

AGENDA
IRVINE RANCH WATER DISTRICT
ENGINEERING AND OPERATIONS COMMITTEE
WEDNESDAY, JUNE 7, 2017

CALL TO ORDER 7:00 a.m., IRWD's Operations Center, First Floor Committee Room,
3512 Michelson, Irvine Ranch Water District

ATTENDANCE Committee Chair: Steve LaMar _____
 Committee Member: John Withers _____

<u>ALSO PRESENT</u>	Paul Cook _____	Patrick Sheilds _____	Harry Cho _____
	Kevin Burton _____	Eric Akiyoshi _____	Paul Weghorst _____
	Rich Mori _____	Scott Toland _____	Tom Roberts _____
	Kellie Lew _____	Ken Drake _____	Ken Pfister _____
	Lars Oldewage _____	Arseny Kalinsky _____	Steve Malloy _____
	Malcolm Cortez _____	Bruce Newell _____	_____

COMMUNICATIONS

1. Notes: Burton
2. Public Comments
3. Determine the need to discuss and/or take action on item(s) introduced that came to the attention of the District subsequent to the agenda being posted.
4. Determine which items may be approved without discussion.

INFORMATION

5. RESERVOIR MANAGEMENT PLANS FOR FISCAL YEAR 2017-18 –
PFISTER/ROBERTS/SHEILDS

Recommendation: Receive and file.

ACTION

6. SYPHON RESERVOIR EXPANSION ANALYSIS – AKIYOSHI/BURTON

Recommendation: That the Board approve an Expenditure Authorization in the amount of \$2,500,000 for the Syphon Reservoir Expansion, Project 03808, for the environmental documentation and supporting engineering services.

OTHER BUSINESS

7. A. Directors Comments

B. Adjourn

Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District's office, 15600 Sand Canyon Avenue, Irvine, California ("District Office"). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available at the entrance of the meeting room at the District's Operation's Committee Room at 3512 Michelson, Irvine, California. The Irvine Ranch Water District's Committee Room is wheelchair accessible. If you require any special disability-related accommodations (e.g., access to an amplified sound system, etc.), please contact the District Secretary at (949) 453-5312 during business hours at least seventy-two (72) hours prior to the scheduled meeting.

June 7, 2017

Prepared by: K. Pfister

Submitted by: T. Roberts / P. Sheilds

Approved by: Paul A. Cook 

ENGINEERING AND OPERATIONS COMMITTEE

RESERVOIR MANAGEMENT PLANS FOR FISCAL YEAR 2017-18

SUMMARY:

Staff is presenting the IRWD Reservoir Management Plans for Fiscal Year (FY) 2017-18. These plans consider various assumptions and constraints for the recycled water reservoirs and for Irvine Lake.

BACKGROUND:

Recycled Water System Reservoir Management Plan:

The Reservoir Management Plan for the IRWD Recycled Water System is a 12-month projection of the recycled water system's supply and demands, as well as rainfall amounts; system and permitting constraints are also taken into consideration. The San Joaquin, Sand Canyon, Syphon, and Rattlesnake Reservoirs currently have a maximum combined storage capacity of 5,300 acre-feet (AF) as shown in Table 1.

Table 1. Recycled Water Storage

Reservoir	Max Level	Max Capacity
San Joaquin	470 ft	2,910 AF
Rattlesnake	406 ft	1,102 AF
Sand Canyon	193.5 ft	788 AF
Syphon	378 ft	500 AF
Total		5,300 AF

The goal for this plan is to maintain adequate storage in the reservoirs to accept full production from the Michelson Water Recycling Plant, Wells 78, ET-1 and ET-2 during low demand periods while maximizing recycled water in storage for peak demand periods. Ensuring that the inventory in storage is maximized will reduce the need to purchase untreated supplemental water.

During FY 2016-17, 1,205 AF was sent to the Green Acres Project (GAP) and to the Orange County Sanitation District (OCSD) outfall due to low demands and low available storage levels. Approximately 1,000 AF of run-off was added to storage as a result of rain events. Projected demands were forecasted using the averages from the previous two years and other factors.

The Recycled Water System Reservoir Management Plan for FY 2017-18, provided as Exhibit “A”, was developed with the following assumptions:

- Starting storage level of 3,200 AF as of July 1, 2017;
- Recycled system water demands of 27,843 AF for a full year;
- Recycled system supplies of 29,210 AF;
- Routing 675 AF of recycled water to the GAP and/or OCSD outfall;
- Los Alisos Water Recycling Plant will operate for six months;
- Mandatory operation of Wells 78, ET-1, and ET-2 for 10 months of the year; and
- Achieving a combined maximum storage level for all reservoirs of 90% or 4,770 AF by May 31, 2018.

Irvine Lake Plan Reservoir Management Plan:

The Reservoir Management Plan for Irvine Lake anticipates capturing 2,000 AF of native run-off and utilizing 6,000 AF of native water that was allocated to IRWD on April 20, 2017. At this time, staff does not anticipate needing to purchase additional untreated water to meet demands or to supplement the recycled water system. If runoff capture projections are not realized, imported untreated water would be purchased at a rate of \$695 per AF. The reservoir will be maintained at the lowest level possible entering the winter season to maximize the potential to capture any runoff from precipitation events.

The Irvine Lake Reservoir Management Plan, provided as Exhibit “B”, was developed with the following assumptions:

- Starting storage of 12,000 AF as of July 1, 2017;
- Demands of 7,388 AF based on a two-year average; and
- Annual rainfall capture of 2,000 AF.

FISCAL IMPACTS:

None.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

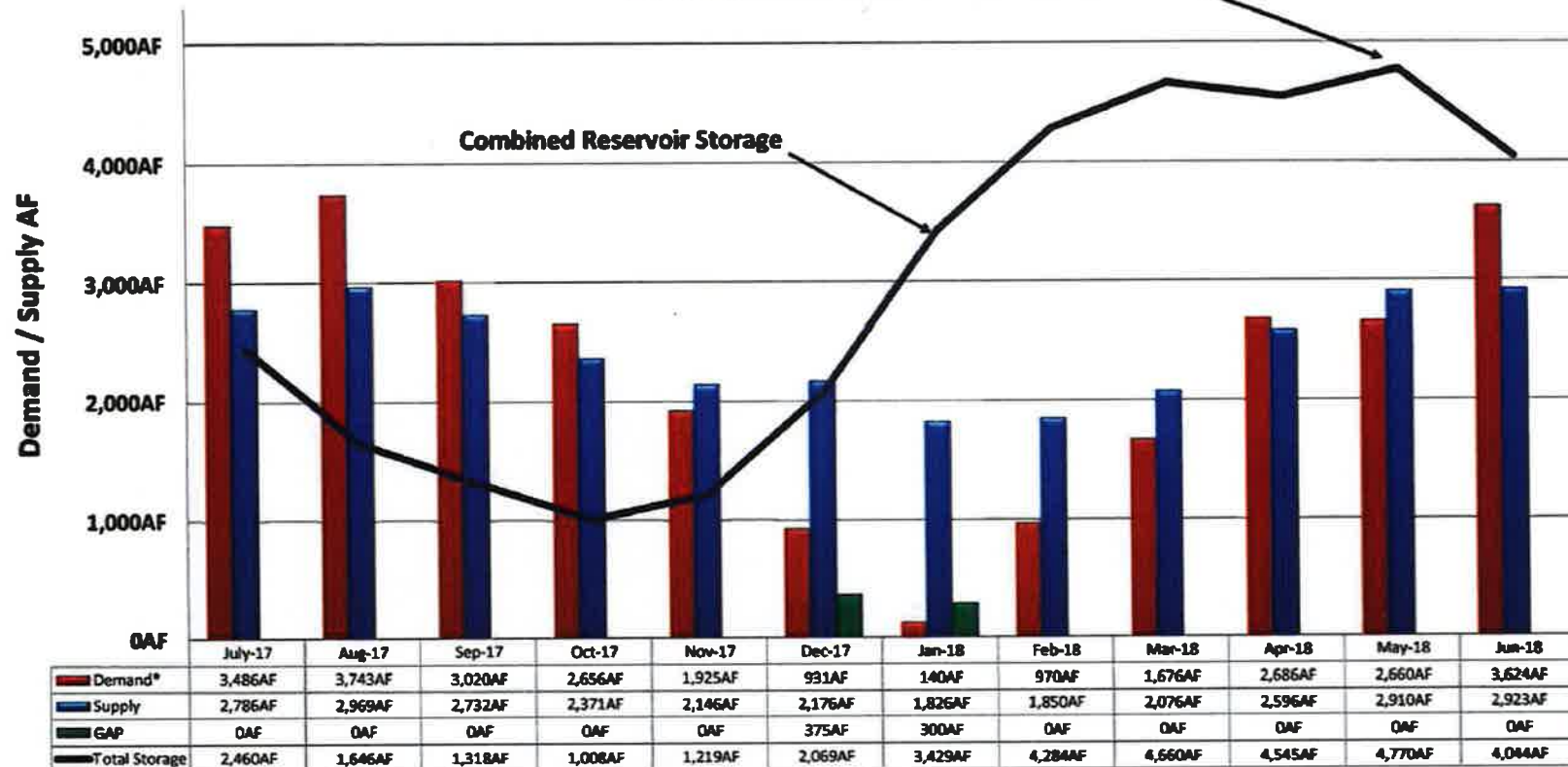
Exhibit “A” – Recycled Reservoirs Management Plan FY 2017-18

Exhibit “B” – Irvine Lake Reservoir Management FY 2017-18

"Exhibit A"

Recycled Reservoir Management Plan FY 2017-2018 San Joaquin, Rattlesnake, Syphon and Sand Canyon

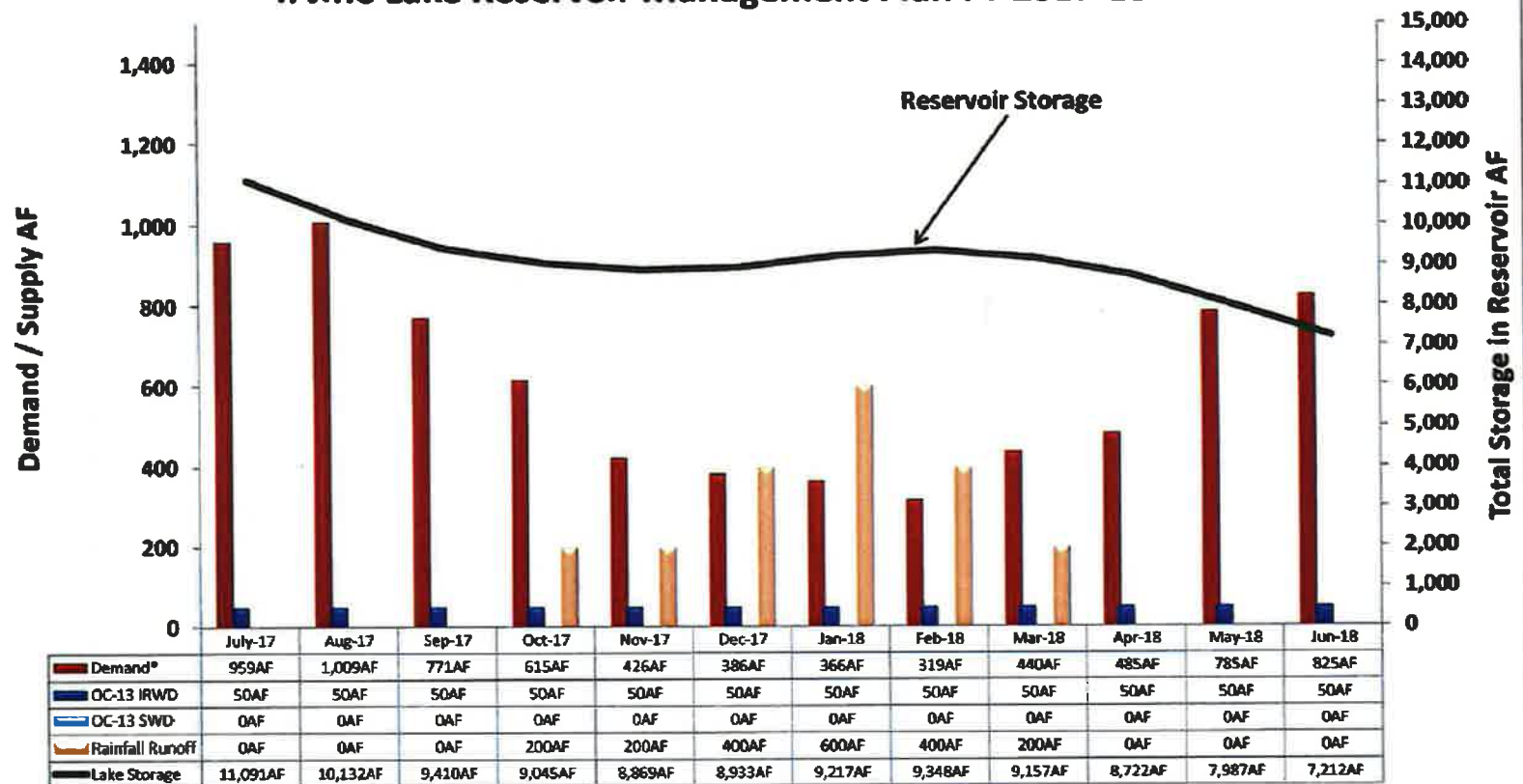
Maximum Storage of 4,770 AF by May 31, 2018



*Demand Projections Based on a 2 Year Average

“Exhibit B”

Irvine Lake Reservoir Management Plan FY 2017-18



*Demand Projections Based on a 2 Year Average and includes evaporation loss

June 7, 2017

Prepared by: E. Akiyoshi

Submitted by: K. Burton

Approved by: Paul A. Cook 

ENGINEERING AND OPERATIONS COMMITTEE

SYPHON RESERVOIR EXPANSION ANALYSIS

SUMMARY:

Staff has prepared an analysis of the proposed expansion of IRWD's Syphon Reservoir, quantifying the cost effects of the project relative to reduced purchases of untreated imported water from Metropolitan Water District and reduced sewage diversions to Orange County Sanitation District particularly during wet weather events. Staff recommends that the Board approve an Expenditure Authorization in the amount of \$2,500,000 for the environmental documentation and supporting engineering analyses.

BACKGROUND:

IRWD purchased Syphon Reservoir in January 2010. Subsequently, the "Syphon Reservoir Expansion Feasibility Study" and associated constructability analysis was completed in August 2012. The reservoir was integrated into the recycled water system in October 2014.

IRWD's sewage projections were calibrated in 2016 and presented to the Board. While the current capacity at Michelson Water Recycling Plant (MWRP) is 28 MGD, the projected baseline sewage flows to MWRP at buildout are 32.5 MGD.

The current Syphon Reservoir expansion analysis was conducted with several baseline assumptions. This focuses the decision-making process on Syphon Reservoir while keeping options open for future projects, interagency agreements, and analyses. The assumptions used include:

- *Constrain MWRP flows to 28 MGD:* Although the March 2016 calibrated flow projections indicate 32.5 MGD, capping the MWRP flows to 28 MGD allowed for a conservative approach to the analysis;
- *Perform a sensitivity analysis for future recycled water demands:* A sensitivity analysis was conducted for baseline, increased (+10%), and decreased (-10%) future demands; and
- *Assume no grant funding:* While IRWD continues to pursue grant funding for this project, this analysis excludes any capital offsets through grant funding that may be obtained for this project.

Staff will make a presentation of the details of the analysis at the Committee meeting. A copy of the presentation is attached as Exhibit "A". Using the described approach, the analysis demonstrates that expanding Syphon Reservoir makes sense now. Staff recommends that IRWD proceed with the environmental documentation and supporting engineering analyses.

FISCAL IMPACTS:

The Syphon Reservoir Expansion, Project 03808, is in the FY 2016-17 Capital Budget as a flagged project and has sufficient budget for this work. An Expenditure Authorization is required for this work and staff will bring the environmental and engineering consultant contract awards to the Board for approval in the near future.

Project No.	Current Budget	Addition <Reduction>	Total Budget	Existing EA	This EA Request	Total EA Request
03808	\$60,169,200	\$0	\$60,169,200	\$150,000	\$2,500,000	\$2,650,000

ENVIRONMENTAL COMPLIANCE:

This project is subject to the California Environmental Act (CEQA). In conformance with the California Code of Regulations Title 14, Chapter 3, Section 15004, the appropriate environmental document will be prepared when meaningful information becomes available.

RECOMMENDATION:

That the Board approve an Expenditure Authorization in the amount of \$2,500,000 for the Syphon Reservoir Expansion, Project 03808, for the environmental documentation and supporting engineering services.

LIST OF EXHIBITS:

Exhibit "A" – Draft Presentation

EXHIBIT "A"

Syphon Reservoir Expansion Analysis

Engineering and Operations Committee
June 6, 2017



Workshop Overview

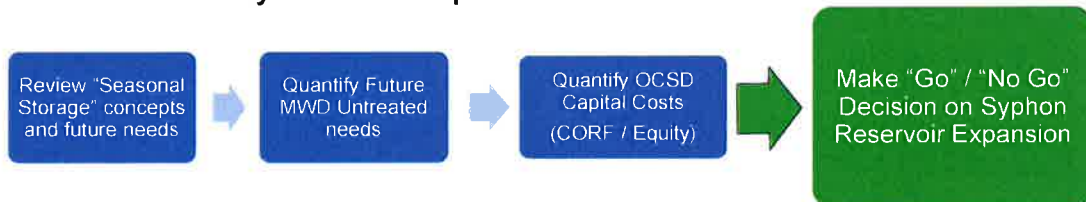
- Project Background
- Syphon Reservoir Expansion Analysis
 - Quantify effects on purchasing MWD untreated water
 - Quantify effects on sewage diversions to OCSD
- Path Forward and Recommendations

Project Background

- Syphon Background

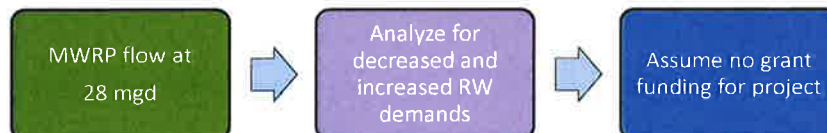


- Goals for Today's Workshop



Setting up the Syphon Expansion Analysis

- Baseline concepts



- Demonstrate that expanding Syphon Reservoir makes sense now

Setting up the Syphon Expansion Analysis

- Baseline

This approach allows decisions independent of:

“What if sewage flows at MWRP remain the same?”

“What if MWRP Phase 3 never happens?”

“What if our RW demands are lower (or higher) than we are projecting?”

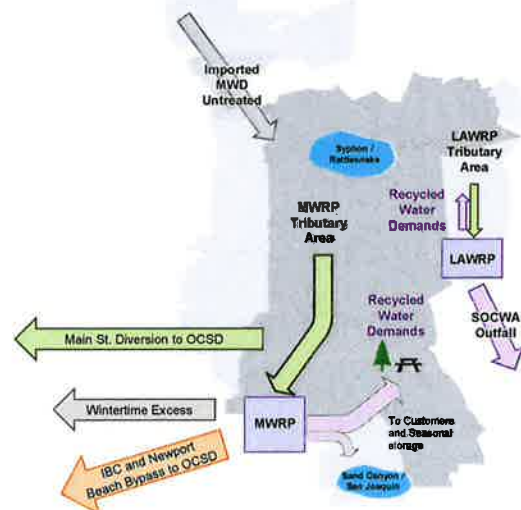
“What about Potable Reuse?”

- Demon

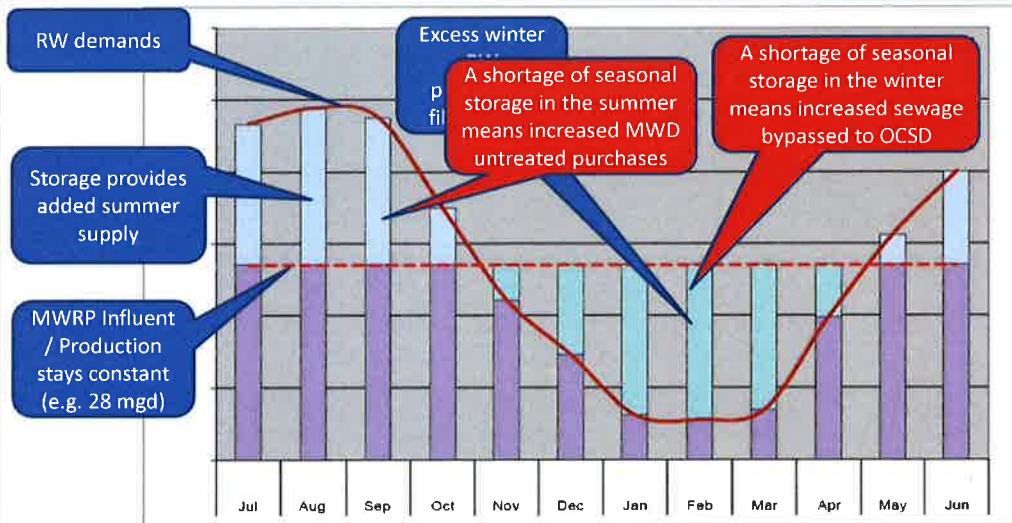
is sense now

Review Seasonal Storage Concepts

- Helps balance sewage flows with annual variations in RW Demands
- Minimizes purchasing MWD untreated water during peak summer season
- Optimizes excess sewage disposal at OCSD and SOCWA outfall



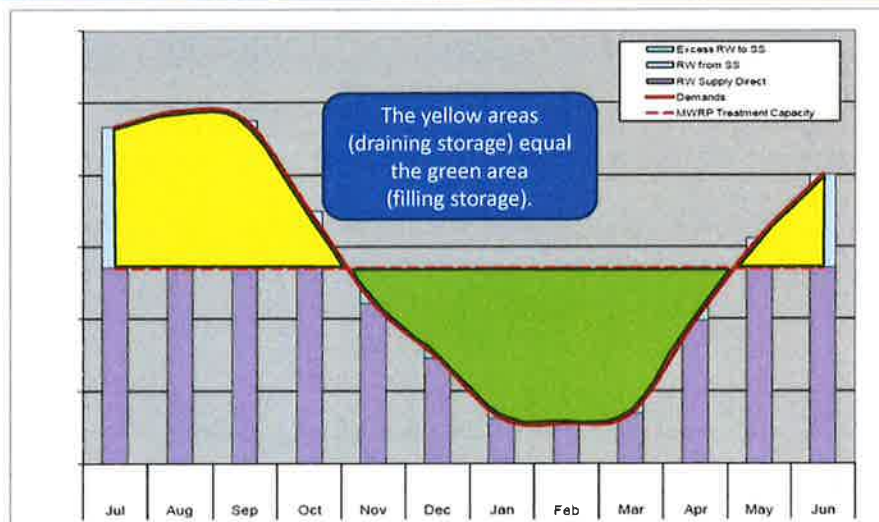
Seasonal Storage Overview



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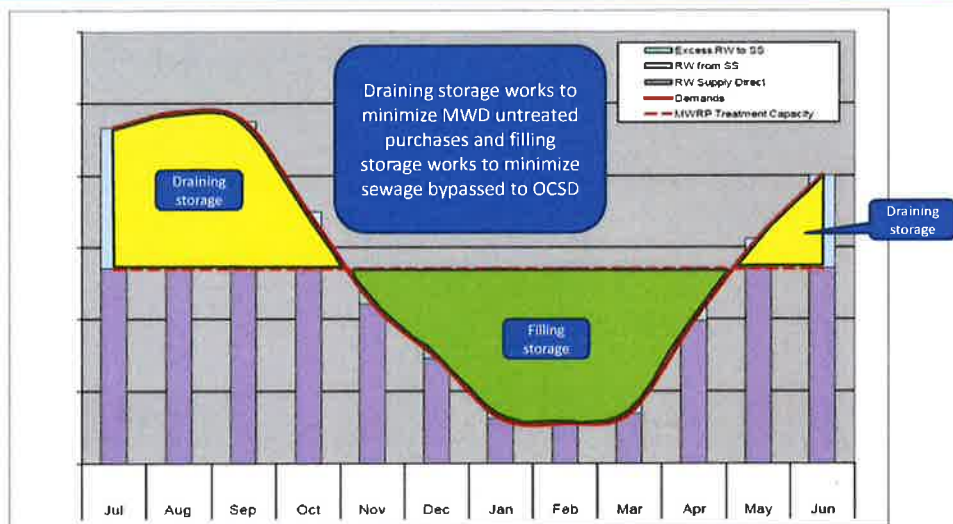
Additional Seasonal Storage Needed



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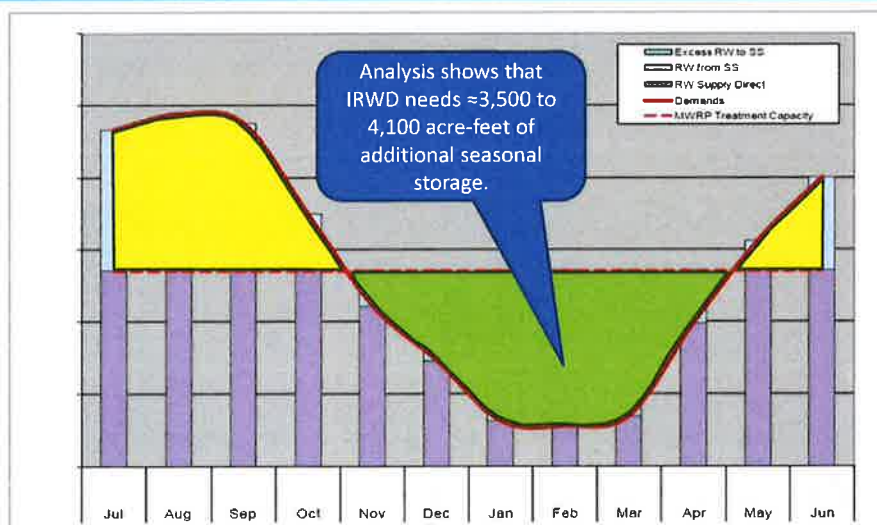
Additional Seasonal Storage Needed



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Additional Seasonal Storage Needed



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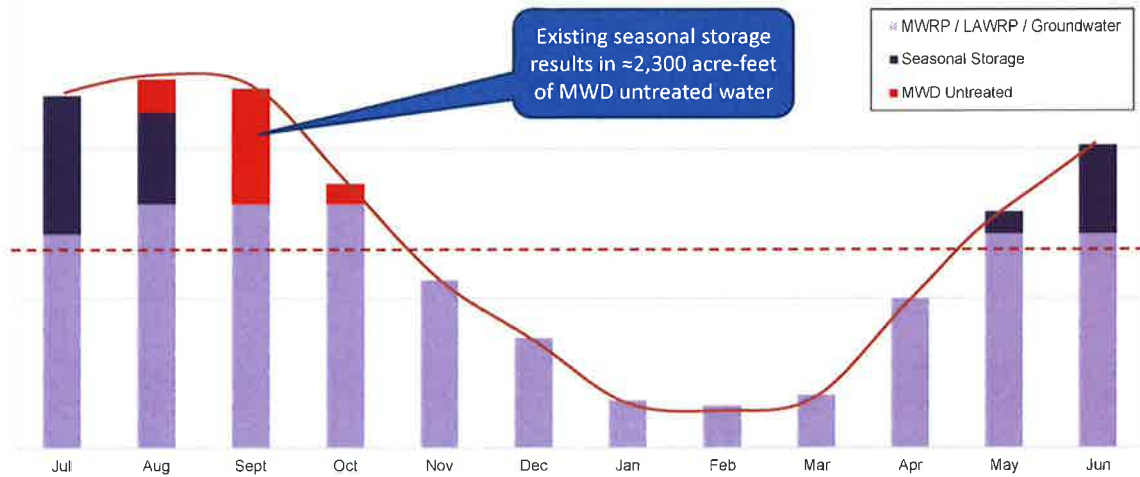
Seasonal Storage Requirements

Seasonal Storage Reservoir	Usable Capacity (acre-feet)
Rattlesnake Reservoir	900
Sand Canyon Reservoir	750
San Joaquin Reservoir	2,500
Existing Syphon Reservoir	400
Total Existing	4,550

Seasonal Storage Requirements

Seasonal Storage Reservoir	Usable Capacity (acre-feet)
Rattlesnake Reservoir	900
Sand Canyon Reservoir	750
San Joaquin Reservoir	2,500
Existing Syphon Reservoir	400
Proposed Syphon Expansion	+4,100
Total Required	8,650

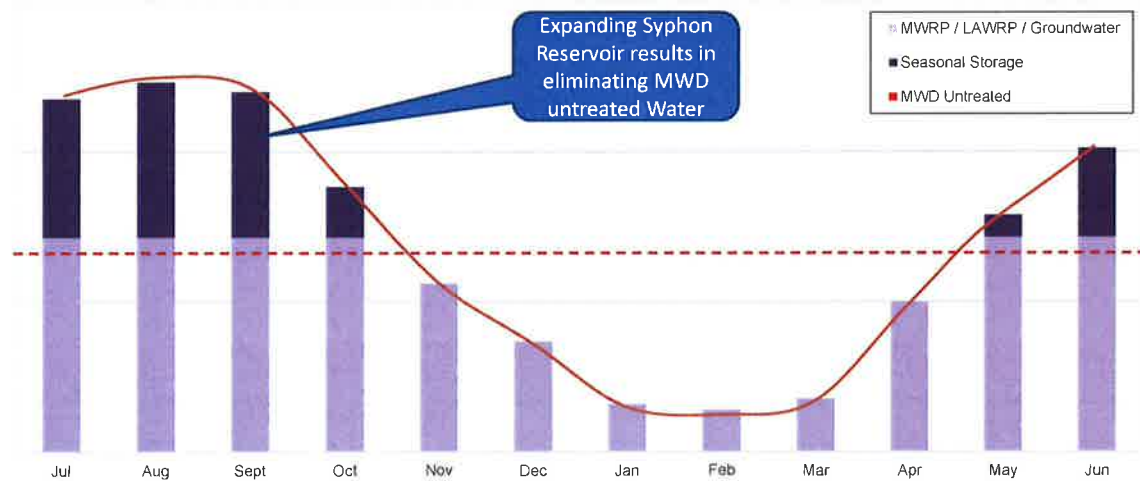
Reduced Reliance on MWD Untreated Water



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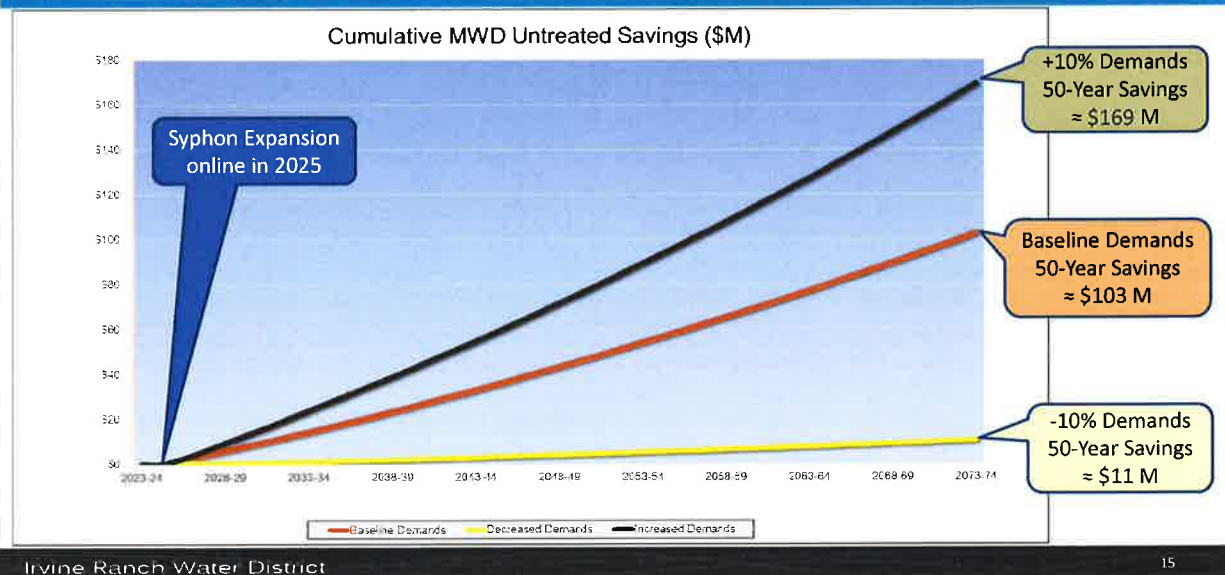
Reduced Reliance on MWD Untreated Water



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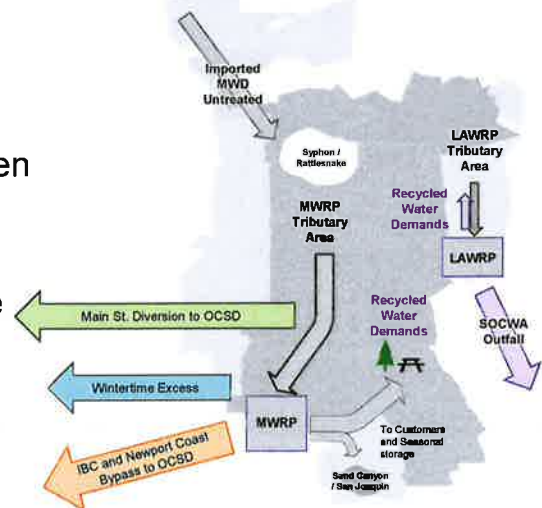
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Effect of Increased Independence from MWD Untreated Water

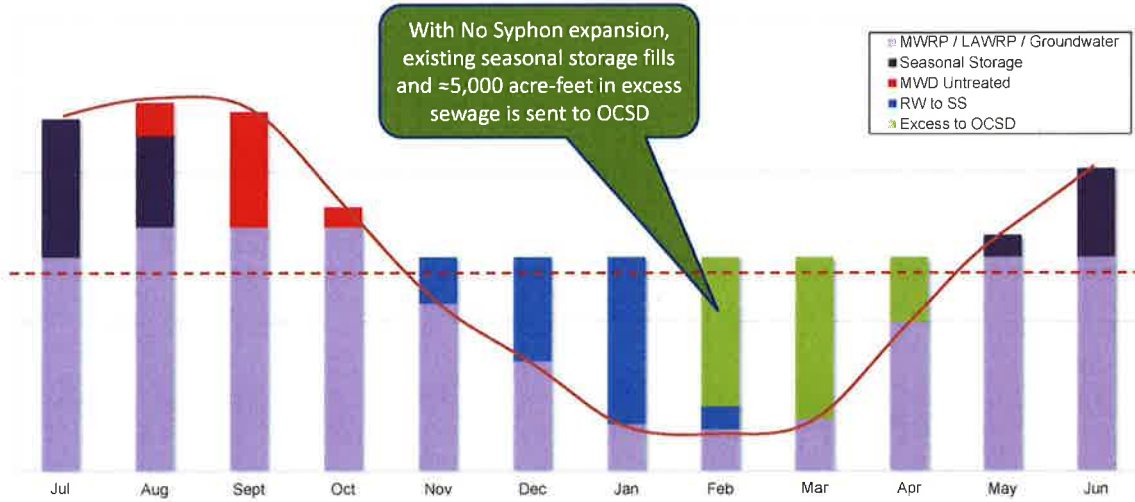


Excess Sewage Diversions

- Main Street Diversion to OCSD is primarily used when sewage influent exceeds MWRP treatment capacity.
- Wintertime Excess bypass occurs when seasonal storage is full and MWRP treatment capacity exceeds demands
- IBC and Newport Coast Bypasses are year-round occurrences and are excluded from this analysis
- SOCWA Outfall is used when LAWRP Tertiary is not needed.



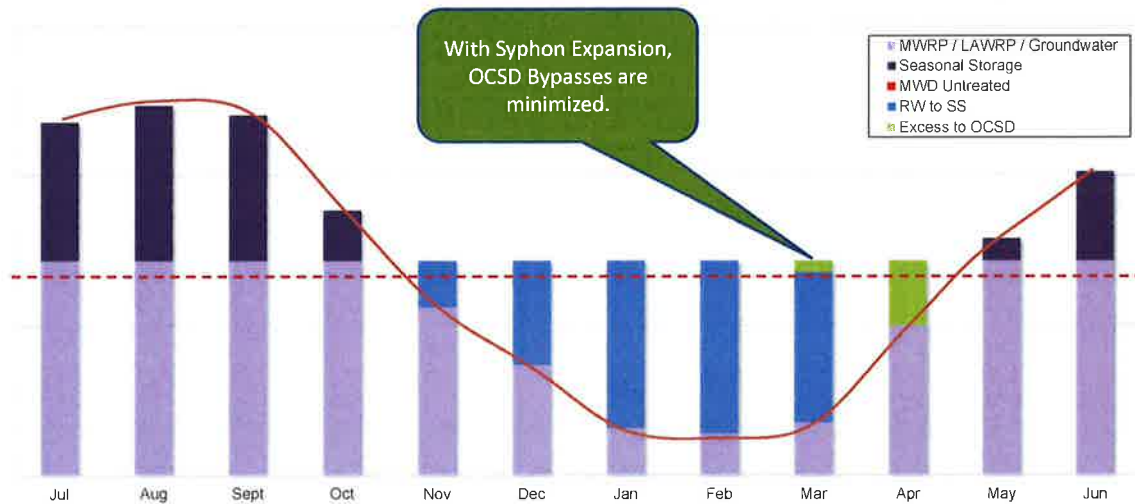
OCSD Sewage Diversion without Syphon



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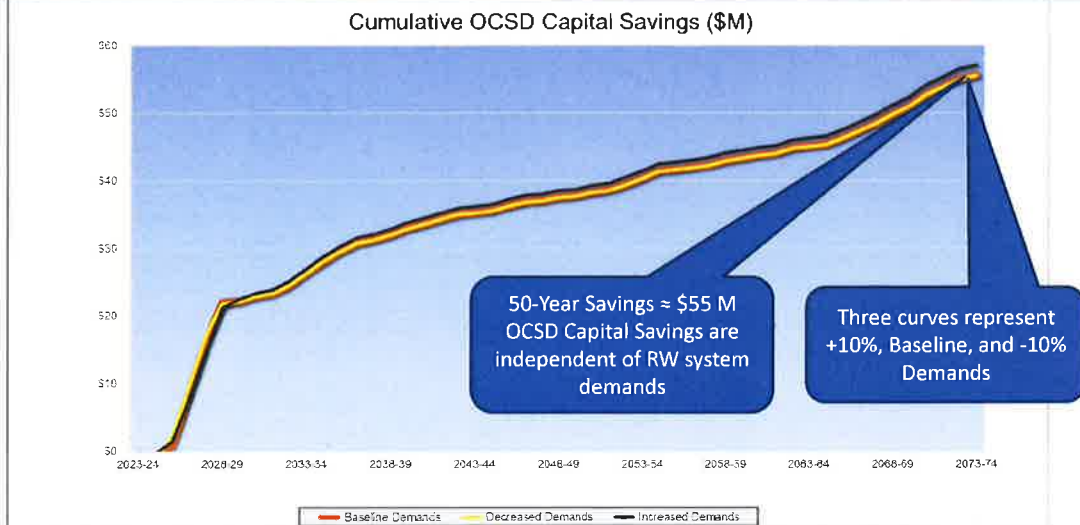
OCSD Sewage Diversion With Syphon Expansion



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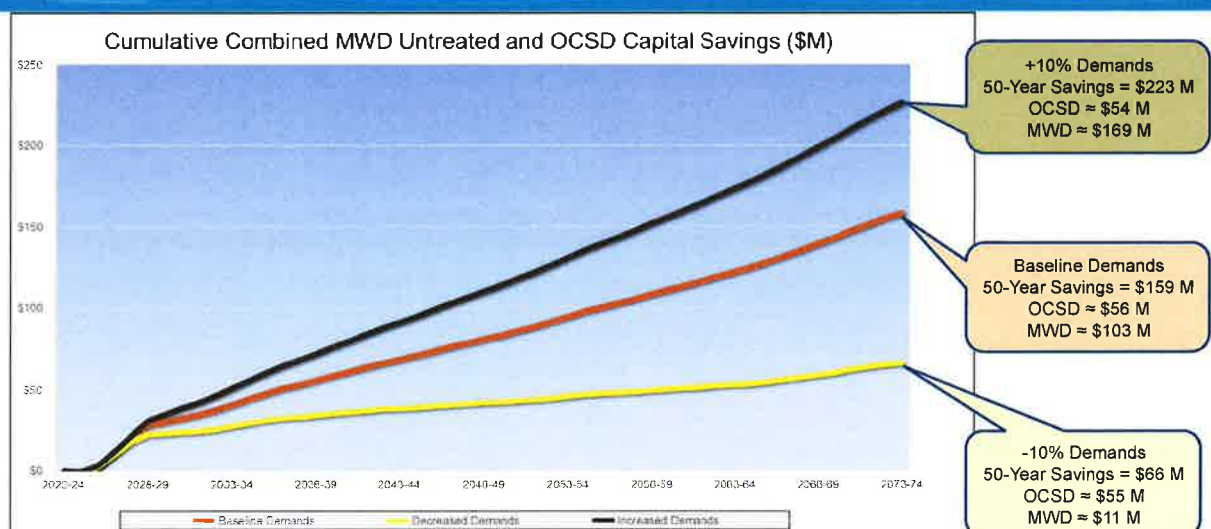
Effect of Minimizing OCSD Diversions



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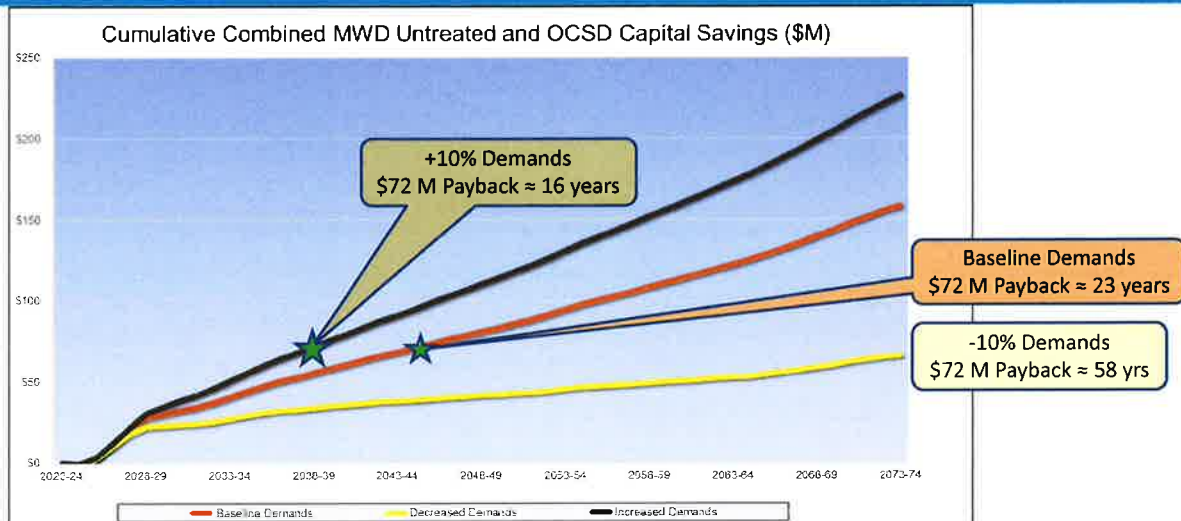
Cumulative MWD Untreated and OCSD Capital Savings



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Cumulative MWD Untreated and OCSD Capital Savings



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Conclusions for the Syphon Reservoir Expansion

- Cumulative savings exceed project cost under all scenarios (Without including O&M savings)
- Furthers IRWD's Long-Time Strategic Goals
 - Reduces IRWD reliance on MWD untreated water
 - Optimizes the use of recycled water
 - Minimizes OCSD sewage disposal
- Preserves options for:
 - Future Potable Reuse
 - MWRP Expansion Phase 3
 - Green Acres Project concepts

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Recommendations

- Authorize Expenditure Authorization in the amount of \$2,500,000
- Proceed with CEQA and environmental documentation process
- Proceed with Preliminary Design to support environmental documentation process
- Continue pursuing grant funding for Syphon Reservoir
- Return to Board for CEQA and Engineering Consultant Awards