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March 17, 2017

Jeanine Townsend  
Clerk of the Board  
State Water Resources Control Board  
1001 I Street, 24th Floor  
Sacramento, CA 95814-0100

**Re: Comment Letter – 2016 Bay Delta Plan Amendment & SED**

Dear Chair Marcus and Members of the Board:

Thank you for the opportunity to comment on the Draft Substitute Environmental Document in support of potential changes to the Water Quality Control Plan for the Bay Delta: San Joaquin River Flows and Southern Delta Water Quality (Draft SED). The Tuolumne River Trust (TRT) filed comments on the original draft Phase I Substitute Environmental Document (SED) that was published in December 2012 and has presented testimony during public hearings in December 2016 on the Draft Revised SED published in September 2016. The Bay Delta Water Quality Control Plan has the greatest potential to improve the health of not only the Tuolumne River, but also the San Joaquin mainstem, its other tributaries, and the southern Delta. It is incredibly important that the SED lay out a clear plan for achieving biological and environmental goals, with numerical goals, and a well-articulated adaptive management plan for adjusting efforts as progress is made (or not made) on components of the plan.

The State Water Resources Control Board's 2010 Flow Criteria Report, using the best available science, demonstrated the strong relationship between instream flow and subsequent escapement of chinook salmon. This report documented that 60% of unimpaired flow in the San Joaquin Basin, under current conditions, would likely be required to protect public trust resources. The Draft Revised SED recommends a flow range of 30%-50%, but offers no additional measures in conjunction with this flow recommendation to protect public trust resources. We therefore urge the Board to adopt a 50% unimpaired flow target. This target can be adjusted subsequently through careful adaptive management if other actions are taken that contribute to protecting public trust resources.

TRT was founded in 1981 to protect and restore the Tuolumne River and its tributaries. We have 2,000 members, most of whom live in the Central Valley, Sierra Foothills and Bay Area. TRT has been involved in fishery management issues since the 1990s and was a signatory to a Settlement Agreement in 1995 with the Turlock and Modesto Irrigation Districts (TID and MID, collectively the Districts), the City and County of San Francisco (CCSF), the U.S. Fish & Wildlife Service (USFWS), the California Department of Fish and Game (now the Department of Fish and Wildlife or DFW), and other stakeholders. While this

Settlement Agreement included both non-flow measures, including spawning gravel management and predator habitat modifications, and modest flow improvements, it clearly has not achieved the results that the groups intended. Chiefly, the participants intended the 1995 Settlement Agreement to increase the naturally occurring salmon populations.

Historically, an estimated 130,000 salmon spawned in the Tuolumne each year. Unfortunately, naturally occurring salmon populations have not increased. In fact, fall run salmon populations on the Tuolumne have declined since 2000, with as few as a few hundred returning adults in many years. Meanwhile, the National Marine Fisheries Service (NMFS) listed Central Valley steelhead as a Threatened Species and the agency designated the Tuolumne River as Critical Habitat for steelhead in 2005. Water quality in the lower Tuolumne is now listed as impaired under Clean Water Act standards. Something must be done.

Over the years there has been a direct correlation between flows and the health of the salmon population. For example, the heavy storms of 1982/3 flushed juvenile salmon out to the Delta, Bay and Ocean, and in 1985, 40,000 of those salmon returned as spawning adults. This was a peak in the population during that time period.

In 1997/8 there was so much water flowing down the Tuolumne River that it spilled over Don Pedro Dam, flooding areas downstream. While this caused problems for downstream communities, it led to a peak of 18,000 returning salmon in 2000. The high flows during both of these water years benefitted juvenile salmon by creating floodplains for foraging, improving water quality, including temperature and dissolved oxygen, providing cover from predators, and moving them to the ocean faster to avoid predation.

Our goal is to ensure that we do not repeat the failures of the past to achieve meaningful improvements not only for salmon and steelhead, but also more broadly for all native aquatic-dependent species, water quality, and recreation.

The biggest direct impacts to the Tuolumne come from Don Pedro Dam, which impedes the migration of salmon and steelhead to much of their historic spawning grounds, and water diversions that have reduced flows in the lower Tuolumne. The 1995 Settlement Agreement did not provide adequate flows to the lower Tuolumne to ensure cold temperatures are maintained in the river at critical moments in the fish's lifecycles. Currently, only 16% of unimpaired flow is guaranteed for fish and wildlife below Don Pedro Dam. The Settlement Agreement also did not include any significant floodplain restoration. Floodplain restoration and channel-floodplain connectivity are critical for rearing of juvenile salmon. While some organizations, including TRT, have independently purchased and restored more than 2,000 acres of riverside lands, there remains a need to restore many thousands of additional acres of high quality rearing habitat that is carefully integrated with a flow regime that ensures these lands are inundated with increased frequency, duration, and depth.

## **BACKGROUND**

On September 15, 2016, the State Water Resources Control Board (State Water Board) released the Draft Supplement Environmental Document (SED) which presents the State Water Board's

analysis of the need for, and effects of, potential changes to the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (2006 Bay-Delta Plan). State water quality law requires the adoption of Water Quality Control Plans that identify existing and potential beneficial uses of waters of the state and establish water quality objectives to protect these uses. The Bay-Delta Plan protects water quality in the region and includes water quality objectives to protect fish and wildlife beneficial uses through inflows to the Delta from the Sacramento River and San Joaquin River and Delta outflows, in addition to objectives for salinity to protect agricultural beneficial uses.

The 2006 Bay-Delta Plan was adopted by the State Water Board on December 13, 2006. It identified a number of emerging issues that required additional review and water quality control planning. San Joaquin River flow was one of the emerging issues. During development of the 2006 Bay-Delta Plan, data submitted by fisheries agencies suggested that various fish species within the Delta and San Joaquin River basin had not shown significant signs of recovery since adoption of the San Joaquin River Spring Flow and Pulse Flow objectives in the 1995 Plan and the implementation of the Spring Flow objectives in D-1641. Some species have shown significant declines. The San Joaquin River flow objectives were not changed in the 2006 Plan due to a lack of scientific information on which to base any changes. Thus, San Joaquin River flow is the focus of this SED along with southern Delta salinity, one of the other emerging issues.

Specifically, the purpose for the plan amendment to the 2006 Bay-Delta plan is twofold: To establish flow objectives during the February-June period and a program of implementation for the reasonable protection of fish and wildlife beneficial uses in the lower San Joaquin River, including the three eastside, salmon-bearing tributaries (the Stanislaus, Tuolumne, and Merced Rivers).

## **RECOMMENDATIONS**

We do not believe the SED adequately accomplishes what the State Water Board has set out to accomplish for several reasons.

1. The proposed February through June flow requirement of 40% unimpaired flow as a starting point is too low to protect native fish populations. The State Water Board in its report *Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem* presented a thorough analysis of flow requirements to protect native fish species and concluded that 60% of 14-day average unimpaired flow from February through June is required to protect public trust resources. The 2010 report went on to state that the 60% criterion is “supported by sufficiently robust scientific information” (State Water Board Development of Flow Criteria, p. 119).

Available information is unequivocal that 40% is too low. Testimony prepared and submitted on behalf of The Bay Institute, American Rivers, Environmental Defense Fund, Natural Heritage Institute, and the Natural Resource Defense Council clearly demonstrate the need for higher flows. Among the points made in this testimony:

- Based on the abundance to prior flow relationship, average springtime inflows of 10,000 cfs or more are likely to achieve the salmon doubling goals.
- Periodic springtime inflows of 25,000 cfs are needed to achieve large-scale floodplain inundation on the lower San Joaquin as currently physically constrained.
- Inflows of at least 5,000 cfs are necessary to maintain minimum temperature conditions for migrating salmonids in April and May.
- Salmon population growth was negative in two-thirds of years when spring San Joaquin River inflows were below 5,000 cfs.
- Population growth was positive 84% of years when inflows were in excess of 5,000 cfs.

The proposed 40% of unimpaired flow requirement does not meet these thresholds and will not protect public trust resources. The State Water Board provides no analysis to justify its determination that 40% of unimpaired flow will protect public trust resources. The Tuolumne River Trust believes that at least 50% of unimpaired flow is necessary to protect public trust resources.

2. As described in the SED, the State Water Board's objective is to protect native fish populations, yet the entire focus of the flow analysis appears to be focused solely on salmonids. For fall run Chinook salmon, the SED restricts itself to providing flows only for outmigrating juveniles, and ignores the needs of other life stages, including upmigration, spawning, and incubation. The SED ignores the summertime needs of steelhead. Beyond salmon and steelhead, the SED ignores the needs of other native fish species, including spring run Chinook salmon, Green sturgeon, Delta smelt, Longfin smelt, Sacramento splittail, River lamprey, San Joaquin roach, Pacific lamprey, and hardhead. While in general fall run Chinook salmon and steelhead receive the majority of attention through agency recovery programs, the SED provides little justification for limiting its scope to these species. This appears to be contrary to the explicitly stated goal of providing flow conditions to maintain the natural production of viable native fish populations migrating through the Delta.

The State Water Board must take a more holistic approach to aquatic ecology in the lower San Joaquin River and examine the full life cycle of salmon, steelhead, and other species. By isolating life cycles and/or species, the State Water Board is taking a piecemeal approach that will unlikely result in recovery of any of the species and will doom future recovery efforts. Even if juvenile salmon survival is improved through the lower San Joaquin River, it provides no certainty that other life stages will be similarly successful. Beyond fall run Chinook salmon, the continued decline of other species could threaten the entire integrity of the Bay-Delta ecosystem, just as we have seen occurring with the decline of pelagic organisms in the Delta.

3. The draft narrative objective stated in the SED states:

Maintain inflow conditions from the San Joaquin River Watershed to the Delta at Vernalis, sufficient to support and maintain the natural production of viable native San Joaquin River Watershed fish populations migrating through the Delta. Inflow conditions that reasonably contribute toward maintaining viable native migratory San Joaquin River fish populations include, but may not be limited to, flows that more closely mimic the natural hydrographic conditions to which native fish species are adapted, including the relative magnitude, duration,

timing, and spatial extent of flows as they would naturally occur. Indicators of viability include population abundance, spatial extent, distribution, structure, genetic and life history diversity, and productivity (SED p.3-8).

The Draft Revised SED states: “The salmonid biological goals for this program of implementation will be specific to the LSJR and its tributaries and will contribute to meeting the overall goals for each population, including the salmon doubling objective established in state and federal law. Biological goals for salmonid populations will be consistent with best available scientific information, including information regarding viable salmonid populations, recovery plans for listed salmonids, or other appropriate information” (Appendix K, p. 33).

We strongly support inclusion of the doubling goal, but are concerned that there is no clear linkage with how the recommended flow range of 30%-50% of unimpaired flow from February-June will actually achieve the doubling goal. We strongly recommend further analysis and explanation of cause-effect relationships to better elucidate how the plan will achieve the doubling goal.

There is an extensive body of scientific information available that the Board can analyze and incorporate into the SED that would clarify how the proposed flow contributes to viable salmonid populations. There is no clear quantitative analysis presented that demonstrates the relationships between hydrographs and salmon survival. As a result, we cannot determine what level of survival will be achieved by the proposed 30%-50% range of flows.

4. We object to the Board’s proposed adaptive management plan, specifically the proposed governance scheme. In the Draft Revised SED, the Board proposes a Stanislaus, Tuolumne, Merced Working Group (STM Working Group) that will recommend adaptive operations, procedures for implementing the adaptive management activities, and assessment of the effectiveness of flows. The Board proposes to include State and Federal fisheries agencies and local water users. The Board does not propose to include representatives of the fishing industry, conservation groups, or the public interest in general, which creates a basic issue of fairness. The rules under which the STM Working Group will operate and the decision-making process are not clear. We believe this governance scheme is doomed to face gridlock and failure.

One of the elements of the 1995 Settlement Agreement was a Tuolumne River Technical Advisory Committee (TRTAC), which was made up of CDFW, USFWS, TID, MID, and CCSF. Although conservation groups and other interested parties were allowed to participate in TRTAC meetings, decisions were formally made by the fish and water agencies. Our experience was that when it came to flow scheduling in particular, the governance did not work very well.

We recommend that the Board maintain decision-making in-house with regard to the issues that it has proposed assigning to the STM Working Group. If the Board wishes to solicit the recommendations of agencies and water users, it can do so through a public meeting process, which would likely be required anyway to ensure compliance with the Ralph M. Brown Act and the California Environmental Quality Act. In essence, changes to operations have the potential to have impacts on public trust resources, and thus decisions should be made in an open and transparent process. Even if the STM Working Group is established, it will still need to adhere to

open meeting policies and afford the public the opportunity to comment. We recommend eliminating the additional layer of bureaucracy and simply conducting open meetings that provide all interested members of the public the opportunity to participate. Decision-making, however, should be retained by the Board or its Executive Director.

5. The State Water Board's proposal to adopt the objective of 40% of unimpaired flow as a starting point appears to be made as an effort to balance the competing uses of water. However, no clear standards or explicit decision-making framework is identified to support the recommendation. The Board must describe a transparent process and framework for reaching any conclusion, and it must clearly justify the conclusion. As it stands, the 40% of unimpaired flow recommendation appears to be made with little or no clear justification. In fact, it will not protect public trust resources. We recommend that the Board define its decision-making framework and process before making a decision.

6. We are concerned that installation of the gage to measure flow on the Tuolumne just above its confluence with the San Joaquin River could result in flows below La Grange Dam, where anadromous fish spawn and juvenile fish rear, being reduced to less than the required unimpaired flow between February and March. This is because at times Dry Creek contributes significant inflow into the Tuolumne above the proposed gage. If Dry Creek flows contribute to the percentage of unimpaired flow, releases from La Grange could be reduced, potentially harming juvenile fish. We request that the unimpaired flow requirement be imposed immediately below La Grange Dam in order to maximize the benefits to fish populations.

Note that La Grange Dam, located two miles below Don Pedro Dam on the Tuolumne River, is currently undergoing a licensing process. La Grange Dam was built in 1883 by the Turlock and Modesto Irrigation Districts. Having been built prior to the Federal Power Act, the dam was never issued a license from the Federal Energy Regulatory Commission (FERC). However, through the course of the relicensing of Don Pedro Dam, several parties requested that FERC review the La Grange project due to modifications that occurred subsequent to the passage of the Federal Power Act and other characteristics of the dam. Ultimately, FERC determined that La Grange Dam should be licensed, a determination that was upheld by the DC Court of Appeals. FERC has not indicated whether it will issue a single or separate licenses for Don Pedro Dam and La Grange Dam, but it has indicated that it will issue a single NEPA document for both dams. The current schedule could have the two dams licensed as early as 2020. A major aspect of the La Grange licensing is a suite of studies related to constructing fish passage facilities to move salmon and steelhead around both dams to the upper Tuolumne.

7. TRT believes opportunities exist to maintain robust agricultural and urban economies while also protecting and restoring the Bay-Delta and river ecosystems. Water use efficiency will be key to balancing human needs with those of other species. We present comments and recommendations below.

### **SFPUC WATER USE**

TRT believes the revised Bay Delta Plan will not impose excessive hardship on the San Francisco Public Utilities Commission (SFPUC). This is because water conservation efforts have

dramatically reduced demand in the SFPUC service territory and there's room for more improvement. Potential socioeconomic impacts have been exaggerated, and our modeling shows the SFPUC could manage the drought of record even under the increased instream flow obligation proposed in the SED.

## 1. Problems with Current SFPUC Reservoir Operations

The SFPUC's policy is to assume every year is the beginning of, or continuation of, an 8.5-year "design drought." Therefore, the SFPUC releases a minimum amount of water from its reservoirs to meet instream flow obligations and flood protection rules. The Tuolumne often runs low while water is impounded behind dams. But then when a wet year occurs, or a couple of normal years, storage fills and water must be released, often in large quantities, to free up runoff storage capacity to prevent downstream flooding. As a result, the ecosystem experiences one or two good years at the expense of many bad years, and the timing of releases often does not provide the maximum benefit to fish.

The recent drought and subsequent wet year are a good example of how current SFPUC water operations fail to protect fish populations. During the drought, instream flows were minimal, but once the Tuolumne reservoirs filled this January, water had to be released at the maximum amount allowed, and this is expected to continue into the summer. Had releases been more evenly distributed over the past five years, the ecosystem would have experienced much greater benefit, and any decrease in storage would now be erased.

## 2. Conservation, Efficiency and Alternative Water Resources

By continuing to implement efficiency measures, water could be freed up for the Tuolumne River ecosystem without compromising economic output. Between 2007 and 2016, water demand in the SFPUC service territory decreased by 30% (see Attachment A). In 2007 the SFPUC's customers used about 257 million gallons per day (mgd). At that time demand was projected to increase to 285 mgd by 2018, but to avoid challenges to its Water System Improvement Program, the SFPUC agreed to cap water sales at 265 mgd until at least 2018. Conservation kicked in, and between 2010 and 2014, demand averaged about 223 mgd. In 2015 it decreased to 195 mgd, and declined even further in 2016 to 175 mgd.

In 2014 the Bay Area Water Supply and Conservation Agency (BAWSCA), which represents the SFPUC's 26 wholesale customers in San Mateo, Santa Clara and Alameda Counties, revised its 2040 demand projections downward by 20%. Current projections suggest total SFPUC demand (retail and wholesale combined) will be 250 mgd in 2040, well below the SFPUC's sales cap of 265 mgd.

The SFPUC continues to use 265 mgd as its projected future demand, but it should be noted that this figure refers to contractual obligations and not actual demand.

There's still plenty of room to improve water use efficiency and develop alternative water resources in the SFPUC territory. Advanced purified recycled water is especially promising. For example, the Santa Clara Valley Water District recently brought online a facility in San Jose that

produces eight million gallons of advanced purified water daily, and is expected to increase to 32 mgd. This water is currently blended with tertiary-treated recycled water to reduce salinity and produce better water for irrigation, but eventually it will be used to recharge groundwater for domestic and commercial uses. In the future, the Water District plans to implement a direct potable reuse program.

Opportunities to expand the use of advanced purified water exist elsewhere in the region. For example, the Palo Alto Regional Water Quality Control Plant treats 20 million gallons of wastewater per day, but most of that water is released into San Francisco Bay. Palo Alto, which purchases water from the SFPUC, is currently partnering with the Santa Clara Valley Water District and the Cities of Mountain View and East Palo Alto to explore opportunities to utilize more recycled water. Discussions have included the possibility of recharging the groundwater basin with advanced purified water for future use.

Furthermore, the County of San Mateo recently initiated a groundwater assessment process to better understand the San Mateo Plain sub-basin and potentially integrate it into a more comprehensive water management program.

Regarding water conservation, TRT leads a coalition of water agencies, business networks and environmental groups that hosts the annual Silicon Valley Water Conservation Awards. Now in its ninth year, the program highlights innovative and effective projects and programs that use water wisely and serve as models for others. Award winners demonstrate that there are tremendous opportunities to reduce water consumption without compromising economic output or quality of life. Information on past winners can be found at [www.WaterAwards.org](http://www.WaterAwards.org).

### 3. The SFPUC's Socioeconomics Study is Flawed

Following the release of the SED, the SFPUC and BAWSCA published a guest editorial in the San Francisco Chronicle suggesting the revised Bay Delta Plan could result in \$49 billion in lost sales revenue and the loss of 188,000 jobs. In the ensuing months, the SFPUC referenced these figures in meetings with influential groups and decision-makers, so the Water Board will likely see them cited in various comment letters. However, the study these projections were based on was seriously flawed.

In 2009, economist David Sunding, a consultant for the SFPUC, presented the above figures before an administrative law judge during a FERC relicensing proceeding. These figures were again presented in 2013 before the State Water Board. In 2014 Mr. Sunding fleshed out his analysis and presented a draft study to the SFPUC.<sup>1</sup> It was circulated for comment, and a coalition of environmental groups provided a response.<sup>2</sup>

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<sup>1</sup> Socioeconomic Impacts of Water Shortages within the Hetch Hetchy Regional Water System Service Area, March 13, 2014, [https://www.tuolumne.org/wp-content/uploads/2016/10/CCSF-Draft-Socioeconomic-Study\\_3\\_13\\_2014.pdf](https://www.tuolumne.org/wp-content/uploads/2016/10/CCSF-Draft-Socioeconomic-Study_3_13_2014.pdf)

<sup>2</sup> Conservation Groups' Comments on CCSF Draft Socioeconomics Report for FERC Relicensing of Don Pedro Dam, April 9, 2014, <https://www.tuolumne.org/wp->



The environmental groups identified a number of problems with the 2014 study. For example, it based rationing on demand vs. supply, it comingled Bay Area water sources with Tuolumne supply, it treated instream flow as reduced water supply and failed to assess the impact of carryover storage and replenishment, and it misjudged consumer response and conservation potential.

Despite the fact that the updated 2014 study projected lower socioeconomic impacts than the 2009 study, the SFPUC chose to cite the higher figures from the earlier study. Real world experience over the past few years showed that both studies were far from accurate. Water use in the SFPUC service territory decreased 30% between 2007 and 2016, which was the equivalent of 30% rationing, yet the region did not lose any jobs or sales revenue. In fact, both grew. According to the CA Employment Development Department, between 2010 and 2015 San Francisco added 125,400 jobs and San Mateo County added 65,700 jobs. Alameda County and Santa Clara County, both of which receive a portion of their water from the SFPUC, added 93,200 and 172,500 jobs respectively.

The 2014 study projected the loss of \$6.5 billion and nearly 25,000 jobs at 30% rationing, which did not happen. The 2009 study did not specifically cite potential impacts from 30% rationing, but its projections for other rationing levels were higher than those in the 2014 study, so they were even more off the mark (See Attachment B).

The figures cited by the SFPUC suggest that every acre-foot of water lost would result in more than \$400,000 in lost sales revenue. Should the SFPUC ever need to purchase additional water, one would think they could find a seller who would be willing to charge less than \$400,000 per acre-foot. In water transfer negotiations with the Modesto Irrigation District in 2012, the price discussed was \$700 per acre-foot.

#### 4. The SFPUC Could Manage the Drought of Record Under the Revised Bay Delta Plan

Between its Sierra and Bay Area reservoirs, the SFPUC has 1,458,684 acre-feet of storage capacity without encroaching into flood water storage. Of this, 96,000 acre-feet is considered dead pool. On occasion, the SFPUC can utilize an additional 170,000 acre-feet of flood water storage capacity in its water bank at Don Pedro Reservoir. The SFPUC's large amount of storage provides a buffer against extended droughts.

For example, at the height of the recent drought, the SFPUC still had enough water in storage to last three years. By December 2016, following the normal 2015/16 water year and a good start to the 2016/17 water year, storage rebounded to 1,208,712 acre-feet – enough water to last five years (see Attachment C). By early January 2017, all of the Tuolumne reservoirs were near capacity, and water had to be released from Don Pedro at the maximum amount allowed (9,000 cfs) to prevent downstream flooding. There's so much snow in the Tuolumne watershed now that these high releases are expected to continue into the summer.

TRT created a model to explore how the revised Bay Delta Plan might impact the SFPUC's water supply if the 1987-1992 drought of record were to reoccur (see Attachment D). Assuming water demand rebounds to the pre-recent drought level of 223 mgd, the State Water Board requires 40% of unimpaired flow between February and June, the SFPUC is responsible for 52% of the flow increase per the 4<sup>th</sup> Agreement, and only modest rationing occurs, our modeling demonstrates the SFPUC could withstand the drought of record if it were to occur in the near future.

Assuming demand projections are correct, and total water demand increases to 250 mgd by 2040, there would be a slight deficit of 102,000 acre-feet in the sixth year of a repeat of the six-year drought of record.

#### 5. Implementing a Groundwater Recharge Program

Should the State Water Board require instream flows higher than 40%, which we hope it will, the SFPUC and the Modesto and Turlock Irrigation Districts could compensate for the reduction in water supply by partnering to implement a groundwater recharge program in Stanislaus County. Such a project could capture and store excess water in years like WY 2016/17 in which maximum flows are being released from Don Pedro to create capacity in the dam for floodwater capture. These high releases are expected to continue into the summer.

Such a program could be similar to how Don Pedro Reservoir is managed. The SFPUC helped fund construction of the dam in exchange for a water bank of 570,000 to 740,000 acre-feet. When the SFPUC's upstream reservoirs are full, and it is still entitled to capture more runoff per the Raker Act, the excess water can be banked in Don Pedro. In future dry years, the SFPUC can capture water in Hetch Hetchy to which it would otherwise not be entitled, and subtract an equal amount from the water bank.

Groundwater recharge also would help the Irrigation Districts meet SGMA requirements.

### AGRICULTURAL WATER USE

Agricultural water use efficiency must be an integral part of any solution to ensure that water is used as wisely as possible to better meet the needs of the environment, agriculture and urban uses. There are undoubtedly a range of options that could be explored to improve water use efficiency in agricultural irrigation. Some measures specific to the Tuolumne system include the following.

#### 1. Water-Efficient Irrigation Practices and Technologies

Water efficient irrigation practices and technologies, including 1) soil moisture sensors and smart irrigation controllers, 2) real-time weather data, daily evapotranspiration reports and computer models that help farmers irrigate more precisely, and 3) shifting crops from flood irrigation to sprinklers and drip systems would help farmers adjust to reduced water availability. Improving irrigation efficiency has the added benefit of reducing fertilizer and pesticide use, reducing soil

erosion, and minimizing runoff.

Pressurized irrigation delivery systems present significant opportunities to save water. The South San Joaquin Irrigation District (SSJID) completed a pilot project to understand the potential benefits of converting open canal deliveries to a pressurized water delivery system. The pilot project, conducted on a 3,800-acre portion of the District, demonstrated that water use could decrease by 30% while productivity increased 30%.<sup>3</sup> For the SSJID alone, this could translate into saving as much as 73,000 acre-feet of water per year.<sup>4</sup>

With higher crop yields on prime agricultural land, the irrigation districts could provide incentives to retire drainage-impaired and/or flood-prone lands to reduce irrigation on marginal farmland. The Big Bend Floodplain Protection and Habitat Restoration Project on the Tuolumne River has successfully restored 240 acres of floodplain that had previously faced a long history of flooding. A similar project is underway at the 1,600-acre Dos Rios project at the confluence of the Tuolumne and San Joaquin Rivers.

The irrigations districts could encourage greater implementation of water efficient technologies and practices by providing rebates to offset initial capital investments. They could further encourage efficiency by providing educational and technical assistance to their customers. Providing farmers with meteorological and hydrological information on climate, soil conditions and crop water needs also would be beneficial.

Beyond these specific water use efficiency measures, other potential measures to use water wisely include aggressive pricing to incentivize water savings, water transfers/sales out of district in very wet years to generate revenue for other water efficiency measures, and a system of taxes and subsidies to further incentivize water savings and offset costs of implementing water saving measures.

## 2. Modest Crop Shifting

Modest crop shifting could increase crop value while reducing water consumption. By replacing lower-value, water-intensive crops with higher-value, water-efficient crops, farmers could produce more food with less water. According to a report by the Pacific Institute a few years ago, field crops, such as rice and alfalfa, accounted for 56% of irrigated acreage in California. They used 63% of applied water but generated only 17% of California's crop revenue. Vegetables, on the other hand, accounted for only 16% of irrigated acreage, and used just 10% of applied water, but generated 39% of California's crop revenue.

Incentivizing some transition to higher-value, water-efficient crops would increase agricultural income while freeing up more water for the benefit of fish and wildlife, water quality and recreation.

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<sup>3</sup> American City & County, March 2015. Maximizing crop per drop for California farmers, p. 5. <http://viewer.zmags.com/publication/a0d7babd#/a0d7babd/6>, retrieved 3/13/17.

<sup>4</sup> The Modesto Bee, September 8, 2015. SSJID exploring remaking the entire delivery system. <http://www.modbee.com/news/article34425708.html>, retrieved 3/13/17.

### 3. Infrastructure Improvements and Tailwater Capture

In 2011, the Modesto Irrigation District proposed capturing and selling up to 25,000 acre-feet of tailwater spills to San Francisco. This is water that normally runs off of agricultural fields into the lower Tuolumne and San Joaquin Rivers. As part of the proposal, MID would have captured the runoff before it spilled into the water, pump it back to the east, and provide it to farmers for irrigation, thus reducing withdrawals by 25,000 acre-feet. Due to ratepayer opposition, the project was eventually dropped, but the fact remains that at least 25,000 acre-feet of tailwater spills could be captured and used for irrigation. MID's own Agricultural Water Management Plan identified 49,700 acre-feet of operational spills. The Turlock Irrigation District's Agricultural Water Management Plan identified 56,000 acre-feet of operational spills.

MID's Water Resources Management Plan identified several infrastructure improvements that have the potential to reduce water waste dramatically. These include renovating the Dry Creek Flume, improving the main lateral and headings, improving flow control structures, instituting outflow interception, installing canal interceptor pipelines, and constructing regulating reservoirs (see Attachment E).

### 4. Eliminating Water Subsidies and Improving Tiered-Pricing

Irrigation water in Stanislaus county is artificially cheap, providing little incentive to use it more efficiently. In fact, a class-action lawsuit filed by electricity customers contends they're being overcharged to subsidize water customers. According to a March 14, 2017 article in the Modesto Bee, "MID staff last year said the gap between farm water revenue (\$3.82 million) and the district's cost to deliver it (\$21.2 million) came to more than \$17 million" (see Attachment F).

The Modesto and Turlock Irrigation Districts should consider higher volumetric pricing of water through an improved tiered-rate structure. Currently, the vast majority of cost is incorporated into the fixed charge, and volumetric increases are minimal. MID's structure is as follows:

Fixed charge: \$40/acre  
First two acre-feet: \$1/acre-foot  
Third acre-foot: \$2  
Next six inches: \$3/acre-foot  
Anything above 42 inches: \$10/acre-foot

TID rates are only slightly higher, as follows:

Fixed charge: \$60/acre  
First two acre-feet: \$2/acre-foot  
Third and fourth acre-feet: \$3/acre-foot  
Fifth acre-foot: \$15

By increasing volumetric rates, the Irrigation Districts would send a strong price signal to encourage efficiency while potentially generating revenue to help fund those efficiency measures.

#### 5. Dry Creek Flood Detention and Groundwater Recharge

Dry Creek is an unregulated tributary to the Tuolumne River that originates in the low foothills east of Modesto and flows southwestward until it joins the Tuolumne River in Modesto. Although for much of the year Dry Creek mostly conveys agricultural and urban runoff, during heavy, localized rainstorms, discharges on Dry Creek can reach up to 5,000 cfs. The U.S. Army Corps of Engineers (Corps) at one time had proposed evaluating a flood detention basin on Dry Creek that could hold 20,000-30,000 acre-feet. Coming on the heels of the 1997 floods, the Corps was primarily motivated by flood management benefits and did not consider the possible benefits of groundwater recharge. Unfortunately, the study was never completed.

#### 6. Operation of the Infiltration Gallery and Pump Station at Geer Road

As part of the 1995 Settlement Agreement for the Don Pedro Project, the Turlock and Modesto Irrigation Districts (TID and MID) agreed to advance a plan to divert water for irrigation from a downstream location on the Tuolumne River to provide additional water upstream to improve fish habitat. Under this project, an additional 100 cfs would remain in the Tuolumne River channel rather than being diverted from La Grange Reservoir. This would improve flows in the important fish-spawning habitat on the lower Tuolumne. The Infiltration Gallery, which is essentially an in-channel diversion facility that relies on the river bed's sand and gravel to act as a screen, was installed when the Special Run Pool 9 Restoration Project at river mile 26 was completed in 2002. Several municipalities south of the Tuolumne River that currently rely on groundwater are exploring whether to connect the infiltration gallery and begin purchasing surface water for municipal use from TID. Although these project partners are actively working towards this goal, to date no project has been built. If this project were accelerated, the 26 miles of the Tuolumne River between La Grange Dam and RM 26 would benefit from increased flows while there would be no reduction in diversions.

#### 7. Updating of the Don Pedro Flood Control Manual

The Don Pedro Flood Control Manual was written by the U.S. Army Corps of Engineers in 1972. This manual requires that TID maintain flows at Modesto, 38 miles downstream of Don Pedro Dam, at no more than 9,000 cfs. Don Pedro Dam is capable of releasing up to 15,000 cfs through its outlet works. This objective release does not require the use of the Dam's gated or emergency spillways. Dam operators must take into account any high flows on Dry Creek, which can be as much as 5,000 cfs, when targeting their releases from Don Pedro Dam. Because the water's travel time is approximately 24 hours from Don Pedro to Modesto, dam operators have to reduce their flows to as little as 4,000-5,000 cfs 24 hours prior to any storms in the Dry Creek watershed. Unfortunately, the 45-year old dam manual is significantly out of date. It does not take into account modern weather forecasting, a better understanding of the watershed's hydrology, and on-the-ground changes that have occurred in the floodway since 1972. A number of channel constrictions have been removed or modified since 1972 that would allow for greater

release levels from Don Pedro Dam. For example, over 2,500 acres of low-lying floodplain have been purchased for flood management and habitat conservation purposes. Several bridges with narrow footings have been removed or modified. The Modesto Wastewater Treatment Plant has received upgrades to better protect it from floods (and it may soon be removed from the floodplain altogether).

While there is certainly more that can be done, all of this work has paid off and the river channel can indeed convey higher flows than the flood manual indicates. As we witnessed during this year's very wet winter, the flood reserve pool became severely encroached and came within 1-2 feet of the emergency spillway as more and more runoff filled the reservoir. All the while, the dam operators maintained modest releases. However, TID did eventually get permission from the Corps to open its controlled spillway (only the second time since the dam was constructed) and released 16,000 cfs. The dam operators maintained higher releases exceeding the 9,000 cfs maximum for several weeks and there were no reports of any permanent structures being flooded. The channel and floodplain improvements along the river seem to have paid off and the flood control manual should be updated. If the dam operators know that the channel can convey higher flows, they can store more water behind the dam and release it when truly necessary. This could improve water availability in the spring.

#### 8. Better Snowpack Monitoring

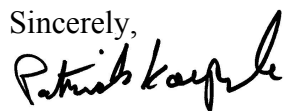
Through improved monitoring of the snowpack, more water could be released from reservoirs in the spring to enhance the out-migration of juvenile salmon, and then late season run-off could be captured for storage. Currently, in many years water is captured when the salmon need it most, and then released later in the season to create capacity for flood water storage. Better management would allow for both beneficial releases and storage.

#### 9. Generating Revenue from Crop Exports

In California, water is a public trust resource, meaning it belongs to the people of California. Water agencies have water rights, but the State Water Board can determine which beneficial uses have priority. It could be argued that food grown for Californians is a beneficial use of our water, but it's harder to make that case for exports. Agricultural exports benefit a few farmers – often corporations – at the expense of other beneficial uses. In 2015 California's agricultural exports generated \$21.5 billion in sales.

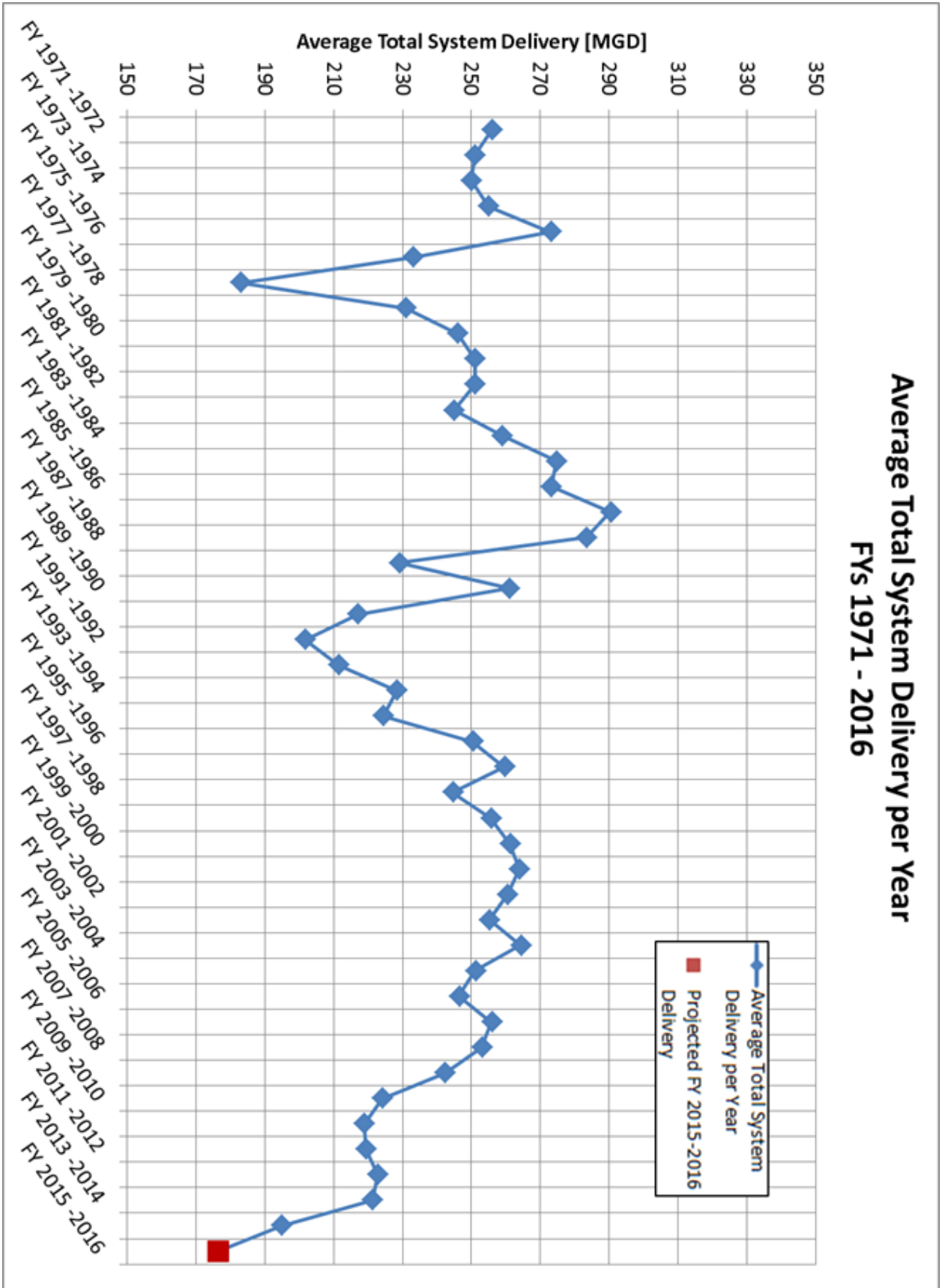
The State should consider imposing a fee on water used to grow crops for export, and dedicate the funds to helping farmers implement water efficiency measures.

Thank you for considering our comments that we submit on behalf of our 2,000 members.

Sincerely,  


Patrick Koepele  
Executive Director

### Average Total System Delivery per Year FYs 1971 - 2016



## Projected Sales Losses were Inflated

Rationing	Sunding 2009	Sunding 2014
20%	\$3.1 B	\$2.03 B
30%	-	\$6.5 B
40/41%	\$37 B	\$15.35 B
50/51%	\$49 B	\$20.56 B

## Projected Job Losses were Inflated

Rationing	Sunding 2009	Sunding 2014
20%	6,562	7,510
30%	-	24,510
40/41%	139,146	54,030
50/51%	188,000	71,390





# December 11, 2016 Reservoir Storage Levels

Reservoir	Current Storage <sup>1,2,3</sup> (AF)	Maximum Storage <sup>3,4</sup> (AF)	Available Capacity (AF)	Percent of Maximum Storage	Normal Percent of Maximum Storage <sup>5</sup>
<b>Tuolumne System</b>					
Hetch Hetchy	319,360	360,360	41,000	88.6%	<b>65.9%</b>
Cherry	235,670	273,500	37,830	86.2%	-
Eleanor	22,500	27,113	4,613	83.0%	-
Water Bank	476,788	570,000	93,212	83.6%	<b>98.4%</b>
<b>Total Tuolumne Storage</b>	<b>1,054,318</b>	<b>1,230,973</b>	<b>176,655</b>	<b>85.6%</b>	-
<b>Local System</b>					
Calaveras	36,017	96,670	60,653	37.3%	-
San Antonio	42,163	50,637	8,474	83.3%	-
Crystal Springs	54,883	58,309	3,426	94.1%	-
San Andreas	18,583	19,027	444	97.7%	-
Pilarcitos	2,749	3,069	320	89.6%	-
<b>Total Local Storage</b>	<b>154,394</b>	<b>227,711</b>	<b>73,317</b>	<b>67.8%</b>	-
<b>Total System Storage</b>	<b>1,208,712</b>	<b>1,458,684</b>	<b>249,972</b>	<b>82.9%</b>	<b>76.1%</b>
<b>Total without water bank</b>	<b>731,924</b>	<b>888,684</b>	<b>156,760</b>	<b>82.4%</b>	-

## TRT Models for SED Impact on SFPUC if Drought of Record Reoccurred

The attached spreadsheets model how the SED (40% unimpaired flow from February-June) would affect the SFPUC if the six-year drought of record (1987-1992) were to reoccur in the near future and in 2040. To the best of our ability, we used SFPUC figures and assumed the following:

- Total demand on the Regional Water System is 223 mgd (250 TAF/y) in 2018 (based on pre-drought demand), and 250 mgd (280 TAF/y) in 2040 based on updated demand projections.
- The SFPUC's Water First Policy (implemented after the 1987-92 drought) is in effect.
- The 1995 FERC instream flow requirements are in affect.
- System storage at the beginning of the drought starts at 1,517 TAF (1,613 TAF going into 1987 minus 96 TAF of dead storage).
- The SFPUC is responsible for 52% of increased instream flow per the 4<sup>th</sup> Agreement.
- Calculations do not include SED drought off-ramps, which would reduce unimpaired flow requirements during extended droughts.
- Rationing is 0% in the first two years of drought (because no one knows it's a drought yet), 10% in years three and four, and 20% in years five and six.

While these models reflect most SFPUC assumptions, we believe alternative scenarios also should be considered. Factors that would influence the outcome of these models include:

- Rationing levels (when does rationing begin, and what is the percentage per year?).
- Percentage of unimpaired flow required (SED suggests 30%-50%).
- SFPUC's obligation for percentage of unimpaired flow (does the 4<sup>th</sup> Agreement apply?).
- New water supplies and/or conservation measures brought online.

Column headers are as follows:

- A. Water year.
- B. Total annual unimpaired flow (SFPUC figures).
- C. Unimpaired flow from Feb.-June (SFPUC figures)
- D. 40% of Feb.-June unimpaired flow.
- E. Actual flow (after capture and diversions) in the lower Tuolumne from Feb.-June (Irrigation Districts are responsible for these releases).
- F. Lower Tuolumne releases required from Feb.-June based on 1995 FERC order (figures provided by Spreck Rosekrans). Irrigation Districts are responsible for these releases.
- G. Additional flow required by the Bay Delta Plan (D minus F).
- H. SFPUC's obligation for increased flow (52% of G based on 4<sup>th</sup> Agreement).
- I. "SFPUC Demand" is based on the following rationing formula: Y1=0, Y2=0, Y3=10%, Y4=10%, Y5=20%, Y6=20%.
- J. "Other Losses" include flood control releases, evaporation and other losses.
- K. "Total SFPUC Loss" is the sum of their new downstream flow obligation (H), SFPUC demand (I) and other losses (J).
- L. Water available to the SFPUC from the Tuolumne River (figures provide by Spreck Rosekrans).
- M. Water available to the SFPUC from Bay Area watersheds (SFPUC figures).
- N. Local groundwater available to SFPUC.
- O. Total water available to the SFPUC (L+M+N).
- P. "Net Reduction" is "Total SFPUC Loss" (K) minus water available to SFPUC (O).
- Q. Remaining system storage (Tuolumne and Bay Area) following each water year.

# TRT Models for SED Impact on SFPUC if Drought of Record (1987-1992) Reoccurred

## Water Demand at 223 MGD (250 TAF)

Year	Total UF	UF Feb-June	40% UF Feb-June	ID Releases Feb-June Actual	1995+ Releases Feb.-June - FERC	Additional Releases (D-F)	SFPUC Share (52% of G)	SFPUC Demand	Other Losses	Total SFPUC Loss (H+H+)	SFPUC TR Capture	Bay Area Capture	Groundwater	Total Capture (L+M+N)	Net Reduction (K-O)	Useable Storage (Start at 1517)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1987	656	589	236	84	50	186	97	250	220	567	85	4	0	89	478	1039
1988	821	632	253	31	59	194	101	250	38	389	31	3	8	42	347	692
1989	1,312	1,184	474	30	106	368	191	225	33	449	394	2	8	404	45	647
1990	843	685	274	36	59	215	112	225	31	368	64	4	8	76	292	355
1991	1,099	987	395	51	77	318	165	200	28	393	291	19	8	318	75	280
1992	835	674	270	49	59	211	110	200	28	338	70	40	8	118	220	60
TOTAL	5566	4751	1902	281	410	1492	776	1,350	378	2,504	935	72	40	1047	1457	60

## Water Demand at 250 MGD (280 TAF)

Year	Total UF	UF Feb-June	40% UF Feb-June	ID Releases Feb-June Actual	1995+ Releases Feb.-June - FERC	Additional Releases (D-F)	SFPUC Share (52% of G)	SFPUC Demand	Other Losses	Total SFPUC Loss (H+H+)	SFPUC TR Capture	Bay Area Capture	Groundwater	Total Capture (L+M+N)	Net Reduction (K-O)	Useable Storage (Start at 1517)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1987	656	589	236	84	50	186	97	280	220	597	85	4	0	89	508	1009
1988	821	632	253	31	59	194	101	280	38	419	31	3	8	42	377	632
1989	1,312	1,184	474	30	106	368	191	252	33	476	394	2	8	404	72	560
1990	843	685	274	36	59	215	112	252	31	395	64	4	8	76	319	241
1991	1,099	987	395	51	77	318	165	224	28	417	291	19	8	318	99	142
1992	835	674	270	49	59	211	110	224	28	362	70	40	8	118	244	-102
TOTAL	5566	4751	1902	281	410	1492	776	1,512	378	2,666	935	72	40	1047	1619	-102

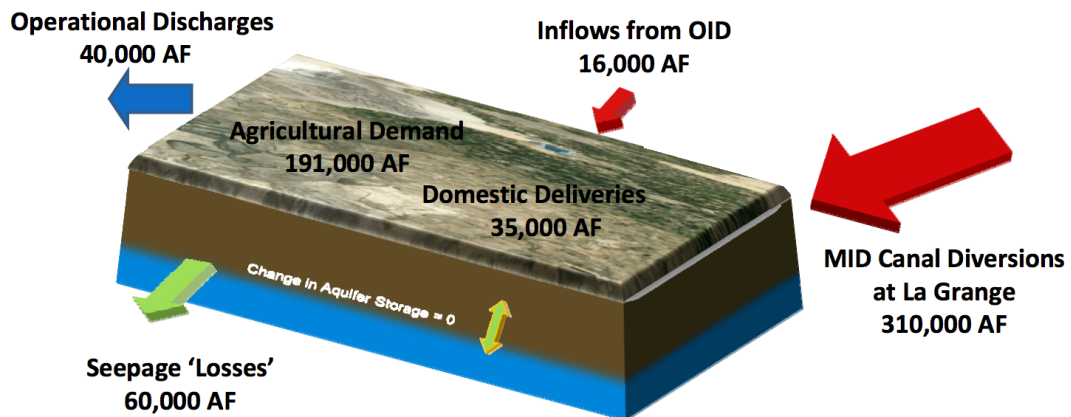


# COMPREHENSIVE WATER RESOURCES MANAGEMENT PLAN

Feb. 28, 2012



## Generalized Average Water Balance



February 2012



## Examples of Necessary Work

- Improve main lateral and headings
- Continue to improve flow control structures
- Institute outflow interception
- Automate trash screens
- Install canal interceptor pipelines
- Replace or renovate Dry Creek flume
- Construct regulating reservoirs

February 2012



## Potential Water Savings and Estimated Cost

### Retained Water

The average amount of water to be retained annually will be between 25,000 and 40,000 acre feet

### Cost

The total estimated cost of all anticipated improvements will be about \$115 million

February 2012

NEWS MARCH 14, 2017 4:22 PM

# MID board debates farm water subsidy while class-action lawsuit looms



< 1 of 4 >

MID board member Larry Byrd **Deke Farrow** - [jfarrow@modbee.com](mailto:jfarrow@modbee.com)

BY GARTH STAPLEY  
[gstapley@modbee.com](mailto:gstapley@modbee.com)

An office staff decision not to raise water prices this year led to a lively debate Tuesday among Modesto Irrigation District leaders over whether electricity customers truly subsidize farmers' water.

The dispute ought to be settled in court and not the boardroom, said some leaders of MID, which faces an important legal battle over the issue.

All evidence in past years points to a massive subsidy. MID staff last year said the gap between farm water revenue (\$3.82 million) and the district's cost to deliver it (\$21.2 million) came to more than \$17 million. Decades of district audits and bonding documents back up that picture.

In the past three successive years, the board – sensitive to public perception of the subsidy – raised farm water prices 10 percent, then 40 percent, then 20 percent, while leaving power prices alone. That pattern meant to John Mensinger – the only board member representing mostly city people, as opposed to farmers – a conscious move in the right direction, even though the gap between true cost and revenue remains large.

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“

**I HAPPEN TO THINK, FOR MANY REASONS, OUR IRRIGATION RATES ARE TOO LOW.**

John Mensinger, MID board

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However, MID staff last week told growers not to worry about higher rates this year, prompting Mensinger Tuesday to publicly question why MID apparently has abandoned the steady price increase strategy. After all, rates charged by MID’s sister district on the Tuolumne River – the Turlock Irrigation District – are about 20 percent higher than MID’s, Mensinger said.

That brought a rebuke by board members Jake Wenger, Larry Byrd and Nick Blom. Wenger, for example, said TID upped water rates 107 percent to cover equipment upgrades, while MID has nothing of substance to show for its cumulative 70-percent rate hike.

MID knew that farmers would need to pump more groundwater than normal in the recent drought, Wenger said. But with this winter’s record storms, he said, MID should encourage farmers to water as much as possible to recharge aquifers.

Byrd said to Mensinger, “Your loyalty should be to your constituents of MID.” Byrd said he believes MID’s current rates are sufficient.

Assistant General Manager John Davids acknowledged a “delta” between farm water costs and revenue in years past, but also said replenishing groundwater benefits everyone. Past calculations of the pricing gap apparently don’t take that benefit into account.

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**“  
ONCE WE HAVE THE TRUE COST OF SERVICE – UNTIL THEN WE’RE  
PUTTING THE CART BEFORE THE HORSE.**

Nick Blom, MID board

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Blom revealed that the district is preparing a new cost-of-service study and hinted that this time it will include the groundwater angle. Results should show that costs and revenue are “relatively close,” Blom said, asking for patience until the study is done.

Mensingher and others said they look forward to seeing results of the study. After the meeting, spokeswoman Melissa Williams said such studies help inform decisions on rates.

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**“  
THERE IS GOING TO BE A COURT DECISION THAT VALIDATES ONE  
SIDE OR THE OTHER. FOR US TO SIT HERE AND DISCUSS IT, ...  
WHILE I APPRECIATE THE PASSION, IT’S IRRELEVANT.**

Jake Wenger, MID board

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Wenger repeatedly urged the board not to stray into legal discussions. “I think you’re stepping on some dangerous waters here when we’re involved in a lawsuit on this very issue,” he said. Any amount of board bickering is irrelevant because it won’t change the outcome of the class-action lawsuit, Wenger said.

The MID board has not raised power rates since before their attorney in 2012 warned that doing so without letting customers vote might be illegal under state law.

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**“  
IT SEEMS YOU’RE NOT NECESSARILY AS CONCERNED ABOUT THE  
TRUE COSTS AS YOU ARE ABOUT PROTECTING FARMERS.**

Emerson Drake, Modesto resident

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The district’s average profit from selling electricity, or income minus expenses, has been more than \$93 million a year since 2010, according to bonding documents. MID uses the extra money to repay debt, build reserves and cover the farm water subsidy.

The next court date in the class-action lawsuit is scheduled for July 31.

The MID board unanimously agreed Tuesday that:

- Growers can start taking water about March 22.
- Customers will get 42 vertical inches of water, plus 6 inches



more, if they want it. The extra is deemed “replenishment water” for its contribution to the aquifer.

- Individuals can move water among parcels that each owns, leases or rents. Other drought-time programs, such as selling portions of one’s water share on the open market to other MID customers, are discontinued.

*Garth Stapley: 209-578-2390*