



Engineering, Operations, & Technology Committee

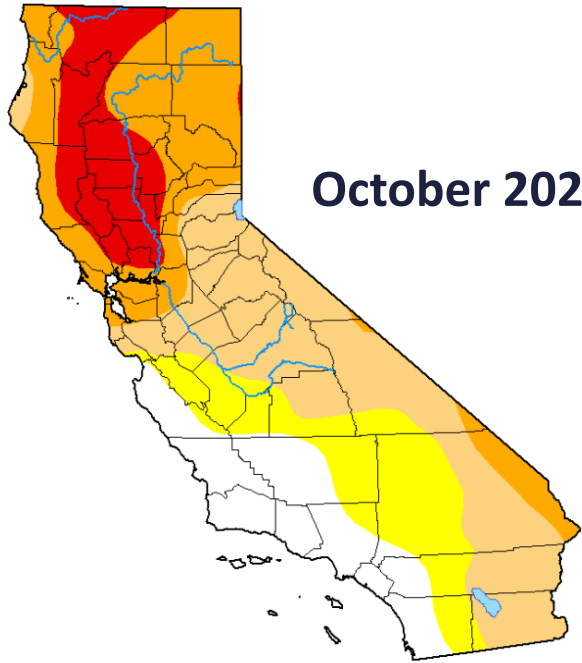
2022 System Operations A Year in Review

Item 6b

Monday, January 9, 2023

9:30 a.m.

Continued Extreme Drought Conditions



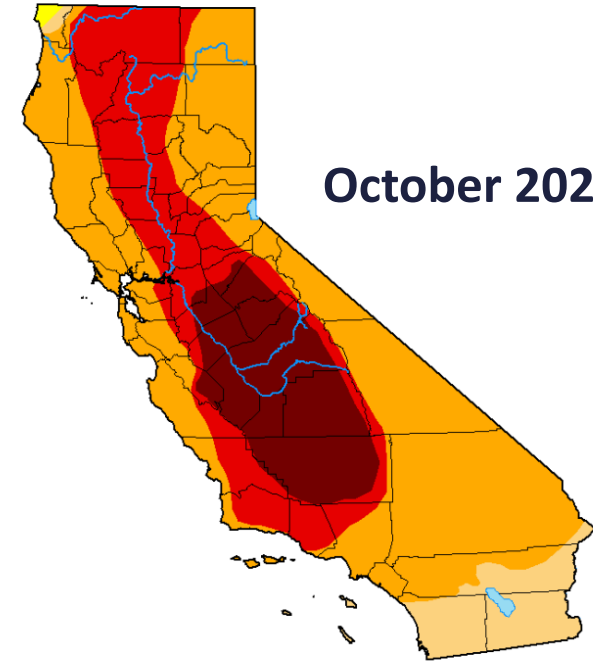
October 2020

20% SWP Allocation



October 2021

5% SWP Allocation



October 2022

5% SWP Allocation + HH&S

None
D0 (Abnormally Dry)

D1 (Moderate Drought)
D2 (Severe Drought)

D3 (Extreme Drought)
D4 (Exceptional Drought)

White areas on map indicate no drought

Images from the United States Drought Monitor



8-Station
Index

Northern Sierra 8-Station Index



Water Year Cumulative 8-Station Precipitation (inches)



Last year started good

... however, 2022 transitioned to record dryness
(Driest January through October in 103 year record)



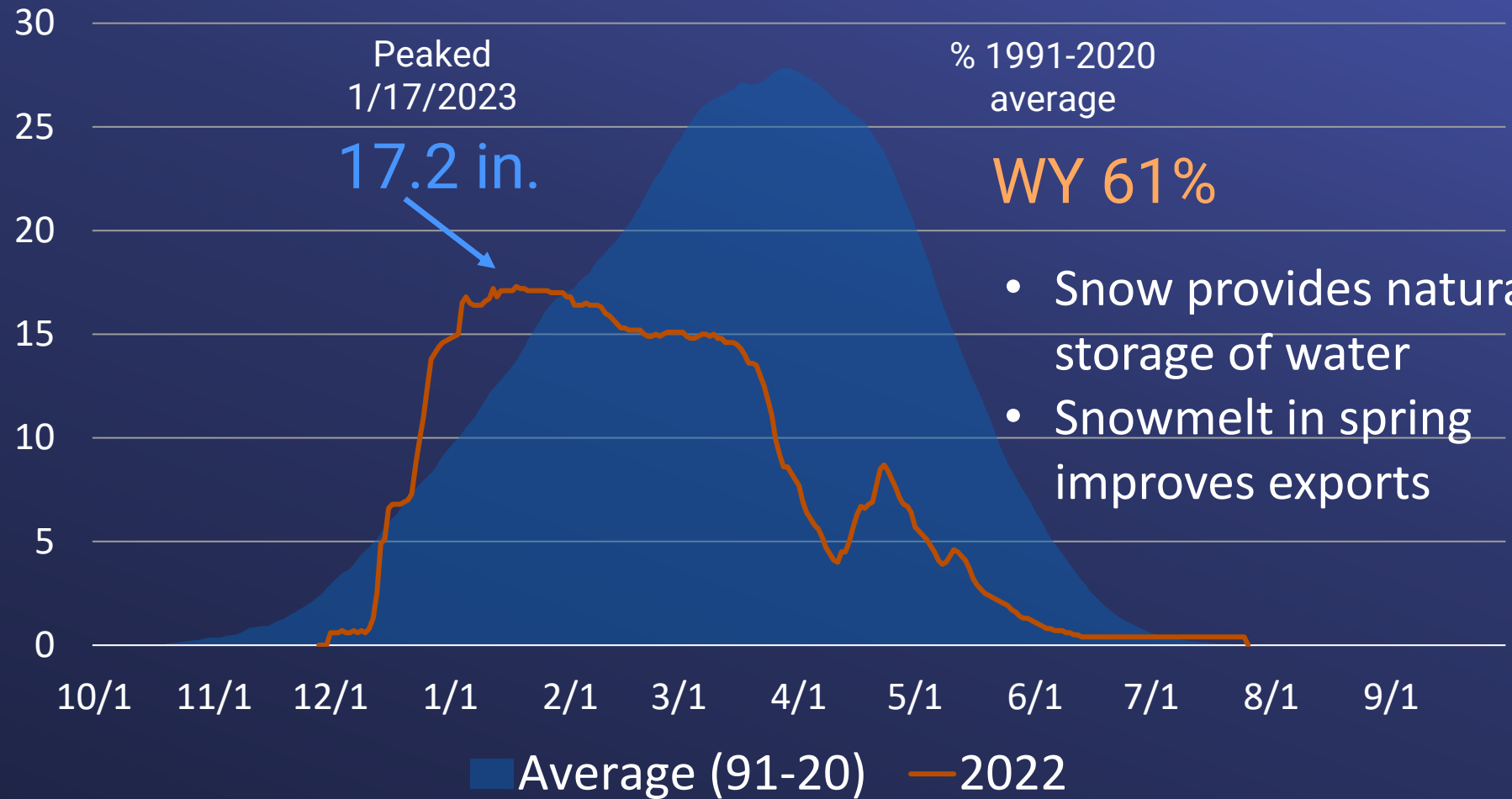
Northern Sierra Snowpack



Phillips Snow Course April 1, 2022

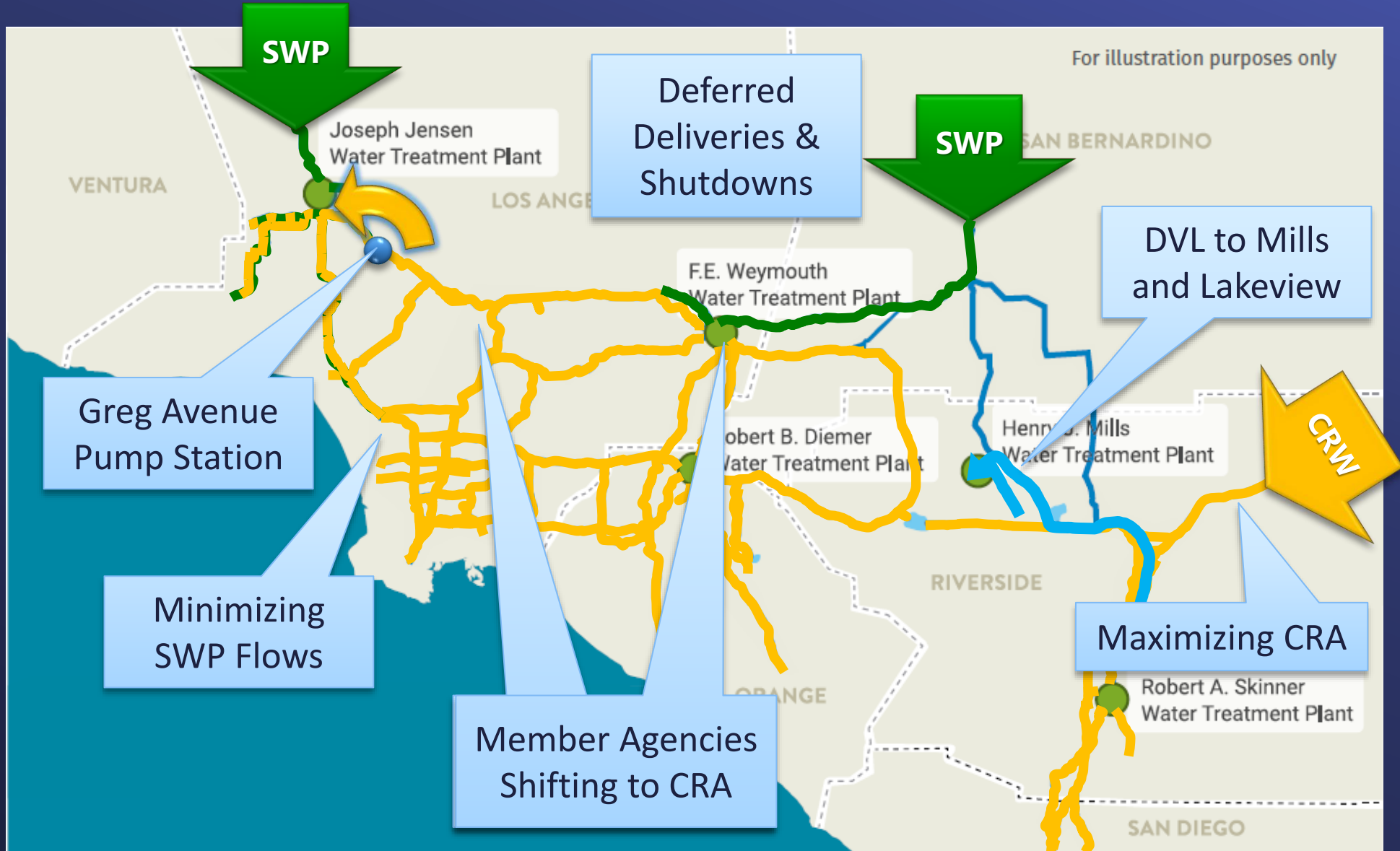
Below-Average Snowpack WY 2022

Northern Sierra Snow Water Content (inches)



Source:
<https://cdec.water.ca.gov/snowapp/sweq.action>


Drought Actions to Conserve SWP Supplies



Actions Conserve SWP Supplies

Extraordinary
Drought
Actions

Drought Operations	2022 (AF)
Defer Deliveries	49,500
Defer Shutdowns	36,200
DVL to Lakeview Pipeline	22,400
DVL to Mills	49,300
Greg Avenue Pumping	35,000
Shift to CRW Connections	80,300
System Modifications	14,300
Total	286,900 AF



Total conserved supply is more than a 15% SWP allocation, and a 42% increase over last year's drought actions

Colorado River Aqueduct Flowed Full Most of 2022



Cleaning CRA while operating



Cleaning CRA during shutdown



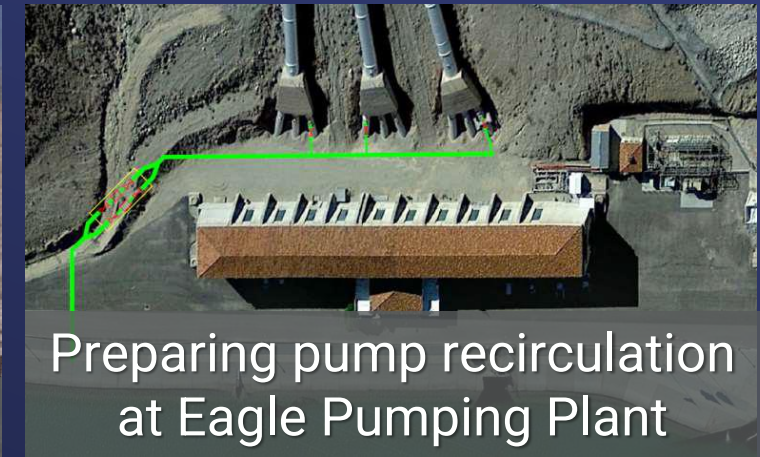
Branch tee for recirculation



Installing orifice gates at Hinds Pumping Plant

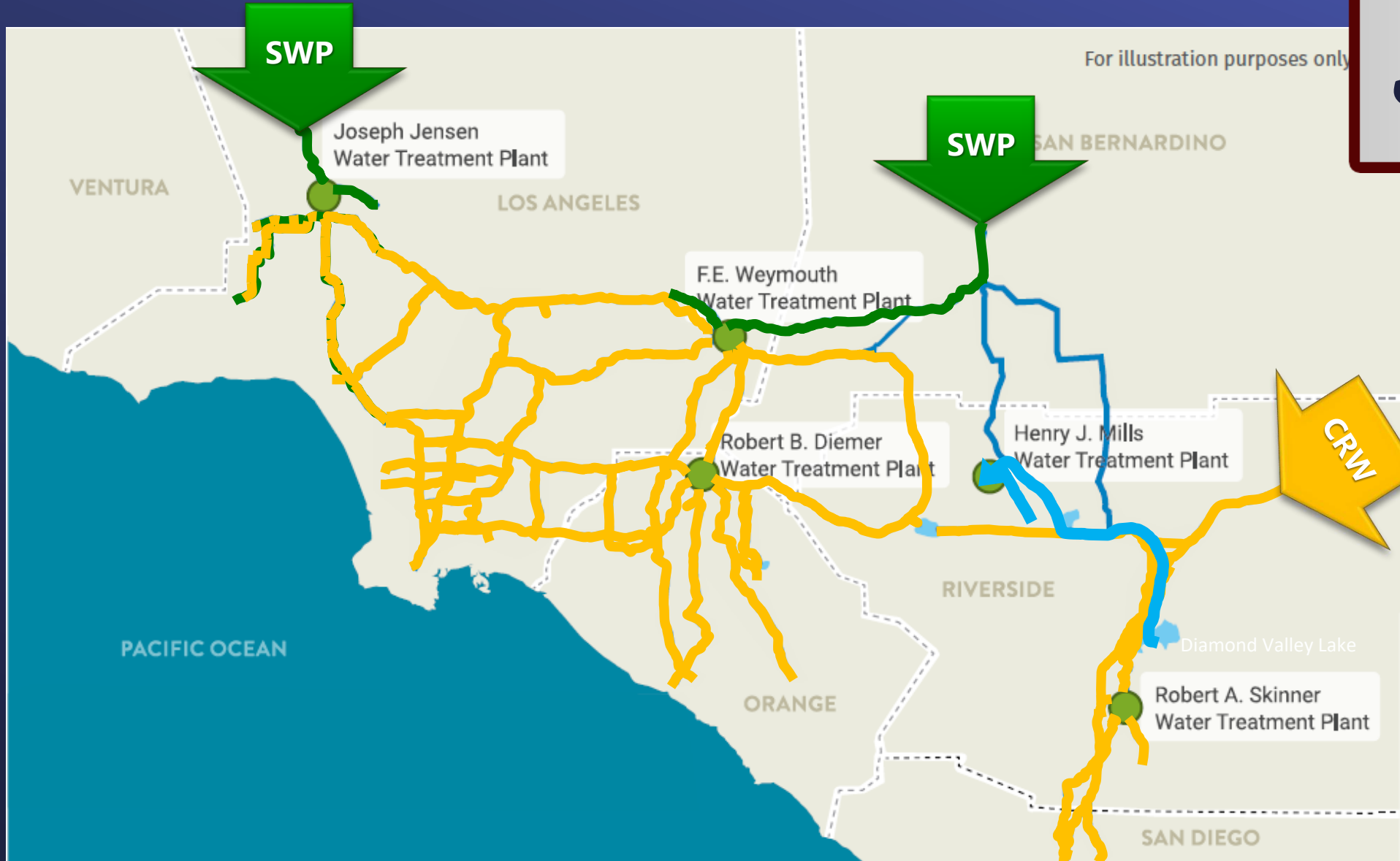


CRA flowing at capacity

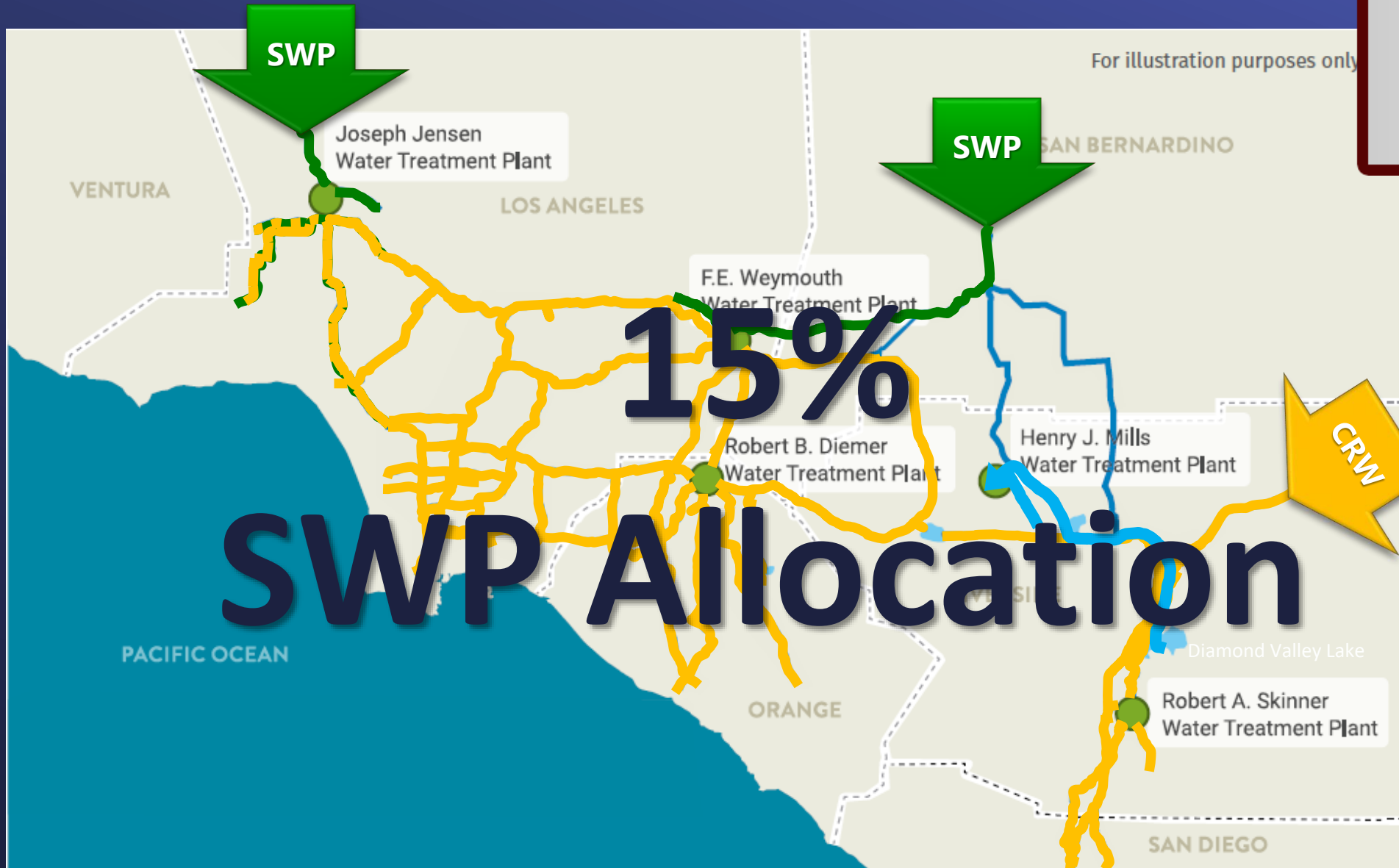


Preparing pump recirculation at Eagle Pumping Plant

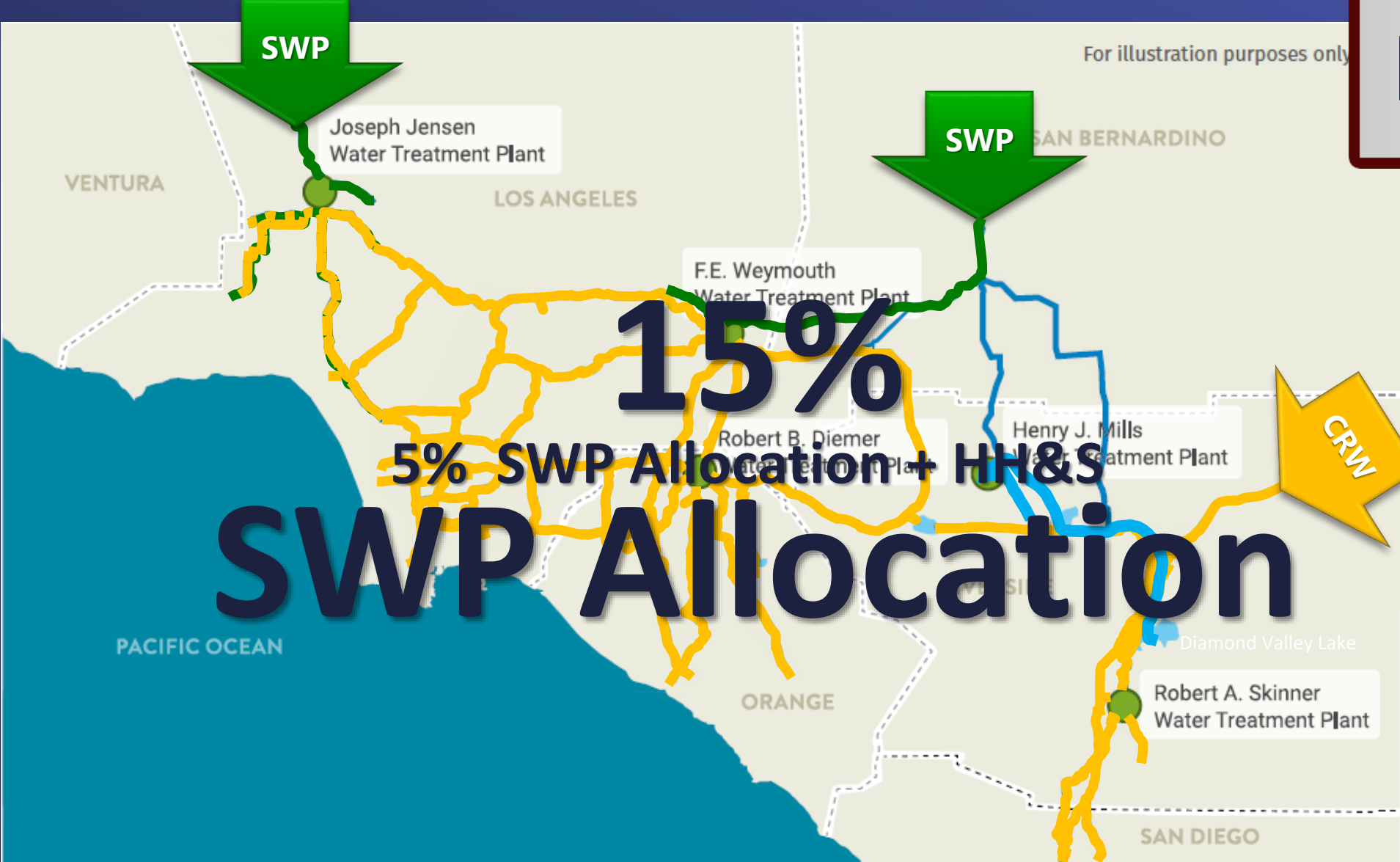
A Year of Challenges



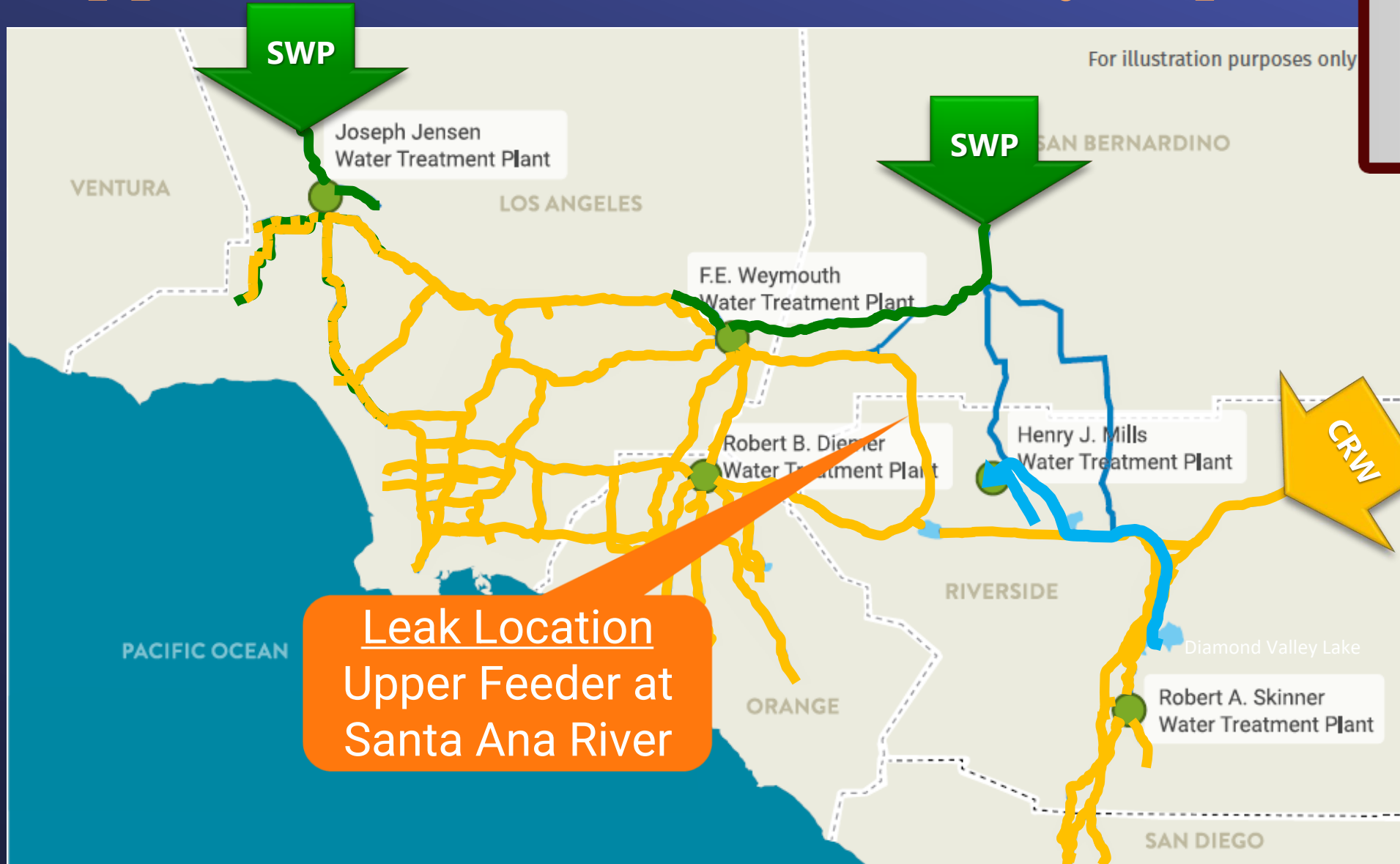
January SWP Allocation



SWP Allocation Reduced



Upper Feeder Leak – Emergency Repair

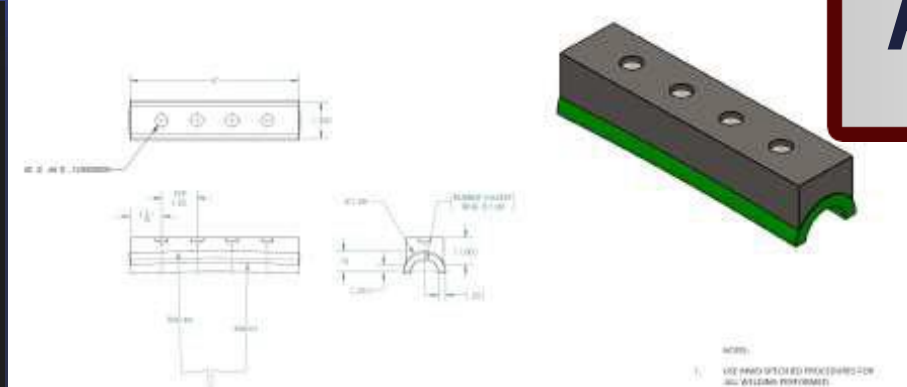
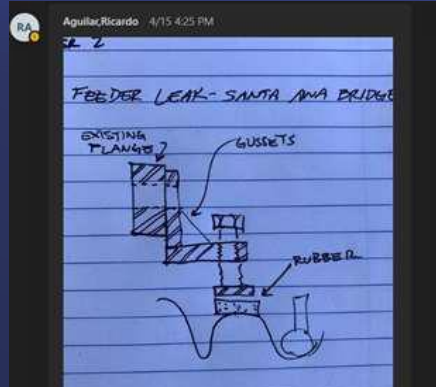


Upper Feeder Leak

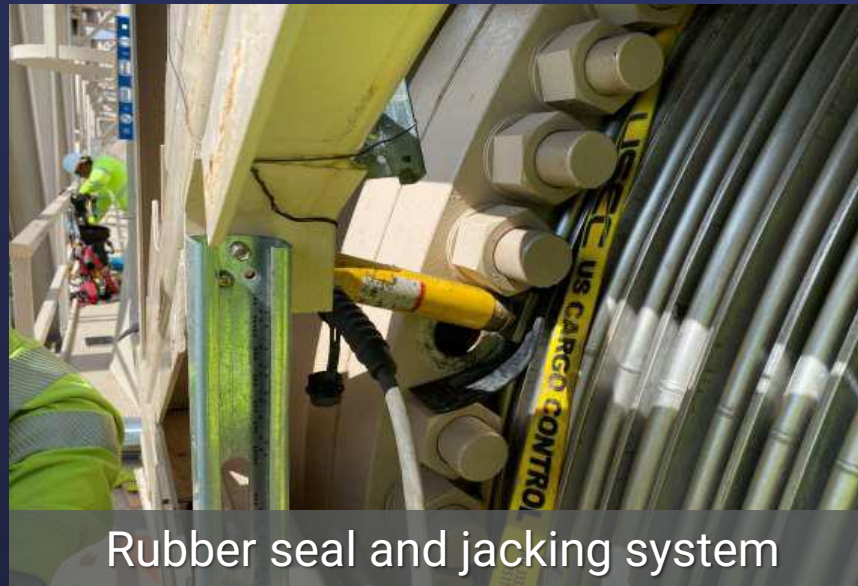
Collaborating on innovative short-term repair



Initial leak on bellows joint



On-line design collaboration for temporary repair

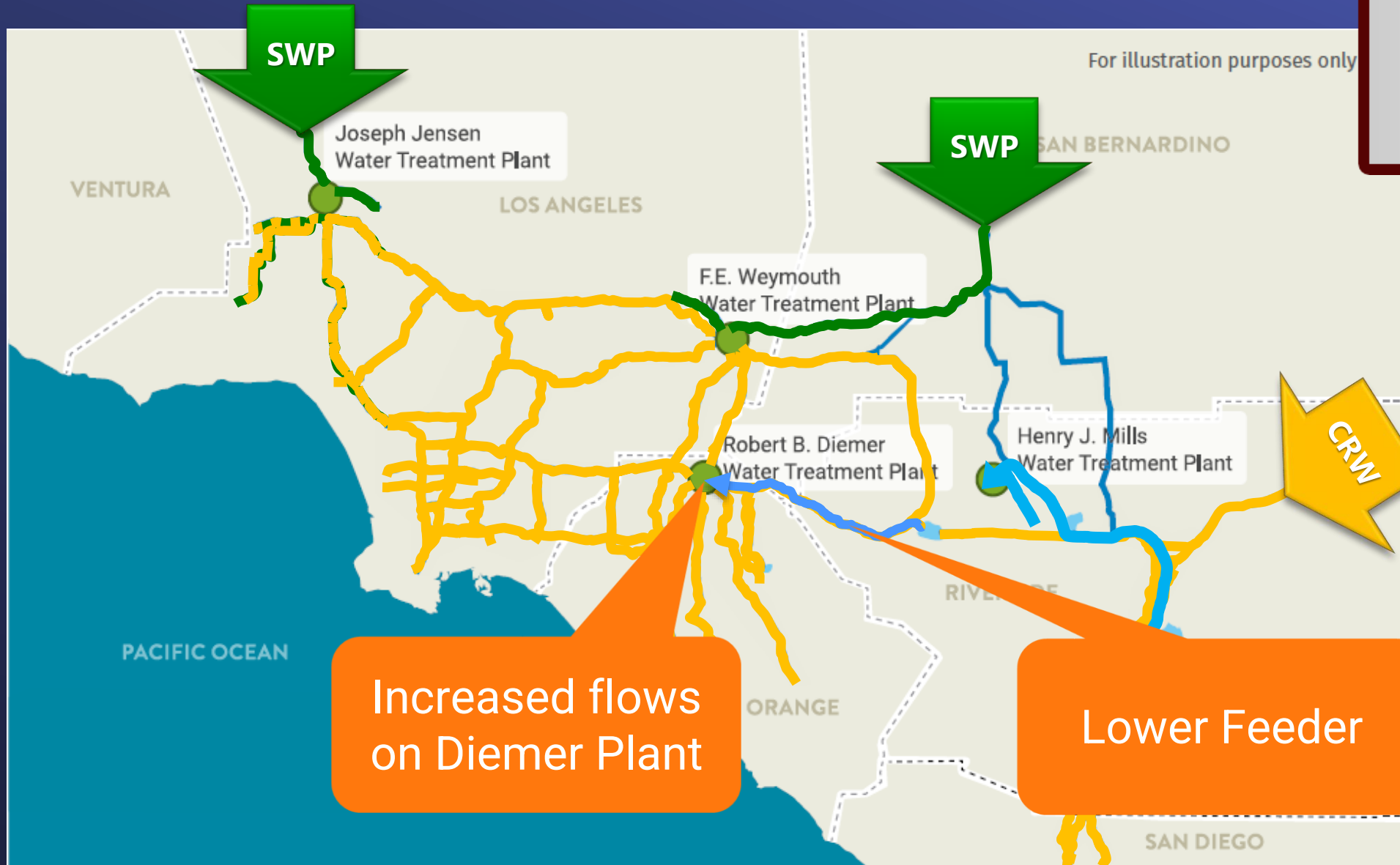


Rubber seal and jacking system



Custom bracket and plate

Diemer Plant – Managing High Flows



Lower Feeder and Diemer Plant

Overcoming challenges to maximize CRW deliveries



Replacing filter media



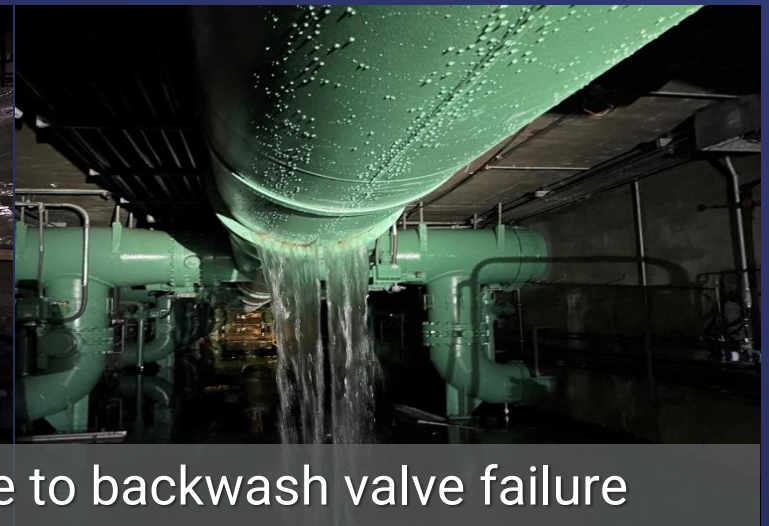
Foam buildup on basins



Repairing filter piping



Filter piping damage due to backwash valve failure



Preparing for Upper Feeder Shutdown



Preparation for dewatering at Upper Feeder

TEMPORARY CARBON STEEL SLIP-TYPE EXPANSION JOINT
 ** NOTE: THIS DESIGN IS FOR EMERGENCY USE ONLY (SERVICE LIFE NOT TO EXCEED 1 YEAR) **

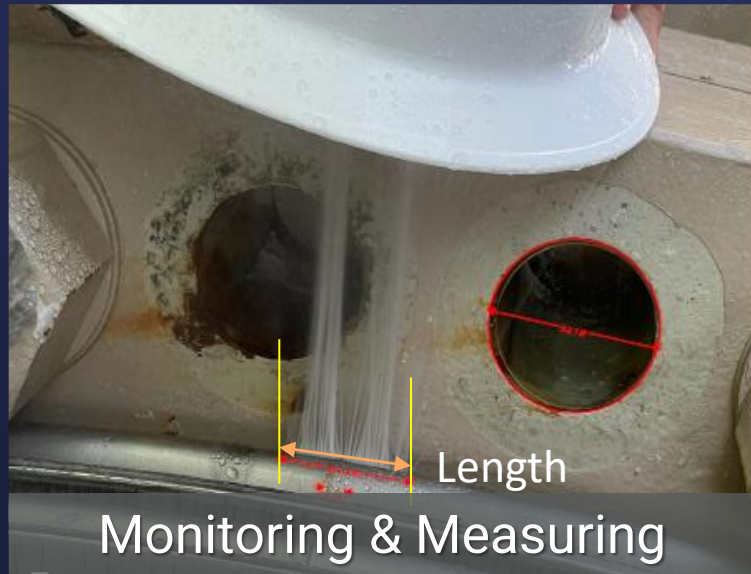
ITEM	QTY	DESCRIPTION	MATERIAL
1	1	UPSTREAM INSULATING KIT, 114" AWWA C207 CLASS E (118.69" ID, 3.0625" BOLT HOLE DIAMETER)	G-10 GASKETS, SLEEVES, & WASHERS WITH EPDM SEALING ELEMENTS
2	1	DOWNSTREAM INSULATING KIT, 114" AWWA C207 CLASS E (118.69" ID, 3.0625" BOLT HOLE DIAMETER)	G-10 GASKETS, SLEEVES, & WASHERS WITH EPDM SEALING ELEMENTS
3	48	EXPANSION JOINT STUD, 8" X 20" LONG, ALL THREAD, CUT TO SIZE	ASTM A329, GRADE 808 OR 809
4	96	EXPANSION JOINT NUT (HEAVY HEX), 8"	EVERDRUM PER ASTM F467 AND F468, ALLOY'S C6100 OR C6500
5	96	EXPANSION JOINT WASHER, 8"	ASTM F884, TYPE 316
6	1	THE ROD GUIDE, FREE END, 1.5" THICK X 127.75" X 125" OD	ASTM A36, A363, A572, A1018, OR A516
7	1	THE ROD GUIDE, FOLLOWER RING END, 1.5" THICK X 115.8" X 125" OD	ASTM A36, A363, A572, A1018, OR A516
8	1	FOLLOWER RING, 7/8" THICK X 5" WIDE X 115.7" OD	ASTM A36, A363, A572, A1018, OR A516
9	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516
10	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516
11	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516
12	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516
13	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516
14	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516
15	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516
16	1	SLIP PIPE COLLAR, 115.8" OD X 5" THICK X 75" LONG	ASTM A36, A363, A572, A1018, OR A516

REV. 5/20/22

Engineering designing new slip joint



Rolling steel



Monitoring & Measuring



Flat Carbon Steel



Metropolitan shop manufacturing slip joint

Hoover Dam Electrical Transformer Fire



Explosion at Hoover Dam July 19, 2022



Transformer fire due to 230kV bushing failure



USBR fire crews quickly extinguish fire

Reduced Metropolitan's allocation of Hoover power by about 10 MW, requiring additional purchase of supplemental energy for 2022 CRA operations

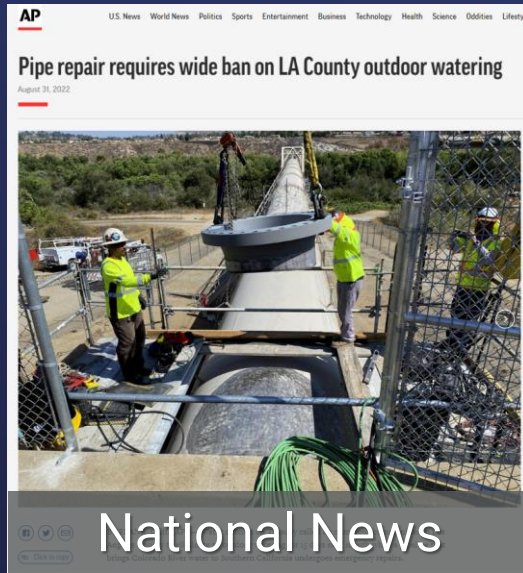
Upper Feeder Preparation and Messaging



General Manager and Board Chair messaging conservation during Upper Feeder Shutdown



Slip joint completed

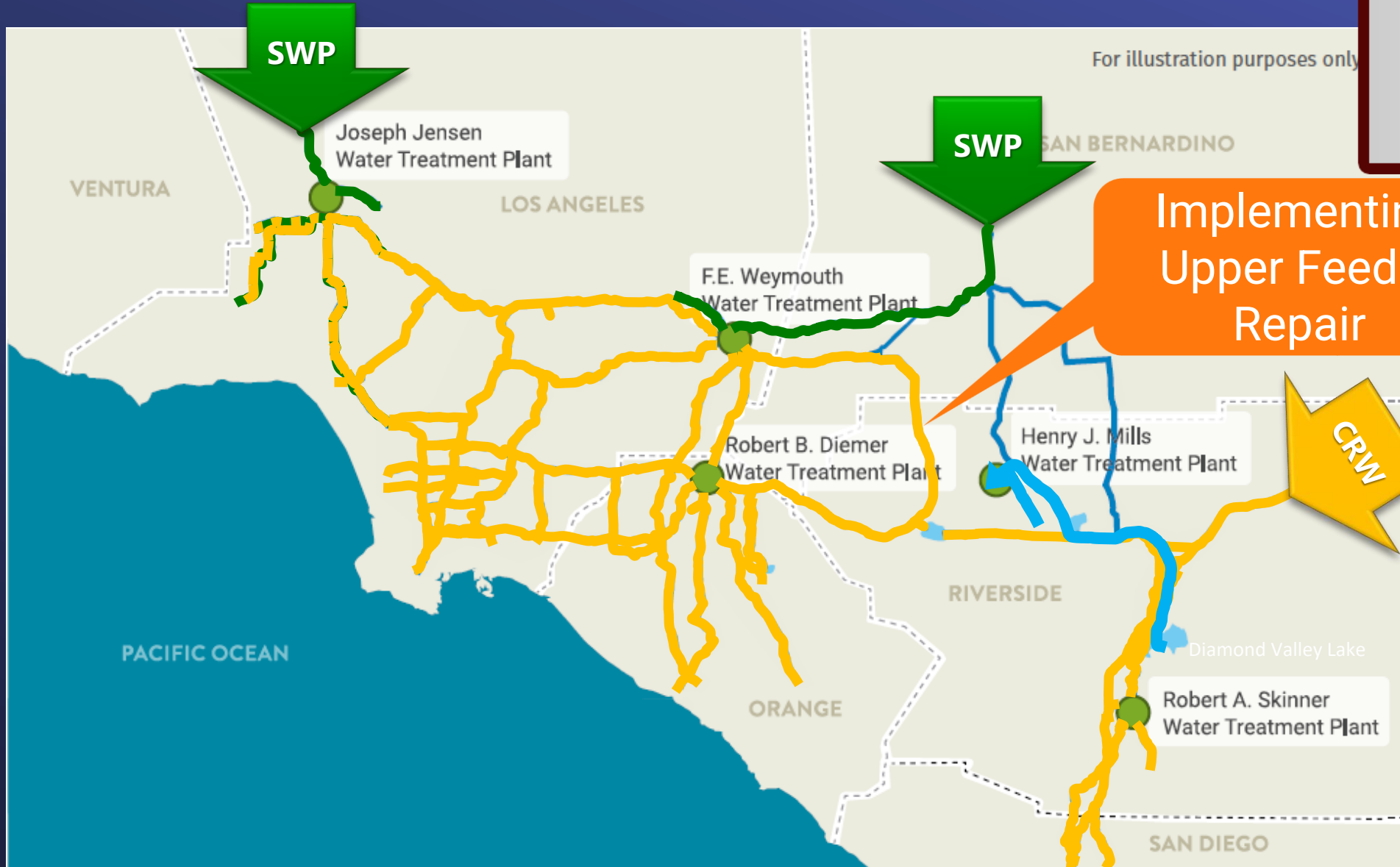


National News



Slip joint delivered to job site

Upper Feeder Shutdown



Upper Feeder Shutdown



Santa Ana River
Low Flows



Santa Ana River Flowing



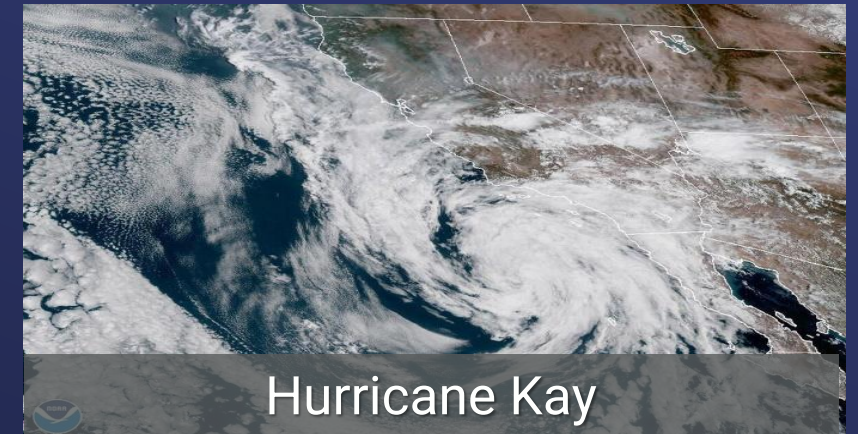
Crane Positioned in River



HEAT
WAVE
advisory



CAISO
EEA 3
ISO Emergency



Responding to California ISO Emergency



Devil Canyon Powerplant



Red Mountain Hydroelectric Plant



Intake Pumping Plant



Gene Pumping Plant

Additional Challenges



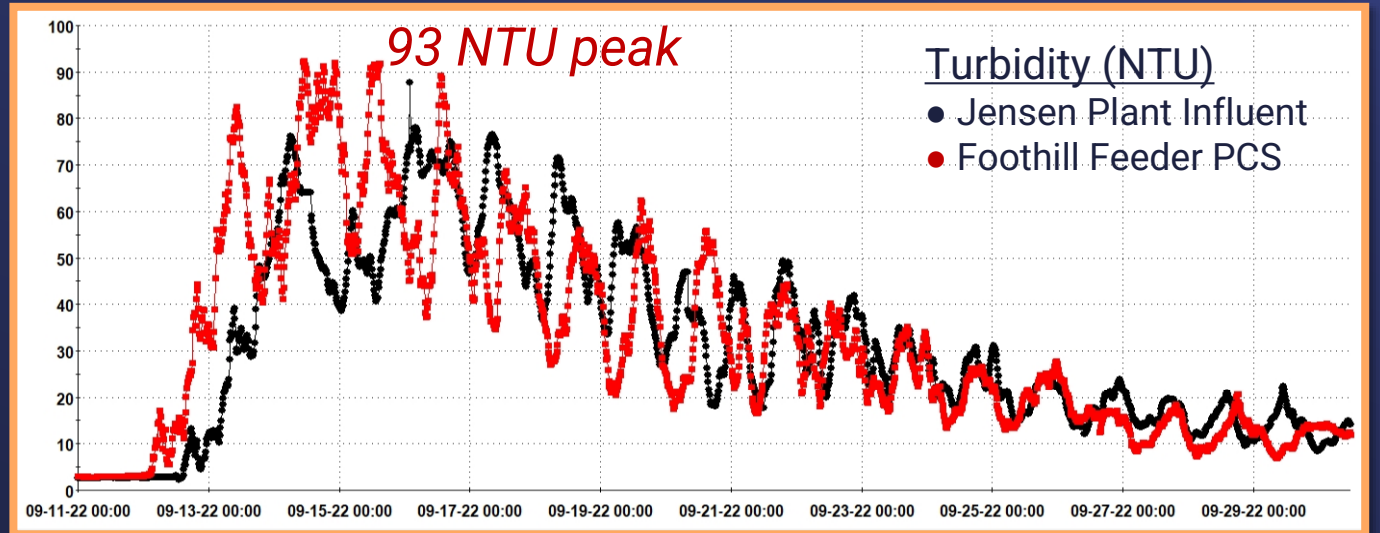
Fairview Fire near
DVL and Skinner Plant



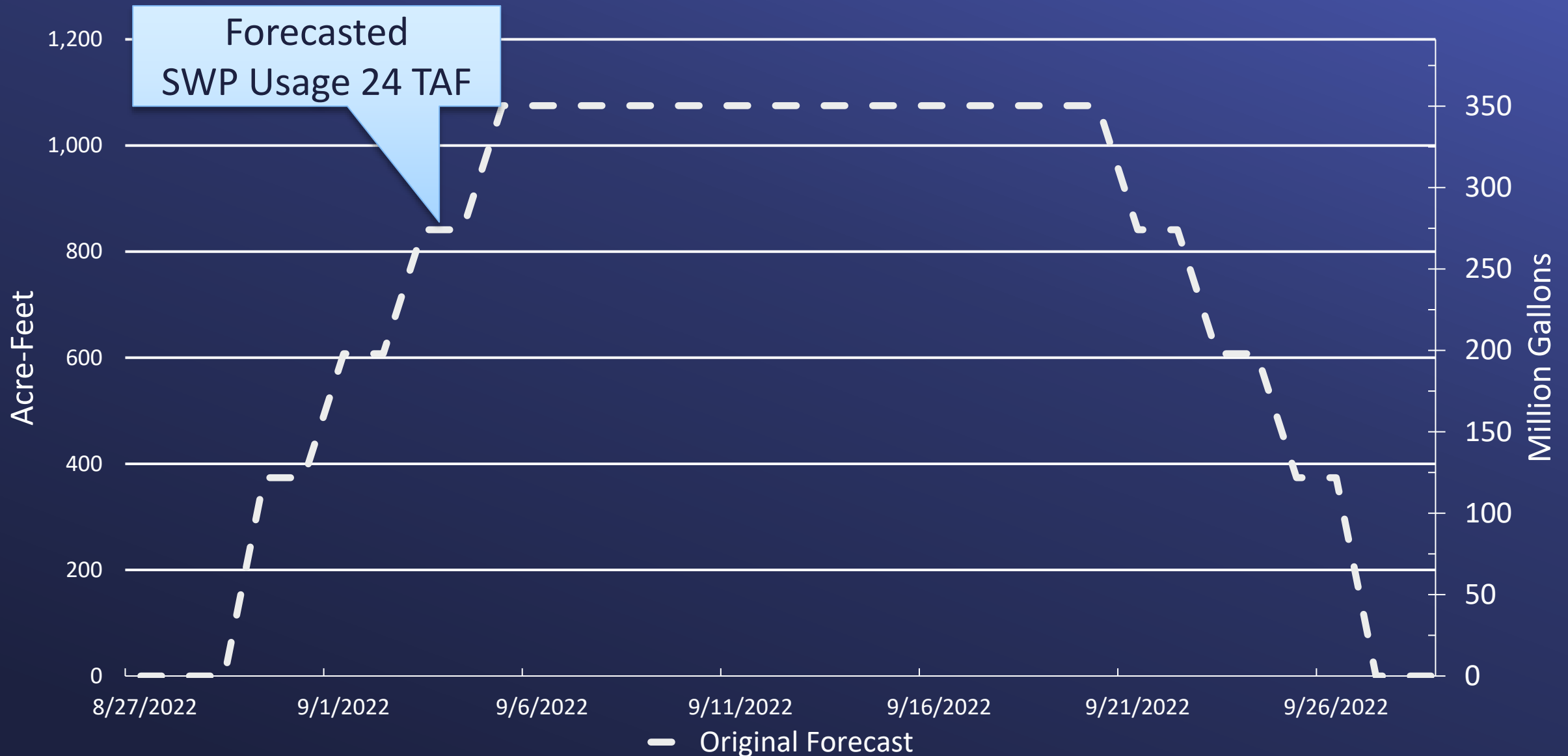
Jensen Plant - Castaic Lake Turbidity Event



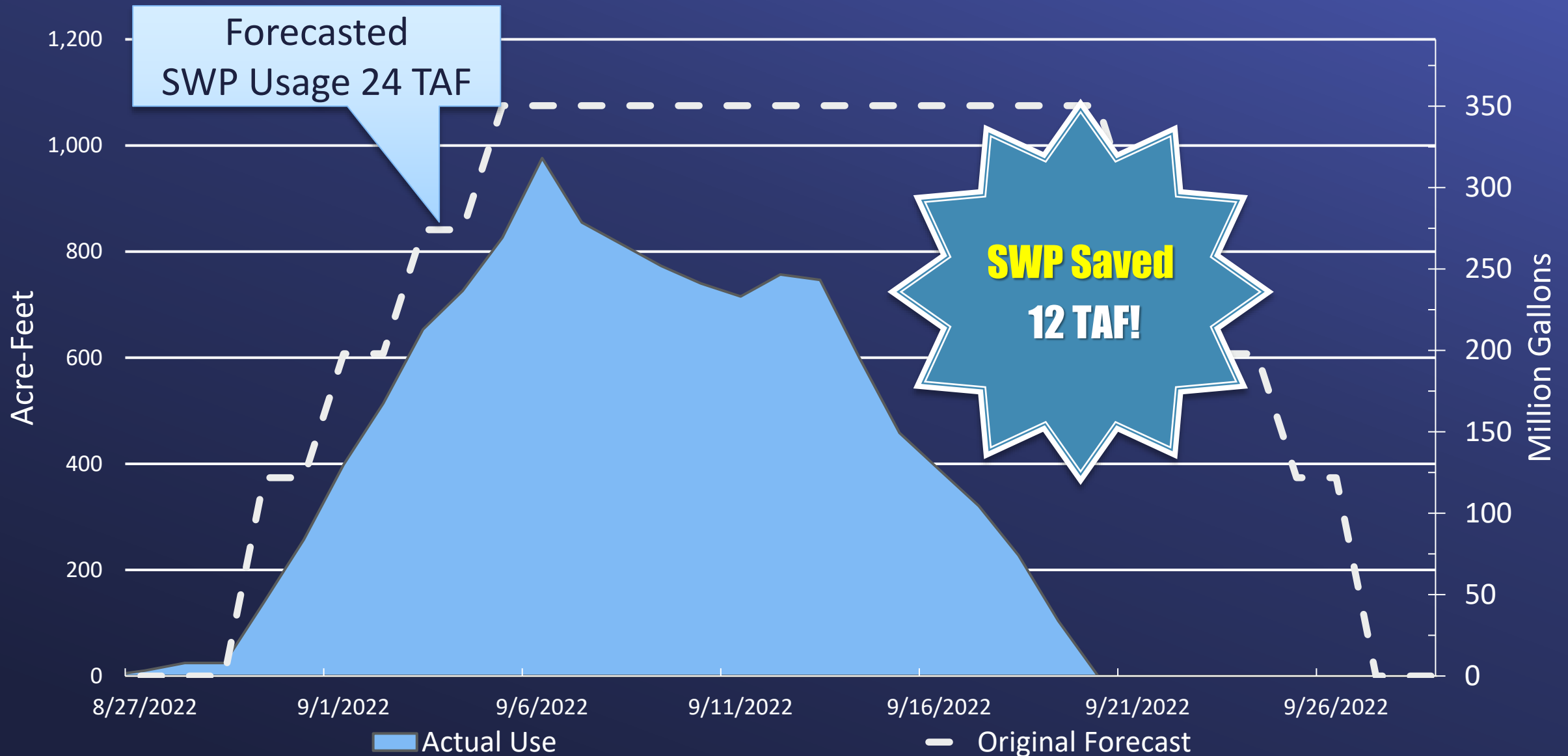
Helicopters pulling water from DVL



SWP Usage During Upper Feeder Shutdown



SWP Usage During Upper Feeder Shutdown



Upper Feeder Shutdown Completed Successfully and Safely



January 9, 2023

Engineering, Operations, & Technology Committee

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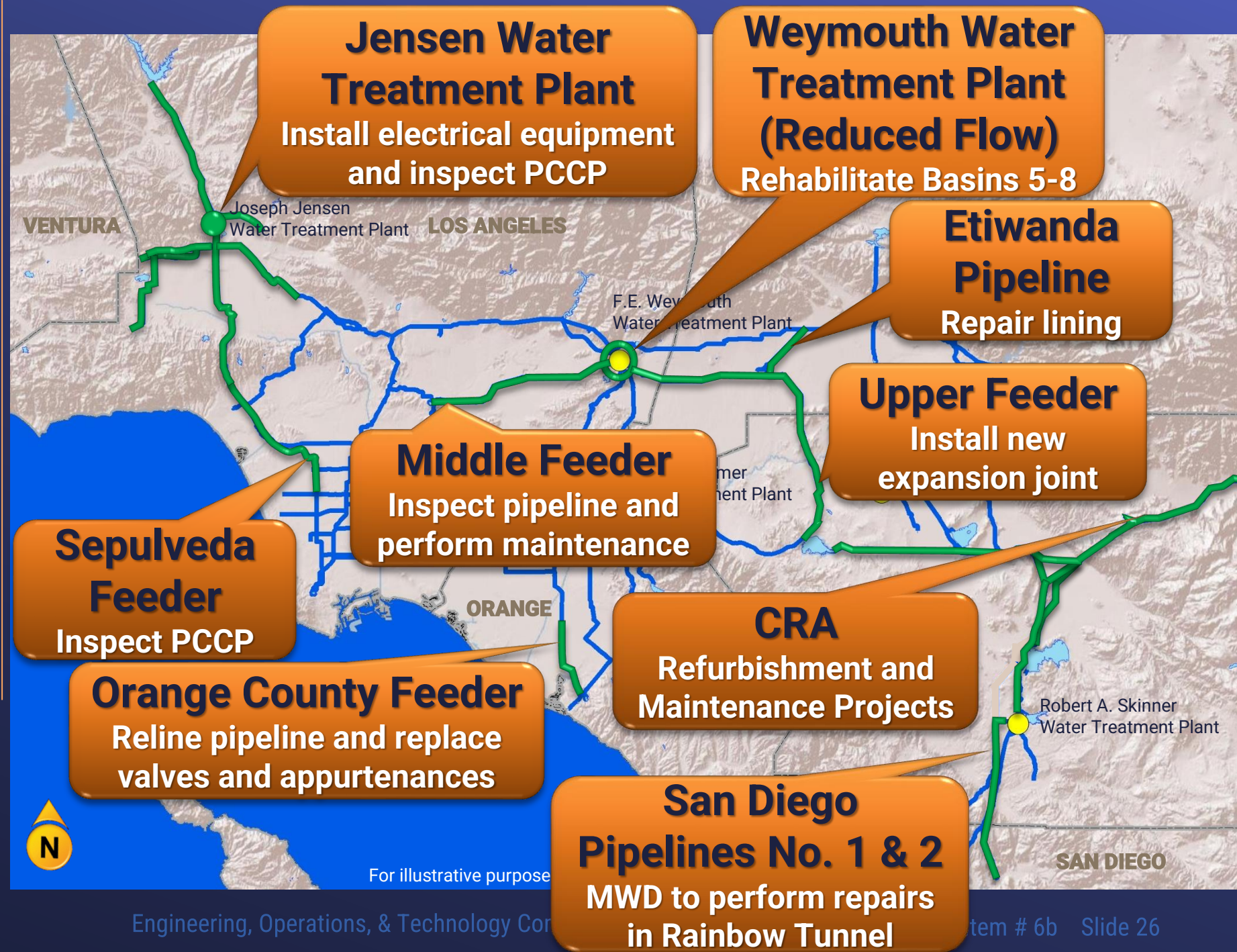
Safety Awareness Days at our field facilities reinforced that **Safety is Essential** to everything we do

Safety First

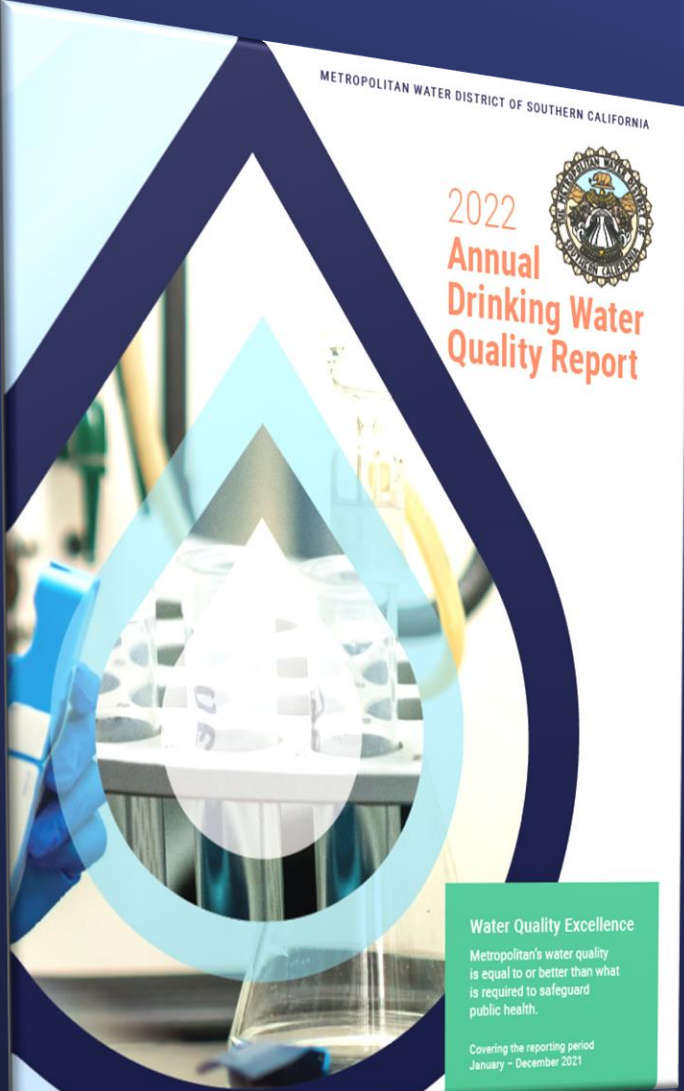
Site-wide cleanups, awards, facility tours, technical workshops, vendor exhibits, staff celebratory luncheons, and more.



Shutdowns
Ensuring
Continued
System
Reliability



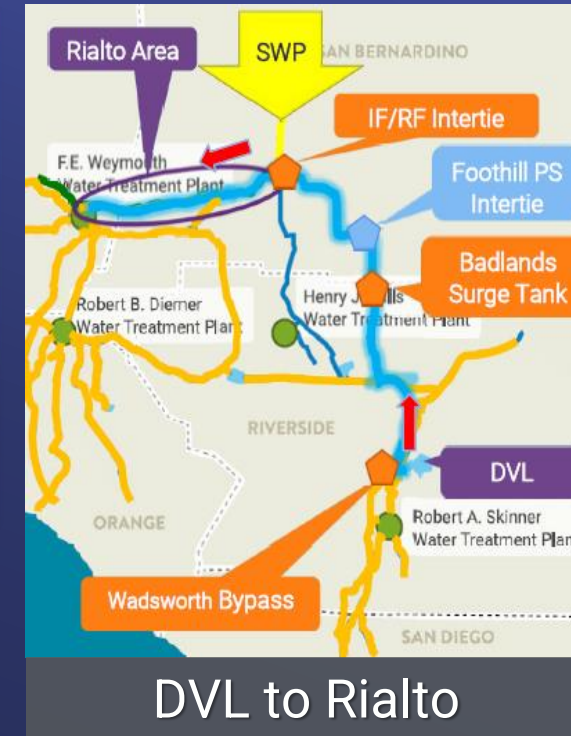
Ensuring High Quality Water



Preparing for future droughts



AVEK
High Desert
Water Bank



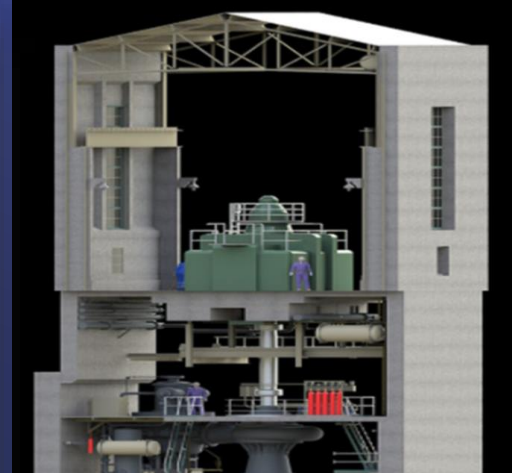
Success through Teamwork



Planning



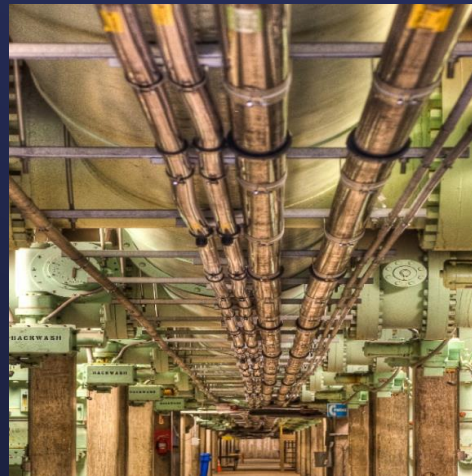
Leading



Engineering



Constructing



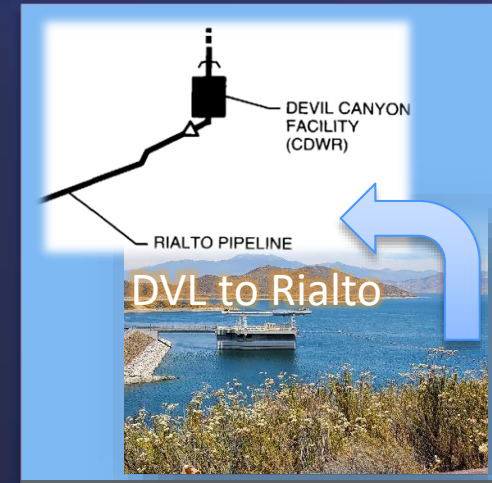
Operating



Maintaining

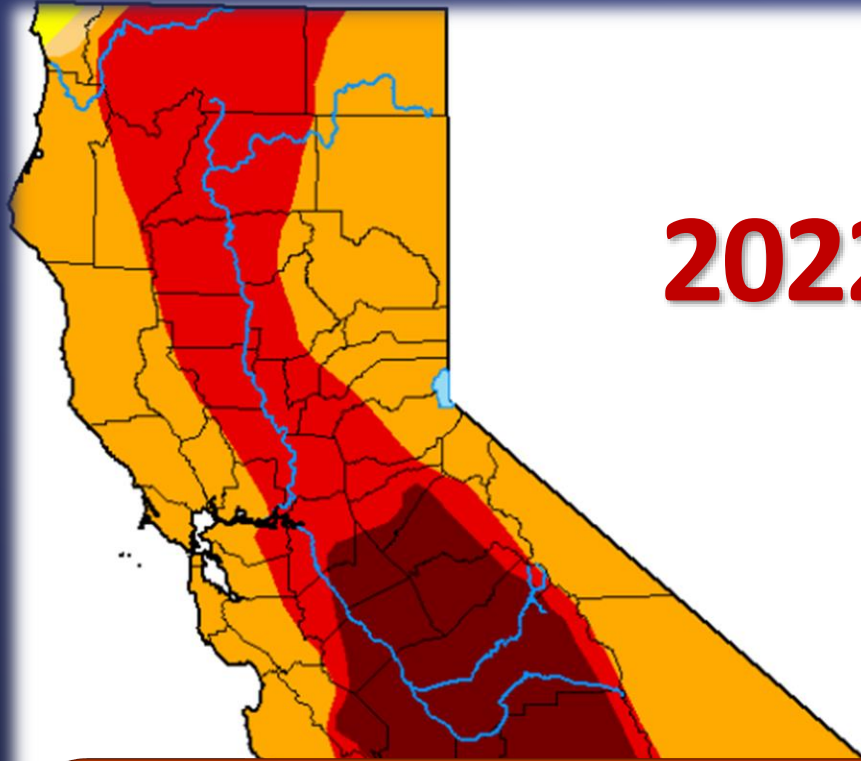


Partnering



Innovating

What will 2023 bring?



2022



2023?

Metropolitan staff are prepared to meet the challenge whether we continue in the drought or shift to surplus conditions. We are working to improve the reliability of the region today, tomorrow, and long into the future.

