# REPORT TO AD HOC ADVISORY COMMITTEE

# FALLBROOK PUD AND RAINBOW MWD WHOLESALER REORGANIZATION

**Submitted by**

**Professor Michael Hanemann**

**DRAFT**

**October 11, 2021**

# TABLE OF CONTENTS

**Q. Is it the case that, if FPUD and RMWD exit from SDCWA, they still would end up receiving the same MWD water from the same turnouts on the same pipes? Nothing would really change?**

**Q. Why will it not be the same water?**

**Q. How is water supplied by MWD different from water supplied by SDCWA?**

**Q. How is MWD water physically delivered by MWD to FPUD and RMWD different in source from SDCWA water physically delivered by MWD to FPUD and RMWD?**

**Q. Isn't it true that MWD currently delivers to SDCWA some water from the SWP?**

**Q. What is the difference between MWD's role as a supplier of water versus its role as a conveyor of water?**

**Q, Is conveying water the same as wheeling water?**

**Q. Is MWD selling or conveying the QSA water it delivers to SDCWA?**

**Q. When MWD delivers SWP water to SDCWA in exchange for QSA water, does it own that SWP water?**

**Q. Is most of the water delivered by MWD to SDCWA QSA water (i.e., MWD acts as a conveyor of water) rather than MWD-owned water (i.e., MWD acts as a supplier)?**

**Table 2 Breakdown of water delivered by MWD to SDCWA**

## 2. HOW DID DETACHMENT COME TO BE AN ISSUE

**Q. Are FPUD and RMWD different from other SDCWA member agencies?**

**Figure 2 SDCWA all-in melded water rate 1998-99 to 2018-2019.**

**Q. What caused SDCWA's all-in melded water rate to rise significantly?**

**Figure 3 MWD Untreated Water Rate 1960 – 2020**

**Q. Could the sharp increase in SDCWA's all-in water rate be due to the introduction of QSA water?**

**Q. Could the sharp increase in SDCWA's all-in water rate be due to the desalinated seawater from the Carlsbad Facility?**

**Table 3 Total water use in SDCWA service area, broken down by source**

**Q. Did anything else change that could explain the sharp increase in SDCWA's all-in water rate after 2010?**

## 3. THE FINANCIAL IMPACT OF DETACHMENT



## 4. A DEPARTURE FEE

**Q. What portion of SDCWA's outstanding water-supply related obligations should serve as the basis for a departure fee?**

**Q. What is the amount of SDCWA's outstanding obligations that relates to QSA water?**

**Q. What is a fair share of the QSA contractual obligation to assign to FPUD and RMWD?**

**Table 6 FPUD/RMWD share in total use by SDCWA member agencies**

**Q. Using the CY 2021 cost of SDCWA's contractual supply obligation for QSA water, what annual payment would be assigned to FPUD and RMWD?**

**Table 7 Calculation of a departure fee**

**Q. Could a purchase commitment be another approach?**

**Q. If FPUD and RMWD detach from SDCWA, would it possible for SDCWA to sell the water that it otherwise would have delivered to FPUD and RMWD to some other member agencies, thereby recouping lost revenue?**

**Q. If FPUD and RMWD detach from SDCWA, would it possible for SDCWA to sell the water that it otherwise would have delivered to FPUD and RMWD to some other water agency that is *not* a member agency, thereby recouping lost revenue?**

**Q. How likely it is that SDCWA could find itself being asked to deliver less than 320,700 AF/yr to its member agencies if FPUD and RMWD were to depart?**

**Q. Does the possibility that, if FPUD and RMWD depart, SDCWA could on some occasion face member agency demands that fall short of 320,700 AF suggest a possible alternative to a departure fee?**

## 5. WATER SUPPLY RELIABILITY: SDCWA vs EASTERN MWD

**Q. What are the threats to the reliability of supply for FPUD and RMWD?**

**Q. With regard to the possibility of an insufficient water supply, how could that differ as between SDCWA vs EMWD?**

**Q. How reliant are SDCWA and EMWD on MWD water?**

**Q. Does MWD water have any supply reliability issues?**

**Q. What are the supply reliability issues with SWP water?**

**Q. What are the supply reliability issues with regard to the amount of water SWP can obtain from the Sacramento Valley?**

**Q. Has the SWP supply to member agencies diminished in recent years?**

**Q. What is the Sacramento-San Joaquin River Delta and how does it affect the conveyance of SWP water?**

**Q. What are the supply reliability issues with regard to the ability to convey SWP water through the Sacramento/ San Joaquin Delta to SWP member agencies south of the Delta?**

**Q. What is the current assessment of the supply reliability issues with regard to the ability to convey SWP water through the Delta?**

**Q. If it is certain that the current conveyance of CVP and SWP project through the water will not endure, what is California's policy response?**

**Q. Will the Water Fix project fix the reliability issues for SWP?**

**Q How much will Water Fix cost?**

**Q. Will Water Fix raise the cost of SWP water?**

**Q. Will Water Fix raise the cost to SDCWA to convey QSA water from the Colorado River to SDCWA's service area?**

**Q. When will Water Fix be completed?**

**Q. How important is MWD's Colorado River water as a source of supply for MWD compared to its SWP water?**

**Q. Apart from the reduction in MWD's water right once the QSA was implemented, are there any supply reliability issues affecting Colorado River water?**

**Q. Is the historically low water level in Lake Meade currently an issue for California's water supply from the Colorado River?**

**Q. Could a historically low water level in Lake Meade become an issue for California's water supply from the Colorado River?**

**Q. If California did have to forfeit some of its entitlement to Colorado River water, would that affect MWD and SDCWA equally?**

**Q. Will the water supply situation in the Colorado River get better in the long run?**

**Q. In summary, what are the differences in the reliability of water supply for FPUD and RMWD as between SDCWA and EMWD?**

**Q. Has EMWD assessed the reliability of the MWD supply that it could offer to FPUD and RMWD if they were to become member agencies?**

**Q. What other assumptions are being made in EMWD's analysis of the reliability of its supply?**

**Q. What are the two classes of EMWD wholesale customer agency?**

**Q. In the event that MWD imposes a WSAP supply reduction on EMWD, would there be any concerns within EMWD about allocating the reduced availability of MWD water to its limited-service wholesale customers on exactly the same terms as its retail customers and its full-service wholesale customers?**

**Q. Is urban growth in EMWD's service area also a consideration here?**

**Q. In summary, what factors affect the reliability of supply for FPUD and RMWD if they join EMWD compared to the reliability they have with SDCWA?**

## 6. CONCLUDING OBSERVATIONS

# EXECUTIVE SUMMARY

## Context

The pipeline connecting the Metropolitan Water District of Southern California (MWD) water distribution system to the San Diego County Water Authority (SDCWA) distribution system is owned for part of its length by MWD (in northern San Diego County) and for part by SDCWA. Fallbrook Public Utility District (FPUD) and Rainbow Municipal Water District (RMWD) are the only SDCWA member agencies that receive some of their water from turnouts along the portion of the pipeline owned by MWD. But this does not make FPUD or RMWD customers of MWD. They are customers of SDCWA, and the water they receive is owned by SDCWA and controlled by SDCWA.

If FPUD and RMWD detach from SDCWA and become member agencies of Eastern Municipal Water District (EMWD), while they would continue to receive water from the same turnouts, they would not be receiving the same water.

MWD currently provides water to SDCWA in two different capacities: (1) as a conveyor of "QSA water" and (2) as a supplier of water which MWD obtains from its right to Colorado River water and as a contractor with California's State Water Project (SWP) --- "MWD water."

QSA water is water from the Colorado River which SDCWA has acquired through a transfer agreement to purchase conserved water from Imperial Irrigation District (IID) and through water saved by the lining of the All-American Canal and Coachella Canal. SDCWA started to receive QSA water in 2003. Prior to 2003, MWD delivered water to SDCWA only in the capacity as supplier of water. Deliveries of QSA water have ramped up over the past decade and now (FY 2020 and 2021) account for around 80% of the water delivered by MWD to SDCWA.

When MWD provides water to EMWD, it is acting only in the role of supplier of water – it provides MWD water. It does not convey QSA water since that is owned by SDCWA. Therefore, if FPUD and RMWD become member agencies of EMWD, they would receive only MWD water and not any QSA water. QSA water and MWD water have different costs and different degrees of reliability.

FPUD and RMWD are among the handful of SDCWA member agencies with significant levels of agricultural water use in their service areas. Because of their agricultural base, they are especially sensitive to the increase in SDCWA's charges for water over the past 15 years.

SDCWA's all-in melded rate for water was around $500-600/AF from 1998 to about 2008. It then rose quite rapidly, reaching around $1,000/AF in 2010 and $1,653/AF in FY 2020.

What caused SDCWA's all-in water rate to rise so sharply? This does not appear to be due to the introduction of QSA water after 2003. The all-in melded cost to SDCWA of its QSA supply is about the same or slightly cheaper than the all-in melded cost of MWD water.

SDCWA's supply of water from the Carlsbad Desalination Facility is more than twice as expensive for SDCWA as QSA water and MWD water, but this supply only started to be received in 2016 and, between 2016 and 2020, it accounted for only about 10% or less of the water delivered by SDCWA.

Two factors that certainly played a role in the increase in the cost of SDCWA water are (1) increases in what MWD has charged to both supply and convey water to SDCWA since 2008, and (2) a sharp decline in the amount of water delivered by SDCWA to its member agencies since 2008.

Between 2008 and 2020, MWD's basic rate for untreated water has increased at an average rate of 6.4% per year.

Between 2005 and 2017, there was a 35% reduction in per capita water use in SDCWA's service area. That translated into a reduction of almost 40% in the amount of water delivered by SDCWA to member agencies between 2008 and 2020.

A large component of SDCWA's operating cost is fixed cost. A fixed cost is defined as a cost that does not change when the volume of water delivered by SDCWA changes. SDCWA's purchase of MWD water is a variable cost, but its use of QSA water and desalinated water are both fixed costs because it had to accept take-or-pay contracts for those sources of water. The reduction in SDCWA deliveries after 2008 would have triggered an increase in operating cost per acre-foot delivered of at least 30%.

## Financial Impact of detachment

FPUD and RMWD account for 1.7% of the population served by SDCWA but about 6% of the water delivered to member agencies. Their higher level of per capita water use reflects their heavy orientation towards agriculture compared to elsewhere in the SDCWA service area. With a groundwater conjunctive use project coming online this year in FPUD, the combined FPUD/RMWD share of SDCWA delivered water will be going down to about 5%.

The detachment of FPUD and/or RMWD would reduce SDCWA's costs of operations to some limited degree, because so many of those costs are fixed costs. It would reduce SDCWA's revenues to a larger degree, and the net effect would be a loss of net revenue under the current SDCWA rate structure. SDCWA would therefore need to raise its rates for the remaining member agencies.

As an estimate for a single year's impact, SDCWA calculated the financial impact of detachment as a reduction of $16.4 million in net revenue, broken down into a net revenue impact of $5.7 million for FPUD and $10.7 million for RMWD. This estimate seems reasonable to me.

However, conditions in the water business vary from one year to another. Sales vary and what is required to support reserve accounts varies. Therefore, a multi-year assessment of the financial impact of detachment provides a more realistic assessment than a one-year analysis. SDCWA also developed a decadal analysis of the financial impact of detachment. The largest annual impact was a reduction of $45.7 million in net revenue, and the smallest a reduction of $11.2 million. The median was an annual reduction of $33.9 million.

If one takes the range of $16.4 million to $33,9 million as the central estimate for the reduction in annual net revenue, that corresponds to a reduction ranging from 2.9% to 6.0% of SDCWA's annual operating revenue.

The background for these estimates is an underlying fiscal imbalance facing SDCWA and other water supply organizations (including MWD). In SDCWA's case, I estimate that, if it supplies one less acre-foot to member agencies, it surrenders about $1,188 in revenue but it lowers its expenses by only about $253, generating a potential deficit of $935.

## A departure fee

Since 1990, SDCWA has made major infrastructure investments and has taken on substantial contractual commitments to ensure a more reliable water supply. The infrastructure investments and supply commitments have benefited all member agencies. These commitments are long-term in nature, and they impose a fixed and ongoing financial burden on SDCWA and its member agencies. They provide a sound economic justification for requiring FPUD and RMWD to assume some financial commitment to SDCWA for a fixed period of time after a detachment from SDCWA.

The purpose of the financial commitment by FPUD and RMWD is to provide an appropriate level of protection for SDCWA and the remaining member agencies in the short run while they adjust to the changed situation of a departure. This assists SDCWA in meeting financial obligations that are fixed, ongoing and unavoidable for a fixed period after the detachment.

The underlying aim is to promote flexibility and efficiency in the management of scarce water resources and in the operation of a supply network that is essential to the wellbeing of the regional economy. It is not appropriate that the departure fee afford such protection in perpetuity. It is important that SDCWA and all its member agencies receive an economic signal about the need for efficient network organization and rationalization. Compensation in perpetuity would work against the objective of promoting the efficient use of the region's water infrastructure assets.

In the water industry, a period of 10 years would typically count as the short run for planning purposes. I therefore suggest that the period of adjustment during which FPUD and RMWD be required to provide compensation to SDCWA be ten years.

There are two ways by which FPUD and RMWD could provide this compensation: (1) an annual departure fee, or (2) an annual water purchase commitment.

If there is an annual departure fee, it should be keyed to the portion of SDCWA's outstanding obligations that most directly serve FPUD and RMWD, namely its take-or-pay contracts for QSA water. The annual cost of these obligations in 2021 is $284.4 million. FPUD and RMWD together account for 5% of SDCWA's total water deliveries to all member agencies, and 3.1% of deliveries for municipal and industrial use. Applying those proportions to SDCWA's annual debt payments for QSA water would lead to annual payment by FPUD and RMWD combined amounting to either $8.9 million or $14.3 million a year for ten years.

If there is an annual water purchase commitment, it should be keyed to the amount of water for which SDCWA is committed under take-or-pay contracts, namely QSA water plus its share of desalinated water from the Carlsbad facility, which total 320,700 AF per year. If FPUD and RMWD leave SDCWA, there is a projection that SDCWA will not have sufficient demand for this committed water after 2034, but with the variability in annual demands and the uncertainty of future trends, there is a chance that this could occur before 2034. Therefore, FPUD and RMWD could commit to jointly purchase water from SDCWA over the next ten years (or through 2034) when SDCWA deliveries to member agencies fall short of 320,700 AF. FPUD and RMWD would commit to purchase the amount by which SDCWA deliveries that year to the remaining member agencies fall short of 320,700 AF, up to a joint cap of, say, 17,500 AF, their projected future consumption if they stay in SDCWA.

## Supply reliability under SDCWA versus EMWD

There are two distinct threats to supply reliability for FPUD and RMWD. (1) Their wholesale supplier, SDCWA or EMWD, lacks sufficient water; or (2) it (temporarily) lacks sufficient connectivity due to a physical break in a pipeline. Here, I focus on the former.

In 2020, SDCWA depended on MWD for only 24% of its supply and this is expected to decline to 14% by 2030. The rest of SDCWA's supply is desalinated water from Carlsbad, which is protected from the depredation of climate change, and QSA water which is shielded by IID's senior right to Colorado River water.

Under the arrangement proposed by FPUD and RMWD, if they join EMWD they will be 100% dependent for their water on what MWD delivers to EMWD. Since the QSA came into effect in 2003, MWD has relied on the SWP for 63% of its supply, and on the Colorado River for 37%. The SWP faces significant challenges with respect to both the volume of water it can expect to obtain from the Sacramento River Basin in the future and also its ability to convey that water to member agencies south of the Delta. With regard to MWD's water from the Colorado River, most of this holds a lower level of seniority than SDCWA's QSA water.

For these reasons, FPUD and RMWD will have less reliability of supply when served by EMWD than when served by SDCWA.

Moreover, if FPUD and RMWD join EMWD, they will have a limited-service membership in EMWD as opposed to a full-service membership. Full-service member agencies make use of EMWD's distribution system, have access to its local supplies, and pay a surcharge of $246/AF over MWD's Tier 1 charge to EMWD. Limited-service member agencies do not have access to EMWD's distribution system, do not have access to its local supplies, and pay a surcharge of $11/AF over MWD's charge to EMWD. An important question is whether, if MWD is compelled in future to impose a supply reduction, EMWD will share the reduced supply of MWD water the same with its limited-service wholesale customers as with its full-service wholesale customers. In its Technical Memorandum on Supply Reliability, EMWD assumes that will happen, but this could be a bit too optimistic.

# 1. HOW SAN DIEGO COUNTY GETS ITS WATER

**Q. If I am served by a member agency of the San Diego County Water Authority (SDCWA), where does my water come from?**

**A**. Your water comes from one of two sources: (1) *local supplies* -- water your member agency obtains from local sources that it controls, and (2) water supplied to your member agency by SDCWA.

**Q. What are local supplies?**

**A.** Historically, local sources were groundwater and surface water within the local area of the urban water agency. Before 1947, the San Diego region relied entirely on local surface water runoff and groundwater pumped from local aquifers.

Over time, local sources have expanded to include the use of treated wastewater from local wastewater plants, the use of desalinated local groundwater and, also, desalinated seawater (some of the seawater at the Carlsbad Facility is contracted for by SDCWA member agencies Carslbad MWD and Vallecitos WD, and counts as part of their local supplies).

However, as the region's population and economy have grown, local supplies became insufficient to meet the region's water needs.

**Q. How did San Diego County's local supplies come to be augmented?**

**A.** In 1928, the Metropolitan Water District of Southern California (MWD) was formed to develop, store and distribute supplemental water in Southern California, with the specific intention of importing water to the region from the Colorado River. MWD built the Colorado River Aqueduct (CRA) during the 1930s to convey this water, with the aqueduct coming into operation in 1941. The founding members were Los Angeles and its neighboring cities in Los Angeles County.

World War II caused a great increase in water consumption in San Diego and threatened to deplete the region's available local water supply. The solution was to connect the region to the Los Angeles area CRA and import Colorado River water from MWD. In 1943, engineering studies were completed in 1943 for an aqueduct that would connect with the terminus of the CRA at what is now called Lake Mathews and convey water south across Riverside County and into San Diego County. The San Diego County Water Authority was organized with nine original members in June 1944 under an enabling act of the California State Legislature known as the

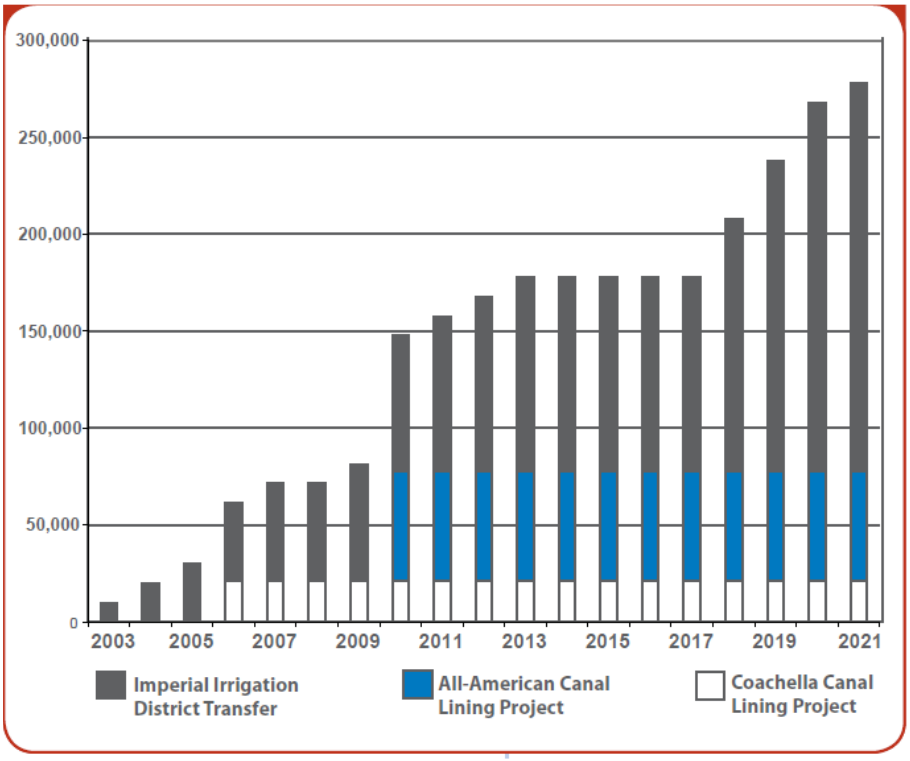
County Water Act.[1] The primary purpose was to contract with MWD as a member agency and supply imported MWD water to the region. The San Diego Aqueduct was completed and placed in operation in December 1947. Between the 1950s and the 1980s, SDCWA constructed four additional aqueducts that are all connected to MWD's distribution system and import water to the County.

SDCWA supplies from 75% to 95% of the region's water consumption, depending on hydrologic conditions and yield from local supplies.

**Q. Where does SDCWA get its water from?**

**A.** For almost sixty years, from 1947 to 2003, MWD was the sole provider of imported water to SDCWA. This changed in 2003; starting that year, SDCWA began to receive water purchased in a transfer agreement with Imperial Irrigation District (IID). In 2007, SDCWA started to receive an amount of water from projects that lined portions of the All-American Canal (AAC) and the Coachella Canal (CC) in order to conserve water that infiltrated into the ground while the canals were unlined. The ramp-up in the delivery of this water from the Colorado River is depicted in the graph below:[2]

**FIGURE 1: Build-up of QSA Water to be obtained by SDCWA.**




[1] SDCWA now has 24 member agencies.
[2] Source: SDCWA, 2010 Urban Water Management Plan, page 4-4.June 2011.

The water obtained by SDCWA from IID and from the canal lining is referred to as *QSA water*. It is conveyed from the Colorado River to the SDCWA service area by MWD using the CRA under a 2003 agreement known as the Exchange Agreement.

In addition, in 2016, SDCWA started to receive desalinated seawater from the Carlsbad Desalination Facility.

**Q. Why did SDCWA decide to broaden its source of water beyond water from MWD?**

**A.** SDCWA decided it needed to expand the sources from which it received water in the light of its experience with MWD during the drought in 1991.

**Q. What happened to SDCWA during the drought in 1991?**

**A.** The period from 1987 to 1992 saw one of the major droughts in California's history.

This was by no means California's first drought. There had been multi-year droughts in California in 1918-1920, 1928-1934, 1947-1950, 1976-1977 and, subsequently, there were droughts in 2007-2009 and 2012-2016. But, the droughts prior to 1976-1977 occurred when California's population was much smaller and before major reservoirs had been constructed.

What made the droughts of 1976-1977, 1987-1992, 2007-2009 and 2012-2016 so significant was the combination of very low precipitation, low runoff, and severely depleted reservoir storage.

1976-1977 was the single most severe drought in terms of precipitation and runoff, but it was just a two-year drought and the water supply impact was not as severe as in the subsequent longer droughts starting with 1987-1992.

The drought of 1987-1992 came as a major shock to Southern California's water system. In April 1990, MWD's Board had approved a first-ever drought management plan, calling on agricultural and municipal water users within its service area to voluntarily reduce their usage of water. Adopting a tougher approach, in December 1990 MWD mandated cutbacks in water use by agricultural and municipal users. In January 1991 it mandated sharper cutbacks. It increased the mandated cutbacks in February 1991 and again in March 1991, when it ended up by cutting deliveries of water for agricultural use by 90% and deliveries for municipal use by 30%. MWD came within a few weeks of an even more severe cutback – it had given notice of an upcoming cutback of 50% in the County's water supply. This was unexpectedly avoided when heavy rains fell during the March Miracle of 1991.

The 30/90% cutbacks that were implemented were still devasting to SDCWA. SDCWA was almost entirely dependent on delivered water from MWD – MWD deliveries accounted for 95%

of the water supply in San Diego County in that year, with local supplies making up only 5%. By contrast, the City of Los Angeles relied on MWD for about 60% of its water, having its own supplies for the remainder. A 30% cutback on 60% of Los Angeles' municipal water supply equated to an 18% cutback, while a 30% cutback on 95% of San Diego County's water supply equated to a 28.5 percent cutback. MWD's cutback of deliveries for agricultural users was even more draconian for SDCWA since, in 1991, it accounted for 62.67 percent of MWD's total agricultural water sales.

In the event, the SDCWA Board decided to meld MWD's water supply cutbacks and impose a uniform rate on all member agencies and their customers, regardless of whether those were agricultural or municipal uses of water.

**Q. What were the consequences of the 1991 drought experience?**

**A.** The experience during drought in 1991 had important consequences both for SDCWA and also for MWD.

For SDCWA, the consequence was a desire for less dependence on MWD and "a unified regional resolve to use visionary planning and smart investments to ensure San Diego's water supplies would be more resilient to shortage."[3] This led to the 1998 agreement between SDCWA and IID under which SDCWA would purchase water from IID, and also to the negotiations between SDCWA and Poseidon Resources, initiated in 2002 and finally consummated in 2012, for the construction of the Carlsbad Desalination Facility.

For MWD, too, the consequence was a desire for greater resilience in its water supply, including more water marketing transactions and the acquisition of more water storage capacity outside MWD's service area.[4]

**Q. Where does MWD get its water from?**

**A.** MWD has two core sources of water. The first source, as noted above, was water from the Colorado River, for which MWD was established in 1928, and which it started to deliver in 1941. The second is water from the State Water Project (SWP), which is owned by the State of California.

The SWP stretches more than 600 miles from Lake Oroville on the Feather River in Butte County down to Lake Perris in Riverside County. MWD contracted with California's Department of

[3] Pete Wilson, Foreword on *To Quench a Thirst: A Brief History of Water in the San Diego Region* as quoted in SDCWA Combined Response, 9-18-2020, p. 18.

[4] MWD's planning for the Eastside Reservoir (Diamond Valley Lake) had begun in 1987, and so predated the 1991 drought.

Water Resources (CDWR) in 1960 when the project was planned. MWD is one of 29 water agencies that have long-term contracts with the SWP. SWP was initially planned to deliver about 4.2 million acre-feet (MAF) of water, and MWD contracted for about 2 MAF, or about 48% of the total. MWD received its first deliveries of SWP water in 1972.

An important feature of the SWP contracts is that the full amount of water was not anticipated to be needed for at least the first 20-30 years. Facilities needed to transport the full 4.2 MAF were expected to be constructed over time as demands on the system increased. However, in a famous ballot in 1982, California voters rejected what was known as the Peripheral Canal Act that would have authorized building a canal around the periphery of the Sacramento-San Joaquin River Delta to move additional SWP water down to Central and Southern California. That left the SWP delivery capacity at about 2.7 MAF on average, and only about 1.2 MAF in a dry year. The most recent estimate of average SWP Table A deliveries is 2.4 MAF.[5] Following amendments to the SWP contracts under the 1994 Monterey Agreement, all SWP supplies are allocated to contractors in proportion to their original contractual entitlements. Thus, MWD's 48% share of total SWP contract entitlements allows it to receive about 1.2 MAF of average year SWP supplies, and about 0.6 MAF or less in a dry year depending on the severity of the drought.

In addition to a reduced supply of SWP water, MWD has also had to deal with a reduced supply of Colorado River water. Until 1963, MWD had a firm allocation of 1.2 MAF of Colorado River water through contracts with the U.S. department of Interior, which was enough to keep the CRA full. However, as the results of the U.S. Supreme Court's 1963 ruling in Arizona v. California, California's supply of Colorado River water was reduced to a total of 4.4 MAF and MWD's supply was reduced to 550,000 AF.

That ruling had little effect at first because Arizona and Nevada did not make use of the full apportionment of Colorado River water awarded to them by the U.S. Supreme court. In the interim, California water users, including MWD, took advantage of the situation to divert more Colorado River water than their allocation.

By the 1990s, the situation was different. By then, Las Vegas had grown into a large metropolitan area, and the Central Arizona Project, authorized by Congress in 1968 to deliver Arizona's apportionment of Colorado River water, had been completed. Arizona and Nevada were ready to take their full allocation of Colorado River water (2.8 MAF and 0.3 MAF, respectively). However, California water agencies, notably IID and MWD continued their high rates of diversion. On average during the 1990s, MWD was able to fill the CRA and California overall took 5.1 MAF of Colorado River water.[6] At this point the Secretary of the Interior

[5] California DWR, *The Final State Water Project Delivery Capability Report 2019*, August 2020, Figure 5.2.
[6] The years 1996-2000 were relatively wet in the Colorado River watershed and the Secretary of the Interior was able to declare that surplus water was available, which benefited California's water users and gave them some time to prepare for the coming change.

stepped into the situation and moved to enforce the limits on California's use of Colorado River water.

The new arrangement on the Colorado River took effect when the Quantification Settlement Agreement (QSA) was signed in October 2003. This enforced the limits on California's use of Colorado River water, including MWD's limit of 550,000 AF.[7]

In addition to its contractual rights to SWP water and Colorado River water, MWD has augmented its water supply through water leasing and transfer arrangements with other parties outside its service area, including other holders of Colorado River water rights, other SWP contractors, and other California water agencies. To store this water, MWD developed additional storage, both the Eastside Reservoir (which was completed in 2000) and additional storage outside its service area, including storage in groundwater banks and storage in Lake Meade through the Colorado River 's Intentionally Created Surplus program.

**Q. Where does Fallbrook Public Utility District (FPUD) get its water from?**

**A.** FPUD obtains its water from (i) some small local supplies and (ii) mainly from SDCWA.

Local supplies: according to FPUD's 2020 Urban water Management Plan, in Calendar Year (CY) 2020 FPUD obtained 100 AF from local groundwater and 517 AF of recycled water from its Fallbrook Water Reclamation Plant, for a total local supply of 617 AF.

SDCWA: In addition, FPUD obtained 8,303 AF from SDCWA in CY 2020.

**Q, Will FPUD's local supplies increase in the future?**

**A.** Yes: there are three projects that will increase FPUD's local supplies.

FPUD recently completed a rehabilitation of its Fallbrook Water Reclamation Plant which will allow it to increase the use of recycled water from 517 AF to 830 AF.

FPUD has been a developing a major new local supply project, the Santa Margarita Conjunctive-Use Project, in collaboration with Camp Pendleton. The project involves capturing surface water flows during storms along the Santa Margarita, a short intermittent river that runs through Camp Pendleton, and storing the surplus flow in an aquifer on Camp Pendleton. Facilities to pump raw water from the aquifer near the Pendleton/FPUD boundary have been completed, and FPUD is currently constructing an advanced water treatment plant to desalinate the brackish groundwater extracted from the aquifer. It is estimated that the project

[7] In addition, MWD had completed a water transfer agreement with IID in 1988 to obtain about 106,000 AF out of IID's right to Colorado River water. Under certain conditions, however, MWD must provide 50,000 AF to the Coachella Valley Water District. Therefore, MWD's firm supply from the Colorado River is about 600,000 AF.

will come online in 2022. The amount of water yielded is expected to vary with hydrological conditions; it has been assessed conservatively at an average annual yield of 4,200 AF.

FPUD is also working on a project to obtain 300 AF of surface water by relocating a water right it held to the Santa Margarita but could not utilize to a diversion point on a tributary of the river outside its service area, upstream of Lake Skinner in Riverside County. Lake Skinner is MWD's reservoir that feeds MWD's Skinner Drinking Water Treatment Plant which provides drinking water to MWD's member agencies in Riverside and San Diego Counties. FPUD will stored the water it diverts from the tributary in Lake Skinner, and MWD will wheel (convey) the water to FPUD via the SDCWA pipeline that connects SDCWA and MWD in return for a treatment charge plus a wheeling charge to be levied by MWD. When this comes into operation, it is conservatively expected to provide a yield of 300 AF for FPUD.

**Q. Where does Rainbow Municipal Water District (RMWD) get its water from?**

**A.** RMWD, like FPUD, is a member agency of SDCWA. It currently has no local supply and relies on SDCWA for the entirety of its water supply, which amounted to 14,297 AF in CY 2020.

**Q. Will RMWD develop some local supply in the future?**

**A.** RMWD is investigating the feasibility of developing local San Luis Rey River basin groundwater resources as a local supply of water. This would require the construction of a desalting plant or some other appropriate form of treatment facility for the groundwater extracted. In its 2020 Urban Water Management Plan, RMWD anticipates that this groundwater project might provide a local supply of 2,000 AF by 2030.

**Q. In its 2020 Urban Water Management Plan, FPUD states that it has historically purchased its water from "our two wholesalers, SDCWA and MWD."[8] Is that a correct statement?**

**A.** No, it is not correct.

So far in its history, PFUD has had no supply relationship with MWD. FPUD is not a member agency of MWD, and MWD does not sell water to non-member agencies. FPUD is a member agency of SDCWA and SDCWA is its sole wholesale supplier.

If FPUD starts to receive a surface water diversion from upstream of Lake Skinner, wheeled to it by MWD, then it will have a relationship with MWD. But MWD will then be serving in the roles of a treater of the water and a (partial) conveyor of the water, not as a supplier of that water.

[8] FPUD 2020 Urban Water Management Plan, p2.

**Q. Why does FPUD claim that MWD is its wholesale supplier?**

**A.** FPUD is focusing on a detail of the water distribution system in the northern part of San Diego County.

MWD's water distribution line that comes down from Riverside County and connects to SDCWA's distribution system is owned by MWD for some of its length and by SDCA for the rest. Although the county line demarcates the boundary of SDCWA's service area, the county line did not serve as the demarcation point between the portion of the pipeline controlled by MWD and the portion controlled by SDCWA. Instead, the control demarcation points for Aqueducts 1, 2, 3 and 4 are located at varying distances into San Diego County.

In consequence, FPUD and RMWD are each served by some turnouts owned by MWD and some owned by SDCWA. The details are presented in the following table:[9]

[9] Provided to me by SDCWA in an email dated 8-31-2021.

**TABLE 1**

**Metered Deliveries to Fallbrook PUD and Rainbow MWD (AF) [1]**

(FY 2017 - FY 2021)

| Meter Description | Pipeline Turnout Structure Owner | Flow Control Facility (FCF) Owner | Meter Deliveries (AF) FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 |
|---|---|---|---|---|---|---|---|
| **Fallbrook Public Utility District** | | | | | | | |
| DeLuz 1 FCF | MWD | MWD | 2,180 | 2,264 | 1,541 | 1,426 | 1,579 |
| Fallbrook 3 FCF | MWD | SDCWA | 1,739 | 1,485 | 1,340 | 2,393 | 2,635 |
| Fallbrook 4 FCF | SDCWA | SDCWA | 1,132 | 1,499 | 1,197 | 292 | 0 |
| Fallbrook 5 FCF | MWD | SDCWA | Not in Service | | | | |
| Fallbrook 6 FCF | MWD | MWD | 3,667 | 5,102 | 3,808 | 3,763 | 4,799 |
| | | **Total** | **8,718** | **10,350** | **7,886** | **7,874** | **9,013** |
| **Rainbow Municipal Water District** | | | | | | | |
| Rainbow 1 FCF | MWD | SDCWA | 2,151 | 2,892 | 2,584 | 2,940 | 3,149 |
| Rainbow 3 FCF | SDCWA | SDCWA | 3,560 | 4,335 | 3,534 | 2,293 | 3,564 |
| Rainbow 4 FCF | MWD | SDCWA | Not in Service | | | | |
| Rainbow 5 FCF | SDCWA | SDCWA | Not in Service | | | | |
| Rainbow 6 FCF | SDCWA | SDCWA | 2,403 | 2,393 | 1,962 | 1,866 | 2,799 |
| Rainbow 7 FCF | SDCWA | SDCWA | 3,110 | 3,119 | 2,601 | 1,191 | 383 |
| Rainbow 8 FCF | MWD | MWD | 2,238 | 2,647 | 1,425 | 3,585 | 3,747 |
| Rainbow 9 FCF | MWD | MWD | 1,617 | 1,842 | 1,496 | 1,197 | 1,456 |
| Rainbow 10 FCF | MWD | SDCWA | 955 | 1,060 | 548 | 462 | 634 |
| Rainbow 11 FCF | SDCWA | SDCWA | 1,167 | 922 | 506 | 946 | 1,239 |
| Rainbow 12 FCF | SDCWA | SDCWA | Not in Service | | | | |
| | | **Total** | **17,202** | **19,211** | **14,654** | **14,479** | **16,972** |

[1] Represents water delivered to FPUD and RMWD. No adjustment for small volumes of interagency exchanges.

As shown, FPUD is currently being served by three pipeline turnouts owned by MWD and one owned by SDCWA. In 2021, for the first time, FPUD took delivery of no water from the turnout owned by SDCWA.

RMUD is currently being served by four pipeline turnouts owned by MWD and by four owned by SDCWA.

**Q. Are there any other SDCWA member agencies that have turnouts on a portion of the pipeline from Lake Skinner owned by MWD?**

**A.** No. FPUD and RMWD are the only SDCWA member agencies located sufficiently far north in San Diego County that they receive water from turnouts owned by MWD rather than SDCWA.

**Q. Does the fact that MWD owns a turnout from which FPUD or RMWD receives water make MWD a wholesale supplier to FPUD or RMWD?**

**A.** No. The fact that MWD owns a turnout from which a SDCWA member agency receives water does not make that member agency a wholesale customer – or any other form of customer – of MWD. The member agency is solely a customer of SDCWA.

This is so for several reasons.

SDCWA is the entity that acquired the water from MWD.

SDCWA is the entity billed by MWD for the water.

SDCWA owns the water it obtains from MWD.

SDCWA, through its Board of Directors, controls the disposition of the water obtained from MWD. The extent to which such water is made available to an SDCWA member agency is decided by SDCWA's Board of Directors.

**Q. Does the fact that SDCWA waives its Transportation Charge for water received by FPUD and RMWD from a turnout owned by MWD make that not SDCWA water?**

**A.** No. The fact that SDCWA has decided to waive its Transportation Charge for water received by FPUD and RMWD does not make this something other than SDCWA water, for the reasons stated above.

**Q. Is it the case that, if FPUD and RMWD exit from SDCWA, they still would end up receiving the same MWD water from the same turnouts on the same pipes? Nothing would really change?**

**A.** No – that is not the case.

FPUD and RMWD would not receive water from turnouts owned by SDCWA.

More importantly, FPUD and RMWD would NOT be receiving the same water as they receive as member agencies of SDCWA.

**Q. Why will it not be the same water?**

**A.** It will be water belonging to MWD and supplied by MWD, rather than water belonging to SDCWA and supplied to FPUD and RMWD by SDCWA.

**Q. How is water supplied by MWD different from water supplied by SDCWA?**

A. It is different in source, it is different in supply reliability, it is different in pricing, and it is different in Delta reliance.

**Q. How is MWD water physically delivered by MWD to FPUD and RMWD different in source from SDCWA water physically delivered by MWD to FPUD and RMWD?**

**A.** SDCWA, as an MWD member agency, purchases water from MWD. But this is supplemental water. SDCWA's base water supply – water that it owns directly – consists of QSA water from the Colorado River (canal lining water and IID Transfer water) and desalinated water from the Carlsbad Facility.

MWD base supply – water that it owns directly – consists of water obtained under its right to Colorado River and water purchased from IID, totaling approximately 600,000 AF, plus water obtained by MWD through its 48% share of the SWP supply.

**Q. Isn't it true that MWD currently delivers to SDCWA some water from the SWP?**

**A.** It is more complicated than that. MWD delivers molecules of SWP water to SDCWA in *two distinct capacities*.

MWD delivers water to SDCWA as a *supplier* of water. MWD also delivers water as a *conveyor* (wheeler) of water.

**Q. What is the difference between MWD's role as a supplier of water versus its role as a conveyor of water?**

**A.** As a supplier of water, MWD is both selling the water and transporting the water to SDCWA. MWD owns the water supplied and it owns the conveyance facility. It charges for both the water supplied and for the conveyance.

As a conveyor of water, MWD is just transporting water which it does not itself own – the water is owned by SDCWA – and it is charging just for conveyance of SDCWA-owned water.

**Q, Is conveying water the same as wheeling water?**

**A.** A dictionary definition of wheeling water is the following:

"The conveying of water through the unused capacity in a pipeline or aqueduct by someone other than the owner."

There is a subtle distinction between wheeling water and what MWD does for SDCWA under the 2003 Exchange Agreement between those two parties. Typically, wheeling occurs only if there is available capacity in the pipeline. In this case, however, MWD committed to making capacity available. SDCWA pays MWD a volumetric rate to cover MWD's expenses in exchange for the conveyance of water. "Unlike the wheeling context, the Exchange Agreement does not literally call for the conveyance of water but instead for the *exchange* of water."[10]

**Q. Is MWD selling or conveying the QSA water it delivers to SDCWA?**

**A.** This question was resolved in the course of rate litigation between SDCWA and MWD.

MWD had argued that the Exchange Agreement involved a purchase of water by SDCWA because, under the agreement, SDCWA gives MWD water (QSA water) and money and obtains from MWD different water – some blend of Colorado River water and SWP water.

The trial judge in San Francisco Superior court ruled against MWD and in favor of SDCWA. He held that "San Diego is not purchasing water from Met. San Diego is exchanging water with Met to make use of its own independent supplies. The parties agreed to exchange an equal amount of water; the only water quality requirement was for Met to provide San Diego with water of at least the same quality as the water Met received from San Diego. These facts underscore that the Exchange Agreement was not an agreement pursuant to which San Diego obtained water from Met, but instead an agreement pursuant to which Met in effect conveyed water on behalf of San Diego. That the Exchange Agreement differs in some respects from a wheeling contract does not mean that the Exchange Agreement was not in substance an agreement to convey, rather than purchase water."[11]

The trial judge's ruling was relitigated before the California Court of Appeals in 2017. The Court of Appeals upheld the trial court on this point. It stated:

"The trial court found 'the Exchange Agreement was not an agreement pursuant to which [the Water Authority] obtained water from [Metropolitan], but instead an agreement pursuant to which [Metropolitan] in effect conveyed water on behalf of [the Water Authority].' … We agree with this conclusion."[12]

The Appeals Court further stated: "The purpose, structure and terms of the [exchange] contract make it clear that the Water Authority is not purchasing water from Metropolitan but from Imperial. As the trial court rightly discerned, the Water Authority is exchanging water with Metropolitan 'to make use of its own independent supplies.' … In agreeing to pay rates equal to

[10] Karnow, August 28, 2015, p.27.
[11] Karnow, August 28, 2015, pp. 28-29.
[12]

the Metropolitan-supplied water rates, the Water Authority did not agree it was purchasing Metropolitan water. There was no purchase of Metropolitan water…"[13]

**Q. When MWD delivers SWP water to SDCWA in exchange for QSA water, does it own that SWP water?**

**A.** When MWD delivers water to SDCWA in its role as a supplier of water, some of the MWD supply is SWP water, and MWD can be considered to own that water.

When MWD delivers water to SDCWA in its role as a conveyor of QSA water, the water being conveyed is water owned by SDCWA, regardless of whether it is actually Colorado River water or SWP water being conveyed in exchange for SDCWA's QSA water.

The water that MWD delivers to SDCWA under the exchange agreement in its role as conveyor of water is owned by SDCWA, not by MWD; it counts as Colorado River water; and it comes under SDCWA's water right to Colorado River water, not under either MWD's water right to Colorado River water nor under MWD's right to SWP water.

**Q. Is most of the water delivered by MWD to SDCWA QSA water (i.e., MWD acts as a conveyor of water) rather than MWD-owned water (i.e., MWD acts as a supplier)?**

**A.** That was not true at first, but it is true now – see Table 2 below:[14]

[13]

[14] This uses data provided to me by SDCWA in an email dated 9-2-2021.

| TABLE 2 BREAKDOWN OF WATER DELIVERED BY MWD TO SDCWA (AF) | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **Fiscal Year** | **QSA Water** | **MWD Water** | **Total** | **QSA Share** | |
| 2012 | 156,604 | 282,948 | 439,552 | 35.6% | |
| 2013 | 183,500 | 296,472 | 479,971 | 38.2% | |
| 2014 | 180,256 | 325,729 | 505,985 | 35.6% | |
| 2015 | 180,123 | 305,039 | 485,162 | 37.1% | |
| 2016 | 179,347 | 187,057 | 366,404 | 48.9% | |
| 2017 | 178,278 | 189,919 | 368,197 | 48.4% | |
| 2018 | 194,326 | 163,639 | 357,965 | 54.3% | |
| 2019 | 192,241 | 132,831 | 325,072 | 59.1% | |
| 2020 | 230,430 | 82,843 | 313,273 | 73.6% | |
| 2021 | 274,702 | 42,322 | 317,024 | 86.7% | |
| | | | | | |
| 2012-2021 | 1,949,807 | 2,008,798 | 3,958,604 | 49.3% | |
| 2012-2013 | 340,104 | 579,420 | 919,523 | 37.0% | |
| 2017-2021 | 1,069,977 | 611,554 | 1,681,531 | 63.6% | |
| 2020-2021 | 505,132 | 125,165 | 630,297 | 80.1% | |

As the table shows, over the past decade, the water delivered by MWD to SDCWA breaks down almost evenly between MWD-owned water and QSA water, but the share QSA water has risen steadily, from 37% in 2012 and 2013 to almost 64% in the last five years, to 80% in the most recent two years.

## 2. HOW DID DETACHMENT COME TO BE AN ISSUE

**Q. Are FPUD and RMWD different from other SDCWA member agencies?**

**A.** Two features stand out as points of some difference between FPUD and RMWD versus other SDCWA member agencies.

First, as noted above, FPUD and RMWD are the only member agencies located sufficiently far north in San Diego County that they receive water from turnouts owned by MWD rather than by SDCWA.

Second, FPUD and RMWD are heavily agricultural users of water. Agricultural water use in SDCWA's service area overall amounted to about 37,050 AF, or 8% of total water use in the service area in 2020.[15] However, in RMWD agricultural use amounted to 8,876 AF out of a total use of 14,297 AF in 2020, or 62%. [16] FPUD had about 2,676 AF of agricultural use, or about 30% of total water use.[17]

Other SDCWA member agencies with significant levels of agricultural use include Valley Center MWD, Ramona MWD, Yuima MWD and the City of Escondido, all located in the northern parts of the County.

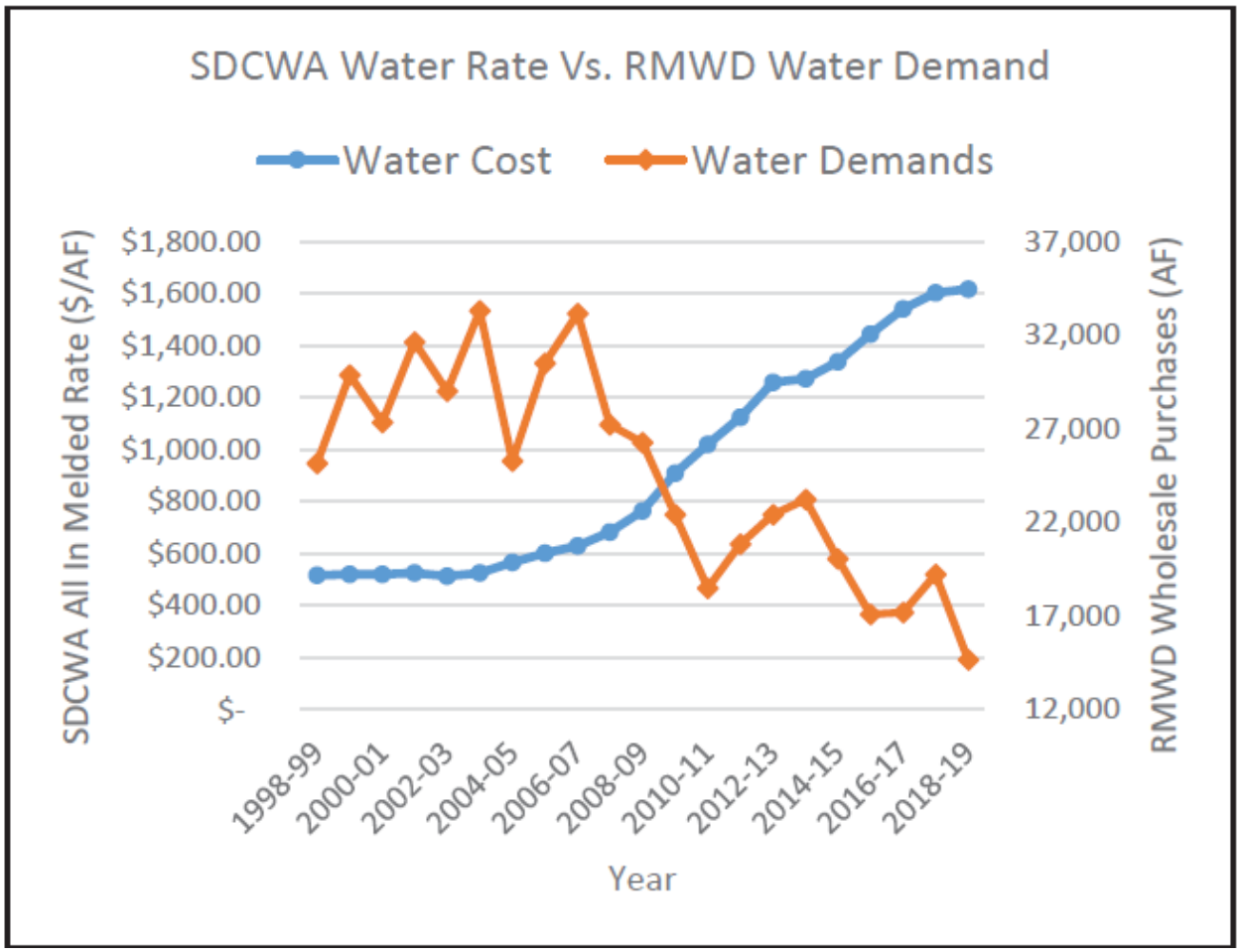
The primary crops grown by SDCWA's agricultural water users include avocado, citrus, cut-flowers, vegetables, vine crops and nursery products. These are generally high value agricultural crops. Nevertheless, a high price for water is an issue for many agricultural producers, even of high value crops. And SDCWA's charges for water have risen significantly over the past 20 years.

As an illustration of the upward trend in the cost of SDCWA water, Figure 2 reproduces a chart prepared by RMWD and presented to the RMWD Board of Directors on December 3, 2019 plotting the SDCWA all-in melded water rate from FY 1999 through FY 2019.[18]

The all-in melded rate was roughly $500/AF in FY 1999 and had been at about that level for at least two years earlier and it started to rise significantly around 2008, reaching around $1,000/AF around 2010 and $1,600/AF in 2019.

[15] SDCWA 2020 Urban Water Management Plan p. ES-1.
[16] RMWD 20202 Urban Water Management Plan, Table 4-1, p. 4-1.
[17] FPUD 2020 Urban Water Management Plan p. 12.
[18] Memorandum Subject: Consider Adoption of a Resolution of Application Authorizing the General Manager to Prepare and Submit an Application to the San Diego LAFCO to detach from SDCWA and Annex to EMWD." Page 46 of 238.

**Figure 2 SDCWA all-in melded water rate 1998-99 to 2018-2019**

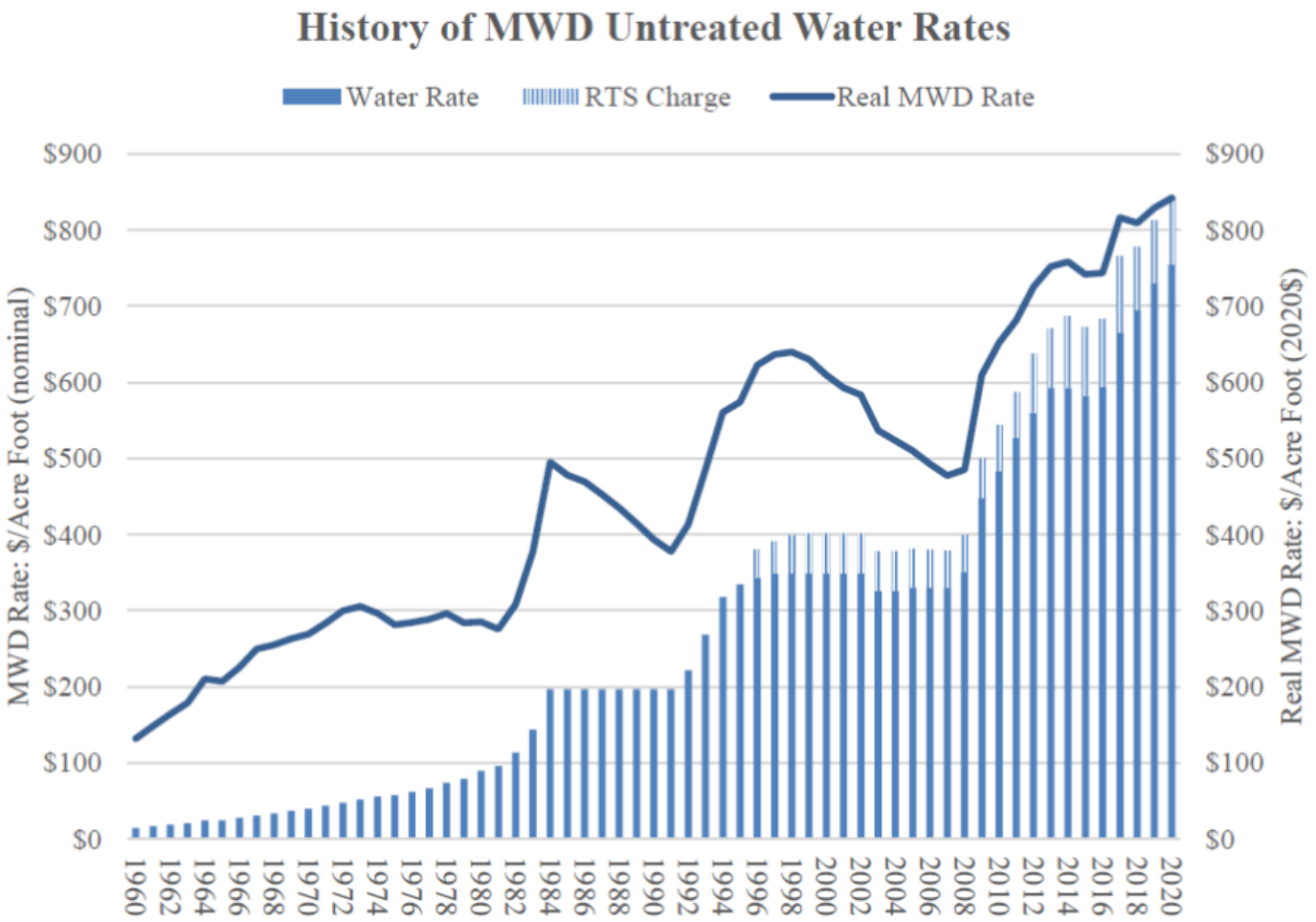



**Q. What caused SDCWA's all-in melded water rate to rise significantly?**

**A.** For any water agency, there is always upward pressure on operating costs, including cost increases from the wholesale supplier, in this case MWD.

Table 3 below shows that MWD rate increases were a major driver of the SDCWA rate increase. MWD's rate was stable in nominal terms (actually declining in real terms) between 1984 and 199, and again between 1996 and 2008. Between 2008 and 2020, MWD's rate rose at an annual average rate of 6.4%.

**Figure 3 MWD Untreated Water Rate 1960 – 2020**[19]




**Annual Increases in Metropolitan's Water Rate by Eras**

| *Cumulative Annual Growth Rate* | *1960-1984* | *1985-2007* | *2008-2020* | *1960-2020* |
|---|---|---|---|---|
| Metropolitan Water Rate | 11.3% | 3.0% | 6.4% | 6.9% |
| Inflation | 5.4% | 3.0% | 1.6% | 3.7% |
| Real Metropolitan Water Rate | 5.7% | 0.0% | 4.7% | 3.1% |

**Q. Could the sharp increase in SDCWA's all-in water rate be due to the introduction of QSA water?**

**A.** It appears that the answer is NO.

[19] This is Figure 17 in SDCWA Submittal dated 1-6-2021, Attachment 2, Stratecon 12/31/2020 Report on Metropolitan LAFCO Submission, page 26.

As explained above, before SDCWA's QSA water became available, it was entirely dependent on MWD as the source of the water it distributed. So, the arrival of QSA water would have triggered the increase in SDCWA's water rate if and only if that was a more expensive source of water for SDCWA than water purchased from MWD.

At least currently, this is not the case, based on data provided to me by SDCWA.[20]

MWD's Tier 1 rate is $777/AF.

SDCWA adds to this the MWD's Readiness to Serve charge (RTS) and MWD's Capacity Charge (CC) which are each fixed charges for a member agency in any given year. The RTS is a fixed monetary amount, apportioned among member agencies on a rolling average use (volume) basis. The Capacity Charge is a charge per cfs based on the member agency's peak flow (cfs) of water from MWD. SDCWA combines those two charges and then nets out the MWD charge assessed separately to parcels under the Standby Availability charge.

SDCWA combines this net fixed charge with the MWD Tier 1 rate to form an all-in MWD rate.

The following is the calculation of SDCWA's all-in MWD rate as presented to the SDCWA Board on February 25, 2021:[21]

| | CY 2020 | CY 2021 | CY 2022 |
|---|---|---|---|
| **All-in MWD Rate** | | | |
| MWD Untreated Tier 1 Rate | $208 | $243 | $243 |
| Transportation | 547 | 534 | 556 |
| Readiness-to-Serve Charge | 179 | 161 | 174 |
| Capacity Charge | 103 | 137 | 156 |
| **Total** | **$1,037** | **$1,075** | **$1,129** |

This is compared with SDCWA's melded QSA, whose calculation was given in the same Board presentation:

[20] Email to me from SDCWA dated 7-16-2021.
[21] Presentation by Kara Mathews.

## 2021 QSA Melded Rate Calculation

| Description | Rate ($/AF) | | Supply (AF) | | Cost ($M) |
|---|---|---|---|---|---|
| IID Transfer | $688 | x | 200,000 | = | $137.6 |
| IID Early Transfer | $214 | x | 5,000 | = | $ 1.1 |
| IID Socioeconomic Reimbursement | ($2) | x | 205,000 | = | $ (0.3) |
| Canal lining OM&R | $17 | x | 77,700 | = | $ 1.3 |
| Canal lining Debt Service^ | $76 | x | 77,700 | = | $ 6.0 |
| **Total Cost ($M)** | | | | | **$145.5** |
| **Total 2021 Supply (AF)** | | | | | **282,700** |

*^Estimate*

**Not a Board-approved rate*

| | |
|---|---|
| Melded QSA Supply Rate ($/AF) | $515 |
| MWD Exchange Rate | $534 |
| Melded QSA All-In Rate* | $1,049 |

Our Region's Trusted Water Leader
San Diego County Water Authority

The comparison indicates that, over the period analyzed here, QSA water is slightly cheaper for SDCWA than MWD water:

## MWD vs. QSA Melded Supply ($/AF)

| | CY 2020 | CY 2021 | CY 2022 |
|---|---|---|---|
| **All-in MWD Rate** | | | |
| MWD Untreated Tier 1 Rate | $208 | $243 | $243 |
| Transportation | 547 | 534 | 556 |
| Readiness-to-Serve Charge | 179 | 161 | 174 |
| Capacity Charge | 103 | 137 | 156 |
| **Total** | **$1,037** | **$1,075** | **$1,129** |
| | | | |
| **All-in QSA Melded Supply Rate** | | | |
| QSA Supply | $504 | $515 | $531 |
| MWD Exchange | 482 | 534 | 556 |
| **Total** | **$986** | **$1,049** | **$1,087** |
| | | | |
| ***Difference:*** | *($51)* | *($26)* | *($42)* |

Our Region's Trusted Water Leader
San Diego County Water Authority

*As of February 2021*

Assuming something like this held true over the period since 2010, the arrival of QSA would not explain the increase in SDCWA's all-in rate to member agencies over this period.

**Q. Could the sharp increase in SDCWA's all-in water rate be due to the desalinated seawater from the Carlsbad Facility?**

**A.** At a projected 2020/2021 unit cost of $2,752/AF,[22] water from the Carlsbad Facility is significantly more expensive for SDCWA than purchased MWD water with an all-in rate of $1,075/AF. But this is unlikely to explain most of the escalation in the SDCWA's all-in water rate for two reasons.

First, the sharp increase in SDCWA's all-in rate began around 2010, but SDCWA did not start receiving Carlsbad water until 2016.

Second, between 2016 and 2020, Carlsbad water accounted for only 10% or less of the water delivered by SDCWA -- see Table 3.

[22] Presentation by Jeremy Crutchfield to SDCWA Board of Directors, October 22, 2020.

## TABLE 3 TOTAL WATER USE IN SDCWA SERVICE AREA, BROKEN DOWN BY SOURCE

| | Water Authority Supplies | | | | | |
|---|---|---|---|---|---|---|
| Fiscal Year | Local Supplies | Seawater Desalination | QSA | From MWD | Total Water Used | Total Supplied by SDCWA |
| 1999 | 150,173 | - | - | 454,436 | 604,609 | 454,436 |
| | | | | | | |
| 2012 | 111,914 | - | 156,604 | 282,948 | 551,466 | 439,552 |
| 2013 | 104,081 | - | 183,500 | 296,472 | 584,052 | 479,971 |
| 2014 | 97,185 | - | 180,256 | 325,729 | 603,170 | 505,985 |
| 2015 | 53,668 | - | 180,123 | 305,039 | 538,830 | 485,162 |
| 2016 | 62,875 | 25,599 | 179,347 | 187,057 | 454,877 | 392,003 |
| 2017 | 74,910 | 34,421 | 178,278 | 189,919 | 477,528 | 402,618 |
| 2018 | 125,699 | 34,907 | 194,326 | 163,639 | 518,570 | 392,871 |
| 2019 | 98,526 | 40,036 | 192,241 | 132,831 | 463,634 | 365,108 |
| 2020 | 116,706 | 33,157 | 230,430 | 82,843 | 463,137 | 346,431 |
| 2021 | 138,171 | 47,530 | 274,702 | 42,322 | 502,725 | 364,554 |

### BREAKDOWN OF ALL SOURCES BY SHARE

| Fiscal Year | Local Supplies | Seawater Desalination | QSA | From MWD |
|---|---|---|---|---|
| 1999 | 24.8% | - | - | 75.2% |
| | | | | |
| 2012 | 20.3% | - | 28.4% | 51.3% |
| 2013 | 17.8% | - | 31.4% | 50.8% |
| 2014 | 16.1% | - | 29.9% | 54.0% |
| 2015 | 10.0% | - | 33.4% | 56.6% |
| 2016 | 13.8% | 5.6% | 39.4% | 41.1% |
| 2017 | 15.7% | 7.2% | 37.3% | 39.8% |
| 2018 | 24.2% | 6.7% | 37.5% | 31.6% |
| 2019 | 21.3% | 8.6% | 41.5% | 28.6% |
| 2020 | 25.2% | 7.2% | 49.8% | 17.9% |
| 2021 | 27.5% | 9.5% | 54.6% | 8.4% |

### BREAKDOWN OF SDCWA SUPPLY BY SOURCE

| Fiscal Year | | Seawater Desalination | QSA | From MWD |
|---|---|---|---|---|
| 1999 | | - | - | 100.0% |
| | | | | |
| 2012 | | - | 35.6% | 64.4% |
| 2013 | | - | 38.2% | 61.8% |
| 2014 | | - | 35.6% | 64.4% |
| 2015 | | - | 37.1% | 62.9% |
| 2016 | | 6.5% | 45.8% | 47.7% |
| 2017 | | 8.5% | 44.3% | 47.2% |
| 2018 | | 8.9% | 49.5% | 41.7% |
| 2019 | | 11.0% | 52.7% | 36.4% |
| 2020 | | 9.6% | 66.5% | 23.9% |
| 2021 | | 13.0% | 75.4% | 11.6% |

If 10% of SDCWA's water costs about $1,700/AF more than the other two sources of water used by SDCWA (MWD water and QSA water), that would raise SDCWA's cost by only $170/AF.

Therefore, it does not appear that bringing online water from the Carlsbad Desalination Facility provides a major explanation for the sharp increase in SDCWA's all-in water rate after 2010.

**Q. Did anything else change that could explain the sharp increase in SDCWA's all-in water rate after 2010?**

**A.** Figure 2 depicts something else that changed over this period – a dramatic reduction in the amount of water purchased by RMWD from SDCWA – this fell by half, from being somewhere in the range of 27,000 – 32,0000 AF through about 2006 to around 15,000 AF by 2019.

The reduction in water use demand may have been especially pronounced in RMWD because of the large component of agricultural water use, which is likely to be more price-sensitive than urban use generally. However, striking reduction in water use was occurring at this time throughout SDCWA's service area. This phenomenon was not limited to RMWD.

Figures 4 and 5 provide evidence of a general decline in water use throughout SDCWA's service area.

**FIGURE 4 Decline in Total Potable Per Capita Water Use in SDCWA Service Area**[23]

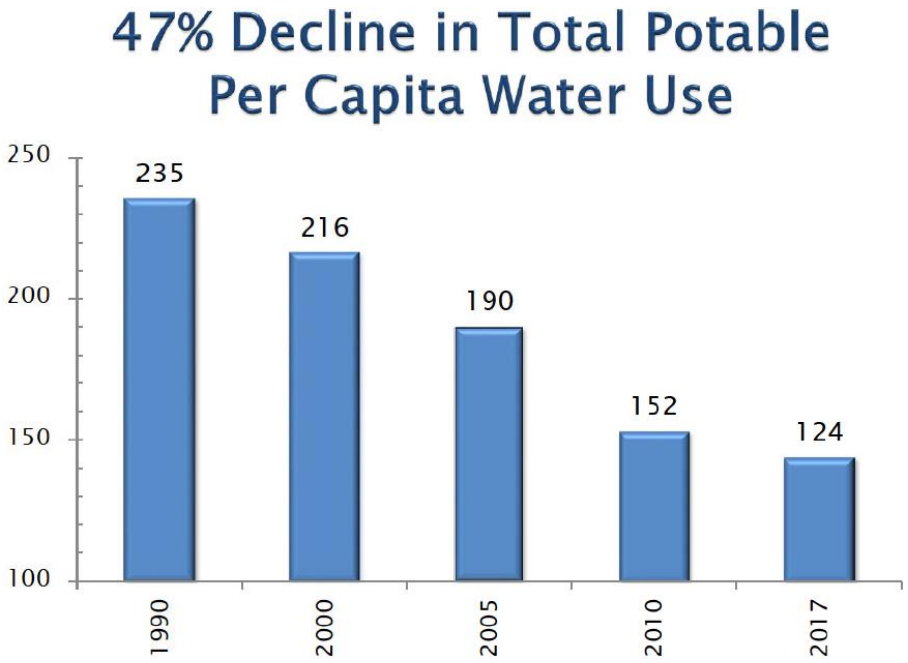


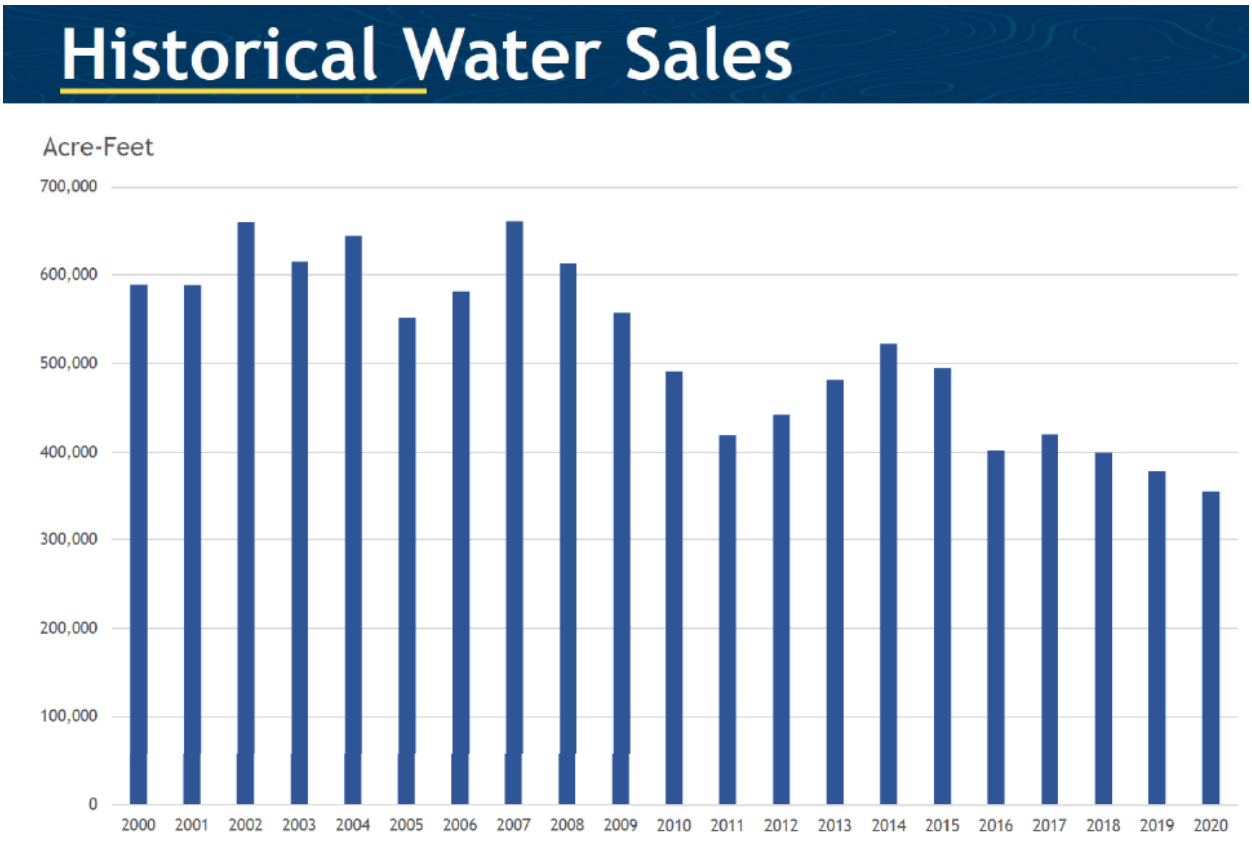

Figure 3 identifies a 35% reduction in per capita water use in the SDCWA service area between 2005 and 2017.

[23] Presentation by Tim Bombadier to SDCWA Board, February 22, 2018.

Figure 5 tracks water sales to by SDCWA to member agencies, where:

**SDCWA WATER SALES = TOTAL WATER USE IN SERVICE AREA – MEMBER AGENCY LOCAL SUPPLIES**

**FIGURE 5 Historical SDCWA Sales to Member Agencies**[24]




Total sales declined from over 600,000 AF in 2008 to about 365,000 AF in 2020, a reduction of almost 40%.

**Q. Could the reduction in SDCWA sales to member agencies between 2008 and 2020 have had an impact on SDCWA's all-in water rate over that period?**

**A.** Yes.

[24] Presentation by Sandra L. Kerl to SDCWA Board of Directors, January 28, 2021.

This comes about from the fact that most of SDCWA operating costs are what economists call *fixed costs* – that is, costs that effectively do not change from one year to the next with variation in the volume of water delivered by SDCWA that year to its member agencies.

Table 4 presents a breakdown of SDCWA expenditures during FY 2020.

**TABLE 4 BREAKDOWN OF SDCWA EXPENDITURES FY20 ADOPTED BUDGET**

| ITEM | $ Thousands | Percent | | Cost Type |
|---|---|---|---|---|
| Water Supply | | | | |
| Colorado River Water | | | | |
| MWD Wheeling Cost | $119,184 | 15.1% | | Fixed |
| All other Colorado River water costs | $124,414 | 15.8% | | Fixed |
| Water Purchased from MWD | $82,967 | **10.5%** | | **Variable** |
| Carlsbad Desal Plant | $97,934 | 12.4% | | Fixed |
| All Other Water Supply Expenses | $61,639 | 7.8% | | Fixed |
| Subtotal | $486,138 | 61.7% | | |
| | | | | |
| Operating Departments* | $54,252 | 6.9% | | Fixed |
| Debt Service* | $148,716 | 18.9% | | Fixed |
| CIP Expenditures* | $81,111 | 10.3% | | Fixed |
| Equipment Replacements* | $3,012 | 0.4% | | Fixed |
| Grant Expenditures* | $13,162 | 1.7% | | Fixed |
| Other Expenditures* | $1,944 | 0.2% | | Fixed |
| | | | | |
| **TOTAL** | **$788,335** | 100.0% | | |
| | | | | |
| * FY20 obtained by halving FY20 & 21 amount in Table 1. | | | | |
| | | | | |
| SOURCE: SDCWA Adopted Budget FY 2021 & 2022, Table 1, p.26. | | | | |

Non-water supply expenditures are fixed costs.

Today, most of the SDCWA's water supply costs are also fixed costs. Of SDCWA's three sources of water, QSA water and Carlsbad Desalination water are also fixed costs for SDCWA because it contracted to pay for specified quantities of water from those sources. Only MWD water is a variable cost for SDCWA because it has discretion to purchase more or less MWD water.

Around the time of 2008, however, MWD water was a larger component of SDCWA's supply than it is today, and that made the variable cost component of SDCWA's expenditures a larger component than it is today.

For simplicity, say that 45% of SDCWA's expenditure back then was fixed cost and 55% was variable. With that cost structure, if SDCWA experienced a 40% drop the demand for its water over a relatively brief period of time, as happened to SDCWA after 2008, the financial impact would be as follows:

The variable cost, accounting for 55% of total operating cost, is reduced by 40%.

The other 45% of operating cost, being fixed cost, does not change.

Overall operating cost drops by 22% (= 0.4*55%).

Total units of water sold drops by 40%.

Operating cost per unit of water delivered *rises* by 30% (= 0.78/0.6)

This calculation suggests that the drop in member agencies' demand for water from SDCWA would itself have contributed towards the sharp increase in SDCWA's all-in rate after 2008.

## 3. THE FINANCIAL IMPACT OF DETACHMENT

This section analyzes the financial impact on the other member agencies of SDCWA is FPUD or/and RMWD detach from SDCWA.

The detachment of a member agency reduces the revenues received by SDCWA. It also may reduce the expenses incurred by SDCWA in operating in water supply and distribution system. The key question will be the net impact: will revenues be reduced by more or less than operations expenses?

**Q. How large are FPUD and RMWD in relation to the other SDCWA member agencies?**

**A.** FPUD and RMWD accounted for 1.7%[25] of the population served by SDCWA in FY 2020 and 8.1%[26] of the acreage in SDCWA's service area.[27] In FY2020, FPUD and RMWD together received 6.4%[28] of the water delivered by SDCWA in FY 2020 to member agencies, which represents a higher rate of usage per capita, but not per acre, than the average across all member agencies.

In FY 2019, FPUD and RMWD together accounted for 5.9% of the water supplied by SDCWA to member agencies, while at the same time accounting for 2.9% of the meter equivalents. Specifically, In FY 2019 FPUD and RMWD received 22,253 AF from SDCWA for use by their 26,542 meter equivalents (ME), amounting to a usage of 0.8384 AF per ME. In FY 2019, the other member agencies combined received 356,277 AF for use by 898,551 ME, amounting to an average usage of 0.3965 AF per ME.

*The average usage of SDCWA water per meter equivalent within the FPUD and RMWD service areas in FY 2019 was more than twice that of the other member agencies* (0.8384 AF/ME versus 0.3965 AF/ME).

Going forward, FPUD's share of water delivered to SDCWA member agencies will fall as the Santa Margarita Conjunctive-Use Project comes on line.

Moreover, about 42% of the water received by FPUD and RMWD has come under the SDCWA's Permanent Special Agricultural Water Rate (PSAWR) program for agricultural water users in the SDCWA service area. Under this program, eligible agricultural users served by member agencies pay a reduced rate water, which sets the supply charge as equivalent to MWD's Tier 1 rate and adds in SDCWA's charges for treatment, transportation and customer service while omitting SDCWA's storage and supply reliability charges. For CY 2021, this lowers SDCWA's melded all-in

[25] = 54,944/323,060.6.
[26] = 75,658/934,777.5.
[27] These and the following statistics are taken from the SDCWA Annual Report FY 2020, consulted online at sdcwa.org/annualreport/2020/diversification-and-operation/water-sources-and-uses.php on 6/11/2021.
[28] =22,278.9/346,430.9.

rate for treated water from $1,769/AF for municipal and industrial (M&I) users to $1,295/AF for agricultural users under the PSAWR program. In exchange for the lower water rate, agricultural users receive a less reliably water supply. They are subject to higher cutbacks compared to M&I users in the event of a supply limit imposed by MWD ("an allocation") or other water shortages faced by SDCWA. If MWD imposes a reduction in its supply of MWD water (as opposed to QSA water), deliveries to PSAWR users will be cut in the proportion used by MWD even if SDCWA cuts deliveries to M&I users by less due to the availability of QSA water and Carlsbad water.

**Q. What are the revenues that SDCWA receives from member agencies?**

**A.** SDCWA obtains revenue from certain water-related charges and from certain other charges. Table 5 details these charges.

| TABLE 5 SDCWA WATER RATES AND CHARGES CY 2021 | | |
|---|---|---|
| | | |
| | ITEM | |
| CHARGED TO MEMBER AGENCIES | | |
| | | |
| a | M&I Water supply rate ($/AF) | $940 |
| | | |
| b | Agricultural water supply rate ($/AF) | $777 |
| | | |
| c | Transportation rate ($/AF) | $150 |
| | | |
| d | Treatment rate ($/AF) | $295 |
| | | |
| e | Customer Service Charge - Total, all member agencies ($) | $25.6M |
| | | |
| f | Storage Charge - Total, all member agencies ($) | $60.0M |
| | | |
| g | Supply Reliability Charge - Total, all member agencies ($) | $38.84M |
| | | |
| h | Infrastructure Access Charge ($/meter equivalent) | $4.24 |
| | | |
| CHARGED TO PROPERTIES IN SERVICE AREA | | |
| | | |
| i | Water Availability Standby Charge (per property in service area) | $10 |
| | | |
| j | Ad Valorem Property Tax | VARIES |
| | | |
| k | System Capacity Charge per new meter less than 1" ($) | $5,301 |
| | | |
| l | Treatment Capacity Charge per new meter less than 1" ($) | $147 |

Some of the items are charged to member agencies (items a-h), and others are charged to properties in the SDCWA service area (i-l).

Depending on the item, charges to member agencies vary by acre-feet of water supplied each month (items a-d), by the individual agency's share of the acre-feet supplied to all member agencies over a past three-year period (e,f) or five-year period (g), or by the number of individual meter equivalents served by the agency in the previous year (h).

**Q. If FPUD and/or RMWD leave SDCWA's service area, which of SDCWA's revenue sources would be reduced?**

**A.** If FPUD and/or RMWD leave SDCWA's service area, SDCWA's revenue from each item in the table will be reduced.

For each acre-foot less of water supplied by SDCWA, it foregoes $1,090 (= 940 + 150) if the water is untreated and delivered by a member agency for M&I use, and $1,385 (= 1,090 + 295) if it is treated.

If the water is delivered for agricultural use, SDCWA charges a member agency only $927 (= 777 + 150) if the water is untreated, and $1,222 (= 927 + 295) if it is treated. In doing this, SDCWA is reducing the commodity supply rate for water for agricultural use from the standard level of $940 to a rate of $777, which corresponds to MWD's Tier 1 rate for untreated water. In exchange for receiving the lower supply rate, agricultural customers of a member agency receive a less reliable water supply with a higher likelihood of being cut back in the event of shortage than M&I customers.[29]

The volumetric rates (a-d) represent the most highly variable sources of revenue for SDCWA. The least variable sources of revenue are the Water Availability Standby Charge and the ad valorem property tax (items i and j).[30] Intermediate in variability are items (e - h). These are fixed annual charges to member agencies designed to cover specific types of fixed costs incurred in connection with SDCWA's supply system.

**Q. If FPUD and RMWD were not member agencies of SDCWA, how much lower would SDCWA's annual revenue be?**

**A.** SDCWA submitted its analysis of this question in its memorandum to LAFCO on 9-18-2020.[31] That analysis was conducted using SDCWA's internal financial model, run in two modes: (1)

[29] This reflects the lower supply reliability of water obtained by SDCWA from MWD as compared to SDCWA's own sources (Colorado River and desalination). In the event of a shortage, SDCWA deliveries to member agencies for agricultural customers are cut back by the same percentage that MWD cuts its deliveries.

[30] The capacity charges (items k and l) are a one-time fee collected whenever a water delivery system is expanded to include new development.

[31] SDCWA Combined Response to Reorganization Applications by Fallbrook/Rainbow, Sep 18, 2020, pp. 54-62.

with FPUD and RMWD members (the present situation), and (2) with FPUD and RMWD not members (i.e. detachment).

I conducted an independent analysis using readily available published data, including SDCWA's Comprehensive Annual Financial Report and Carollo Inc's CY 2022 Cost of Service Study for SDCWA.[32]

SDCWA calculated that its revenue would be $40.0 million lower if FPUD and RMWD both detached, broken down as a $13.8 million revenue reduction if FPUD detached and a $26.3 revenue reduction if RMWD detached. My own analysis, which was necessarily less precise, supported that conclusion: my estimate was a combined revenue reduction of $39.1 million.

**Q. If FPUD and RMWD were not member agencies of SDCWA, how much lower would SDCWA's expenditures be?**

**A.** SDCWA and I each analyzed this question, but my analysis lacked one element of the SDCWA analysis.

We both examined SDCWA's water-related operating expenses. Here, SDCWA estimated an expenditure reduction of $27.2 million. My estimate was essentially identical – an expenditure reduction of $27.5 million.

The element I could not assess was SDCWA's management of its reserve accounts. Like any other utility, SDCWA holds certain reserve accounts which are required to cover covenants on its outstanding debt or are designed to provide some cover against future volatility in sales. Depending on the circumstances, in any given year, SDCWA may find it needs to add to its reserves (requiring it to raise its rates that year so as to bring in additional revenue to meet the requirement for increased reserves) or it may find that it can draw down its reserves to some degree (permitting it to have lower rates that year because it can use funds drawn from the reserves to cover some of its cost of operations).

SDCWA included the reserve component into its analysis, but I was not able to account for this. SDCWA concluded that, with detachment of FPUD and RMWD, it would have been able to draw on $3.6 million less of its reserve.

SDCWA calculated the current-year net effect of detachment at $16.4 million in reduced net revenue, which would have to be made up in higher payments by the other member agencies. This was broken down into a net impact of $5.7 million for FPUD detachment and $10.7 million for RMWD detachment. Given that my own analysis dovetails with SDCWA's analysis with respect to the impacts of detachment on SDCWA water-related revenue and on water-related

[32] I presented my preliminary analysis to the Ad Hoc Advisory Committee at its meeting on June 14, 2021, and I presented a revised analysis to the Ad Hoc Advisory Committee at its meeting on July 12, 2021.

operating expenses, the estimate of $16.4 million for the current year net impact of detachment seems reasonable.

**Q. Is a one-year analysis of the net financial impact conclusive?**

**A.** No.

In the water business, conditions can vary from one year to another, as Table 4 above suggests. Weather conditions are different. Water use varies. Member agencies' demands on SDCWA vary. Streamflow that supports supplies available to SDCWA from both the Colorado River and the SWP vary. Also, what is needed to support SDCWA's reserves accounts varies.

The consequence is that one obtains a more realistic assessment of the financial impact of detachment by performing a multi-year assessment rather than an analysis of a single year

**Q. What does a multi-year analysis of the net financial impact of detachment show?**

**A.** SDCWA also presented a multi-year analysis of the financial impact of detachment as projected over the decade from CY 2022 through CY 2031. For this purpose, SDCWA used its internal projection of member agencies' annual demands for SDCWA water over this future decade, combined with the internal financial model for planning reserve additions and draw downs.

In that analysis, the annual financial impact of detachment by both FPUD and RMWD varied from year to year, depending on circumstances. The largest annual impact was a reduction of $45.7 million in net revenue, and the smallest a reduction of $11.2 million. The median was an annual reduction of $33.9 million.

**Q. How large is this net financial impact in relation to SDCWA's total water-related revenue and water-related operating expenses?**

**A.** In FY 2020, SDCWA's operating revenues and expenses totaled around $569 million. If one takes the range of $16.4 million to $33,9 million as the central estimate for the reduction in annual net revenue, that corresponds to a reduction ranging from 2.9% to 6.0% of annual operating revenue.

**Q. Is this just a one-year impact to net revenue?**

**A.** No.

It is a recurring annual loss of net revenue once the detachment occurs, lasting for as long as SDCWA does not have another buyer for the water that it would have sold to FPUD and RMWD.

**Q. Why does it impose a net cost on SDCWA when it sells less water to a member agency?**

**A.** There is a fiscal imbalance between SDCWA's cost structure and its revenue structure.

In FY 2020, SDCWA supplied 354,007 AF to member agencies and earned $585.1 million in water related revenue. That corresponds to an all-in rate of $1,653/AF (= 420,165 million/354,007 AF).

If SDCWA supplied one less acre-foot to a member agency in FY 2020, it surrendered about $1,188 of water-related operating revenue, since the per-acre-foot component of SDCWA's water charges account for about 71.9% of its total water related revenue, the rest being the fixed charges – the Infrastructure Access Charge, the Customer Service Charge, the Storage Charge and the Supply Reliability Charge.[33]

However, if SDCWA supplied one less acre-foot to a member agency in FY 2020, it reduced its operating expenses by about $253, since I estimate that variable water costs amount to about 15.3% of its operating expenses.[34]

The fiscal imbalance for SDCWA is that, if it supplies one less acre-foot to member agencies, it surrenders about $1,188 in revenue but it lowers its expenses by only about $253, generating a potential deficit of $935.

[33] 1188 = 0.719*1653.
[34] 253 = 0.153*1653.

## 4. A DEPARTURE FEE

One of the items I was asked to address is a potential financial obligation to be imposed on FPUD and RMWD if they depart from SDCWA such as a departure fee. I was tasked with quantifying what - if any – financial commitment should be made a condition if the San Diego County LAFCO Commission approves either or both of the de-annexation proposals submitted by FPUD and RMWD.

I am aware that there is currently disagreement among some of the parties with respect to whether LAFCO has the legal authority to prescribe conditions of approval that include a financial obligation such as a departure fee. I am not being asked to opine on this legal question. I am being asked, instead, to examine whether there is a sound economic justification for imposing a financial obligation of FPUD and RMWD and, if so, what an appropriate obligation would be.

**Q. Is there a sound economic justification for imposing some financial obligation?**

**A.** Yes.

Since 2000, SDCWA has made major infrastructure investments and has taken on substantial contractual commitments for a more reliable water supply. The infrastructure investments and supply commitments have benefited all member agencies. These commitments are long-term in nature, and they impose a fixed and ongoing financial burden on SDCWA and its member agencies.

**Q. What is the purpose of a financial obligation?**

**A.** The purpose of imposing some financial obligation is to provide an appropriate level of protection for SDCWA and the remaining member agencies in the short run while they adjust to the changed situation of a departure. The purpose is to cover SDCWA's own financial obligations that are fixed, ongoing and unavoidable after the departure for the duration of a period of adjustment.

The aim is to promote flexibility and efficiency in the management of scarce water resources and in the operation of a supply network that is essential to the wellbeing of the regional economy. It is not appropriate that the departure fee afford such protection in perpetuity. It is important that SDCWA and all its member agencies receive an economic signal about the need for efficient network organization and rationalization. Compensation for multiple decades would work against the objective of promoting the efficient use of the region's water infrastructure assets.

**Q. Over how long a period should FPUD and RMWD bear some financial obligation?**

**A.** The purpose of the financial obligation is to provide an appropriate level of protection for SDCWA and the remaining member agencies in the short run while they adjust to the changed situation of a departure.

In the water industry, a period of 10 years would typically count as the short run for planning purposes. I therefore suggest that FPUD and RMWD bear a financial obligation for a period of ten years if they depart SDCWA.

**Q. What form could the financial obligation take?**

**A.** In principle, this is something that should be negotiated between SDCWA, FPUD and RMWD. Here I will suggest directions along which negotiations could occur.

Two ways come to mind by which FPUD and RMWD could compensate SDCWA: an annual departure fee or an annual water purchase commitment — or some combination of both.

If there is an annual departure fee, it should be keyed to the portion of SDCWA's outstanding obligations that most directly serve FPUD and RMWD. If there is an annual purchase commitment it should be related to the volume of water for which SDCWA has signed take-or-pay contracts.

**Q. What portion of SDCWA's outstanding water-supply related obligations should serve as the basis for determining a departure fee?**

**A.** That is a judgment call.

On the one hand, like every other SDCWA member agency, FPUD and RMWD have benefited from all of the financial obligations incurred by SDCWA because member agencies are bound together by an integrated infrastructure network. Each member agency benefits to some degree from all investments in the infrastructure either directly or indirectly.

A member agency benefits directly from an investment in a particular source of supply or in a particular component of the infrastructure if it is directly served by that particular infrastructure component or it directly receives water from that particular supply source. But, even if a member agency is not served directly by that particular component and does not directly receive water from that particular supply source, the member agency still benefits indirectly through being part of an integrated water distribution network. If *other* member agencies receive water from particular source or through that particular component, it makes it possible for *this* member agency to receive water from another source within SDCWA's portfolio, thereby benefiting indirectly.

On the other hand, it is reasonable to recognize that FPUD and RMWD are in a somewhat special situation by virtue of both their particular location at the furthest end of SDCWA's distribution system and their rural and agricultural local economies.

In the light of these factors, I recommend that a departure fee target the portion of SDCWA's outstanding obligations that relates specifically to QSA water.

**Q. What is the amount of SDCWA's outstanding obligations that relates to QSA water?**

**A.** In its submission on 9-18-2020, SDCWA presented a table breaking down its contractual supply obligations as follows:[35]

| Desc. | CY 2021 Cost | Remaining Term (as of 1/1/2021) (yrs) | Escalation Factor | Net Present Value (3% Discount) |
|---|---|---|---|---|
| IID | $135,000,000 | 27 | 2.5% | $3,401,733,753 |
| MWD Exchange - IID | $106,800,000 | 27 | 4.6% | $3,642,717,018 |
| Canal | $1,233,099 | 93 | 3.0% | $114,678,207 |
| MWD Exchange - Canal | $41,491,800 | 93 | 4.6% | $9,029,224,611 |
| Desal | $111,846,000 | 26 | 3.0% | $2,907,996,000 |
| **Total** | **$396,370,899** | | | **$19,096,349,589** |

The first four rows constitute the QSA water component of these obligations. The CY 2021 cost of the QSA component amounted to $284.525 million.

**Q. What is a fair share of the QSA contractual obligation to assign to FPUD and RMWD?**

**A.** I suggest that this be based on FPUD and RMWD shares of either total deliveries to SDCWA member agencies or of deliveries for municipal and industrial use, as opposed to deliveries made under SDCWA's special agricultural water rate program.

Table 6 provides an example of the calculation of this share using a demand projection for FY 2021 used by SDCWA in preparing its analysis of the rate impact of detachment for its 9-18-2020 submission.[36] Other data could also be used, such FPUD/RMWD share over several past years or their share as projected for several future years.

[35] Table 4.3.
[36] Email from Pierce Rossum, 7-2-2021.

| TABLE 6 FPUD/RMWD SHARE IN TOTAL USE AND M&I USE BY SDCWA MEMBER AGENCIES | | | | |
|---|---|---|---|---|
| | | | | |
| | FY 2021 PROJECTED | | | |
| | Water delivery (AF) | Share | | |
| **ALL USES** | | | | |
| Fallbrook | 4,010 | 1.2% | | |
| Rainbow | 13,518 | 3.9% | | |
| Subtotal | | 5.0% | | |
| All member agencies | 348,272 | | | |
| | | | | |
| | | | | |
| **PSAWR USE** | | | | |
| Fallbrook | 1,803 | 7.8% | | |
| Rainbow | 5,536 | 23.9% | | |
| Subtotal | | 31.7% | | |
| All member agencies | 23,145 | | | |
| | | | | |
| | | | | |
| **M&I USE** | | | | |
| Fallbrook | 2,207 | 0.7% | | |
| Rainbow | 7,982 | 2.5% | | |
| Subtotal | | 3.1% | | |
| All member agencies | 325,127 | | | |

With this particular data, which reflects FPUD's imminent implementation of the Santa Margarita Conjunctive-Use Project, FPUD and RMWD together account for 5% of total water deliveries to all member agencies[37] and 3.1% of deliveries for municipal and industrial use.

**Q. Using the CY 2021 cost of SDCWA's contractual supply obligation for QSA water, what annual payment would be assigned to FPUD and RMWD?**

**A.** The amount of the annual departure fee depends on whether one uses the share of all member agencies deliveries received by FPUD and RMWD, or the share of deliveries to member agencies for municipal and industrial use. The resulting calculations are exhibited in Table 7.

[37] This is down from an average of 6.4% over the period FY 2017-2020.

| TABLE 7 CALCULATION OF A DEPARTURE FEE | | |
|---|---|---|
| | | |
| | **Share** | **Annual payment** |
| | | |
| **USING THE SHARE OF M&I DELIVERIES** | | |
| FPUD | 0.7% | $1,931,388 |
| RMWD | 2.5% | $6,985,202 |
| Total | 3.1% | $8,916,590 |
| | | |
| **USING THE SHARE OF TOTAL DELIVERIES** | | |
| FPUD | 1.2% | $3,276,017 |
| RMWD | 3.9% | $11,043,689 |
| Total | 5.0% | $14,319,705 |

**Q. Could a purchase commitment be another approach?**

**A.** Yes, although there are logistical and operational issues involved for all parties if FPUD and RMWD continue to take delivery of SDCWA water after their departure which do not arise if FPUD and RMWD just make annual payments to SDCWA.

**Q. If FPUD and RMWD detach from SDCWA, would it possible for SDCWA to sell the water that it otherwise would have delivered to FPUD and RMWD to some other member agencies, thereby recouping lost revenue?**

**A.** SDCWA is committed to paying for 78,700 AF of canal lining water through 2112. It is committed to paying IID for 200,000 AF of conserved water through 2047, with the possibility of a 30 year extension beyond that. Under the exchange agreement, SDCWA is committed to paying MWD to convey this water for the same period of time as in those underlying supply contracts. This is a commitment by SDCWA to pay for 278,700 AF of QSA water per year.

In addition, SDCWA has a 30-year Water Purchase Agreement with Poseidon Resources to purchase 42,000 AF of water annually from the Carlsbad Desalination Plant upon commencement of commercial operations, which occurred in December 2015.

Together these purchase commitments total 320,700 AF per year and run at least through 2045.

If SDCWA needs to deliver more water to member agencies than 320,700 AF/yr, it can obtain the additional water as a member agency of MWD at an annual cost which varies in part with the volume of water purchased from MWD.

If SDCWA needs to deliver less water to member agencies than 320,700 AF/yr, it must still make its committed annual payments that are keyed to the receipt of 320,700 AF/yr.

If there are no operational constraints on how SDCWA receives and distributes QSA water, Carlsbad water and MWD-supplied water, SDCWA would be able to sell water to other member agencies that it otherwise would have delivered to FPUD and RMWD as long as the other member agencies demand for water from SDCWA exceeds 320,7000 AF.

However, if the other member agencies demand for SDCWA water falls short of 320,7000 AF in a future year through 2045 or later, SDCWA would not be able to recoup from the remaining member agencies the full amount that it has committed to paying that year.

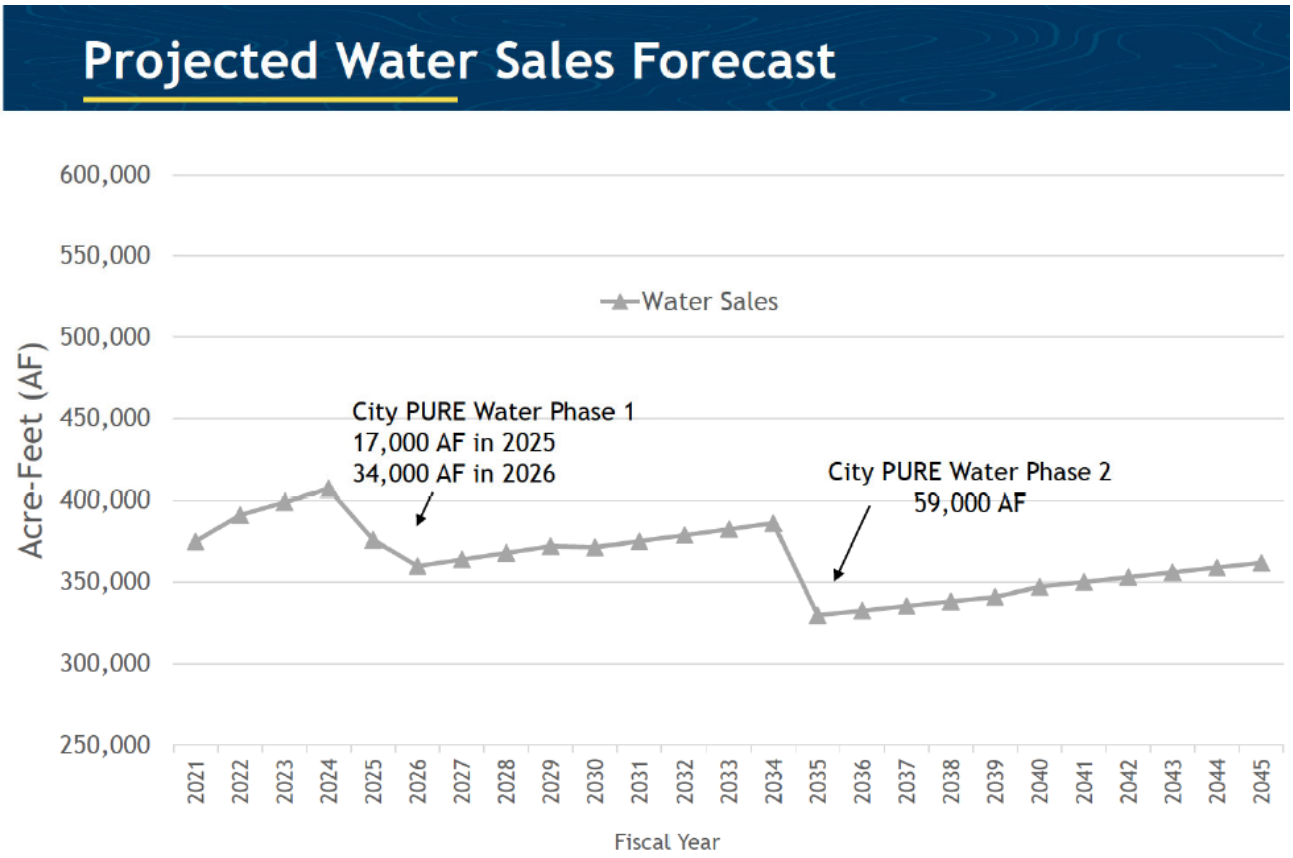
**Q. If FPUD and RMWD detach from SDCWA, would it possible for SDCWA to sell the water that it otherwise would have delivered to FPUD and RMWD to some other water agency that is *not* a member agency, thereby recouping lost revenue?**

**A.** In theory, one mechanism by which SDCWA might recoup lost revenue is to sell water that otherwise would have been delivered to FPUD and RMWD to a *non-member* water agency. Logical possibilities are to sell water to MWD itself or to individual member agencies served by MWD. The water distribution systems serving MWD and SDCWA are sufficiently interlinked that this ought to be possible in principle, although there could be some operational complications and constraints.

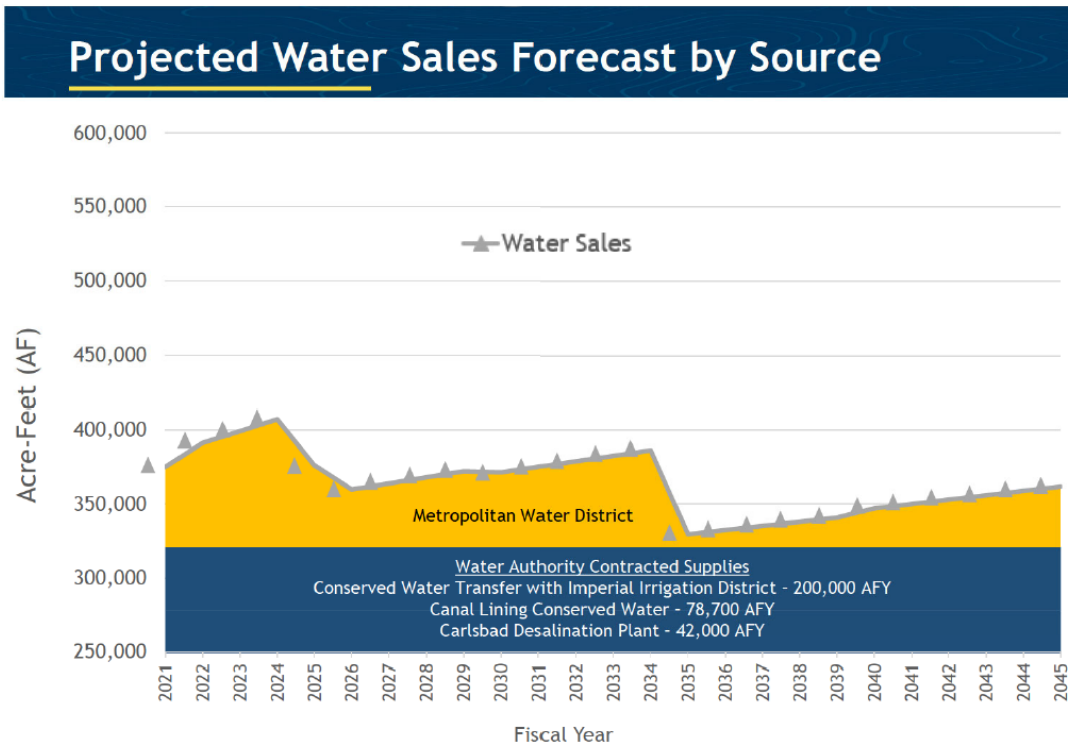
From a purely economic perspective, Southern California as a region would be better served if there could be a more open and collaborative relationship between MWD and SDCWA, its largest single customer.

**Q. How likely it is that SDCWA could find itself being asked to deliver less than 320,700 AF/yr to its member agencies if FPUD and RMWD were to depart?**

**A.** At a SDCWA Board Meeting on 6-10-2021, Kelley Gage, SDCWA Director of Water Resources, presented a graph showing a forecast of SDCWA water sales through 2045. The graph is reproduced below:




She presented a second graph comparing this sales forecast with SDCWA's water purchase commitment of 320,700 AF (marked in solid blue):



The lowest level of deliveries to member agencies in this forecast is projected to occur in 2035, by which time 116,770 AF of additional local supplies are projected to have come online within the SDCWA service area compared to what existed in 2020.[38] SDCWA deliveries to member agencies projected for 2035 amount to about 325,000 AF.

The sales forecast assumes no detachment by FPUD or RMWD. If FPUD and RMWD departed as member agencies of SDCWA, that would reduce this sales forecast. The sales reduction is projected to amount to a combined total of about 17,500 AF annually. If so, that would push SDCWA deliveries to member agencies without FPUD or RMWD in 2035 down to about 307,500 AF.

The analysis just presented suggests that SDCWA will be able to deliver its committed purchase of 320,700 AF every year through 2034, but would fail to do so in 2035. However, it would be unwise to place too much weight on this analysis because there is considerable uncertainty in the forecast of annual sales – there is really a probability distribution spread (a confidence interval) around each of the numbers in the graphs.

A major source of uncertainty is the possible occurrence of drought during the period from now through 2035. A drought might reduce local supplies, thereby increasing member agency demands on SDCWA. A drought might also accelerate the development of local supplies, thus reducing member agency demands on SDCWA. Moreover, a drought coupled with mandated urban conservation, as happened under Governor Brown in 2015 – 2016, and may be imminent this year under Governor Newsom, could have the effect of limiting member agency demands on SDCWA below the levels projected in the graphs.

Thus, there is a real chance that, if FPUD and RMWD depart, SDCWA could on some occasion face member agency demands that fall short of its commitment to pay for 320,700 AF.

[38] These are additional local supplies from groundwater, recycled water, and potable re-use. Between 2021 and 2025, 36,365 AF are projected to come online; between 2026 and 2030, another 20,945 AF is projected to come online; and between 2031 and 2035, an additional 59,640 AF is projected to come online.

**Q. Does the possibility that, if FPUD and RMWD depart, SDCWA could on some occasion face member agency demands that fall short of 320,700 AF suggest a possible alternative to a departure fee?**

**A.** A possible approach would be for FPUD and RMWD to commit to jointly purchase water from SDCWA over the next 10 years, or through 2034, under certain contingencies.

For example, the sale commitment could be triggered each year when SDCWA deliveries to member agencies fall short of 320,700 AF. FPUD and RMWD would commit to purchase the amount by which SDCWA deliveries that year to the remaining member agencies fall short of 320,700 AF, up to a joint cap of, say, 17,500 AF.

The trigger events and the amount of the purchase commitment could also be something different – these are items for negotiation.

Another important issue to be negotiated is what FPUD and RMWD would pay SDCWA when they purchase water under their commitment. One possibility is that they would pay that year's all-in melded SDCWA rate per AF.

## 5. WATER SUPPLY RELIABILITY: SDCWA vs EASTERN MWD

This section addresses the question of whether any substantive difference exists with respect to the overall water supply reliability for FPUD and RMWD depending on whether they are served by SDCWA or EMWD.

**Q. What are the threats to the reliability of supply for FPUD and RMWD?**

**A.** There are conceptually two distinct kinds of threat: (1) A situation occurs where the wholesale supply agency – SDCWA, MWD or EMWD – does not itself have access to sufficient water to provide all the water that FPUD and/or RMWD wishes to obtain; the supply provided to them is curtailed or rationed. (2) A physical break or disruption occurs on a major pipeline supplying FPUD and/or RMWD and there is not sufficient connectivity remaining in the wholesale agency's distribution system to deliver the amount of water that FPUD and/or RMWD wishes to receive. In one case, the wholesale agency lacks sufficient water; in the other, it (temporarily) lacks sufficient connectivity.

**Q. With regard to the possibility of an insufficient water supply, how could that differ as between SDCWA vs EMWD?**

**A.** Difference between SDCWA vs EMWD with regard to the sufficiency of the water supply available to FPUD/RMWD arises because (1) SDCWA and EMWD have access to different supplies of water, and also (2) the member agency status currently proposed for FPUD and RMWD within EMWD will be different from the status they currently have within SDCWA.

**Q. How reliant are SDCWA and EMWD on MWD water?**

**A.** EMWD has a supply of water that it owns (groundwater and recycled water) but, under the arrangement currently proposed, this will not be made available to FPUD and RMWD. The water that EMWD will supply to FPUD/RMWD is supplemental water that it purchases from MWD. Therefore, the reliability of the water to be supplied by EMWD to FPUD/RMWD comes directly from the reliability of MWD's water supply.

According to EMWD's 2020 Urban Water Management Plan, EMWD depended on MWD for 60% of the water that it delivered to its retail and wholesale customers in 2020. Under normal conditions, this is projected to decline to 55% of the water it delivers in 2030, and 51% in 2035.

SDCWA has a core supply of water in the form of QSA water and Carlsbad desalinated water. In addition, it has a supplemental supply purchased from MWD. SDCWA depended on supplemental water from MWD for 24% of the water it delivered to its member agencies in FY

2020. According to SDCWA's 2020 Urban Water Management Plan, under normal conditions this is projected to decline to 14% in 2030 and 4% in 2035. Clearly, SDCWA is far less reliant than EMWD on supplemental water from MWD.

**Q. Does MWD water have any supply reliability issues?**

**A.** Both of MWD's sources of water – SWP water and Colorado River water -- have some supply reliability issues

**Q. What are the supply reliability issues with SWP water?**

**A.** There are supply reliability issues for SWP water with regard to (1) the amount of water available for it to take from its source, the Feather River in the Sacramento Valley, and (2) the ability to convey that water through the Sacramento/San Joaquin Delta to SWP member agencies south of the Delta.

**Q. What are the supply reliability issues with regard to the amount of water SWP can obtain from the Sacramento Valley?**

**A.** There are two long-standing reliability issues and one newer issue now coming into focus.

The long-standing issues are that (i) droughts are a fact of life in California, and (ii) the SWP has relatively little carryover storage compared, say, to the Colorado River – two consecutive years of drought in Northern California could create a bad situation.

The new factor now coming more clearly into focus is climate change. For almost twenty years now, scientists have been warning that climate change will make California's droughts worse – both more frequent and more severe.[39] The new feature is a recognition that not only will droughts become more frequent and more severe in California but they will also become *harder to predict* on a seasonal basis. The higher temperatures currently being experienced in California are making seasonal forecasts of streamflow runoff less reliable, with past forecast methods turning out to be too optimistic.[40] Snowmelt in the Sacramento River Basin was forecast in early May this year to be about 800,000 AF less than had been predicted in early April based on the past relationship between snowpack and runoff. This was equivalent to 10%

[39] This was a major finding from the State of California's Climate Scenarios Project, which I helped to run from 2003 to 2011.

[40] As noted below, the same is turning out to be true for the forecasts of streamflow used for the Colorado River.

less Sacramento River system runoff than had been predicted by California's Department of Water Resources using its standard models and methods.[41]

**Q. Has the SWP supply to member agencies diminished in recent years?**

**A.** Yes.

One indication is the changing estimates of the average Table A amount that the SWP can deliver from the Delta which have appeared biennially in the SWP Delivery Capability Reports since 2005. The estimated average Table A delivery from the Delta was 2.818 MAF/yr in the 2005 Report and is 2.414 MAF/yr in the most recent 2019 Report. This change is due to increased environmental regulation aimed at protecting native species of fish in the Delta, rather than to climate change.

In addition, however, actual SWP deliveries have decreased since 2006 in a manner indicative of climate change. Through 2012, there were only two years in SWP history where it delivered low supplies relative to the Table A amounts – 1991, where it delivered 20% of Table A, and 2008 where it delivered 35%. Since then, there have been six years of very low SWP supplies amounting to 35% of Table A entitlements in 2013, 5% in 2014, 20% in 2015, 35% in 2018, 20% in 2020 and 5% this year.

**Q. What is the Sacramento-San Joaquin River Delta and how does it affect the conveyance of SWP water?**

**A.** The Delta is a web of channels and reclaimed islands at the confluence of the Sacramento and San Joaquin Rivers. It originated through sea level rise after the last ice age bringing a steady accumulation of sediment into a large freshwater marsh which commingled with vast quantities of organic matter from the vegetation, forming an area of shallow channels and sloughs amid low islands of peat and tule. Starting around 1850 with the planting of orchards to provide fresh fruit for the gold mining camps, these Delta lands were drained to reclaim them for farming, protected by levees, to form a network of islands separated by freshwater channels. By 1900, nearly half of the Delta's land area had been reclaimed. By the 1920's reclamation of almost all the farmable land in the Delta had been completed.

When the Central Valley Project (CVP) came into operation in the late 1940s, and then the SWP in the 1960s, the Delta became the hub of the system for transporting water from the Sacramento Valley to the San Joaquin Valley and Southern California. Water stored behind dams in the Sacramento Valley is released into the Sacramento River and flows naturally into the northern end of the Delta. It flows south on the eastern side of the Delta, kept separate by

[41] Abatzoglou, J. et al. "California's Missing Forecast Flows in Spring 2021 – Challenges for seasonal flow forecasting," CaliforniaWaterBlog.com, Posted on July 18, 2021.

the various islands from brackish water on the far western side of the Delta, which would be harmful for water supply purposes. The water flows in the channels between the Delta islands ("Tracts") but, instead of following the natural course of streamflow in a westerly direction to exit the San Francisco Estuary at the Golden Gate, it is sucked by powerful pumps at the southern end of the Delta into two major aqueducts that convey the water to CVP and SWP users in the San Joaquin Valley and Southern California.

**Q. What are the supply reliability issues with regard to the ability to convey SWP water through the Sacramento/ San Joaquin Delta to SWP member agencies south of the Delta?**

**A.** The integrity of the levees has long been a concern. The levees were quite often poorly designed and constructed, they were generally poorly maintained, and they are subject to natural erosion. Moreover, the Delta islands are mainly peat soil which is highly erodible with wind action. The land inside the islands is now mostly below sea level. This land subsidence has triggered failures of some levee and flooding of some islands.

It has also long been known that there are several major earthquake faults within the vicinity of the Delta that are capable of generating ground shaking which could likely lead to levee failure, although so far there have been no significant earthquakes in or closely adjacent to the Delta since the late 1800s.

Between 1900 and 1982, there were over 160 levee failures, but significant improvements were then made to the levee system and there was no major levee failure for the next 22 years. On a sunny June day in 2004, with calm seas, the Upper Jones Tract levee failed spontaneously inundating the entire island with more than 150,000 AF. It took three weeks to repair the levee, using special equipment which had to be brought down from Seattle, and an additional five months to de-water the island, which lay 3 meters below sea level, for a total cost of about $90 million.

Around the same time, new data mapping became available showing that the Delta islands lie further below sea level than previously thought, up to 8 meters in some cases. The implication was that, if a levee was breached, the task of restoring the land would be more arduous than expected because of the great volume of water that would have to be extracted.[42]

Sea level rise due to climate change adds a new risk on top of seismicity. The sea level off San Francisco has risen about 10" since 1900 and is projected to rise by a meter or more by 2100. The threat from sea level rise become acute during a storm coming at high tide, because that increases the chance of waves overtopping levees and destroying them.

[42] Jeffrey Mount and Robert Twiss, "Subsidence ,Sea Level Rise and Seismicity in the Sacramento-San Joaquin Delta." *San Francisco Estuary & Watershed Science*, vol. 3, issue 1 (March 2005).

**Q. What is the current assessment of the supply reliability issues with regard to the ability to convey SWP water through the Delta?**

A. Between land subsidence within the Delta Islands, the fragility of the Delta levees, the threat of an earthquake and the anticipated rise in sea level due to climate change, there is a very high likelihood – in fact, a certainty – of significant levee failures in the Delta during this century. Indeed, there is a high likelihood that *multiple* levees might fail at the same time, whether due to an earthquake or a winter storm at high tide, rather a single levee failing as in June 2004. If several Delta levees were breached simultaneously, the physical resources would probably not be available to repair them all and the islands would be irreversibly flooded.[43] Depending on their location, the flooding of multiple islands would increase the risk of brackish water intruding and comingling with CVP and SWP water being conveyed through the Delta, thereby shutting down those projects' deliveries.

**Q. If it is certain that the current conveyance of CVP and SWP project through the water will not endure, what is California's policy response?**

**A.** California's policy response, which emerged in 2009 and is now known as Water Fix, is to re-rout the conveyance of CVP and SWP project water underneath the Delta through one (or two) tunnels. The tunnel(s) provide an alternative to conveyance using the Delta channels and would eliminate our reliance on the integrity of the Delta levees.

**Q. Will the Water Fix project fix the reliability issues for SWP?**

**A.** Once Water Fix is completed, it will eliminate the present risk associated with the ability to convey SWP and CVP water to users south of the Delta. It will maintain the current ability to convey SWP water against the threat of future disruption. It is a means of preserving the status quo.

It will not fix the unreliability associated with declining streamflow in the Sacramento River Basin due to the effects of climate change.

**Q How much will Water Fix cost?**

A. The cost of the Water Fix project was estimated at $15 billion in 2016. With construction delays and possible cost overruns, the cost may turn out to be higher.

[43] "Over the next 50 years there is a two-third chance of catastrophic levee failure in the Delta leading to multiple island floodings and the intrusion of sea water" PPIC 2007, p. v

**Q. Will Water Fix raise the cost of SWP water?**

**A.** Undoubtedly.

Water Fix does not generate any additional water supply. It prevents future reductions in SWP deliveries to member agencies south of the Delta that would be caused by failures of the levees in the Delta. In effect, SWP member agencies will have to pay more -- $15 billion more – for the same amount of water they receive at present.

**Q. Will Water Fix raise the cost to SDCWA to convey QSA water from the Colorado River to SDCWA's service area?**

**A.** The Sacramento Valley's SWP and the Colorado River are two different sources of water. From an economic perspective, there would be no legitimate reason to comingle the cost of conveying SWP water through the Delta and over the Tehachapi Mountains with the cost of conveying QSA water from the Colorado River to the SDCWA service area. From an economic perspective, it could be seen as a form of predatory pricing if that were to occur.

**Q. When will Water Fix be completed?**

**A.** That is not known at present.

**Q. How important is MWD's Colorado River water as a source of supply for MWD compared to its SWP water?**

**A.** As noted earlier, MWD was formed to bring water from the Colorado River to Southern California. The Colorado River constituted MWD's only source of supply until SWP deliveries started arriving in the 1970s. The Colorado River remained MWD's dominant source of water until the QSA was implemented in 2003.[44] Between 1982 and 2002, MWD took an average of over 1.1 MAF annually from the Colorado River alongside an average of 860,000 AF annually from the SWP. Over this period, the Colorado River made up 56.8% of MWD's supply while the SWP made up 43.2%. The access to Colorado River water shielded MWD from the worst effects of drought on SWP supplies in 1977 and 1991.

The situation changed once the QSA came into effect in 2003. MWD's firm supply of Colorado River water was reduced to about 600,000 AF.[45] In consequence, MWD has come to rely more

[44] In the fifty years prior to 2003, California overall had exceeded its 4.4 MAF annual apportionment of Colorado River water almost every year, drawing on Arizona's and Nevada's unused apportionments. About half of the time California took more than 5 MAF.
[45] See footnote 7 above.

on its SWP supply. Between 2003 and 2020, the Colorado River made up about 37% of MWD's supply, while the SWP made up about 63%.

**Q. Apart from the reduction in MWD's water right once the QSA was implemented, are there any supply reliability issues affecting Colorado River water?**

**A.** Climate change, which has been impacting the availability of streamflow in the Sacramento River Basin, is also affecting streamflow in the Colorado River Basin.

The drought in the Colorado River Basin has actually been more severe and more sustained than that in the Sacramento River Basin.

Lake Mead was last at full capacity (an elevation of 1,221 feet) in 2000. Over the subsequent 22 years, the watershed has experienced 17 dry years. According to Udall and Overpeck (2017): "Between 2000 and 2014, annual Colorado River flows averaged 19% below the 1906–1999 average, the worst 15-year drought on record. Approximately one-third of the flow loss is due to high temperatures now common in the basin, a result of human caused climate change."[46] The drought continued, with dry winters in 2019-2020 and in 2020-2021.

Until now, water users were shielded by the availability of extensive storage in the basin, including in Lake Mead and Lake Powell, the two largest reservoirs in the U.S. However. Those reservoirs have been depleted since 2000 and are now at the lowest levels ever reached since they first being filled (Lake Mead around 1935, Lake Powell in 1980). Between January 1 and October 1 of this year, the water level in Lake Mead dropped by 16 feet and is projected to decline another 9 feet, for a total of 25 feet this calendar year, to a level of 1,067 feet. A decline of one foot in the level of Lake Mead corresponds to a reduction of about 85,000 AF held in storage. Lake Mead is now at 35% of its capacity.

**Q. Is the historically low water level in Lake Meade currently an issue for California's water supply from the Colorado River?**

**A.** It is not currently an issue for California, but it *is* an issue for Arizona and Nevada under the Interim Guidelines for the Colorado River Lower Basin promulgated by the Secretary of the Interior in 2007 in response to then seven years of drought in the Colorado River Basin.

The Secretary of the Interior functions as the master of the river for the Colorado River Lower Basin and must approve all diversions in the Lower Basin. The 2007 Guidelines set limits on diversions by the three Lower Basin states depending on the amount of water in storage at Lake Mead. Those limits are now taking effect.

[46] Xiao, Udall and Lettenmaier, "On the Causes of Declining Colorado River Streamflows" *Water Resources Research*, August 2018 subsequently modified this analysis to estimate that 50% of the flow reduction from 2000 to 2014 was due to higher temperatures..

The limits are tied to specific water elevations in Lake Mead. Under the Interim Guidelines, as supplemented by the 2019 Drought Contingency Plan for the Lower Basin, Tier Zero applies in a calendar year when the January 1 elevation is projected to fall below 1,090 feet. This has been in effect since January 2020. Under Tier Zero, Arizona forfeits 192,000 AF of its 2.8 MAF annual entitlement to Colorado River water, and Nevada forfeits 8,000 AF of its annual entitlement to 300,000 AF.

Tier One applies when the elevation at Lake Meade on January 1 is projected to fall below 1,075 feet (which happened this May).[47] Under Tier One, Arizona forfeits a total of 512,000 AF of its Colorado River entitlement, and Nevada forfeits 21,000 AF. In August, the Secretary of the Interior announced that the Tier One restrictions will take effect starting January 2022.

Tier One restrictions do not apply to California.

**Q. Could a historically low water level in Lake Meade become an issue for California's water supply from the Colorado River?**

**A.** Yes.

California starts to forfeit some of its annual entitlement to Colorado River if the projected January 1 elevation falls below 1,045 feet, which triggers what is known as Tier 2b.[48] [49]

Under Tier 2b, California forfeits 200,000 AF of its 4.4 MAF entitlement to Colorado River water; Arizona forfeits 640,000 AF; and Nevada forfeits 27,000 AF.

If the projected January 1 elevation of Lake Mead falls below 1,025 feet, this triggers Tier Three for that year.[50]

Under Tier Three, California forfeits 350,000 AF, Arizona forfeits 720,00 AF, and Nevada forfeits 30,000 AF.

The Bureau of Reclamation issues five-year projections of future conditions in the Colorado River system in January every year and then updates them in April and August. The projections released this August, looking through January 2026, project zero chance that Lake Mead will be below 1,025 feet in January 2022, a 22% chance in January 2023 (thereby triggering Tier Three), a 44% chance in January 2024, a 66% chance in January 2025, and a 62% chance in January 2026.

[47] To put this in perspective, as explained below Lake Mead is holding water to meet a delivery of 9 MAF to the Lower Basin states and to Mexico, plus there is 0.6 MAF of evaporation loss from Lake Mead. At an elevation of 1,075 feet, Lake Meade is storing about 9.6 MAF.
[48] Tier 2a is triggered if the elevation falls below 1,050 feet. That tier impacts only Arizona (which forfeits 592,000 AF) and Nevada (which forfeits 25,000 AF).
[49] At an elevation of 1,045 feet, Lake Mead is storing about 7.3 MAF.
[50] At an elevation of 1,025 feet, Lake Mead is storing about 6 MAF.

The Bureau also projected that, while there is zero chance that Lake Mead will fall below 1,000 feet in January 2022 or 2023, there is a 12% chance that it will fall below 1,000 AF in January 2021, and a 22% chance in January 2025 and 2026. An elevation below 1,025 feet, such as 1,000 feet, was not anticipated in the 2007 Interim Guidelines and would necessitate more drastic actions by the Lower Basin states.[51]

Obviously, conditions may change between now and January 2023 or January 2025, but as of today there is a real probability that Tier Three may take effect, thus cutting back the amount of water that California can obtain from the Colorado River.

**Q. If California did have to forfeit some of its entitlement to Colorado River water, would that affect MWD and SDCWA equally?**

**A.** No.

Reductions in the diversion of Colorado River water are governed by the seniority of the right to that water within California. Under the 1931 Seven-Party Agreement among California users of Colorado River water, there are four tranches of seniority. The first two seniority tranches take up the full current allocation of 4.4 MAF. The senior allocation is 3.85 MAF for Palo Verde Irrigation District, the Yuma Project, and Imperial Irrigation District. Junior to this is an allocation of 550,000 for MWD.[52]

SDCWA obtains all of its Colorado River water in a transfer or exchange with IID and this water is covered by IID's seniority.

Some of MWD's Colorado River water comes from a transfer agreement with Palo Verde Irrigation District (about 50,000 AF) and is covered by that seniority. The remainder of MWD's Colorado River water comes from its lower seniority right of 550,000 AF, and this is junior to the QSA water which SDCWA obtains from IID.

Therefore, if California is required to forfeit some of its entitlement to Colorado River water, the reduction would be disproportionately larger for MWD than for SDCWA.

Exactly how the reduction would be apportioned among the California users is something that could be modified in future negotiations, including negotiations among the Lower Basin States, and also between them and the Upper Basin states, to formulate a post-2026 Drought Contingency Plan. Those negotiations are likely to be brutal.[53]

---

[51] The 2019 Drought Contingency plan itself expires at the end of 2026, by when a new Drought Contingency Plan will have to be negotiated.

[52] Following this is an additional allocation of 662,000 AF to MWD, followed by an allocation of 300,000 to Imperial Irrigation District and Palo Verde Irrigation District. These would come into play in the event of a surplus supply of Colorado River water.

[53] The executive director of the Colorado River Board of California, which coordinates California's users of Colorado River water, was quoted last month as saying that the basin states must grapple with the "new normal" of reduced

**Q. Will the water supply situation in the Colorado River get better in the long run?**

**A.** No.

In addition to climate change, there is a second calamitous threat to the Colorado River Basin states' entitlements to Colorado River water. Even without climate change, the fact is that the river was over-allocated when the Colorado River Compact was negotiated among the states in 1922. The seven basin states divided up among themselves water that did not actually exist.

The negotiators of the Compact believed that the natural flow of the Colorado River at Lees Ferry was 17.5 MAF. The Compact itself allocated 16.5 MAF – 7.5 MAF each to the Upper and Lower Basins, and 1.5 MAF held for an eventual arrangement with Mexico.[54] This was mistaken in two ways. It overlooked evaporation and operational losses, and it overestimated streamflow.

Because of evaporation and operational losses, there is a water deficit built into the Lake Mead Budget. With releases from Lake Powell upstream and side inflows, the annual inflow into Lake Mead would average 9.0 MAF. Lake Mead is intended to deliver 9.0 MAF to the Lower Basin and to Mexico. However, there is an evaporation loss of 0.6 MAF from Lake Mead itself, and there are evaporation and operational losses downstream of Lake Meade also amounting to about 0.6 MAF. The result is a structural deficit of 1.2 MAF.

At the time the Compact was negotiated, some government hydrologists had lower estimates of the average natural flow of the Colorado River over the prior period 1878-1920, including 14.2 MAF and 15 MAF.[55] These turned out to be closer to the mark. The average over the period 1906-2017 is 14.8 MAF, but with a clear downward trend. The average flow between 2000 and 2018 was only 12.8 MAF; extended through 2021, this average falls to 12.4 MAF.

At its maximum extent (Tier 3), the 2019 Drought Contingency Plan brought about a reduction of 1.1 MAF in total diversions by Lower Basin States, which more or less removed the structural deficit at Lake Mead with an average annual streamflow at Lees Ferry of 14.8 MAF. But, Tier Three is not adequate if the "new normal" average streamflow is 12.4 MAF. Closing that gap might require some cap on Upper Basin diversions along with a substantial increase – perhaps a doubling – in the reductions imposed on the Lower Basin states under a post-2026 Drought Contingency Plan.

---

flows. "We're dealing with a new reality, and it's got to change the way we think about putting our long-term plans together" *FarmProgress*, September 17, 2021, accessed at https://www.farmprogress.com/print/444857.

[54] The treaty with Mexico was negotiated in 1944.

[55] The story of these estimates and their neglect by the parties negotiating the Compact is recounted by Kuhn and Fleck, *Science Be Dammed: How Ignoring Inconvenient Science Drained the Colorado River*. University of Arizona Press, 2019.

**Q. In summary, what are the differences in the reliability of water supply for FPUD and RMWD as between SDCWA and EMWD?**

**A.** In 2020, SDCWA depended on MWD for only 24% of its supply, and this is expected to decline to 14% by 2030. The rest of SDCWA's supply is desalinated water from Carlsbad, which is protected from the depredation of climate change, and QSA water which is shielded by IID's senior right to Colorado River water.

If served by EMWD, FPUD and RMWD would be 100% dependent for their water on MWD. Since the QSA came into effect in 2003, MWD has relied on the SWP for 63% of its supply, and on the Colorado River for the remainder. The SWP faces significant challenges with respect to both the volume of water it can expect to obtain from the Sacramento River Basin in the future and also its ability to convey that water to member agencies south of the Delta. With regard to MWD's water from the Colorado River, most of this holds a lower level of seniority than SDCWA's QSA water.

**Q. Has EMWD assessed the reliability of the MWD supply that it could offer to FPUD and RMWD if they were to become member agencies?**

**A.** Yes.

EMWD submitted a Technical Memorandum dated February 12, 2020, which concludes that EMWD possesses adequate supplies from MWD such that no wholesale customer agency, including RMWD and FPUD, would be subject to a MWD drought penalty fee, even at an MWD Shortage Level 5.

By way of context, in 1990 (as noted above) MWD had adopted a first-ever drought management plan which called on member agencies to voluntarily cut their water usage. As that drought grew more severe, this became a mandatory requirement ultimately cutting back municipal water deliveries by 30% and agricultural deliveries by 90%. That rationing program ended when the drought abated.

In 2007, with the possibility of drought re-appearing, MWD initiated a process to develop what became its Water Supply Allocation Plan (WSAP), adopted in February 2008 and put into effect in April 2009, covering the period July 2009 – April 2011.

In 2014, when another dry year was anticipated, the WSAP was updated and then implemented in April 2015, covering the period July 2015 – June 2016.

The 2014 version remains MWD's official policy for allocating supplies in the event of shortage.

Key features of the WSAP is that (1) it does not impose mandatory cutbacks but, instead, uses an economic incentive to encourage member agencies to achieve their targeted reduction in water use, and (2) the targeted reduction is tailored to the circumstances of each member agency based several factors including its dependence on MWD at the retail level and its existing level of per capita use.

As in the 1990 program, there are tiers of reduction corresponding to the degree of regional water shortage. In Tier 3, which applied in 2015-2016, depending on their situation member agencies received an allocation from MWD that at a minimum is 7.5% less than their baseline allocation and is no more than 30% below that baseline.[56] In Tier 5, MWD member agencies receive an allocation that at a minimum is 12.5% below their baseline allocation and is no more than 37.5% below that baseline.

However, if a member agency needs to exceed its WSAP allocation, it can do so on payment of a surcharge of $1,480/AF above the MWD Tier 1 water rate[57] for excess water up to 15% over the WSAP allocation, or a surcharge of $2,960/AF for excess water beyond 15% over the WSAP allocation.

Without going into details, two points should be noted with regard to EMWD's analysis:

(1) If MWD's shortage coincides with a drought during which the Governor of California requires retail water agencies to meet certain conservation mandates, as happened in 2015 and 2016, retail agencies that comply with the Governor's mandate may have little difficulty in getting by with MWD's reduced WSAP supply.

(2) If FPUD and RMWD are member agencies of EMWD and MWD implements a WSAP reduction, FPUD and RMWD themselves can get by with cutting their consumption by *less* than EMWD's overall WSAP supply reduction if other EMWD retail customers turn out to cut their consumption by *more* than EMWD's overall WSAP supply reduction. What matters for MWD is the overall compliance with a WSAP supply reduction by a member agency, not compliance by the individual agencies served by the MWD member agency.

**Q. What other assumptions are being made in EMWD's analysis of the reliability of its supply?**

**A.** EMWD is making two other assumptions.

The first assumption is that MWD will be able to maintain its current policy of non-mandatory supply restrictions on member agencies combined with surcharges for missing the WSAP supply allocation, rather than imposing mandatory restrictions as was done in 1991. The current WSAP

[56] Member agencies more heavily dependent on MWD received a smaller cutback.
[57] For comparison, the MWD Tier 1 rate for treated water is $1,104/AF in 2021.

policy provides more flexibility to MWD member agencies but it is not clear that it will always be viable in the future if MWD comes to face a severe supply shortage.

The second assumption is that EMWD will be able to resolve any disagreement among its retail and wholesale customers that might perhaps arise if some of its wholesale customer agencies fail to reduce their water use sufficiently to avoid EMWD's overall WSAP supply reduction, thereby triggering MWD's WSAP surcharge rate, especially given that there are two classes of EMWD wholesale customer agencies which pay different wholesale rates and receive different levels of service from EMWD.

**Q. What are the two classes of EMWD wholesale customer agency?**

**A.** As a wholesaler of water, EMWD has two types of customers.

What might be called full-service member agencies make use of EMWD's distribution system infrastructure and (subject to operational constraints) have access to its local supplies from recycled wastewater, groundwater and desalinated groundwater. For this they pay a supply charge amounting (this year) to $1,350/AF. This charge is equivalent to MWD's Tier 1 rate for treated water ($1,104) plus an additional charge of $246/AF for access to EMWD's distribution system.

Another type of agency is what might be called a limited-service member agency. At present, the prime example is Rancho California Water District (RCWD). RCWD has an MWD pipe passing through its service area and it takes water directly from turnouts on the MWD pipe. It does not have access to EMWD's distribution system, and it does not receive any of EMWD's local supply: all of the water it obtains through EMWD comes from the turnouts on MWD's pipeline. It is billed for this MWD water through EMWD. It pays EMWD the MWD Tier 1 rate for treated water plus an administrative fee of $11/AF to cover EMWD expenses, for a total charge (this year) of $1,115/AF.

If FPUD and RMWD join the EMWD service, EMWD plans to treat them the same as RCWD – they will make no use of EMWD's distribution system, they will have no access to EMWD's local supply, and they will pay MWD's Tier 1 treated water supply rate plus an administrative fee of $11/AF.

According to EMWD's 2020 UWMP, EMWD's wholesale customers received a total supply of 37,669 AF, while its retail customers received 115,916 AF, for a total delivery of 153,585 AF. RCWD accounted for two-thirds of EMWD's total deliveries to its wholesale customer agencies (25,028 AF) and 16% of its deliveries to all customers, retail as well as wholesale.

Using the data from their 2020 UWMPs, if FPUD and RMWD had been member agencies of EMWD in 2020, that would have raised EMWD's deliveries to limited-service customer agencies by 22,600 AF. The limited-service customer agencies would then have accounted for 80% of

EMWD's total deliveries to its wholesale customer agencies, and 27% of its deliveries to all customers, retail as well as wholesale.

**Q. In the event that MWD imposes a WSAP supply reduction on EMWD, would there be any concerns within EMWD about allocating the reduced availability of MWD water to its limited-service wholesale customers on exactly the same terms as its retail customers and its full-service wholesale customers?**

**A.** In its Technical Memorandum EMWD implicitly assume that there would be no objection to doing this – no objection to treating limited-service wholesale customers such as FPUD or RMWD in exactly the same way as other, full-service wholesale customers. Since the limited-service wholesale customers are paying EMWD a markup of $11/AF over the MWD Tier 1 water rate while the full-service wholesale customers are paying a mark-up of $246/AF, one wonders whether this assumption might be a bit over-optimistic.

**Q. Is urban growth in EMWD's service area also a consideration here?**

**A.** Yes.

Based on data from the 2020 UWMP, EMWD's retail service population and its current wholesale service area population are each expected to grow by around 22% between 2020 and 2035. Demand for water is expected to grow more over this period -- by 46% in the retail service area and by 59% in the current wholesale service area. By 2035, EMWD will need to supply an additional 75,315 AF/yr (an increase of 49% overall).

To meet this extra demand, EMWD plans to increase its recycled water supply by 31% and its groundwater supply by 38%. In addition, it will need an extra 24,920 AF/yr from MWD by 2035, an increase of 27% compared to now.

If FPUD and RMWD join EMWD's service area this will add an extra demand of about 17,600 AF/yr in 2030 and 2035, raising the need for extra MWD water to 42,543 AF/yr in 2035, an increase of 46% compared to now.

**Q. In summary, what factors affect the reliability of supply for FPUD and RMWD if they join EMWD compared to the reliability they have with SDCWA?**

**A.** There are three main factors:

1. The reliability of MWD's supply compared to the reliability of SDCWA's supply. As noted above, MWD's sources of supply – the SWP and its right to Colorado River water – are now less

reliable than SDCWA's sources of supply – QSA water from the Colorado River and desalinated water from the Carlsbad facility.

2. The degree to which, when MWD imposes a WSAP supply reduction in the future, EMWD will share the reduced supply of MWD water the same with its limited-service wholesale customers as with its full-service wholesale customers.

3. The extent to which rapidly growing urban demand in EMWD's service area over the next 10 years or so generates pressure within EMWD on its supply of water from MWD.

## 6. CONCLUDING OBSERVATIONS

Water supply is highly capital intensive – more so than any other utility industry -- and water supply infrastructure is massively affected by economies of scale. A consequence is that water supply infrastructure is typically developed intermittently in large increments, rather than through a smooth and gradual development over time. Supply investments are made on a scale significantly ahead of current demand conditions, but then demand evolves to catch up with supply capacity.

At any given time, different wholesale water supply agencies in the same region can find themselves at different phases of their investment cycle. Thus, MWD had to finance major investments in its supply infrastructure in the 1960s and 1970s, with the development of the SWP, and in the 1990s, with the Eastside Reservoir. SDCWA had to finance major investments in its supply infrastructure during the past fifteen years. And, in the next decade or so, MWD will face major cost increases to finance the Delta Water Fix.

Since 2008, Southern California, and especially San Diego County, has experienced a remarkable and unprecedented reduction in urban water use per capita. This has occurred on a scale and at a pace that nobody expected – or could have expected. It reflects the success of the region's efforts to promote water conservation and its initiatives to expand local supply, especially the re-use of treated wastewater.

Reducing our water footprint per capita is essential for California's long-run sustainability and for the long-run economic prosperity of our arid region. In the short-run, however, it poses a severe economic challenge. With the large fixed-cost component of water supply, the cost of operating a water supply system does not fall commensurately with the reduction in water delivered. Cost per acre foot delivered inevitably rises when less water is delivered. Over time, population growth takes up the slack in supply capacity and mitigates the increase in water cost. But, mitigation does not occur right away. The fiscal pain of reduced sales but the same fixed costs will be felt for some time.

This is a fundamental problem not only for San Diego County's water supply but also, to a greater or lesser degree, for water supply in California and other parts of the United States. It just is becoming visible in San Diego County sooner than elsewhere.

Traditionally, member agencies of a wholesale water suppliers in California and elsewhere have wanted to preserve their flexibility. They want the necessary investment in water supply infrastructure to occur, but they do not want to have to commit themselves financially to pay for using the infrastructure in the future. That has been the financial model of urban water supply in this country. This financial model is now broken. It is a financial challenge for all wholesale water supply agencies in California, including MWD. In the face of the common challenge, it will be essential to have a strong degree of cooperation and collaboration between Southern California's two premier water supply agencies.