

American Sub-basin

Sub-basin-level Review of Proposed Projects

Sub-basin Water Requirements and Sources

The American Sub-basin (see Figure 1 in the Introduction and Figure 1 at the end of this sub-basin review) is located east of the Sacramento River and north of the American River in Sacramento, Sutter, and Placer counties. In 1995, municipal and industrial water use for the sub-basin was approximately 280 thousand acre-feet per year (taf/yr), accounting for 30 percent of the total water use. Agricultural water use was approximately 590 taf/yr in 1995, accounting for over 65 percent of the total water use. The remaining water uses are for environmental management purposes. In 2020, municipal and industrial water use for the sub-basin is projected to average approximately 420 taf/yr in 2020, accounting for 45 percent of the total water use. Agricultural water use is projected to average approximately 460 taf/yr in 2020, accounting for over 50 percent of the total water use. The remaining water uses are for environmental management purposes. Within the sub-basin, water users utilize surface water (e.g., water rights contract entitlements such as Central Valley Project PL 101-514 or “Fazio Water;” contracts with other agencies; and other agreements such as interagency agreements, Section 215) and groundwater to meet their water needs.

Surface water from both the Sacramento and American rivers is the primary source of supply currently utilized in the sub-basin, with groundwater accounting for between 30 percent (in wet years) and 40 percent (in dry years) of supply.

Within the sub-basin, the majority of water users are members of the Sacramento-Area Water Forum (Water Forum)¹ and signatories to the Water Forum Agreement. The Water Forum Agreement prescribes a regional conjunctive use program for the lower American River and the connected groundwater basin. Compliance with the Water Forum Agreement and implementation of a regional groundwater management program are anticipated to result in reliable water supplies in all years.

Proposed Projects

As shown in Table 1 and on Figure 1 (at the end of this review), four projects were evaluated in the American Sub-basin, including both short- and long-term components. All four projects involve conjunctive water management. Three of the four projects could potentially

¹ Begun in 1993, the Water Forum comprises representatives from the business, environmental, public interest, and water purveyor communities. The co-equal objectives of the group are (1) to provide a reliable and safe water supply for the region's economic health and planned development through the year 2030, and (2) to preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River. After a 6-year consensus-based, stakeholder process, the Water Forum Agreement was completed. In addition, the Water Forum completed an “Environmental Impact Report for the Water Forum Proposal” (State of California Clearinghouse Number 95082041). The document was certified by the two lead agencies (the City of Sacramento and the County of Sacramento) in December 1999.

produce a total of 40 taf/yr by 2003. Total cost of implementing these three short-term projects was estimated at approximately \$22.5 million. A total of 93 taf/yr was identified as potentially available from full implementation of the four long-term projects, with an associated cost totaling approximately \$711.6 million. Project proponents include the Natomas Central Mutual Water Company (Natomas) and the Sacramento Groundwater Authority (SGA; formerly the Sacramento North Area Groundwater Management Authority [SNAGMA]). The project proponents have indicated willingness to share in the cost of project implementation.

TABLE 1
Short-term Projects Proposed to Produce Water by 2003 in the American Sub-basin

Project / Proponent	Project Type	Supply (acre-feet/year)	Cost (\$)	Issues
Natomas Conjunctive Use Project (Project 7A)	Conjunctive Water Management	15,000	1.5 million	Funding
SGA Conjunctive Use Program – San Juan Family/North Central Group Project (Project 17A)	Conjunctive Water Management	12,500	8.3 million	Coordination of transfer program with operation of projects; financing; institutional arrangements among SGA, member agencies, potential transfer partners
SGA Conjunctive Use Program – City of Sacramento / Arcade Water District-Area “D” Project (Project 17B)	Conjunctive Water Management	12,500	12.7 million	Coordination of transfer program with operation of projects; financing; institutional arrangements among SGA, member agencies, potential transfer partners
Total Conjunctive Water Management		40,000	22.5 million	

Current Status of Projects

The Natomas Conjunctive Use Project (Project 7A) would allow Natomas to develop and use groundwater on overlying lands or elsewhere while reducing its surface water diversions from the Sacramento River. The project potentially has three phases, depending on the outcome of the first phase. As a consequence, Natomas proposes to initiate a pumping and test program to demonstrate conjunctive use (pumping) operations and to observe and analyze stream-aquifer interconnection and third-party impacts. The ultimate intent is to devise appropriate mitigation measures for any substantial impact so that third parties are made whole, and pumping extracts “new” water, yielding an equivalent amount of “new” water into the river system by reducing Natomas’ complete dependence on surface water diversions.

Phase 1 of Project 7A would be a pilot study that would make use of existing facilities to pump 15 taf of groundwater in 2002 and allow an equivalent amount of surface water to remain in the river. This water would be available for in- or out-of-basin use. This phase would focus on a key impact issue – the potential of pumping surface water via groundwater pumping in close proximity to the Sacramento River. The primary objective of this effort is to evaluate stream-aquifer interaction and characterize the underlying aquifer.

Phase 2 of Project 7A would be a continuation of pumping through existing facilities during 2003. This would be done in a manner that would offset or mitigate for any stream-aquifer interconnection, to the extent that such interconnection exists as determined during Phase 1 work, and make an attempt to determine the perennial yield of the basin.

Phase 3 of Project 7A would be a full-scale project that would consider modifications to Natomas' facilities to allow more efficient use of its groundwater and surface water supplies. This phase could potentially result in the pumping of as much as 30 taf (per year) of groundwater.

The SGA Conjunctive Use Program (SGA Program) would be made possible through three the following principal projects (Projects 17A, B, and C) involving SGA members:

- San Juan Family/North Central Group Project (Project 17A) – This project would involve the San Juan Family (San Juan Water District, Citrus Heights Water District, Fair Oaks Water District, and Orange Vale Water Company) and the North Central Group (Northridge Water District, McClellan Air Force Base, Arcade Water District–North Highlands Service Area, Citizens Water Resources, and Rio Linda/Elverta Community Water District). In wet years, the North Central Group would utilize surface water to meet water demands in lieu of groundwater extraction. This water would be treated at the Peterson Water Treatment Plant (WTP) and delivered via the Cooperative Transmission Pipeline (CTP) and the Northridge Transmission Pipeline (NTP). The San Juan Family would recover this stored groundwater, minus losses, in dry years. When extracting groundwater, the San Juan Family would forebear diversion of surface water out of Folsom Lake, making that surface water available for other purposes.

In the short-term, Project 17A is estimated to yield up to 12.5 taf/yr (average annual yield of 4.6 taf/yr; average annual net project recharge of 3.1 taf/yr). In addition to existing facilities, the short-term Project 17A would require the construction of two wells and the extension of the Walerga Pipeline.

The long-term Project 17A is estimated to yield up to 21.0 taf/yr (average annual yield of 7.8 taf/yr; average annual net project recharge of 7.9 taf/yr). In addition to the new facilities required for the short-term component, the long-term Project 17A would require the expansion of Peterson WTP to 170 million gallons per day (mgd) and the construction of 19 new wells.

- City of Sacramento/Arcade Water District-Area "D" Project (Project 17B) – This project would involve Arcade Water District, the other Area "D" agencies (Del Paso Manor Water District, Citizens Water Resources–Arden Service Area, Arden Cordova Water Service Company, and Sacramento County Water Agency–Arden Park Vista), and the City. Area D refers to a portion of the place of use for the City of Sacramento's water rights. In wet years, the City and Arcade-Area "D" would utilize surface water to meet water demands in lieu of groundwater extraction. This water would be treated at the Fairbairn and/or Sacramento River WTPs and delivered via the City's transmission network. The City and providers in Area "D" would also recover this stored groundwater, minus losses, in dry years. When extracting groundwater, the City and Area "D" providers would forebear diversion of surface water out of the lower American River, making that surface water available for other purposes.

In the short-term, Project 17B is estimated to yield up to 12.5 taf/yr (average annual yield of 4.6 taf/yr; average annual net project recharge of 3.4 taf/yr). In addition to existing facilities, the short-term Project 17B would require the construction of the Howe Avenue Pipeline and intertie at the Enterprise Pump Station, and the construction of the Enterprise/Northrop Reservoir and Booster Pump Station.

The long-term Project 17B is estimated to yield up to 42.0 taf/yr (average annual yield of 13.4 taf/yr; average annual net project recharge of 7.5 taf/yr). In addition to the new facilities required for the short-term component, the long-term Project 17A would require the expansion of Fairbairn WTP to 200 mgd, the expansion of Sacramento River WTP to 160 mgd, and the construction of 18 new wells.

- Placer County Water Agency (PCWA)/City of Sacramento Project (Project 17C) – In this project, PCWA, the City, and others are pursuing a diversion on the Sacramento River and associated treatment and conveyance facilities. The ability to provide water supplies from the Sacramento River to southern Placer County and northern Sacramento County would create an operational “link” between it and the American River. Such a link facilitates the SGA Program by providing additional system flexibility and reliability in support of Project 17B.

Through this project, PCWA plans to provide up to 35 af/yr of treated water to the Franchise Area of Citizens Water Resources in western Placer County and adjacent development areas in Placer County. This water would be made available through the exchange/transfer of its American River water rights and contract entitlements. Instead of being diverted, this water would be allowed to flow into Folsom Lake. Once in Folsom Lake, it would be available for other purposes including increased dry-year Delta export, improvement of Bay-Delta water quality, or enhancement of in-stream flows for environmental purposes.

The City, which has substantial Sacramento River water rights, is also pursuing a Sacramento River diversion and associated treatment facilities to provide up to 100-mgd capacity to serve areas within its existing place of use. This diversion would serve multiple purposes in the northwest area of the City (e.g., providing necessary treatment capacity, improving hydraulic efficiencies, reducing future groundwater pumping, providing needed system redundancy, and developing a conjunctive use program).

Other agencies are also expected to participate in this project. Per the Water Forum Agreement, Northridge Water District could divert water from the Sacramento River in years when American River water would not be available. This water would be used to meet demands in lieu of groundwater extraction, promoting conjunctive use within the region. In dry years, the City of Roseville could also divert Sacramento River water to meet demands in lieu of groundwater extraction.

In the short-term, Project 17C is not anticipated to be operational. In the long-term, Project 17C would require the construction of a 165-mgd intake on the Sacramento River, the construction of associated treatment and conveyance facilities, and the construction of 16 new wells.

Projects 17A, B, and C are the product of the planning efforts undertaken by water purveyors in southern Placer County and northern Sacramento County – the American

River Basin Cooperating Agencies (Cooperating Agencies). The Cooperating Agencies initiated work on implementation of the regional conjunctive use program envisioned by the Water Forum. The objective of this effort, referred to as the Regional Water Master Plan (RWMP), is the development of equitable, cost-effective water resource management strategies for enhancing water supply reliability and operational flexibility for water users of Folsom Lake, the lower American River, and the connected groundwater basin.

The potential for water storage and recovery via a conjunctive use program was evaluated as part of the RWMP. The technical analyses performed through this process involved the use of surface water models (PROSIM and CALSIM), a groundwater model (the “three county” Integrated Groundwater and Surface Water Model [IGSM]), and spreadsheet analyses. Much of the RWMP effort built upon the Water Forum analyses. The RWMP also included an evaluation of the additional facilities required for implementation of this conjunctive use program and the associated costs. This evaluation was based on an analysis of the existing facilities and operations.

Because the goals and objectives of the Cooperating Agencies and the SGA are fully compatible, the two organizations formed a “partnership” to coordinate development and implementation of the regional water resources management strategies identified in the RWMP as cost-effectively and efficiently as possible².

In 2000, the SGA conducted a pilot conjunctive use program to demonstrate the viability of a conjunctive use project in the region. The pilot program, which involved banking (through in-lieu recharge) and recovering (by diversion forbearance and exchange) 2,100 acre-feet of water, included the U.S. Bureau of Reclamation and the Sacramento Area Flood Control Agency as partners.

The SGA is also investigating expanding the parameters of that pilot program. In support of a larger conjunctive use program, the SGA has also begun development of a groundwater monitoring network through the Data Management System project. The SGA is pursuing an arrangement with the CALFED Environmental Water Account (EWA) for implementation of an expanded pilot program.

Existing Funding

Currently, none of the three phases of the Natomas Conjunctive Use Project (Project 7A) are funded by an outside source.

SGA members have taken the initial steps to develop and implement a comprehensive groundwater and surface water conjunctive use program within the framework established by the regional Water Forum Agreement. SGA members have extensive surface water rights and entitlements, and have invested millions of dollars in water diversion and treatment and conveyance facilities that would be essential elements for delivering surface water to areas that historically have depended upon groundwater. Supplemental funding from

² The Cooperating Agencies/SGA partnership encompasses water users in both Sacramento County and Placer County including: Arcade Water District, Carmichael Water District, Citizens Water Resources, Citrus Heights Water District, City of Folsom, City of Roseville, City of Sacramento, County of Sacramento, Del Paso Manor Water District, Fair Oaks Water District, Natomas Mutual Water Company, Northridge Water District, Orange Vale Water Company, Placer County Water Agency, Rio Linda/Elverta Community Water District, Southern California Water Company, San Juan Water District, and individual representatives from agriculture and self-supplied groundwater users (principally parks and recreation districts).

sources other than these purveyors could accelerate these projects in exchange for benefits beyond the American River basin that would otherwise not occur.

For example, San Juan Water District, in cooperation with Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, and Northridge Water District, has constructed the CTP to convey treated surface water diverted from Folsom Lake. Northridge Water District has constructed the NTP to convey surface water from the CTP into Northridge Water District's service area to implement a conjunctive use groundwater stabilization program. In another example, Arcade Water District recently completed a \$65 million upgrade of its wells and transmission main network to facilitate conjunctive use. This was done through its Capital Improvement Program. Additionally, the City is expanding the Fairbairn WTP and installing a new "fish friendly" intake. This expansion will increase the City's participation in a conjunctive use program. These facilities represent a portion of the infrastructure necessary to implement the broader conjunctive use program that would not only enhance local water supplies and implement the Water Forum Agreement, but could make surface water supplies available for other uses as described above.

In addition to the funds contributed by SGA members, the SGA has received funding for several elements of the SGA Program including:

- Continued investigation of conjunctive use opportunities – from CALFED Integrated Storage Investigation Conjunctive Water Management Program
- Data Management System – from CALFED Integrated Storage Investigation, U.S. Army Corps of Engineers, and SGA members
- Groundwater recharge feasibility studies – through Proposition 13 (the SGA was notified of its selection for funding, but the funds have not yet been released)

The SGA is also pursuing an arrangement with the CALFED EWA for implementation of a 1-year pilot program.

The funds received to date are not designated for the actual construction of facilities to implement conjunctive use activities or the associated environmental, legal, and institutional requirements. Absent additional outside revenue sources, SGA members would fund construction of facilities in their districts through revenues collected from transfer activities and from their ratepayers. It is the SGA members' intent to enter into a water transfer contract with another agency (or agencies), generating revenue to partially offset investments (both past and future) in infrastructure that make the conjunctive use program possible.

To fund a portion of the short-term components of Projects 17A, B, and C, the SGA intends to apply for Proposition 13 funds for Groundwater Storage Construction Grants. The next funding cycle is expected to begin in late 2001.

Interrelationship of Projects

The SGA is a joint powers authority (JPA) charged with the protection and management of the groundwater basin underlying the service areas of water purveyors north of the

American River. Because the four projects (Projects 7A, 17A, 17B, and 17C) would share the same groundwater basin, they would also be subject to the groundwater management program that would be implemented by the SGA. Operations under this program would produce local, regional, and statewide benefits. Existence of the SGA serves to minimize the potential for third-party concerns and provides for a built-in management entity to assure security of the groundwater resource.

Benefits

Water Supply

Through implementation of the SGA Program, the SGA members' water supply needs would be met in all years and they would be in compliance with the Water Forum Agreement. The SGA could partner with federal, state, and/or local agencies for disposition of the short-term and long-term yields of Projects 17A, B, and C.

Projects 17A, B, and C are also expected to result in net project recharge that would provide regional benefits to all SGA member agencies adjacent to the cone of depression that utilize groundwater. These benefits may include greater available supply and reduced groundwater extraction pumping costs.

If Project 7A should prove successful in identifying limited interconnection between the river and groundwater, this water could be made available far into the future by providing an alternate source of water for local needs.

Dry-year Delta Exports

Within the context of the CALFED Record of Decision, the yields of Projects 17A, B, and C could be used in a "dry-year" transfer program to augment Delta exports.

Because of the nature and extent of the groundwater basin underlying the SGA members, the project provides the ability to put water in the system through forbearance of surface water diversion on nearly an on-call basis during any week, month, or season of need. This would be accomplished by having SGA members that would have taken surface water, extract groundwater instead. This flexibility would allow the SGA to move water into and through the Delta, taking advantage of "windows" in the Delta export restrictions and flow requirements.

Bay-Delta Water Quality

The yields of Projects 7A and 17A, B, and C could also be used to improve the quantity and quality of Delta outflow. The project's flexibility would allow the SGA to put water in the system for the Delta when needed. In addition, the travel time from Folsom Lake to the Delta is considerably shorter than from other state and federal reservoirs

In addition, releases from Folsom Lake reach the Delta in less time than from most other reservoirs (both state and federal). This shorter travel time would allow the SGA to be more responsive to in-Delta needs.

Environmental Benefits

Projects 17A, B, and C's flexibility would allow the SGA to put water in the system for environmental purposes when needed. Once in the system, this water would provide extensive aquatic, terrestrial, and ecological benefits both in-stream and to the Delta. In particular, releases from Folsom Lake through this program may improve conditions in the American River including in-stream flows augmentation; temperature reduction; water quality improvement; and recreational, fishery, and riparian benefits. In essence, these projects would allow early implementation of the flow management measures agreed to in the Water Forum process, which would otherwise not occur until basin demands had grown.

Surface Water/Groundwater Interaction and Data Collection

Project 7A would provide valuable information regarding the interaction between surface water and groundwater. This information would facilitate determination of how best to balance one area rich in both surface water and groundwater supplies (Natomas) with a neighboring area of smaller surface supplies and groundwater overdraft (northeast Sacramento County). Increased conjunctive use within Natomas would provide additional water supplies for Natomas; however, the objective of the overall program reaches beyond the supplies available to Natomas and considers maximizing benefits to neighboring communities and the overall system. Operation of multiple, comparatively small-capacity sources (wells) would also equip Natomas with locally distributed sources throughout its distribution system. This would allow for local introduction of water sources in response to real-time water demand based on irrigation scheduling, thus contributing toward overall increased irrigation efficiency. Because of Natomas' extensive reuse system, groundwater could be distributed throughout its conveyance system. This project would also be an early precursor for an eventually connection between the Sacramento and American River systems, thus providing greater flexibility to agencies and local districts.

The project could potentially assist the state and federal agencies currently looking to expand conjunctive use throughout the state by answering the questions regarding the stream-aquifer interconnection. This issue currently limits the state and federal agencies from expanding or utilizing potential groundwater sources because of concern about pumping surface water supplies and thereby not creating "new" water.

Through the Data Management System Project, the SGA would also be collecting valuable information on the response of the groundwater basin to conjunctive use activities.

Implementation Challenges and Implementation Approach

Short-term Projects

Implementation of Phases 1 and 2 of Project 7A are not anticipated to result in negative impacts to the environment. Land subsidence is not considered to be a likely issue at the scale of Phases 1 and 2. However, depending upon the findings and any plans for ongoing conjunctive use, appropriate monitoring of subsidence would be added to ongoing monitoring activities.

Implementation of the short-term components of Projects 17A and B are not anticipated to involve extensive environmental issues. The surface water and groundwater usage under

these activities is within the parameters (e.g., water balance) of the Water Forum Environmental Impact Report (EIR). The cumulative impact analyses conducted for that document considered impacts on both the American River and the Sacramento River at year 2030 system-wide demands. Consequently, the SGA's activities could potentially tier off the Water Forum EIR for the "water-side" impacts.

Further, the additional and expanded infrastructure required for the short-term components of Projects 17A and B would be centered largely in urbanized areas; therefore, the "land-side" impacts would also be limited. Thus, the environmental documentation requirements for these projects should be minimal.

Project 17C has no short-term component.

Long-term Projects

Phase 3 of Project 7A would be a full-scale operation that would consider modifications to Natomas' facilities. However, this phase is not anticipated to result in negative impacts to the environment. As in Phases 1 and 2, it may be necessary to monitor land subsidence along with other ongoing monitoring activities.

Implementation of the long-term Projects 17A, B, and C are not anticipated to involve extensive environmental issues. The surface water and groundwater usage under these activities is within the parameters (e.g., water balance) of the Water Forum EIR. The cumulative impact analyses conducted for that document considered impacts on both the American River and the Sacramento River at year 2030 system-wide demands. Consequently, the SGA's activities could potentially tier off the Water Forum EIR for the "water-side" impacts.

Further, the additional and expanded infrastructure required for the long-term Projects 17A and B would be centered largely in urbanized areas; therefore, the "land-side" impacts would also be limited. Thus, the environmental documentation requirements for these projects should be minimal. The long-term Project 17C and the overall SGA Program, however, would require substantial new infrastructure and are likely to have more extensive environmental documentation requirements.

