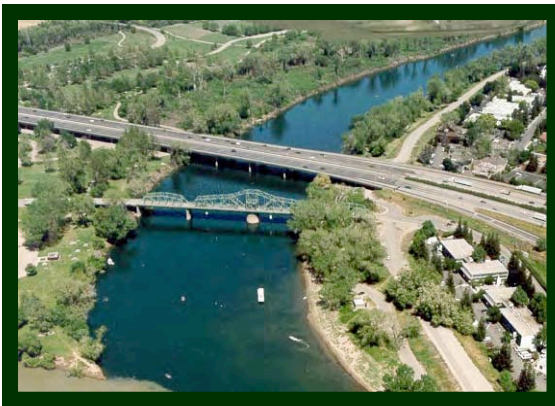


Sacramento Groundwater Authority



Basin Management Report 2004-2005

May 2006



Sacramento Groundwater Authority
*Managing Groundwater Resources
in Northern Sacramento County*

May 22, 2006

Sacramento Groundwater Authority

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Citrus Heights Water District
Del Paso Manor Water District
Fair Oaks Water District
Folsom, city of
Golden State Water Company
Natomas Central Mutual Water Company
Orange Vale Water Company
Rio Linda/Elverta Community Water District
Sacramento, city of
Sacramento, county of
Sacramento Suburban Water District
San Juan Water District
agricultural and self-supplied representatives*

***Groundwater Management Plan
Implementation Committee Members:***

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Chuck Rose, SGA Vice Chair
Barry Brown
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Gary Reents
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To Interested Parties and Individuals:

The Sacramento Groundwater Authority (SGA) is pleased to release this Basin Management Report (BMR) on the conditions and management activities through 2005 in the groundwater basin underlying Sacramento County north of the American River. The BMR reports on hydrologic conditions for 2003-2004 and management activities during 2004-2005, and includes the status of each of the action items in the SGA Groundwater Management Plan (GMP) adopted in December 2003.

SGA and its members are committed to the regional objectives established by the historic Sacramento Water Forum Agreement, and to the objectives of the SGA GMP. Since SGA's formation in 1998, SGA members have taken many steps to preserve the valuable groundwater resources underlying our region.

While this BMR was fully funded by SGA members, it is important to acknowledge the extensive support that has provided much of its foundation. SGA is grateful for the excellent input, technical assistance and funding for groundwater management activities provided through partnerships with the U.S. Army Corps of Engineers and the California Department of Water Resources.

This BMR represents a starting point for future assessment of the health of the groundwater basin and the effects of SGA's basin management activities.

Sincerely,

Edward D. Winkler
Executive Director

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SGA Basin Management Report

Introduction

This Basin Management Report¹ documents management activities of the Sacramento Groundwater Authority (SGA) and its member agencies in 2004 and 2005. The biennial report is designed to document hydrologic conditions in 2003 and 2004 – the most recent data available – as well as management activities undertaken in 2004 and 2005 to help ensure the long-term sustainability of the region's vital groundwater resources. The report also documents the ongoing implementation of the SGA Groundwater Management Plan (GMP) and recommends future implementation activities.

SGA Background

The SGA is a joint powers authority (JPA) formed in 1998² to manage the Sacramento region's groundwater basin north of the American River. Known formally as the North Area Groundwater Basin (North Area), the basin encompasses the southern one-third of the North American Subbasin (Basin 5-21.64) as defined by the California Department of Water Resources (Figure 1). Formed as an outgrowth of the Sacramento Area Water Forum, SGA is recognized as an essential part of implementing the groundwater management element of the historic Water Forum Agreement (WFA)³ of 2000. A centerpiece of the agreement is a regional program to manage and conjunctively use groundwater and surface water to help meet water needs through the year 2030 while reducing diversions from the lower American River during environmentally sensitive times.

The SGA draws its authority from a joint powers agreement signed by the cities of Citrus Heights, Folsom and Sacramento and the County of Sacramento. The signatories chose to manage the basin cooperatively by delegating their common

¹ This is the second comprehensive report completed for the SGA area. The first was published for the 2002 calendar year in February 2004. Originally known as a State of the Basin Report, the name has been changed to more appropriately reflect SGA's basin management responsibilities. The 2002 State of the Basin Report is available on-line at <http://www.sgah2o.org/sga/news/publications/>

² The SGA was originally formed in 1998 as the Sacramento North Area Groundwater Management Authority. In 2002, it was renamed the Sacramento Groundwater Authority.

³ The WFA is available on-line at <http://www.waterforum.org>.

police powers to representatives of local public and private water purveyors (Figure 2), agricultural groundwater users and self-supplied groundwater users within their jurisdiction. These representatives constitute the Board of Directors of the SGA⁴. The agreement cites the following purposes for establishing SGA:

- To maintain the long-term sustainable yield of the North Area Basin;
- To manage the use of groundwater in the North Area Basin and facilitate implementation of an appropriate conjunctive use program by water purveyors;
- To 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
- To work collaboratively with other entities, including groundwater management authorities that may be formed in other areas of the County of Sacramento and adjacent political jurisdictions, to promote coordination of policies and activities throughout the region.

⁴ The SGA Board includes representatives of: California American Water, Carmichael Water District, Citrus Heights Water District, City of Folsom, City of Sacramento, County of Sacramento, Del Paso Manor Water District, Fair Oaks Water District, Golden State Water Company (formerly Southern California Water Company), Natomas Central Mutual Water Company, Orange Vale Water Company, Rio Linda/Elverta Community Water District, Sacramento Suburban Water District, San Juan Water District, and individual representatives from agriculture and self-supplied groundwater users (principally parks and recreation districts).

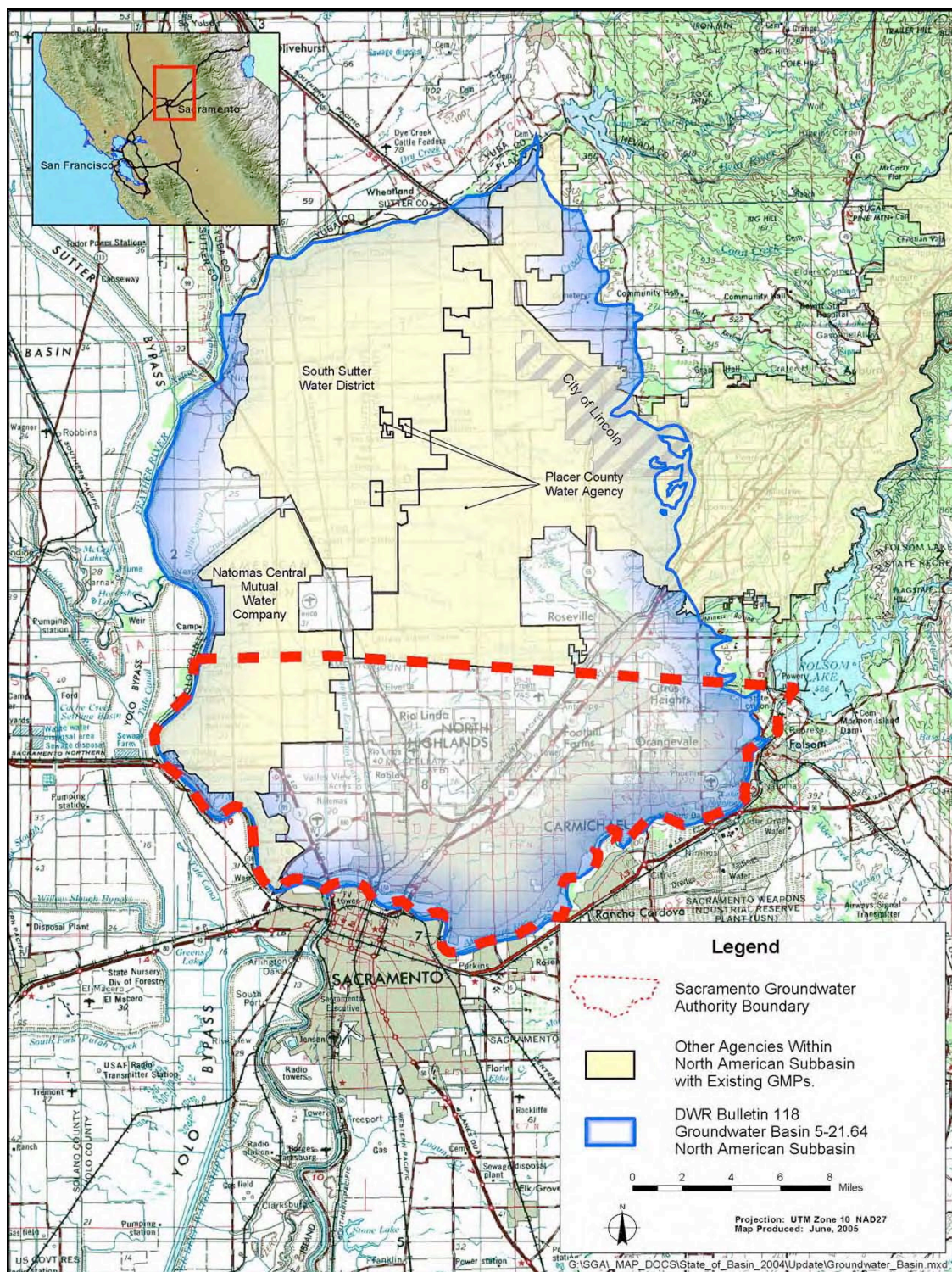


Figure 1. North American Subbasin

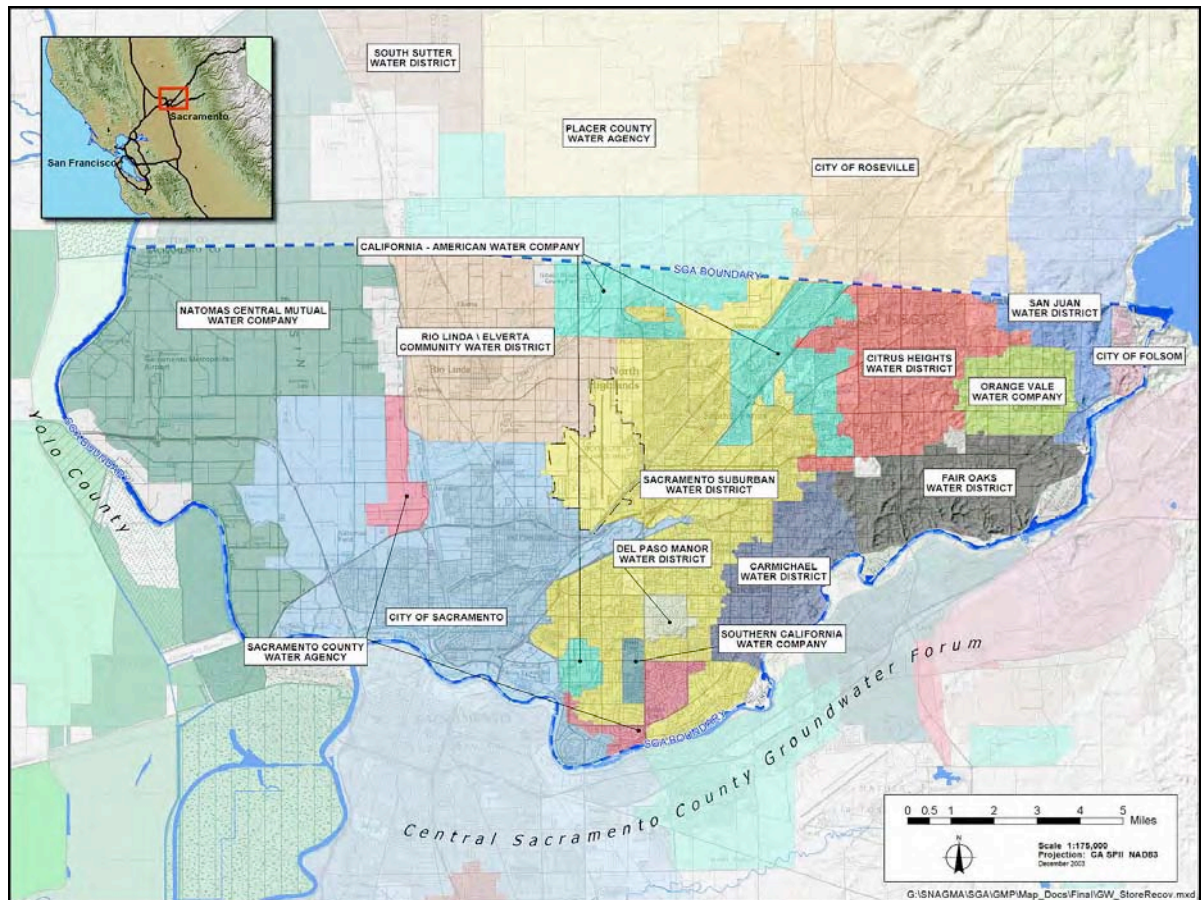


Figure 2. Local Water Purveyors in SGA Area

SGA Groundwater Management Plan

In December 2003, SGA adopted a Groundwater Management Plan (GMP)⁵ to create a framework for maintaining a sustainable, high-quality groundwater resource consistent with the objectives of the WFA. The GMP was prepared under the authority of SGA's JPA and is consistent with the provisions of California Water Code § 10750 *et seq.* Additionally, the GMP includes components recommended by the California Department of Water Resources in its 2003 update of Bulletin 118: California's Groundwater. A key component of the GMP is to report periodically on the implementation of the GMP itself. Accordingly, this Basin Management Report includes a summary of the GMP's 63 initial action items and a description of progress to date on those items (see Appendix A).

Another key component of the GMP is to identify management objectives to guide future implementation of the plan. Five management objectives were identified in SGA's plan:

⁵ The SGA GMP is available on-line at <http://www.sgah2o.org/sga/programs/groundwater/>

- Maintain or improve groundwater quality in the SGA area for the benefit of basin groundwater users.
- Maintain groundwater elevations that result in a net benefit to basin groundwater users.
- Protect against any potential inelastic land surface subsidence.
- Protect against adverse impacts to surface water flows in the American River and Sacramento River.
- Protect against adverse impacts to water quality resulting from interaction between groundwater in the basin and surface water flows in the American River and Sacramento River.

Report Organization

The report is organized into the following sections:

Section 1: Introduction. This section introduces the purpose of this report, the SGA, and the SGA GMP.

Section 2: Basin Conditions in 2003 and 2004. This section describes the hydrologic conditions in the basin during the 2003 and 2004 calendar years, and conditions of water elevations and water quality. There is a one-year time lag in this data because of the effort required to collect it and enter it into the SGA Data Management System.

Section 3: Basin Management Activities. This section describes the most significant management actions taken by SGA and other local agencies that affect SGA during the 2004 and 2005 calendar years.

Section 4: Conclusions and Recommendations. This section evaluates whether current basin management objectives are being met and makes recommendations for future management actions in the region.

Basin Conditions in 2003 and 2004

Hydrologic Conditions

The 2003 and 2004 hydrologic conditions in the region were close to the historical average. Three indicators are used here to describe hydrologic conditions for this period: 1) Sacramento River Water Year Index, 2) Water Forum Agreement Year Type, and 3) total rainfall. Each of these is described further below.

Sacramento River Water Year Type

The Department of Water Resources (DWR) maintains a water year index based on Sacramento River and tributary runoff⁶. Hydrologic conditions are described as wet, above normal, below normal, dry, or critical. The 2003 and 2004 water years were classified as above normal and below normal, respectively. As a practical matter, both years were unremarkable in that runoff levels were close to the dividing line between above and below normal values. Table 1 summarizes the classifications from 1995 through 2004 and defines each classification.

Table 1. DWR Water Year Classifications

Water Year	Sacramento River Index Value (million acre-ft)	Year Type
1995	12.4	Wet
1996	9.7	Wet
1997	11.0	Wet
1998	12.4	Wet
1999	10.0	Wet
2000	9.2	Wet
2001	5.9	Dry
2002	6.5	Dry
2003	8.0	Above Normal
2004	7.7	Below Normal

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

⁶ A description of the calculation method is available at <http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST>

Water Forum Agreement Year Type

March-through-November total unimpaired inflows into Folsom Lake are of particular relevance to Sacramento area water purveyors. This inflow total dictates the amount individual water purveyors may divert from Folsom Lake and the lower American River as specified in their purveyor-specific agreements under the WFA. The 2003 and 2004 years were classified as wet and average, respectively, according to this index (Figure 3). Table 2 shows the definition of WFA water year types based on unimpaired inflow to Folsom Lake.

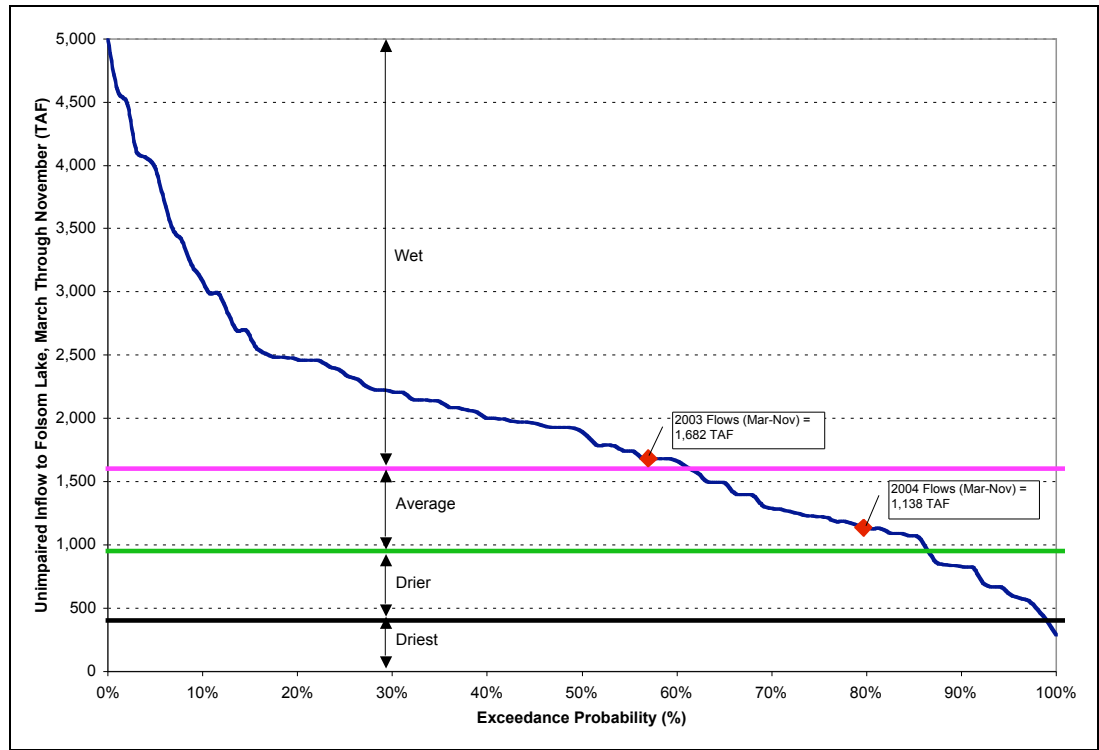


Figure 3. Unimpaired Inflow to Folsom Lake, March-November

Table 2. Water Year Types as Defined by Water Forum Agreement

Year Type	Unimpaired Inflow to Folsom Lake, March through November (acre-ft)
Wet	Greater than 1,600,000
Average	Greater than 950,000 and less than 1,600,000
Drier ⁷	Greater than 400,000 and less than 950,000
Driest ⁷	Less than 400,000

⁷ In these year types, diverters and others confer on how best to meet demands and protect the American River.

Total Rainfall

DWR maintains precipitation data on its California Data Exchange Center (CDEC) Web site (<http://cdec.water.ca.gov>) for six stations within and adjacent to the SGA area. The locations of these stations are shown on Figure 4, along with the annual precipitation totals for 2003 and 2004 for those stations. Complete data is available only for the four stations located at Sacramento International Airport (SMF), Rio Linda (RLN), Roseville (RSV), and Folsom Dam (FLD) for 2003 and 2004. The average of these four stations for 2003 and 2004 is 17.38" and 18.42", respectively. These amounts are close to the long-term average of 17.93" at a National Oceanic and Atmospheric Administration (NOAA) monitoring station maintained at Sacramento Executive Airport. Figure 5 shows the monthly average of the four CDEC sites for 2003 and 2004 in comparison to the long-term monthly average at Sacramento Executive Airport.

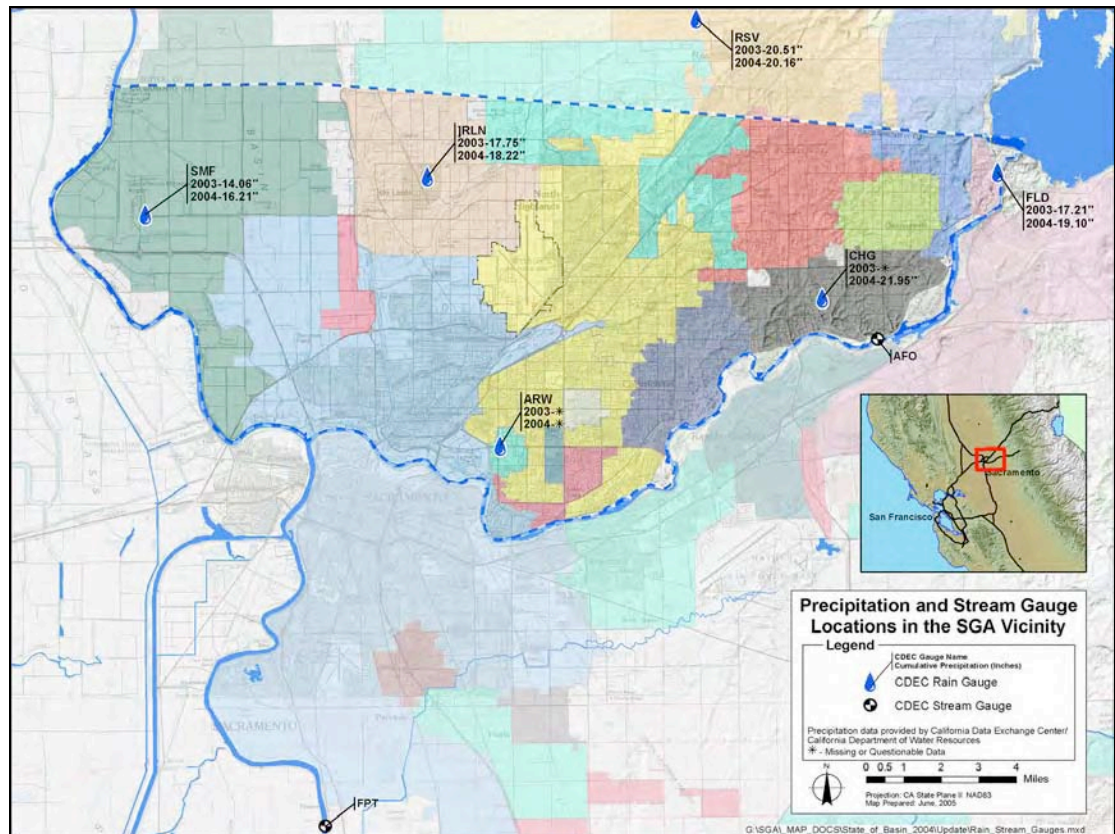


Figure 4. Locations and Precipitation Totals for Six CDEC Stations in SGA Vicinity

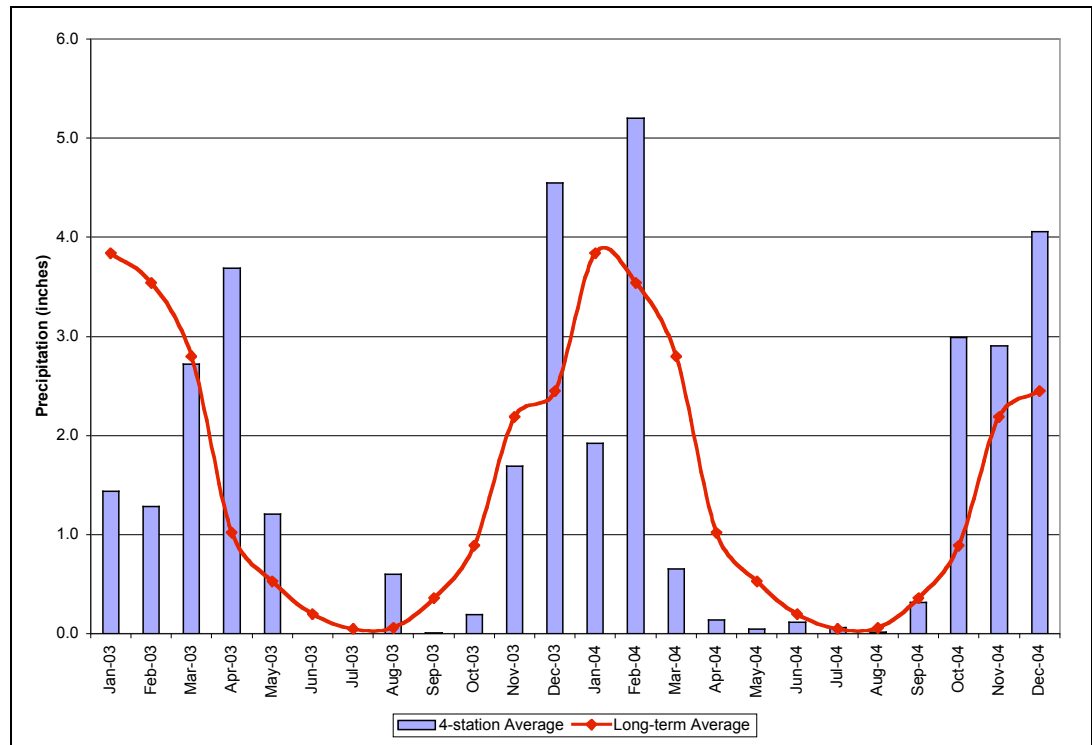


Figure 5. Monthly Four-Station Precipitation Average

Water Use

In 2003 and 2004, SGA member agencies met about 30% of their water supply needs with groundwater and about 70% with surface water. Table 3 shows the reported surface water and groundwater supplies by agency from 2000 through 2004. While the region has been moving toward more conjunctive use of surface water and groundwater, the table shows that some agencies continue to rely entirely on groundwater, while others rely predominantly on surface water.

Figure 6 shows total reported groundwater pumping from 2000 through 2004. Over the five-year period, extractions dipped below 90,000 acre-feet in 2002, were stable in 2003, and increased slightly to over 91,000 acre-feet in 2004.

Table 3. Reported Surface and Groundwater Supplies by Agency

Water Purveyor	Year	Surface Water (AF)	Groundwater (AF)	Total Water Delivered (AF)
California American Water	2004	0	19,784	19,784
	2003	0	19,240	19,240
	2002	0	19,868	19,868
	2001	0	20,408	20,408
	2000	0	20,057	20,057
Carmichael WD	2004	9,843	3,836	13,679
	2003	9,358	3,265	12,623
	2002	8,507	3,778	12,285
	2001	6,196	6,323	12,519
	2000	3,694	7,375	11,069
Citrus Heights WD	2004	19,753	1,347	21,100
	2003	17,938	573	18,511
	2002	17,576	152	17,728
	2001	20,554	588	21,142
	2000	18,393	197	18,590
Del Paso Manor WD	2004	0	1,747	1,747
	2003	0	1,477	1,477
	2002	0	1,693	1,693
	2001	0	1,794	1,794
	2000	0	1,801	1,801
Fair Oaks WD	2004	13,629	312	13,941
	2003	12,333	240	12,573
	2002	11,456	109	11,565
	2001	15,040	108	15,148
	2000	14,407	1,048	15,455
Folsom, City of	2004	23,404	0	23,404
	2003	23,404	0	23,404
	2002	22,895	0	22,895
	2001	17,900	0	17,900
	2000	17,578	0	17,578
Golden State WC (formerly Southern California WC)	2004	0	1,372	1,372
	2003	0	1,311	1,311
	2002	0	1,373	1,373
	2001	0	1,427	1,427
	2000	0	1,338	1,338
Natomas Central Mutual WC	2004	93,705	0	93,705
	2003	77,146	0	77,146
	2002	88,028	0	88,028
	2001	69,981	0	69,981
	2000	80,544	0	80,544
Orange Vale WC	2004	4,165	0	4,165
	2003	3,816	0	3,816
	2002	4,377	0	4,377
	2001	4,633	0	4,633
	2000	4,422	0	4,422

Table 3 (Cont'd). Reported Surface and Groundwater Supplies by Agency

Water Purveyor	Year	Surface Water (AF)	Groundwater (AF)	Total Water Delivered (AF)
Rio Linda / Elverta CWD	2004	0	3,407	3,407
	2003	0	3,163	3,163
	2002	0	3,387	3,387
	2001	0	3,355	3,355
	2000	0	3,355	3,355
Sacramento, City of	2004	42,804	20,339	63,143
	2003	31,594	22,621	54,215
	2002	32,817	22,483	55,300
	2001	15,779	23,578	39,357
	2000	14,923	24,149	39,072
Sacramento, County of	2004	0	5,691	5,691
	2003	0	5,034	5,034
	2002	0	5,279	5,279
	2001	0	5,404	5,404
	2000	0	4,923	4,923
Sacramento Suburban WD	2004	15,338	33,261	48,599
	2003	15,214	32,494	47,708
	2002	16,922	31,362	48,284
	2001	15,470	33,394	48,864
	2000	14,982	31,705	46,687
San Juan WD	2004	17,941	0	17,941
	2003	17,101	0	17,101
	2002	17,351	0	17,351
	2001	16,208	0	16,208
	2000	13,862	0	13,862
Total for SGA Area	2004	240,582	91,096	331,678
	2003	207,904	89,418	297,322
	2002	219,929	89,484	309,413
	2001	181,761	96,379	278,140
	2000	182,805	95,928	278,733

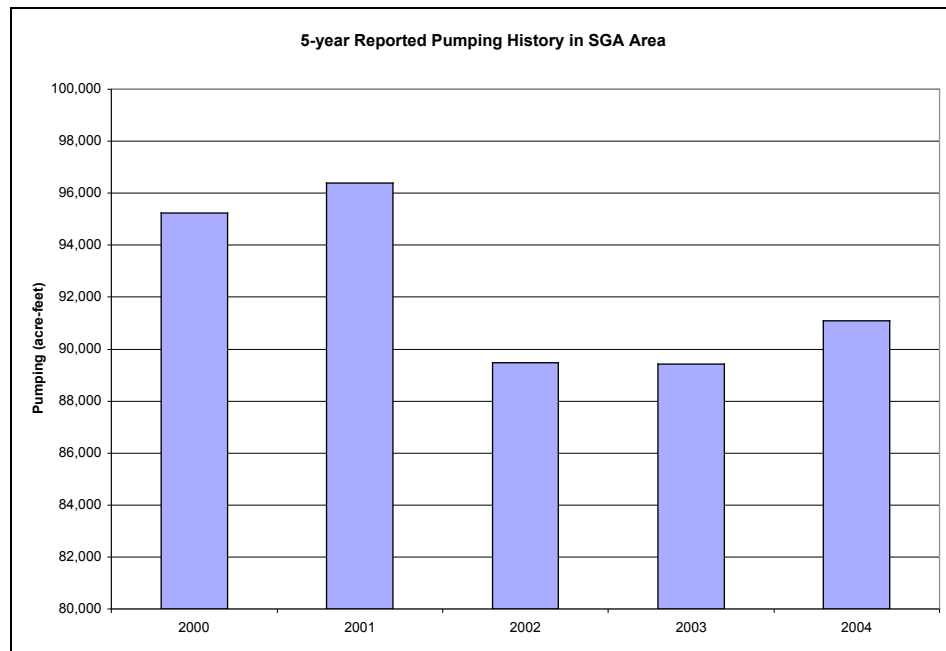


Figure 6. Groundwater Pumping in SGA Area 2000-2004

Groundwater Elevation

DWR and Sacramento County Water Agency maintain a series of monitoring wells throughout Sacramento County dating back to 1950s. Long-term hydrographs from the wells provide for observation of groundwater elevation trends throughout the period of major groundwater development of the underlying aquifer system.

Additionally, there are many multiple-completion⁸ monitoring wells within the basin that have been monitored since the 1980s. These wells offer a view of groundwater elevation trends as well as an understanding of the vertical gradients that exist between different depth intervals within the aquifer system.

Regional Groundwater Elevations

Over the past 50 years, groundwater extraction was concentrated in the central part of the SGA area. This resulted in a regionally extensive cone of depression. Regional water purveyors have worked diligently over the past decade to finance and construct facilities to bring more surface water into the region when available, allowing groundwater levels to recover from their historical drawdown.

Figure 7 is a contour plot of equal elevations of groundwater in the SGA area for Spring 2004. Note the continued presence of a cone of depression in the central part

⁸ Multiple-completion wells are wells that monitor more than one discrete depth from the same location.

of the SGA area. The low elevation in the area is approximately 35 feet below mean sea level (MSL), represented by the -35 foot contour. In general, the rest of the SGA area does not show any distinctive patterns with respect to regional groundwater elevations, and the water table tends to mimic the local topography. This is also reflected in the increasing density of water elevation contours as the land surface elevation gradient increases in the eastern part of the SGA area.

Figure 8 is a contour plot of equal elevations of groundwater in the SGA area for Spring 1997. Note that although the low elevation in the area was in roughly the same location as the 2004 depression, the elevation in 1997 was approximately 40 feet below mean sea level. Comparing the 1997 and 2004 elevations, it can be seen that groundwater elevations increased an average of about five feet during that time. The increase suggests that greater utilization of surface water supplies in conjunction with groundwater (conjunctive use) is having a positive impact on the basin. The effect is most noticeable within the Sacramento Suburban Water District service area (shown in yellow in both figures).

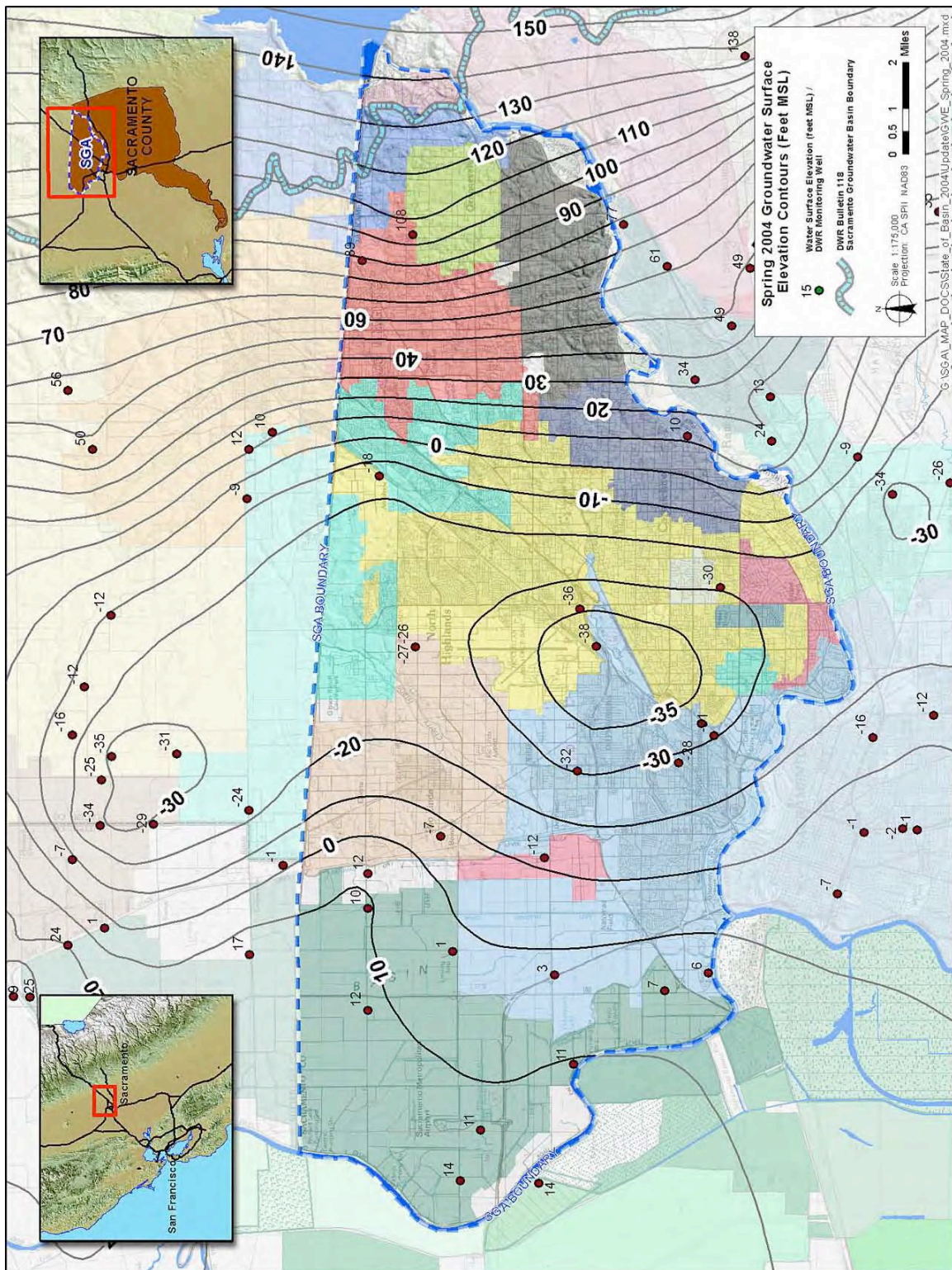


Figure 7. Groundwater Elevations in Spring 2004

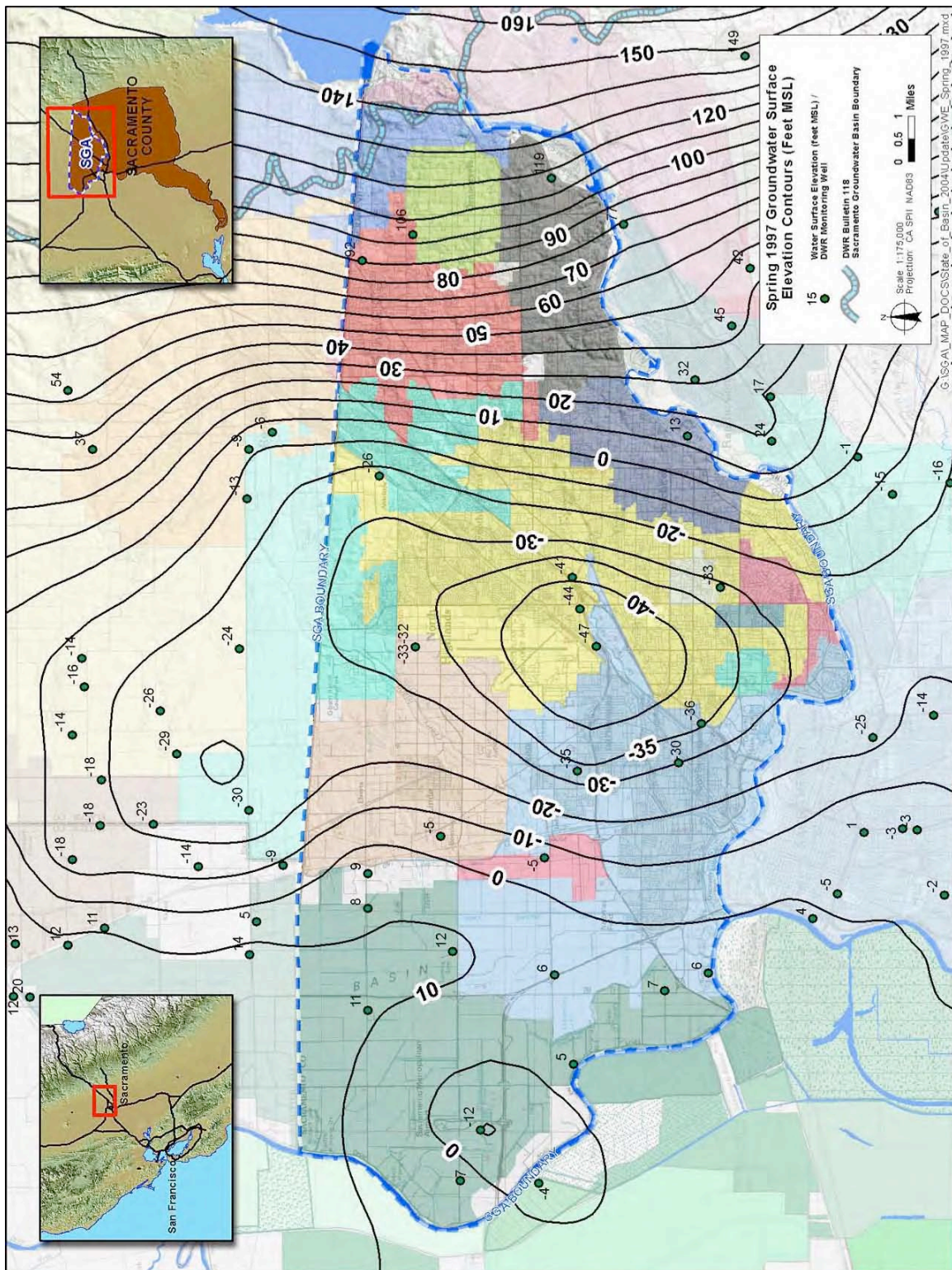


Figure 8. Groundwater Elevations in Spring 1997

Long-term Hydrographs

Figure 9 shows the locations and hydrographs of selected long-term monitoring wells in the basin. In general, data from 2003 and 2004 support observations of the previous decade that water levels are remaining stable in the basin and in some cases groundwater elevations are continuing to increase slightly. For purposes of further discussion, the SGA area can be divided into three sub-areas.

Western Area

The western portion of the SGA area is bounded by the Sacramento River on the west and extends east to approximately the boundary between Natomas Central Mutual Water Company and Rio Linda/Elverta Community Water District (Figure 9). This area is served almost exclusively by surface water. Hydrographs for SWP-216, SWP-261, and SWP-263 show that groundwater elevations range from about five feet below MSL to 20 feet above MSL. The hydrographs show that water levels have been fairly stable over the period of record, with very modest increases in 2003 and 2004. These wells typically experience only seasonal fluctuations.

Figure 10 shows a multiple-completion monitoring well constructed and maintained by DWR. This hydrograph shows that water elevations in the shallow aquifer have declined by less than five feet over the period of record and were fairly stable during 2003 and 2004. The hydrograph also demonstrates a downward vertical flow gradient in the middle and deeper monitored zones.

Central Area

The central portion of the SGA area is bounded roughly on the west by the boundary between Natomas Central Mutual Water Company and Rio Linda/Elverta Community Water District and to the east by a line running approximately along San Juan Avenue (Figure 9). This area currently uses a combination of surface water and groundwater, but has historically relied predominantly on groundwater. Hydrographs for SWP-220, SWP-229, SWP-232, SWP-240, SWP-270, and SWP-276 show that groundwater elevations currently range from about 10 feet above MSL to 40 feet below MSL. The drawdown in these wells over the past 50 years has been in excess of about 70 feet. Groundwater levels in this area continued to decline every year until around the mid-1990s, when water levels appear to have stabilized due, at least in part, to expanded conjunctive use operations. Water levels in 2003 and 2004 appear to have increased slightly over previous years.

Figure 11 shows a multiple-completion monitoring well constructed and maintained by the Air Force Real Property Agency at the former McClellan Air Force Base. The well is consistent with other longer-term hydrographs that show groundwater elevations continuing to decline into the mid- to late-1990s. Water levels have since stabilized and continue to show slight recovery during 2003 and 2004. Also note that the deepest zone monitored has the highest groundwater elevation, indicating a slight upward gradient. This may be the result of the shallower three zones being pumped at a higher rate as part of groundwater remediation efforts at McClellan.

Eastern Area

The eastern portion of the SGA area extends roughly east of San Juan Avenue to the eastern edge of the basin (Figure 9). This area has historically relied primarily on surface water. Hydrographs for wells SWP-236 and SWP-283 are typically in excess of 100 feet above MSL. Groundwater elevations can be highly varied from one well to another, as the area has rolling topography and the groundwater level tends to mimic ground elevations. Hydrographs indicate that groundwater elevations have not changed greatly with time, reflecting the limited use of groundwater in the area. There were no notable changes in 2003 and 2004 to groundwater elevations.

Figure 12 shows a multiple-completion monitoring well constructed and maintained by Aerojet north of the American River in connection with groundwater contamination remediation activities at the Aerojet facility near Rancho Cordova. The upper two zones are consistent with regional groundwater elevation trends declining by about five feet since the early 1990s through 2004. The deeper zone (1483) shows a downward trend beginning in the late 1990s. This is likely a localized effect associated with groundwater extractions as part of the American River Groundwater Extraction and Treatment (ARGET) facilities operated by Aerojet.

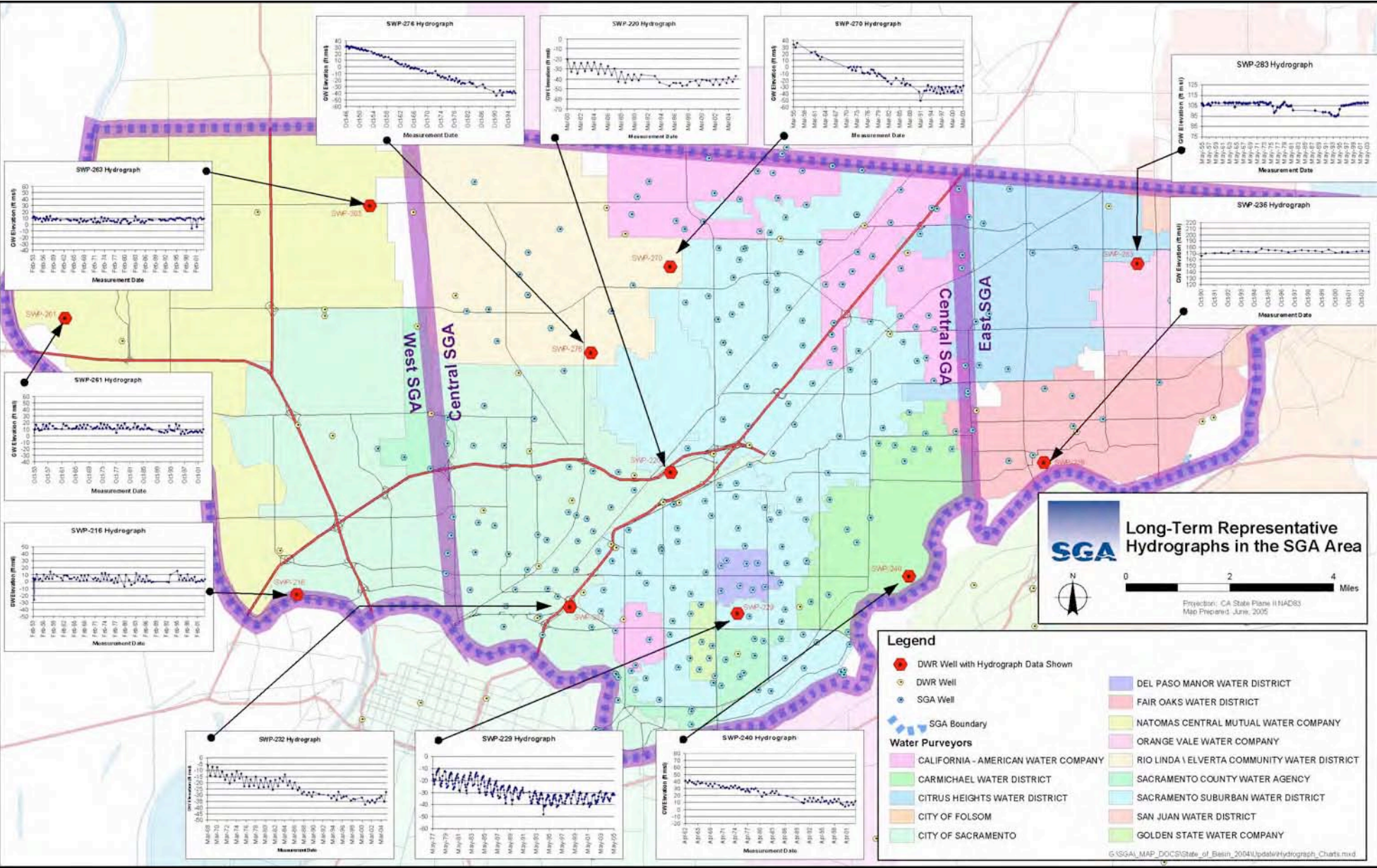


Figure 9. Long-Term Hydrographs for the SGA Area.

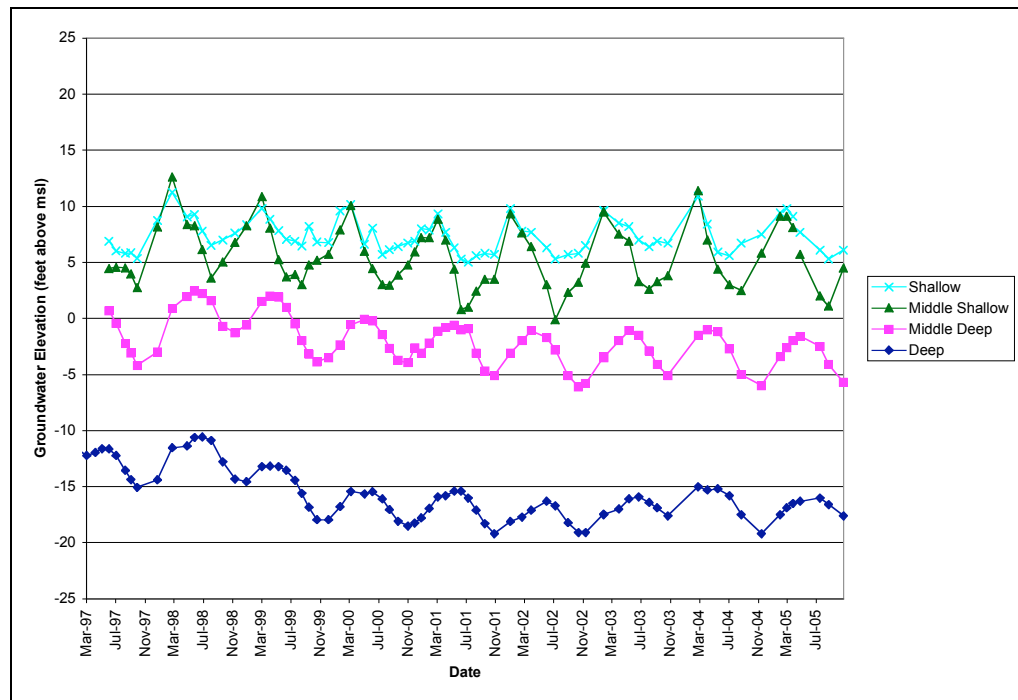


Figure 10. Multiple-Completion Monitoring Well Data for SGA Western Area

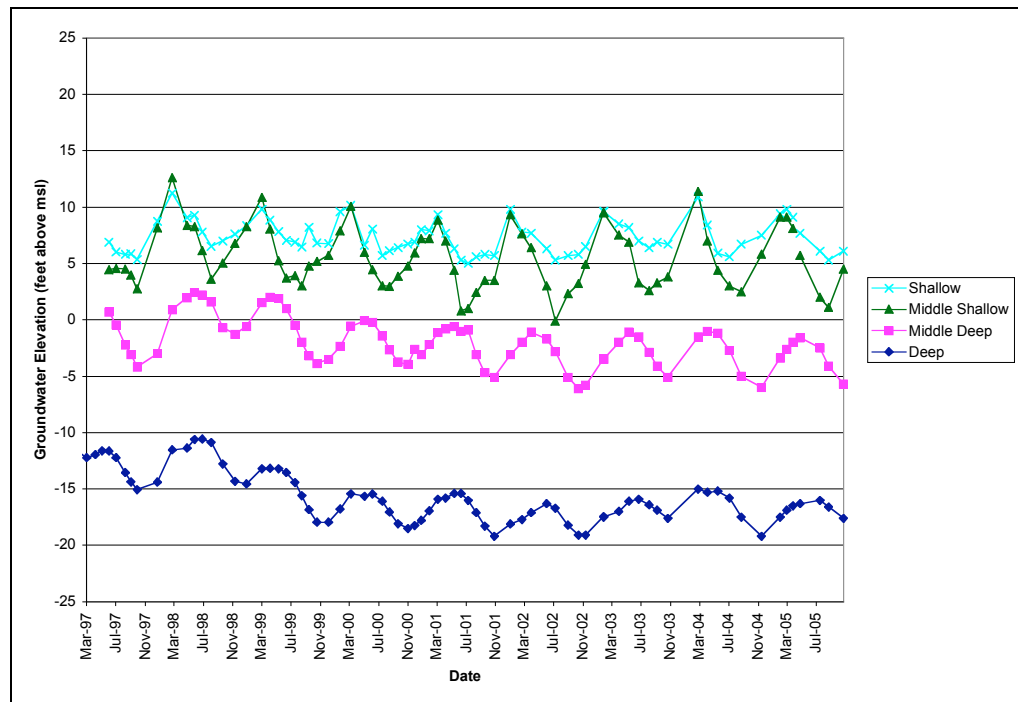


Figure 11. Multiple-Completion Monitoring Well Data for SGA Central Area

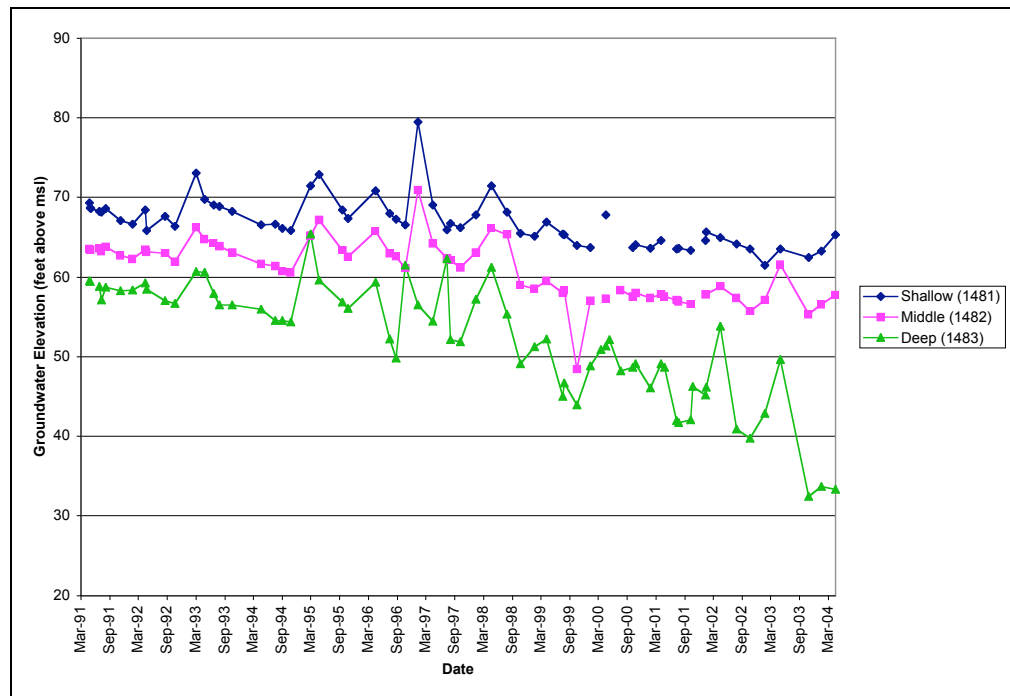


Figure 12. Multiple-Completion Monitoring Well Data for SGA Eastern Area

Groundwater Quality

Generally, the quality of groundwater in the basin is 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

There are currently 195 public supply wells in the SGA area classified as either "active" or "standby" by the California Department of Health Services. Additionally, there are 22 independent small water systems relying on groundwater that are monitored by the Sacramento County Environmental Management Department. SGA members provide water quality data to SGA for entry into the SGA Data Management System. This data is currently requested every other year, with the most recent update being water quality data for 2003 and 2004. While each member agency is responsible for its own compliance with drinking water regulations, SGA utilizes this information to evaluate any regional observations with respect to water quality parameters of interest.

This Basin Management Report describes available data from public supply wells for total dissolved solids (as an overall indicator of groundwater quality), arsenic, nitrate, radon, iron, and manganese. Sampling frequencies for individual constituents vary considerably and are also subject to waivers granted by the Department of Health Services. To obtain a record for as many wells as possible, the water quality data

were queried for records from 2000 through 2004. One exception is radon, for which data has been collected since 1989 to allow for as large a dataset as possible. Each of the parameters is described further below.

Total Dissolved Solids

Total dissolved solids (TDS) is a measure of all dissolved constituents in water, resulting primarily from rocks and sediments with which the water comes in contact. TDS has a secondary maximum contaminant level (MCL) drinking water standard (associated with the aesthetics of the water) of 500 milligrams per liter (mg/L). There were 185 distinct samples from wells analyzed in the period from 2000 through 2004. With respect to TDS, the quality of water in the basin is excellent, with an average TDS of 240 mg/L and with no wells exceeding the secondary MCL. Figure 13 shows the general distribution of TDS in public supply wells in the SGA area.

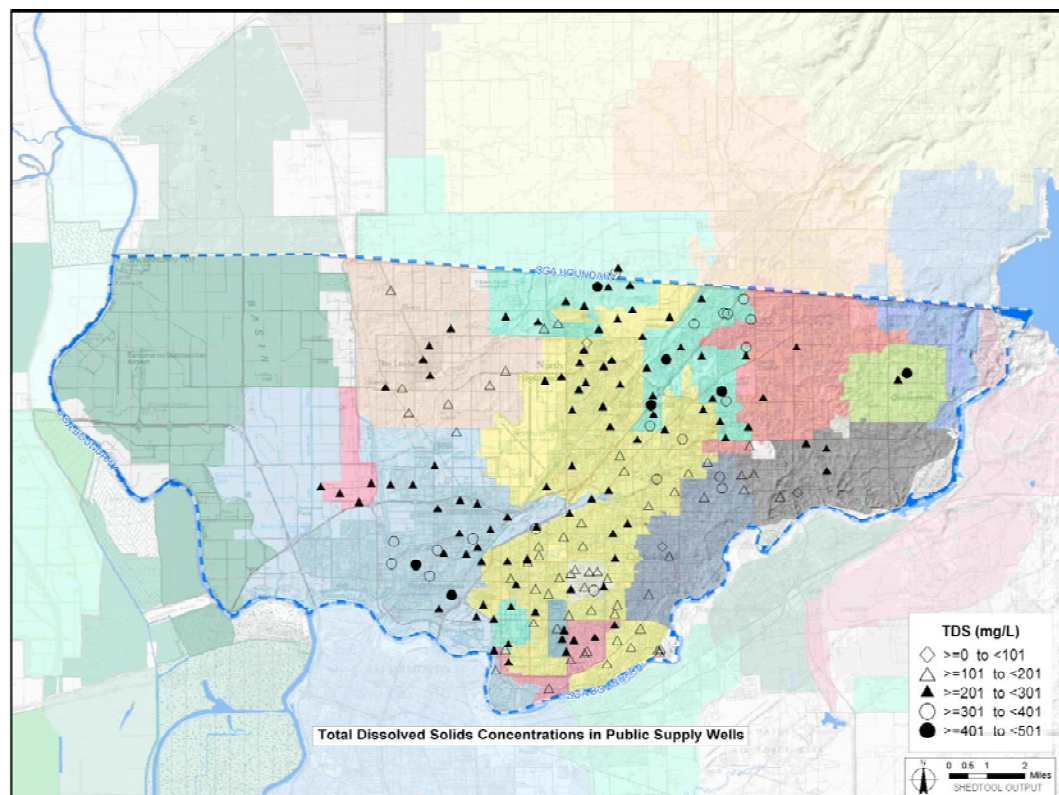


Figure 13. TDS Concentrations in Public Supply Wells in the SGA Area

Arsenic

Arsenic is a naturally occurring element in the earth's crust. As of January 26, 2006, the federal drinking water standard for arsenic was lowered to 10 micrograms per liter (ug/L). In general, elevated arsenic in the Sacramento region is not the significant problem it is in many parts of the San Joaquin Valley. Of the 170 distinct arsenic samples from wells during the period from 2000 through 2004, 57 were below the analytical detection level of 2 ug/L. Of the remaining wells with values above the detection level, the average was only 3.3 ug/L, with two wells exceeding the new federal MCL. Figure 14 shows the general distribution of arsenic concentrations in public supply wells in the SGA area.

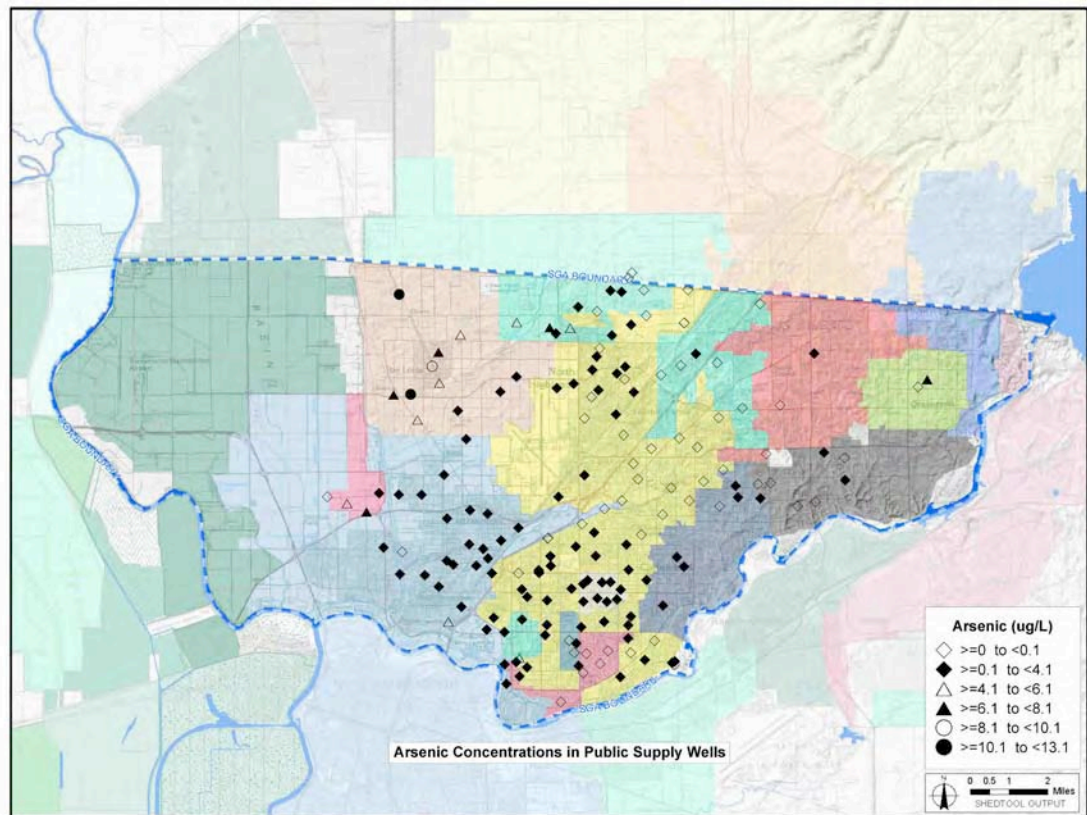


Figure 14. Arsenic Concentrations in Public Supply Wells in the SGA Area

Nitrate

Nitrate is a naturally occurring element, but elevated concentrations are often associated with human activities such as wastewater discharge, urban runoff of applied fertilizers, and agricultural activities. High concentrations of nitrate interfere with the body's ability to transfer oxygen in the blood stream, most notably in "blue baby" syndrome. The primary MCL for nitrate (as NO₃) in drinking water is 45 mg/L. Tests have shown that nitrate levels in public supply wells are generally not of concern within the SGA area. Of 146 samples from public supply wells tested between 2000 and 2004, the average concentration was 7.4 mg/L with a maximum observed concentration of 27 mg/L. Figure 15 shows the general distribution of nitrate concentrations in public supply wells in the SGA area.

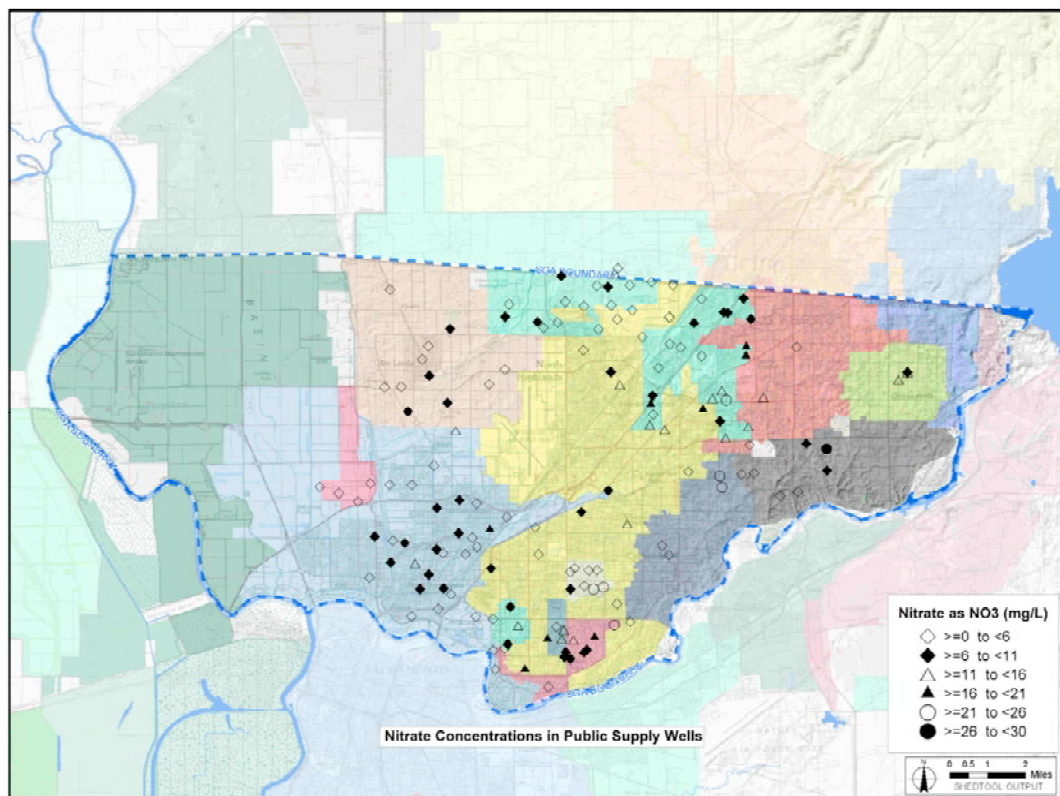


Figure 15. Nitrate Concentrations in Public Supply Wells in the SGA Area

Radon

Radon is a naturally occurring radioactive gas believed to cause lung cancer in humans (USEPA 1999). Although radon from drinking water sources contributes only a small percentage of overall exposure to radon from all sources, EPA issued a proposed rule for maximum concentrations of 300 picoCuries per liter (pCi/L) in 1999. That rule has yet to be finalized and will likely not be further examined until at least 2007. Therefore, there is no current standard for radon in drinking water.

Relative to the proposed rule, radon could be a potential future concern for local public water suppliers in the SGA area. Of 101 samples from public supply wells collected between 1994 and 2002, the average concentration of radon exceeded 395 pCi/L. Fifty-nine of the wells (58%) exceeded 300 pCi/L, with 16 of the wells exceeding 600 pCi/L. Local water purveyors will closely monitor this proposed rule as it is further examined in the future. Figure 16 shows the general distribution of radon concentrations in public supply wells in the SGA area.

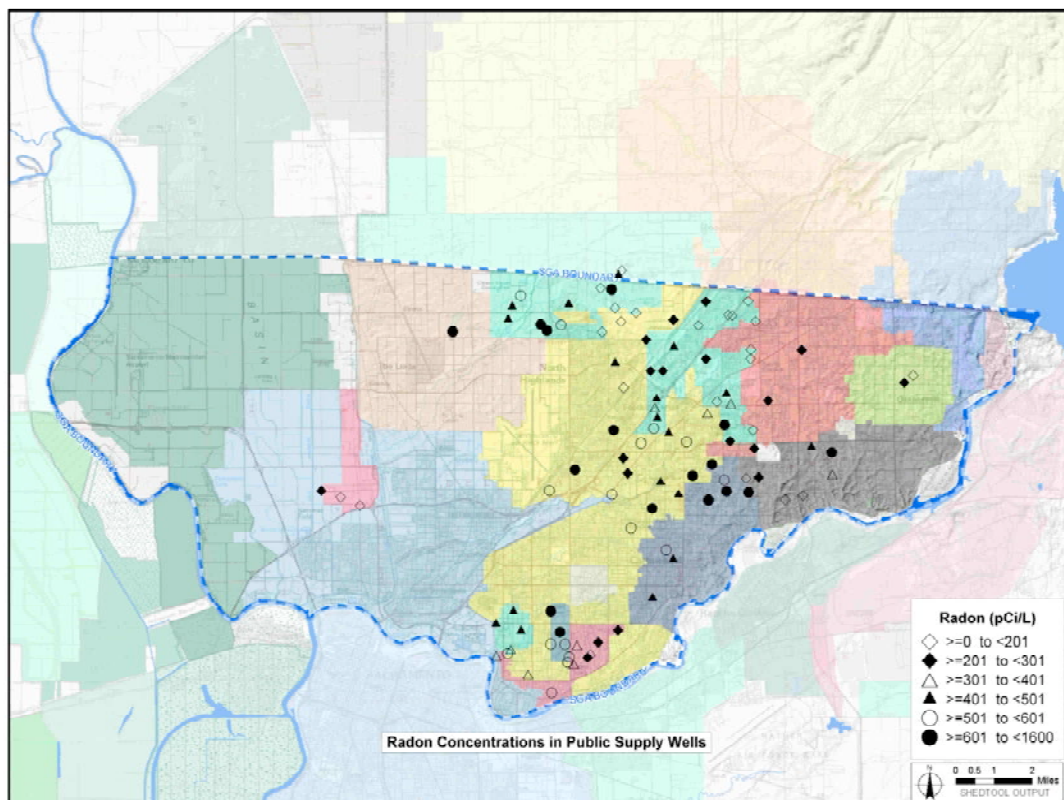


Figure 16. Radon Concentrations in Public Supply Wells in the SGA Area

Iron

Iron is a naturally occurring element in the earth's crust and is found in groundwater as a metallic ion. Iron has a secondary MCL of 300 ug/L because at elevated concentrations, it tends to have a bad taste and can precipitate as a red-brown solid on plumbing fixtures. In general, dissolved iron is not a problem in SGA-area public supply wells. Of the 158 wells sampled from 2000 through 2004, 109 wells were below the detection level of 10 ug/L. Of the 49 wells with detections, the average concentration was 277 ug/L. Only 14 wells had concentrations exceeding the secondary MCL. Figure 17 shows the general distribution of iron concentrations in public supply wells in the SGA area.

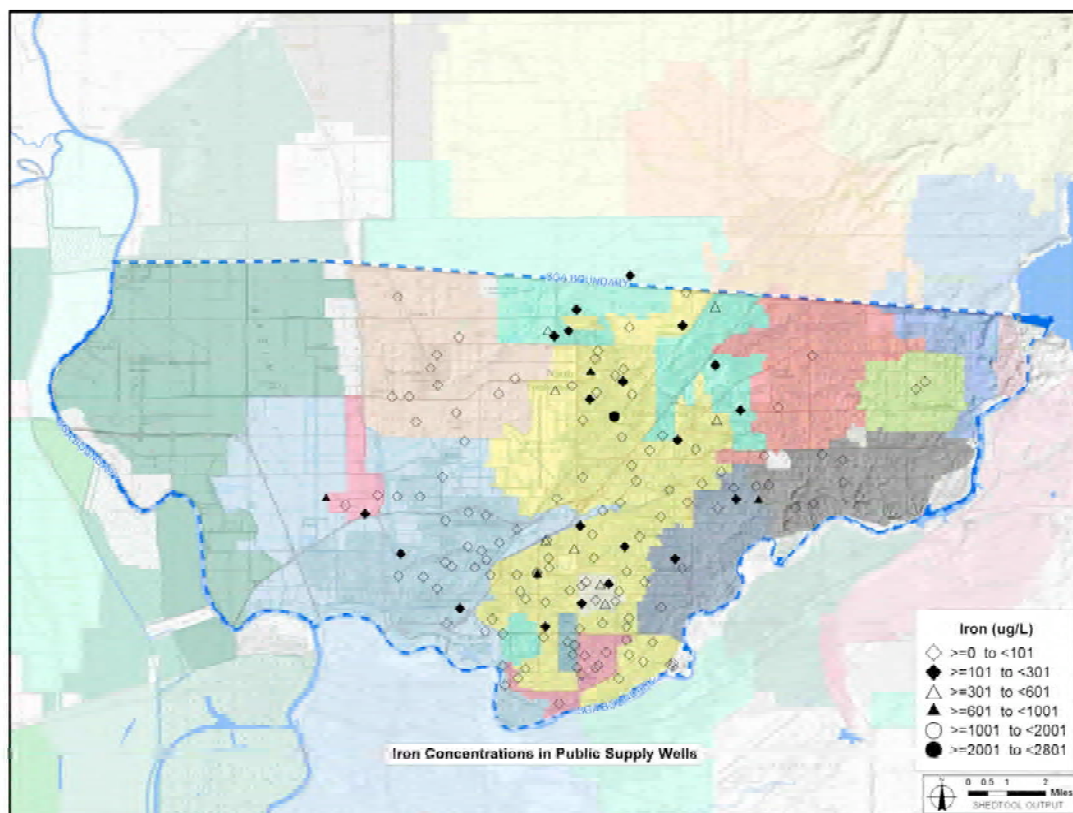


Figure 17. Concentrations of Iron in Public Supply Wells in the SGA Area

Manganese

Manganese is a naturally occurring element in the earth's crust and is found in groundwater as a metallic ion. Manganese has a secondary MCL of 50 ug/L because at elevated concentrations, it can have a bad taste and can precipitate as a black solid on plumbing fixtures. In general, dissolved manganese is not a significant issue in SGA-area public supply wells. Of the 154 wells sampled from 2000 through 2004, 109 wells were below the detection level of 10 ug/L. Of the 45 wells with detections, the average concentration was 39 ug/L. Only 10 wells had concentrations exceeding the secondary MCL. Figure 18 shows the general distribution of manganese concentrations in public supply wells in the SGA area.

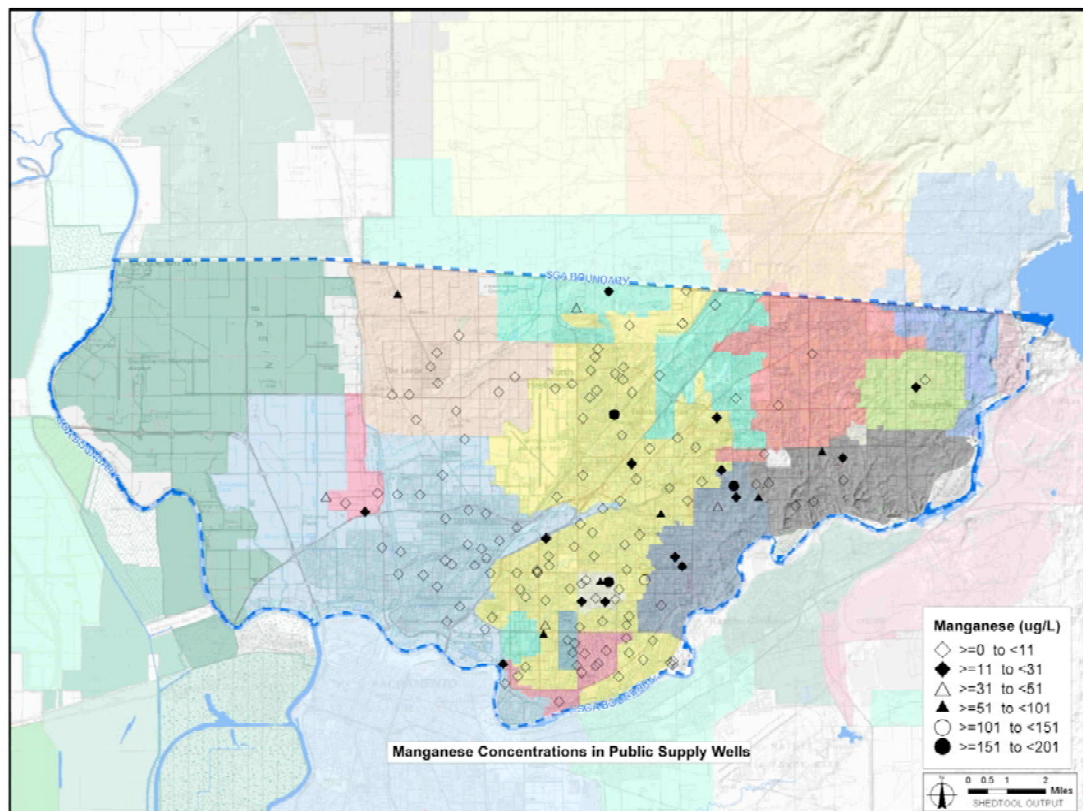


Figure 18. Concentrations of Manganese in Public Supply Wells in the SGA Area

Known Contaminant Plumes in SGA and Vicinity

Principal groundwater contaminant plumes within or near the SGA area are known to exist from source areas at the former McClellan Air Force Base, the former Mather Air Force Base, and Aerojet. The extent of these plumes based on available data from late 2003 and early 2004 is shown in Figure 19. The presence of these plumes is of great concern to SGA members as it may impact their ability to fully develop conjunctive use programs to implement the Water Forum Agreement. Further identification of these plumes and other more localized sources of groundwater contamination will continue to be a major focus of the SGA / Water Forum Joint Contamination Strategy Committee (described in the Basin Management Activities section of this report).

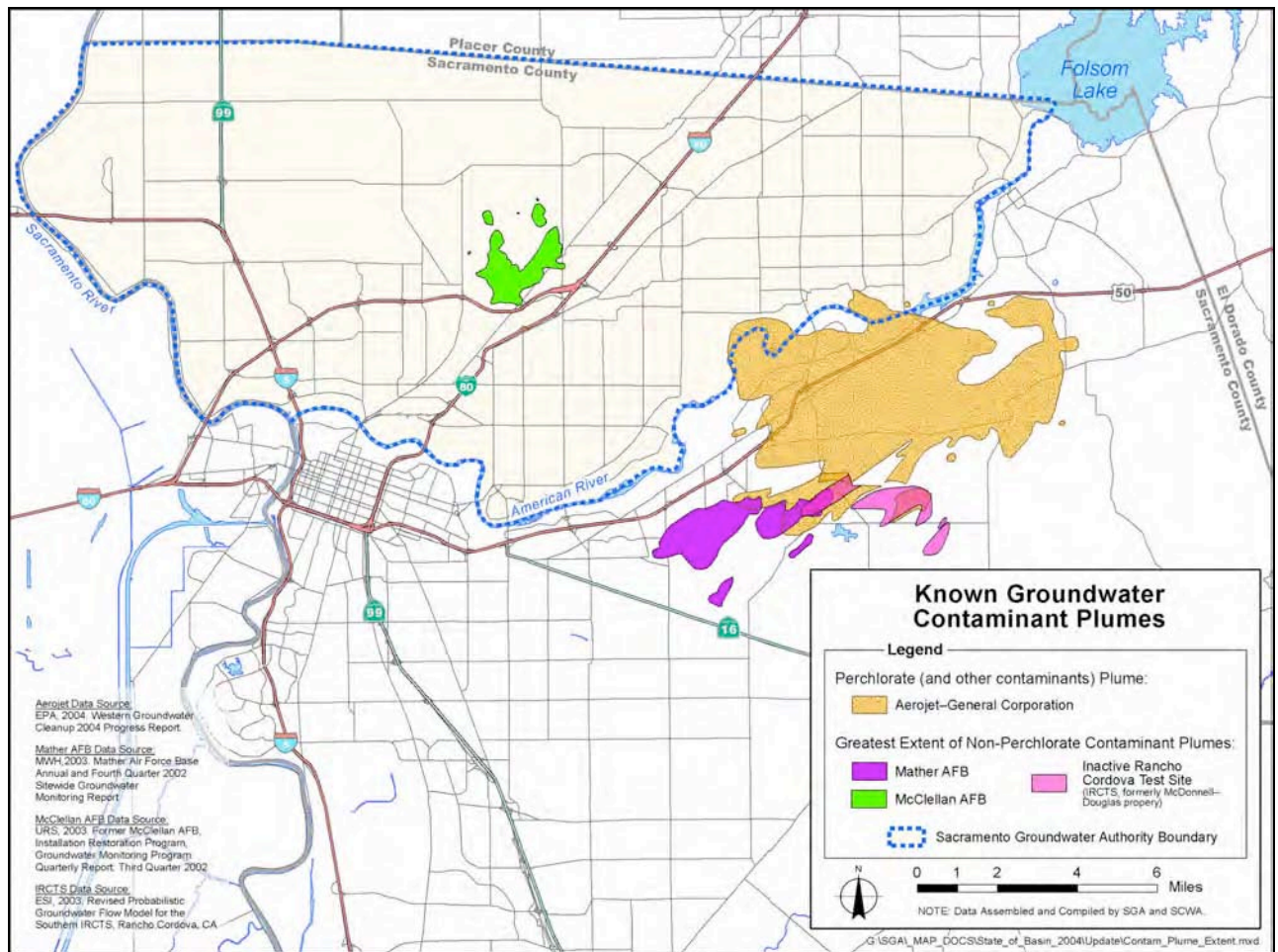


Figure 19. Extent of Contaminant Plumes in the SGA Area and Vicinity

Basin Management Activities

Management activities in the basin during 2004 and 2005 are described in three general categories in this section: overall implementation of the SGA GMP; specific management activities by SGA that warrant more detailed discussion; and management activities by other entities that are relevant to SGA.

Implementation of the SGA GMP

The GMP adopted by SGA in December 2003 identified 63 specific management actions for the groundwater basin. Significant progress was achieved in implementing these actions throughout 2004 and 2005. While many of the actions are considered ongoing items, there are many others that have been completed. Some lower-priority actions have been deferred until a later time. Appendix A provides a detailed status for each of the adopted actions.

The GMP Implementation Committee will convene in 2006 to review the actions and recommend any needed modifications.

Other SGA Management Actions

Several key management actions identified in the GMP warrant more detailed discussion. These include: 1) improving communication and coordination with both regulators and responsible parties to improve the effectiveness of remediation of contaminated groundwater; 2) improving the existing regional monitoring well program; and 3) making any needed improvements to the existing groundwater model for the SGA area.

SGA made significant progress on all of these items in 2004 and 2005. Each is discussed further below.

Improving Communication and Coordination with Regulators and Responsible Parties

One issue of particular importance to SGA is the presence of extensive plumes of groundwater contamination in the region (Figure 19) associated with federal defense-related activities. This contamination may limit local water purveyors' access to a reliable supply of high-quality groundwater, which in turn would threaten the region's ability to implement the Water Forum Agreement.

In February 2004, SGA learned that N-nitrosodimethylamine (NDMA) associated with a contaminant plume from the Aerojet facility near Rancho Cordova had been detected in a monitoring well within Carmichael Water District. In response, SGA formed a Contamination Strategy Committee (CSC) in early June 2004 to press for a

more effective approach to groundwater remediation activities in the region. A key premise of the committee is that remediation efforts could be greatly improved by factoring in local water purveyors' plans for operating the groundwater basin.

In late June 2004, SGA's committee joined forces with the Water Forum to establish a new Joint Contamination Strategy Committee (JCSC) in recognition of the Water Forum's stake in addressing regional groundwater contamination issues. The JCSC requested a meeting to discuss regional contamination concerns with the regulators overseeing remediation efforts at Aerojet as well as the responsible party for the cleanup. The request resulted in an initial meeting in September 2004. The JCSC also requested a meeting with regulatory agency managers to discuss key concerns, and that meeting was held in November 2004.

To outline its concerns, the JCSC presented a "Groundwater Contamination Issues White Paper" that reinforced the importance of protecting local groundwater resources from migrating contamination plumes (Appendix B). Regulatory agency managers agreed to commit their staffs to monthly meetings with local water purveyors to better coordinate remediation efforts. These meetings are now scheduled for the fourth Thursday of every month.

In July 2005, the *Sacramento Bee* reported that the Air Force Real Property Agency (AFRPA) was proposing to scale back its efforts to remediate contaminated groundwater at the former McClellan Air Force Base (McClellan). SGA immediately contacted regulatory agency representatives and confirmed that the AFRPA was proposing to modify its plan for groundwater cleanup, which the public had already commented on in August 2004. Regulatory staff informed SGA that this proposal had been submitted by the Air Force in its Draft Final Groundwater Record of Decision (ROD) in March 2005 and that it was not acceptable to regulators. In April 2005, the regulatory agencies invoked a formal process to have the issue resolved by a dispute resolution committee (DRC) comprised of representatives of the Air Force, the U.S. Environmental Protection Agency, and the California Department of Toxic Substances Control.

In August 2005, SGA wrote a letter outlining its concerns to the DRC members (Appendix C). SGA also authored a guest editorial in the *Sacramento Bee* urging the AFRPA to stick with its original plan to remediate the contaminated groundwater and to better coordinate with local area water purveyors that may be impacted by the contamination (Appendix D). In September 2005, the Air Force and the regulators released a joint statement indicating that the DRC agreed to defer action on the Groundwater ROD to allow for additional technical evaluation of groundwater conditions, to investigate options for the most effective methods of groundwater cleanup, and to more appropriately define the standards for determining when groundwater cleanup is considered complete.

After a briefing on the issue by SGA staff, the *Sacramento Bee* published its own editorial in October 2005 highlighting the need to protect the groundwater basin from risks associated with contamination at McClellan (Appendix E).

Subsequently, the Air Force and regulators agreed to form a Joint Technical Team (JTT) to guide the investigation. SGA and water purveyors adjacent to McClellan have been invited to participate in the JTT, which meets on the third Thursday of every month. SGA is an active participant in these meetings.

In addition, SGA and local water purveyors have briefed members of Congress and their staff on regional groundwater contamination issues associated with federal defense-related activities. SGA is requesting funding from the Department of Defense and / or the U.S. Environmental Protection Agency to support studies and other activities to protect the region's groundwater resources. If approved, the funding would help pay for studies to assess contamination risks, identify possible water supply replacement options, and expand regional groundwater modeling capabilities.

Improving the Regional Monitoring Well Network

In June 2004, SGA learned it was successful in its \$250,000 grant application through the Department of Water Resources' Local Groundwater Management Assistance Program (AB 303). The grant funding was sought to support construction of dedicated monitoring wells to help fill gaps and supplement the vast data collected from more than 260 public supply wells operated by SGA's member agencies. The wells would be used to evaluate progress toward meeting the management objectives of SGA's GMP. Because SGA's Joint Powers Agreement specifically precludes SGA from owning any capital facilities, it was necessary to seek member agencies that would voluntarily have wells constructed within their service areas and would assume ownership and maintenance responsibility for the wells including their eventual destruction. SGA executed voluntary monitoring well agreements with Orange Vale Water Company (OVWC), Rio Linda/Elverta Community Services District (RLECWD), and Sacramento Suburban Water District (SSWD).

Locations of the monitoring wells are shown in Figure 20. Construction of the nine regional monitoring wells began in June 2005 and was completed in October 2005. Water quality sampling was completed in December 2005, with results expected in early 2006. Additionally, the wells will be outfitted in early 2006 with pressure transducers to collect groundwater elevation measurements at regular intervals. Each of the wells is intended to fill a specific need as discussed further below.

Within SSWD, SGAMW-5 is located central to the extensive regional cone of depression that developed over the previous several decades in northern Sacramento County. SGAMW-5 is also located within 200 feet of an existing SSWD production well. Data from SGAMW-5 will help SGA observe aquifer properties as the production well is used, and it will help observe the effects of expanded conjunctive use operations within the basin. SGAMW-4 and SGAMW-6 are located along the American River near existing SSWD production wells. These wells are intended to monitor the relationship between surface water flows in the American River and the adjacent groundwater basin. The wells will also help monitor conditions to ensure that expanded conjunctive use operations in the basin do not negatively impact the American River.

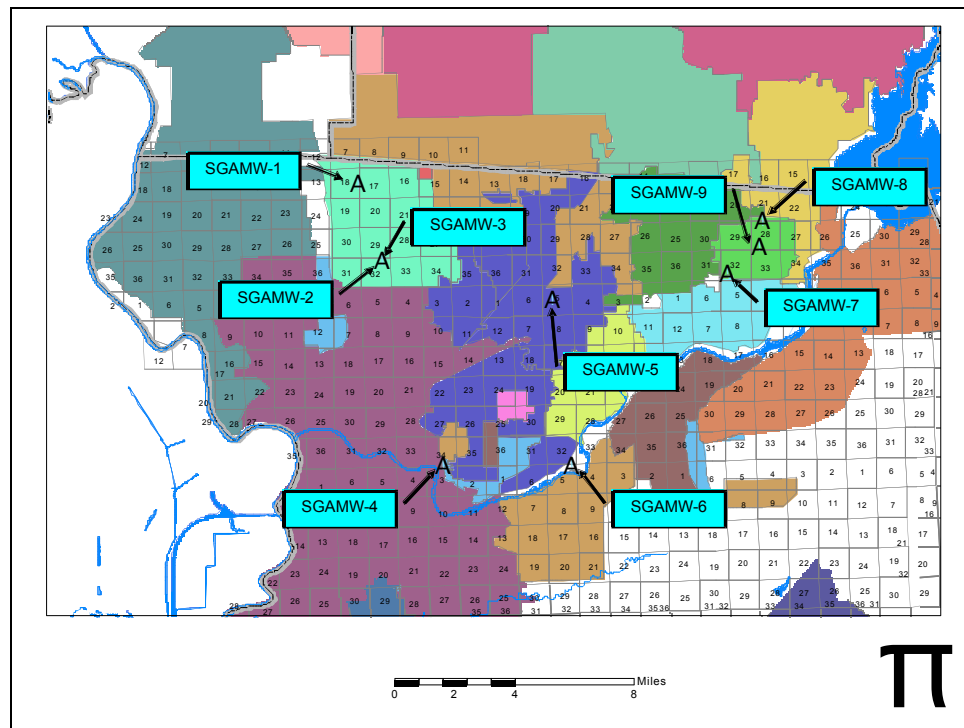


Figure 20. Locations of Regional Monitoring Wells

Within the OVWC service area, very few production wells exist and the geology is complex due to the presence of volcanic flows of the Mehrten Formation. To help further define the subsurface geology, SGAMW-7 and SGAMW-8 were drilled to depths of approximately 300 feet, with continuous core collected from 100 feet to 300 feet below ground surface (BGS). These cores helped develop a much better understanding of in-place conditions. For example, one of the cores clearly demonstrated that subsurface strata had a high degree of cementation with limited ability to produce water. Under normal drilling conditions, these strata are disturbed to the point that the cementation is not evident. SGA also coordinated closely with DWR and the United States Geological Survey to make these cores available for other studies.

SGAMW-9 is located within a few hundred feet of OVWC's existing high capacity production well. This monitoring well will help further define aquifer properties when the production well is used.

Within the RLECWD service area, some production wells have arsenic levels that are close to or exceed the new primary drinking water standard for arsenic of 10 micrograms per liter (ug/L). The RLECWD monitoring wells are intended primarily to further define the occurrence of dissolved arsenic in the aquifer. Additionally, SGAMW-2 and SGAMW-3 are clustered wells completed at depths of 110 feet and

310 feet BGS, respectively. These wells are intended to provide an additional protection for RLECWD production wells by confirming that contamination from the former McClellan Air Force Base is not mobilized beyond its previously defined boundaries. The well cluster will also provide additional information on vertical groundwater gradients between different aquifer layers.

Improving the Regional Groundwater Model

The existing groundwater model for Sacramento County was developed in the mid-1990s using the Integrated Groundwater and Surface Water Model (IGSM). Since that time, several improvements have been made to the programming to warrant an update of the model datasets. In particular, the model is now capable of simulating daily surface water flows, which could greatly improve simulation of the interaction between groundwater and surface water systems. Additionally, improvements have been made to the algorithm that calculates the surface water/groundwater interaction. Finally, improvements to desktop computer processor speeds enable a much greater number of calculations to be made in shorter time periods. This in turn enables more model nodes, resulting in a more refined model grid and more detailed simulations in areas of particular interest.

In June 2005, SGA learned it was successful in its \$250,000 grant application through the Department of Water Resources' Local Groundwater Assistance Program (AB 303) to help fund an update of the IGSM application in northern Sacramento County. The entire update is part of a \$500,000 update with additional funding from the Regional Water Authority (RWA), the U.S. Army Corps of Engineers, and a Proposition 50 planning grant from DWR.

The model improvements include: 1) updating the hydrology for the calibration period (1970 to 1995) from monthly to daily; 2) refining the model grid to improve the model simulation, particularly along stream nodes where recharge to the aquifer system may be occurring; 3) identifying additional monitoring wells to increase the number of groundwater elevation measurements used in calibrating aquifer hydrogeologic parameters; and 4) developing baseline models of existing and future conditions to evaluate potential impacts of various conjunctive use scenarios.

The first phase of improvements has been completed, including refinement of the model grid and development of a daily hydrology dataset for the calibration period. Figures 21 and 22 show the previous and updated model grids. The remainder of the calibration and development of the baseline conditions models are targeted for completion in early 2007.

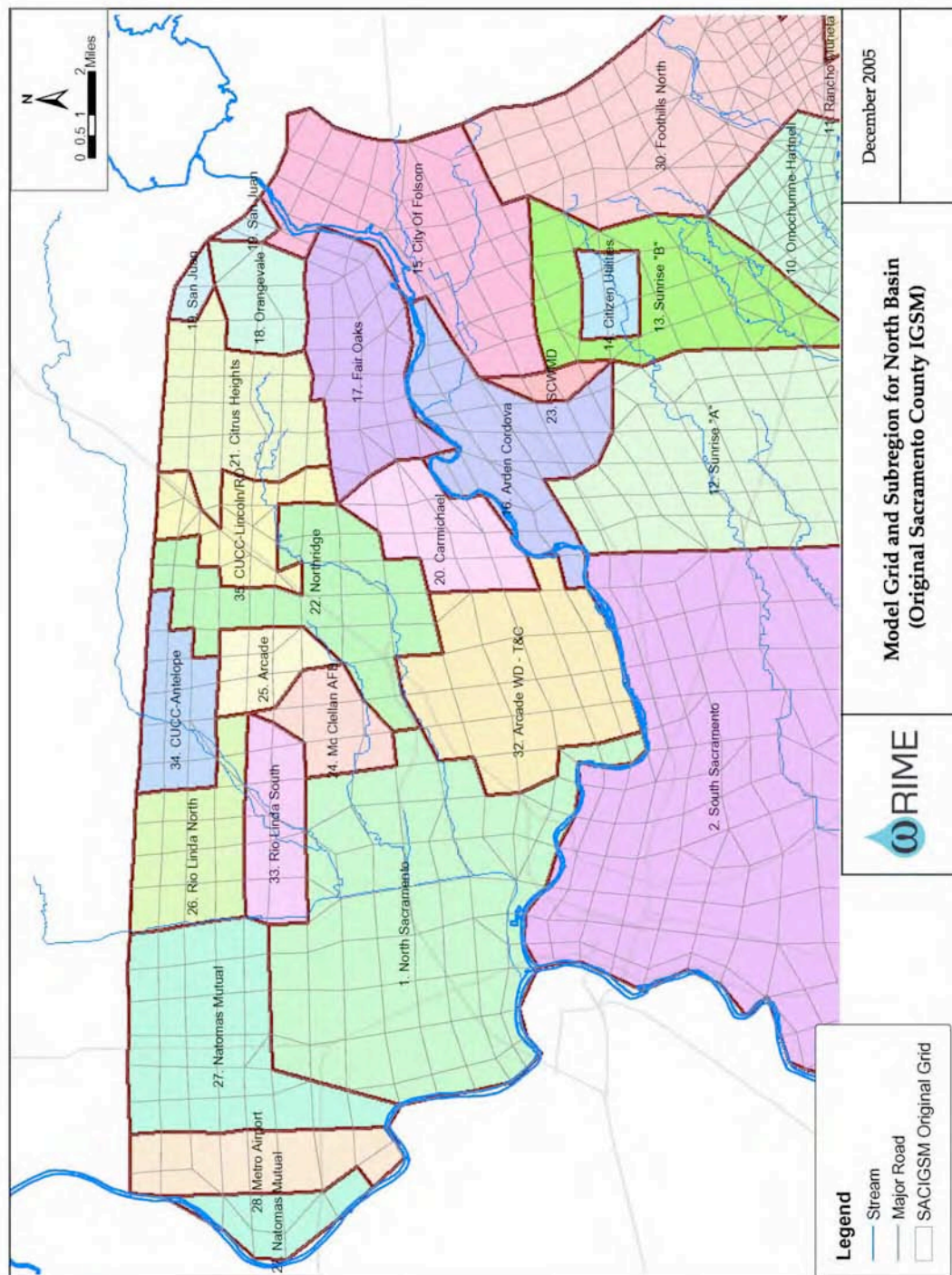


Figure 21. Previous Model Grid for North Area Groundwater Basin

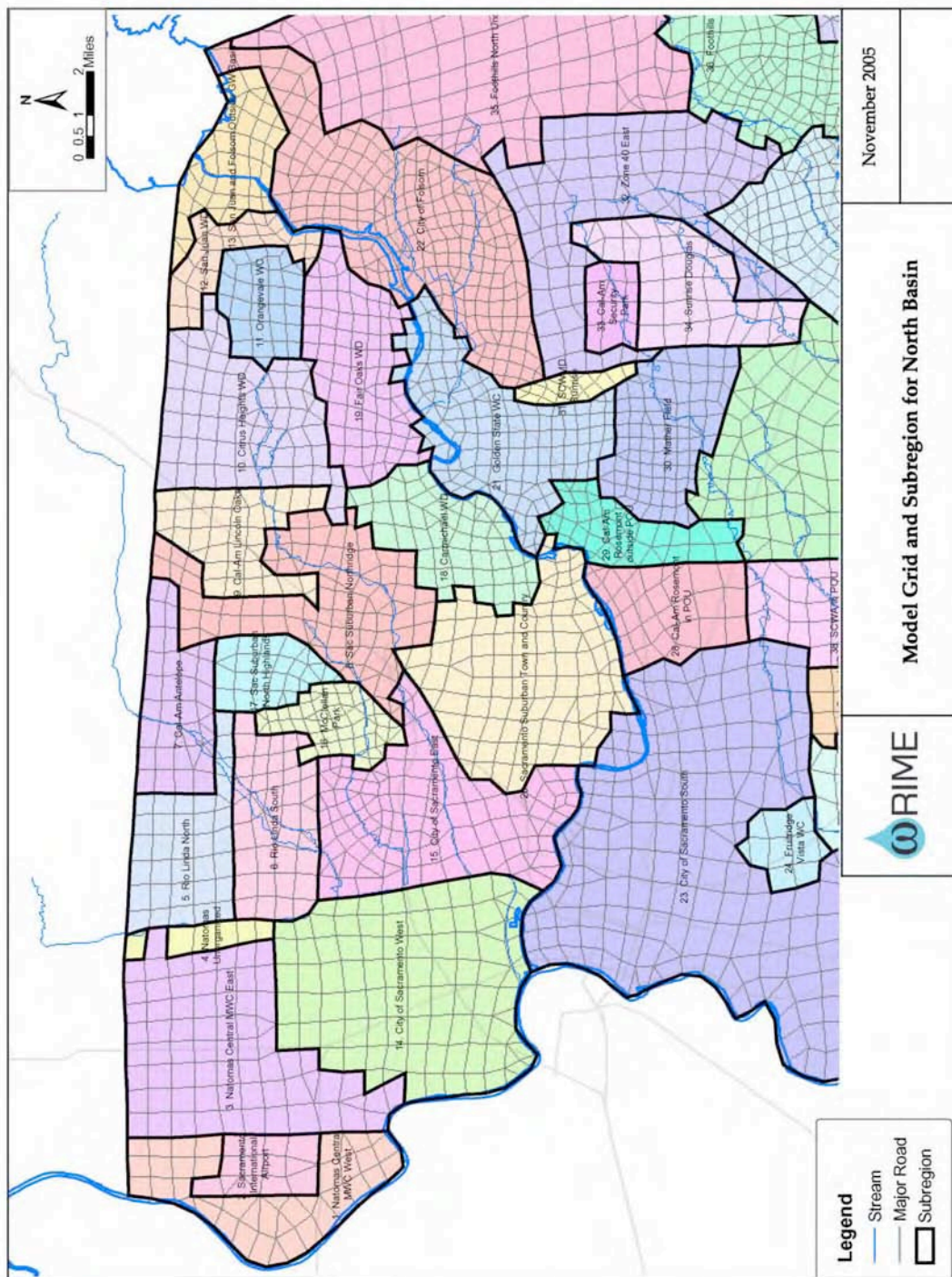


Figure 22. Updated Model Grid for North Area Groundwater Basin

Management Actions by Other Regional Agencies

SGA's management activities are closely coordinated with those of other regional agencies. In 2004 and 2005, several key management activities occurred that were directly relevant to SGA. Significant activities by RWA, the Water Forum, Placer County, Central Sacramento County Groundwater Forum, and associated stakeholders are discussed further below.

RWA Integrated Regional Water Management Plan

In April 2004, RWA launched the Integrated Regional Water Management Planning Program. In partnership with the U.S. Army Corps of Engineers, 16 RWA members are participating in developing an Integrated Regional Water Management Plan (IRWMP) and associated tools to identify the regional projects and partnerships that will help the region best meet its future needs. The program will build on previous efforts, such as the 2003 Regional Water Master Plan through the American River Basin Cooperating Agencies, to support a regional conjunctive use program and promote water recycling, water use efficiency and other strategies that improve local water supply reliability. In January 2006, the Department of Water Resources announced that it will award a \$500,000 Proposition 50 planning grant in support of the RWA IRWMP Program.

Participants represent a diverse array of water management areas, including public water supply, recycled water supply, water conservation, and environmental monitoring and improvement. Sixteen agencies have elected to participate in the program, including:

- California American Water
- Carmichael Water District
- Citrus Heights Water District
- City of Folsom
- City of Lincoln
- City of Roseville
- City of Sacramento
- El Dorado Irrigation District
- Fair Oaks Water District
- Golden State Water Company (formerly Southern California Water Company)
- Orange Vale Water Company
- Placer County Water Agency
- Rio Linda/Elverta Community Water District
- Sacramento Regional County Sanitation District
- Sacramento Suburban Water District
- San Juan Water District

Additionally, the program is being closely coordinated with the Sacramento Area Flood Control Agency (SAFCA).

The IRWMP Project Committee decided that the highest priority projects to complete over the first two years of the program include: 1) developing a state-compliant Integrated Regional Water Management Plan; 2) establishing a Water Accounting Framework to create the foundation for equitable conjunctive use operations in the region; and 3) updating the regional groundwater flow model as a tool to evaluate projects and agreements that emerge during development of the IRWMP.

Each of these priority projects is directly relevant to SGA. Although the SGA GMP is a stand-alone document, it will be incorporated into the IRWMP as a key component. The Water Accounting Framework, which will establish critical operating rules for the underlying groundwater basin (see next section for description of WAF), is critical to both SGA and RWA and will be funded jointly by those agencies. Nearly half of the funding for the SGA groundwater model update (see discussion above) will come from the IRWMP Program.

Most recently, RWA, the Freeport Regional Water Authority (FRWA) and the Sacramento County Water Agency have agreed to work together to develop a single plan that will be known as the American River Basin Integrated Regional Water Management Plan.

Water Forum Lower American River Flow Standard

When the Water Forum Agreement was executed in April 2000, signatories recognized that in order to meet the Water Forum's co-equal objective of preserving the fishery, wildlife, recreational and aesthetic values of the Lower American River, it was necessary to have flow releases and water temperatures from Folsom Reservoir that closely match the needs of anadromous fish, particularly fall-run Chinook salmon and steelhead trout. Beginning in 2001, technical and policy representatives of stakeholder groups began meeting to develop a Flow Management Standard (FMS). In September 2005, the Water Forum, USBR, and the U.S. Fish and Wildlife Service reached agreement on the flow regime portion of the proposed FMS. The remaining two elements of the FMS (river management group and monitoring) will be developed in cooperation with the National Marine Fisheries Service and the California Department of Fish and Game in 2006. Upon completion of all FMS elements, stakeholders will seek approval of the FMS from the State Water Resources Control Board.

Placer County Groundwater Management

The City of Roseville (Roseville) and Placer County Water Agency (PCWA) are currently developing an SB 1938-compliant Groundwater Management Plan (GMP). Roseville and PCWA are developing the content of the GMP with the assistance of a Technical Review Committee (TRC), which includes Roseville, PCWA, the City of Lincoln, Placer County, a representative from agricultural interests in the GMP area, and Department of Water Resources staff. The Roseville/PCWA GMP will be a

planning tool that assists overlying water providers in maintaining a safe, sustainable and high quality groundwater resource.

The goal of the Roseville/PCWA GMP is to ensure the long-term availability of groundwater within the Placer County portion of the North American Groundwater Subbasin to supplement available surface water sources in dry years and other emergency periods to provide a sustainable integrated water supply for western Placer County. To meet this goal, the GMP will serve as a framework for coordinating many independent groundwater management activities into a cohesive set of shared goals and objectives coupled with related actions to meet those goals and objectives.

The Roseville/PCWA GMP is focused on the southwestern Placer County portion of the North American Subbasin and is intended to complement other existing GMPs in the greater Sacramento region.

Central Sacramento County Groundwater Management

When the Water Forum Agreement was executed in April 2000, a key element of the agreement was the establishment of groundwater management entities over the north, central, and south portions of Sacramento County. The Central Sacramento County Groundwater Forum (CSCGF) began in February 2002, with 30 representatives from six interest groups participating in negotiations to develop a management structure for the area south of the American River and north of the Cosumnes River. SGA has been an active participant in these meetings and has provided guidance to the CSCGF on a variety of groundwater management structure options.

In late 2004, the Sacramento County Water Agency completed an SB 1938-compliant groundwater management plan for its Zone 40 service area, which covers a significant portion of the geographic area of the CSCGF. In December 2004, the CSCGF formed a task force to complete a GMP for the entire CSCGF area. This task force made significant progress toward developing a GMP during 2005, and is expected to complete a GMP in early 2006. Upon completion of the GMP, the CSCGF will resume work on determining the preferred management structure for the central area.

Conclusions and Recommendations

Throughout 2004 and 2005, SGA made significant strides toward ensuring a reliable groundwater basin for future generations and advancing successful implementation of the Water Forum Agreement. With the development of critical monitoring and management tools, SGA has begun laying a solid foundation for managing the basin. These tools include completing the SGA Data Management System, developing a regional monitoring well network, and securing funding to enhance the regional IGSM model that will help analyze future conjunctive use operations aimed at improving water supply reliability. In addition to solid technical work, SGA has raised the visibility of regional contamination issues among policy makers and focused significant attention on the potential impact contamination could have on local water supplies.

As stated in the introduction to this report, the Groundwater Management Plan adopted by SGA includes five primary objectives. SGA and its members have made significant progress toward meeting each of these objectives. That progress is described in further detail below.

SGA Groundwater Management Plan Objectives

Maintain or improve groundwater quality in the SGA area for the benefit of basin groundwater users

SGA is making good progress toward meeting this objective. With the noted exception of regional contamination plumes, groundwater quality is very good in the basin and suitable for public water supply needs. SGA has taken a proactive approach to improving the basin's groundwater quality through its Joint Contamination Strategy Committee with the Sacramento Water Forum. The committee meets regularly with regulatory agencies and responsible parties to ensure that the basin's importance as a public water supply is considered in developing clean-up strategies. Actions by this committee have helped ensure that clean-up efforts remain on track at McClellan and that effective clean-up strategies are aggressively pursued for recently detected contaminants associated with Aerojet.

The dedicated monitoring well network installed by SGA in 2005 will provide additional insight into water quality in shallower parts of the aquifer system – an area not currently well understood. When combined with the extensive water quality data compiled by SGA for public supply wells, this will be a valuable monitoring tool for further assessing groundwater quality.

Maintain groundwater elevations that result in a net benefit to basin groundwater users

SGA member agencies have implemented a variety of programs in recent years that are helping to meet this objective. Groundwater elevation contour maps included in this report clearly show that conjunctive use programs are starting to produce tangible results. More projects are underway that will further benefit the basin and support implementation of the Water Forum Agreement.

The dedicated monitoring well network installed by SGA in 2005 will provide additional information on changes to the water table as conjunctive use activities are expanded. When combined with the water elevation data from public supply wells, this will serve as an effective network to monitor and ensure beneficial groundwater elevations in the basin.

Finally, SGA launched development of a Water Accounting Framework in early 2006 that will ensure the basin is operated in a sustainable fashion and that some cost equity is achieved for those investing most heavily in conjunctive use facilities in the basin.

Protect against any potential inelastic land surface subsidence

While subsidence is not a documented problem within the SGA area, SGA and its members have taken steps to monitor for potential future subsidence. As part of the regional monitoring well project funded by an AB 303 grant, SGA is working to establish specific well elevations with a level of accuracy that will allow future surveys to detect potential land surface subsidence. Sacramento Suburban Water District is surveying the elevations of 89 production wells throughout its service area. Since 30 of these locations were previously surveyed in 1991, the new data will help determine whether any recent land surface subsidence has taken place.

Protect against adverse impacts to surface water flows in the American River and Sacramento River

SGA is making progress toward meeting this objective. SGA recently installed two dedicated monitoring wells intended to observe the relationship between water elevations in the American River and the adjacent groundwater basin. These wells are located along the central part of the lower American River, where the greatest amount of groundwater pumping is likely to occur in the future. SGA also recently identified dozens of existing monitoring wells along the American and Sacramento rivers. SGA will begin assessing this data to better understand the current relationship between the surface water system and underlying aquifers, and investigate the potential for future interactions between these two systems.

In addition to direct monitoring, SGA will enhance the existing integrated groundwater and surface water model (IGSM) for the area during 2006. Enhancements include refining the model elements that represent the American River and improving the level of simulation to include daily as well as monthly data. This should enhance understanding of the surface water/groundwater relationship

and allow SGA to develop operational scenarios if needed to ensure that surface water systems are adequately protected.

Protect against adverse impacts to water quality resulting from interaction between groundwater in the basin and surface water flows in the American River and Sacramento River

SGA is making progress toward meeting this objective. In addition to monitoring groundwater elevations in wells along the river system, SGA will also monitor water quality to better understand the dynamics between these two systems. Additional surface water quality data are available via cooperative studies between SGA and the State Water Resources Control Board to assess overall water quality conditions in the basin and in the American River. Data have also been collected from the Sacramento River Coordinated Monitoring Program sponsored by the Sacramento Regional County Sanitation District, the City of Sacramento, and the County of Sacramento. These conditions will be assessed and reported in the next Basin Management Report.

Recommendations for SGA Priorities

Based on work done in 2004-2005, SGA adopted seven principal goals and identified specific strategies and actions for FY 2006. A complete listing of these goals and activities is included in Appendix F.

Building on that effort, this section identifies the highest priority activities for FY 2007 within the context of SGA's adopted goals.

Goal: Devise and implement strategies to safeguard groundwater quality
Recommendations:

- Continue to press regulators and responsible parties to better integrate water supply operations with remediation efforts.
- Continue monthly contamination meetings with regulators and responsible parties and participate in the McClellan remediation Joint Technical Team.
- Continue to brief elected officials on regional contamination concerns.
- Continue to pursue funding opportunities to assess impacts on regional water supply due to contamination and identify potential replacement water supply options.

Goal: Develop and utilize groundwater management tools, consistent with the adopted GMP, to support the policy and technical foundation for managing the basin and fostering regional conjunctive use programs

Recommendations:

- Coordinate with Regional Water Authority to develop Water Accounting Framework for SGA Board consideration.
- Update groundwater model for SGA area.
- Monitor wells installed as part of regional monitoring well network funded through AB 303 grant from the Department of Water Resources.

- Continue to maintain and update the SGA Data Management System.
- Continue to pursue funding partnerships for development and utilization of groundwater management tools.

Goal: Foster conjunctive use of surface water and groundwater, consistent with the framework established by the Water Forum Agreement
Recommendations:

- Coordinate with Regional Water Authority to develop Water Accounting Framework for SGA Board consideration.
- Continue to pursue short-term banking and exchange opportunities.

Recommendations for GMP Objectives and Action Items

SGA has had good success in implementing its GMP during the two years since its adoption. It does not appear that the objectives or action items need to be significantly modified at this time.

Appendix A

GMP Action Items

**SGA Adopted GMP Action Items
(as of 4/8/06)**

Description of Action		Status	Comments
COMPONENT CATEGORY 1: STAKEHOLDER INVOLVEMENT			
1.1 <i>Involving the Public</i>			
1	Continue efforts to encourage public participation as opportunities arise.	On-going	Provide GMP Program status update at each publicly noticed SGA Board meeting.
2	Review and take actions from the public outreach plan as necessary during implementation of various aspects of the GMP.	On-going	SGA has not encountered any issues requiring significant public outreach since adopting the GMP. To date, the most effective ways of notifying the public have been through regular Board meetings, quarterly newsletters, and the SGA website. The SGA website includes a regularly updated announcements section on the main page. Finally, SGA's participation in regular monthly meetings of the Water Forum Successor Effort (see item below) provides opportunities to identify issues from a variety of interests throughout the region.
3	Provide briefings to the Water Forum Successor Effort on GMP implementation progress.	On-going	SGA staff participate in regular monthly meetings of both the Water Forum Successor Effort and are available to provide briefings upon request.
4	Work with members to maximize outreach on GMP activities including the use of the SGA website, member websites, or bill inserts.	On-going	SGA website launched in November 2003 (www.sgah2o.org). Provide updates through regular quarterly newsletter by RWA and SGA.
1.2 <i>Involving Other Agencies Within and Adjacent to the SGA Area</i>			
1	Continue high level of involvement demonstrated through the SGA GMP development into implementation of the plan by continued participation on committees described above.	On-going	SGA staff participate in regular meetings of both the Water Forum Successor Effort and the Central Sacramento County Groundwater Forum.
2	Provide copies of the adopted GMP and subsequent annual reports to representatives from Placer, Sutter, and Yolo counties, and the Groundwater Forum.	On-going	Copies of the GMP were sent to Placer County (Placer County Water Agency, City of Lincoln, City of Roseville), Sutter County (South Sutter Water District, Sutter County Public Works), Yolo County Resources Coordinator, and Sacramento County Water Agency (representing the Central Sacramento County Groundwater Forum) on January 22, 2004. The schedule for the Basin Management Report has been modified to a biennial report. The report will be sent to the agencies listed above when it is completed in early 2006.
3	Meet with representatives from Placer, Sutter, and Yolo counties, and the Central Sacramento County Groundwater Forum as needed.	On-going	Left voice mail with Linda Fiack, Yolo County Resource Director (530) 666-8019 on July 30, 2004 offering to provide briefing at their request. Spoke to Brad Arnold, GM of South Sutter WD (530) 656-2242 on July 30, 2004. Brad indicated that South Sutter WD will begin updating their AB3030 plan soon. SGA offered assistance, including potentially sitting on an advisory committee for the update. On August 30, 2004, Sacramento County WA staff requested that SGA staff participate in limited review of a GMP under development for SCWA's Zone 40 area. Attend regular monthly meetings of Central Sacramento County Groundwater Forum. Forum meeting recurrence was changed to quarterly in 2005. SGA/RWA Executive Director serves on the Implementation Committee of the City of Lincoln GMP.
4	Coordinate a meeting with the agricultural groundwater pumpers in the SGA area to inform them of SGA's management responsibilities and activities, and develop a list of agricultural groundwater pumpers concerns and needs relative to SGA's management of the area.	Deferred	Met with Jack DeWit, an SGA Board member and independent agricultural groundwater pumper within SGA in May 2004. Jack agreed to facilitate setting up a meeting with what is a small number of independent pumpers in early 2005 prior to commencement of the next growing season. In June 2005, the SGA adopted a resolution to not assess fees to agricultural water pumpers. The GMP Implementation Committee recommended that staff defer action on this item until such time as specific concerns or needs are expressed.
5	Coordinate a meeting with other self-supplied pumpers in the SGA area to inform them of SGA's management responsibilities and activities, and develop a list of self-supplied groundwater pumpers concerns and needs relative to SGA's management of the area.	Deferred	Received list with contact information of 23 small water systems licensed through DHS within the SGA area from Sac County EMD (small water systems in SGA.doc) on August 31, 2004. The systems total approximately 35 wells. EMD confirmed that pumping by these systems is not reported to the EMD or DHS. Because these pumpers likely account for a very small percentage of pumping in the basin, the GMP Implementation Committee has decided to defer any actions in coordinating with them at this time.
1.3 <i>Utilizing Advisory Committees</i>			
1	Upon adoption of the GMP, the Policy Committee will meet to discuss the continuation and composition of committees to guide implementation of the plan.	Complete	A GMP Implementation Committee was established on July 8, 2004 consisting of Mitch Dion (Cal-AM WC), Rob Roscoe (SSWD), Shauna Lorange (SJWD) and Gary Reents (City of Sacramento). The first committee meeting was held August 2, 2004. Committee met January 31, 2005. Will meet as needed for future.
1.4 <i>Developing Relationships with State and Federal Agencies</i>			

**SGA Adopted GMP Action Items
(as of 4/8/06)**

Description of Action		Status	Comments
1	Continue to develop working relationships with local, state, and federal regulatory agencies.	On-going	<p>Provided regional briefing of water supply issues to the Manager of the Water Policy and Reform Team for the Government of Australia on Oct 8, 2004. The briefing was given at the request of DWR.</p> <p>Met with management and staff of USEPA, SWRCB, Central Valley RWQCB, DTSC, Water Forum Successor Effort, and purveyors on November 4, 2004 to express concerns over regional impacts of contamination in basin. Beginning in June 2005, set the fourth Tuesday of every month as a standing meeting date with regulatory representatives of Aerojet and McClellan contaminant sites. This meeting will serve to involve other regulatory agencies as needed.</p> <p>SGA staff serve on a Joint Technical Team to evaluate groundwater remediation options at McClellan. The JTT meets on the third Wednesday of every month.</p>
1.5 Pursuing Partnership Opportunities			
1	Continue to promote partnerships that achieve both local supply reliability and achieve broader regional and statewide benefits.	On-going	<p>SGA staff will promote partnerships as requested by SGA membership.</p> <p>SGA is closely coordinated with the RWA Integrated Regional Water Management Planning Program. Part of that effort has identified the need to update the IGSM regional model. SGA was successful in its application for an AB 303 grant from DWR to fund half of the update.</p>
2	Continue to track grant opportunities to fund groundwater management activities and local water infrastructure projects.	On-going	<p>Awarded \$250K AB303 grant on June 30, 2004 for regional monitoring well network.</p> <p>Awarded \$250K AB303 grant on June 30, 2005 for update to regional groundwater model.</p> <p>Funding for the AB 303 program is currently on hold. SGA staff are working to ACWA in an effort to revive funding for the program.</p>
COMPONENT CATEGORY 2: MONITORING PROGRAM			
2.1 Groundwater Elevation Monitoring			
1	Coordinate with member agencies and DWR to identify an appropriate group of wells for monitoring for a spring 2004 set of groundwater elevation measurements.	Complete	SGA met DWR and SCWA on January 29, 2004 at the DWR Central District 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.
2	Coordinate with DWR and SCWA to ensure that the selected wells are maintained as part of a long-term monitoring network.	Complete	SGA met DWR and SCWA on January 29, 2004 at the DWR Central District Office and explained the importance of their monitoring wells to our overall network and determined that both DWR and SCWA are maintaining long-term monitoring plans in the basin.
3	Coordinate with DWR and SCWA to ensure that the timing of water level data collection by member agencies coincides within one month of DWR and SCWA data collection.	Complete	SGA met DWR and SCWA on January 29, 2004 to coordinate the timing of water elevation measurements. An April 15 goal was set for the collection of spring water elevations. An October 15 goal was set for the collection of fall water elevations. Each participating agency attempted to collect levels within +/- two weeks of these dates.
4	Coordinate with member agencies to ensure that needed water level elevations are collected and verify that uniform data collection protocols are used among the agencies.	Complete	The final GMP was sent to all member agency General Managers and Directors on January 23, 2004. Water level measurement protocols are included in Appendix D of the SGA GMP. The other important aspect with respect to protocol is the timing of measurements. SGA coordinated with member agencies to collect spring water elevations around April 15.
5	Coordinate with the USGS to determine the potential for integrating USGS monitoring wells constructed for the National Water Quality Assessment (NAWQA) Program into the SGA monitoring network.	Complete	<p>SGA spoke with Ken Belitz (California NAWQA Program Chief) of the USGS on January 7, 2004. Ken referred SGA staff to USGS staff to coordinate the collection of water elevation data from USGS monitoring wells when the timing of collection is determined.</p> <p>In February 2005, received water elevation data through 2004 for USGS NAWQA wells monitored in the Sacramento area.</p>
6	Consider ways to fill gaps in the monitoring well network by identifying additional suitable existing wells or identifying opportunities for constructing new monitoring wells.	On-going	<p>Secured \$250K AB303 grant to install dedicated monitoring wells in the basin - award date June 30, 2004. In October 2005, completed installation of nine regional monitoring wells where critical data gaps were known.</p> <p>In 2005, received data on monitoring wells associated with McClellan and Aerojet. The data are mostly limited to water elevation data, but do include some water quality parameters related to contaminant monitoring.</p> <p>Discussed with Dana Booth at February 23, 2004 meeting about opportunities to integrate wells from existing LUST sites into our network. Had subsequent meeting with Dana Booth on Sep 7, 2004 - Mr. Booth indicated that opportunities could be available to collect split samples from these sites to analyze water quality for our information. Given the additional regional monitoring wells and more data available through McClellan, Aerojet, and the USGS NAWQA wells, SGA will not pursue this further at this time.</p>
7	Assess groundwater elevation trends and conditions based on the network annually.	On-going	<p>Initial State of the Basin Report for 2002 calendar year data was completed in February 2004. Electronic version of report is available on SGA website.</p> <p>State of Basin Report for 2003 and 2004 calendar years to be completed in early 2006. Recommending changing name to Basin Management Report.</p>

**SGA Adopted GMP Action Items
(as of 4/8/06)**

Description of Action		Status	Comments
8	Assess the adequacy of the groundwater elevation monitoring well network annually.	On-going	To be assessed for first time in early 2006 during preparation of the Basin Management Report.
9	Identify a subset of monitoring wells that will be monitored more frequently than twice annually to improve the SGA's understanding of aquifer responses to pumping throughout the year.	On-going	This will continue to be assessed through time. In early 2006, dedicated pressure transducers will be installed on the nine regional monitoring wells installed through funding from a DWR AB 303 grant.
2.2 Groundwater Quality Monitoring			
1	Coordinate with member agencies to verify that uniform protocols are used when collecting water quality data.	Complete	A copy of the DHS guidelines were sent to all member agency General Managers and Directors on January 23, 2004 with the GMP.
2	Coordinate with the USGS to obtain historic water quality data for NAWQA wells, determine timing and frequency of monitoring under USGS program, and to discuss the potential for integrating USGS monitoring resources with the SGA network.	On-going	Obtained 1998 water quality data from USGS for NAWQA wells. Wells were sampled again by USGS in 2003/2004. That data will be provided to SGA when it has been QA/QC checked. SGA participated in a USGS/SWRCB AB 599 water quality sampling program in early 2005. The results of that study are expected in early 2006.
3	Coordinate with member agencies and other local, state, and federal agencies to identify where wells may exist in areas with sparse groundwater quality data.	Complete	Added monitoring well data from McClellan and Aerojet.
4	Assess the adequacy of the groundwater quality monitoring well network annually.	On-going	To be assessed for first time in early 2006 during preparation of the Basin Management Report.
2.3 Land Surface Elevation Monitoring			
1	Investigate the feasibility and costs of re-surveying the wells in the Arden Arcade area that were last measured in 1991.	Complete	Sacramento Suburban Water District has been awarded an AB303 grant application to be conduct additional surveying of these and other locations in 2006.
2	Coordinate with the USGS to ascertain the suitability of the use of Interferometric Synthetic Aperture Radar (InSAR) images of the SGA and surrounding area. If the technology appears suitable, identify the costs of determining ground surface elevations and identify potential cost-sharing partners.	Deferred	Surveys data from benchmarks in the 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.
3	Coordinate with other agencies, particularly the City and County of Sacramento and the National Geodetic Survey to determine if there are other suitable benchmark locations in the SGA area to aid in the analysis of potential land surface subsidence.	Deferred	Surveys data from benchmarks in the Arden Arcade area indicate that subsidence is not a significant concern at this time. Because of limited staff time at SGA, this task is being deferred.
4	Educate SGA member agencies of the potential for land surface subsidence and signs that could be indicators of subsidence.	Deferred	Surveys data from benchmarks in the Arden Arcade area indicate that subsidence is not a significant concern at this time. Because of limited staff time at SGA, this task is being deferred.
2.4 Surface Water Groundwater Interaction Monitoring			
1	Compile available stream gage data and information on tributary inflows and diversions from the American and Sacramento rivers to quantify net groundwater recharge or discharge between gages in the SGA area.	Complete	A memorandum report on available data on the American River was prepared for SGA by MWH on September 22, 2004. This included a summary of known inputs and outputs to the stream budget of the American River. 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. SGA has obtained the 2002-2003 version of this report. One of the objectives of the current effort to update the SGA groundwater model (IGSM) is to simulate daily flows on the American and Sacramento rivers. When completed in early 2007, the model should provide additional data on potential recharge.
2	Coordinate with local, state, and federal agencies to identify available surface water quality data from the American and Sacramento Rivers adjacent to the SGA area.	Complete	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. SGA has obtained the 2002-2003 version of this report.
3	Correlate groundwater level data from wells in the vicinity of river stage data to further establish whether the river and water table are in direct hydraulic connection, and if the surface water is gaining or losing at those points.	Complete	In late 2003, the State Board considered stream aquifer interaction along the American River as part of a fully appropriated stream hearing. Consulting 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 becoming available, no additional studies are planned at this time.
4	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 Sacramento River and American River.	On-going	As mentioned above, the results of the fully appropriated streams hearing on the American River in 2003 have made this a low priority item. In 2005, two monitoring wells were installed for SSWD near the American River. Data collected beginning in early 2006 will be evaluated to assess these relationships.
5	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.	On-going	Met with Dave Evans of CSUS on September 8, 2004. Dr. Evans indicated that several wells on the south side of the river at CSUS are equipped with pressure transducers, which collect continuous water elevation measurements. The data are collected, but have not been processed to date. Dr. Evans expects to bring in a graduate student in the near future to analyze the relationship between stream stage and groundwater elevations.
2.5 Protocols for the Collection of Groundwater Data			

**SGA Adopted GMP Action Items
(as of 4/8/06)**

Description of Action		Status	Comments
1	Use a Standard Operating Procedure (SOP) for collection of water level data by each of the member agencies.	Complete	Water level measurement protocols are included in Appendix D of the SGA GMP. The final GMP was sent to all member agency General Managers and Directors on January 23, 2004.
2	Provide member agencies with guidelines on the collection of water quality data developed by DHS for the collection, pretreatment, storage, and transportation of water samples (DHS, 1995).	Complete	A copy of the DHS guidelines were sent to all member agency General Managers and Directors on January 23, 2004 with the GMP.
3	Provide training on the implementation of these SOPs to member agencies, if requested.	Complete	The cover letter for the GMP and water quality protocols sent to member agencies on January 23, 2004 extending an offer to provide training on protocols.
2.6	Data Management System		
	No Action Required		The initial DMS was completed in February 2004. SGA maintains an annual consulting budget item of \$20,000 for maintenance and support of the DMS.
COMPONENT CATEGORY 3: GROUNDWATER RESOURCE PROTECTION			
3.1	Well Construction Policies		
1	Ensure that all member agencies are provided a copy of the county well ordinance and understand the proper well construction procedures	Complete	Provided each member agency with 2003 revised county well construction and destruction standards on April 6, 2004.
2	Inform member agencies of Sacramento County's Consultation Zone and provide a copy of the boundary of the former McClellan AFB prohibition zone to appropriate member agencies.	On-going	Met with James Taylor of CVRWQCB on September 13, 2004 and received a copy of the 2004 update to the Sacramento County Special Consultation Zone Ground Water Plume Site report. Informed member agencies at the October 14 SGA Board meeting that the report is available at SGA and that we will make a future effort scan the maps into an electronic file.
3	Provide a copy of the most recently delineated plume extents at the former McClellan AFB, the former Mather AFB, and Aerojet to the EMD and SGA members for their review and possible use.	Complete	Submitted a September 1, 2004 letter to member agency managers. Each letter included a map showing the maximum plumes extents in a 2-dimensional map view based on 2002 quarterly monitoring reports for each site (GMP letter to GMS 01sep04.doc).
4	Coordinate with member agencies to provide guidance as appropriate on well construction. Where feasible and appropriate, this could include the use of subsurface geophysical tools prior to construction of the well to assist in well design.	Complete	Offered assistance to all SGA member managers in letters dated January 23, 2004 and again on April 6, 2004.
3.2	Well Abandonment and Well Destruction Policies		
1	Ensure that all member agencies are provided a copy of the code and understand the proper destruction procedures and support implementation of these procedures	Complete	Provided each member agency with 2003 revised county well construction and destruction standards on April 6, 2004.
2	Follow up with member agencies on the reported abandoned and destroyed wells to confirm the information collected from DWR	Complete	Submitted a September 1, 2004 letter to member agency managers. Each letter included a table of member wells and their current status in the SGA database. The letter requested that member agencies update the well status (GMP letter to GMS 01sep04.doc). The updated status was entered into the DMS.
3	Provide a copy of the information on abandoned and destroyed wells in northern Sacramento County to fill any gaps in their records	On-going	Data received on well status requested from SGA members on September 1, 2004 will be input into the SGA data management system in early 2005 as part of the State of the Basin Report update. This information on well status will be forwarded to the Central District office of DWR at that time.
4	Meet with the EMD to discuss ways to ensure that wells in the SGA area are properly abandoned or destroyed	Complete	Spoke with Steve Kalvelage of Sac County Environmental Management Department on July 26, 2004. Discussed possibility of preparing grant application under AB 303 for a well destruction program. Met with Dana Booth of EMD on September 7, 2004. Encouraged EMD to develop an AB303 grant application for a well abandonment program. Forwarded the AB303 grant application workshop notification to Dana on October 5, 2004.
5	Obtain "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.	Complete	An electronic version of the District 6 well location database for the Sacramento area was downloaded and incorporated into a GIS coverage of the SGA area. The DOG records confirm that oil and gas development has been very limited in the SGA area. Almost all activity has been confined to the western one-third of Sacramento County. There are records for only 53 permits issued: 40 are for plugged and abandoned dry holes; 5 active gas holes exist in the vicinity of Sacramento International Airport; 1 steam flood well is active in the vicinity also near the airport; and 7 previous gas wells have been plugged and abandoned (SGA DOG map.pdf).
3.3	Wellhead Protection Measures		
1	Request that member agencies provide vulnerability summaries from the DWSAP to the SGA to be used for guiding management decisions in the basin.	Complete	This request was not sent to members, because it was unnecessary. The information for each well is available on-line at http://swap.ice.ucdavis.edu/TSinfo/TSsystemc.asp?myCounty=34 .
2	Contact groundwater basin managers in other areas of the state for technical advice, effective management practices, and "lessons learned," regarding establishing wellhead protection areas	Deferred	Because of limited SGA staff time, this item is being deferred. In 2005, SGA staff coordinated a session on local agency management for the Biennial Groundwater Conference. In addition to SGA, briefings on the activities of Orange County Water District and Eastern Municipal Water District were given. This provided insightful information on differences between management in northern and southern California.
3.4	Protection of Recharge Areas		
1	When CAS results are available, meet with the SWRCB to discuss those results and consider follow-on actions.	Complete	Coordinated SWRCB and LLNL presentation to SGA Board of Directors on February 12, 2004. Reviewed LLNL draft report in March 2004. Received final report in April 2004.

**SGA Adopted GMP Action Items
(as of 4/8/06)**

Description of Action		Status	Comments
3.5 Control of the Migration and Remediation of Contaminated Groundwater			
1	Coordinate with known responsible parties to develop a network of monitoring wells to act as an early warning system for public supply wells.	On-going	Met with Craig Fegan and Steve Costello at Aerojet on August 26, 2004. Aerojet agreed to provide construction, water quality and water elevation data on approximately 77 monitoring wells within and adjacent to the SGA boundary. They will provide updated data on those wells on a semi-annual basis. Spoke to Dana Booth with Sac County Environmental Health on July 27, 2004 and again on September 7, 2004. Dana is in charge of leaking underground storage tank site investigations. He indicated that some of the locations might be willing to member agencies to collect a split water sample during active investigations for the purposes analyzing other constituents of interest to local purveyors.
2	If detections occur in these monitoring wells, work with the responsible parties and the potentially impacted member agency to develop strategies to minimize the further spread of contaminants.	On-going	An SGA Contamination Strategy Committee was formed in June 2004. This committee will work proactively to ensure that member purveyor needs are addressed if detections occur. Committee met with regulators and Aerojet responsible parties to get briefing of status of remediation efforts at Aerojet on October 4, 2004. Met with management and staff of USEPA, SWRCB, Central Valley RWQCB, DTSC, Water Forum Successor Effort, and purveyors on November 4, 2004 to express concerns over regional impacts of contamination in basin.
3	Provide SGA members with all information on mapped contaminant plumes and LUST sites for their information in developing groundwater extraction patterns and in the siting of future production or monitoring wells	Complete	Spoke to Dana Booth with Sac County Environmental Health on July 27, 2004. He recommended that rather than prepare a static map of these locations that SGA should develop a procedure for querying the GeoTracker web site and consulting with Sac County staff when locating future wells. The directions for using Geotracker were developed by SGA staff and provided to member agency managers in a September 1, 2004 letter (GMP letter to GMS 01sep04.doc).
4	Meet with representatives of the RWQCB to establish a mutual understanding about SGA's groundwater management responsibilities	Complete	Met with Central Valley Regional Water Quality Control Board staff on February 26, 2004. Briefed them on SGA background, SGA GMP, and DMS. RWQCB added SGA to mailing list for updates on underground storage tank sites.
3.6 Control of Saline Water Intrusion			
1	Track the progression, if any, of saline water bodies moving toward the east from the Delta.	On-going	Will work with DWR Central District staff to determine if any representative wells are located in the north Delta area to assist in tracking of any possible saline groundwater bodies.
2	Observe TDS concentrations in public supply wells of North Area Groundwater Basin water suppliers that are routinely sampled under the DHS Title 22 Program. These data will be readily available in the SGA's DMS and are already an on-going task for the annual review of basin conditions.	On-going	To be assessed in the Basin Management Report.
3	Inform all member water purveyor managers of the presence of the interface and the approximate depth of the interface below their service area for their reference when siting potential wells.	On-going	No action on this item will be taken until after SGA staff have had an opportunity to discuss the TDS data from the Delta with DWR Central District staff in early 2005.
COMPONENT CATEGORY 4: GROUNDWATER SUSTAINABILITY			
4.1 Conjunctive Management Activities			
1	Continue to investigate conjunctive use opportunities within the SGA area	On-going	SGA will assist any members upon request. Currently, the Integrated Regional Water Management Planning Program is underway under the RWA umbrella. This program will identify opportunities and facilities for implementing expanded conjunctive use in the region.
2	Continue to investigate opportunities for the 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 river or stream beds).	On-going	SGA has been closely coordinating with the City of Roseville in its feasibility study of an aquifer storage and recovery well. Some SGA members have indicated an interest for use of this methodology pending results of the Roseville study.
4.2 Demand Reduction			
1	Coordinate with the RWA and its members that have signed specific agreements to the WFA to ensure that those conservation efforts are on track. For members that are not signatory, the SGA will ensure that they are informed of the benefits and regional importance of RWA's WEP.	On-going	Signatories to the Water Forum Agreement are currently completing a review and renegotiation of existing best management practices for water conservation. That effort is expected to be completed by mid-2006.
2	Coordinate with SRCSD through the RWA to investigate opportunities for expanded use of recycled water throughout the county.	On-going	SRCSD began a recycled water master plan effort in late 2004 with a scheduled completion of early 2006. One of the goals of the plan is to identify uses in the County for between 30 to 40 mgd of recycled water by the year 2020. SRCSD also joined an RWA effort to complete an Integrated Regional Water Management Plan. The results of the SRCSD effort will be integrally linked to the RWA planning effort.
COMPONENT CATEGORY 5: PLANNING INTEGRATION			
5.1 Existing Integrated Planning Efforts			

SGA Adopted GMP Action Items
(as of 4/8/06)

Description of Action	Status	Comments
1 Prepare and adopt a formal integrated water management plan in accordance with CWC Section 10540 et seq. The SGA will form an ad hoc committee with the RWA to determine which agency would be most appropriate to prepare that plan.	On-going	RWA began an Integrated Regional Water Management Planning Program with several goals including adopting an integrated plan by late 2005. Project agreements were sent to participants in April 2004 and the program the required number of participants were achieved in September 2004. The SGA, PCWA, and City of Lincoln GMPs will be each be a component of the integrated plan.
2 Review the Water Forum Land Use procedures and make recommendations on what additional role, if any, SGA should take with respect to land use decisions within the SGA area.	Complete	Reviewed the February 2002 Final Draft: Relationship of the Water Forum Agreement to Land Use Decision-Making with the GMP Implementation Committee. At the direction of the committee, sent an August 18, 2004 letter to Leo Winternitz, Water Forum Successor Effort Executive Director, expressing our continued support of SGA's role in providing groundwater information within the SGA area as requested (land use to Winternitz 10aug04.doc).

Appendix B

Groundwater Contamination Issues White Paper

Groundwater Contamination Issues White Paper
October 25, 2004

Groundwater supplies between 40 to 50 percent of the municipal and industrial water demand in the Sacramento area. To meet regional objectives for growth and environmental protection in the lower American River, stakeholders in the region have committed to a conjunctive use plan as conceptualized in the Water Forum Agreement. Simply defined, conjunctive use maximizes the use of surface water when available, preserving groundwater for use when surface water supplies are reduced. The region's water purveyors have designed and built facilities to implement this plan, which requires a safe and reliable groundwater supply.

Currently, several known contamination sites in the immediate vicinity of public drinking water wells threaten the regional groundwater supply. These include US EPA Superfund sites such as McClellan AFB, Mather AFB, and the Aerojet facility. Additionally, there are several other significantly contaminated sites, including the Roseville Railroad Yard, and Kiefer and Gerber landfills. Cumulatively, these sites seriously jeopardize the water supply needed to support the community and its future demand. Because of the concern over the impacts of contamination to the region's public drinking water supply, the Sacramento Water Forum and the Sacramento Groundwater Authority have formed a Joint Contamination Strategy Committee (JCSC).

Traditionally, the region's water purveyors have taken a "hands-off" approach and have depended on regulatory agencies to execute their responsibilities in dealing with remediation of contaminated sites. However, the recent discovery of contaminants in Carmichael associated with the Aerojet facility has added another specific site to the areas of concern and emphasized the lack of a defined regional approach to the problem. This caused the purveyors to take a more active role in communicating with the regulatory agencies responsible for remediation oversight activities. With respect to the Aerojet facility specifically, the JCSC has the following objectives:

- 1) to raise the level of awareness of regulatory agencies to our concerns
- 2) to insist that responsible parties fully delineate and contain all contaminant plumes
- 3) to ensure that responsible parties expeditiously proceed with cleanup efforts
- 4) to have the responsible parties develop a plan for alternative water supplies that do not reduce the basin yield in advance of contamination being detected in public water supply wells.

Each of these objectives is discussed further below.

Raise level of awareness of regulatory agencies and responsible parties

It is important that the regulatory agencies responsible for addressing groundwater contamination consider the implications of contamination on groundwater supply. Water purveyors spend a great deal of time and resources on planning efforts to provide a safe

and reliable water supply to their customers. Contaminant plumes that are not appropriately contained or remediated can threaten these planning efforts and undermine the accomplishments of the historic Water Forum Agreement, resulting in significant environmental impact to aquatic resources in the lower American River. Therefore, regulators and responsible parties should work more closely with water purveyors to ensure that water supply planning issues are incorporated into characterization and remediation efforts.

Fully delineate and contain the plumes

Recent data indicate that a number of contaminant plumes in the Sacramento area have not been fully delineated or contained. The current approach is not adequate for delineating or containing these plumes within the timeframe appropriate for water supply planning efforts. Monitoring and remediation efforts should be developed with water purveyor input to resolve this issue.

Expedite the cleanup efforts

While it is appropriate to develop long-term plans for groundwater remediation, it is often possible to begin interim remediation efforts to better protect water supply wells. Water purveyors can assist by providing local expertise, data and possible easements for monitoring and remediation.

Develop a plan for an advance replacement water supply

A number of water supply wells have been lost to contamination, and it is not unreasonable to assume that additional wells will be lost in the future. Furthermore, the known presence of a contaminant plume within the boundaries of a water purveyor induces impacts through necessary operational changes and reduced access to uncontaminated groundwater supplies. While these losses can be minimized by implementing the JCSC recommendations, it is also prudent to begin planning for replacement water supplies. Water purveyors can greatly assist in these efforts, and discussions should begin immediately to secure these replacement supplies.

Conclusions and Recommendations

Groundwater contamination in the Sacramento area significantly threatens our drinking water supply. Conjunctive management programs designed to improve water supply reliability and help protect the lower American River are also compromised by groundwater contamination. Consequently, we are providing the following recommendations to address these issues:

- Establish a protocol for communication and the exchange of information between water purveyors, responsible parties, and the regulatory community

- Allow for the participation of the water purveyors in the design and implementation of contaminant characterization and remediation efforts; this participation should include purveyors who are impacted, as well as *potentially* impacted, by contaminant plumes
- Develop a plan to assess the potential impacts of the various contaminant plumes on the regional water supply; this should include the development and implementation of an appropriate scale groundwater model
- Develop a plan for a replacement water supply north of the American River in the event that a contaminant plume causes the shut-down of one or more water supply wells; as a matter of prudent resource management, this plan should be developed *well in advance* of a water purveyor's inability to meet demands as a result of contamination

We believe that these measures, which are designed to incorporate water supply planning issues into the contaminant remediation process, are imperative steps to help ensure a safe and reliable water supply for the Sacramento area.

Appendix C

SGA Letter to Dispute Resolution Committee, August 2005



Sacramento Groundwater Authority
*Managing Groundwater Resources
in Northern Sacramento County*

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Edward D. Winkler
Executive Director

August 16, 2005

California-American
Water Company

Carmichael
Water District

Citrus Heights
Water District

City of Citrus Heights

City of Folsom

City of Sacramento

County of Sacramento

Del Paso Manor
Water District

Fair Oaks Water District

Natomas Central Mutual
Water Company

Orange Vale
Water Company

Linda / Elverta
Community Water
District

Sacramento Suburban
Water District

San Juan
Water District

Southern California
Water Company

Agricultural and
Self-Supplied
Representative

Colonel Richard Ashworth
United States Air Force
SAF/IEE
1665 Air Force Pentagon (Room 5C866)
Washington DC 20330-1665

Mr. Timothy Swickard
Director
Department of Toxic Substances Control
P.O. Box 806
Sacramento, CA 95812-0806

Mr. Wayne Nastri
Regional Administrator
US EPA Region IX
75 Hawthorne Street
Mailcode ORA-1
San Francisco, CA 94105-3901

Dear Colonel Ashworth and Messrs. Swickard and Nastri,

These comments are submitted by the Sacramento Groundwater Authority (SGA) in response to the United States Air Force's groundwater remediation program at the former McClellan Air Force Base (Base). We write to express our alarm with the Air Force's recent proposal to substantially reduce the scope and extent of groundwater remediation efforts at the Base. Specifically, we are troubled that the proposed new remediation program recommends only "containment" at the Base boundary, rather than full remediation of contaminated soils and groundwater; as you are well aware, other containment programs in the basin have proven ineffective to protect groundwater supplies in the region. We are also disturbed that we had to learn about this recent proposal in an article in the Sacramento Bee, rather than directly from the Air Force or the Air Force Real Property Agency (AFRPA). The Air Force must be held accountable for full clean-up and remediation of contamination at the Base and, toward that end, provide an appropriate public review and comment process prior to finalizing any such remediation program.

SGA Background

The SGA is a joint powers authority created through agreement between the cities of Citrus Heights, Folsom, and Sacramento and the County of Sacramento to manage the groundwater basin underlying Sacramento County north of the American River. The SGA's mission is to manage, protect and sustain the groundwater resources of Sacramento County north of the American consistent

with the Water Forum Agreement for the benefit of the water users within the basin. The SGA coordinates its groundwater management activities with other water management entities throughout the region, and protects the North Area groundwater basin on behalf of the 14 water purveyors overlying the basin. These 14 water purveyors rely to a large extent on groundwater supplies in the north area groundwater basin to meet the water demands of more than 500,000 people. The McClellan Air Force Base is located near the center of the North Area groundwater basin.

Concerns

The SGA first learned of the proposed ROD in an article published in the July 9, 2005 edition of the Sacramento Bee. The article states that the Air Force is proposing to substantially scale back its groundwater remediation efforts at the Base, and that these proposed changes are in response to changes in groundwater elevations in the vicinity of the Base due to changed operations of some of the local water purveyors. Following several discussions with the California Department of Toxic Substances Control and Central Valley Regional Water Quality Control Board, we confirmed at a meeting with the AFRPA on August 4, 2005 that the Air Force does in fact intend to “scale back” its remediation efforts at the Base.

We understand that the Air Force’s proposed “scaled back” remediation program is described in a “Draft Final Volatile Organic Compound (VOC) Record of Decision (ROD),” but to date the SGA and its affected member agencies have been denied access to the Draft Final ROD and associated documents. The Air Force also has failed (or refused) to solicit input from the SGA or its affected members concerning this proposed change in direction.

As noted above, the Air Force’s final remediation program must be designed to provide full protection of the beneficial uses of the North Area groundwater basin now and into the future. As such, the remediation program must include both containment and clean-up components. Given the magnitude of the resources at stake, the Air Force must provide an appropriate public review and comment process on any remediation proposal, and must actively seek input on the remediation program from those entities that use and manage the groundwater resource. The SGA is committed to working with the Air Force to develop a remediation program that fully protects our region’s valuable groundwater resources.

The Draft Final ROD Public Process

In June 2004, the AFRPA issued a Proposed Plan for Cleanup of VOCs in Groundwater. The SGA commented on the Proposed Plan in an August 3, 2004 letter to Mr. Brian Sytsma (attached). Our comments expressed concerns that the AFRPA’s assumptions for developing a cleanup strategy were flawed because the AFRPA assumed a continued decline of groundwater levels in the vicinity of the Base, when in fact groundwater levels have stabilized and are expected to fluctuate in the future. Our letter suggested that these assumptions be corrected and noted that the remediation proposal, as a whole, would be

improved if there were more effective communications between the AFRPA and the adjacent water purveyors that have the greatest potential to influence groundwater elevations in the basin. We stressed the need to facilitate more effective communication between SGA, the AFRPA and SGA's members as the remediation plan is developed. We did not receive a response to our letter.

We understand that AFRPA also issued an addendum in June 2004 indicating that groundwater conditions had changed significantly since their assumptions from the 1999 Basewide VOC Feasibility Study. We are puzzled that the Air Force did not provide us with this addendum at the same time that it requested comments on a Proposed Plan for Cleanup, and that the AFRPA requested comments on a Proposed Plan for Cleanup that included assumptions that even their own analyses proved to be incorrect. Moreover, had the AFRPA consulted more closely with local water purveyors in 1999, they would have known that their assumptions regarding a steadily declining groundwater table were not appropriate, as plans and programs to address declining groundwater levels already were well underway at that time. Despite our comments in August, 2004, the Air Force has yet to coordinate with the SGA and local water purveyors to better understand how the basin may be exercised in the future.

We are now surprised to learn that, rather than proposing better coordination with the purveyors in the area so as to develop a more informed remediation plan, the Draft Final VOC ROD was prepared without any input from those purveyors and proposes even less protection to our region's groundwater resources than the plan that the public commented on in August 2004. We request that the AFRPA actively seek input from the SGA and local water purveyors and convene an open and public process to allow those most affected by the Draft Final ROD – the local water purveyors and concerned citizens – an opportunity to review and comment on the proposed plan.

The Beneficial Use of the Groundwater Basin

It is well documented that groundwater levels in the north area basin have declined as a result of many decades of pumping, which has led to a substantial groundwater "cone of depression" in the center of the basin. It is also well documented that local water purveyors have invested over \$100 million constructing projects over the past decade to bring more surface water into the region in wet years to help reverse the trend of declining groundwater levels. These "conjunctive use" projects are, in part, in response to commitments made by the purveyors in signing the historic Water Forum Agreement (WFA) in April, 2000. The WFA seeks to implement a regional-scale conjunctive use program that will allow local water purveyors to reduce dry-year lower American River (LAR) diversions to protect endangered fish and other LAR environmental values. To accommodate higher groundwater pumping in the dry-years, purveyors must take actions to store groundwater in the wet years. This is the essence of a "conjunctive use" program, and has been a central component of our regional water management planning for more than a decade.

Because the area has experienced a fairly wet period since 1995, the local purveyors have

had more opportunities to utilize surface water that has allowed groundwater elevations to recover. Depending on hydrologic conditions and annual water needs in the north area basin, groundwater elevations within the basin are expected to fluctuate in the future. For instance, it is likely that groundwater extractions would increase if the region entered into another dry cycle, resulting in a lowering of groundwater elevations. **The presence or even the threat of a large area of contaminated groundwater in the center of the basin significantly imperils more than a decade of work and many millions of dollars invested in water management efforts in this region and is fundamentally unacceptable as policy.**

The Sacramento region has a complex, highly heterogeneous geologic setting with many buried river channel deposits that can create preferential flow paths for groundwater and contaminants. As local residents are too frequently reminded, the containment strategies employed in other areas of the County, such as the Aerojet General site in Rancho Cordova, have proven ineffective. The geologic setting of buried river channels makes containment very difficult. The data emerging from the Aerojet site indicate that the contaminants are moving out in "fingers" and much of the monitoring has been ineffective at detecting the extent of contaminant migration.

Requested Action and Summary

The SGA desires to work more closely with the AFRPA and the regulatory agencies to ensure that the McClellan effort does not become a repeat of the Aerojet scenario, and to ensure that adequate measures are in place to make full clean-up of contaminated groundwater. Three of McClellan's four surrounding water purveyors have already been affected by contamination. In the 1990s, domestic water supply wells in the community of Rio Linda, northwest of the Base, were shut down due to the presence of contaminants. The City of Sacramento has lost two of its public water supply wells outside the southwest boundary of the Base. The Sacramento Suburban Water District, which supplies water along the southeast and east side of the Base, has voluntarily placed some of its wells on standby status due to their proximity to McClellan. Clearly, any proposed remediation strategy must take into account the present and future plans of the local water purveyors as well as potential regional impacts, and must ensure our ability to implement and comply with the historic Water Forum Agreement.

SGA appreciates your consideration of these comments. We believe that it would be detrimental to the region if the AFRPA were to back away from its responsibility to fully remediate this contamination. The AFRPA's remediation plan must ensure that the basin's water supply is available for the benefit of future generations; the recent "containment" proposal falls short of that goal. We are open and available to work with the AFRPA on future plans, as we believe that the most effective solutions can be reached through a coordinated effort. We suggest that the Air Force work with and solicit input directly from the SGA and affected local purveyors in the development of a final remediation plan.

Please feel free to contact me directly at (916) 967-7692 if you need any additional information.

Sincerely,



Edward D. Winkler
Executive Director

cc: Senator Dianne Feinstein
Senator Barbara Boxer
Congressman John Doolittle
Congressman Dan Lungren
Congresswoman Doris Matsui
Senator Dave Cox
Senator Deborah Ortiz
Assemblymember Roger Niello
Sandy Sheedy, Sacramento City Council, District 2
Steve Cohn, Sacramento City Council, District 3
Roger Dickinson, Sacramento County Supervisor, District 1
Illa Collin, Sacramento County Supervisor, District 2
Susan Peters, Sacramento County Supervisor, District 3
Roberta MacGlashan, Sacramento County Supervisor, District 4
Lester Snow, Director, Department of Water Resources
Celeste Cantu, Executive Director, State Water Resources Control Board
Paul Hahn, Director, County of Sacramento Economic Development Department
Kathryn Halvorson, Director, Air Force Real Property Agency
Paul Brunner, BRAC Environmental Coordinator, Air Force Real Property Agency
Keith Takata, Director, Superfund Division, Environmental Protection Agency
Kathleen Johnson, Chief, Federal Facilities & Clean Up Branch, Environmental Protection Agency
Sheryl Lauth, Chief, Federal Facilities Section 1, Environmental Protection Agency
Martin Zeleznik, Environmental Engineer, Environmental Protection Agency
Kevin Depies, Engineering Geologist, Department of Toxic Substances Control
Tom Pinkos, Executive Officer, Central Valley Regional Water Quality Control Board
Antonia Vorster, Supervising Engineer, Central Valley Regional Water Quality Control Board
James Taylor, Engineering Geologist, Central Valley Regional Water Quality Control Board
Sandra Shewry, Director, Department of Health Services
Carl Lischeske, Chief, Department of Health Services
Terry Macaulay, Engineer, Department of Health Services
SGA Board of Directors
SGA Contamination Strategy Committee
Steve Hall, Executive Director, Association of California Water Agencies
Leo Winternitz, Executive Director, Sacramento Water Forum

Appendix D

SGA Guest Editorial in *Sacramento Bee* on McClellan Issues

METRO

www.sacbee.com/news

INSIDE

Grants to train nurses
American River and
Sacramento City colleges
receive state funds to expand
their nursing programs.
► Page B2

Stick with a cleanup plan for McClellan groundwater

By Ed Winkler
SPECIAL TO THE BEE

Reports the Air Force is changing its approach to cleaning up groundwater contamination at the former McClellan Air Force Base have alarmed local water managers. The change calls for "containment" of contaminated water instead of the cleanup outlined in previous plans.

Like many California communities, the Sacramento region has faced its share of water challenges in recent decades. In 1998, cities and water suppliers banded together to form SGA, the Sacramento Groundwater Authority, to protect the groundwater basin in Sacramento County north of the American River. Through this partnership, local water suppliers are investing tens of millions of dollars in infrastructure to manage and coordinate the use of groundwater and surface water to help reverse declining groundwater levels. This partnership is the centerpiece of the historic Water Forum Agreement of 2000 to allow the region to meet water needs while reducing diversions from the lower American River during dry spells or environmentally sensitive times. That's why the McClellan cleanup is so important.

At McClellan, industrial solvents taint about 6 billion gallons of groundwater, some of it off-base. The new proposal revealed in July would attempt to "contain" the tainted water from spreading off-base instead of cleaning it up, which was outlined in previous plans released for public comment in 2004. Our region's complex geology makes containment difficult. As local residents know, the strategies at the Aerojet site in Rancho Cordova have not prevented contamination plumes from migrating off-site and causing loss of water supplies.

The presence or even the threat of a large area of contaminated groundwater in the basin not only imperils a decade of water management efforts, but also is unacceptably risky as public policy. Further, it would inappropriately shift the risks and responsibilities of the federal government to local water rate-payers.

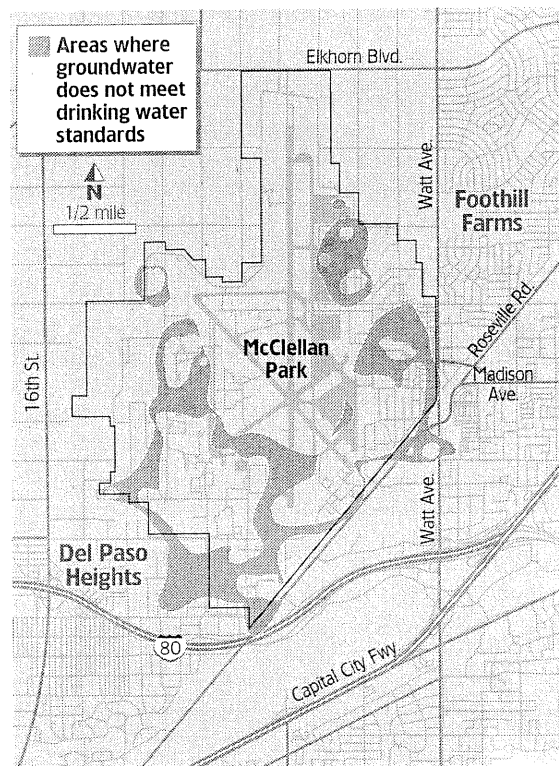
The Air Force did not follow an appropriate public process in drafting its proposed change, and it has failed to coordinate with local water agencies to ensure protection of the groundwater supplies so critical to our region's future. It now appears to be backing away from the level of cleanup required in favor of a less-costly "containment" strategy that could leave our water supplies vulnerable to contamination.

SGA wants to work with the Air Force and the regulatory agencies to ensure adequate measures to achieve a full cleanup. There is too much at stake to allow it to back away from its responsibility to fully remediate this contamination. Let's make certain that McClellan does not become a repeat of the Aerojet scenario.

The Air Force should rethink its approach and develop a plan that would more effectively protect our water supplies and infrastructure investment.

Underground pollution

Contaminated groundwater at McClellan Park, the former McClellan Air Force Base, from a 2004 survey:



Source: Air Force Real Property Agency Sacramento Bee/Nathaniel Levine

Doing so in an open, public process involving all parties is essential.

■ ■ ■

Ed Winkler is executive director of the Sacramento Groundwater Authority. Reach him at ewinkler@rwah2o.org Web site: www.sgah2o.org

Appendix E

Sacramento Bee Editorial on McClellan Issues

What lurks beneath

McClellan's pollution threatens water supplies; Air Force must clean it up

Above ground, the site of the former McClellan Air Force Base is steadily evolving into a vibrant private enterprise. Underneath, however, is a toxics problem that could blow into a groundwater crisis.

The ground at McClellan is grossly contaminated with solvents and other industrial liquids from the days when the base was an aircraft maintenance facility. For now, the solvents are largely contained to an underground plume around the base. But if this plume were to spread into an aquifer that this region depends on, watch out.

This prospect is all too real. The Air Force earlier this year made noises about backing down from its vow to clean up the underground mess, no matter how long it took. It floated the idea of simply containing the contamination to the base. If only the problem were so simple – but it is not.

The ground upon which McClellan sits is simply not an island unto itself. If the Air Force were to try to contain this plume, it would have to pump out a whole lot of groundwater to create an empty underground “cone.” Gravity would guide the toxic plume forever into this cone. But gravity would do some mischief as well.

Beyond the borders of McClellan, water districts are well on their way to preserving the groundwater supply and actually increasing this supply by relying on river water in wet years. The

groundwater level has actually been rising in recent years, evidence that this strategy (aided by some rains) is working.

Success, however, quickly could turn to failure because of McClellan. If the rising groundwater table begins to fill that “cone” under McClellan, the toxic plume could begin to spread way beyond the base. The same could happen as the rising groundwater comes in contact with contaminated soils. Either way, the basin is at risk. And so long as that is the case, so is the American River. It becomes the alternative source if groundwater to its north becomes contaminated. But this river simply can't make up the difference. The river barely can meet all of its demands as it is.

The region's vast groundwater supply is nothing to gamble with. Were large sections to become off limits due to contamination, many water customers would suddenly find themselves vulnerable to shortages during drought years. There is simply no good long-term way to coexist with a horrible toxic plume of pollution under McClellan because it is smack dab in the middle of a key groundwater basin.

The Air Force recently agreed to defer a decision about whether to continue cleaning up the McClellan plume or to simply contain it. That's a good sign. It will take years and be expensive, but it is simply too big a gamble to leave all that contamination under McClellan.

Appendix F

SGA Goals and Activities for FY 2006

Sacramento Groundwater Authority
Goals and Activities for FY 2006

<i>Where We Have Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
1. Goal 1: Provide an effective SGA Institutional Framework for managing, protecting and sustaining the groundwater resources of the North-Area Basin consistent with the SGA JPA and Water Forum Agreement.		
<ul style="list-style-type: none"> • Bi-monthly Board of Directors meetings. • Board appointment requests forwarded periodically to JPA appointment entities. • Ad-hoc Committee meetings hosted as necessary. • Annual workshop / orientation tour. 	<ul style="list-style-type: none"> • RWA meets bi-monthly, so SGA bi-monthly meetings on alternate months is manageable and avoids meeting conflicts. • Current Committees include: Budget, GMP Implementation, and Groundwater Contamination. 	<ul style="list-style-type: none"> • Host effective bi-monthly meetings and plan meeting agendas to reflect current / ongoing issues and to address needed decisions in fulfillment of the JPA and SGA board directives. • Promptly process Board appointment requests. • Foster education, cooperation, and collaboration among Board members and agency managers by convening SGA Board meetings, individual meetings, committee meetings, and annual holiday social event. • Conduct annual member outreach orientation program. • Provide regular updates of RWA activities.
<ul style="list-style-type: none"> • Prepared and distributed periodic outreach materials, including newsletters, web-site postings, press releases and electronic notices to keep the membership and community informed of SGA activities and current groundwater-related issues. • Track and report on relevant state / federal legislative and / or regulatory issues. • SGA website developed. 	<ul style="list-style-type: none"> • Water Forum and state and federal agencies that have historically provided SGA funding support stress the need for strong public outreach efforts. 	<ul style="list-style-type: none"> • Provide public, water community and stakeholder outreach by distributing periodic outreach materials, including newsletters, website postings, press releases and electronic notices to keep the membership and community informed of SGA activities and current groundwater-related issues. • Track and report on relevant state / federal legislative and / or regulatory issues.

<i>Where We Have Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
<ul style="list-style-type: none"> SGA projects and activities have been coordinated with members, ARBCA, RWA, Water Forum Successor Effort and adjacent basin (Placer, Central County) groundwater management efforts. 	<ul style="list-style-type: none"> Placer County GW management effort underway. Central County GW management effort underway. 	<ul style="list-style-type: none"> Coordinate SGA projects, policies and programs with members, RWA, WFSE, and adjacent groundwater basin management efforts.
<ul style="list-style-type: none"> Annual Budget Committee convened. SGA/RWA Services Agreement established to provide staffing (2.2 FTE's) and office services. SGA Designation/Reserve policy adopted. SGA annual objectives developed / adopted. SGA annual budgets adopted, with 5-year projections. SGA annual financial audits performed. 	<ul style="list-style-type: none"> New financial audit standards are more rigorous / expensive. 	<ul style="list-style-type: none"> Convene SGA Budget Committee in Spring. Develop and adopt SGA Goals, Strategies, Actions. Develop and adopt SGA budget, with 5-year projections. Effectively and efficiently manage SGA staff and financial resources in accordance with SGA / RWA services agreement and within adopted budgets and policies. Effectively manage and administer contracts. Obtain and present clean SGA financial audit to the Board.

<i>Where We've Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
2. Goal 2: Develop and Implement a Groundwater Management Plan consistent with existing statutes to implement the groundwater management element of the Water Forum Agreement		
<ul style="list-style-type: none"> • GMP developed and adopted in 2003. Total Cost of GMP: \$50K (federal grant with SGA baseline staff support). • GMP Implementation Committee established (Reents, Lorange, Roscoe, Niederberger, CAL-AM) to guide GMP implementation (Table 6). • GMP incorporates and builds upon prior work of ARBCA. • Adopted Basin Management Objectives: <ul style="list-style-type: none"> ○ Maintain/Improve GW quality for benefit of basin users. ○ Maintain GW elevations that result in net benefit to basin users. ○ Protect against inelastic land surface subsidence. ○ Protect against adverse impacts to surface water flows. ○ Protect against adverse impacts to water quality due to interaction of AR and SR. • GMP Fully compliant with existing statutes resulting from SB1938 (Costa 2002). 	<ul style="list-style-type: none"> • SGA commitment to adopt / implement GMP tied to ARBCUP, EWA Pilot Program, US Army Corps DMS Phase II and other grants. • GMP incorporates Stakeholder objectives. • Policy considerations / advantages of having a compliant GMP: <ul style="list-style-type: none"> ○ Validates groundwater management at the local level (better positions region to head off state intervention/adverse legislation). ○ GMP provides coverage / eligibility for SGA, RWA and member grants. ○ GMP will satisfy key element of the RWA IRWMP for the North Area Basin. ○ GMP objectives memorialize SGA commitments (protection / maintenance of safe yield and GW water quality) to implement the WFA groundwater management element for the north area basin. 	<ul style="list-style-type: none"> • Continue to coordinate with GMP Implementation Committee. • Implement Table 6 of GMP. • Prepare Annual "State of Basin" Report. • Regularly report implementation progress to SGA board. • Coordinate with RWA IRWMP effort. • Continue to coordinate implementation with grant funding partners.

<i>Where We've Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
3. Goal 3: Develop and utilize groundwater management tools, consistent with the adopted GMP, to support the policy and technical foundation for managing the basin and fostering regional conjunctive use programs.		
<ul style="list-style-type: none"> • Data Management System (DMS) Developed at a total cost of \$680K (\$285K federal; \$285K state; and \$110K SGA). • DMS data Parameters: <ul style="list-style-type: none"> ○ Well location / construction ○ Aquifer lithology ○ GW elevations ○ GW extractions ○ GW quality (Title 22) • Annual data obtained from members, and DMS updated. • \$250,000 AB 303 grant awarded (2003) to install up to 11 monitoring wells. • Applied for \$250,000 of AB 303 (2004) funding to support North Area Groundwater modeling effort, consistent with phasing of the RWA IRWMP scope of work. • Participated and helped fund (\$60K, DWR ISI) initial development of the Water Accounting Framework. 	<ul style="list-style-type: none"> • SGA commitment to adopt / implement DMS referenced in ARBCUP as evidence of commitment to monitoring the basin response. • SGA referenced / relied upon DMS for successful EWA pilot project. • ARBCA vision for DMS: <ul style="list-style-type: none"> ○ Gather, store, analyze and present the data required to both establish the existing condition and monitor the future condition of the GW basin. ○ Application of the DMS tool will be critical for evaluating and tracking the response of the GW basin to future conjunctive use operations. • Policy considerations / advantages of having DMS and GW monitoring wells: <ul style="list-style-type: none"> ○ DMS and new monitoring wells provide evidence of Groundwater management efforts at the local level (better positions region to head off state intervention / adverse legislation). ○ DMS and monitoring wells helps validate future conjunctive use and/or banking / exchange arrangements – both internally and externally. 	<ul style="list-style-type: none"> • Continue with annual data updates of the DMS to keep DMS current. • Explore potential data interface improvements to better automate data updates (potential AB 303 grant). • Continue to implement terms of AB 303 monitoring well program to install and monitor 11 monitoring wells in the basin. • Coordinate the SGA monitoring and data management activities with the RWA IRWMP program. • If successful, execute agreements to implement the \$250,000 AB 303 (2004) north area modeling effort in coordination with the RWA IRWMP effort. • Coordinate the development of a Water Accounting Framework with the RWA IRWMP effort. Bring any proposed framework or policies to the SGA Board for consideration of adoption.

<i>Where We've Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
	<ul style="list-style-type: none"> ○ DMS and monitoring wells help provide coverage / eligibility for SGA, RWA and member grants. ○ DMS and monitoring wells will satisfy key elements of the RWA IRWMP for the North Area Basin (monitoring / modeling). ○ DMS and monitoring wells furthers / validates SGA commitments (protection / maintenance of safe yield and GW water quality) to implement the WFA groundwater element for the north area basin. 	

<i>Where We've Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
4. Goal 4: Foster the Conjunctive Use of surface water and groundwater, consistent with the framework established by the Water Forum Agreement		
<ul style="list-style-type: none"> • SGA executed first Integrated Storage Investigation MOU with DWR in 2001, to partner with the ARBCA agencies. • SGA was integral partner with RWA and ARBCA in securing the ARBCUP (\$22 million) conjunctive use grant. • Implemented the SAFCA pilot study (2,100 AF). • Implemented the SGA / DWR ISI partnership which included \$450K of state funding for conjunctive use studies leading up to the EWA pilot transfer: <ul style="list-style-type: none"> ○ Modeling ○ Legal/Water Rights Analysis ○ Water Accounting Framework ○ Contractual / Institutional Mechanisms ○ Environmental Studies ○ Groundwater Monitoring Network ○ Evaluation of Pricing Methodologies • Implemented the EWA pilot water transfer. <ul style="list-style-type: none"> ○ 7,100 AF delivered to USBR at \$75/af (over \$500K revenues distributed to participating members) 	<ul style="list-style-type: none"> • CALFED programmatic EIR / EIS identifies SGA as potential future EWA partner. • ARBCUP grant documents identify SGA commitments to implement GMP and DMS to manage and monitor basin response to the ARBCUP program. • RWA IRWMP is regional planning vehicle for development of regional conjunctive use projects and programs. 	<ul style="list-style-type: none"> • Identify, facilitate and potentially implement banking / exchange partnerships in coordination with members. • Coordinate with RWA IRWMP effort to further develop regional conjunctive use projects and programs consistent with the Water Forum Agreement.

<i>Where We've Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
5. Goal 5: Devise and Implement Strategies to Safeguard Groundwater Quality		
<ul style="list-style-type: none"> • SGA adopted GMP addresses water quality concerns and actions. • SGA DMS populated with Title 22 water quality data. • Formed the Groundwater Contamination Strategy Committee. • Formed the Joint Contamination Strategy Committee, in coordination with the WFSE. • Secured commitments from responsible parties and regulatory agencies for monthly technical meetings, and quarterly policy meetings. • GW contamination White Paper developed, and briefings of elected officials have been scheduled, including Cap-to-Cap. • Joined MTBE litigation. 	<ul style="list-style-type: none"> • Groundwater Contamination is a growing concern, particularly with the discovery of NDMA in Carmichael and problems associated with the growing Aerojet plume. • Other contamination sites threaten long-term plans for exercising groundwater basin storage for conjunctive use operations. • Without properly addressing it, regional contamination may threaten the WFA sustainable yield of 131,000 AF for the north area basin. • Groundwater Contamination poses issues of regional concern – including Water Forum compliance issues. • To date, the responsible parties and the regulatory agencies (EPA, RWQCB, SWRCB, DHS, and DTSC) have not addressed the issue of advance replacement water supplies. 	<ul style="list-style-type: none"> • Continue to press responsible parties and regulators to expedite containment efforts and address regional issues. • In coordination with Board and members, elevate groundwater contamination issues with stakeholders (WFSE) and elected officials. • In coordination with the Board, members and Groundwater Contamination Strategy Committee, press responsible parties and regulators to fund and implement plans for replacement water supplies, and coordinate such plans with the RWA IRWMP effort. • Work with RWA IRWMP effort to ensure adequate analysis of contamination issues. • Continue to participate in MTBE litigation.

<i>Where We've Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
6. Goal 6: Foster Outside Funding Partnerships		
<ul style="list-style-type: none"> Secured partnerships and substantial funding from state / federal sources: <ul style="list-style-type: none"> DWR \$450K ISI (conjunctive use) studies USBR \$60K for EWA pilot studies DWR \$100K AB 303 for Roseville Recycled water study DWR \$285K for DMS development DWR \$200K for DMS development DWR \$250K for Monitoring wells COE \$325K for DMS development COE \$50K for GMP development USBR \$500K for EWA water transfer 	<ul style="list-style-type: none"> State / federal budget situations are tight for next couple of years; near-term future water bond not likely. DWR ISI funds not likely available in near future. SGA positioned well for DWR AB 303 grant opportunities for up to \$250K annually. SGA GMP, monitoring and modeling efforts help bolster RWA IRWMP and RWA Prop 50 grant opportunities. 	<ul style="list-style-type: none"> Work with Board and GMP Implementation committee to develop and possibly submit 2005-06 AB 303 Grant application. Track Proposition 50 funding and other grant opportunities. Continue to foster positive relationships with state/federal funding partners. Coordinate with RWA IRWMP effort to maximize opportunities for Prop 50 grants for SGA, RWA and/or members.

<i>Where We've Been</i>	<i>Current / Future Drivers</i>	<i>FY 2006 Objectives / Strategies / Actions</i>
7. Goal 7: Promote Integrated Planning within the region		
<ul style="list-style-type: none"> • Participated in the ARBCA effort. • Closely Coordinating with RWA planning efforts, including the IRWMP. • Participating in WFSE. • Participating in efforts to develop GW management institutions in Placer County and Central Sacramento County. • Help lead the WFSE Water Caucus meetings. 	<ul style="list-style-type: none"> • Recent statutes and DWR policies are aimed at rewarding integrated planning efforts, such as the RWA IRWMP effort. 	<ul style="list-style-type: none"> • Continue to coordinating with RWA planning efforts, including the IRWMP. • Continue to participate in WFSE, including the Water Caucus meetings. • Continue to participate in and report on efforts to develop GW management institutions in Placer County and Central Sacramento County.