MEETING OF THE BOARD OF DIRECTORS OF THE
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY
Jointly with the
PLANNING & OPERATIONS COMMITTEE
October 1, 2018, 8:30 a.m.
Board Room

P&O Committee:
Director Osborne, Chair
Director Tamaribuchi
Director Yoo Schneider

Staff: R. Hunter, K. Seckel, J. Berg, H. De La Torre, K. Davanaugh

Ex Officio Member: Director Barbre

MWDOC Committee meetings are noticed and held as joint meetings of the Committee and the entire Board of Directors and all members of the Board of Directors may attend and participate in the discussion. Each Committee has designated Committee members, and other members of the Board are designated alternate committee members. If less than a quorum of the full Board is in attendance, the Board meeting will be adjourned for lack of a quorum and the meeting will proceed as a meeting of the Committee with those Committee members and alternate members in attendance acting as the Committee.

PUBLIC COMMENTS - Public comments on agenda items and items under the jurisdiction of the Committee should be made at this time.

ITEMS RECEIVED TOO LATE TO BE AGENDIZED - Determine there is a need to take immediate action on item(s) and that the need for action came to the attention of the District subsequent to the posting of the Agenda. (Requires a unanimous vote of the Committee)

ITEMS DISTRIBUTED TO THE BOARD LESS THAN 72 HOURS PRIOR TO MEETING -- Pursuant to Government Code section 54957.5, non-exempt public records that relate to open session agenda items and are distributed to a majority of the Board less than seventy-two (72) hours prior to the meeting will be available for public inspection in the lobby of the District's business office located at 18700 Ward Street, Fountain Valley, California 92708, during regular business hours. When practical, these public records will also be made available on the District's Internet Web site, accessible at http://www.mwdoc.com.

- **STAFF INTRODUCTIONS**

DISCUSSION ITEM

1. ORANGE COUNTY WATER RELIABILITY STUDY 2018

INFORMATION ITEMS (The following items are for informational purposes only – background information is included in the packet. Discussion is not necessary unless a Director requests.)

2. STATUS REPORTS

   a. Ongoing MWDOC Reliability and Engineering/Planning Projects
   b. WEROC
   c. Water Use Efficiency Projects

d. Water Use Efficiency Programs Savings and Implementation Report

3. REVIEW OF ISSUES RELATED TO CONSTRUCTION PROGRAMS, WATER USE EFFICIENCY, FACILITY AND EQUIPMENT MAINTENANCE, WATER STORAGE, WATER QUALITY, CONJUNCTIVE USE PROGRAMS, EDUCATION, DISTRICT FACILITIES, and MEMBER-AGENCY RELATIONS

ADJOURNMENT

NOTE: At the discretion of the Committee, all items appearing on this agenda, whether or not expressly listed for action, may be deliberated, and may be subject to action by the Committee. On those items designated for Board action, the Committee reviews the items and makes a recommendation for final action to the full Board of Directors; final action will be taken by the Board of Directors. Agendas for Committee and Board meetings may be obtained from the District Secretary. Members of the public are advised that the Board consideration process includes consideration of each agenda item by one or more Committees indicated on the Board Action Sheet. Attendance at Committee meetings and the Board meeting considering an item consequently is advised.

Accommodations for the Disabled. Any person may make a request for a disability-related modification or accommodation needed for that person to be able to participate in the public meeting by telephoning Maribeth Goldsby, District Secretary, at (714) 963-3058, or writing to Municipal Water District of Orange County at P.O. Box 20895, Fountain Valley, CA 92728. Requests must specify the nature of the disability and the type of accommodation requested. A telephone number or other contact information should be included so that District staff may discuss appropriate arrangements. Persons requesting a disability-related accommodation should make the request with adequate time before the meeting for the District to provide the requested accommodation.

Item No. 1

DISCUSSION ITEM
October 1, 2018

TO: **Planning & Operations Committee**
(Directors Osborne, Tamaribuchi, Yoo Schneider)

FROM: **Robert Hunter, General Manager**

Staff Contact: Karl Seckel

SUBJECT: **Orange County Water Reliability Study 2018**

STAFF RECOMMENDATION

Staff recommends the Planning & Operations Committee receive and file the report.

COMMITTEE RECOMMENDATION

Committee recommends (To be determined at Committee Meeting)

SUMMARY

Staff and CDM Smith completed the QC (Quality Control) version of the Reliability Study in a format that included an 81 page "Background Report" that does not include evaluations and findings and a 120 page Powerpoint presentation that included a full description of the work completed including the approach, methodology, project evaluations and findings. The reason this was called a QC draft was to provide the information to our agencies to get their initial reactions and to determine if we had missed anything or mischaracterized any of the project concepts or project evaluations before we complete the report.

The Background Report was sent out ahead of the workshop to give workshop participants information important to the actual workshop. On September 20, a 3½ hour workshop was held on the study that included 26 attendees from among 20 of our agencies.

Staff compiled a summary of the comments collected at the meeting, either via direct discussions or from questions submitted by the agencies during the meeting (we had

Budgeted (Y/N):	Budgeted amount:	Core ✓	Choice __
Action item amount:	Line item:		
Fiscal Impact (explain if unbudgeted):			

advised the agencies to take the opportunity while things were fresh to give us direct feedback). Staff also indicated to the workshop participants that we were interested in any other initial comments to be shared with the P&O Committee and that the "comment period" will be open for some time to allow the agencies to fully digest the report and its implications.

Staff will be prepared to discuss the report at the P&O Committee. Staff is also planning a presentation to WACO on October 5.

Cadiz Analysis

It was reported in the workshop that our Cadiz-Retail cost numbers looked high. SMWD asked Cadiz to follow up with us. After an initial exchange of information, the numbers have been mostly resolved and staff is waiting on a final confirmation from Cadiz. The differences between the MWDOC numbers and Cadiz numbers in the Worksheet information were as follows:

- MWDOC's numbers for the Retail Cadiz were about $196 high in 2020 and $580 high in 2050.
- The SMWD Cadiz numbers were much closer, being about $1 lower in 2020 and about $102 higher in 2050.
- We believe we will reach agreement with Cadiz on final numbers an update our analysis.

	Cadiz So Cal Project Participant (RETAIL)		MWDOC 2020 for Comparison	MWDOC 2050 for Comparison
	2020	*2050*		
TOTAL COST ($/AF)	$ 1,645	$3,613	$1,841	$4,193
		Difference	$196	$580
	Cadiz SMWD Project Participant			
	2020	*2050*	MWDOC 2020	MWDOC 2050
TOTAL COST ($/AF)	$ 1,276	$3,156	$1,275	$3,258
		Difference	-$1	$102

Previously provided documents include (these will be posted to the website as part of the meeting materials for this meeting, but not included in the packet):

- Background report (81 pages)
- Workshop Presentation (120 pages)

Link to Background Report and Workshop Presentation:
https://www.dropbox.com/sh/9k29roijfl6rm65/AADnLnHR5ICPzEDT9cX3eHdIa?dl=0

New Information (attached to this report) includes the compilation of comments from the Workshop.

Additional information to be emailed, to be provided by staff, will include additional thoughts from staff and consultant regarding the analysis, findings, conclusions and follow-up (to be emailed under separate cover and posted to the website.)

Next Steps

The next steps include the following:

1. Continue the discussions among our agencies and SOC in particular regarding the recommendations. Staff suggests that the comment period on the study remain open until Friday October 26. This will allow any further comments to be shared at the November 5 P&O Committee.
2. Complete additional work on the Carson Project and its reliability implications in Orange County (includes work between MWDOC and OCWD)
3. Complete additional analysis on the Strand Ranch Integrated Water Banking Program using the results of the study
4. Develop a list of items to advocate for at MET with respect to the next update they do of their IRP based on comments coming out of our study
5. Complete additional work on systems integration for local water in SOC (includes water quality issues, chloramination facilities, reversing flow of systems, building in redundancies, metering of low flow water, base-loading of projects, etc)
6. Integrate the results of the recent workshop regarding integration of local projects into the Orange County water system
7. Work with OCWD on the SARCCUP Project to determine the potential uses of the extraordinary supplies developed through the project and how they can best be used in Orange County.

RELIABILITY STUDY WORKSHOP
SEPTEMBER 20, 2018
FEEDBACK NOTES

Summary and Overview of Comments from Below

Twenty six staff from twenty agencies attended. A summary overview of comments is as follows:

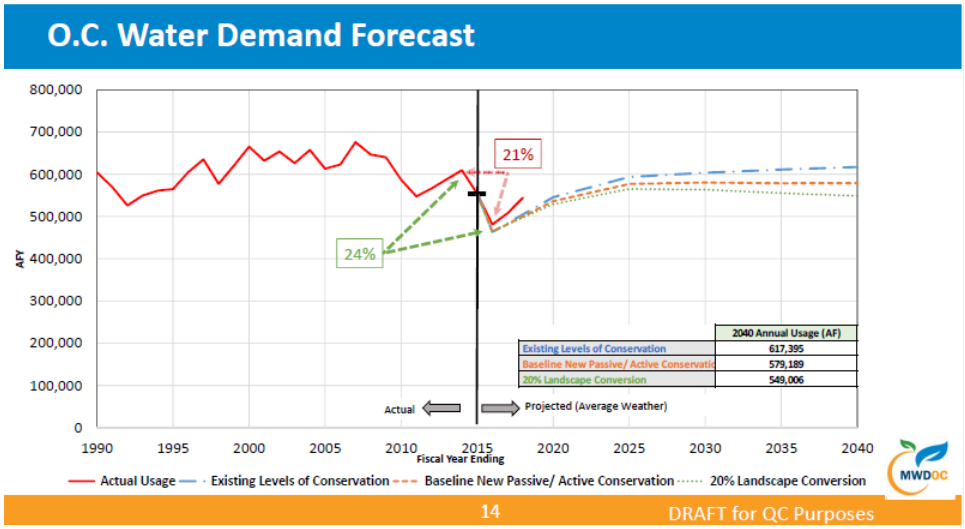
- Several participants had difficulty with what we had to project at the MET level in order to complete the evaluation of projects in Orange County. Many had pre-conceived notions that you simply look at the cost of a project and they found out it was a more complex analysis.
- We started the presentation talking about Supply reliability. In actuality, the System or emergency reliability controls what needs to happen in the more immediate future. Several times it was noted that we evaluated Supply reliability and then evaluated System reliability but never brought them together under a common ranking system. We believe this can be done and will help the acceptance of the report.
- The other major factor discussed was considering winter demands when trying to fill gaps by using local projects that are base-loaded throughout the year. Having to cut back supply from a project due to low winter demand period in combination with maintaining a minimum import level to protect water quality is a significant factor to consider.
- Without a change in way MET approaches accounting for local projects under the Water Supply Allocation Plan (WSAP), a major source of supply that will be sought is "extraordinary" supplies. Developing these supplies also avoids the problem of base-loaded projects and low winter demands.
- It was suggested there may be a problem with the analysis of the Cadiz Retail numbers utilized in the analysis. Cadiz staff will be asked to review and provide input.
- Participants seemed concerned with the apparent roll-off of the MET system as a common practice among the MET member agencies and seemed to concur this should be an issue to be addressed in the next MET IRP. Concerns about how MET might change its rate structure to prevent this from happening were also raised.
- Some thought we did not capture all of the benefits of the projects.
- Some thought we did not quantify all of the risks out into the future.
- A number of participants seemed concerned about what the MWDOC Board would do with the report – adopt it, make it the official position of MWDOC, or other?

Attendees

Mike Grisso (Buena Park)
Lisa Ohlund (EOCWD)
Dennis Cafferty (ETWD)
Mark Sprague (Fountain Valley)
Ken Vecchiarelli (GSWC)
Paul Weghorst (IRWD)
Fiona Sanchez (IRWD)
Dave Youngblood (LBCWD)
Phil Lauri (Mesa Water)
Drew Atwater (MNWD)
Jose Solorio (MNWD)
Steffen Catron (Newport Beach)
Mark Vukojevic (Newport Beach)
Adam Hutchinson (OCWD)
Alicia Duncan (OCWD)
Greg Woodside (OCWD)
Jose Diaz (Orange)
Dave Rebensdorf (San Clemente)
Steve May (San Juan Cap.)
Dan Ferons (SMWD)
Don Bunts (SMWD)
Jerry Vilander (Serrano)
Rick Shintaku (SCWD)
Art Valenzuela (Tustin)
Rosanne Weston (YLWD)
Philip Bogdanoff (Anaheim)

Workshop Questions & Comments

Slide 14 – OC Water Demand Forecast



- Request by Karl to the agencies: What are you seeing in terms of rebound in demands within your agencies? Karl noted that the hot weather the past several years may be why the rebound is above where we expected and asked for input from the agencies.
- One agency noted the weather plays a major factor – and also, at least within their agency, growth has been greater than expected; if the gpcd consumption is adjusted for the growth, it still shows that water use is at an efficient level even though the overall rebound is faster than expected.

Slide 24 – 2018 OC Study Update Planning Scenarios (through 2050)

2018 OC Study Update Planning Scenarios (through 2050)

Scenario Name	WaterFix	New CRA Transfers (AFY)	New SWP Transfers (AFY)	New LRP Supply (AFY)	Carson IPR Project (AFY)	New MET Reservoir (AFY)
1. Minimal Climate Change*						
A) Low-Cost MET investments	Yes (2035)	100,000 (2020)	0	88,000 (2025)	0	0
B) High-Cost MET investments	Yes (2035)	100,000 (2020)	150,000 (2035)	88,000 (2025)	168,000 (2029)	0
2. Significant Climate Change**						
A) Low-Cost MET investments	Yes (2035)	1A + 80 TAF = 180,000 (2030)	150,000 (2035)	1A + 74 TAF = 162,000 (2030)	0	0
B) High-Cost MET investments	Yes (2035)	1B + 80 TAF = 180,000 (2030)	1B + 150 TAF = 300,000 (2035)	1B + 74 TAF = 162,000 (2030)	168,000 (2029)	400,000 (2035)

* Only includes minimal climate impacts on SWP supplies (as modeled by CA DWR, and defended by several CMIP5 GCMs)
** Significant climate change on SWP and CRA supplies, and moderate impacts on demands and SAR (based on CSIRO GCM)

24 DRAFT for QC Purposes

- It was noted that it is likely that we will see New SWP Transfers prior to 2035 given the direction of the State Water Contract extension and other provisions included in the Extension Agreement Provisions; the Agreement in Principle dated June 2018 includes these provisions and DWR has initiated CEQA proceedings on such.

Slide 25 – New Supplies Included Under the Various Scenarios

NEW Supplies Included Under the Various Scenarios (1,000's of AF per Year)

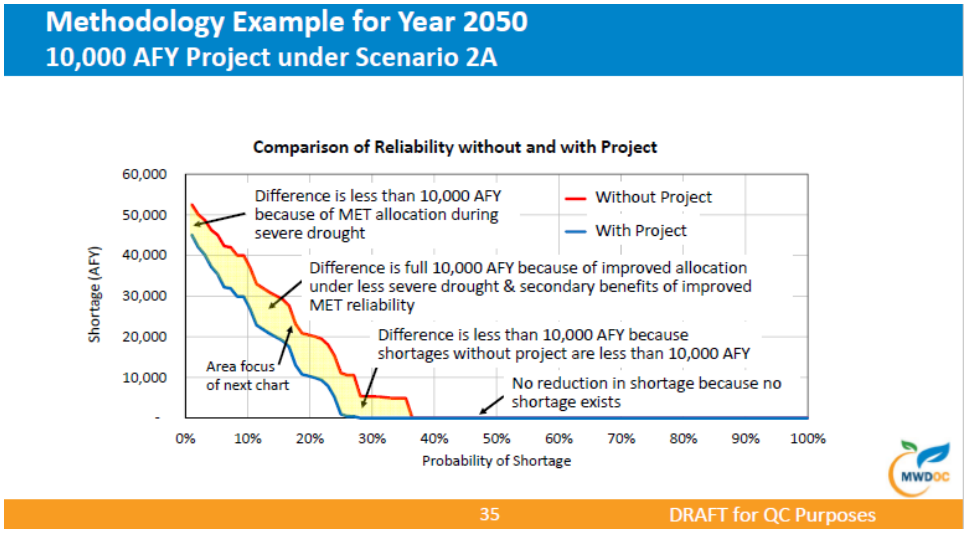
New Supplies Above MET's Current	Scenario 1A	1B	2A	2B
WaterFix (approved by MET Board)	440	440	440	440
CRA Transfers (base loaded)	100	100	100	100
LRP (base loaded)	88	88	88	88
Carson IPR (base loaded)	0	168	0	168
More LRP (base loaded)	0	0	74	74
More CRA Transfers (dry year)	0	0	80	80
SWP Transfers (dry year)	0	150	150	150
More SWP Transfers (dry year)	0	0	0	150
Regional Surface Reservoir (dry year)	0	0	0	400
Total Base Loaded and Dry Year	**628**	**946**	**932**	**1,650**

25 DRAFT for QC Purposes

- Has there been a decision made that Carson is being built? What is the criteria being used to determine which supplies will be available and when? It was noted that the MET Board has not made any commitments to Carson and that is why we had to add costs into the MET forecast whenever new supplies were added. We also decreased the MET sales whenever new LRP projects were shown coming on-line. It was explained that a very difficult and tricky aspect of the reliability study is estimating what MET projects, what local projects, what LRP projects and what transfers will happen over time; and then we use these forecasts of new investments to see what reliability we have in OC and how that is improved by projects we can do in OC. If we simple looked at MET's reliability now and out to 2050 without any supply improvements, essentially any project we could identify would likely test out to be very cost effective. But that

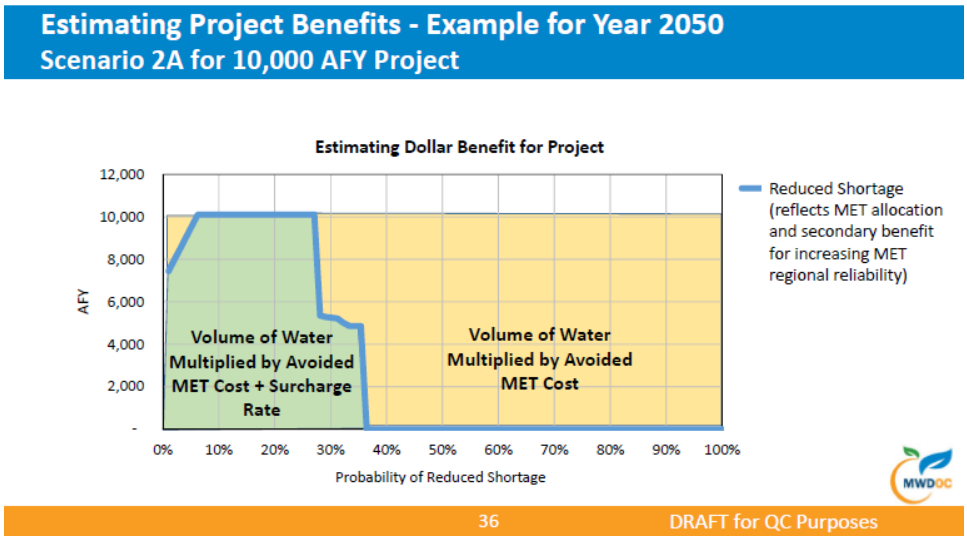
is not a reasonable approach. MET and the MET member agencies have always made investments and these strategic investment are what has made MET so reliable over time. In fact, at the most recent MET Board meeting, the Board approved staff moving forward on the Antelope Valley East Kern (AVEK) Water Bank investment that would increase MET's put and take from the water bank by 70,000 AF per year in each direction. This investment is being made because MET realized that a zero or 5% allocation is a possibility on the State Water Project (based on the 2016 experience) and it was difficult for MET, under those circumstances, to meet demands in their State Water Project only service territory (western portion of MET). This example of adaptive management and these types of investments are expected to continue.

Slide 35 – Methodology Example for Year 2050; 10,000 AFY Project under Scenario 2A



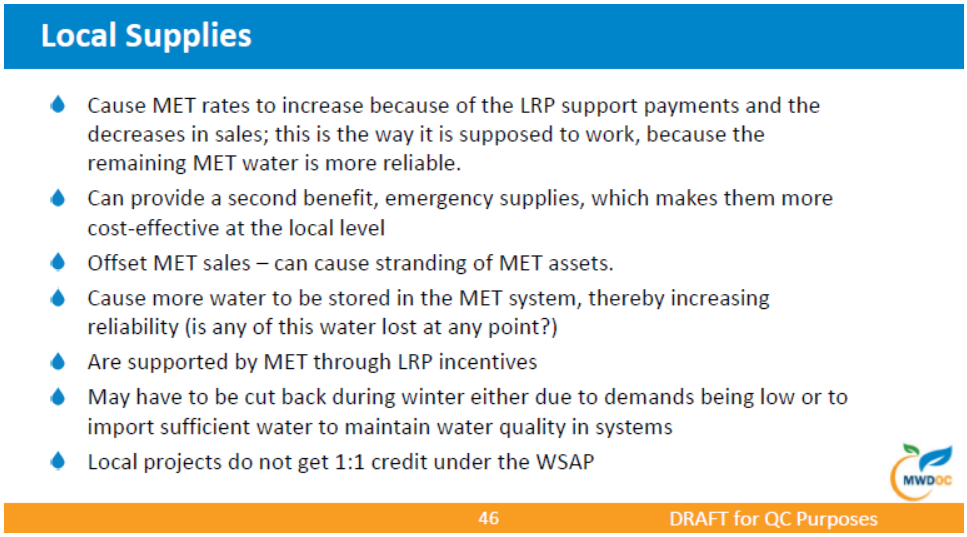
- It was noted that from the Policy Makers perspective, it can be difficult to differentiate between <u>supply</u> gaps and <u>system</u> gaps and which projects provide both.
    - Dan Rodrigo noted that maybe we should flip the order when presenting to show system before supply
    - It may be possible to develop a criteria that can be used for selecting both supply and system needs at the same time.

Slide 36 – Estimating Project Benefits – Ex. for Year 2050; Scenario 2A for 10,000 AFY Project



- A question was asked about the benefits of a project if the project costs less than the Metropolitan rate. The way we are calculating the benefits in the modeling work, the benefits accrue depending on what supplies are provided by the project, which is independent of the cost of the project.

Slide 46 – Local Supplies



- With respect to developing local supplies, it was requested we add a bullet to slide 46 stating that MET is a supplemental supplier and this is heavily imbedded in MET staff attitude. This caused problems at times with how certain portions of the MET service area view MET as the primary supplier (such as SOC). Having such a belief seems to mean to MET that they don't have the obligation to provide water ALL the time. We have all been at meetings with MET where they have been very clear that they are a supplemental supplier.
    - Karl noted that the MET IRP calls for achieving reliability collectively between MET and local agencies. Keeping better track of projected new supplies by others is an area of the next IRP update that we should weigh in on at MET.

- It was noted that if MET switches their rate structure (especially the fixed vs. variable coverage), it could have an impact on the development for local projects within the LRP.
- One participant noted that they were having trouble with the difference between MET reliability vs. Local reliability. When they look at MET's projections they don't know to what degree other agencies' want to roll-off the MET system and how this is accounted for. In our modeling work, any time we brought more LRP supplies on, the MET sales are decreased. This handles it in the modeling, but it is an issue MWDOC has flagged – if most all agencies are decreasing their dependence on MET (e.g. by implementing base-loaded projects) we face the potential that then MET could become an inefficient, high-priced, supply of last resort. Local and regional coordination is essential. The OC Water Reliability Study is looking from the OC water perspective to evaluate the question of which sources of supply and which investments make sense regionally within OC and within Southern California. Continuing to purchase water from MET should remain a priority for all of MET's member agencies, combined with the development of local projects in a diversified portfolio when they make sense.
    - Karl: We are trying to get MET to alter the way they are developing the IRP for the next update.

Slide 50 – SOC Supply with No New OC Projects

SOC Supply Gaps with No New OC Projects

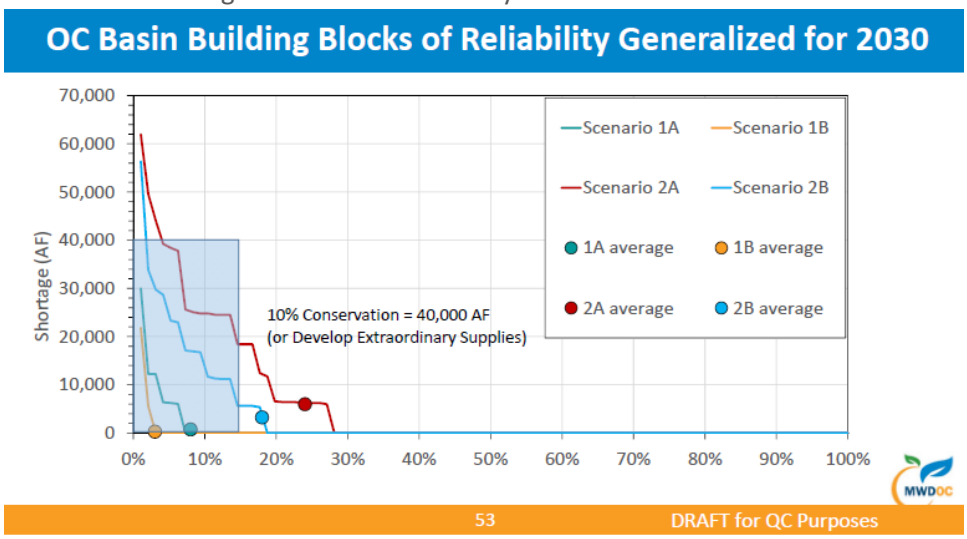
Scenario	Year 2030		Year 2040		Year 2050	
	Max GAP (AFY)	% time GAP > 5,000 * AFY	Max GAP (AFY)	% time GAP > 5,000* AFY	Max GAP (AFY)	% time GAP > 5,000* AFY
1 A) Minimal Climate Impacts with Low-Cost MET Investments	27,000	6%	24,000	8%	28,000	10%
1 B) Minimal Climate Impacts with High-Cost MET Investments	22,000	2%	0	0%	5,000	0%
2 A) Significant Climate Impacts with Low-Cost MET Investments	57,000	27%	53,000	24%	53,000	35%
2 B) Significant Climate Impacts with High-Cost MET Investments	56,000	16%	26,000	11%	37,000	17%

* Represents ≈ 4% of water demand.

50 DRAFT for QC Purposes

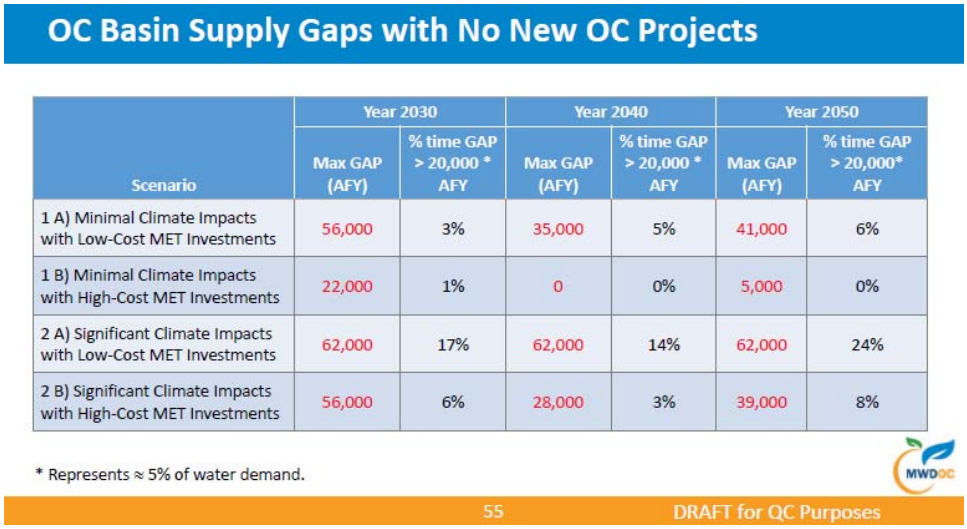
- It was suggested using 10% conservation instead of 4% of water demand for this example will make it look even more reasonable.

Slide 53 –OC Basin Building Blocks of Reliability Generalized for 2030



- The question was posed as to how you define a shortage in the Basin? This is a technical area of the modeling. The modeling assumes certain purchases of water by OCWD for groundwater replenishment up to a maximum of 65,000 AF per year when it is available. During shortages, the purchases by OCWD are limited to 25,000 AF per year. The model tries to achieve a certain BPP and when it cannot hit that BPP a shortage is registered. This is not how it happens in reality, but this methodology flags when changes in the basin management or water conservation would have to be triggered to balance the system. OCWD has several options with respect to basin management. These were deemed beyond the scope of the study. OCWD has done a good job managing the basin throughout the recent droughts.

Slide 55 –OC Basin Supply Gaps with No New OC Projects



- Climate change has some new metrics, do you have a glimpse of what MET will use for Climate Change modeling coming up.

- Karl noted that we were not entirely happy because MET had not really evaluated impacts from Climate Change and we are hoping that they include a more robust analysis in their next IRP update.

Slide 58 –Potential Local Projects by OCWD NOT included in the modeling

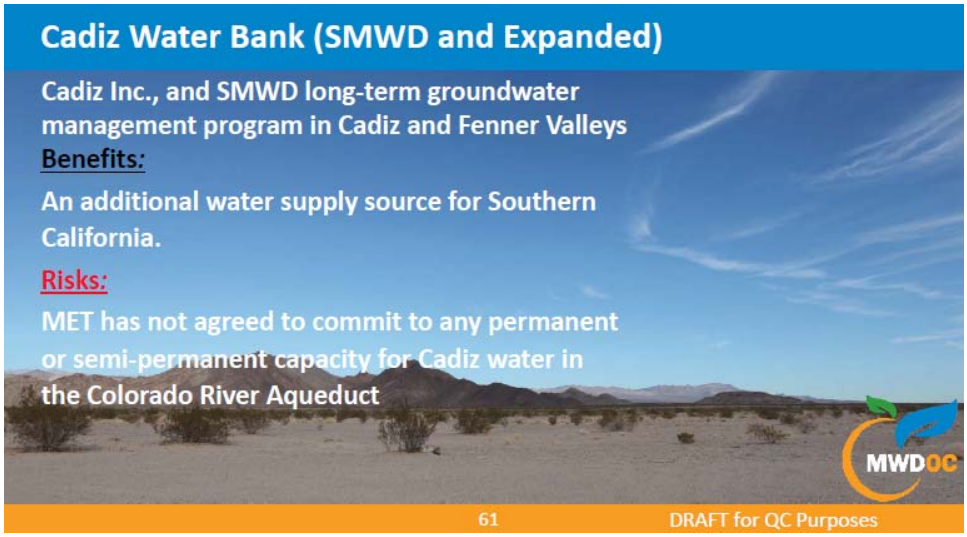
Potential Local Projects by OCWD NOT included in the modeling

Project	Amount (afy)
CADIZ for OCWD supplies	5,000 to 10,000
West Orange County Well Field	3,000 to 6,000
Prado Dam Operations to 505' year round	≈7,000
Purchasing Upper SAR Watershed Supplies	?
Silting up of Prado Dam (loss of storage)	?
GWRS RO Brine Recovery	5,000 to 10,000
Purchase Land for Additional Replenishment Basins	?
SARCCUP – dry year yield	12,000
Chino Basin Water Bank	?
Capture Urban Runoff/Shallow GW for Recycling	?

58 DRAFT for QC Purposes

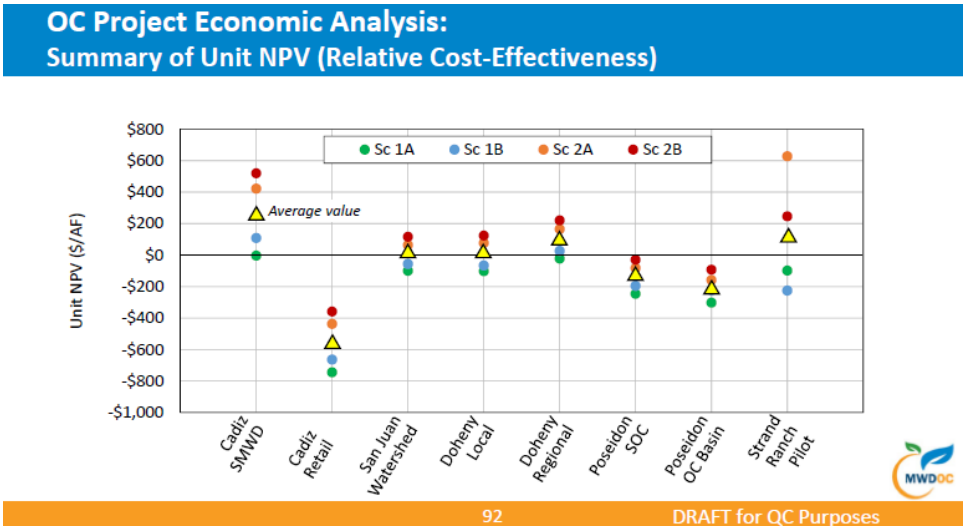
- Several groundwater producers suggested adding a project called "Basin Management" as another project that would be appropriate by OCWD. It was noted that some had misinterpreted the question marks in the table as questioning whether these projects would happen or note; Karl clarified the intent of the question marks was not whether it would happen, but coming up with a quantity for project.

Slide 61 –Cadiz Water Bank (SMWD and Expanded)



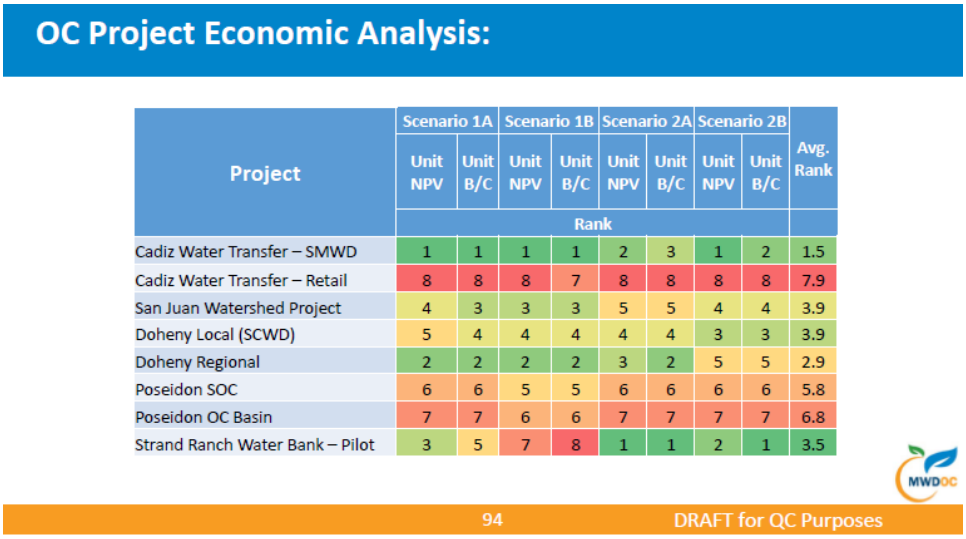
- Dan Ferons (SMWD) noted that it looked like the Cadiz Retail numbers were too high; he will have Cadiz get back to us. Karl asked Dan how it would work if the overall Cadiz project did not move forward, would SMWD still receive any benefits. Dan noted that SMWD would get the first 5 TAF regardless of the size of the project. The project probably won't happen if it goes much below 35 TAF.

Slide 92 –OC Project Economic Analysis: Summary of Unit NPV (Relative Cost Effectiveness)



- With respect to the analysis, what would happen if another 10 years were added to the project life? When the capital drops off, the projects can begin to look very favorable. Dan Rodrigo noted that extending the life of the project can make the projects look better, but you also need to consider additional R&R investments to keep things running. Also, because of the discounting factor and that the extension of project life is 30 years or more out into the future, it does not make a significant difference. Dan noted that he checked this issue, but had not presented it.

Slide 94 –OC Project Economic Analysis



Project	Scenario 1A		Scenario 1B		Scenario 2A		Scenario 2B		Avg. Rank
	Unit NPV	Unit B/C	Unit NPV	Unit B/C	Unit NPV	Unit B/C	Unit NPV	Unit B/C	
	Rank								
Cadiz Water Transfer – SMWD	1	1	1	1	2	3	1	2	1.5
Cadiz Water Transfer – Retail	8	8	8	7	8	8	8	8	7.9
San Juan Watershed Project	4	3	3	3	5	5	4	4	3.9
Doheny Local (SCWD)	5	4	4	4	4	4	3	3	3.9
Doheny Regional	2	2	2	2	3	2	5	5	2.9
Poseidon SOC	6	6	5	5	6	6	6	6	5.8
Poseidon OC Basin	7	7	6	6	7	7	7	7	6.8
Strand Ranch Water Bank – Pilot	3	5	7	8	1	1	2	1	3.5

- This chart needs footnotes to explain the ranking used and to note that it is for Supply benefits only and does not include System benefits. This supports the earlier comment that the report should focus on system analysis prior to supply reliability.

Slide 111 –Cost Effectiveness of Emergency Supplies

Cost Effectiveness of Emergency Supplies

Project	Max Capacity	NPV Cost per MGD 1A	NPV Cost per MGD 1B	NPV Cost per MGD 2A	NPV Cost per MGD 2B	AVG Rank
Doheny Local (SCWD) (1)	4.75 MGD	-$3.4	-$2.2	$2.6	$4.2	2
Doheny Regional(1)	9.50 MGD	-$0.7	$0.8	$5.0	$6.7	1
San Juan Watershed Project(1)	8.50 MGD	-$3.0	-$1.7	$1.9	$3.5	2
Poseidon SOC(1)	14.25 MGD	-$8.3	-$6.6	-$2.8	-$1.0	4
OCWD/SOC Emergency Supply (2)	9.7 MGD but scalable	-$2.3	-$2.3	-$2.3	-$2.4	3

1. Costs are based on local project unit capital and O&M costs of operation, less the cost of MET water, discounted to a NPV; this is the reason some costs are negative as those local projects can provide water at lower cost than MET water
2. Costs are based on capital plus O&M basis to provide target amount; assumes cost-sharing of wells and other facilities with groundwater producing agencies and consent of OCWD
3. Each scenario is run under a different rate structure

111 DRAFT for QC Purposes

- With respect to the pump-in to the EOCF#2, it was requested to explain where the water was originating from. Karl explained the concept that wells would be cost-shared between the OCWD groundwater producers and SOC with SOC paying about 1/3rd of the cost in exchange for the groundwater producer allowing the water to flow to SOC during an emergency event. The costs were estimated based on 3 wells with an interconnection to the EOCF #2.

Slide 112 –Portfolio Cost Analysis for SOC Emergency Needs; Based on avg. system needs of 27.5 mgd

Portfolio Cost Analysis for SOC Emergency Needs
Based on average system needs of 27.5 mgd

Project	Max Capacity	Portfolio 1	Portfolio 2
Doheny Local (SCWD)	4.8 MGD	4.8	4.8
Doheny Regional	9.5 MGD	9.5	4.8
San Juan Watershed Project	8.5 MGD	8.5	4.25
Subtotal	22.8	22.8	13.85
Additional Capacity		4.7	10 – 20 (1)
Total Recommended		27.5	24 - 34

Notes:
(1) Provide for near-term emergencies to allow service to larger geographic area; to be developed through Emergency Groundwater or pump-in to the EOCF#2 in cooperation with OCWD

112 DRAFT for QC Purposes

- The question was raised about whether the Baker Treatment Plant is assumed to be operational during the emergency outage. Karl noted that "Yes", that has already been accounted for, with water coming either from MET or from Irvine Lake, to arrive at the "recovery needs" for the SOC agencies.

General Input and Feedback

- How will the comments be handled?
    - Karl: There is an initial P&O board item, we will try and provide all of the comments received by the middle of next week, but that will not close the comment period for good. We believe that full understanding of the study will require additional discussions and possibly presentations for all to get comfortable with the results.
    - Rob: The MWDOC Board is very interested in what the comments are. The Directors are very interested in what the feedback of the agencies they represent is.
- It was noted that this was an update from 2016 - is the biggest change the inclusion of the WaterFix? That is one of the main changes; the others are the update on the CRA shortage sharing, climate change and assumptions of projects by MET. In addition, this version of the study evaluated specific projects and ranking metrics for agencies to be able to use to make decisions.
- Is your board going to vote to approve this study, and if that is case is this going to be the official MWDOC stance on the various projects? Rob noted that the Board does not normally take actions of "approving the projects." However, it is expected that the MWDOC and MET Directors will discuss a number of issues addressed in the study to move positions forward at MET and with MWDOC policies
- How were the supplies from the SOC projects anticipated to be physically integrated into the SOC water system? How did you deal with the minimum flows that have to go through the MET meters at CM-10 and CM-12. Karl noted that both CM-10 and CM-12 were in the process of being converted from venturi meters to mag meters to allow a lower flow and an increased flow range to be accurately metered? Furthermore, MWDOC had looked conceptually at moving Doheny water into the South County Pipeline via a booster pump station and had included other costs for chloramination stations if they need to be installed to maintain water quality. Karl also note that additional work needs to be conducted in this area and that MWDOC had begun the process of seeking input from MET and water quality experts to assist in these areas so we know what to expect before we start operations.
- One participant noted that Carson is problematic from the standpoint of LA allowing water to transfer out of LA County (out of the service area where the water was sold). One participant would like to see more information on the projects and time periods when the projects might come online. Perhaps identifying additional projects as hedges in case any of the suggested projects encounter problems.
    - Dan Rodrigo noted that we can annotate slide 26 to make the date of integration more apparent. We can also add other projects that could be developed.
    - Karl noted that this is also one of the responsibilities of MET's IRP and that MWDOC would advocate for additional clarity the next time around.
    - We should also note what the range of impact of stranding MET's assets and what might happen and what the financial impacts would be.
- The slide presentation did not include direct potable reuse (DPR) which is plausible for SOC - it seems like you may want to at least acknowledge the potential for DPR in SOC including an estimate of how much might be developed. Karl asked for assistance from a committee comprised of Dan Ferons, Don Bunts and Drew Atwater to help quantify the potential and the

potential costs from the perspective of SOC. MWDOC had noted in the written report that 4,000 AF was the potential at IRWD and maybe 2,000 AF in SOC.

- Anonymous:
  - You might want to add some discussion in the report of additional supply risks:
    1. CRA shortage sharing and where this is going
    2. Longer duration droughts
    3. SWP Impacts, especially to the Bay-Delta supplies from sea level rise
    4. Changes to endangered species laws and the Coordinated Operations Agreement between the SWO and the CVP as the Feds seem to be taking a new direction on these issues.
  - Discussion of the climate models and their strengths and weaknesses
  - Discussion of how the local economy is impacted by reliability (this is not accounted for in your benefit numbers)
- Some projects are based on untreated MET water costs and several noted that MET's flat projection for the treatment surcharge over the long run did not seem correct (sandbagging was the description). The rate does not even seem to increase for electricity and chemicals and manpower which increase every year. Karl noted this is an area staff can look into as the treatment surcharge is part of the Cost of Service Study by MET, which must be adhered to at least with respect to Proposition 26.
  - It was noted that when you look at the long-term forecast there are no capital improvements, and the treated rates are within a $1 or so each year, although the percentage increase from year to year varies between the treated and untreated rates.

Yellow Page Feedback

- Anonymous:
  - Economic Analysis – Recommend the analysis be done for SOC and OC Basin separately (for OC Basin, possibly include West OC well field, Prado Projects, SARCCUP, etc.)
  - Include 2016 line on reliability graphs (shortage vs. probability)
  - Tie or compare 2018 findings back to 2016 findings
  - "No New Projects" – should be modified to include WaterFix only, or add a line for WaterFix only.
- Anonymous:
  - Where would 400 TAF surface reservoir be located?
  - Why not consider DPR plausible vs. 400 TAF yield surface reservoir?
  - OC Project Summary for Water Supply (Slide 78) – maybe include MET costs for ease of comparison.
  - Use same cost of money for all projects; use same escalation rate for each project.
- Anonymous:
  - Comparison of MET Supply Gaps in 2050, Minimal vs. Significant Climate Change (Slide 31) – is WaterFix included in "no' project or in minimal?
  - Methodology Summary (Slide 34) – How does the 2017-2022 hydrology get modified for Climate Change?
  - Project Sizing Based on Base Load Limitations, SOC 2040 (Slide 47) – Existing G.W. may be twice what it should be.

    - SOC Supply, Averaging Peak Gaps after Conservation (Slide 51) – Compare 28,750 to average indoor use AFY
    - OC Project Summary for Water Supply (Slide 78) – 2050 costs seem high, capital costs should drop out? What happens in 2051 and beyond?
    - Normalize escalation costs across all projects – Footnote if is a different assumption then the project proponents. Look at Doheny as a sample - Phase 1 uses 2% and Phases 2 and 3 use 3%. Should be consistent across the county.
    - Should model SOC water distribution system with projects.
- Anonymous:
    - The concept of negative NPV/AF is very abstract. I suggest focusing on NPV.
    - Since there was not an attempt to identify benefits (other than cost avoidance), I would rename "Benefit/Cost Ratio" to Evaluation Metric."
    - I think you should craft a clear recommendation/finding related to "Extraordinary Supplies" for SOC.
    - I suggest adding a finding that OCWD should consider opportunities for improved "Basin Management" strategies that would eliminate shortages.
- Anonymous:
    - Include a discussion in the report that the SWP contact amendment (anticipated in 2019) will provide increased flexibility for multi-year transfers prior to 2035 (and beyond). This will likely provide MET with increased opportunities to store water in wet years – assuming storage is available. This should potentially reduce the gaps identified in the report.
    - Include a discussion of how the CRA drought contingency plan is incorporated or not.

ENGINEERING & PLANNING	
Orange County Reliability Study	Staff and CDM Smith completed the QC (Quality Control) version of the Reliability Study in a format that included an 81 page "Background Report" that does not include evaluations and findings and a 120 page Powerpoint presentation that included the project evaluations and findings. The Background Report was sent out ahead of the workshop and on September 20, a 3 ½ workshop was held on the study that included 26 attendees from among 20 of our agencies. A summary of the comments collected at the meeting will be provided to the P&O Committee. Staff anticipates an update to the MWDOC P&O Committee on October 1st and then a presentation to WACO on October 5.
Workshop with B&V Engineers and Hazen & Sawyer Consultants	MWDOC held a meeting on August 31 to discuss, in a workshop setting, issues associated with the integration of local projects into the Orange County system, especially with respect to mixing waters of differing qualities. This concept can include ocean desalination projects, other local project or projects such as the pump-in to the EOCF#2. Operations and water quality experts participated from MET, Black & Veatch Engineers, Hazen & Sawyer Consultants and Means Consulting. Ed Means from Means Consulting will be working with the other consultants to prepare a summary report to help us anticipate and understand the associated concerns.
Strand Ranch Project	The analysis of this project was included in the OC Water Reliability Study. Based on the analysis, additional discussions will be held with IRWD. In addition, we believe discussions and concepts associated with a longer-term program will also be developed based on the study results. As progress is made, staff will report back to the Board.
Poseidon Resources	(Nothing new to report) The OCWD Board approved a new non-binding 2018 Water Reliability Agreement (Term Sheet) with Poseidon Resources On July 18, 2018. Poseidon continues working with the Santa Ana Regional Water Quality Control Board (SARWQCB) to renew and update its existing National Pollution Discharge Elimination System permit and comply with new regulations (referred to as the Ocean Plan amendments) which were approved by the State Water Resources Control Board in May 2015. Poseidon expects the SARWQCB to act on its permit in the next 6 months. Assuming success, Poseidon would then seek a permit from the California Coastal Commission in 2019.
SMWD Rubber Dams Project	The Draft Environmental Impact Report (DEIR) public review period was closed for comments on February 23, 2018. Ultimately twenty-one comment letters were received with the major topics of concern being characterized as relating to: • Steelhead trout migration including the provisions of fish passages • Impacts on San Juan Creek Lagoon

	• Aesthetics and impacts of the various structures that may be required as part of the project on the surrounding neighborhoods • Sediment transport Legal review of the draft document has been completed. An approach for addressing the comments was developed amongst the team members with a new schedule also being developed. The additional technical studies of the issues listed above are being performed. The results will be incorporated into the Responses to Comments and brought to the Board for consideration of adopting the EIR
Doheny Ocean Desalination Project	South Coast WD submitted a grant application for up to $20 million for project construction through Bureau of Reclamation 'Water SMART: Desalination Construction Projects under the WIIN Act'. Applications are currently being reviewed. MWDOC participated in a phone conference call with South Coast Water District to provide a briefing to the Deputy Commissioner Harrison and to make her aware of the grant application. South Coast staff and consultants are in the process of responding to comments submitted regarding the EIR for the project. They anticipate adopting the response to comments in December 2018.
Trampas Reservoir Recycled Water Project by SMWD	This project involves the construction of a 5,000-acre-foot recycled water storage reservoir and the various complementary facilities to support this reservoir. The construction of the Trampas Canyon Recycled Water Seasonal Storage Reservoir consists of three main components: 1) Trampas Canyon Dam (Dam) 2) Conveyance facilities to transport recycled water into and out of the Reservoir (Pipelines) 3) Trampas Canyon Pump Station (Pump Station) The construction of the facilities is being completed in three phases: 1) Preconstruction/Site Preparation for the Dam and Pump Station Construction 2) Dam and Pipelines 3) Pump Station PROJECT STATUS Preconstruction/Site Preparation The work to relocate various facilities integral to the existing mining operation was completed in December 2017. The relocation of the high-tension power lines that feed an existing major communication facility was completed in April 2018. The final relocation of AT&T facilities was completed in May 2018, which was the final remaining activity for this phase.

	Dam and Pipelines The $81M Construction Contract was awarded in December 2017 and is approximately 25% complete. Pump Station The preliminary design of this facility has been completed. Final design began on May 30, 2018 when the final hydraulic requirements for this facility were finalized. AECOM has recently provided a 30% design package and the District has provided review comments. The design process is likely to continue thru the end of this year, and the project will likely be available to start the construction bidding process in January 2019. Completion of the construction is expected to be in January 2020, about 3 months ahead of the Reservoir and Dam completion
Meetings	
	The issues below are still being discussed with MET and EOCWD staff. In addition, the pumps at OC-70 appear to have some intermittent inconsistencies in their operation. MET is responsible for the pump station and has been requested to attend to the facility for trouble-shooting purposes. A field meeting is being set-up. Staff will report back on findings. Karl Seckel and Jim Green, Chief of Operations at MET, are discussing how best to bring resolution to this issues that have been dragging on for years. MET has suggested, and MWDOC is willing to participate, in having Utah State Water Lab construct a replica of the piping for the OC-70 facility and test the accuracy of a temporary sonic meter. If it can be demonstrated that such a meter set-up can register accurately, then the same meter can be used in the field at the OC-70 facility to conduct the necessary flow test. MET has proposed that MWDOC and MET enter into a letter agreement to conduct the Utah State and OC-70 flow test. The cost is about $15,000. If the OC-70 meter is determined to be accurate, MWDOC would pay the costs and if the OC-70 meter is not accurate, MET will pay the costs and a process to determine the historical readjustment will begin. Karl Seckel and Jim Green are also working on a concept whereby EOCWD can locate a generator at the OC-70 site to ensure the pumping into their system can always be maintained. Ultimately, this will take an agreement between the parties.
	Rob Hunter, Karl Seckel, Charles Busslinger, South Coast director Bill Green and South Coast Legal Counsel Kari Vozenilek participated in a discussion with Bob Yamada and some of his staff members to better understand the ins and outs of the Poseidon Carlsbad Water Purchase Agreement negotiation, construction and operations. Bob and his staff were very complimentary of the efforts of Poseidon Resources regarding the plant in San Diego County. The purpose of the meeting was to help South Coast understand issues associated with contracts and contract performance and negotiations, a phase that will soon be started on Doheny.

	MET has a number of difficult projects in OC where they are requesting our agencies to shut down certain service connection for several months during the summer. These types of shutdowns are not normal, but permitting issues and competing shutdowns in the winter time have pushed schedules into the summer period. MWDOC is working with its agencies on a shutdown of the Orange County Feeder that will impact Mesa Water and a shutdown of the Second Lower Feeder that serves La Palma and Golden State Water Company. The issues being balanced are to conduct shutdowns in the summer under planned conditions or push the shutdowns off and possibly have emergency shutdowns. Several meetings have been held with MET and the local agencies. Many local agencies have sufficient well supplies to go without MET water in the summer period. However, they typically count on MET for supplies if they have an unexpected pump failure. We are working with the involved parties to see if we can develop recommendations for back-up supplies. We have advocated at MET for flexibility in assisting with funding some of the necessary work or costs that might occur for agencies allowing shutdowns to occur in the summer periods. Work is continuing.

Status of Ongoing WEROC Projects
September 2018

Description	Comments
Coordination with WEROC Member Agencies	*Ongoing: WEROC, with Michal Baker as the lead consultant, is facilitating 19 agencies through the process of updating the Orange County Water and Wastewater Multi-Jurisdictional Hazard Mitigation Plan.* Update: Currently, a draft of the plan is out for public review. The plan can't be submitted until all participating agencies have distributed the plan using agency website and social media platforms. Next steps: Submittal to CalOES & FEMA, and local agency approval. *WEROC Radio Replacement Update: Francisco Soto continues to work with member agencies, Motorola, and the Sheriff's Communications staff to implement the OC 800 MHz radio system for WEROC.* Update: The transition to the OC 800 MHz system has been completed. WEROC conducted the first test of the new 800 MHz Radio System on Wednesday, September 12, 2018. The test was successful with 100% of participating agencies checking in and being heard clearly. Radio tests will be conducted on the second Wednesday of each month. Francisco Soto provided 800MHz training to Serrano Water District staff. Training consisted of a description of the overall system, its intended use, and hands on training. WEROC and the County's Communication Division is available to provide additional training to agency staff if needed. Kelly Hubbard met with South Coast Water District staff and the City of San Clemente's Emergency Manager to review the Draft Palisades Dam Emergency Action Plan. Kelly walked the group through response scenario considerations and made some recommendations to meet the revised requirements. Francisco, Melissa Baum-Haley and Kelly had a conference call with Trabuco Canyon Water District (TCWD) on the FEMA Hazard Mitigation Grant eligibility and the application process. Staff also provided info on services provided by the MWDOC Grants Consultant. Kelly is working with TCWD and the County on writing the Holy Incident-Post Fire Debris Flow Response Plan. TCWD has a facility within the possible debris flow area and is identifying how to best protect the facility, as well as what the impacts of its lost would be.
Training and Programs	Francisco provided three separate Standard Emergency Management System (SEMS)/National Incident Management System (NIMS)/ Incident Command

	System (ICS) courses for our member agencies. These training courses are required for all staff for agencies trying to meet NIMS compliance. Approximately 60 member agency staff were trained, as well as 5 MWDOC staff. The following trainings were completed: • September 10, 2018, at Moulton Niguel Water District • September 11, 2018, at Santa Ana Corporate Yard • September 19, 2018, at Yorba Linda Water District Kelly provided Exercises Made Easy on behalf of the OCEMO Exercise Design Committee to individuals, including staff from the WEROC member agencies. The County-Wide exercise in January has significant participation from agencies who have not hosted a disaster exercise in many years. This presentation was to provide resources on how to put together develop an agency's training and exercise program. Janine Schunk, Francisco and Kelly attended the Orange County Water Association (OCWA) Pipe Tapping Contest and BBQ. This annual event is a great opportunity to chat with member agency field staff about how WEROC can assist in a disaster, as well as for WEROC staff to learn about the member agencies. Francisco and Kelly attended the California Emergency Services Association (CESA) 2018 Annual Training and Conference in Indian Wells. This is the only state-wide professional association for emergency management. The conference provides excellent opportunities to learn from other agencies and recent disasters. Kelly attended the OCFA hosted program "VEGAS STRONG: After Action Review of the Route 91 Harvest Festival Shooting" which included responders and emergency managers from Las Vegas. FEMA has released an After-Action report on the response. The 1st Anniversary of the shooting is Monday, October 1, 2018.
Coordination with the County of Orange	Francisco & Kelly attended the August Orange County Emergency Management Organization (OCEMO) General Meeting and Kelly attended the OCEMO Exercise Design meeting. Jessica Neuman and Scott Smith of Westbound Communications provided updates on ReadyOC and If You See Something, Say Something Campaign. The Emergency Management Division provided an overview of the County of Orange Mass Evacuation and Joint Information System Annex. The Exercise Design meeting continues to plan for the January 2019 county-wide exercise. *County and FEMA Recovery Exercise Update: WEROC staff is working with the County and FEMA on a Recovery Exercise on October 18, 2018 that*

	involves responding to a 7.8 earthquake on the San Andreas Fault. The exercise scenario will begin 3 weeks after the earthquake and focus on recovery operations. The exercise is unique in that it is testing long term recovery concepts by focusing in on housing and infrastructure repair. Kelly continues to participate and work with the county to develop this exercise. *Ongoing: WEROC staff participation in the OA Agreement Revision Working Group.* Kelly previously met with the ISDOC Executive Committee to present the current status of the Working Group and OA Agreement revision process. Kelly informed the ISDOC Executive Committee that MWDOC has formally requested that WEROC be added to the OA Agreement as a direct voting member and discussed the potential of how this representation could impact ISDOC's representation to the OA Executive Board. Kelly met with the Executive Committee a second time to provide some additional information and to request a formal stance on changes to the OA Agreement to be presented to the OA Agreement Working Group. The Executive Committee is going to write a letter of position to the County Emergency Management Division. *Ongoing: The Operational Area has started its review and update of the County of Orange and Orange County Operational Area Flood, Dam and Reservoir Annex. This update will combine what was two separate plans, as well as address planning requirement updates in Dam Emergency Action Planning that were implemented this year.* CalOES called into the September meeting to provide further insight into the Dam Emergency Action Plan review process and to answer questions from Dam agencies. Participants asked CalOES to provide in writing what their expectation is for "coordination with impacted agencies and documentation of that coordination." Staff still has significant concerns regarding what the initial planning requirements were (stated in November 2017 by CalOES and submitted by agencies by the January 1, 2018 deadline) and what is now being required by CalOES (updated July 2018). Kelly continues to work with the State, County, Member Agencies with Dams, and local emergency agencies to try to facilitate plans that are clear and well-coordinated. Kelly attended the OC Operational Area Family Assistance Center (FAC) Tabletop Exercise. The FAC is a response plan for how to support the community following a mass casualty/fatality disaster.
EOC Readiness	Janine Schunk successfully participated in the OA and MET Radio Test and WebEOC tests for the month. Janine met with contractors to conduct annual fire extinguisher maintenance and monthly cleaning at both the North and South EOCs.

	Kelly Hubbard provided a training to potential WEROC Operational Area EOC Liaison staff at the OA EOC. The training consisted of an overview of the position, its specific functions, and lessons learned from past activations at the Operational Area EOC. Lessons learned are in the process of being incorporated into WEROC processes. WEROC staff met with CDR and MWDOC engineering staff to discuss how to manage and request map updates efficiently. CDR provided information on the many various map formats CDR maintains for us and some of the nuances of how that data is shared between formats. Staff discussed how to best ensure all versions of mapping are updated when appropriate, as well as how to best ensure new maps are utilizing the right data.
Coordination with Outside Agencies	Kelly had the opportunity to talk to the City of Nape Director of Public Works (previously the Water Division Chief) regarding their response to the Napa Earthquake in 2014 and the Napa/Sonoma Fires in 2017. She provided some good lessons learned, as well as a summary PowerPoint and forms they created that will be shared with our member agencies. *Southern California Edison (SCE) Public Safety Power Shutoff (PSPS) Plan – Background: SCE will utilize this program to proactively shut off power in high fire risk areas when extreme weather conditions present a clear and imminent threat to Edison powerlines. The idea is that Edison will proactively shutoff power to any lines that could possibly be knocked down by various weather conditions and create a fire or safety hazard. The program will provide the water utilities with very little notification of the plan being activated and does not guarantee that they will actually receive notification prior to the power being shutoff. This could result in losing power at critical water and wastewater facilities with no notification to pre-deploy generators if they are available.* UPDATE: Kelly received the Edison PSPS Plan maps and is working with CDR to map what water facilities are within these areas. Agencies will use this information to work with Edison on possible impacts, concerns and to update their own Power Outage Plans. Additionally, Edison is hosting three meetings specifically for water and wastewater utilities on the new plan. Kelly attended the first meeting in Irwindale, and the second meeting via skype. These meetings are giving the utilities a better opportunity to delve into operational concerns and hopefully develop coordination plans with Edison. The new Orange County Fire Authority (OCFA) Deputy Fire Marshal and Fire Safety Engineer requested a meeting with WEROC. Staff provided the staff background on WEROC and how we coordinate with member agencies, the county and fire agencies. They provided some background on outreach efforts with water utilities on fire hydrant maintenance programs.

Status of Water Use Efficiency Projects

October 2018

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
Smart Timer Rebate Program	MWDSC	Ongoing	Ongoing	In August 2018, 333 residential and 85 commercial smart timers were installed in Orange County. For program water savings and implementation information, see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Rotating Nozzles Rebate Program	MWDSC	Ongoing	Ongoing	In August 2018, 1,672 rotating nozzles were installed in Orange County. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Residential Indoor Rebate Program	MWDSC	Ongoing	Ongoing	In August 2018, 243 high efficiency clothes washers and 20 premium high efficiency toilets were installed through this program. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
SoCal Water$mart Commercial Rebate Program	MWDSC	Ongoing	Ongoing	In August 2018, 98 commercial premium high efficiency toilets, 477 residential premium high efficiency toilets, 413 plumbing flow control valves, and 1 zero water urinal were installed through this program. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Industrial Process/ Water Savings Incentive Program (WSIP)	MWDSC	75%	July 2020	This program is designed for non-residential customers to improve their water efficiency through upgraded equipment or services that do not qualify for standard rebates. Incentives are based on the amount of water customers save

Description	Lead Agency	Status % Complete	Scheduled Completion or Renewal Date	Comments
				and allows for customers to implement custom water-saving projects. This fiscal year, one project has been completed, saving over 20 AFY. Total water savings to date for the entire program is 673 AFY and 3,153 AF cumulatively.
Turf Removal Program	MWDOC	Ongoing	Ongoing	In August 2018, 49 rebates were paid, representing $58,464.60 in rebates paid this month in Orange County. To date, the Turf Removal Program has removed approximately 21.6 million square feet of turf. For program savings and implementation information, please see MWDOC Water Use Efficiency Program Savings and Implementation Report.
Spray to Drip Conversion Program	MWDOC	Ongoing	Ongoing	This is a rebate program designed to encourage residential and commercial sites to convert their existing conventional spray heads to low-volume, low-precipitation drip technology. To date, 236 residential sites and 63 commercial sites have completed spray to drip conversion projects.
Recycled Water Retrofit Program	MWDSC	75%	September 2018	This program provides incentives for commercial sites to convert dedicated irrigation meters to recycled water. To date, Metropolitan has provided a total of $429,784.43 in funding to 27 sites irrigating over 75 acres of landscape, and MWDOC has paid a total of $45,851.00 in grant funding to 16 of those sites. The total potable water savings achieved by these projects is over 180 AFY.

Orange County

Water Use Efficiency Programs Savings
and
Implementation Report

Retrofits and Acre-Feet Water Savings for Program Activity

Program	Program Start Date	Retrofits Installed in	Month Indicated		Current Fiscal Year		Overall Program		
			Interventions	Water Savings	Interventions	Water Savings	Interventions	Annual Water Savings[4]	Cumulative Water Savings[4]
High Efficiency Clothes Washer Program	2001	August-18	243	0.70	350	1.31	116,895	4,033	30,379
Smart Timer Program - Irrigation Timers	2004	August-18	418	6.09	616	14.88	23,329	8,173	54,890
Rotating Nozzles Rebate Program	2007	August-18	1,672	6.69	1,672	6.69	565,979	2,749	19,637
Commercial Plumbing Fixture Rebate Program	2002	August-18	989	2.07	2,114	5.23	95,887	4,964	49,327
Industrial Process/Water Savings Incentive Program (WSIP)	2006	August-18	1	1.66	1	1.66	33	673	3,153
Turf Removal Program[3]	2010	August-18	38,317	0.45	61,888	1.00	21,656,966	3,033	13,314
High Efficiency Toilet (HET) Program	2005	August-18	20	0.07	32	1.36	60,135	2,223	19,274
Water Smart Landscape Program [1]	1997						12,677	10,621	72,668
Home Water Certification Program	2013						312	7.339	15.266
Synthetic Turf Rebate Program	2007						685,438	96	469
Ultra-Low-Flush-Toilet Programs [2]	1992						363,926	13,452	162,561
Home Water Surveys [2]	1995						11,867	160	1,708
Showerhead Replacements [2]	1991						270,604	1,667	19,083
Total Water Savings All Programs				**18**	**66,673**	**32**	**23,864,048**	**51,850**	**446,478**

[1] Water Smart Landscape Program participation is based on the number of water meters receiving monthly Irrigation Performance Reports.
[2] Cumulative Water Savings Program To Date totals are from a previous Water Use Efficiency Program Effort.
[3] Turf Removal Interventions are listed as square feet.
[4] Cumulative & annual water savings represents both active program savings and passive savings that continues to be realized due to plumbing code changes over time.

HIGH EFFICIENCY CLOTHES WASHERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	FY18/19	Total	Current FY Water Savings Ac/Ft (Cumulative)	Cumulative Water Savings across all Fiscal Years	15 yr. Lifecycle Savings Ac/Ft
Brea	93	115	114	76	57	56	7	1,930	0.02	502.87	999
Buena Park	105	106	91	76	54	50	2	1,570	0.01	396.85	812
East Orange CWD RZ	10	8	8	8	3	1	-	193	0.00	53.71	100
El Toro WD	134	121	111	65	47	50	6	1,577	0.02	398.66	816
Fountain Valley	115	102	110	76	65	49	3	2,452	0.01	664.44	1,269
Garden Grove	190	162	165	251	127	87	4	3,654	0.01	947.29	1,891
Golden State WC	265	283	359	260	138	156	17	5,188	0.07	1,343.19	2,684
Huntington Beach	334	295	319	225	180	141	14	8,401	0.05	2,310.92	4,347
Irvine Ranch WD	1,763	1,664	1,882	1,521	1,373	1,203	119	25,988	0.45	6,407.51	13,447
La Habra	82	114	87	66	53	48	5	1,380	0.02	347.50	714
La Palma	34	25	34	29	10	14	1	473	0.01	120.32	245
Laguna Beach CWD	38	37	39	32	19	20	3	955	0.01	253.54	494
Mesa Water	114	86	89	113	80	54	10	2,582	0.04	707.97	1,336
Moulton Niguel WD	442	421	790	688	575	527	69	10,517	0.26	2,552.73	5,442
Newport Beach	116	92	95	66	61	51	10	2,685	0.03	749.81	1,389
Orange	218	163	160	124	80	74	10	3,982	0.03	1,101.00	2,060
Orange Park Acres					-	-	-	12	0.00	4.09	6
San Juan Capistrano	76	73	92	63	33	33	2	1,494	0.01	392.05	773
San Clemente	140	94	141	75	70	85	7	2,712	0.02	709.88	1,403
Santa Margarita WD	553	662	792	466	367	274	44	9,834	0.19	2,475.03	5,088
Seal Beach	31	29	38	23	9	17	-	619	0.00	162.93	320
Serrano WD	13	10	26	8	11	8	-	365	0.00	100.05	189
South Coast WD	89	79	68	43	44	36	2	1,622	0.01	423.53	839
Trabuco Canyon WD	30	45	47	34	28	22	1	821	0.00	211.93	425
Tustin	78	59	80	66	44	49	5	1,666	0.02	447.83	862
Westminster	121	82	109	149	84	65	-	2,651	0.00	695.77	1,372
Yorba Linda	181	167	156	123	56	67	9	3,828	0.04	1,055.85	1,981
MWDOC Totals	5,365	5,094	6,002	4,726	3,668	3,237	350	99,151	1.31	25,537.25	19,156
Anaheim	331	285	295	266	213	173	-	10,855	0.00	3,037.43	5,617
Fullerton	200	186	211	165	107	99	-	3,794	0.00	998.43	1,963
Santa Ana	163	131	132	259	141	124	-	3,095	0.00	806.18	1,601
Non-MWDOC Totals	694	602	638	690	461	396	-	17,744	0.00	4,842.04	3,428
Orange County Totals	6,059	5,696	6,640	5,416	4,129	3,633	350	116,895	1.31	30,379.29	22,584

SMART TIMERS INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY16/17		FY17/18		FY18/19		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm	Res	Comm.	
Brea	9	8	4	0	43	6	20	4	31	4	32	0	6	0	169	80	584.33
Buena Park	3	0	0	0	4	10	7	4	10	7	15	3	6	4	52	48	184.05
East Orange CWD RZ	2	0	0	0	2	0	1	0	11	1	6	0	1	0	32	1	26.81
El Toro WD	7	2	11	0	8	9	9	17	33	8	29	4	7	0	151	359	2,728.64
Fountain Valley	3	2	4	0	7	10	13	1	33	12	28	12	7	1	126	53	228.37
Garden Grove	5	2	9	0	10	14	13	11	28	0	27	2	8	0	136	40	208.43
Golden State WC	9	49	9	25	39	12	35	16	56	37	88	6	26	13	339	211	976.48
Huntington Beach	18	33	20	35	19	2	42	12	88	94	70	30	23	0	365	298	1,300.84
Irvine Ranch WD	414	135	71	59	67	310	239	207	344	420	416	78	95	35	2,280	2,399	13,079.68
La Habra	4	7	2	0	4	7	3	1	12	7	8	0	7	2	51	46	235.19
La Palma	1	0	2	0	2	0	3	2	1	0	5	0	1	0	16	2	8.29
Laguna Beach CWD	76	2	71	0	86	0	86	1	27	0	11	0	1	0	509	20	272.36
Mesa Water	10	2	15	2	17	28	36	12	149	41	49	0	8	0	375	154	855.93
Moulton Niguel WD	51	74	40	45	46	95	163	100	236	129	284	33	81	55	1,279	889	4,261.73
Newport Beach	242	26	168	75	11	9	28	43	30	12	24	0	6	0	1,068	409	2,940.58
Orange	20	24	13	9	18	31	51	13	69	10	61	13	29	26	375	204	1,075.03
San Juan Capistrano	14	18	6	11	6	19	20	8	22	8	23	5	6	0	251	130	745.55
San Clemente	26	7	28	2	28	24	26	3	37	13	38	41	7	0	1,096	415	3,014.29
Santa Margarita WD	53	171	64	93	53	321	189	136	326	221	273	220	57	19	1,484	1,611	6,917.32
Santiago CWD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Seal Beach	1	0	1	36	1	12	2	2,446	2	4	5	0	0	0	12	2,502	6,804.34
Serrano WD	1	0	0	0	4	0	11	2	4	0	8	0	3	0	49	2	17.80
South Coast WD	13	16	8	4	104	73	9	11	7	0	15	2	1	0	294	214	1,307.18
Trabuco Canyon WD	6	0	2	0	6	1	16	50	13	3	20	0	7	0	130	157	1,062.61
Tustin	8	4	9	1	18	14	33	8	33	23	27	1	15	0	185	81	403.52
Westminster	1	1	2	0	13	17	7	1	17	12	22	0	6	0	93	44	231.71
Yorba Linda	20	0	12	5	32	2	61	27	72	71	68	10	24	0	430	193	985.15
MWDOC Totals	1,017	583	571	402	648	1,026	1,123	3,136	1,691	1,137	1,652	460	438	155	11,347	10,562	50,456.22
Anaheim	19	10	9	26	7	52	30	34	87	10	62	0	21	0	327	457	2,930.89
Fullerton	9	29	8	0	40	26	32	12	53	7	43	0	1	0	243	199	1,080.63
Santa Ana	8	19	7	8	9	27	22	26	15	3	11	0	1	0	94	100	422.18
Non-MWDOC Totals	36	58	24	34	56	105	84	72	155	20	116	0	23	0	664	756	4,433.70
Orange County Totals	1,053	641	595	436	704	1,131	1,207	3,208	1,846	1,157	1,768	460	461	155	12,011	11,318	54,890

ROTATING NOZZLES INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 13/14			FY 14/15			FY 15/16			FY 16/17			FY 17/18			FY 18/19			Total Program			Cumulative Water Savings across all Fiscal Years
	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	Small		Large	
	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	Res	Comm.	Comm.	
Brea	84	0	0	157	45	0	74	2,484	0	0	0	0	0	0	0	0	0	0	572	2,749	0	61.57
Buena Park	53	0	0	248	0	0	45	98	0	0	0	0	0	0	0	0	0	0	509	173	2,535	815.14
East Orange	30	0	0	221	0	0	0	0	0	0	0	0	30	0	0	0	0	0	781	0	0	20.63
El Toro	56	3,288	0	1,741	28,714	0	730	4,457	0	55	242	0	36	0	0	0	0	0	3,260	43,348	890	1,374.09
Fountain Valley	0	0	0	107	0	0	222	0	0	0	0	0	85	0	0	0	0	0	919	2,874	0	19.34
Garden Grove	80	0	0	88	50	0	110	0	0	55	98	0	52	0	0	0	0	0	855	254	0	35.24
Golden State	192	0	0	583	1,741	0	1,088	0	0	207	6,008	0	161	-495	0	35	0	0	3,480	10,837	0	289.91
Huntington Beach	120	0	0	798	1,419	0	1,345	2,836	0	149	3,362	0	-37	0	0	0	0	0	4,001	9,135	2,681	1,351.83
Irvine Ranch	11,010	4,257	0	1,421	632	0	1,989	5,047	0	335	9,511	0	356	-215	0	0	0	0	46,498	43,325	2,004	4,986.44
La Habra	15	0	0	109	338	0	300	0	0	0	0	0	0	0	0	0	0	0	1,515	55,404	900	369.02
La Palma	0	0	0	0	0	0	46	505	0	0	2,385	0	33	0	0	0	0	0	89	3,163	0	38.08
Laguna Beach	2,948	878	0	2,879	1,971	0	1,390	0	0	0	0	0	0	0	0	0	0	0	11,948	2,896	0	355.81
Mesa Water	361	0	0	229	0	0	166	0	0	113	0	0	36	0	0	0	0	0	2,062	302	343	199.99
Moulton Niguel	361	227	0	1,596	4,587	0	5,492	1,441	0	153	5,872	0	893	0	0	148	0	0	12,728	20,598	2,945	1,782.61
Newport Beach	19,349	6,835	0	460	3,857	0	348	670	0	0	0	0	45	0	0	0	0	0	46,865	16,632	0	1,812.10
Orange	245	120	0	304	668	0	631	91	0	0	0	0	0	0	0	0	0	0	3,133	5,853	0	118.53
San Juan Capistrano	370	0	0	495	737	0	310	593	0	75	123	0	59	0	0	0	0	0	5,027	3,143	0	465.23
San Clemente	415	5,074	0	326	0	0	426	0	0	0	0	0	146	0	0	0	1,400	0	10,062	11,948	1,343	828.92
Santa Margarita	389	0	0	1,207	1,513	0	1,820	837	0	15	0	0	224	0	0	0	0	0	15,387	7,283	611	852.79
Seal Beach	0	0	0	40	5,261	0	0	2,300	0	0	0	0	0	0	0	0	0	0	155	7,561	0	157.83
Serrano	105	0	0	377	0	0	695	0	0	0	0	0	0	0	0	0	0	0	1,907	291	0	98.75
South Coast	70	0	0	4,993	13,717	0	1,421	2,889	0	16	0	0	0	0	0	0	0	0	9,628	18,870	0	566.88
Trabuco Canyon	0	0	0	56	0	0	130	0	0	0	4,339	0	0	0	0	0	0	0	729	4,339	0	149.82
Tustin	329	0	0	408	0	0	317	386	0	65	-341	0	30	0	0	0	0	0	4,444	1,849	0	127.30
Westminster	0	0	0	54	0	0	73	0	0	105	0	0	50	0	0	47	0	0	748	0	0	12.54
Yorba Linda	40	990	0	921	0	0	1,715	0	0	213	0	0	0	0	0	42	0	0	5,790	1,103	500	478.49
MWDOC Totals	36,622	21,669	0	19,818	65,250	0	20,883	24,634	0	1,556	31,599	0	2,199	-710	0	272	1,400	0	194,823	274,867	14,752	17,368.89
Anaheim	338	0	0	498	712	0	794	5,221	0	147	3,953	0	0	0	0	0	0	0	4,020	49,799	105	1,402.16
Fullerton	107	0	0	684	1,196	0	521	7,015	0	65	3,034	0	0	0	0	0	0	0	2,910	11,309	1,484	719.68
Santa Ana	86	2,533	0	310	0	0	0	1,420	0	0	1,106	0	0	0	0	0	0	0	859	5,752	0	146.67
Non-MWDOC Totals	531	2,533	0	1,492	1,908	0	1,315	13,656	0	212	8,093	0	0	0	0	0	0	0	7,789	66,860	1,589	2,268.51
Orange County Totals	37,153	24,202	0	21,310	67,158	0	22,198	38,290	0	1,768	39,692	0	2,199	-710	0	272	1,400	0	202,612	341,727	16,341	19,637.40

COMMERCIAL PLUMBING FIXTURES REBATE PROGRAM[1]
INSTALLED BY AGENCY
through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	Totals	Cumulative Water Savings across all Fiscal Years
Brea	234	0	10	91	734	242	0	**1,607**	**586**
Buena Park	5	23	56	591	133	49	0	**2,538**	**1,363**
East Orange CWD RZ	0	0	0	0	0	0	0	**0**	**0**
El Toro WD	0	212	6	268	35	737	717	**2,516**	**750**
Fountain Valley	0	0	1	249	0	895	0	**1,767**	**755**
Garden Grove	4	1	167	676	410	0	0	**2,451**	**1,805**
Golden State WC	0	1	0	1,008	53	93	0	**2,958**	**2,278**
Huntington Beach	104	144	7	783	641	10	0	**2,964**	**1,942**
Irvine Ranch WD	1,090	451	725	11,100	5,958	1,599	413	**29,878**	**9,794**
La Habra	0	0	0	340	42	0	0	**925**	**664**
La Palma	0	0	0	0	509	0	0	**675**	**159**
Laguna Beach CWD	0	27	0	0	0	0	0	**446**	**373**
Mesa Water	6	0	79	661	782	0	0	**4,254**	**2,545**
Moulton Niguel WD	0	0	3	413	281	506	0	**1,783**	**1,032**
Newport Beach	0	0	566	0	0	0	0	**1,834**	**1,550**
Orange	1	271	81	275	2,851	458	414	**5,902**	**2,280**
San Juan Capistrano	0	14	0	0	0	0	0	**260**	**457**
San Clemente	0	0	1	0	0	0	0	**432**	**444**
Santa Margarita WD	0	0	2	90	743	598	506	**2,054**	**368**
Santiago CWD	0	0	0	0	0	0	0	**0**	**0**
Seal Beach	0	0	0	0	184	278	0	**816**	**519**
Serrano WD	0	0	0	0	0	0	0	**0**	**0**
South Coast WD	148	0	382	0	0	0	0	**1,320**	**646**
Trabuco Canyon WD	0	0	0	0	0	0	0	**11**	**18**
Tustin	0	0	75	358	212	2	64	**1,468**	**1,007**
Westminster	1	28	0	146	177	25	0	**1,163**	**1,191**
Yorba Linda	1	0	0	226	84	338	0	**933**	**684**
MWDOC Totals	**1,594**	**1,172**	**2,161**	**17,275**	**13,829**	**5,830**	**2,114**	**70,955**	**33,208**
Anaheim	165	342	463	3,072	309	1,808	0	**15,561**	**8,466**
Fullerton	94	0	178	476	621	274	0	**3,052**	**2,015**
Santa Ana	16	17	5	1,293	238	582	0	**6,319**	**5,637**
Non-MWDOC Totals	**275**	**359**	**646**	**4,841**	**1,168**	**2,664**	**0**	**24,932**	**16,119**
Orange County Totals	**1,869**	**1,531**	**2,807**	**22,116**	**14,997**	**8,494**	**2,114**	**95,887**	**49,327**

Family 4-Liter HETs, Zero Water Urinals, High Efficiency Clothes Washers, Cooling Tower Conductivity Controllers, Ph Cooling Tower Conductivity Controllers, Flush Valve Retrofit Kits, Pre-rinse Spray heads, Hospital X-Ray Processor Recirculating Systems, Steam Sterilizers, Food Steamers, Water Pressurized Brooms, Laminar Flow Restrictors, and Ice Making Machines.

INDUSTRIAL PROCESS/WATER SAVINGS INCENTIVE PROGRAM

Number of Projects by Agency

Agency	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	Overall Program Interventions	Annual Water Savings[1]	Cumulative Water Savings across all Fiscal Years[1]
Brea	0	0	0	0	0	0	0	0	0	0	0
Buena Park	0	0	0	0	1	0	0	0	2	54	523
East Orange	0	0	0	0	0	0	0	0	0	0	0
El Toro	0	0	0	0	0	0	1	0	1	9	4
Fountain Valley	0	0	0	0	0	1	0	0	1	23	35
Garden Grove	0	0	0	0	1	0	0	0	1	0	1
Golden State	0	0	0	0	0	0	0	0	1	3	31
Huntington Beach	0	2	0	1	2	0	1	0	6	180	641
Irvine Ranch	1	1	1	0	2	1	1	0	10	119	681
La Habra	0	0	0	0	1	0	0	0	1	0	1
La Palma	0	0	0	0	0	0	0	0	0	0	0
Laguna Beach	0	0	0	0	0	0	0	0	0	0	0
Mesa Water	0	0	0	0	0	0	0	0	0	0	0
Moulton Niguel	0	0	0	0	0	0	0	0	0	0	0
Newport Beach	0	0	0	1	0	0	0	0	1	21	79
Orange	0	0	0	0	1	2	1	0	5	97	538
San Juan Capistrano	0	0	0	0	0	0	0	0	0	0	0
San Clemente	0	0	0	0	0	0	0	0	0	0	0
Santa Margarita	0	0	0	0	0	0	0	0	0	0	0
Seal Beach	0	0	0	0	0	0	0	0	0	0	0
Serrano	0	0	0	0	0	0	0	0	0	0	0
South Coast	0	0	0	0	1	1	0	0	2	134	202
Trabuco Canyon	0	0	0	0	0	0	0	0	0	0	0
Tustin	0	0	0	0	0	0	0	0	0	0	0
Westminster	0	0	0	0	0	0	0	0	0	0	0
Yorba Linda	0	0	0	0	0	0	0	1	1	20	2
MWDOC Totals	1	3	1	2	9	5	4	1	32	662	2736
Anaheim	0	0	0	0	0	0	0	0	0	0	0
Fullerton	0	0	0	0	0	0	0	0	0	0	0
Santa Ana	0	0	0	0	1	0	0	0	1	11	417
OC Totals	1	3	1	2	10	5	4	1	33	673	3153

[1] Acre feet of savings determined during a one year monitoring period.

If monitoring data is not available, the savings estimated in agreement is used.

TURF REMOVAL BY AGENCY[1]

through MWDOC and Local Agency Conservation Programs

Agency	FY 12/13		FY 13/14		FY 14/15		FY 15/16		FY 16/17		FY 17/18		FY 18/19		Total Program		Cumulative Water Savings across all Fiscal Years
	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	Res	Comm.	
Brea	7,605	0	5,697	0	71,981	30,617	118,930	404,411	8,354	479	9,853	27,234	2,834	0	228,651	472,207	**406.02**
Buena Park	0	0	0	0	11,670	1,626	77,127	16,490	3,741	0	4,586	0	1,230	0	98,354	18,116	**64.76**
East Orange	0	0	1,964	0	18,312	0	27,844	0	0	0	0	0	0	0	48,120	0	**30.06**
El Toro	4,680	72,718	4,582	0	27,046	221,612	63,546	162,548	13,139	48,019	7,273	42,510	3,035	0	128,024	547,407	**425.70**
Fountain Valley	682	7,524	4,252	0	45,583	5,279	65,232	0	3,679	0	8,631	0	1,777	0	131,136	12,803	**89.41**
Garden Grove	4,534	0	8,274	0	67,701	22,000	177,408	49,226	11,504	0	4,487	0	0	0	287,921	117,403	**281.06**
Golden State	31,813	3,200	32,725	8,424	164,507	190,738	310,264	112,937	0	0	0	0	0	0	581,902	346,272	**636.92**
Huntington Beach	9,219	12,437	20,642	0	165,600	58,942	305,420	270,303	9,560	21,534	14,236	6,032	2,308	0	555,416	421,737	**628.44**
Irvine Ranch	32,884	32,384	36,584	76,400	234,905	317,999	782,844	2,675,629	231,483	46,725	86,893	61,037	7,700	2,942	1,425,166	3,227,576	**2,674.39**
La Habra	0	0	0	0	14,014	1,818	49,691	72,164	0	0	3,003	0	1,504	0	68,212	90,019	**99.42**
La Palma	0	0	0	0	4,884	0	10,257	59,760	0	0	0	0	0	0	15,141	59,760	**42.63**
Laguna Beach	2,664	1,712	4,586	226	13,647	46,850	47,614	0	3,059	0	589	0	0	0	75,670	48,788	**82.86**
Mesa Water	10,667	0	22,246	0	131,675	33,620	220,815	106,896	4,173	77,033	17,373	77,785	1,360	0	415,086	295,334	**396.89**
Moulton Niguel	11,538	84,123	14,739	40,741	314,250	1,612,845	889,748	1,059,279	220,749	0	98,271	0	9,363	0	1,564,097	2,840,054	**2,758.97**
Newport Beach	3,548	2,346	894	0	33,995	65,277	76,675	375,404	2,924	0	5,938	6,499	0	0	127,428	449,526	**337.75**
Orange	15,951	8,723	11,244	0	120,093	281,402	289,990	106,487	12,847	2,366	11,956	0	2,238	0	477,290	398,978	**561.26**
San Clemente	16,062	13,165	18,471	13,908	90,349	1,137	215,249	438,963	4,267	0	33,083	7,098	1,634	0	400,617	474,271	**523.58**
San Juan Capistrano	29,544	27,156	12,106	0	101,195	32,366	197,290	143,315	2,624	40,748	0	0	0	0	365,415	347,277	**509.68**
Santa Margarita	10,151	11,600	17,778	48,180	211,198	514,198	534,048	550,420	17,010	28,094	62,706	25,000	11,786	0	871,124	1,194,453	**1,264.55**
Santiago	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Seal Beach	3,611	0	0	0	15,178	504	17,349	15,911	1,234	0	752	0	0	0	38,124	16,415	**33.87**
Serrano	0	0	2,971	0	41,247	0	127,877	4,403	5,450	0	555	0	2,000	0	180,100	4,403	**108.17**
South Coast	9,429	4,395	15,162	116,719	84,282	191,853	181,102	128,290	14,967	0	13,319	7,806	2,542	0	327,609	465,387	**531.62**
Trabuco Canyon	1,542	22,440	2,651	0	14,771	0	42,510	88,272	1,465	0	4,788	0	0	0	67,999	110,712	**111.56**
Tustin	9,980	0	1,410	0	71,285	14,137	232,697	33,362	11,173	0	16,926	0	0	0	343,471	47,499	**229.18**
Westminster	0	0	0	0	14,040	34,631	71,833	23,902	11,112	0	10,033	0	421	0	107,439	58,533	**95.21**
Yorba Linda	0	0	0	0	112,136	12,702	360,279	116,985	19,420	0	9,529	3,696	7,214	0	519,927	133,383	**381.82**
MWDOC Totals	**216,104**	**303,923**	**238,978**	**304,598**	**2,195,544**	**3,692,153**	**5,493,639**	**7,015,357**	**613,934**	**264,998**	**424,780**	**264,697**	**58,946**	**2,942**	**9,449,439**	**12,198,313**	**13,305.79**
Anaheim	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Fullerton	0	0	0	9,214	0	0	0	0	0	0	0	0	0	0	0	9,214	**7.74**
Santa Ana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-**
Non-MWDOC Totals	**0**	**0**	**0**	**9,214**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9,214**	**7.74**
Orange County Totals	**216,104**	**303,923**	**238,978**	**313,812**	**2,195,544**	**3,692,153**	**5,493,639**	**7,015,357**	**613,934**	**264,998**	**424,780**	**264,697**	**58,946**	**2,942**	**9,449,439**	**12,207,527**	**13,314**

[1]Installed device numbers are listed as square feet

HIGH EFFICIENCY TOILETS (HETs) INSTALLED BY AGENCY

through MWDOC and Local Agency Conservation Programs

Agency	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	Total	Cumulative Water Savings across all Fiscal Years
Brea	0	38	146	154	4	6	0	**456**	**116.31**
Buena Park	0	96	153	112	13	3	0	**687**	**215.26**
East Orange CWD RZ	0	13	26	24	0	0	0	**86**	**24.09**
El Toro WD	133	218	869	264	12	6	4	**2,047**	**611.62**
Fountain Valley	0	41	132	220	7	9	0	**832**	**278.72**
Garden Grove	0	63	350	363	7	4	0	**1,488**	**474.87**
Golden State WC	2	142	794	512	9	11	0	**2,801**	**877.48**
Huntington Beach	0	163	1,190	628	4	3	0	**2,904**	**821.99**
Irvine Ranch WD	1,449	810	1,777	2,798	638	239	24	**17,172**	**6,024.75**
Laguna Beach CWD	0	45	112	81	1	4	0	**392**	**118.10**
La Habra	0	37	94	83	5	1	0	**591**	**215.86**
La Palma	0	21	59	52	4	2	0	**224**	**66.01**
Mesa Water	0	147	162	162	7	3	0	**1,621**	**650.09**
Moulton Niguel WD	0	400	2,497	1,939	49	40	1	**5,731**	**1,344.36**
Newport Beach	0	49	168	243	11	6	0	**731**	**208.28**
Orange	1	142	978	416	17	10	2	**2,191**	**608.89**
San Juan Capistrano	0	35	140	202	3	9	0	**532**	**139.76**
San Clemente	0	72	225	246	11	6	0	**878**	**255.87**
Santa Margarita WD	0	528	997	1,152	114	34	0	**3,343**	**793.90**
Seal Beach	2	17	50	69	-1	0	0	**857**	**421.72**
Serrano WD	0	2	40	55	3	0	0	**121**	**28.68**
South Coast WD	64	102	398	235	11	7	0	**1,028**	**266.55**
Trabuco Canyon WD	0	10	108	169	2	3	0	**342**	**77.41**
Tustin	0	64	132	201	12	10	1	**1,517**	**589.83**
Westminster	0	35	161	359	3	4	0	**1,335**	**460.36**
Yorba Linda WD	0	40	280	379	12	8	0	**1,259**	**388.69**
MWDOC Totals	1,651	3,330	12,038	11,118	958	428	32	**51,166**	**16,079.45**
Anaheim	0	156	1,188	614	70	19	0	**5,884**	**2,192.98**
Fullerton	0	61	293	286	14	9	0	**1,064**	**313.92**
Santa Ana	0	33	602	293	20	0	0	**2,021**	**687.54**
Non-MWDOC Totals	0	250	2,083	1,193	104	28	0	**8,969**	**3,194.44**
Orange County Totals	**1,651**	**3,580**	**14,121**	**12,311**	**1,062**	**456**	**32**	**60,135**	**19,273.89**