

MANAGING THE EASTERN SAN JOAQUIN COUNTY SUB-BASIN AN URBAN/AG PARTNERSHIP CASE STUDY STOCKTON EAST WATER DISTRICT

Kevin M. Kaufman, P.E.¹

ABSTRACT

Senior agency managers work with the ‘politics’ of the water industry almost everyday while doing their job of serving the governing board elected or appointed to set policy for their water agency. Conflict in general arises from the ‘bottom-line’ issues like the cost of services charged by these agencies. From an individual’s perspective, cost can become a very personal issue. From a company or entity’s perspective, cost can become a significant challenge to their budgeting process. When a water agency is perceived as taking an approach with an individual, group, company, or entity that is prejudicial or inequitable, the governing board member’s telephones ring too often. Working with the customers of this agricultural/urban water district to spend money on infrastructure intended to assure a sustainable and reliable water supply has raised some interesting communication and policy challenges. For ten-years, the Stockton East Water District (SEWD) has applied various approaches to achieve its objectives in reaching this water supply goal. Although these objectives have not yet been achieved, it was felt to be interesting for SEWD to share what it has learned, and where it might head in the future as a result of the progress made to date.

INTRODUCTION

SEWD is a water conservation district authorized by the Legislature to secure supplemental surface water sources in order to provide a sustainable water supply for agricultural and urban users, and residents that rely on the San Joaquin County Sub-Basin of the San Joaquin Valley Groundwater Basin (Basin).



Figure 1. Location map

¹ General Manager, Stockton East Water District, P.O. Box 5157, Stockton, CA. 95205;
kkaufman@sewd.net

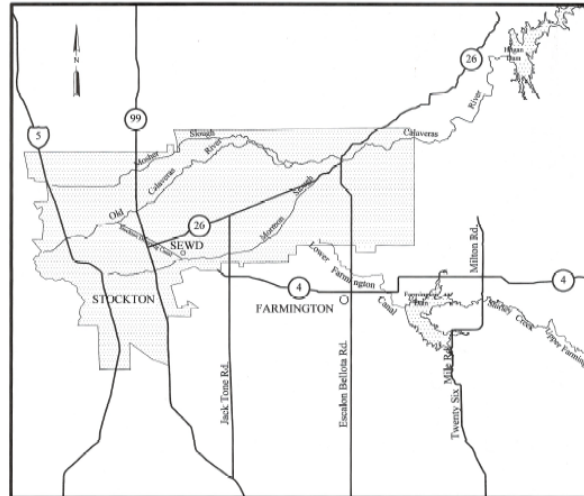
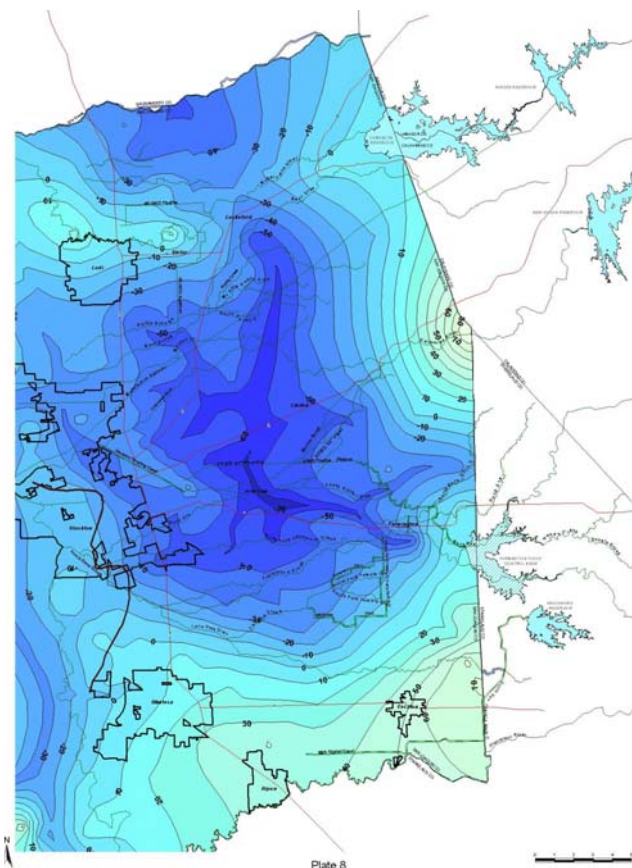


Figure 2. Vicinity Map

CHALLENGED BASIN & UNDERSTANDING TODAY



The Basin has been subject to long-term and continued overdraft and saline intrusion from its western boundary under the Sacramento-San Joaquin River Delta. The total cumulative Basin overdraft to date is estimated to be between 2.5 and 3.0 million AF. Saline waters have contaminated groundwater under the urban area, moving generally from the west to the east, contaminating the City of Stockton's groundwater supply. The leading edge of this intrusion approaches State Highway 99 in the southern half of the City of Stockton (see illustration).



Figure 3. Depth to Groundwater Relative to MSL

Overdraft of the Basin results from agriculture and urban groundwater pumping that exceeded its ability to naturally recharge over the past 60 years.

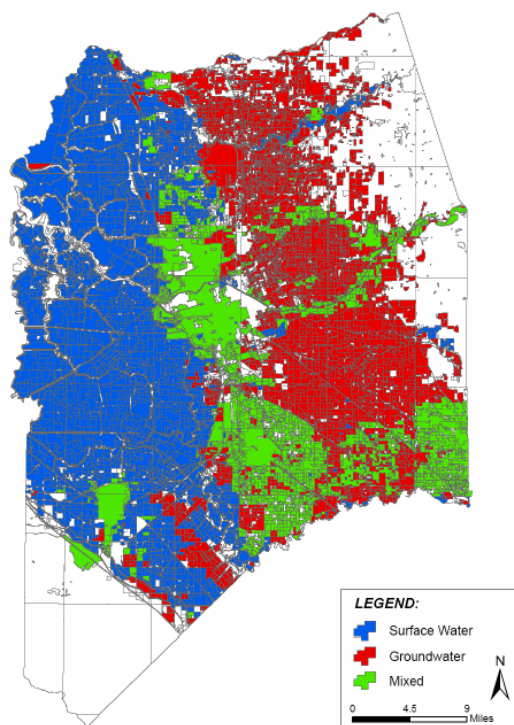


Figure 4. Groundwater and Surface Water use in San Joaquin County

If one looks at the annual average hydrology of surface water availability data (see below), one might conclude that adequate surface water exists to meet local water demands. However, the hydrologic variability from year to year makes reliance on only a surface water supply unreliable, and historically has led this region to rely on groundwater pumping as the primary supply. Had the region secured adequate water rights and constructed surface water storage reservoirs early on, there would have been less reliance on and damage caused from excessive groundwater pumping.

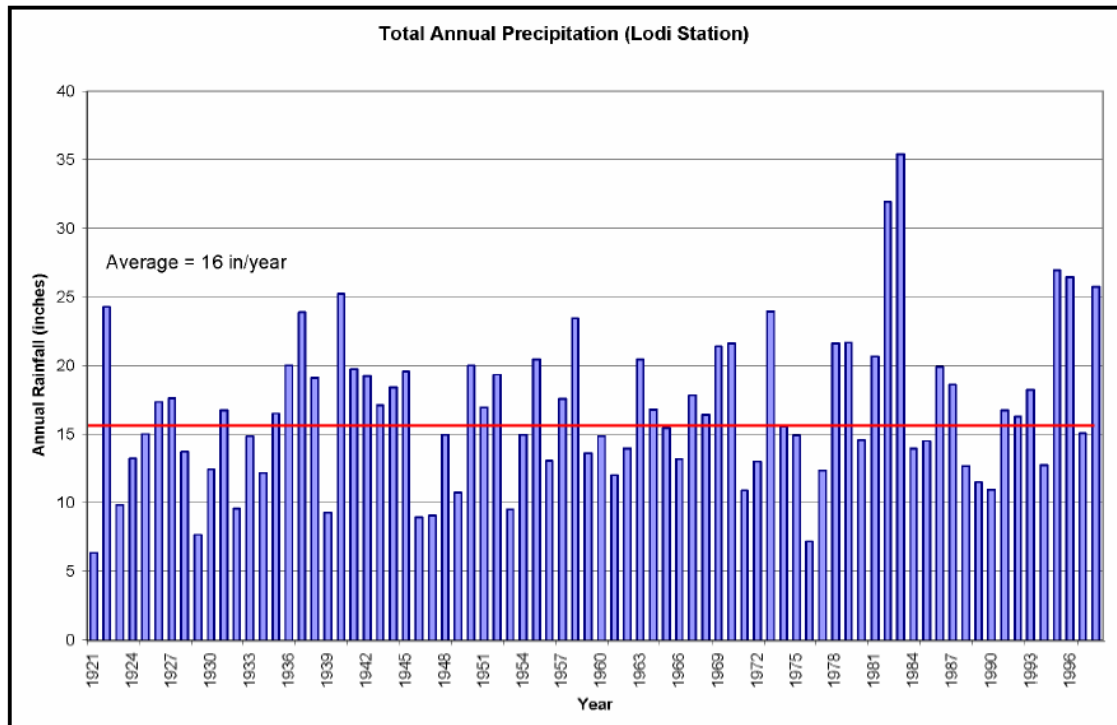


Figure 5. Annual Precipitation (Lodi Station)

To meet water demand projections, SEWD is developing infrastructure to promote the use of a conjunctively managed surface and groundwater supply. A portion of the vacated Basin resulting from overdraft can be used to ‘bank’ surface water in the ground for times when adequate surface water supplies are not available. The portion not pumped in dry years allows groundwater levels throughout the Basin to recover.

Artificial groundwater recharge assists natural recharge by diverting surface water and placing it into the Basin for the purposes of raising groundwater levels and storage for later withdrawal. Groundwater recharge and banking can be achieved either through the use of surface water ‘in-lieu’ of pumping groundwater (passive recharge), or by directly recharging the Basin by flooding fields or constructed percolation ponds (active recharge). The estimated storage capacity of the Basin for banking is estimated to be in excess of 1.5 MAF. Surface water can be ‘directly’ recharged and stored in the ground whenever surface water supplies exceed demands. ‘Passive’ recharge and storage is more seasonally dependent. It is accomplished by utilizing available surface water to meet irrigation and municipal demands, and leaving local groundwater or stored surface water in the ground in the event of a dry period when it will be needed.

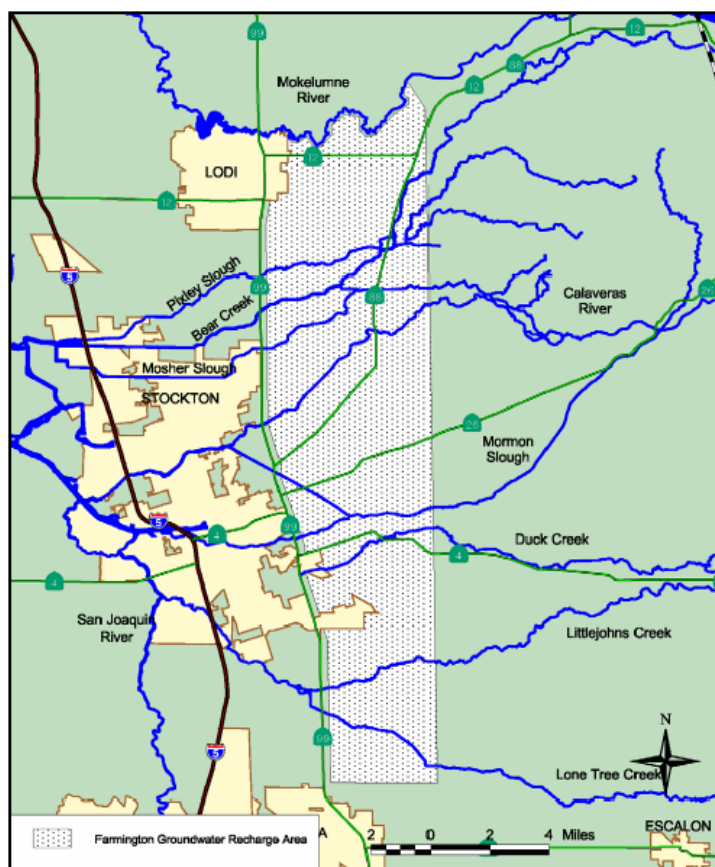


Figure 6. Farmington Groundwater Recharge Area

The City of Stockton urban area, recognized the need to use surface water ‘in-lieu’ of continuing to pump groundwater, and financed the construction of a 30 MGD drinking water treatment plant (DWTP), which began operations in 1977. This DWTP has a current California Department of Public Health rated capacity of 50 MGD. When surface water supplies are available, the DWTP operates in excess of this capacity, meeting about 70% of the annual demand of the urban area. A new DWTP is being constructed by the City of Stockton so that in most years 100% of the urban demand will be met with surface water supplies. In years when surface water supplies cannot meet the urban demand, surface water stored in the ground by this in-lieu method will be pumped to meet the urban demand.



Figure 7. 2007 aerial photo of DWTP looking east

Due to the operation of the SEWD DWTP, groundwater levels under the urban area have generally been more stable or have risen. A benefit of rising groundwater levels under the urban area in addition to the banking component is that the progress of saline intrusion may be thwarted by a mounding effect of this urban in-lieu recharge effort.

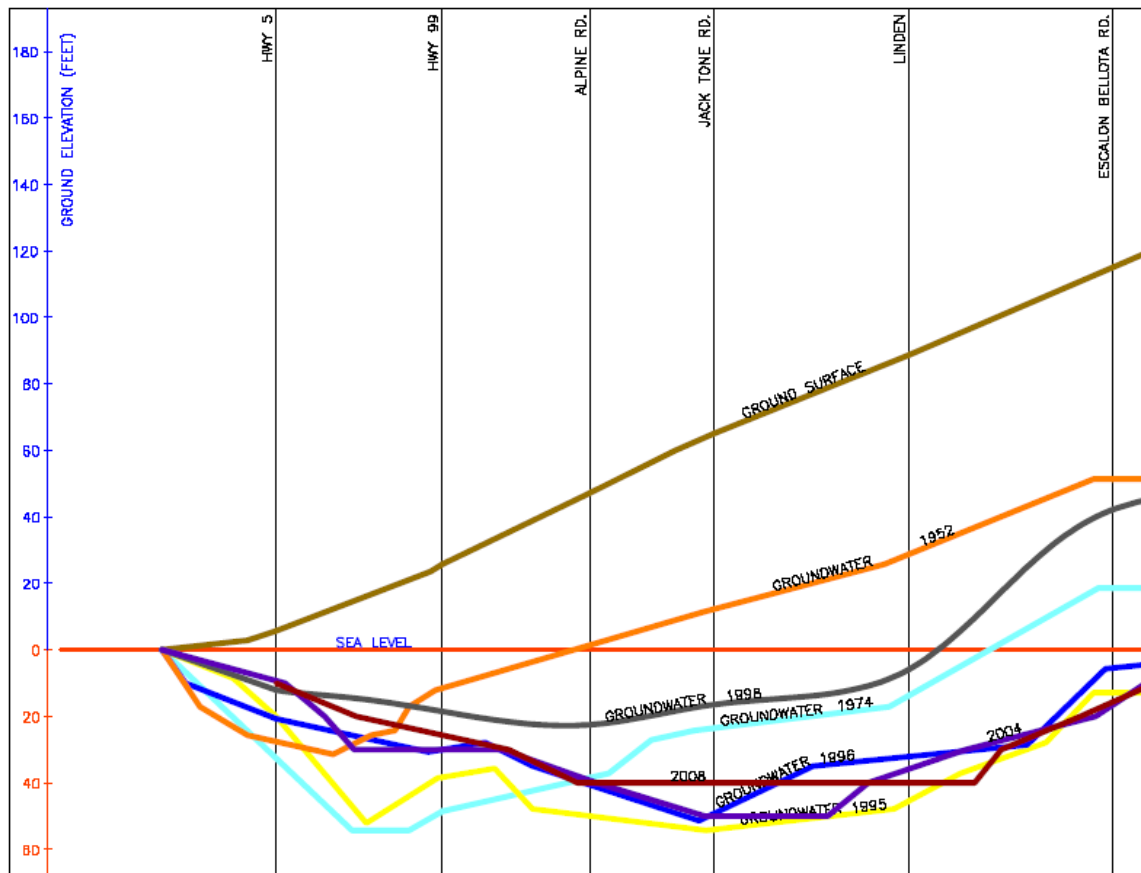


Figure 8. Groundwater Level along Hwy 26

With the saline intrusion coming from under the Delta to the west, this hydraulic barrier/mound may impede its progress toward the low-point of the Basin to the east.

The agricultural area of SEWD, to the east of the urban area, has experienced greater overdraft than the urban area, and is over the low-point of the Basin (80 feet below sea level). Since before the 1930's, agricultural interests recognized the benefit of using surface water to recharge the Basin. The Linden Irrigation District, predecessor to the SEWD, built flashboard dams in the Calaveras River, allowing surface water to percolate within the natural river channel for the benefit of the Basin. This practice continues today along with added surface water diversions from the river so agriculture can use surface water in-lieu of pumping groundwater.



Figure 9. New Melones Conveyance

In order to obtain a sustainable water supply for the urban area, the agricultural area of SEWD must be developed with infrastructure to deliver surface water in-lieu of groundwater pumping. Less than 20% of the 55,000 acres of irrigated agriculture within SEWD currently use surface water. This percentage is not surprising given the fact that the number of acres adjacent to the canals and natural streams currently using these water ways to distribute surface water is small. If expanded infrastructure is constructed to deliver surface water to more acreage, the proper management of surface and groundwater in the agricultural portion of the SEWD is achievable. The storage and banking of water under the agricultural area of SEWD is expected to be the ultimate saving-grace for the urban area in dry years since this is the largest portion of the overdrafted Basin. Solutions can be found through water resources planning and engineering; right? [If the solution were this easy to come by, everyone would want the job!]

COMMUNICATION & CUSTOMER CLASS CHALLENGES

The history of securing and managing water supplies in California varies depending on local and regional geography and attitudes.

For example, in contrast to SEWD, the City of Modesto (located 30 miles SE of Stockton) claims they are rich in water; and they are because of their location south of the Stanislaus River and astride of the Tuolumne River, and their foresight to develop and protect these surface water resources. Many other irrigation districts were equally fortunate both in geography and foresight, and today have ample surface water supplies. The Eastern San Joaquin County region, where SEWD hails, has not been as fortunate.

The Eastern San Joaquin County region's misfortune can be explained by three primary factors: its lack of ideal geography for diverting surface water; its lack of foresight for water management planning; and its unenviable luck in trying to secure and protect what might have been.

Located between the Mokelumne and Stanislaus River watersheds, SEWD has limited surface water supplies from the existing rain-fed streams. The Linden Irrigation District and the City of Stockton acquired water rights on the Calaveras River, which are considered as good as gold today. While the Mokelumne River runs through the City of Lodi and the North San Joaquin WCD, they were forced to settle for a trickle of the river's water thanks to a 1948 decision by the State Engineer granting rights to the river to the East Bay Municipal Utility District. There is potential that a more equitable court may award these local agencies a fairer share of the Mokelumne River supply in the future.

Three 78-inch diameter pipelines transmit Mokelumne River water from above Pardee Dam to EBMUD's service area. These pipelines bisect the City of Stockton. Reportedly, during their construction, a neighborly EBMUD offered the City a tap or two off of these pipelines in the event the City of Stockton would ever want to buy some of this water from EBMUD. The City fathers at the time saw no value in the offer, saying that they had enough groundwater for their foreseeable future. This failure to invest in the future of course is considered the mistake of the century. In the City's defense, however, the city water system was a private water company at the time, with their interests possibly focused only on the short-term. The City became much more active in water issues later in the 20th century, and today has its own water system that has a water demand equivalent to that of the older private water company.

Although the City of Stockton did secure a water right on the Calaveras River, at the time it was more interested in flood protection than water supply. Following the flood of 1955, the New Hogan Dam was designed and constructed by the US Army Corps of Engineers, and completed in 1964. At that time, the City's water right was absorbed or gifted by the water right secured by the USBR, and contracted to the SEWD and its foothills neighbor, the Calaveras County Water District.

On the agricultural side of SEWD, even more significant lack of foresight occurred. Although the Linden area of the district had a great water right and was able to provide surface water to properties adjacent to the Calaveras River, the rest of the district had few surface water options. Despite this, using water from the Calaveras River until the 1977-78 droughts, SEWD delivered over 30,000 AFA of surface water to properties adjacent to the Calaveras River system. Forced to install deeper agricultural wells during the drought, many users never went back to using surface water. To this day, SEWD has yet to provide as much surface water to its agricultural customers. The 1988-92 droughts had similar reductions in surface water use. SEWD offers incentives for the growers to use surface water in-lieu of pumping groundwater, and agricultural demand has now grown to nearly the 30,000 AFA milestone.

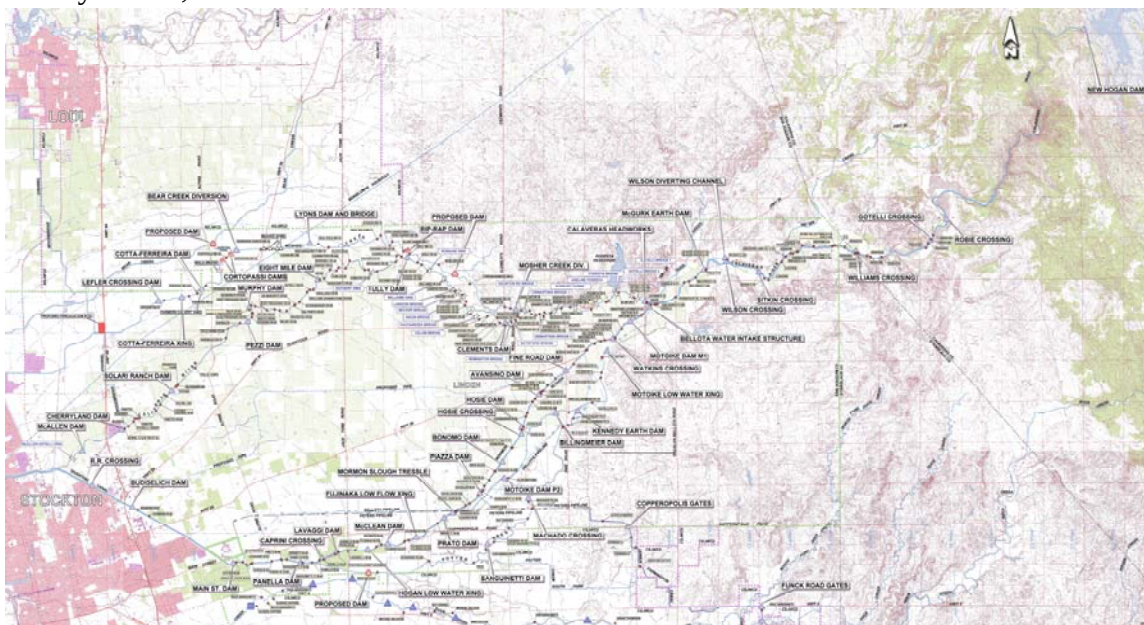


Figure 10. SEWD Agricultural Map

Due to the perceived unreliability of the surface water, and the expense of maintaining a dual surface and groundwater system, the agricultural community has not been willing to invest in the infrastructure needed to make surface water more accessible. In the 1979-80 legislative session, the agricultural community successfully lobbied for a rate-cap on what SEWD could charge for its water fees and assessments, essentially assuring that the water district would never be able to build the infrastructure it needed on the back of the agricultural community. Given the marginal nature of many agricultural ventures, it is not surprising that this rate protection legislation was written into law.

Other political actions and issues that help create the current ‘challenge’ in Eastern San Joaquin County include:

1. Some in San Joaquin County applauded the defeat of Auburn Dam and the extension of the Folsom South Canal into San Joaquin County. This project would have provided still needed flood protection for the City of Sacramento, and allowed Eastern San Joaquin County to have a reliable surface water

supply off of the American River. It is difficult at this date for SEWD to share in the joy of the few that applaud this defeat.

2. When the SEWD treatment plant was constructed 30-years ago, the contract governing its operation was structured to fund only actual costs of operation. The last 30-years have been unnecessarily tense as a result of the contract terms, which has resulted in ulcers not only in individuals but in all the organizations involved. The nit-picking and lawsuits have not been fun. Fortunately, recent understanding of this tragic document has led to a possible solution to this issue.
3. With lack of surface water from the American and Mokelumne Rivers, SEWD was asked by USBR to be one of two CVP contractors on the Stanislaus River. A 1983 contract resulted in SEWD investing \$65million on a conveyance system for this water. SEWD continues to spend about \$500,000 a year trying to get USBR to honor these contracts. Fortunately, SEWD has been able to use this conveyance system for purchased water from understanding and cooperative local irrigation districts. To say this CVP contract has been a nightmare would be an understatement. Progress in 2009 is encouraging, but SEWD has not yet satisfied that it will receive reliable deliveries from the Stanislaus River.
4. With a new Board of Directors in 1998, and a new manager in 1999, SEWD changed its direction from one of being a malcontent to one of communicating and building partnerships. Working with the City of Stockton, SEWD proposed a local initiative that would have removed the agricultural rate-caps and allow for the construction of surface water distribution systems. The negotiations started with the City wanting to take over the DWTP and ended with the City providing the water district with funds to build the infrastructure it recommended at the time. Early on in the debate, the mayor of the City was quoted in local newspapers saying that he wanted 'a divorce' from SEWD. From that low-point, SEWD and its urban contractors have built a sound relationship that is now expected to thrive. The City's need for a defensible general plan and to issue will-serve letters became a very good reason for the relationship to improve. SEWD also made concessions. We now have a 'trust but verify' relationship; a significant accomplishment.
5. The district has been mired in litigation for the past 15 years; litigation against the United States demanding increased water supply allocations; litigation between the urban area customers and the district over expenditures. Current policy changes are expected to reduce the amount of litigation over time.



Figure 11. SEWD in the 2002 Newspaper

One of the primary difficulties of the district stems from one of its greatest strengths: the fact that it is both urban and agricultural. The two service areas have different needs, financing capabilities and philosophies. Reasons for many Urban and Agriculture approach differences are probably obvious. How each group of individuals deals with land-use, budgets, regulations, missions, goals and objectives, differ vastly and should not be expected to be compatible. However, when it comes to the quantity and quality of groundwater, attitudes are similar and provide common objectives and a basis to support SEWD's management of the Basin approach.

From SEWD's experience, the challenge has been how to get both the urban and agricultural interests to support a sustainable water supply plan into the future. Both interests line up behind the benefits of conjunctive management of surface and ground water and the need to provide a sustainable water supply. The questions of who benefits and who pays for specific projects creates the controversy and challenges.

Examples of past Urban concerns:

1. How would these projects limit our ability to gain independence from SEWD?
2. Why should urban rate-payers be expected to pay the lion's share of the cost?
3. Can't the agricultural community pay a fair share?
4. Why can't we rely on only our portion of the Basin? [see figure 11]
5. The Urban area practices water conservation and if the Ag area did the same there would be plenty of water for Ag, Urban and the environment.

Examples of past Agricultural concerns:

1. How reliable will the surface water be, and how much will it cost?
2. Even if I have access to surface water, how can I afford to keep both the surface water and groundwater infrastructure maintained and operational?
3. Will the quality of surface water affect my crops?; how about my costs?

4. It is so easy to turn on my well, why would I want to change? Wouldn't it be easier and more cost effective to let others convert to surface water?
5. Why should I pay for groundwater recharge? Will I really benefit from more reliable groundwater levels and quality or will the urban area receive a greater benefit?
6. If I associate with SEWD, will they bring my operation to bankruptcy?

COMMUNICATION & POLICY MANEUVERS & CURRENT APPROACH

When the customer knows just as much about the Basin challenges as the professionals they hire to address the problems, it is important to listen carefully to what the customers believe are the solutions.

Ten years ago, SEWD was faced with the task of putting together a project to provide surface water to lands currently irrigating with groundwater. Using traditional methods from many years of experience, SEWD approached both agricultural and urban leaders and proposed solutions. Due to conflicts of the past, poorly-written contracts, and other regulatory and financial challenges, progress was dismal for the first few years. It took awhile before SEWD realized that the key to building agricultural infrastructure was to use funding schemes that did not require raising water rates on SEWD agricultural customers. This approach was driven by the policy of the agriculturally dominated Board of Directors elected to manage the SEWD. Understand that this statement is not a criticism of these elected officials. It is simply a statement of fact that the reality to the agricultural community is that no matter how much water rates are raised, there is not enough revenue that can be generated to support the infrastructure improvements needed to resolve the Basin's challenges. This of course continues to be a concern with some in the urban portion of the SEWD. If an urban customer feels they are 'subsidizing' agriculture it is difficult to convince them otherwise. What eventually convinces most is the reality that there is only one groundwater Basin shared by both SEWD agriculture and urban customers, and that the overdraft in both areas must be addressed before the Basin as a whole recovers, or becomes sustainable.

The Basin is a confined, fairly homogeneous aquifer bound by the foothills of the Sierra-Nevada Mountains and the Stanislaus, San Joaquin, and Mokelumne Rivers. Over-pumping in one portion of the Basin creates an overdrafted area, setting up a hydraulic gradient for water from other parts of the Basin to begin migrating to the overdrafted area. Studies conducted over the past 30-years have shown that this is exactly how the Basin reacts. As expected, if recharge of a portion of an overdrafted basin occurs, groundwater levels will endeavor to reach a state of equilibrium benefiting a much larger area of the Basin than just the immediate recharged area. As stated previously, the 'in-lieu' efforts of the urban area (operation of the existing and future DWTPs) are expected to create a hydraulic barrier to further migration of saline contaminated water from under the western boundary of the Basin.

The problem now faced by the urban customers of SEWD is that the surface water banked under the City of Stockton may create water quality issues, and could be useless

to the urban area as drinking water without further treatment. Therefore it is essential that the district have access to banked water in a location where it can be treated to drinking water standards before delivery to the urban area. To solve this problem, SEWD needs to bank surface water in the agricultural area, where recovered water from the bank can be delivered to SEWD's drinking water treatment plant (DWTP). The urban area generally understands the benefit of building an agricultural surface water distribution system if it is designed to deliver banked surface water to the DWTP in their times of need. This is expected to be the long-sought solution to provide a project that achieves a sustainable reliable water supply for our region:

- ✓ Recharge takes place in the agricultural area where the groundwater overdraft is the most severe.
- ✓ The urban area finances the distribution system required to accomplish recharge.
- ✓ The urban area receives the benefit from stored water in dry years when needed.
- ✓ The Basin benefits from the overall increase in groundwater levels and protection from further saline intrusion.

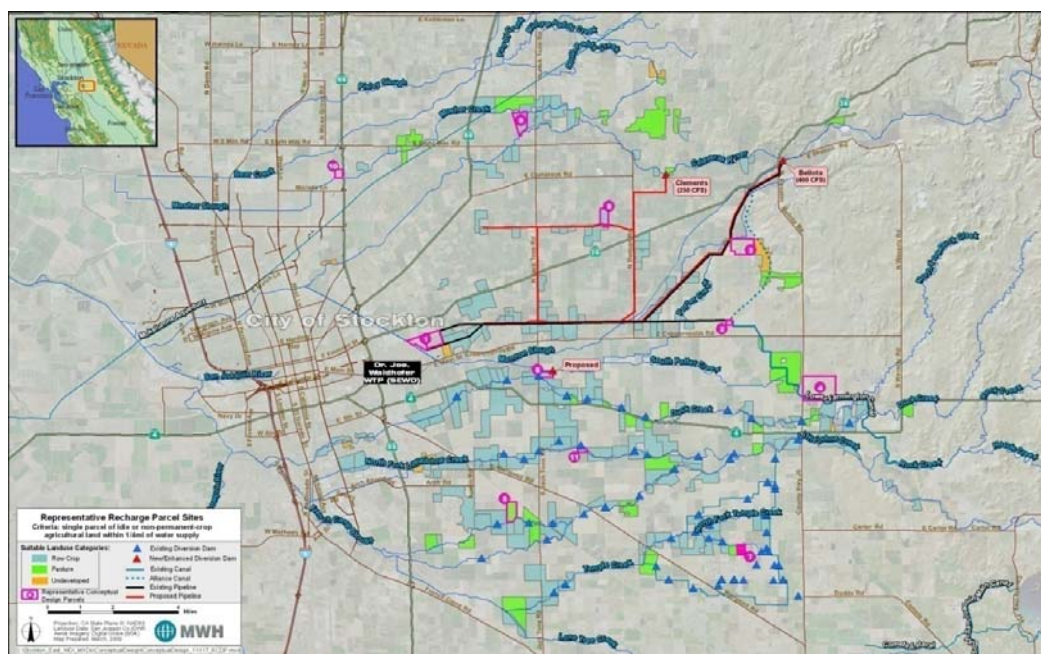


Figure 12. Proposed Farmington Program Phase II Conveyance and Groundwater Storage

So the 'push-back' experienced six to ten years ago has decreased as SEWD has learned the agricultural-urban dynamic that was facing the water district. The successes and progress made is a direct result of the diligent work effort of the Board of Directors, legal and political consultant, involved members of the public, and staff.

All attempts tried other than the current approach described above kept turning SEWD's focus back to the inability of the agricultural community to afford the infrastructure, and the urban community's demand for a sustainable reliable supply of drinking water.

SEWD is prepared to continue to adjust its approach in working with Agricultural and Urban leaders and interest. SEWD is optimistic that it can continue with the progress made, and is confident that the ‘fruits of these efforts’ will be ‘harvested’ for the generations that follow us in the service to our region and communities.

LOOKING FOR INPUT FROM THE EXPERIENCE OF OTHERS

SEWD is interested in your experiences, and what we may be able to learn from your attempts to address similar challenges in your communities. Please either provide them today for all to hear, or send me an email describing your experience. I would be more than willing to establish a blog to continue discussion on this topic for the benefit of all.

ACKNOWLEDGEMENTS

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