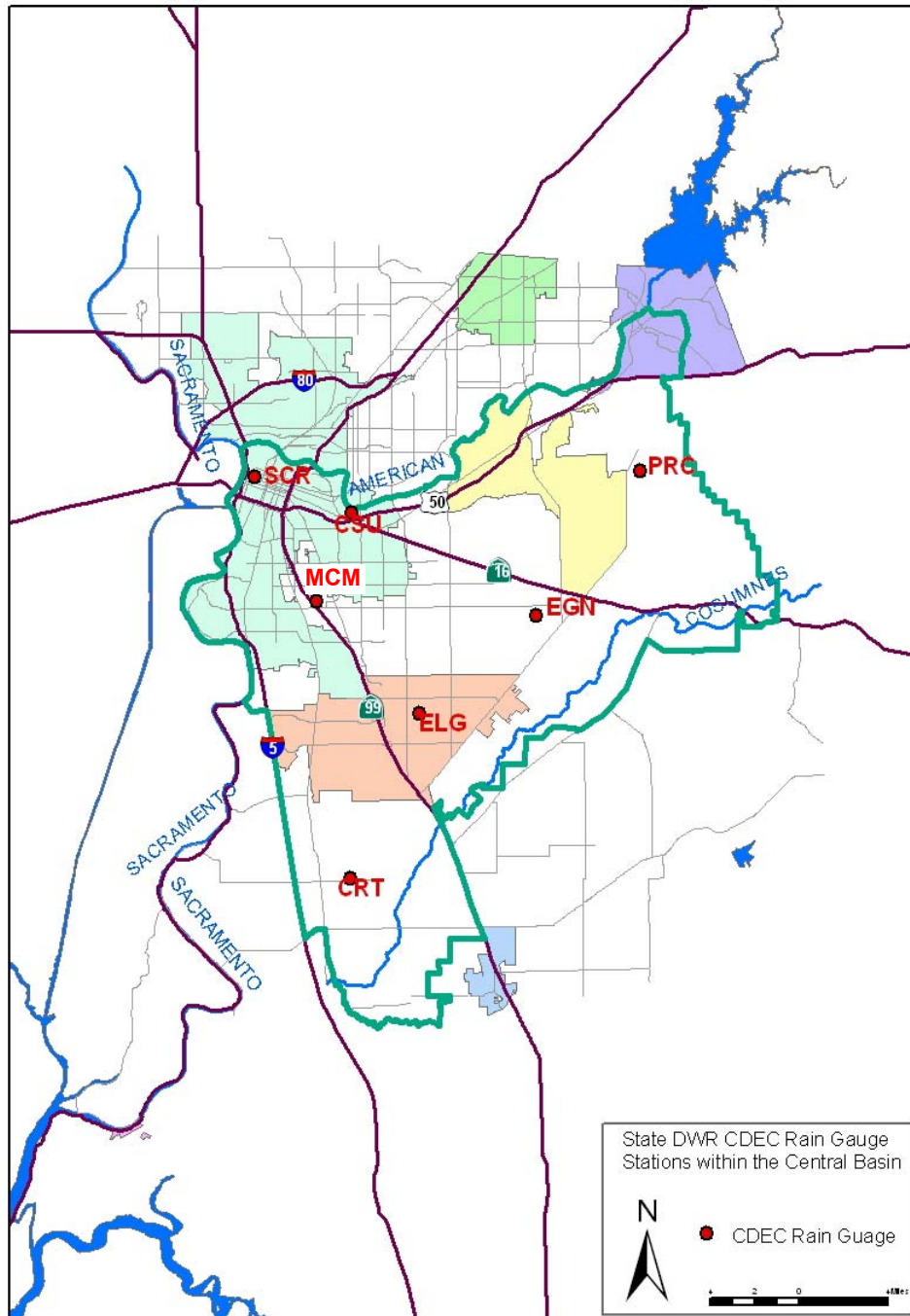
DWR maintains precipitation data for seven stations on the California Data Exchange Center (CDEC) within and adjacent to the Central Basin area. These seven stations represent different areas within the Basin. These stations are shown in **Figure 2** which includes:

- Correctional Center (CRT)
- California State University, Sacramento (CSU)
- Cosumnes River at Eagles Nest Road (EGN)
- Elk Grove Fish Hatchery (ELG)
- Prairie City (PRC)
- Sacramento WB City (SCR)
- Morrison Creek at Mack Road (MCM)

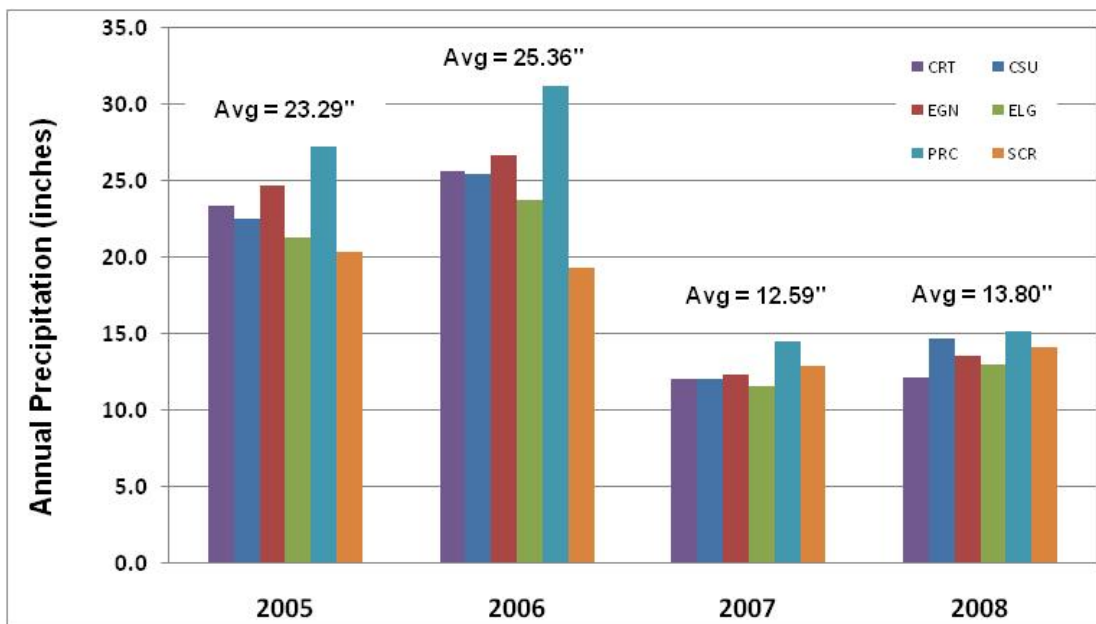


The precipitation data for 2005 – 2008 recorded at these stations was retrieved from CDEC’s website <http://cdec.water.ca.gov>. The MCM station data has been excluded from further analysis because its data is considered to be an anomaly when compared with the other stations.

**Figure 3** shows that the average annual precipitation for CRT, CSU, EGN, ELG, PRC, and SCR was 23.29” (2005), 25.36” (2006), 12.59” (2007), and 13.80” (2008).



**Figure 2** Locations for CDEC Stations within SCGA Vicinity



**Figure 3 Annual Precipitation for CDEC Stations in SCGA Vicinity, 2005-2008**

**Groundwater Pumping**

Not all water users in the Central Basin rely on groundwater to meet their water supply needs. Some purveyors rely on a combination of groundwater and surface water called conjunctive use, such as California-American Water Company (Cal-Am), Golden State Water Company (GSWC), and Sacramento County Water Agency (SCWA). The City of Sacramento relies solely on surface water to serve its customers within the Central Basin.

**Table 3** shows the water use in the Central Basin for 2005-2008 including groundwater, surface water, and recycled water. Remediated groundwater pumping is included for the purpose of showing the total groundwater pumping activities, although remediated groundwater is currently not put to beneficial use. Overall, there has been a slight increase in groundwater use during this period of time. The decrease in groundwater use in 2007 can be attributed to increased surface water use by GSWC. The increase in groundwater use in 2008 is due primarily to dry weather conditions and the availability of surface water to SCWA.

The amount of groundwater pumping for agricultural and agricultural-residential groundwater users was estimated from two bookend land use information sources: 1) 2000 land use condition based on 2000 DWR’s land use survey for Sacramento County; and 2) projected 2030 land use information<sup>3</sup>. Any updates to estimated agricultural or agricultural-residential groundwater pumping would rely on an update of these two data sources.

<sup>3</sup> Based on 2000 DWR land use survey for Sacramento County, DWR Detailed Analysis Unit (DAU) crop acreage estimates, and Sacramento County General Plan land use mapping, and 2002 Zone 40 Water Supply Master Plan EIR.

**Table 3 Water Use in the Central Basin, 2005-2008**

	<b>Groundwater Water Usage (Acre-Feet)</b>			
Water Purveyors <sup>1</sup>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Elk Grove Water Service	5,397	6,365	6,963	6,460
Cal-Am	23,391	22,775	23,651	24,769
GSWC	12,639	13,129	9,754	9,162
SCWA	27,685	29,019	30,450	34,220
Agricultural <sup>2</sup>	167,062	166,148	165,234	164,320
Agricultural – Residential <sup>2</sup>	7,852	7,946	8,041	8,136
<b>SUBTOTAL</b>	<b>244,026</b>	<b>245,382</b>	<b>244,093</b>	<b>247,067</b>
	<b>Surface Water Usage (Acre-Feet)</b>			
City of Sacramento	94,762	97,370	103,971	n/a
GSWC	5,228	5,343	9,124	9,437
SCWA	5,454	4,330	5,403	3,345
Rancho Murieta CSD	1,840	1,938	1,946	1,873
<b>SUBTOTAL</b>	<b>107,284</b>	<b>108,981</b>	<b>120,444</b>	<b>n/a</b>
	<b>Recycled Water Usage (Acre-Feet)</b>			
SCWA	1,121	1,056	1,052	1,008
Rancho Murieta CSD	600	600	600	600
<b>SUBTOTAL</b>	<b>1,721</b>	<b>1,656</b>	<b>1,652</b>	<b>1,608</b>
	<b>Remediated Groundwater Pumping (Acre-Feet)</b>			
Aerojet <sup>3</sup>	11,682	16,356	17,105	17,793
Mather Field <sup>4</sup>	-	-	-	-
Kiefer Landfill <sup>5</sup>	-	-	-	-
<b>SUBTOTAL</b>	<b>11,682</b>	<b>16,356</b>	<b>17,105</b>	<b>17,793</b>

Notes:

1. Annual urban groundwater pumping data was provided to the Authority by purveyors.
2. Annual groundwater pumping for Agricultural and Agricultural Residential groundwater users were estimated for year 2000 and 2030 based on land use data in the WRIME 2005 Groundwater Impact Analysis. The pumping rate for each individual year in this table was obtained through linear interpretation.
3. The total remediated groundwater pumping rate at Aerojet was 15,037 acre-feet, 19,711 acre-feet, 20,460 acre-feet, and 21,148 acre-feet from 2004 to 2008. Water from GET D is recharged back to the aquifer. Water from GETs A and B are discharged to land and infiltrate back into the subsurface. The flows for those facilities have averaged 650 gpm for GET D, 230 gpm for GET A and 1,200 gpm for GET B. Data is provided by the State Water Quality Control Board staff. The table shows the net groundwater pumping (total groundwater pumping volume less the amount infiltrates back into the basin).
4. The remediated groundwater pumping rate at Mather Field is 100 – 200 gpm. According to the State Water Quality Control Board staff who provides the data, most of the water that is extracted by Mather's groundwater remediation operations is injected back into the local aquifer. The table shows the net groundwater pumping.
5. The remediated groundwater pumping rate at Kiefer Landfill was approximately 1,100 gpm and discharged directly to Deer Creek. The assumption is that it infiltrates back into the basin. The table shows the net groundwater pumping.

DWR typically conducts land use surveys every 5 to 10 years, with the last survey taken in Sacramento County in 2000. According to DWR staff, updated land use information for the County will not be available by 2010. In order to estimate groundwater usage for agricultural and agricultural-residential properties from 2005-2008, an interpolation process was used on the agricultural and agricultural-residential groundwater pumping for 2000 and 2030.

The average groundwater pumping rate (including remediated groundwater pumping) within the Central Basin over the past four years (2005-2008) was 260,900 acre-feet/year, below the 273,000 acre-feet/year identified in BMO NO.1.

## **BMO NO.2 – MAINTAIN SPECIFIC GROUNDWATER ELEVATIONS WITHIN ALL AREAS OF THE BASIN CONSISTENT WITH THE WATER FORUM “SOLUTION”**

### **GROUNDWATER ELEVATION**

Regional groundwater elevations are measured through a network of public and private wells throughout Sacramento County. Collected data is maintained by DWR and the SCWA and dates back to the 1950s. This groundwater elevation data is stored collectively in DWR’s water data library and can be accessed through the internet at <http://wdl.water.ca.gov>. Additionally, SCWA staff also produces and maintains historical groundwater elevation contour maps for Sacramento County, available online at: <http://www.msa.saccounty.net/waterresources/files/Files.asp?c=elev>. Each year, groundwater elevation data is collected in the Spring (April) and Fall (October).

Groundwater elevation data is a component of the Central Basin’s Data Management System (DMS). During the initial development of the DMS, groundwater elevation data was provided through 2004. Work is currently under way to update this data. This update will be complete by June 2010.

### **Groundwater Elevation Contour Map**

Since the DMS update project is still in progress, SCWA groundwater contour maps have been used to estimate groundwater elevation conditions in this report. **Figure 4**, **Figure 5** and **Figure 6** show the groundwater elevation contour map for Fall 1997, Spring of 2007, and Fall of 2007. Note the presence of a cone of depression in the Elk Grove area. Since the earliest times when groundwater began to be used for agricultural irrigation, groundwater extraction was concentrated in the Elk Grove area of the Central Basin. This resulted in a regionally extensive cone of depression. By comparing the contour maps for Fall 1997 and Fall 2007, the change in shape and location of the cone of depression can be seen over the last ten years. The elevation at the base of the cone is approximately 40 to 50 feet below mean sea level (MSL) in 2007 as opposed to 70 to 80 feet MSL in 1997. **Figure 5** and **Figure 6** show the seasonal fluctuation in

shape and location of the cone reflecting increased water demands that occurs during the summer irrigation period.

### Groundwater Level Trends

Groundwater hydrographs are developed from groundwater elevation data that has been collected over time. The graphic depiction of these hydrographs delineates groundwater level trends through much of the basin. **Figure 7** and **Figure 8** show the location of the groundwater hydrographs that contain the most complete record and also used in the GMP. Groundwater data to develop these hydrographs was obtained from DWR's water data library.

The hydrographs show a consistent decline in groundwater levels beginning in the 1950s and 1960s until about 1980 of approximately 20 to 30 feet. From 1980 through 1983, water levels recovered by about 10 feet and remained relatively stable until the beginning of the 1987 - 1992 drought. During this period, water levels declined about 15 feet. Between 1995 and 2003, most water levels recovered to levels generally higher than those prior to 1987 - 1992 drought. In some locations, this recovery has continued through 2008.

For the purpose of further discussion, the wells are grouped by their geographic locations as described below:

**Western Area.** The western portion of the basin is generally the area between Interstate 5 and Highway 99. Groundwater level trends in this area can be seen in hydrographs SWP-170, SWP-107, SWP-004, and SWP-063, in **Figure 7**; and SWP-115 and SWP-058 in **Figure 8**. These hydrographs show groundwater levels generally varying between 10 and 90 feet below MSL during the period of record. From 2003 to 2008, groundwater levels in these wells have remained fairly stable or continued to recover from the 1987 - 1992 drought. Some of this recovery can be attributed to the increased use of surface water in the area, and the fallowing of previously irrigated agricultural lands that are transitioning into new urban development areas.

**Central Area.** The central portion of the basin is the area between Highway 99 and Highway 16 (Jackson Highway). Groundwater level trends in this area can be seen in hydrographs SWP-177, SWP-149, and SWP-154, shown in **Figure 7**; and SWP-121, SWP-124, SWP-126, SWP-128, SWP-188 and SWP-054, shown in **Figure 8**. These hydrographs show groundwater levels generally varying between 40 feet above to 40 feet below MSL during the period of record. Groundwater levels in wells located furthest from the Cosumnes River appear to be relatively stable in recent years and continued to recover from the 1987-1992 drought. Groundwater levels in wells located close to the Cosumnes River have shown relative stability in recent years, but it appears that the general trend continues to show a decline (see hydrographs SWP-124, SWP-126, and SWP-128).

**Eastern Area.** The northern portion of the basin is the area north of Highway 16 (Jackson Highway). Groundwater level trends in this area can be seen in hydrographs SWP-185, SWP-250, and SWP-244, shown in **Figure 7**; and SWP-255, SWP-202, and SWP-209, shown in **Figure 8**. These hydrographs show declines in groundwater levels of up to 40 feet since 1960. In recent years, groundwater levels have been relatively stable (see hydrographs SWP-202 and SWP-185). For locations close to Aerojet's Groundwater Extraction Treatment (GET) facilities, it appears that groundwater levels have declined as a result of Aerojet's remediation activities (see hydrographs SWP-244, SWP-255 and SWP-250). Groundwater levels in the well close to the Cosumnes River continues to trend downward (see hydrograph SWP-209).

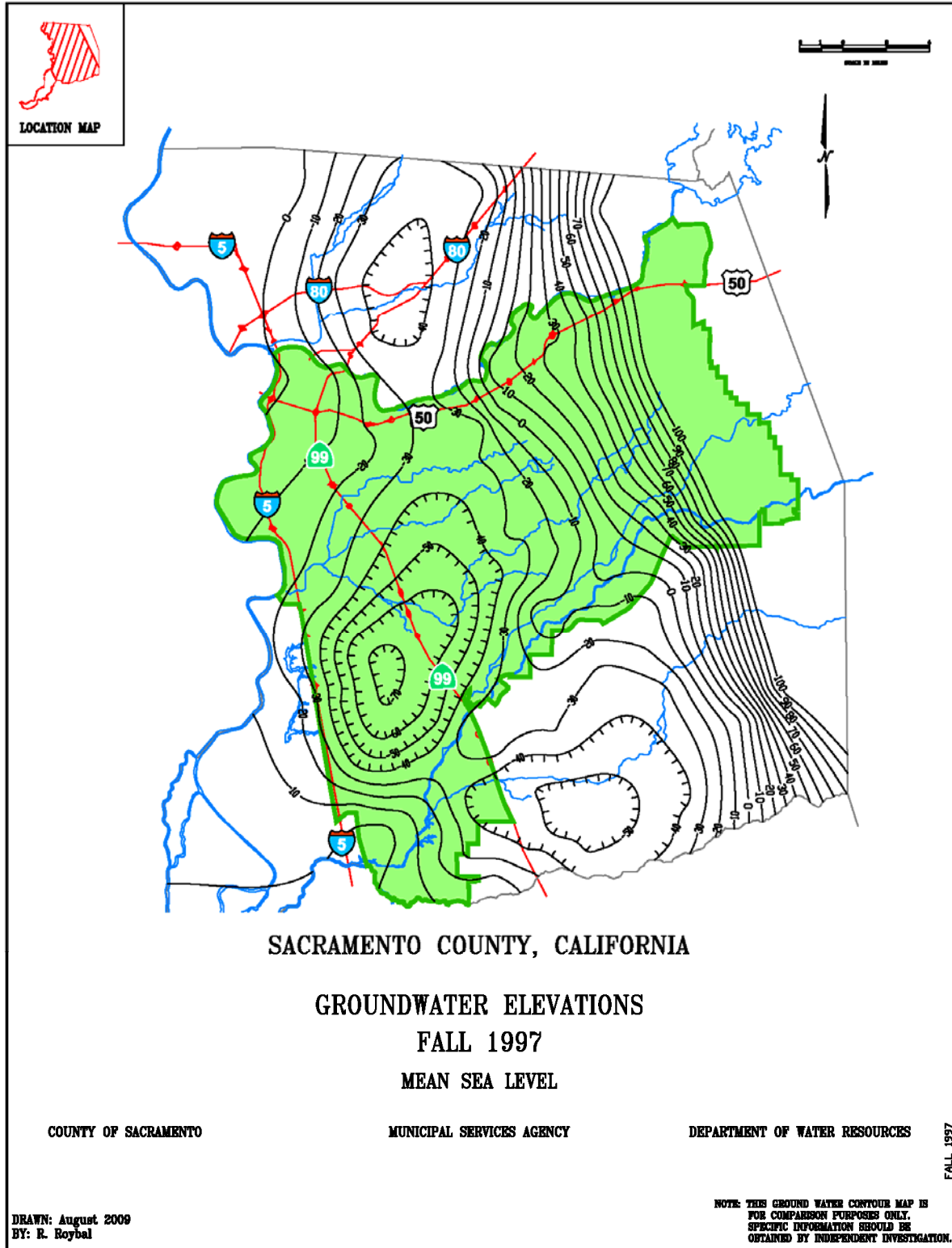


Figure 4 Fall 1997 Groundwater Elevation Contour Map

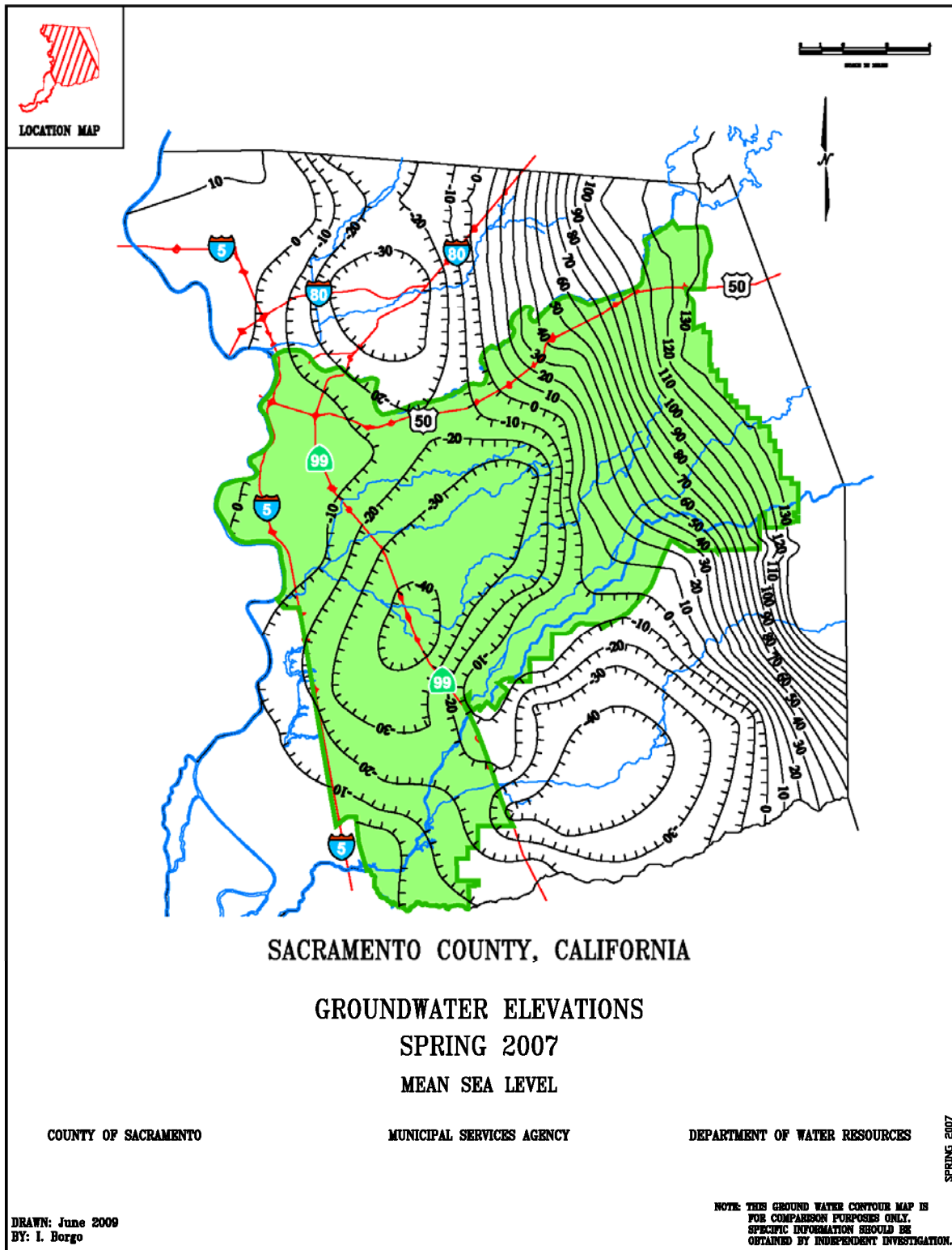


Figure 5 Spring 2007 Groundwater Elevation Contour Map





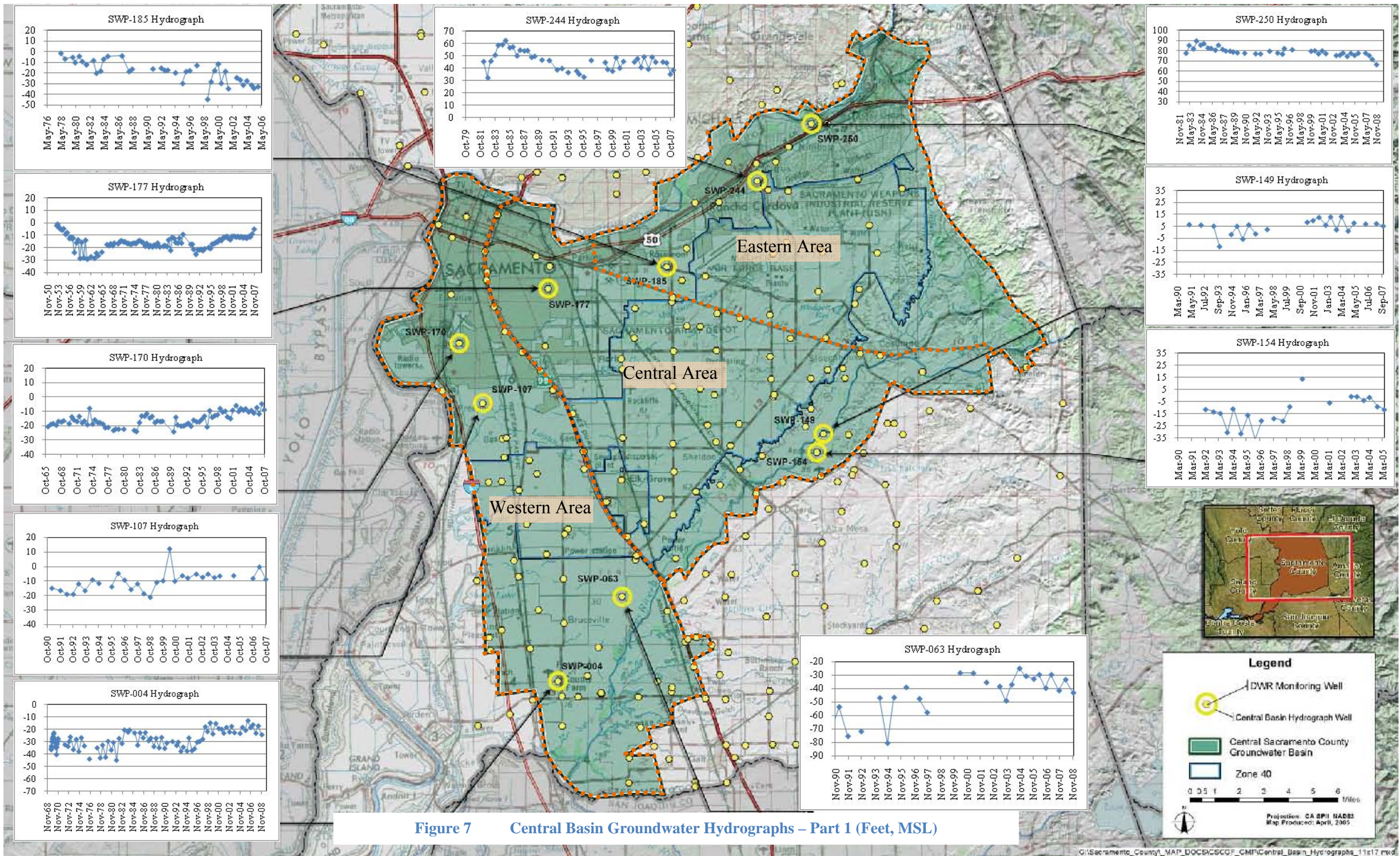


Figure 7 Central Basin Groundwater Hydrographs – Part 1 (Feet, MSL)

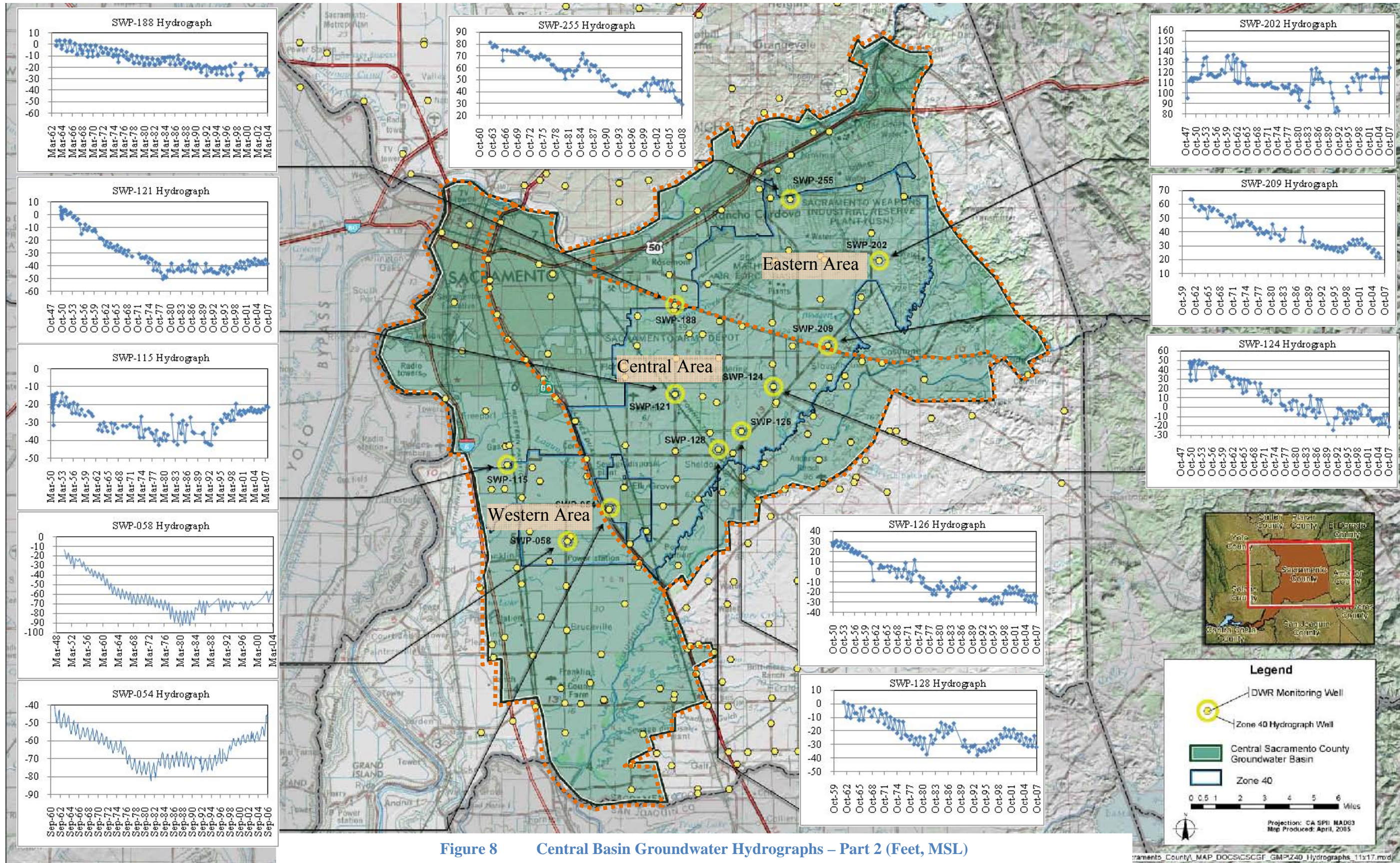


Figure 8 Central Basin Groundwater Hydrographs – Part 2 (Feet, MSL)

### **BMO NO.3 - PROTECT AGAINST ANY POTENTIAL INELASTIC LAND SURFACE SUBSIDENCE BY LIMITING SUBSIDENCE TO NO MORE THAN 0.007 FEET PER 1 FOOT OF DRAWDOWN IN THE GROUNDWATER BASIN.**

Land subsidence can cause significant damage to essential infrastructure. Historic land surface subsidence within the Central Basin has been minimal, with no known significant impacts to existing infrastructure. Given historical trends, the potential for land surface subsidence from groundwater extraction in the Central Basin appears to be remote.

Sacramento Suburban Water District (SSWD) was awarded an AB 303 grant to resurvey wells evaluated for subsidence in the Arden-Arcade area in 1991. Authority staff is interested in the outcome of this resurvey and intends to cooperate with SSWD and SGA in the evaluation of this data once it becomes available.

### **BMO NO. 4 – PROTECT AGAINST ANY ADVERSE IMPACTS TO SURFACE WATER FLOWS IN THE AMERICAN, COSUMNES, AND SACRAMENTO RIVERS.**

Refer to Table A-2, Component 2, Task 4 – Surface Water Groundwater Interaction Monitoring, of Appendix A for details of activities related to this BMO.

### **BMO. NO. 5 – WATER QUALITY OBJECTIVES**

#### **GROUNDWATER QUALITY**

Generally, groundwater quality in the basin makes it suitable for nearly all uses, with the exception of documented areas of contamination and localized quality issues discussed later in this section.

#### **Water Quality in Public Supply Wells**

Available groundwater quality data in the Central Basin is primarily from the public water supply wells operated by the various water purveyors in the basin. The most recent data available to the Authority is the groundwater quality data made available to initially populate the DMS (1999-2003). The analysis in this report is based on that data. As part of the DMS update groundwater quality data from 2003 through the present will be added to the data base providing for a more up to date and comprehensive evaluation. Thereafter, data will be requested every other year from the purveyors for incorporation into the DMS.

- *Total Dissolved Solids (Concentration of Less than 1000 mg/l)*

TDS concentration is a measure of all dissolved constituents in water resulting primarily from rocks and sediments with which the water comes in contact. Most municipal wells in the basin meet the secondary drinking water standards for TDS - maximum contaminant level (MCL) of

500 milligrams per liter (mg/L). Secondary standards were established for aesthetic concerns (e.g., staining of laundry and porcelain fixtures).

- *Iron and Manganese*

Iron and manganese are naturally occurring elements in the earth's crust and are found in groundwater as a metallic ion. Iron and manganese are found in deeper municipal wells and treatment is required by the California Department of Public Health (DPH) when a new well is constructed. Iron has a secondary MCL of 300 microgram per liter ( $\mu\text{g/L}$ ), and manganese has a secondary MCL of 50  $\mu\text{g/L}$ . According to the DMS, iron concentrations range from less than 10  $\mu\text{g/L}$  to 16,000  $\mu\text{g/L}$ , although most wells have average values of less than 200  $\mu\text{g/L}$ . Manganese concentrations range from less than 2  $\mu\text{g/L}$  to 1,700  $\mu\text{g/L}$ , although most wells have average values of less than 50  $\mu\text{g/L}$ . High concentrations of iron and manganese tends to be a problem in deeper wells.

- *Arsenic*

Arsenic is a naturally occurring element in the earth's crust. The U.S. Environmental Protection Agency (EPA) adopted in 2004 a revised MCL for arsenic of 10  $\mu\text{g/L}$  (previously 50  $\mu\text{g/L}$ ), along with monitoring requirements, arsenic health effects language, and best available technologies for arsenic mitigation in public drinking water systems. DPH initiated implementation of the new federal requirements in January 2006. In general, elevated arsenic concentrations in the Sacramento region is not a significant problem. A number of SCWA wells west of HWY 99 have been phased out of production because arsenic concentrations are higher than 10  $\mu\text{g/L}$ . These have been shallower wells developed in the Laguna Formation.

- *Volatile Organic Compounds (VOC)*

Various sources of VOCs exist within the basin; these include old landfills, wrecking yards, military bases, and research and development facilities. Significant concern exists regarding the movement of these compounds from the vadose or unsaturated zone of the soil matrix to the saturated zone or aquifer. Once these compounds are mobilized in groundwater, their movement will depend on many different factors one of which could be management activities within the basin. The GMP identified the need to monitor VOC migration within the basin for the protection of public and private wells. Any measurable trace of VOC in a private or public well should be considered significant and actions should be taken in accordance with programs identified in the GMP and by the regulatory agencies having jurisdiction in addressing the VOC contamination.

There have been no reports of new sources of VOC contamination or of the migration of previously identified plumes.

### Water Quality in Private Wells

The Central Basin has many land use types, and differing types of sewage disposal and agricultural fertilizer application. These activities could cause nitrate to be introduced into the groundwater.

- *Nitrate (NO<sub>3</sub>) (Concentration of Less than 45 mg/l)*

During the development of the GMP the stakeholders expressed a concern regarding the possible presence of nitrate in groundwater, particularly in private wells. The use of on-site disposal systems and agricultural fertilizer application are just two means that nitrate could be introduced into the groundwater. The California Department of Public Health (DPH) has set the Primary Drinking Water MCL for nitrate at 45 mg/l for public water systems. This should also be considered for private wells that are used as a source of potable water.

The Sacramento County Environmental Management Department (EMD) has been engaged in ascertaining the extent (if any) of the nitrate problem in Sacramento County. Staff has requested that EMD provide any information, if available, relative to the extent of the nitrate problem in the County. Staff will then evaluate the data and, depending on the findings, have EMD make a report to the Board in the future.

### Known “Principal” Contaminant Plumes

Principal groundwater contaminant plumes within or near the Central Basin are known to exist from source areas such as Mather Field, Aerojet, Boeing (the Inactive Rancho Cordova Test Site or IRCTS), the former Army Depot, the former Southern Pacific and Union Pacific rail yards, as well as various landfills. These plumes are shown on **Figure 9**, based on available data from 2002 to 2004. In the fall of 2006, EPA updated the approximate extent of the Aerojet plume as shown in **Figure 10**. No updated data is available for the other contaminant plumes at this time.

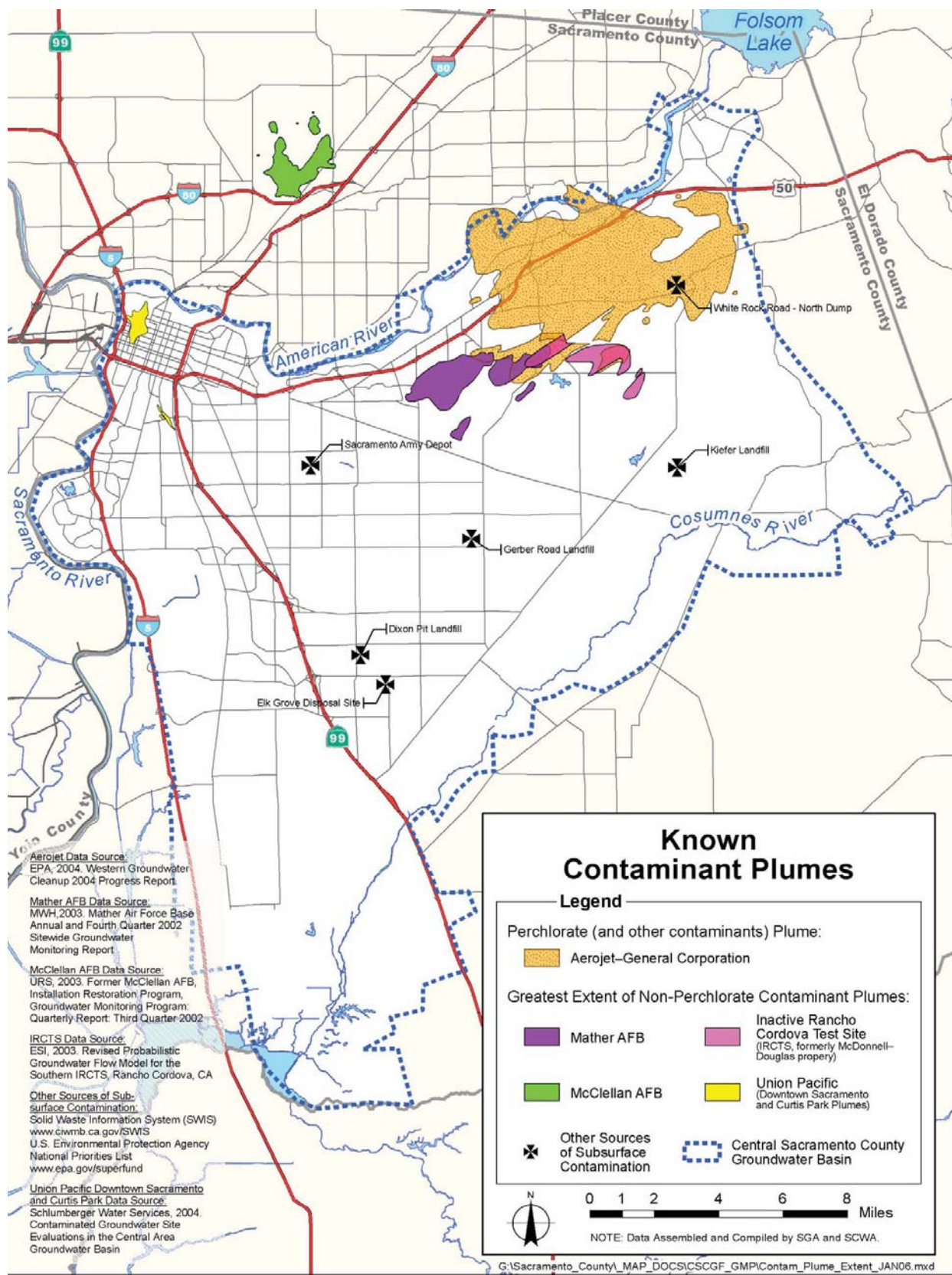
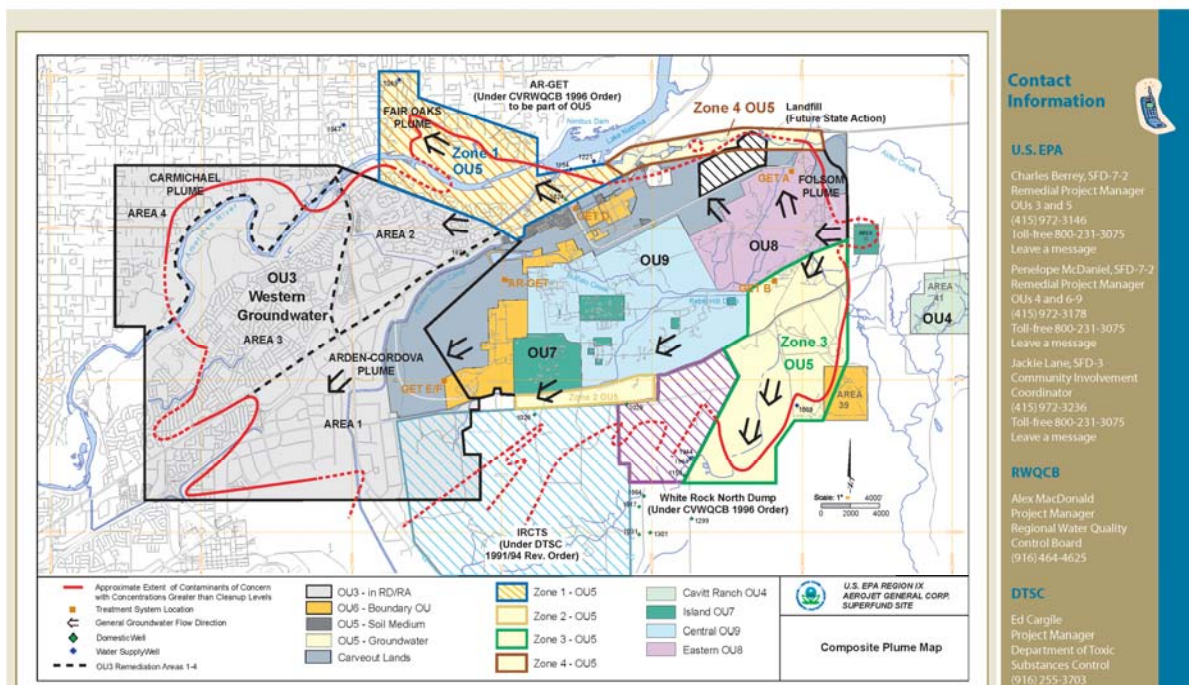


Figure 9 Known Principal Contaminant Plumes in Central Basin and Vicinity



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Source:  
<http://yosemite.epa.gov/R9/SFUND/R9SFDOCW.NSF/3dc283e6c5d6056f88257426007417a2/119d56df30217d0188257227003179c3!OpenDocument>

**Figure 10 Updated Approximate Extent of Aerojet Contaminant Plume**

### CHAPTER 3 BASIN MANAGEMENT ACTIVITIES

Basin management activities during 2007 and 2008 are described in three general categories. These include: implementation of the GMP; specific management activities that warrant more detailed discussion; and activities by other entities that are relevant to the Authority.

#### IMPLEMENTATION OF THE CENTRAL BASIN GMP

The GMP identified 69 specific management actions for the groundwater basin. Significant progress has been made in implementing these actions. While many of the actions are considered on-going, there are many others that have been completed. **Table A-2** in **Appendix A** provides a detailed status of each of the actions.

Several key management actions identified in the GMP warrant more detailed discussion. These taken include: 1) Public Outreach, 2) Update to the DMS, and 3) Well Protection Plan.

#### Public Outreach

The Authority has made significant progress in implementing their public outreach program. These include: 1) development of a Public Outreach Plan (POP) in May 2007 (see **Table A-3, Appendix A**), 2) holding regular noticed Board meetings, 3) development of SCGA’s website



([www.scgah2o.org](http://www.scgah2o.org)) where meeting agendas, notes, and Board items are posted as well as information about the Authority, and 4) on-going relationship building and establishing communication networks with regulatory agencies and responsible parties. For example, EMD staff was invited make a presentation to the Board on the County's Well Ordinance in October 2007 and their On-site Wastewater Treatment Systems Program in February 2008. Staff has also met with EMD staff to discuss other items of mutual interest such as sharing of well data, water quality issues, and well abandonment and destruction policies. Finally, 5) staff has also been regularly engaged with the Sacramento Groundwater Authority (North Basin) and the South Area Water Council (South Basin).

### Update to the DMS

Recognizing that the DMS is an essential tool for basin management, the Board authorized staff to apply for a Local Groundwater Assistance Grant (AB 303) (see **Appendix B**) in November 2007. The grant, for \$250,000, was awarded to SCGA in October 2008. The Authority entered into a contract with WRIME in November of 2008 and work on the update to the DMS began that same month. Completion of the update is scheduled for June 2010.

### Well Protection Plan

As defined in the GMP, the Central Basin WPP is a program designed to protect private domestic and agricultural well owners from being damaged as a result of increased groundwater pumping necessary to support future growth in the basin.

In accordance with the provisions of the JPA, the Authority began development of the WPP in November 2006. **Table A-1** in **Appendix A** documents the major activities and Board actions associated with this process. A more detailed description of these activities/actions can be found in the corresponding monthly Board meeting minutes posted on SCGA's website at [www.scgah2o.org](http://www.scgah2o.org). Key accomplishments include:

- WPP ordinance guidance document for the land use agencies;
- Refined Groundwater Impact Analysis;
- WPP Fee Estimate;
- Defined Benefit and Fee Area; and
- Draft WPP Fee Nexus Study.

Because of the significant challenges associated with implementing a well protection fee during the current housing market downturn, the Board decided in early 2009 to put the WPP on hiatus until there is an improvement in the market.

## CHAPTER 4 CONCLUSIONS AND RECOMMENDATIONS

This section summarizes the state of the basin and provides recommendations for basin management activities for fiscal years 2009/2010 and 2010/2011.

### CONCLUSIONS

During the reporting period, average groundwater pumping was approximately 260,900 acre-feet per year (including remediation groundwater pumping). This average is below the basin's long term sustainable yield of 273,000 acre-feet/year. A review of the groundwater elevation contour maps over the same period of time didn't identify any dramatic change in shape, size, or location of the regional cone of depression, and an analysis of the groundwater level hydrographs indicates that groundwater levels have been relatively stable over the reporting period.

During the report period, the Authority has worked through several technical, political, and potential legal issues in the process of developing the WPP; a program that is a unique yet important component of the GMP. A solid foundation has been laid and a good strategy adopted that should guarantee the ultimate success of the program.

The AB303 grant for DMS update provides the Authority with the necessary financial resources to further develop and enhance an effective basin management tool. Once completed the DMS will provide the means to more fully evaluate basin conditions and ensure full implementation of the GMP.

### RECOMMENDATIONS

During 2009/2010 SCGA will review and prioritize activities related to the various action items described in the GMP. SCGA will also continue to seek funding opportunities for projects, including projects which may be incorporated into the American River Basin Integrated Regional Water Management Plan (ARB IRWMP). Potential projects include:

- **Develop a water accounting framework.** As discussed at previous Board meetings, a water accounting framework is used to track the volume of stored groundwater, changes in the volume of the groundwater stored, estimated volumes of basin losses and rejected recharge, the volume of groundwater recovered, and the volume of surface water forbearance. The framework will be used to manage the use of groundwater in the basin to further facilitate implementation of conjunctive use programs in the basin. SGA has done significant work in developing a water accounting framework in the North Basin and their activities will be used as a guide in developing a program tailored specifically to the Central Basin.
- **Sacramento Integrated Groundwater Surface Water Model (SacIGSM) Hydrologic Model.** The SacIGSM model has been widely used in the region for water supply planning

and groundwater impact analysis. It will continue to be a useful tool in evaluating basin behavior/response for potential groundwater banking/conjunctive use projects. In order to ensure the viability of the model the various regional water entities (RWA, SAWC, SCGA, and SGA) and other interested parties will need to establish ownership of the model, and establish a means for its continued usefulness into the future, and determine access criteria.

- **Update the GMP.** The current version of the GMP represents a critical first step in establishing a framework for maintaining a sustainable groundwater resource and represents a starting point for overall basin management. As more information about the basin is acquired and as groundwater demands and/or basin operations change, there will be a need to revise and update the GMP.
- **Develop a Measuring and Monitoring Program.** The GMP discusses the need to expand groundwater monitoring efforts in the basin. To achieve this goal, the Authority will need to develop a measuring and monitoring program including the identification and/or installation of additional monitoring wells in strategic locations throughout the Central Basin. This process will be supported by the updated DMS.
- **Update DMS.** The Authority's DMS is currently being updated and will become an integral component in managing the groundwater basin. However, it should be realized that once the DMS is up and running it will need to be updated on a regular basis and will be an on-going project.
- **SCGA Contaminant Committee.** The goals of the Contaminant Committee are to 1) raise the level of awareness of the regulatory agencies to the Authority's concerns; 2) insist that the responsible parties fully delineate and contain all contaminant plumes; 3) ensure that the responsible parties expeditiously proceed with cleanup efforts and develop a plan for alternative water supplies in advance of contamination being detected in public water supply wells.
- **Implementation of the WPP.** On the recommendation of counsel, the Board decided in December 2008 that in order for the WPP to be successfully implemented the land use agencies that are signatory to the JPA would need to adopt the ordinance establishing the WPP rather than the Authority. However, recognizing that the current housing market would not support the establishment of a new fee, the Board decided in early 2009 to put completion of the WPP on hiatus until there is an improvement in the market. During this time Authority staff will continue to work with the land use agencies to set the groundwork for eventual adoption and implementation of the WPP.

## **APPENDIX A**

### **Basin Management Activities**

**Table A-1 Basin Management Activities Related to the Well Protection Plan**

Date	Actions
November 2006	In accordance with the JPA, Staff provides a Draft WPP Ordinance to the Board.
December 2006	The Draft WPP Ordinance was submitted to the signatories for review and comment.
January 2007	Staff met with the City of Elk Grove regarding concerns over the financial administration and fee collection components of the WPP and program.
February 2007	Staff met with a community interest group at the request of Don Nottoli to discuss provisions of the WPP.
March 2007	A WPP workshop was held to discuss the City of Elk Grove's concerns with the Draft WPP ordinance.
June 2007	The Board discussed a draft schedule for completion of the ordinance, agreements with land use agencies, and well registration process.
July 2007	<ul style="list-style-type: none"> <li>• Staff continued to work with the Cities and County to identify and address areas of concern regarding the WPP.</li> <li>• Staff conducted parcel data analysis.</li> </ul>
September 2007	<ul style="list-style-type: none"> <li>• Specific concerns of the Cities of Elk Grove and Rancho Cordova are discussed with Board, (i.e., acceptance of fee by BIA, fee nexus, and fee collection.</li> <li>• Staff refined the parcel data analysis.</li> </ul>
October 2007	Continued work on Board member issues and concerns.
December 2007	<ul style="list-style-type: none"> <li>• Counsel recommends adoption of the WPP ordinance by the Authority and collection of the fee by the land use agencies.</li> <li>• Staff proposed to conduct a refined groundwater impact study to delineate the parcels that potentially could be impacted.</li> <li>• WPP Subcommittee was formed to assist staff in developing the WPP ordinance.</li> <li>• WPP subcommittee met for the first time to discuss the development of the WPP: Trust fund shortfall language, costs, procedure for accounting for fee collection, nexus report, area of application, meeting with BIA, and ordinance adoption process.</li> </ul>
January 2008	<ul style="list-style-type: none"> <li>• Developed a work plan for the completion the WPP.</li> <li>• WPP workshop – Purpose and Definitions</li> </ul>
February 2008	<ul style="list-style-type: none"> <li>• WPP workshop – Trust Fund, Well Protection Fee, and Sunset Provision, as well as requirements for fee exemption.</li> </ul>
March 2008	<ul style="list-style-type: none"> <li>• WPP workshop – Eligibility and Benefits.</li> <li>• WRIME completed a draft Refined Groundwater Impact Analysis.</li> </ul>
April 2008	<ul style="list-style-type: none"> <li>• WPP workshop – well protection fee estimate</li> <li>• The Board accepts the findings of the Refined Groundwater Impact Analysis by WRIME.</li> </ul>
May 2008	<ul style="list-style-type: none"> <li>• WPP workshop – Qualifications.</li> <li>• Staff revised the well protection fee estimate based on Board comments.</li> </ul>

	<ul style="list-style-type: none"> <li>Discussed the relationship between the Central Basin WPP and the North Vineyard WPP.</li> </ul>
July 2008	<ul style="list-style-type: none"> <li>Draft SCGA Ordinance sent to Counsel for review.</li> <li>The Board decided to keep the Central WPP and the North Vineyard WPP as two separate programs.</li> <li>Draft maps of the fee and benefit areas were developed based on the Refined Groundwater Impact Analysis.</li> </ul>
August 2008	<ul style="list-style-type: none"> <li>Counsel raises possibility of Prop 218 with ordinance adopted by the Authority because of the connection between the well protection fee and property.</li> <li>Met with County staff to discuss general requirements for setting up a fee collection mechanism in the unincorporated area.</li> <li>Staff met with County's EMD staff to discuss collection of the well protection fee with issuance of a well drilling permit. EMD staff indicated that there is no mechanism to collect the fee.</li> </ul>
September 2008	<ul style="list-style-type: none"> <li>The Board discussed Counsel's comments regarding the applicability of Prop 218.</li> <li>Conducted a data analysis on the number of domestic/ag wells in the past 10 years. Based on these findings, the Well Protection Subcommittee recommended that collecting a well impact fee on new well drilling be dropped.</li> <li>The Board discussed the appeal process for wells outside of the benefit area.</li> </ul>
October 2008	<ul style="list-style-type: none"> <li>Board provided a copy of Counsel's opinion on how Prop 218 relates to the proposed WPP ordinance.</li> </ul>
December 2008	<ul style="list-style-type: none"> <li>Board discussed Counsel's opinion and the alternatives to pursue to move the WPP forward.</li> <li>Based on Counsel's opinion and the aforementioned discussion, the Board decided that the land use agencies would adopt an ordinance and collect the fee. The fee would then be transferred to SCGA's trust fund for the implementation of the WPP.</li> </ul>

**Table A-2 Basin Management Activities Related to Program Component Action Items**

Description of Action	Status	Comments
<b>COMPONENT NO. 1: STAKEHOLDER INVOLVEMENT</b>		
<b>1. Involving the Public</b>		
I. Continue efforts to encourage public participation in the implementation process as opportunities arise.	On-going	Notification of upcoming Board meetings and committee meetings are posted at each of the member agencies and in some cases on their website. These notifications are also posted on SCGA's website.
II. Provide public notice and public comment periods on formal revisions to the GMP	On-going	The Authority has not encountered any issues that require revision to the current GMP. To date, the most effective way to notify the public has been through regular Board meetings and the Authority's website. The Authority's website includes a regularly updated announcement section on the main page where Board agendas, minutes, and items of interest can be viewed and downloaded.
III. Develop a Public Outreach Plan (POP) and periodically review the POP and take actions as appropriate while implementing the GMP	On-going	Staff developed a POP and presented it to the Board in May 2007, see <b>Table A-3</b> . Staff has reviewed the POP and taken actions as appropriate.
IV. Provide briefings to the Water Forum Successor Effort on the GMP implementation process	On-going	Authority staff met with incoming WFSE Executive Director on August 14, 2007 to provide a briefing on Authority activities. Authority staff is available to provide briefings upon request.
V. Maximize outreach on the GMP	On-going	The GMP and Board meeting minutes are posted on the Authority's website <a href="http://www.scgah2o.org">www.scgah2o.org</a> . The GMP is also posted on the Water Forum's website <a href="http://www.waterforum.org">www.waterforum.org</a> .
<b>2. Involving Other Agencies within and Adjacent to the Central Basin</b>		
I. Maintain a high level of involvement by stakeholders in implementing the GMP	On-going	Authority staff participates in regular meetings of South Area Water Council and the Sacramento Groundwater Authority.
II. Provide copies of the adopted GMP and subsequent annual report to representatives of SGA, SSCAWA, TNC, San Joaquin County, and Water Forum Successor Effort, as needed	On-going	Copies of the GMP were sent to the Sacramento Groundwater Authority, Southeast Sacramento County Agricultural Water Authority, The Nature Conservancy, the Water Forum Successor Effort, the South Area Water Council, and State DWR.

III.	Meet with representatives from the Sacramento Groundwater Authority, South Area Water Council, The Nature Conservancy, and the Water Forum Successor Effort	On-going	Periodically attend meetings of the Sacramento Groundwater Authority, South Area Water Council, and the Water Forum Successor Effort. Meet with The Nature Conservancy staff on an as needed basis. Staff made a presentation to the South Area Water Council on August 16, 2008 on the process to develop the Central Basin GMP.
IV.	Coordinate meetings outside SCGA with agricultural and agricultural-residential self-supplied pumpers within the basin.	Deferred	Authority staff in accordance with the POP and in conjunction with direction from the Board will coordinate meetings with agricultural and agricultural-residential self supplied pumpers to inform them of the management responsibilities and activities relative to the groundwater management plan.
V.	Coordinate meetings with commercial/industrial self-supplied pumpers within the basin to inform them of the management responsibilities and activities relative to the basin	Deferred	At this time, there is no representative for this group on the Board. The Authority staff in accordance with the POP and in conjunction with direction from the Board will coordinate meetings with commercial/industrial self supplied pumpers to inform them of the management responsibilities and activities relative to the groundwater management plan.
VI.	Coordinate GMP activities and work to the extent applicable with adjacent groundwater management entities, water interest groups, and state and federal regulatory agencies that have jurisdiction in areas related to the GMP activities	On-going	The Authority is coordinating with EBMUD, SCWA, and private property owners in identifying/evaluating potential groundwater recharge opportunities in the Central Basin.
<b>3. Using Advisory Committees</b>			
I.	Following adoption of the GMP, the basin government body will discuss the continuation and composition of advisory committees that will provide guidance in the implementation of the GMP	Deferred	The Board has indicated a need to have an open discussion on the use and responsibility of advisory committees. No time has been set for this discussion.
<b>4. Developing Relationship with Local, State and Federal Agencies</b>			
I.	Continue to develop working relationship with local, state, and federal regulatory agencies.	On-going	Authority staff continues to develop working relationship with DWR through AB303 contract work.  The Authority has developed a working relationship with EMD on issues related to wells drilled, abandoned, and destroyed in the Basin.
<b>5. Pursuing Partnership Opportunities</b>			
I.	Continue to promote partnerships that accomplish both local supply reliability and broader regional and statewide benefits.	On-going	Authority staff will promote partnerships as requested by the Board.



<p>II. Continue to track grant opportunities to fund groundwater management activities and local water infrastructure projects.</p>	<p>On-going</p>	<p>The Authority was awarded \$250k AB303 grant in October 2008 to update the Data Management System.</p>
<p><b>COPONENT NO. 2: MONITORING PROGRAM</b></p>		
<p><b>1. Groundwater Elevation Monitoring</b></p>		
<p>I. Coordinate with DWR and others to identify an appropriate group of wells for monitoring a spring 2007 set of groundwater elevation measurements</p>	<p>Complete</p>	<p>SGA, SCWA, and DWR met on January 29, 2004 at the DWR Central Office. The status of the existing wells in the monitoring network was discussed. Some of the wells are questionable for monitoring and the agencies will work together to look for opportunities to replace those wells in the long-term. The wells monitored in Spring 2007 were based on the criteria set in this meeting.</p>
<p>II. Coordinate with DWR and others to ensure that the selected wells are maintained as part of a long-term monitoring network</p>	<p>Complete</p>	<p>SGA, SCWA, and DWR met on January 29, 2004 at the DWR Central Office and explained the importance of their monitoring wells (DWRs) to our overall network and determined that both DWR and SCWA are maintaining long-term monitoring plans in the basin.</p>
<p>III. Coordinate with DWR to ensure that the timing of water level data collection by other agencies coincide within one month of DWR and SCWA data collection (currently DWR and SCWA collect water level data in spring and fall).</p>	<p>Complete</p>	<p>SGA, SCWA, and DWR met on January 29, 2004 at the DWR Central Office to coordinate the timing of water elevation measurements. An April 15 goal was set for the collection of spring water elevation data and an October 15 goal was set for the collection of fall water elevation data. Each participating agency will attempt to collect water elevation data within +/- two weeks of these dates.</p>
<p>IV. Coordinate with other agencies to ensure that needed water level elevations are collected and verify that uniform data collection protocols are used among the agencies.</p>	<p>Complete</p>	<p>The water measurement protocol approved for use by SGA is the same used by SCWA and other agencies in the collection of water level data within the Central Basin.</p>
<p>V. Coordinate with USGS to determine the potential for integrating USGS monitoring wells constructed for the NAWQA program into the SCWA and SGA monitoring network.</p>	<p>On-going</p>	<p>SGA and USGS staff coordinated in 2004 the collection of water elevation data from USGS monitoring wells when the timing of collection is determined. Authority staff will contact SGA and USGS to confirm that this information has been collected for the Central Basin and included in the DMS update.</p>
<p>VI. Consider ways to fill gaps in the monitoring well network by identifying existing wells or identifying opportunities for constructing new monitoring wells.</p>	<p>On-going</p>	<p>As part of the Data Management System update staff will identify gaps in the monitoring well network.</p>
<p>VII. Assess annually groundwater elevation trends and conditions based on the monitoring well network</p>	<p>On-going</p>	<p>In conjunction with future Basin Management Reports, completion of the Data Management System update will provide a tool for making this assessment.</p>

VIII.	Assess annually the adequacy of the groundwater elevation monitoring network	On-going	In conjunction with future Basin Management Reports, completion of the Data Management System update will provide a tool for making this assessment.
IX.	Identify a subset of monitoring wells that will be monitored more frequently than twice annually to improve understanding of aquifer responses to pumping throughout the year	On-going	In conjunction with future Basin Management Reports, completion of the Data Management System update will provide a tool for making this assessment.
<b>2. Groundwater Quality Monitoring</b>			
I.	Coordinate with cooperating agencies to verify that uniform protocols are used when collecting water quality data.	Complete	Each of the member agencies follow DPH protocols in the collection of water quality data.
II.	Coordinate with USGS to obtain historic water quality data for NAWQA wells, determine timing and frequency for monitoring under USGS program, and discuss the potential for integrating USGS monitoring resources with other portion of the Central Basin monitoring network	On-going	Will be coordinated as part of the Data Management System update.
III.	Coordinate with local, state, and federal agencies to identify where wells may exist in areas with sparse groundwater quality data. Identify opportunities for collecting and analyzing water quality samples for those wells.	On-going	Will be coordinated as part of the Data Management System update.
IV.	Assess annually the adequacy of the groundwater quality monitoring well network	On-going	To be assessed through the preparation of future Basin Management Reports.
V.	Coordinate with DWR on the groundwater quality data they collect	On-going	Will be coordinated as part of the Data Management System update.
<b>3. Land Surface Elevation Monitoring</b>			
I.	Investigate the feasibility and costs of resurveying the wells in the Arden-Arcade area, which were last measured in 1991.	On-going	Sacramento Suburban Water District was awarded an AB303 grant to conduct additional surveying of these and other locations in 2006. Authority staff will contact SSWD to obtain the final project report and assess its applicability to the Central Basin.
II.	Coordinate with USGS to ascertain the suitability of the use of Interferometric Synthetic Aperture Radar (InSAR) images of the Central Basin and the surrounding area. If the technology appears suitable, identify the costs of determining ground surface elevations and identify potential cost	Deferred	Survey data from benchmarks in Arden Arcade area indicate that subsidence is not a significant concern at this time. Additionally, the uncertainties associated with InSAR in rapidly growing urban and agricultural areas makes this a low priority at this time

<p>sharing partners.</p>		
<p>III. Coordinate with other agencies, particularly the City and County of Sacramento and the NGS to determine if there are other suitable benchmark locations exist in the area to aid in analysis of potential land surface subsidence.</p>	<p>Deferred</p>	<p>Surveys data from benchmarks in Arden Arcade area indicate that subsidence is not a significant concern at this time. Because of limited staff time this task is being deferred.</p>
<p><b>4. Surface Water Groundwater Interaction Monitoring</b></p>		
<p>I. Work cooperatively with SGA, TNC, OHWD, and the Sacramento Valley Conservancy to compile available stream gage data and information on tributary inflows and diversions from the American, Cosumnes, and Sacramento rivers to quantify net groundwater recharge or discharge between gages in the Central Basin area.</p>	<p>On-going</p>	<p>A memorandum report on available data on the American River was prepared for SGA by MWH on September 22, 2004, which included a summary of known inputs and outputs to the stream budget of the American River. Authority staff will request the memorandum from SGA.</p> <p>SCWA contracted with WRIME to update the Sacramento County IGSM model in 2008. When completed, the model should provide additional data on potential recharge in the Central Basin.</p>
<p>II. Coordinate with local, state, and federal agencies to identify available surface water quality data from the American, Cosumnes, and Sacramento rivers proximate to the Central Basin area.</p> <p>Ensure that surface water flows in other natural and restored streams in the area are not adversely impacted as a result of implementation of the CSCGMP.</p>	<p>On-going</p>	<p>The Sacramento Coordinated Water Quality Management Program completes an annual monitoring report including water quality and flow data at several locations along the American and Sacramento rivers. The Authority will obtain the latest annual report and incorporate this information into the future Basin Management Reports.</p> <p>Authority staff will continue to research to find out if there is any available data for the Cosumnes River. For example, what kind of data has been collected by UC Davis/TNC?</p>
<p>III. Correlate groundwater level data from wells in the vicinity of river stage data to further establish whether the river and groundwater are in direct hydraulic connection, and if surface water is gaining or losing at those points.</p>	<p>On-going</p>	<p>In late 2003, the State Board considered stream aquifer interaction along the American River as part of a fully appropriated stream hearing. Consultant studies associated with the report indicate that the American River is a losing stream along nearly its entirety below Nimbus Dam and that the river is substantially disconnected from the groundwater basin. Because of this data, no studies of the American River are planned at this time. Identify and review any data available for the Cosmnes and Sacramento Rivers.</p>
<p>IV. Continue to coordinate with local, state, and federal agencies and develop partnerships to investigate cost-effective methods that could be applied to better understand surface water-groundwater interaction along the American, Cosumnes, and Sacramento rivers.</p>	<p>On-going</p>	<p>As mentioned above, the result of the fully appropriated stream hearing on the American River in 2003 has made this item a low priority for the American River. Identify and review any data available for the Cosmnes and Sacramento Rivers.</p>

V.	Coordinate with CSUS, to analyze data obtained from recently constructed monitoring wells on the CSUS campus to better understand the relationship between groundwater basin and surface water flows at that location.	On-going	Representatives of SGA met with Dave Evans of CSUS on September 8, 2004. Dr. Evans indicated that several wells on the south side of the American River at CSUS are equipped with pressure transducers, which collect continuous water elevation measurements. Data has been collected, but has not been processed to date.
<b>5. Protocols for Collection of Groundwater Data</b>			
I.	The governance body will develop within one year a Standard Operating Procedure (SOP) for collection of water level data	Complete	The water measurement protocol approved for use by SGA is the same used by SCWA and other agencies in the collection of water level data within the Central Basin.
II.	Provide cooperating agencies with guidelines developed by DPH for the collection, pretreatment, storage, and transportation of water quality samples (DPH, 1995).	Complete	Water purveyors within the Central Basin have been provided a copy of the guidelines developed by DPH for the collection, pretreatment, storage, and transport of water quality samples.
III.	Provide training on implementing the SOPs.	Deferred	Authority staff will investigate to see if the training is necessary. If yes, who is responsible for collecting the data?
<b>6. Data Management System</b>			
I.	Continue to update the DMS with current water purveyor data	On-going	DMS Update project was awarded an AB303 grant in December 2008. This update is scheduled for completion by June 2010
II.	Make recommendations to MWH (or assigned DMS developer) on utilities to add to the DMS to increase its functionality	On-going	Will be coordinated as part of the Data Management System update.
<b>COMPONENT NO. 3: GROUNDWATER RESOURCE PROTECTION</b>			
<b>1. Well Construction Policies</b>			
I.	Ensure that appropriate Sacramento County and Central Basin implementation staff and consultants are provided a copy of the County Well Ordinance and understand proper well construction procedures.	Complete	Dana Booth, from the Sacramento County's EMD gave a presentation on the County's Well Ordinance to the Board on October 10, 2007. A copy of the County's Well Ordinance was provided to the member agencies afterward.
II.	Adhere to Sacramento County's Consultation Zone and provide a copy of the boundary of the prohibition zone to appropriate agencies within the central basin.	Deferred	Authority staff will contact RWQCB to obtain a copy of the latest version of the Sacramento County Special Consultation Zone Groundwater Plume Site report.
III.	Provide a copy of the most recently delineated	Deferred	After obtain the report mentioned above, Authority staff will provide a

	plume extents at Mather Field and Aerojet/Boeing to EMD and appropriate staff for their review and possible use.		copy to EMD staff for their review and appropriate use. Authority staff will also check EMD to see if they are regularly updated on this by RWQCB.
IV.	Coordinate with other groundwater users in the Central Basin to provide guidance, as appropriate, on well construction.	Complete	Dana Booth, from the Sacramento County's EMD gave a presentation on the County's Well Ordinance to the Board on October 10, 2007. Representatives of the major water purveyors in the Central Basin were in attendance.
V.	Where feasible and appropriate, use subsurface geophysical tools prior to construction of the well to assist in well design.	Complete	The design, construction, and development of municipal wells in the Central Basin take full advantage of available geophysical tools.
<b>2. Well Abandonment and Destruction Policies</b>			
I.	Complete a survey similar to one conducted in the North Basin of abandoned and/or destroyed wells in the Central Basin and populate DMS with data.	On-going	Authority staff will contact SGA to find out the details about the survey conducted in the North Basin, and coordinate with WRIME for DMS population.
II.	Ensure that all public and private agencies in the Central Basin are provided a copy of the County Well Ordinance and that they understand proper well destruction procedures, and support implementation of these procedures.	Complete	Dana Booth, from the Sacramento County's EMD gave a presentation on the County's Well Ordinance to the Board on 10/10/2007. As part of this discussion County well destruction policies and procedures were covered. A copy of the County's Well Ordinance was provided to the member agencies afterward.
III.	Follow up with cooperating agencies and EMD on reported abandoned and/or destroyed wells to confirm the information collected from DWR.	Deferred	Because of limited staff time, this item is being deferred.
IV.	Obtain copies of any information on abandoned and/or destroyed wells in the Central Basin from EMD or other regulatory agencies to fill any gaps in the governance body's records.	Deferred	Because of limited staff time, this item is being deferred.
V.	Meet with EMD to discuss ways to ensure that wells in the Central Basin are properly abandoned or destroyed.	Deferred	Because of limited staff time, this item is being deferred.
VI.	Obtain and review a copy of a "wildcat map" from California Division of Oil and Gas to ascertain the extent of historic gas well drilling operations in the area as these wells could function as conduits of contamination if not properly destroyed. It should be noted that EMD has no jurisdiction over gas	Deferred	Because of limited staff time, this item is being deferred.

wells.		
<b>3. Well Protection Measures</b>		
I. Request that public water purveyor agencies within the Central Basin provide vulnerability summaries from the DWSAP to the basin governance body to be used for guiding management decisions in the basin.	Complete	The information is available online at: <a href="http://swap.ice.ucdavis.edu/TSinfo/TSsystemc.asp?myCounty=34">http://swap.ice.ucdavis.edu/TSinfo/TSsystemc.asp?myCounty=34</a>
II. Contact groundwater basin managers in other areas of the state for technical advice, effective management practices, and “lesson learned” regarding establishing well head protection areas.	Deferred	Because of limited staff time this item is being deferred.
<b>4. Protection of Recharge Areas</b>		
I. Continue to work with mining companies, TNC, and SSCAWA to explore the possibilities for enhancing recharge into the Central Basin.	Deferred	Because of limited staff time, this item is being deferred.
<b>5. Control of the Migration and Remediation of Contaminated Groundwater</b>		
I. Coordinate with appropriate regulatory agencies (EMD, DTSC, EPA, RWQCB, and DPH) and known responsible parties (such as Aerojet, the Air Force, and Kiefer Landfill) to develop a network of monitoring wells to act as sentry wells for public supply wells.	Deferred	Because of limited staff time, this item is being deferred.
II. If detections occur in these monitoring wells, meet with the appropriate regulatory agencies and responsible parties to develop strategies to minimize the further spread of contaminants.	Deferred	Because of limited staff time, this item is being deferred.
III. Use the information on mapped contaminant plumes and LUST sites in developing groundwater extraction patterns and in locating future production or monitoring wells.	Deferred	Because of limited staff time, this item is being deferred.
IV. Meet with representatives of EMD and RWQCB to establish a mutual understanding about the basin governance body’s groundwater management responsibilities. Identify ways to have open and expedited communication with EMD regarding any new occurrence of LUSTs, particularly when contamination is believed to have reached the	Deferred	Because of limited staff time, this item is being deferred.

groundwater.		
<b>6. Control of Saline Water Intrusion</b>		
I. Track the progression, if any, of saline water bodies moving toward the east from the Delta. Because this is a highly unlikely scenario, this action will be limited to communicating with DWR's Central District Office on a biennial basis to check for significant changes in TDS concentrations in wells. DWR has a regular program of sampling water quality in select production wells throughout the adjacent Solano, San Joaquin, and Yolo counties. This program will serve as an early warning system for potential saline water intrusion from the Delta.	Deferred	Because of limited staff time, this item is being deferred.
II. Observe TDS concentrations in municipal wells that are routinely sampled under CCR Title 22. These data will be readily available as part of the DMS and will be reported on in the annual State of the Basin Report.	On-going	To be assessed in future Basin Management Reports as more temporal data becomes available.
III. Inform all stakeholders of the presence of the salinity interface and the approximate depth to the interface for their reference when locating potential wells. EMD, which issues well permits, is aware of the interface. SCWA will provide a map to EMD indicating the contour of the elevation of the base of fresh water in Sacramento County for its reference when issuing well permits.	On-going	No action on this item will be taken until after Authority staff has had an opportunity to discuss the TDS data from the Delta with DWR Central District staff.
<b>COMPONENT NO. 4: GROUNDWATER SUSTAINABILITY</b>		
<b>1. Conjunctive Management Activities</b>		
I. Continue to investigate conjunctive use opportunities within the Central Basin area. Groundwater users within the Central Basin will coordinate any recharge efforts.	On-going	The Authority will assist any member upon request. Currently, the American River Basin Integrated Regional Water Management Planning Program is an on-going program under the RWA umbrella. This program identifies opportunities and facilities for implementing expanded conjunctive use in the region.  Ultimately, the Authority will prepare a Water Accounting Framework for the Central Basin whereby participating members and others can establish groundwater banks to further promote conjunctive use.

		<p>Present activities include:</p> <ol style="list-style-type: none"> <li>1. On October 8, 2008, Larry Rodriguez with RBI Inc. and Michael Wackman with SSCAWA made a presentation to the Board on a groundwater banking project that would support the Cosumnes River Flow Augmentation Pilot Project.</li> <li>2. On February 11, 2009, Curtis Hanford, who owns a parcel between the Cosumnes River and Deer Creek, made a presentation to the Board regarding his proposal to sell percolated flood water to municipal users.</li> <li>3. EBMUD staff has approached the Authority, in conjunction with developing their 2040 Water Plan, and expressed an interest in investigating groundwater recharge opportunities in the Central Basin.</li> </ol>
<p>II. Continue to investigate opportunities for development of direct recharge facilities in addition to in-lieu recharge (e.g., injection wells or surface spreading facilities, through constructed recharge basins or in riverbeds or streambeds)</p>	<p>On-going</p>	<p>As part of Sacramento County's General Plan Update SCWA is considering direct recharge facilities as a way to meet projected water demands for new growth areas.</p>
<p><b>2. Demand Reduction</b></p>		
<p>I. Participate in RWA's WEP to ensure that Central Basin purveyor conservation efforts are focused and effective. For those who receive wholesale water supplies, the governance body of the Central Basin will ensure that they are informed of the benefits and regional importance of participating in the WEP.</p>	<p>Deferred</p>	<p>Because of limited staff time, this item is being deferred.</p>
<p>II. The basin governance body shall develop BMPs for self-served agricultural and agricultural residential water users.</p>	<p>Deferred</p>	<p>Because of limited staff time, this item is being deferred.</p>
<p>III. Coordinate with SRCSD to investigate further opportunities for expanded use of recycled water throughout the Central Basin.</p>	<p>On-going</p>	<p>SRCS D completed a Recycled Water Opportunity Study in 2006 to identify potential recycled water users in Sacramento County. One of the goals of this plan was to identify between 30 and 40 mgd of recycled water use throughout the County. A number of feasibility studies conducted after completion of the Study found that many of the proposed projects were infeasible. SRCSD does continue to pursue expanded recycled water use opportunities in the Elk Grove area.</p>



COMPONENT NO. 5: PLANNING INTEGRATION		
<b>1. Existing Integrated Planning Efforts</b>		
I. Integrated Groundwater and Surface Water Modeling		
a. Prepare and adopt a formal integrated water management plan in accordance with CWC § 10540 et seq. The plan will include, but not limited to, the elements listed above. The Central Basin governance body will seek to form an ad hoc committee with SCWA, RWA, SSCAWA, and TNC to determine which agency would be most appropriate to prepare that plan and to update and make use of the IGSM model.	Deferred	Because of limited staff time, this item is being deferred.
b. Review the Water Forum Land Use procedures and make recommendations on the type of role, if any, the basin governance body should take with respect to land use decisions within the basin.	Deferred	Because of limited staff time, this item is being deferred.

**Table A-3. SCGA Public Outreach Plan**

**PROJECT GOAL: Implementation of the CSCGMP.**

**PUBLIC OUTREACH GOAL: Inform stakeholders and public regarding the CSCGMP implementation effort and solicit input.**

Target Audience	Objectives	Messages	Strategies	Tactics
<b>Inter-SCGA</b>				
<ul style="list-style-type: none"> <li>• SCGA Board Members</li> </ul>	<ul style="list-style-type: none"> <li>◆ Maintain a clear member awareness of CSCGMP BMO's, implementation schedule, and key political issues.</li> <li>◆ Keep members apprised of any impending breach of BMO "trigger point" monitoring levels.</li> <li>◆ <i>Maintain a high level of involvement by stakeholders.</i></li> <li>◆ Production of a "State of the Basin" report.</li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Management actions taken by the basin governance body may impact a broad range of individuals and agencies that have a stake in the successful management of the basin. (3-8)</i></li> <li>◆ A GMP is designed to be equitable for large and small stakeholders.(L&amp;C:25)                             <ul style="list-style-type: none"> <li>▪ Implementing a groundwater management program will help small stakeholders overcome the political and financial challenges of independent participation in (?).</li> </ul> </li> <li>◆ While SCGA believes in local control, there is a tremendous value in regional planning and participating in projects that also may benefit areas outside our region.(L&amp;C:25)                             <ul style="list-style-type: none"> <li>▪ Funding will be more accessible if a GMP details a regional plan capable of producing broader, statewide benefits.</li> <li>▪ A groundwater management program may help investor-owned utilities demonstrate the need for rate increases.</li> </ul> </li> <li>◆ The goal is to develop a cooperative program with the SCGA member agencies that is implemented within the framework established by the Water Forum Agreement. (L&amp;C:25)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Ongoing internal information sharing to full SCGA membership.</li> <li>◆ Formation of inter-board member advisory committees.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Hold regularly scheduled SCGA Board Member meetings.</li> <li>◆ As needed, the basin governance body will discuss the formation of advisory committees that will provide guidance in the implementation of the Master Plan or in rectifying the breach of BMO monitoring trigger points.</li> <li>◆ Create and utilize DMS.</li> <li>◆ <i>Board to discuss continuation of advisory committees that will provide guidance in the implementation of the GMP. (3-10)</i></li> </ul>
	<ul style="list-style-type: none"> <li>◆ <i>Regional planning integration. (3.2.5)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>With a large number of water purveyors that serve the greater Sacramento area, the need to integrate water management planning on a regional scale is a high priority. (3-21)</i></li> </ul>		<ul style="list-style-type: none"> <li>◆ IRWMP participation.</li> <li>◆ <i>The basin governance body will encourage that all retail purveyors submit Urban Management Plans to DWR. (3-21)</i></li> </ul>

**PROJECT GOAL: Implementation of the CSCGMP.**

**PUBLIC OUTREACH GOAL: Inform stakeholders and public regarding the CSCGMP implementation effort and solicit input.**

Target Audience	Objectives	Messages	Strategies	Tactics
<b>Political Partnerships</b>				
<ul style="list-style-type: none"> <li>• Regional partners within and adjacent to the Central Basin:</li> <li>• SGA</li> <li>• SSCAWA</li> <li>• TNC</li> <li>• San Joaquin Co.</li> <li>• RWA</li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>CSCGMP Program Component No. 1 - Stakeholder Involvement (3.2.1):</i> <ul style="list-style-type: none"> <li>• <i>Involving Other Agencies Within and Adjacent to the Central Basin (3.2.1.2)</i></li> </ul> </li> <li>◆ <i>Expansion of a basin-wide conjunctive use program to achieve broader regional and statewide benefits. (3-10)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>The basin governance body is committed to facilitating arrangements at the local, state, and, federal levels. (3-10)</i></li> <li>◆ <i>The goal is to develop a cooperative program with the SCGA member agencies that is implemented within the framework established by the Water Forum Agreement. (L&amp;C:25)</i></li> <li>◆ <i>Groundwater management by the SCGA will significantly improve the reliability of water supply in the Sacramento region (Central Basin?), especially in times of drought. (L&amp;C:26)</i></li> <li>◆ <i>While SCGA believes in local control, there is a tremendous value in regional planning and participating in projects that also may benefit areas outside our region. (L&amp;C:25)</i> <ul style="list-style-type: none"> <li>• <i>Funding will be more accessible if a GMP details a regional plan capable of producing broader, statewide benefits.</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Meet with representatives of SGA, SSCAWA, TNC, San Joaquin Co., CSCGF, WFSE. (3-9)</i></li> <li>◆ <i>Pursue partnership opportunities. (3.2.1.5)</i></li> <li>◆ <i>WFSE briefing.</i></li> <li>◆ <i>Participate in the implementation of the IRWMP.</i></li> <li>◆ <i>Utilize SCGA Website.</i></li> <li>◆ <i>Create and utilize DMS.</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Coordinate CSCGMP activities and work to the extent practicable with adjacent groundwater management entities, water interest groups, and state and federal regulatory agencies that have jurisdiction in areas related to CSCGMP activities. (3-9)</i></li> <li>◆ <i>Coordinate meetings with commercial/industrial self-supplied pumpers within the basin to inform them of the management responsibilities and activities relative to the CSCGMP. (3-9)</i></li> <li>◆ <i>Coordinate meetings outside of the CSCGF with agricultural and agricultural-residential self-supplied pumpers within the basin to inform them of the management responsibilities and activities relative to the CSCGMP. (3-9)</i></li> <li>◆ <i>Maintain a high level of involvement by stakeholders in implementing the CSCGMP by continued participation with the various stakeholders listed in section 3.2.1.3 of the CSCGMP. (3-9)</i></li> <li>◆ <i>Promote partnerships that accomplish both local supply reliability and broader regional and statewide benefits. (3-11)</i></li> <li>◆ <i>Track grant opportunities to fund groundwater management activities and local water infrastructure projects. (3-11)</i></li> <li>◆ <i>Provide copies of GMP and subsequent annual reports to SGA, SSCAWA, TNC, San Joaquin Co. (3-9)</i></li> </ul>
	<ul style="list-style-type: none"> <li>◆ <i>CSCGMP Program Component No. 5 - Regional planning integration. (3.2.5):</i> <ul style="list-style-type: none"> <li>• <i>Integrated Groundwater and Surface Modeling (3.2.5.1.4)</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>By assuming custodial authority of the IGSM, the Basin Governance body will seek to increase its relevancy with respect to the regional planning efforts of the Bureau of Reclamation and DWR for projects such as ARWRI, CVPIA, and the CALFED process. (3-22)</i></li> <li>◆ <i>The IGSM forms the basis for the WFA and the Zone 40 WSMP environmental analyses. (3-22)</i></li> <li>◆ <i>The IGSM is a suitable tool to analyze the effects of local projects on regional groundwater conditions. (3-22)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Preparation and adoption of a formal integrated water management plan (IWMP) in accordance with CWC § 10540 et seq. (3-22)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>The Central Basin governance body will seek to form an ad hoc committee with SCWA, RWA, SSCAWA, and the TNC to determine which agency would be most appropriate to prepare a IWMP and to update and make use of the IGSM. (3-22)</i></li> </ul>

**PROJECT GOAL: Implementation of the CSCGMP.**

**PUBLIC OUTREACH GOAL: Inform stakeholders and public regarding the CSCGMP implementation effort and solicit input.**

Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• SGA</li> <li>• SSCAWA</li> <li>• TNC</li> <li>• San Joaquin Co.</li> <li>• RWA</li> <li>• USGS</li> <li>• SMUD</li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>CSCGMP Program Component No. 2 - Monitoring Program (3.2.2):</i> <ul style="list-style-type: none"> <li>• <i>Groundwater elevation monitoring. (3.2.2.1)</i></li> </ul> </li> <li>◆ <i>BMO No. 2: Maintain specific groundwater elevations within all areas of the basin consistent with the Water Forum "solution". (3-23)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Determining and maintaining the health of the Central Basin is the governance body's foremost concern and is accomplished through data collection and evaluation, remedial and/or restorative actions if necessary, and reporting. (4-1)</i></li> <li>◆ <i>A monitoring methodology to meet specific objectives requires a systematic, repeatable, and scientific approach. (4-1)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Coordinate CSCGMP activities with adjacent groundwater management.</i></li> <li>◆ <i>Promote partnerships that accomplish both local supply reliability and broader regional and statewide benefits.</i></li> <li>◆ <i>Pursue partnership opportunities. (3.2.1.5)</i></li> <li>◆ <i>Involve other agencies within and adjacent to the Central Basin. (3.2.1.1)</i></li> <li>◆ <i>Develop a standard operating procedure for collecting water level data.</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Coordinate with DWR and others to identify an appropriate group of wells for monitoring. (3-12)</i></li> <li>◆ <i>Coordinate with DWR and other to ensure that selected wells are maintained as part of a long-term monitoring network. (3-12)</i></li> <li>◆ <i>Coordinate with DWR to ensure that water level data collected by other agencies is collected within one month of DWR and SCWA data collection. (3-12)</i></li> <li>◆ <i>Coordinate with other agencies to ensure that needed water level elevations are collected and that uniform data collection protocols are used among the agencies. (3-12)</i></li> <li>◆ <i>Coordinate with USGS to determine the potential for integrating NAWQA wells into the SCWA and SGA monitoring network. (3-12)</i></li> <li>◆ <i>Track grant opportunities to fund groundwater management activities and local water infrastructure projects. (3-11)</i></li> <li>◆ <i>Participate in the implementation of the IRWMP.</i></li> <li>◆ <i>Create and utilize DMS.</i></li> <li>◆ <i>Utilize SCGA Website.</i></li> <li>◆ <i>Meet with representatives of SGA, SSCAWA, TNC, San Joaquin Co., CSCGF, WFSE.</i></li> </ul>

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Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• SGA</li> <li>• SSCAWA</li> <li>• TNC</li> <li>• San Joaquin Co.</li> <li>• RWA</li> <li>• USGS</li> <li>• SMUD</li> </ul>	<ul style="list-style-type: none"> <li>◆ CSCGMP Program Component No. 2 - Monitoring Program (3.2.2):                             <ul style="list-style-type: none"> <li>• Land Surface Elevation Monitoring (3.2.2.3)</li> </ul> </li> <li>◆ BMO No. 3: Protect against any potential inelastic land surface subsidence by limiting subsidence to no more than 0.007 feet per 1 foot of draw down in the groundwater basin.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Land subsidence can cause significant damage to essential infrastructure. Historic land surface subsidence with the Central Basin has been minimal, with no known significant impacts to existing infrastructure. Given historical trends, the potential for land surface subsidence from groundwater extraction in the Central Basin appears to be remote. (3-3)</li> <li>◆ While some measurements have been made to determine the level of subsidence in the Sacramento area, some concern exists regarding the accuracy of the measurements and the sufficiency of the data. (4-5)</li> <li>◆ Subsidence should be measured and thought of as a long-term process. (4-5)</li> <li>◆ The North and Central Basins should collaborate to gain a better understanding of subsidence. (4-5)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Pursue additional actions to continue to monitor potential land surface subsidence especially in the Central Basin. (3-13)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Coordinate with USGS to ascertain the suitability of the use of Interferometric Synthetic Aperture Radar images. If the technology appears suitable, identify the costs of determining ground surface elevations and identify potential cost-sharing partners. (3-14)</li> <li>◆ Coordinate with other agencies, particularly the City and County of Sacramento and the National Geodetic Survey, to determine if there are other existing suitable benchmark locations in the area to aid in analysis of potential land surface subsidence. (3-14)</li> </ul>

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Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• SGA</li> <li>• SSCAWA</li> <li>• TNC</li> <li>• San Joaquin Co.</li> <li>• RWA</li> <li>• USGS</li> <li>• SMUD</li> </ul>	<ul style="list-style-type: none"> <li>◆ CSCGMP Program Component No. 2 - Monitoring Program (3.2.2):                             <ul style="list-style-type: none"> <li>▪ Surface Water/Groundwater Interaction Monitoring (3.2.2.4)</li> </ul> </li> <li>◆ BMO No. 4: Protect against any adverse impacts to surface water flows in the American Consumnes, and Sacramento rivers.</li> </ul>	<ul style="list-style-type: none"> <li>◆ The SCGA is committed to the objectives of the WFA, which include preserving the fishery, wildlife, recreational, and aesthetic values of the lower American River. The CSCGMP also includes goals to restore and preserve the fishery, wildlife, recreational, and aesthetic resources of the lower Consumnes River and to assure stable supply of water for agriculture in the lower Consumnes River floodplain area. (3-7)</li> <li>◆ It is the intent of the CSCGMP that controllable operations of the groundwater system would not negatively impact the water quality of the area's rivers and streams. The basin governance body will seek to gain a netter understanding, in cooperation with SGA and others, of the potential impacts of discharging local area groundwater to major rivers adjacent to the Central Basin. (3-7)</li> </ul>	<ul style="list-style-type: none"> <li>◆ The basin governance body shall coordinate with other responsible regional, county, and local agencies to ensure that surface water flows in the other natural and restored streams in the area are not adversely impacted as a result of implementation of the CSCGMP. (3-7)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Work cooperatively with SGA, TNC and OHWD to compile available stream gage data and information on tributary inflows and diversions from the American, Cosumnes and Sacramento rivers to quantify net groundwater recharge or discharge between gages in the Central Basin area. (3-14)</li> <li>◆ Coordinate with local, state and federal agencies to identify available surface water quality data from the American, Cosumnes and Sacramento rivers proximate to the Central Basin. (3-14)</li> <li>◆ Continue to coordinate with local, state and federal agencies and develop partnerships to investigate cost-effective methods that could be applied to better understand surface water-groundwater interaction along the American, Cosumnes and Sacramento rivers. (3-15)</li> <li>◆ Coordinate with CSUS to analyze data obtained from recently constructed monitoring wells on the CSUS campus to better understand the relationship between the groundwater basin and surface water flows at that location. (3-15)</li> </ul>

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Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• SGA</li> <li>• SSCAWA</li> <li>• TNC</li> <li>• San Joaquin Co.</li> <li>• RWA</li> <li>• USGS</li> <li>• SMUD</li> </ul>	<ul style="list-style-type: none"> <li>◆ CSCGMP Program Component No. 2 - Monitoring Program (3.2.2):                             <ul style="list-style-type: none"> <li>▪ Groundwater Quality Monitoring (3.2.2.2)</li> </ul> </li> <li>◆ BMO No. 5: Water Quality Objectives</li> </ul>	<ul style="list-style-type: none"> <li>◆ Many of the wells in the Central Basin are used for public water supply and an extensive record of water quality data is available for most wells. Water purveyors have compiled available historic water quality data for constituents monitored as required by DHS under CCR Title 22. This level of monitoring is sufficient under regulatory guidelines to ensure that the public is provided with a safe drinking water supply. (3-12)</li> <li>◆ Ultimately, it may be advisable to have in place a network of shallow sentry wells to serve as an early warning system for contaminants that could make their way to greater depths in the basin where groundwater purveyors primarily extract groundwater. (3-12)</li> <li>◆ CCR Title 22 water quality reporting is required by DHS for each public drinking water source with the Central Basin. The Central Basin monitoring network includes these wells. (3-12)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Identify appropriate set of water quality monitoring wells.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Coordinate with cooperating agencies to verify that uniform protocols are being used when collecting water quality data. (3-12)</li> <li>◆ Coordinate with USGS to obtain historic water quality data for NAWQA wells, determine timing and frequency of monitoring under USGS program and discuss the potential for integrating USGS monitoring resources with other portions of the monitoring network. (3-12)</li> <li>◆ Coordinate with other local, state and federal agencies to identify where wells may exist in areas with sparse groundwater quality data. Identify opportunities for collecting and analyzing water quality samples from those wells. (3-12)</li> <li>◆ Coordinate with DWR on the groundwater quality data they collect. (3-12)</li> </ul>

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Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• SGA</li> <li>• SSCAWA</li> <li>• TNC</li> <li>• San Joaquin Co.</li> <li>• RWA</li> <li>• USGS</li> <li>• SMUD</li> <li>• Sacramento County Environmental Management Department (EMD)</li> </ul>	<ul style="list-style-type: none"> <li>◆ CSCGMP Program Component No. 3 - Groundwater resource protection:                             <ul style="list-style-type: none"> <li>• Well Construction Policies (3.2.3.1)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ The basin governance body considers groundwater resource protection a critical component in maintaining a sustainable groundwater resource. (3-16)</li> <li>◆ The Sacramento County Environmental Management Department (EMD) administers the well permitting program for Sacramento County. (3-16)</li> <li>◆ In addition to general well construction standards, Sacramento County has a policy of special review by appropriate regulatory agencies before granting a well permit within 2,000 feet of a known contaminant plume (referred to as Consultation Zones). Prohibitions have been established by various State regulatory agencies for drilling new public supply wells at Mather Field or near the Aerojet or Boeing facilities. As part of the development of the DMS, the extent of contaminant plumes associated with MatherField, Aerojet, and Boeing were delineated for SGA and SCWA. (3-16)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Adhere to Sacramento County's Consultation Zone and provide a copy of the boundary of the prohibition zones to appropriate agencies within the Central Basin. (3-16)</li> <li>◆ Ensure that appropriate Sacramento County and Central Basin implementation staff and consultants are provided a copy of the County Well Ordinance and understand proper well construction procedures. (3-16)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Provide a copy of the most recently delineated plume extents at Mather Field and Aerojet/Boeing to EMD and appropriate staff for their review and possible use. (3-16)</li> <li>◆ Coordinate with other groundwater users in the Central Basin to provide guidance, as appropriate, on well construction. (3-16)</li> </ul>
	<ul style="list-style-type: none"> <li>◆ CSCGMP Program Component No. 3 - Groundwater Resource Protection:                             <ul style="list-style-type: none"> <li>• Well Abandonment and Deconstruction Policies. (3.2.3.2)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ EMD administers the well destruction program for Sacramento County. The standards for well destruction are identified in the County Well Ordinance. A concern of the basin governance body and EMD is that many abandoned supply wells have not been properly destroyed. As part of development of the DMS for SGA, DWR well records for all known wells in the North Basin were reviewed for reported destruction. Based on the information provided, each well was then rated based on the level of confidence that the well in question was actually destroyed properly. This information was then entered into the DMS. (3-16, 17)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Ensure that all public and private agencies in the Central Basin are provided a copy of the County Well Ordinance and that they understand proper well destruction procedures, and support implementation of these procedures. (3-17)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Follow up with cooperating agencies and EMD on reported abandoned and/or destroyed wells to confirm the information collected from DWR. (3-17)</li> <li>◆ Obtain copies of any information on abandoned and/or destroyed wells in the Central Basin from EMD or other regulatory agencies to fill any gaps in the governance body's records. (3-17)</li> <li>◆ Meet with EMD to discuss ways to ensure that wells in the Central Basin are properly abandoned or destroyed. (3-17)</li> </ul>



**PROJECT GOAL: Implementation of the CSCGMP.**

**PUBLIC OUTREACH GOAL: Inform stakeholders and public regarding the CSCGMP implementation effort and solicit input.**

Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• DHS</li> </ul>	<ul style="list-style-type: none"> <li>◆ CSCGMP Program Component No. 3 - Groundwater Resource Protection:                             <ul style="list-style-type: none"> <li>• Wellhead Protection Measures (3.2.3.3)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ Identification of wellhead protection areas is an element of the Drinking Water Source Assessment and Protection (DWSAP) program administered by DHS. (3-17)</li> <li>◆ DHS set a goal for all water systems statewide to complete Drinking Water Source Assessments by mid-2003. Most water purveyors in the basin have completed their required assessments by performing the three major elements required by DHS (3-17):                             <ul style="list-style-type: none"> <li>• Delineation of capture zones around sources (wells).</li> <li>• Inventory of PCAs within protection areas.</li> <li>• Vulnerability analysis to identify the PCAs to which the source is most vulnerable.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ PCA and capture zone information from the DWSAP will need to be added into the DMS. (3-17)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Request that public water purveyor agencies within the Central Basin provide vulnerability summaries from the DWSAP to the basin governance body to be used for guiding management decisions in the basin. (3-17, 18)</li> <li>◆ Contact groundwater basin managers in other areas of the state for technical advice, effective management practices, and "lessons learned" regarding establishing wellhead protection areas. (3-18)</li> </ul>
<ul style="list-style-type: none"> <li>• TNC</li> <li>• SSCAWA</li> <li>• Mining Companies</li> </ul>	<ul style="list-style-type: none"> <li>◆ CSCGMP Program Component No. 3 - Groundwater Resource Protection:                             <ul style="list-style-type: none"> <li>• Protection of Recharge Areas (3.2.3.4)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ Surface geology within and directly adjacent to the Central Basin's boundary was investigated as part of the 1993 Sacramento County General Plan for the purpose of delineating areas of potentially high recharge. Much of the surface area considered to have the highest potential for recharge along the American River is developed. Other recharge areas identified in the Sacramento County General Plan include areas around and adjacent to the streams that flow along and across the Central Basin such as the Cosumnes River and Morrison stream group. (3-18)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Track the progress and results of the pilot recharge program (coordinated through the Water Forum, SCWA, TNC, and SSCAWA) that conveys American River water through the Folsom South Canal and then discharges it to the Cosumnes River at the canal crossing. (3-18)</li> </ul>	<ul style="list-style-type: none"> <li>◆ Continue to work with mining companies, TNC, and SSCAWA to explore the possibilities for enhancing recharge into the Central Basin. (3-18)</li> </ul>

**PROJECT GOAL: Implementation of the CSCGMP.**

**PUBLIC OUTREACH GOAL: Inform stakeholders and public regarding the CSCGMP implementation effort and solicit input.**

Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• EMD</li> <li>• DHS</li> <li>• DTSC</li> <li>• EPA</li> <li>• RWQCB</li> </ul>	<p>◆ <i>CSCGMP Program Component No. 3 - Groundwater Resource Protection:</i></p> <ul style="list-style-type: none"> <li>• <i>Control of the Migration and Remediation of Contaminated Groundwater (3.2.3.5)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Major sources of contamination within the Central Basin are primarily from Mather Field, Aerojet, Boeing, and various active and inactive landfill sites. (3-18)</i></li> <li>◆ <i>Also of concern is localized contamination by industrial/commercial point sources such as dry cleaning facilities and numerous fuel stations throughout the basin. (3-18)</i></li> <li>◆ <i>While the basin governance body does not have the authority or responsibility for remediation of this contamination, it is committed to coordinating with responsible parties and regulatory agencies to stay informed on the status and disposition of known contamination in the basin. (3-18)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Coordinate with responsible parties and regulatory agencies to stay informed on the status and disposition of known contamination in the basin. (3-18)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Coordinate with appropriate regulatory agencies (EMD, DTSC, EPA, and DHS) and known responsible parties to develop a network of monitoring wells to act as sentry wells for public supply wells. (3-18)</i></li> <li>◆ <i>If detections occur in these monitoring wells, meet with the appropriate regulatory agencies and responsible parties to develop strategies to minimize the further spread of contaminants. (3-19)</i></li> <li>◆ <i>Meet with representatives of EMD and RWQCB to establish a mutual understanding about the basin governance body's groundwater management responsibilities. Identify ways to have open and expedited communication with EMD regarding any new occurrences of LUSTs, particularly when contamination is believed to have reached the groundwater. (3-19)</i></li> </ul>
<ul style="list-style-type: none"> <li>• DWR Central Office</li> <li>• EMD</li> <li>• All Central Basin Stakeholders</li> </ul>	<p>◆ <i>CSCGMP Program Component No. 3 - Groundwater Resource Protection:</i></p> <ul style="list-style-type: none"> <li>• <i>Control of Saline Water Intrusion (3.2.3.6)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Saline water intrusion from the Sacramento/San Joaquin Delta (Delta) is not currently a problem in the Central Basin, and is not expected to become a problem in the future. Higher groundwater elevations associated with recharge from the American and Sacramento rivers have maintained a historical positive gradient, preventing significant migration of any saline water from the Delta into the Sacramento County region. These groundwater gradients will continue to serve to prevent any localized pumping depressions in the basin from inducing flow from the Delta into the Central Basin. (3-19)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Track the progression, if any, of saline water bodies moving toward the east from the Delta. Because this is a highly unlikely scenario, this action will be limited to communicating with DWR's Central District Office on a biennial basis to check for significant changes in TDS concentrations in wells. DWR has a regular program of sampling water quality in select production wells throughout the adjacent Solano, San Joaquin, and Yolo counties. This program will serve as an early warning system for potential saline water intrusion from the Delta. (3-19)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Inform all stakeholders of the presence of the salinity interface and the approximate depth to the interface for their reference when locating potential wells. EMD, which issues well permits, is aware of the interface. SCWA will provide a map to EMD indicating the contour of the elevation of the base of fresh water in Sacramento County for its reference when issuing well permits. (3-19)</i></li> </ul>

**PROJECT GOAL: Implementation of the CSCGMP.**

**PUBLIC OUTREACH GOAL: Inform stakeholders and public regarding the CSCGMP implementation effort and solicit input.**

Target Audience	Objectives	Messages	Strategies	Tactics
<b>Technical Partnerships</b>				
<ul style="list-style-type: none"> <li>• Central Basin Stakeholders</li> <li>• City of Roseville</li> <li>• SCWA</li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>CSCGMP Program Component No. 4 - Groundwater Sustainability.</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Conjunctive management is a program that includes both conjunctive use and the development of banking and exchange opportunities with local in-basin partners after local needs are met. (3-20)</i></li> <li>◆ <i>The SCGA and SCWA are also interested in direct recharge and propose to investigate a variety of ways to recharge water into available storage space in the basin. (3-20)</i></li> <li>◆ <i>Opportunities for direct recharge exist through the use of recharge basins (e.g., abandoned aggregate mining pits) or through a aquifer storage and recovery (ASR) program. The City of Roseville is currently implementing an ASR program where treated surface water is injected into the groundwater and then recovered in the summer months and dry years through groundwater wells. The success of this program will be monitored closely by the SCGA. (3-20)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Continue to investigate conjunctive use opportunities within the Central Basin area. Groundwater users within the Central Basin will coordinate any recharge efforts. (3-20)</i></li> <li>◆ <i>Continue to investigate opportunities for development of direct recharge facilities in addition to in-lieu recharge (e.g., injection wells or surface spreading facilities, through constructed recharge basins or in riverbeds or streambeds). (3-20)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Coordinate with SCWA and other Central Basin groundwater users to investigate and develop groundwater recharge opportunities.</i></li> <li>◆ <i>Coordinate with SCWA and other Central Basin groundwater users to investigate and develop conjunctive use opportunities.</i></li> <li>◆ <i>Establish contact with the City of Roseville for the purpose of tracking the success of their ASR program.</i></li> </ul>
<ul style="list-style-type: none"> <li>• RWA</li> <li>• DWR</li> <li>• SRCD</li> <li>• WFSE</li> <li>• Bureau of Reclamation</li> <li>• Self-served agricultural and agricultural-residential water users.</li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>CSCGMP Program Component No. 4 - Groundwater Sustainability:</i> <ul style="list-style-type: none"> <li>• <i>Demand Reduction (3.2.4.1)</i></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>An important factor in maintaining the sustainable yield of the basin is by reducing demand for potable water supplies through conservation and the use of recycled water for landscape irrigation. (3-20)</i></li> <li>◆ <i>RWA's efforts in developing and implementing a regional Water Efficiency Program (WEP) are well recognized by SCGA. (3-20)</i></li> <li>◆ <i>The SRCSD is developing a countywide Water Recycling Master Plan to provide up to 40 MGD of recycled water. (3-20)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>The SCGA will work closely with the Water Forum Successor Effort and RWA to ensure that all applicable cost-effective BMPs are implemented in the Central Basin urban areas. (3-20)</i></li> <li>◆ <i>The SCGA shall develop BMPs for self-served agricultural and agricultural-residential water users. These BMPs will be based on applicable Reclamation and DWR data and recommendations. (3-20)</i></li> </ul>	<ul style="list-style-type: none"> <li>◆ <i>Participate in RWA's WEP to ensure that Central Basin purveyor conservation efforts are focused and effective. For those who receive wholesale water supplies, the governance body of the Central Basin will ensure that they are informed of the benefits and regional importance of participating in the WEP. (3-20)</i></li> <li>◆ <i>The SCGA shall develop BMPs for self-served agricultural and agricultural-residential water users. (3-21)</i></li> <li>◆ <i>Coordinate with SRCSD to investigate further opportunities for expanded use of recycled water throughout the Central Basin. (3-21)</i></li> </ul>

**APPENDIX B**

**Resolution for AB303 Grant Application**

**RESOLUTION NO. 2007-03****RESOLUTION AUTHORIZING SUBMITTAL OF AN APPLICATION TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES FOR A LOCAL GROUNDWATER ASSISTANCE GRANT PURSUANT TO THE WATER SECURITY, CLEAN DRINKING WATER, COASTAL AND BEACH PROTECTION ACT OF 2002**

**WHEREAS**, on August 29, 2006 the Sacramento Central Groundwater Authority (AUTHORITY) was formed through a Joint Powers Agreement (JPA) between the City of Elk Grove, the City of Folsom, the City of Rancho Cordova, the City of Sacramento and the County of Sacramento.; and

**WHEREAS**, the purpose of the AUTHORITY is to maintain the long-term sustainable yield of the Central Basin; ensure implementation of the Basin Management Objectives prescribed in the Groundwater Management Plan; oversee the operation of a Well Protection Program; manage the use of groundwater in the Central Basin and facilitate implementation of an appropriate conjunctive use program by water purveyors; coordinate efforts among those entities represented on the governing body of the AUTHORITY to devise and implement strategies to safeguard groundwater quality; and to work collaboratively with other entities in order to promote coordination of groundwater policies and activities throughout the region; and

**WHEREAS**, the AUTHORITY adopted the Central Sacramento County Groundwater Management Plan (CSCGMP) on November 8, 2006; and

**WHEREAS**, the CSCGMP reviews current and future water supply and demands, contains basin management objectives (BMO) addressing rate of groundwater extraction, groundwater elevations, land subsidence, surface water flows and groundwater contamination; and

**WHEREAS**, the CSCGMP also contains “trigger points” and remedies to ensure full implementation of the BMOs; and

**WHEREAS**, on-going development and improvement to the AUTHORITY’s Data Management System is critical to the successful implementation of the CSCGMP and of managing and monitoring the basin to the benefit of all groundwater users in the Central Basin as described in said BMOs; and

Resolution Authorizing Submittal of an Application to the California Department of Water Resources for a Local Groundwater Assistance Grant Pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002

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**WHEREAS**, the Local Groundwater Management Assistance Act of 2000 (California Water Code Section 10795 *et seq.* (Assembly Bill 303)) was enacted to provide grants to local public agencies to conduct groundwater studies or to carry out groundwater monitoring and management activities.

**NOW, THEREFORE**, be it resolved by the AUTHORITY as follows:

1. That application be made to the California Department of Water Resources for a Local Groundwater Assistance Grant pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Water Code Section 79560 *et seq.*), and to enter into an agreement to receive a grant for the Comprehensive Update of the Sacramento Central Groundwater Authority's Data Management System, and
2. The AUTHORITY finds and determines that the Executive Director of the Sacramento Central Groundwater Authority is hereby authorized to do and perform everything reasonable, convenient, and necessary to carry out the purpose and intent of this Resolution.

Resolution Authorizing Submittal of an Application to the California Department of Water Resources for a Local Groundwater Assistance Grant Pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002  
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**ON A MOTION** by Director Sadler, seconded by Director Bettis, the foregoing resolution was passed and adopted by the Board of Directors of the Sacramento Central Groundwater Authority, State of California, this 14, day of November, 2007 with the following vote, to wit:

AYES: Directors, Korhonen, Sadler, Stricker, van Steyn, Bettis, Smith, Crouse, Robles, Fort

NOES: Directors,

ABSENT: Directors, Johnson, Niederberger, Havener, Helfand, Lowry, Soule

ABSTAIN: Directors,



(S E A L)

Chair of the Board of Directors of the Sacramento Central Groundwater Authority

ATTEST: Michelle Fiorino  
 Clerk of the Board of the Authority