

Southern California Agricultural Water Team

Southern California Water Supply and Implications for Agriculture

Introduction

Coming off the driest year in southern California history and the continuation of eight years of drought on the Colorado River, water agencies were hoping for some relief as 2008 arrived. California water managers knew 2008 would not be easy with a recently imposed federal court order restricting pumping from the California State Water Project and invasive quagga mussels making their way into the pipes and reservoirs of the State's water supply system. After a promising start, the spring has turned out to be extremely dry as three consecutive months of record low precipitation have taken their toll on spring runoff. As we enter the summer, the California Governor has declared the first official statewide drought since 1991, and the Metropolitan Water District of Southern California (Metropolitan), the region's major water wholesaler, has called a Water Supply Alert. Combine these conditions with the worrisome predicted effects to water supplies from climate change, the increasing uncertainty of the future of California's water supply has caught the attention of not only water managers, but lawmakers and the general public as well.

Summary

For southern California farmers and growers, 2008 brought a 30 percent cut in Metropolitan's Interim Agricultural Water Program (IAWP) water supplies. While growers are always mindful of water conditions, this paper is intended to inform the avocado grower community of the current water situation and to provide an informed opinion on the future of water supplies in the region. It also provides an overview of California's water system with a particular focus on Metropolitan, which has largely managed imported water supplies for southern California since 1928. It goes on to discuss efforts to increase the reliability of Metropolitan's two major supply sources – the State Water Project and the Colorado River – which have been the lifeblood of Southern California. Finally, the paper will discuss Metropolitan's agricultural water rates, particularly the current IAWP instituted in 1994. The future of the IAWP is uncertain and this paper will discuss the options being considered for the future of the program.

California's Water System

California's water system is an intricate system of natural and man-made features – reservoirs, canals, and pipelines. This complex water system has allowed cities to grow, and agriculture and industry to thrive in an otherwise semi-arid state.

Approximately 40 percent of California's water supply comes from groundwater. The importance of California's groundwater resources can be summarized as: "It is unlikely that California could have achieved its present status as the largest food and agricultural economy in the nation and fifth largest overall economy in the world without groundwater resources."¹

The other most important link in California's water supply system is the Sacramento - San Joaquin River Delta. The Delta is the largest estuary on the West Coast which sustains wildlife habitat for numerous species. It is also sustains the life of 23 million Californians and more than 7 million acres of farmland. Two of the state's biggest water projects – the State Water Project and the Central Valley Project – rely on the Delta to convey water to project pumping facilities.

The backbone of California's water infrastructure is made up of seven major systems of aqueducts and associated infrastructure which capture and deliver water within the state:

- Central Valley Project (federal) delivers 7 million acre-feet
- State Water Project (state) delivers 2.3 million acre-feet
- All-American Canal (local) delivers 3 million acre-feet
- Colorado River Aqueduct (local) delivers 1.2 million acre-feet
- Los Angeles Aqueduct (local) delivers 200,000 acre-feet
- Mokelumne Aqueduct (local) delivers 364,000 acre-feet
- San Francisco Hetch Hetchy Project (local) delivers 330,000 acre-feet

About two thirds of California's water supply originates north of Sacramento, while two thirds of the demand is from the southern part of the state. Southern California also relies on water from the Colorado River. The entitlement to 4.4 million acre-feet per year (plus half of all surplus) gives California the largest share among the seven states in the Colorado River basin. Nevertheless, California historically has taken more than its share and used as much as 5.37 million acre-feet in a year. In the late 1990s, as growth in Nevada and Arizona propelled these two states to use their full allotment, California was put under pressure to reduce its reliance on the Colorado River.

Planned infrastructure – to address population growth and increasing demand – the Delta, All American Canal, proposed dams, Pipeline 6.

Southern California Water Supply and Demand

The water of Southern California is managed largely by the Metropolitan Water District of Southern California (Metropolitan). Metropolitan, formed in 1928, is a consortium of 26 member cities and water districts which provides drinking water to 18 million people in Southern California. The mission of Metropolitan is to “provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.”²² Metropolitan currently delivers approximately 1.7 billions gallons of water per day to a 5,200 square mile service area.

Metropolitan Water Supply and Demand

2007 marked the driest year in Southern California record since 1877, surpassing the prior record set in 2001/02. The Colorado River continued into its eighth year of drought. As of May 1, 2007, Metropolitan has stopped delivering water for replenishment purposes to reduce demands.

January and early February of 2008 brought significant amounts of precipitation to California, including heavy snowfall in the mountains. Snow water content in California in March 2008 was almost twice as much as in 2007. The large water supply reservoirs in California received some inflow from these storms; however, the amounts were muted because much of the precipitation fell as snow. Because of the extremely dry conditions in 2007, the current long-term, dry hydrologic conditions still prevail. Storage in most of the major water supply reservoirs is still well below average and it would take a significant increase in the snowpack to fill them.

The total demands for 2008 were projected to be 2.13 million acre-feet (as of April 2008). These demands include deliveries to Interim Agricultural Water Program (IAWP) customers. Colorado River supplies for calendar year 2008 are estimated to be 778,910 acre-feet, including the agricultural underuse estimate. The State Water Project Table A allocation is reduced from 60 percent in 2007 to only 35 percent. Based on this allocation, Metropolitan has about 752,600 acre-feet of SWP supplies. The current projection continues to show that Metropolitan has a supply gap of 660 thousand acre-feet.



California Aqueduct through a Dry Central Valley in April 2008



California Aqueduct through a dry Central Valley in April 2008

The balance of supply to meet demand will be made up through the Water Surplus and Drought Management Plan (WSDM) actions. As of May 2008, the WSDM (pronounced wisdom) supplies and management actions available for CY 2008 are approximately 750 TAF. The WSDM actions for 2008 include: pulling from Central Valley storage programs; increasing conservation outreach; withdrawing from surface storage; interrupting replenishment; and pulling from in-basin groundwater storage programs.



*Colorado River Drought Causes Water Level Drop at Lake Mead
(Source: http://www.h2ouniversity.org/html/3-5_facts_drought.html)*



Harvey O. Banks Pumping Plant

(Source: California Department of Water Resources and <http://aquaforia.com/archives/category/aquaforia-exclusives/slideshows>)



San Luis Rey Reservoir (Source: California Department of Water Resources and <http://aquaforia.com/archives/catagory/aquaforia-exclusives/slideshows>)

Sacramento – San Joaquin River Delta Update

Not only that it is a critical habitat for more than 500 species, the Sacramento - San Joaquin River Delta is also the hub of California's major water conveyance system which sustains the life of 23 million Californians and more than 7 million acres of farmland. Two of the state's biggest water projects – the State Water Project and the Central Valley Project – rely on the Delta to convey water to project pumping facilities.

Today, the Delta is in crisis with the decline of important fish species, court-ordered reductions in amount of water that can be pumped, increased urbanization in the floodplain, and anticipated major disaster from sudden collapse of vulnerable and aging levees. The court ruling by Judge Oliver Wanger, “the Wanger decision,” now affects pumping in the first six months of the year during the smelt spawning season and could reduce water deliveries to Southern California by up to 30 percent from their norm. Conditions of century-old levees are deteriorating. Some parts of the Delta have sunk to as much as 30 feet below sea level. State and federal agencies are trying to find sustainable solutions to save the hub of California's water supply. A number of concurrent planning efforts are underway to find a sustainable solution for the Delta. The two major efforts are the Governor's Delta Vision Process and Implementation Plan and the Bay-Delta Conservation Plan (BDCP).

Governor's Delta Vision Process

Governor Arnold Schwarzenegger formed the Delta Blue Ribbon Task Force in 2006 to “identify a strategy for managing the Delta as a sustainable ecosystem that would continue to support environmental and economic functions that are critical to the people of California.” Late 2007, the Task Force released “Our Vision for the California Delta” report³ which gave 12 recommendations of its vision. The recommendations emphasize the Delta ecosystem and reliable water supply as co-equal goals for sustainable management of the Delta; the importance of conservation and water use efficiency goals as policy drivers; new facilities for conveyance and storage, and better linkage between the two.

The report included a combination of ways to fix the infrastructure (levees, water conveyance system, and related infrastructure) and

to restore the ecosystem. Four alternatives were proposed:

1) Existing Through-Delta Conveyance, with addition of habitat restoration amounting to 28% of BDCP planning area

2) Improved Through-Delta Conveyance, separating water supply conveyance flows from the San Joaquin River and providing habitat restoration to 35% of BDCP planning area

3) Dual Conveyance, similar to Option 2 with an additional isolated conveyance facility from the Sacramento River to the south Delta export facilities

4) Peripheral Aqueduct, a peripheral aqueduct from Sacramento River to the south Delta export facilities, which would allow habitat restoration to 75% of BDCP planning area

The concept of a new conveyance system is a resurrection of the peripheral canal concept rejected by voters in 1982 which still faces critique this time round. The dual intake and the isolated facility are likely to offer higher water supply reliability compared to the through-Delta conveyance options as well as provide diversions out of critical fish habitat. While some advantages are clear, opponents contend that the peripheral canal alternative may lead exporters to pump more than they should, in turn harming the Delta.

In February, the Governor wrote state Democratic senators outlining the key actions that he would like to see move forward in 2008. The Governor has directed the California Department of Water Resources and other relevant agencies to begin evaluating the feasibilities of the four water conveyance improvement alternatives; to expedite the eco-restoration process; and to develop a multi-agency Delta disaster plan. The range of conveyance alternatives outlined by the Task Force has overlap with alternatives being reviewed as part of the other major planning effort, the Bay-Delta Conservation Plan (BDCP).

Bay-Delta Conservation Plan

The stated purpose of the BDCP is to “help recover endangered and sensitive species and their habitats in the Delta in a way that also will provide for sufficient and reliable water supplies.” The BDCP is being prepared through a voluntary collaboration of state, federal, and local water agencies, state and federal fish agencies, environmental organizations, and other interested parties, which form the BDCP

Steering Committee.

Southern California water suppliers, led by Metropolitan staff and an independent consulting firm hired by the Bay-Delta Conservation Plan Steering Committee, conducted feasibility and technical analyses of the Delta conveyance and environmental alternatives. The analyses indicate that a dual intake conveyance approach would allow the greatest flexibility in meeting water demands by taking water where and when it is least harmful to migrating salmon and in-Delta fish species. It would also reduce longer-term risks associated with seismic-induced flooding and sea-level rise. Furthermore, this conveyance option would provide the ability to restore fishery habitat throughout the Delta and minimize disruption to tidal food web processes.

Metropolitan's Delta Action Plan

In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for actions to build a sustainable Delta and reduces conflicts between water supply conveyance and the environment. This framework is comprised of the following three components:

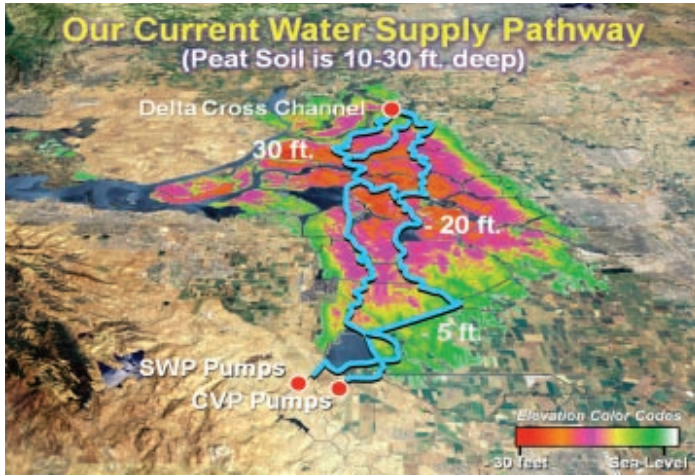
Short Term Action Plan (1-3 years): Actions to secure short-term permits (1) for operating the State Water Project Banks' Pumping Plant and (2) securing state and federal Endangered Species Acts "take" authorization; emergency preparedness steps to prepare for the possibility of catastrophic failure in the event of earthquake or flood; begin eco-restoration projects.

Mid Term Action Plan (3-5 years): Continue implementation of the BDCP projects; continue with selected habitat and fishery improvements to improve Delta native species; begin implementing flood control protections, including bypasses and levee improvements; finalize site selection and environmental documentation for new storage projects; implement new governance structures for managing the Delta; and undertake implementation of the long-term Delta solution.

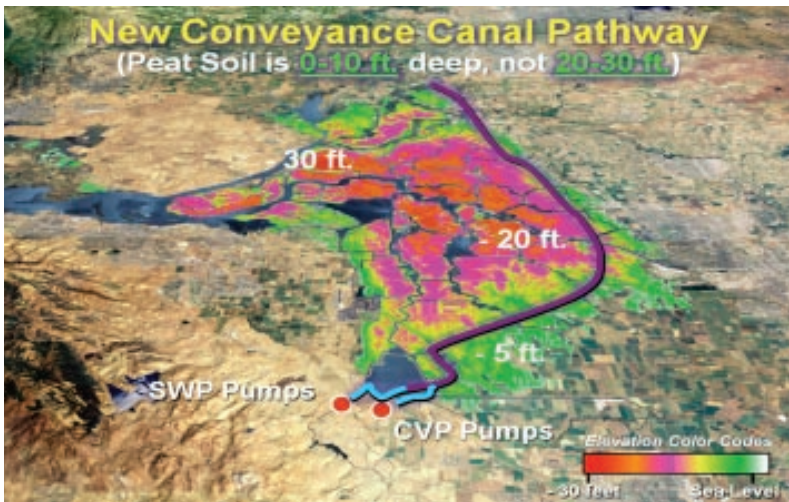
Long Term Action Plan (5-10 years): Actions to fully implement, govern, and finance the elements of a long-term Delta Vision. There are three basic elements that must be addressed: Delta ecosystem restoration; water supply conveyance; and flood control protection and storage development.

Additional Information

To learn more about the Delta Vision work, please visit their website at <http://www.deltavision.ca.gov/>. The Public Policy Institute of California also offers many publications related to California water. Its latest publication on the Bay-Delta topic is *Envisioning Futures for the Sacramento-San Joaquin Delta* (2007)⁴.



Current Through-Delta Water Supply Pathway
(Source: Delta Improvements Update, Metropolitan Water District Special Committee on Bay Delta, Presentation from May 27, 2008, meeting)



Proposed Conveyance Canal Pathway
(Source: Delta Improvements Update, Metropolitan Water District Special Committee on Bay Delta, Presentation from May 27, 2008, meeting)

Colorado River Update

After years of taking more than its share of the Colorado River water, California agreed in 2003 to gradually reduce its take from the river to 4.4 million acre-feet. In December 2007, the seven Colorado River basin states signed a Drought Allocation Plan. This agreement is considered one of the most important by the signing parties since the 1922 compact that originally divided the river's bounty. This 2007 agreement favors California in that in the event of drought, Arizona and Nevada will take the hit first. California will not suffer until the level of Lake Mead goes down to 16 percent. Lake Mead, behind Hoover Dam in Nevada, is 48 percent full after eight years of drought.

Future Trends of Metropolitan's Actions

The increasing uncertainty to secure water supply for Southern California has made Metropolitan impose its first interruption to the Interim Agricultural Water Program (IAWP). Commenced on January 1, 2008, this was the first interruption since the program started in 1994. This interruption cuts water deliveries to agricultural customers within the Metropolitan service area by 30 percent.

In July 2007, Metropolitan and member agencies started drawing up a Water Supply Allocation Plan. The Plan was approved by the Metropolitan Board on February 12, 2008. The Plan is intended to provide the basis for the urban water shortage contingency analysis including specific formulas for calculating member agency supply allocations and key implementation elements for when shortage is declared.

As Metropolitan prepares for water shortage, it is also raising the price of water. On March 12, 2008, Metropolitan approved a 14.3 percent water rate increase to be effective January 1, 2009. This increase reflects the cost to replace water lost from the State Water Project and the Colorado River, the rising cost of power, the rising cost of treating and distributing water, and the efforts to stop the spread of invasive quagga mussels.

In June 2008, Metropolitan called for a Water Supply Alert. The alert called upon Southern California's cities, counties, member agencies and retail water agencies to take immediate steps to reduce near-term water use. The Water Supply Alert is part of a larger call

for extraordinary conservation measures for the remainder of calendar year 2008. The implementation of extraordinary conservation measures is called for under the “severe shortage” stages within Metropolitan’s WSDM Plan. Metropolitan continues to work to avoid implementing a supply allocation in 2009, despite ongoing dry conditions and restrictions in State Water Project pumping. Over the next few years, Metropolitan and water managers are faced with a tough challenge to secure water for Southern California.

Metropolitan’s Agricultural Water Program

Metropolitan began offering discounted rates for agricultural water in 1958. The program became an “Interruptible Program” in 1981. Due to the water shortage caused by the 1987-1992 droughts, in 1991 water deliveries to agricultural customers were interrupted as Metropolitan implemented the Incremental Interruption and Conservation Plan (IICP). Later in the same year, the Interruptible Program was eliminated. A new Interim Agricultural Water Program was adopted in 1994. This program offers water to agricultural customers at a discounted rate in exchange for up to a 30 percent initial cut prior to municipal and industrial (M&I) customers in a case of shortage. After 1999, the only water provided at discounted rates in this program is considered surplus and interruptible.

Interruptible Agricultural Water Program

The current Interim Agricultural Water Program (IAWP) was adopted in 1994 where “surplus” water is offered to agricultural customers at a discounted water rate. In exchange for the discount, IAWP deliveries are subject to a 30 percent reduction prior to M&I cuts (i.e. implementation of mandatory allocations under the WSDM Plan).

Since its initiation in 1994, the IAWP has resulted in over \$200 millions in savings to California growers. In 2006, the IAWP provided growers with a \$13.5 million in direct benefits through rate discounts. The program has generated an additional of \$415 millions in revenues for Metropolitan.

The IAWP was initially set up as a demonstration program with a sunset period of three years. At the end of the three year period, Metropolitan renewed the IAWP for an additional five years. A bundled

rate for treated and untreated agricultural water was incorporated into Metropolitan’s rate structure in January 2003.”⁵

To qualify for an IAWP discount, Metropolitan requires member agencies to certify the amount of agricultural water used within their service area on a monthly basis. Metropolitan reviews the IAWP performance annually. The review process involves verifying water usage on a retail agency basis to ensure that IAWP certifications submitted during the year are accurate, verifying that the IAWP discount is being transferred to end-users, and spot-checking agricultural parcels to ensure participation according to Metropolitan’s agricultural purposes definition⁶.

The annual maximum amount of water available to the IAWP is 155,190 acre-feet. The limit set for each member agency was based on the agency’s average annual agricultural water use for the four-year period preceding the program’s 1994 implementation. In FY 2003/04, a total of 152,819 acre-feet was delivered to agricultural customers (Table 1). FY 2003/04 water year began as a dry year and IAWP deliveries have since been reduced. In FY 2006/07, the total IAWP delivery was down to 112,673 acre-feet.

Table 1: Historical IAWP Water Usage

Member Agency	Annual Max Allowed (AF)	FY 03-04	FY 04-05	FY 05-06	FY 06-07*
Calleguas MWD	7,164	7,156	5,597	5,866	6,633
Inland Empire	122	49	56	107	107
Eastern MWD	6,761	6,761	5,856	3,773	4,252
Fullerton	60	8	7	7	6
Las Virgenes MWD	207	179	142	106	126
MWD of Orange County	7,657	5,785	2,167	2,352	3,003
San Diego CWA	100,459	100,451	71,829	84,993	78,438
Three Valleys MWD	106	83	70	68	51
Western MWD	32,347	32,347	18,487	22,140	20,057
Total	155,190	152,819	104,210	119,412	~112,673

Interruption to IAWP deliveries requires a one-year notice by Metropolitan Board with resolution adopted each year. The program calls for staged delivery reductions based on “baseline” usage once M&I cuts begin.

2008 marks the year of the first interruption to IAWP deliveries since the program was adopted in 1994. The 30 percent cut, effective January 1, 2008, was prompted by the record dry hydrologic conditions and reduced supplies of the Colorado River and the State Water Project. The reduction is likely to be extended into CY 2009. The expected yield of the 2008 IAWP reduction, using FY 2003/04 as a baseline, is approximately 46 thousand acre-feet.

The percentage reduction of IAWP water depends on the regional retail water shortage percentage declared by Metropolitan. The current 30% IAWP water cut corresponds to Stage 1 of the six retail shortage stages as outlined in Table 2. The numbers in the brackets correspond to the retail shortage percentage which increases in 5% increments. The IAWP water cut ranges from 30% in Stage 1 up to 90% in Stage 6.

Table 2: IAWP Reduction and Retail Shortage Stages

Retail Shortage Stage	IAWP Reduction
Stage 1 (5%)	30%
Stage 2 (10%)	30%
Stage 3 (15%)	40%
Stage 4 (20%)	50%
Stage 5 (25%)	75%
Stage 6 (30%)	90%

Future of the IAWP

The future of the IAWP is uncertain. Because the agricultural water provided through the IAWP is classified as surplus water, if shortage worsens, Metropolitan may discontinue IAWP deliveries as needed to meet municipal and industrial demands. While not official, Metropolitan has indicated that water supply conditions are such that there is a high likelihood that the current reductions in IAWP deliveries will continue for the next 3-5 years. Given these conditions, Metropolitan has solicited grower input on their priorities of going forward with regard to matters such as price, reliability and quality.

These discussions are part of Metropolitan's review of the IAWP as part of Metropolitan's update to its Long Range Finance Plan (LRFP). The update of the LRFP was driven by Metropolitan use of its water rate stabilization reserves in four out of the last five years to help fund its operations, which has resulted in an over 40% decrease in these reserves. The Board recognized that this is not sustainable and directed staff to prepare the update. The IAWP was included in the update because the IAWP rate is not based on the actual cost of providing the service, as is the case with the majority of Metropolitan's rates.

A workgroup made up of Metropolitan's member agencies, sub-agencies and staff began meeting in July 2007 to review identified rate structure issues and develop options for the Board. During the workgroup's discussion of the IAWP, those agencies with IAWP participants stated their believe that the program (1) creates additional sales of surplus water that result in lower overall rates to full service customers, (2) provides a regional water management benefit that reduces the likelihood of shortage allocations to urban customers, and (3) helps sustain an important segment of the southern California economy.

However, some non-IAWP participants maintained that, since agricultural deliveries are not fully interruptible prior to cuts to full service, IAWP participants should receive a smaller discount. The same agencies believe that any decision that provides a discount to agricultural users to promote local economic and environmental benefits is best made at the member agency level. Additionally, non-participants expressed concern that Metropolitan is securing water transfers while simultaneously selling surplus water for agricultural use at a discount.

The LRFP Update process, however, did not result in a clear consensus regarding the future of the IAWP. As a result, staff presented a range of options identified through the process for consideration by Metropolitan's Board in June. The six options identified through the process are:

Status Quo - the Board would retain the IAWP at its current discount levels with the current interruptibility provisions, as originally recommended by the Board through its October 2001, rates action.

Status Quo / Integrated Water Resources Plan Update - this

option would retain the Status Quo as described above while providing an opportunity to examine the water management benefits of the IAWP through the Integrated Water Resources Plan Update process.

Elimination - the Board would take action to eliminate the program at some future effective date. Member agencies and program participants would either have to find alternative water sources, pay Metropolitan's full service rates, or provide agricultural water users discounted water, with the discount funded locally.

Phase Out – under this option, the IAWP and its associated discount and curtailment commitments would diminish over time to provide IAWP participants adequate time to transition both financially and operationally from the IAWP program. Suggestions for an appropriate time frame for phasing out the IAWP program ranged from three to ten years.

Flexible Pricing – under this option, the program would be restructured such that in years when surplus water is available, water could be sold to agricultural users at a discount. Surplus years would be defined as those years when water is available to store through the Replenishment Service program after all Metropolitan storage needs were met. In shortage years, deliveries would be cut based upon an agreed upon reduction schedule and remaining deliveries billed at the Tier 1 full service rate. Shortage years would be defined as years when transfers were purchased, storage was reduced, or the recently adopted Supply Allocation Plan was enacted.

Contracts - contracts would be established to provide incentives reflecting the benefits of agricultural water deliveries. Contracts could be performance-based. During periods of adequate supply, Metropolitan would charge the full service rate. During shortages, Metropolitan would call on those participating landowners or lessees to reduce water usage. In exchange for not irrigating contract lands for an agreed time period, Metropolitan could provide structured payments based on the amount of land and water used to irrigate.

Next Steps

In June, Metropolitan's Board reviewed staff's report on the options developed as part of the LRFPP and voted to establish a six month IAWP Revision process to evaluate long-term revisions to the IAWP that would be appropriate given the water supply conditions

and concerns with the IAWP raised by some Metropolitan member agencies. Under this process, Metropolitan staff would meet with member agencies, agricultural water retailers, the California Avocado Commission, and grower representatives to develop a long-term transition plan for the IAWP with the goal of having a revised program in place by January 1, 2009.



A southern California avocado grove.

Footnotes

¹ <http://www.dpla2.water.ca.gov/publications/groundwater/bulletin118/Bulletin118-Chapter1.pdf>

² <http://www.mwdh2o.com/mwdh2o/pages/about/about01.html>

³ <http://deltavision.ca.gov/DeltaVision-DraftTaskForceVision.shtml>

⁴ Lund, J., E. Hanak, W. Fleenor, R. Howitt, J. Mount, and P. Moyle (2007) *Envisioning Futures for the Sacramento-San Joaquin Delta* <http://www.ppic.org/main/publication.asp?i=671>

⁵ October 9, 2007 Board Meeting, Attachment 1

⁶ October 9, 2007 Board Meeting, Attachment 1

