Long-Term Water Supply Workshop

Board of Directors

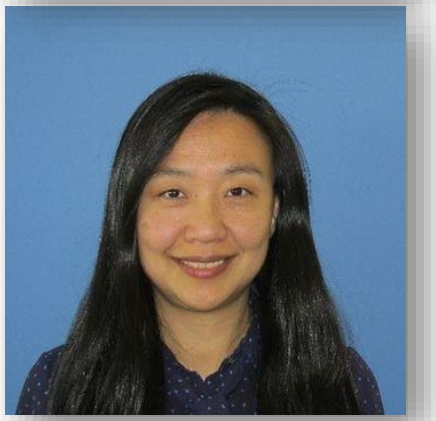
February 25, 2025

Agenda

- Background of EBMUD Water Supply
- Long-Term Water Supply Strategic Plan Goal
- Water Supply Portfolio & Key Program Updates
- Demand Update
- Drought Management Program, Drought Planning Sequence, Need for Water, and Supplemental Supply Sources
- Summary and Next Steps
- Board and Public Comments
  - Feedback from Board on key policy issues and decisions

Speakers

Michael Tognolini
Director of Water and Natural Resources



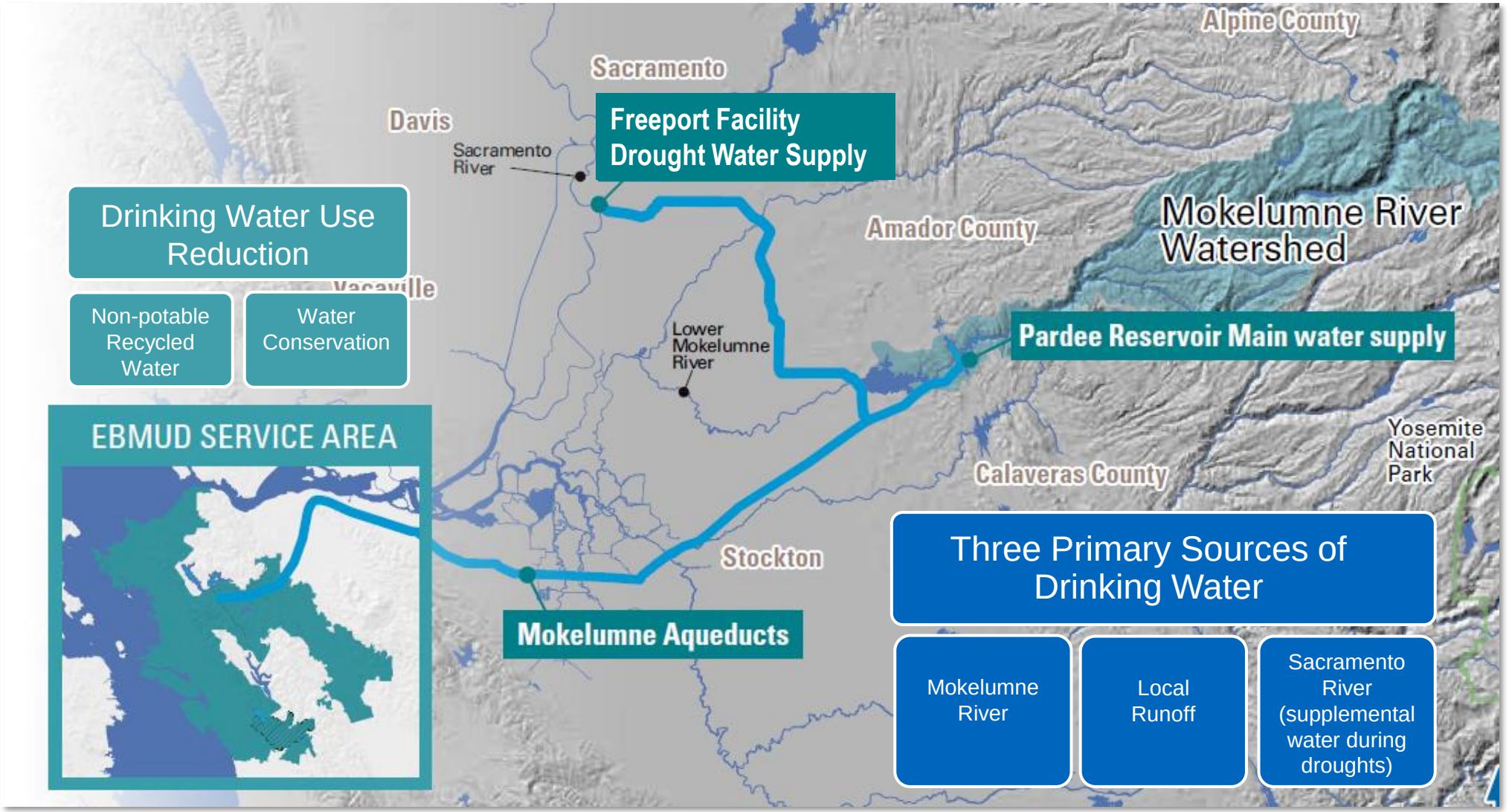
Linda Hu
Manager of Water Supply Improvements

Florence Wedington
Supervisor of Water Recycling

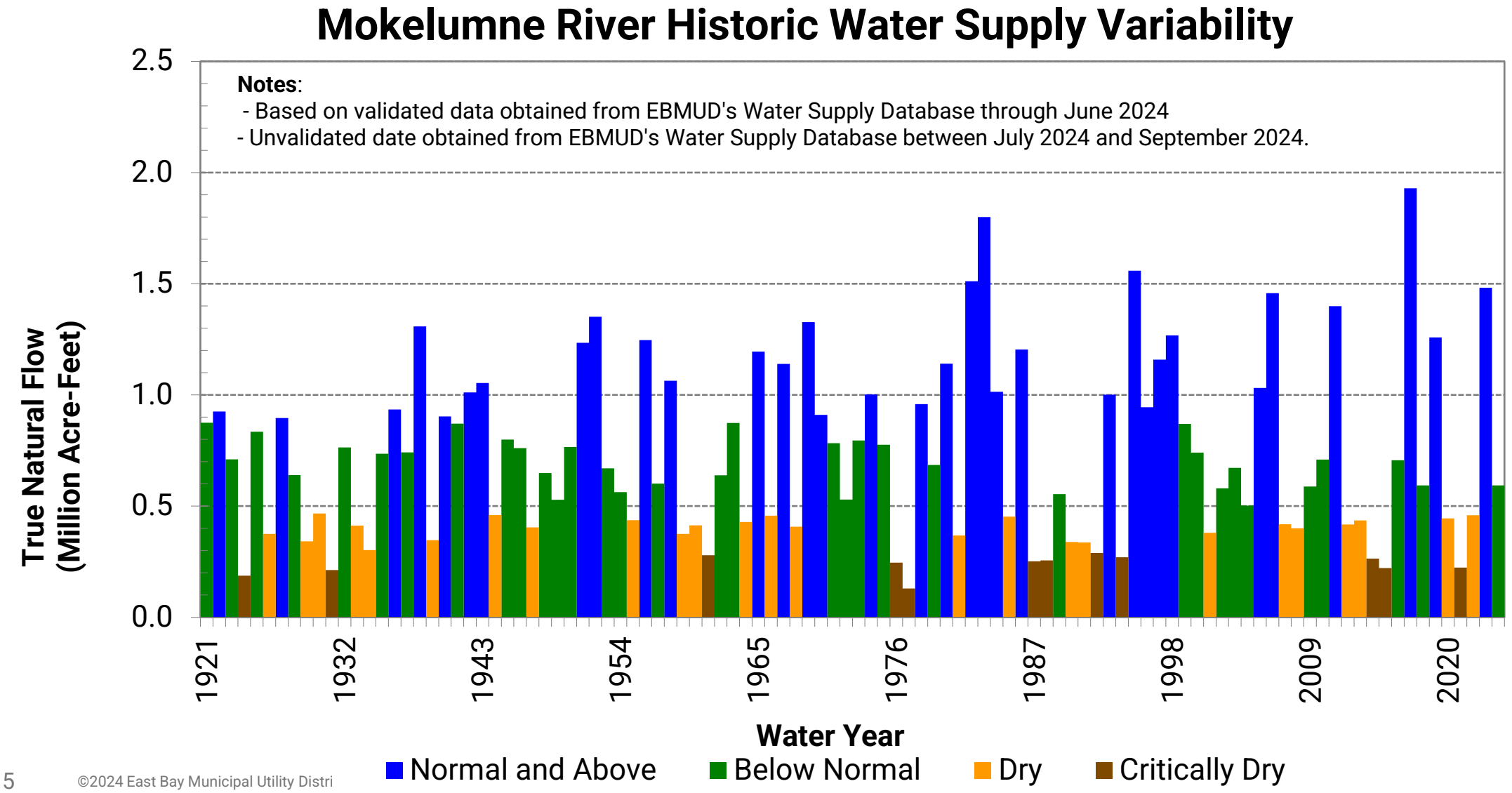
Grace Su
Supervisor of Regional Projects

Hasan Abdullah
Supervisor of Water Transfers

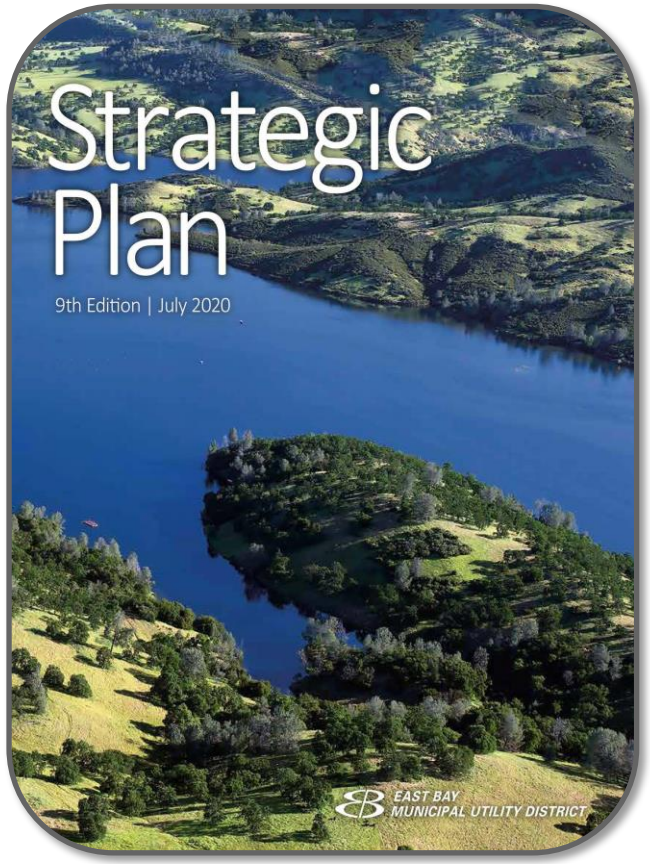
EBMUD Water Supply



Variability of Mokelumne River Supply



Long-Term Water Supply Strategy



GOAL: Ensure a reliable high quality water supply for the future

Supplemental Supply	• Preserve current water rights and entitlements and augment the District's water supply projects by obtaining supplemental supplies
Water Conservation	• Reduce potable water demand through water efficiency and conservation
Water Recycling	• Reduce potable water demand through water recycling
Climate Change	• Consider climate change impacts and take appropriate action to understand and balance mitigation and adaptation responses

Need for Water - Influencing Factors

Covered in this workshop

- Supplemental water supply
- CVP reliability
- Customer demand update
- Drought management plan (background)
- Drought planning sequence (background)

Addressed in future November UWMP workshop

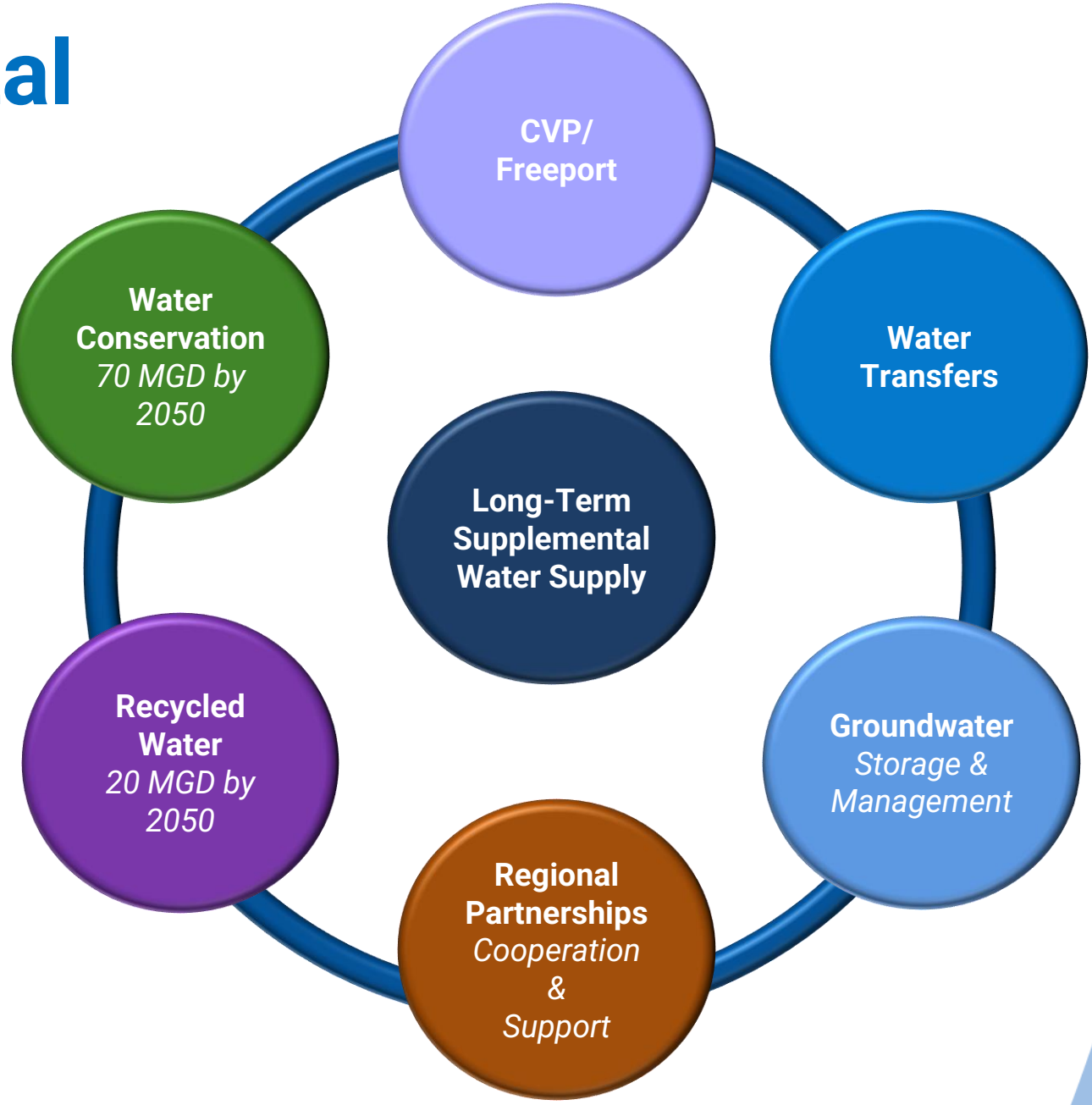
- Drought management plan (update)
- Drought planning sequence (update)
- Upcountry Diversions
- Regulatory constraints
- Climate change & hydrology

CVP: Central Valley Project
UWMP: Urban Water Management Plan

EBMUD Supplemental Water Portfolio

Strategy

"Continue building a resilient and sustainable water supply through diversifying the water supply portfolio"



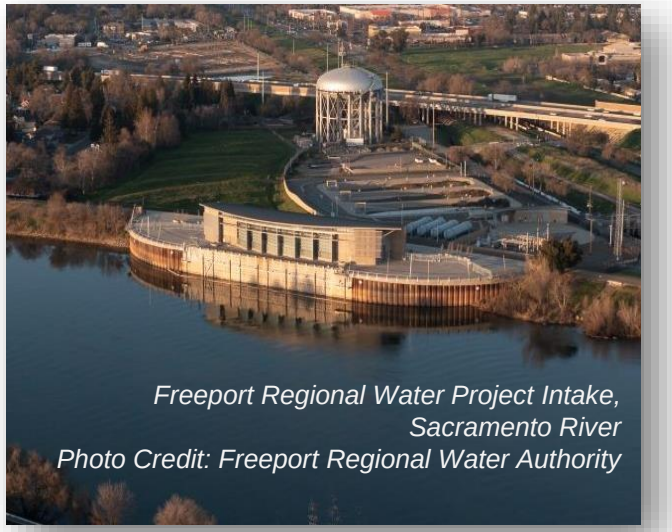
CVP: Central Valley Project

Central Valley Project (CVP) Supply and Water Transfers

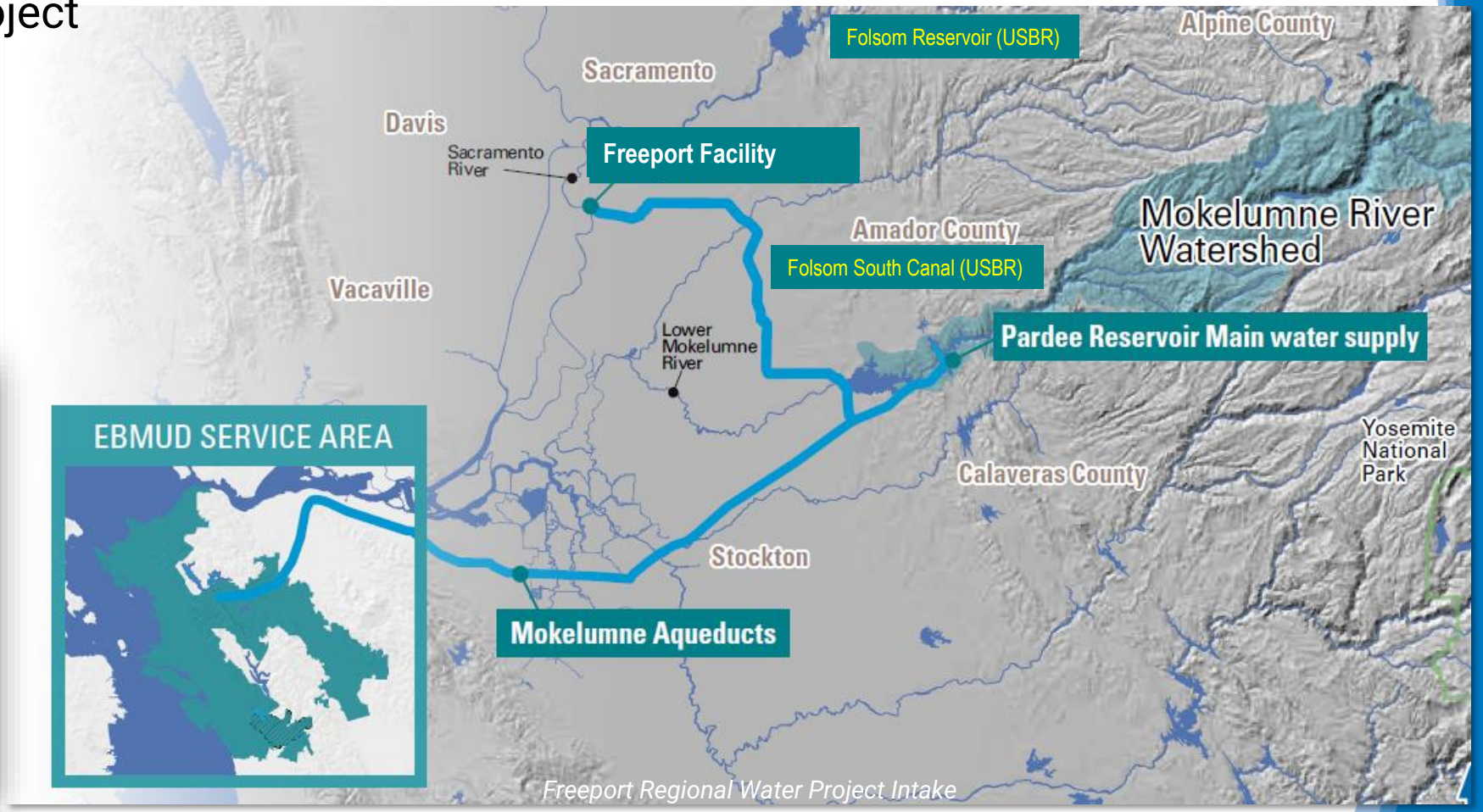
CVP and Water Transfers

Acquiring Supplemental Supply at Freeport

- Freeport Regional Water Project on Sacramento River
  - Completed in 2011
  - Divert supplemental supply:
    - CVP
    - Water transfers



Freeport Regional Water Project Intake, Sacramento River
Photo Credit: Freeport Regional Water Authority



Freeport Regional Water Project Intake

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CVP and Water Transfers

Acquiring Supplemental Supply at Freeport

- CVP
  - Federally owned water system serving 7 million acre-feet (AF) per year to Central Valley and Bay Area
  - US Bureau of Reclamation owns and operates 20 dams and 500 miles of canals
  - Warren Act Contract is needed to use federal facilities (Folsom Reservoir, Folsom South Canal)
- Water transfers
  - A water purchase agreement between a willing seller and a willing buyer
  - Transfer specifics: Water price, source, volume, diversion point, conveyance path, place and use.

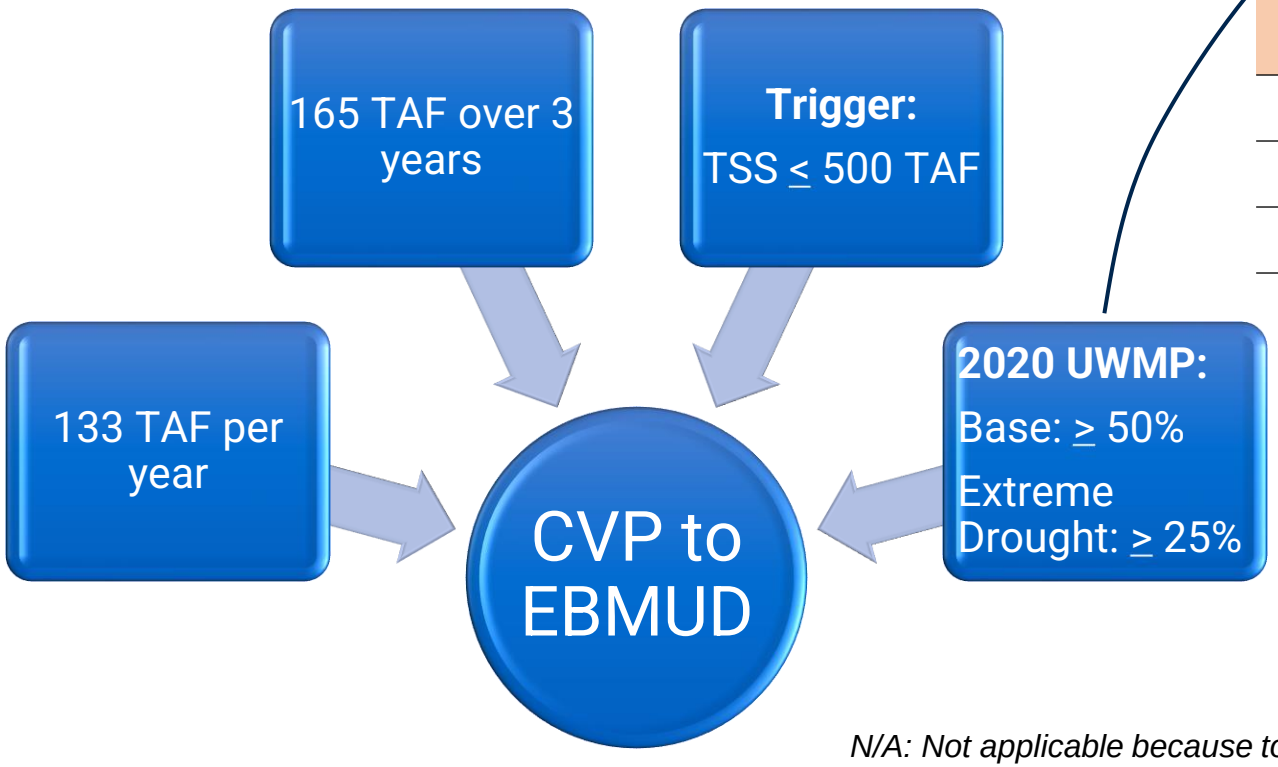
Diversion Totals (AF)		Water Source
2014	23,600	CVP Contract, PCWA
2015	58,500	CVP Contract, PCWA, Sycamore, RD1004
2021	33,900	CVP Contract, CCWD
2022	20,000	PCWA
Total	**136,000**	

AF: Acre feet
PCWA: Placer County Water Agency
CCWD: Contra Costa Water District
RD1004: Reclamation District 1004

CVP and Water Transfers

CVP Supply Reliability

Dry-Year CVP Contract



Reality is Much Different

	Drought Year		
Drought	**1**	**2**	**3**
2007 to 2009	N/A	75%	100%
2013 to 2015	N/A	50%	25%
2020 to 2022	N/A	25%	0%

Increases Need for Water:
Less supplemental supply

Water transfers help replace some of the lost CVP supply

N/A: Not applicable because total system storage (TSS) was more than 500 thousand acre-feet (TAF).

UWMP: Urban Water Management Plan

CVP and Water Transfers

Sacramento Water Forum Agreement

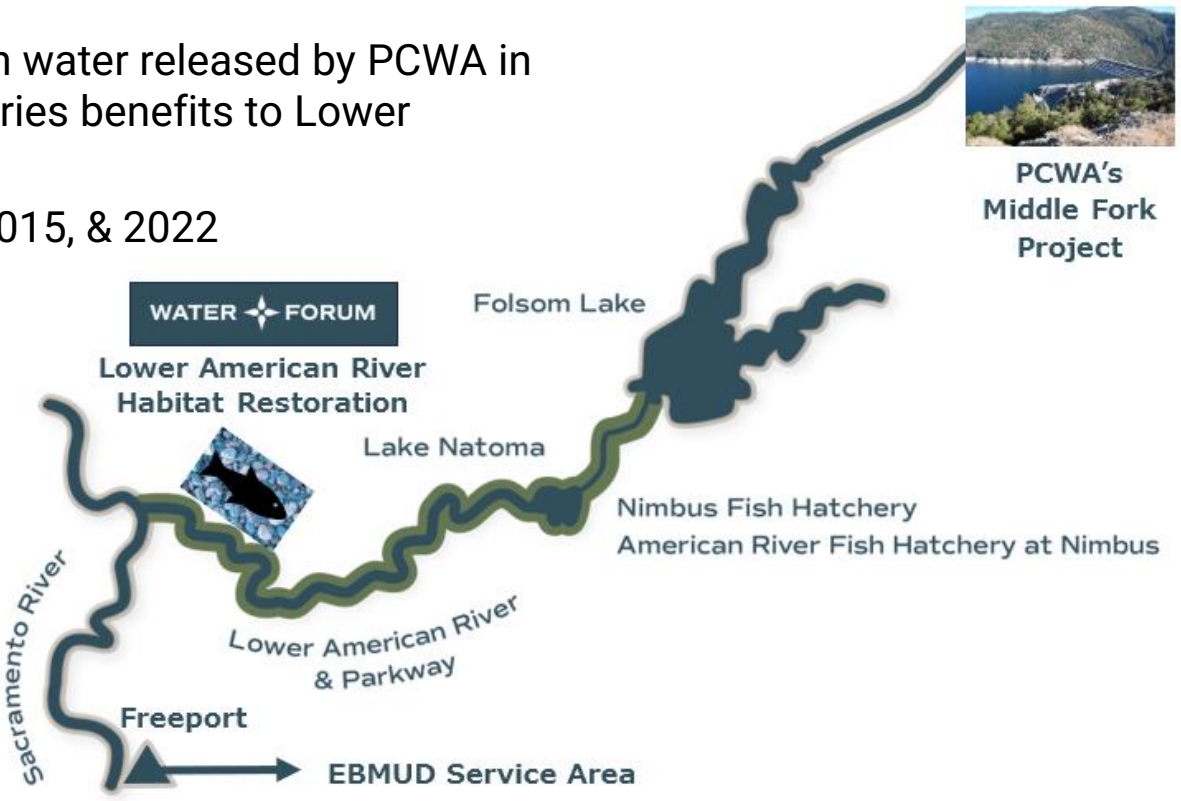
- Water Forum Agreement (WFA)
  - Historic coalition formed in 2000 by local governments, water agencies, environmental NGOs, public entities, businesses and others
- WFA committed to co-equal goals
  - Provide reliable and safe water supply for region's economic health and planned development to the year 2030
  - Preserve fishery, wildlife, recreational, and aesthetic values of Lower American River
- Successor agreement (Water Forum 2.0) in negotiation to extend to year 2050 and address new challenges (climate change, SGMA, fisheries, etc.)
  - EBMUD participating in Water Forum 2.0 development
  - Update the Board in the upcoming months on Water Forum 2.0 agreement and EBMUD's participation for consideration

NGO = Non-governmental organization | SGMA = Sustainable Groundwater Management Act

CVP and Water Transfers

Water Transfers: PCWA-EBMUD Long-Term Partnership

- MOU signed in August 2013
  - **Goal**: Develop long-term agreement to purchase Water Forum water released by PCWA in dry years (10 to 47 TAF per year) for environmental and fisheries benefits to Lower American River
  - Purchased 37 TAF of supplemental supplies in years 2014, 2015, & 2022
- **Long-term Warren Act Contract for use of Folsom Reservoir and Folsom South Canal was signed on December 19, 2024. The agreement expires in 2049.**
- **Next steps** – PCWA leading the efforts with EBMUD's support
  - Complete environmental review and permitting for long-term transfer
  - Complete PCWA's American River water rights extension
  - Develop long-term water purchase agreement



MOU: Memorandum of Understanding

CVP and Water Transfers
Other Long-Term Transfers Efforts

Yuba Water Agency (YWA) Long-Term Water Transfer

- **Goal**: Develop a long-term transfer agreement to purchase up to 25,000 AF that YWA releases for environmental benefits to Yuba River
- Current short-term transfer agreement with YWA and CCWD expires in 2025
- **Next step – Extend current transfer agreement to 2050**

Sycamore Mutual Water Company Long-Term Water Transfer

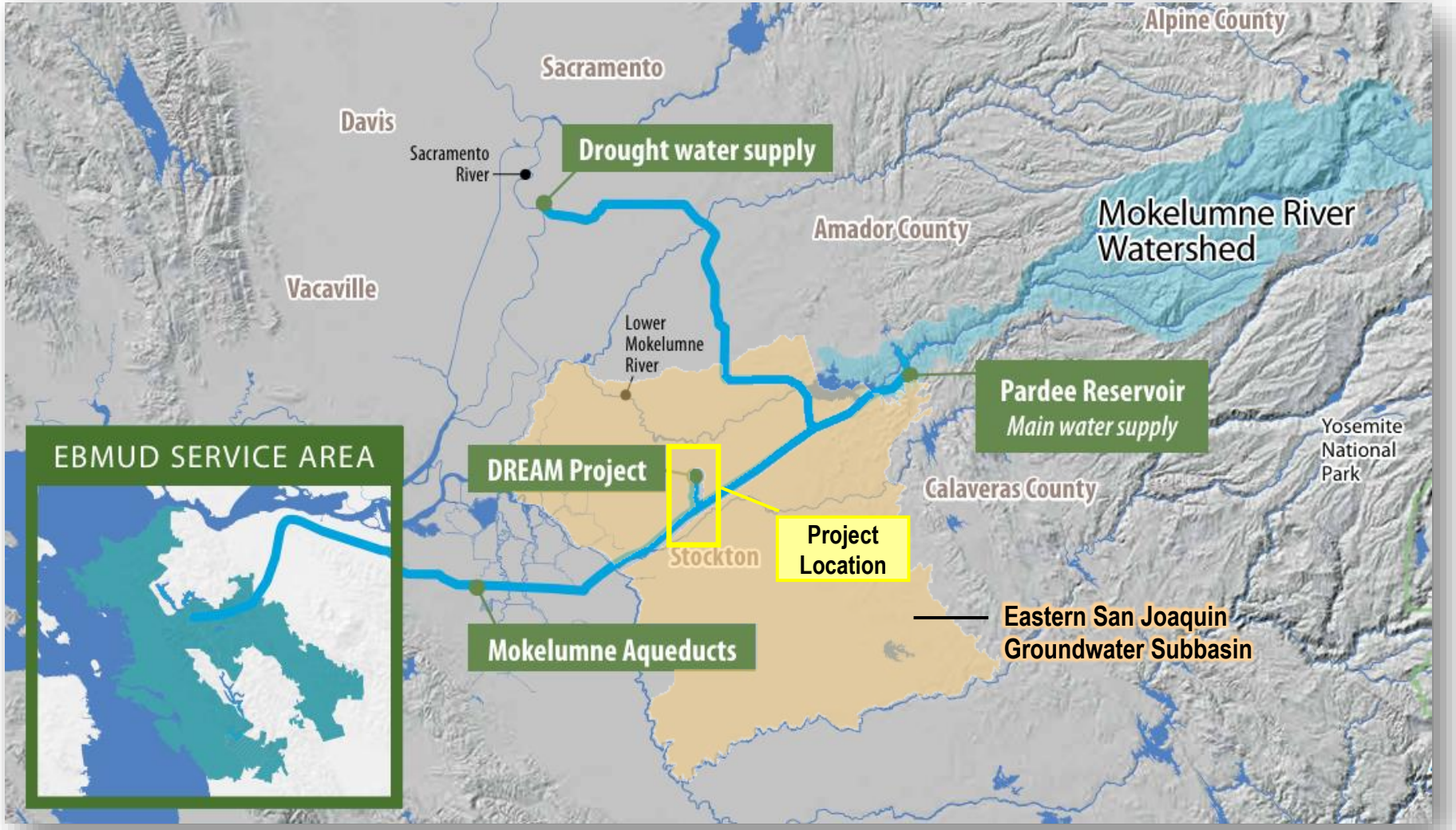
- **Goal**: Develop 10 Year agreement with Sycamore to purchase up to 6,000 AF based on a rolling crop-idling of rice fields
- Water purchased in 2015 (4,454 AF)
- **Next step – Develop project specific details**

Key Takeaways

- Water transfers are needed to replace less reliable CVP supply
- Continue to develop long-term relationships and agreements with multiple agencies and sources
- Bring the YWA and CCWD transfer agreements to the Board at a future date for consideration

Groundwater Banking

Groundwater Banking
DREAM Project

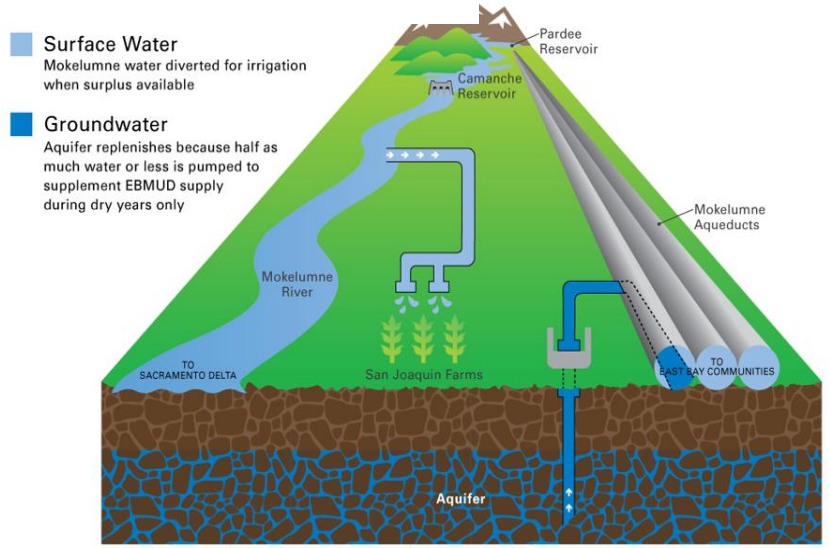


DREAM: Demonstration Recharge Extraction and Aquifer Management
Partners: North San Joaquin Water Conservation District (NSJWCD), San Joaquin County, Eastern Water Alliance, and EBMUD

Groundwater Banking
DREAM Pilot Project

How the DREAM Project Works

- NSJWCD uses EBMUD Mokelumne River water to irrigate crops instead of pumping groundwater, allowing groundwater to be banked
- Up to half of the banked groundwater can be used by EBMUD as supplemental water supply while the remainder replenishes the depleted aquifer



- Successful DREAM pilot with partners completed in April 2024
  - 1,000 AF of EBMUD Mokelumne water released to NSJWCD in 2018, 2019, & 2023
  - 263 AF of groundwater delivered into EBMUD Aqueducts in 2023 & 2024
  - Lessons learned document prepared
- Larger groundwater banking project yield goal in a third year of a drought is up to 20,000 AF

Groundwater Banking
DREAM Lessons Learned

- Partnership built trust and helped overcome institutional barriers
- Transferring water using recycled water credits simplified water rights permitting
- Larger project will need to
  - Increase in-lieu recharge acreage and add direct recharge
  - Re-evaluate groundwater export permit conditions
  - Address monitoring and operations coordination challenges
  - Invest in new facilities


NSJWCD South System Pump Station

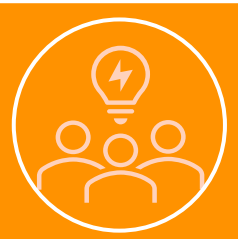

EBMUD DREAM Aqueduct Tie-in Facility

Groundwater Banking

Larger Groundwater Banking Project

EBMUD GOAL

Develop economically viable, long-term, and reliable supplemental drought water supply that meets District's water quality requirements and protects the Eastern San Joaquin Groundwater Subbasin



Develop concepts and solutions for challenges (e.g. coordination, permits, add more growers)

Reuse existing facilities and identify new infrastructure needs

Water rights permit and key agreements

Quantify project benefits and update EBMUD unit cost estimate

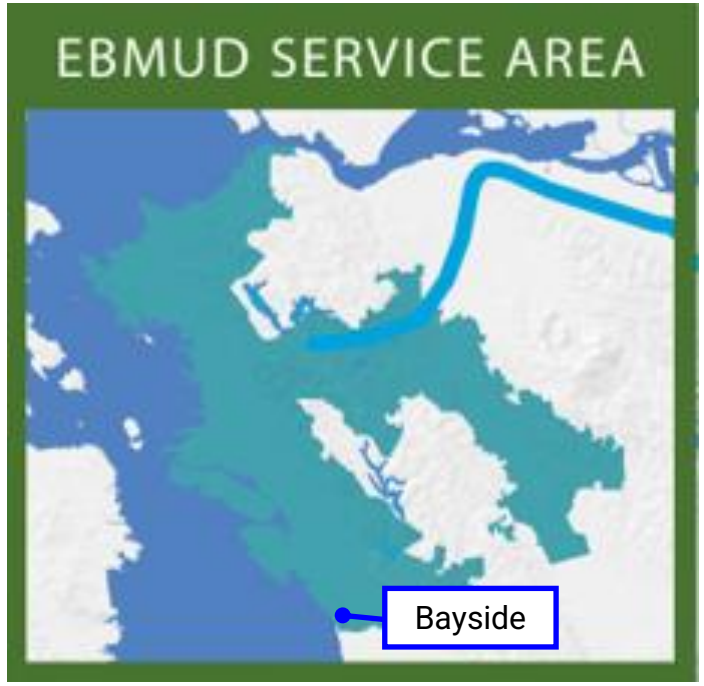
Next Steps for the Larger Project: Consider Partner MOU

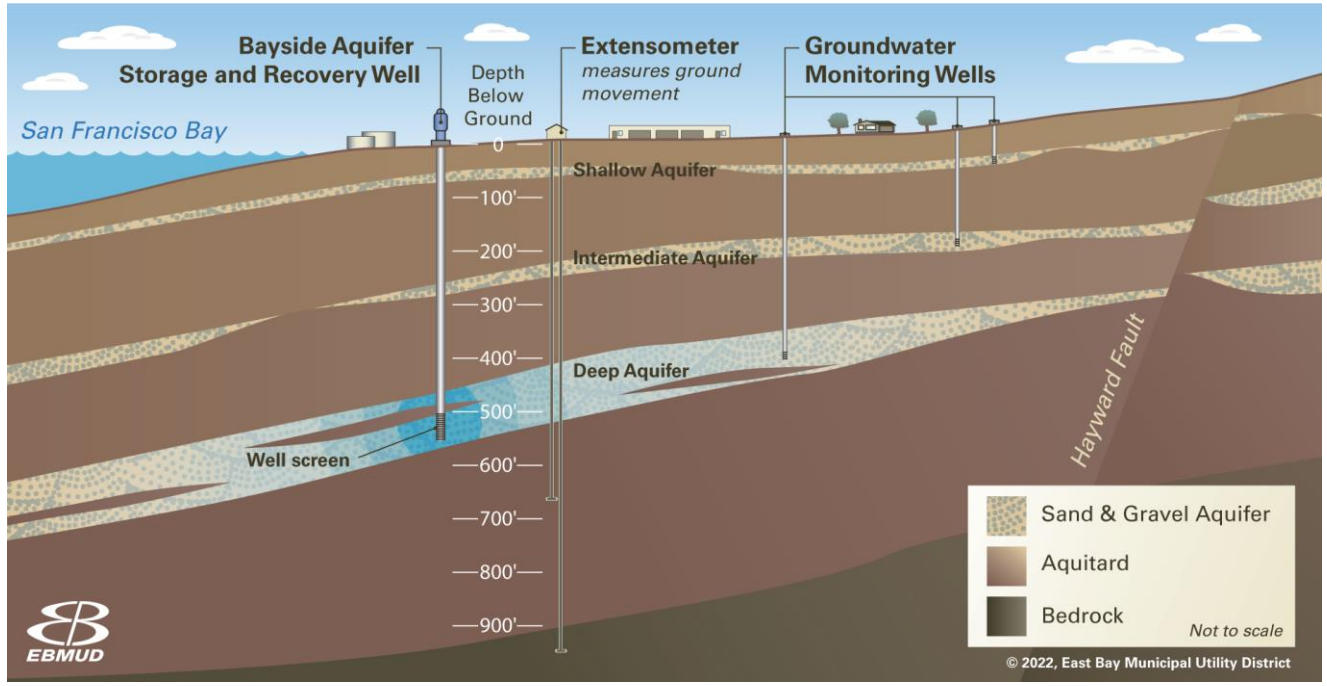
Preliminary Timeline

- 5 years: Make existing facilities permanent to achieve a yield of up to 2 TAF
- 10 years: Construct new facilities to increase yield to up to 10 TAF
- 15 – 20 years: Expand and/or construct new facilities to increase yield to up to 20 TAF

MOU: Memorandum of Understanding

Groundwater Banking
Bayside Facility Overview





- Using a well, treated drinking water is stored in wet years in the aquifer to potentially be pumped later to provide water supply during severe droughts or emergencies, which has not yet been needed
  - Located about 600 feet deep and is protected from shallow groundwater impacts and seawater intrusion
- No purified recycled water injection is planned at Bayside
- Project yield goal in a third year of a drought is up to 5 TAF in 20 years

Recycled Water

Recycled Water

Existing and Future Recycled Water Projects (Non-Potable)

- Richmond Advanced Recycled Expansion Project (RARE)* - (4.0 MGD)
- North Richmond Water Recycling Plant - (2.9 MGD)
- East Bayshore Recycled Water Project* - (0.9 MGD)
- San Ramon Valley Recycled Water Project/DERWA* - (2.4 MGD)
- Phillips 66 Refinery/Rodeo Renewed (Future) - (2.8 MGD)
- **Total (Existing and Future) = Up to 13 MGD**
- **Current Demand = 7.4 MGD**

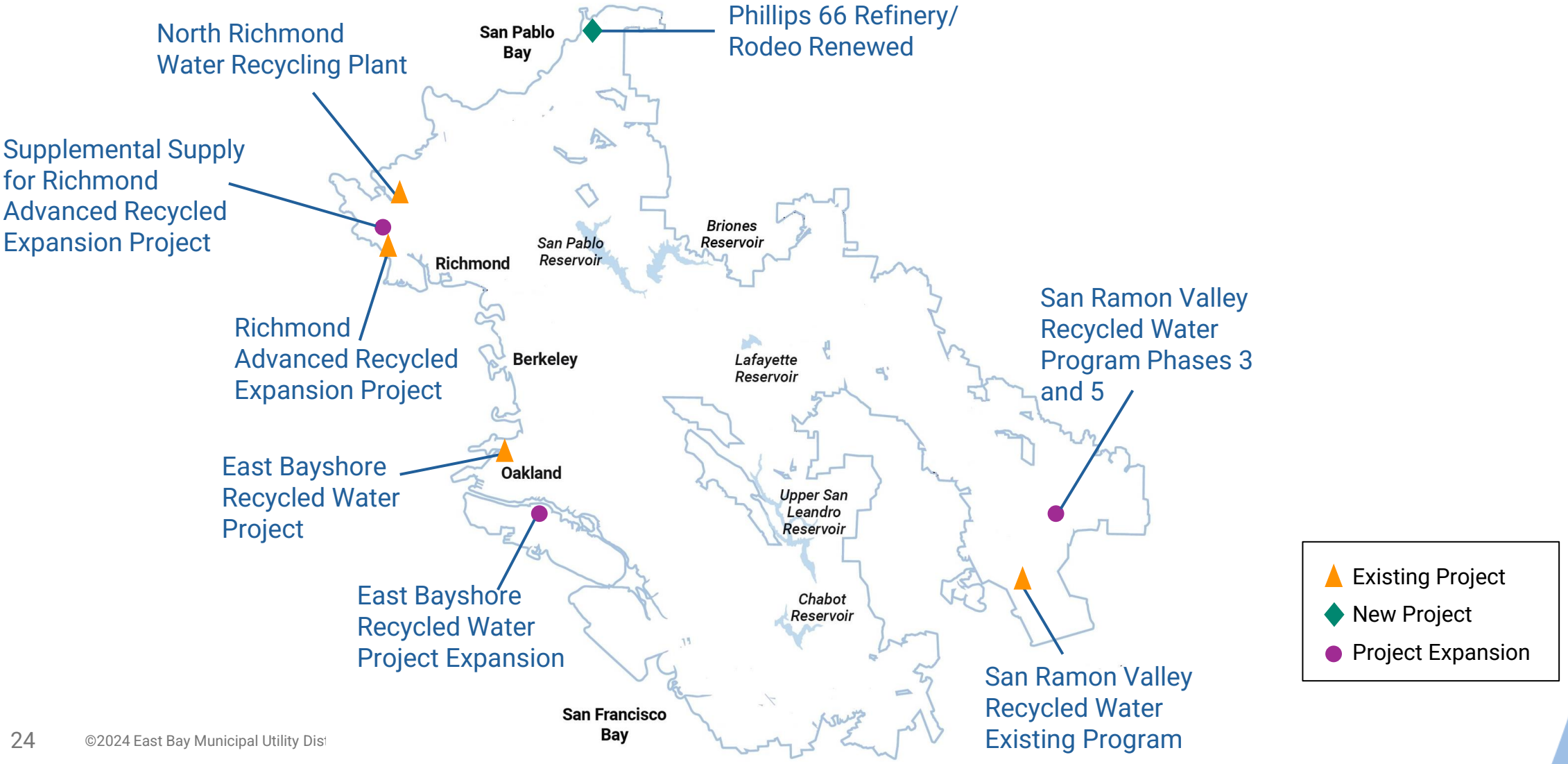
MGD – million gallons per day

*Existing project and future expansion opportunities

DERWA – **D**ublin San Ramon Services District-**E**BMUD-**R**ecycled **W**ater **A**uthority

Recycled Water

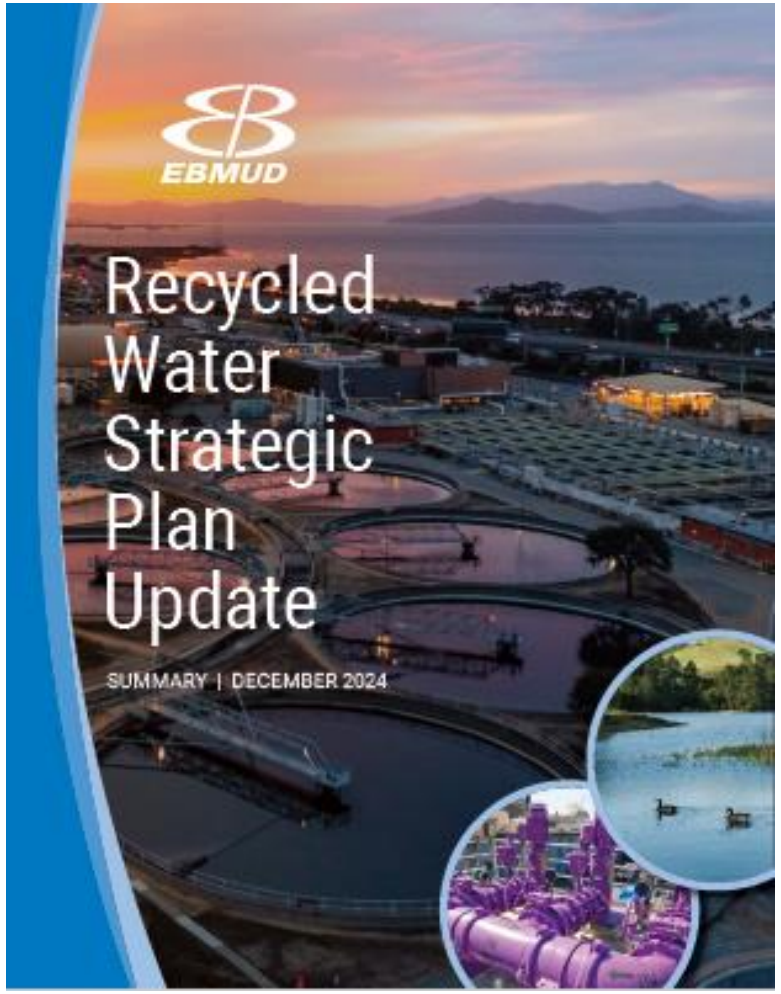
Existing and Future Recycled Water Projects (Non-Potable)



Recycled Water

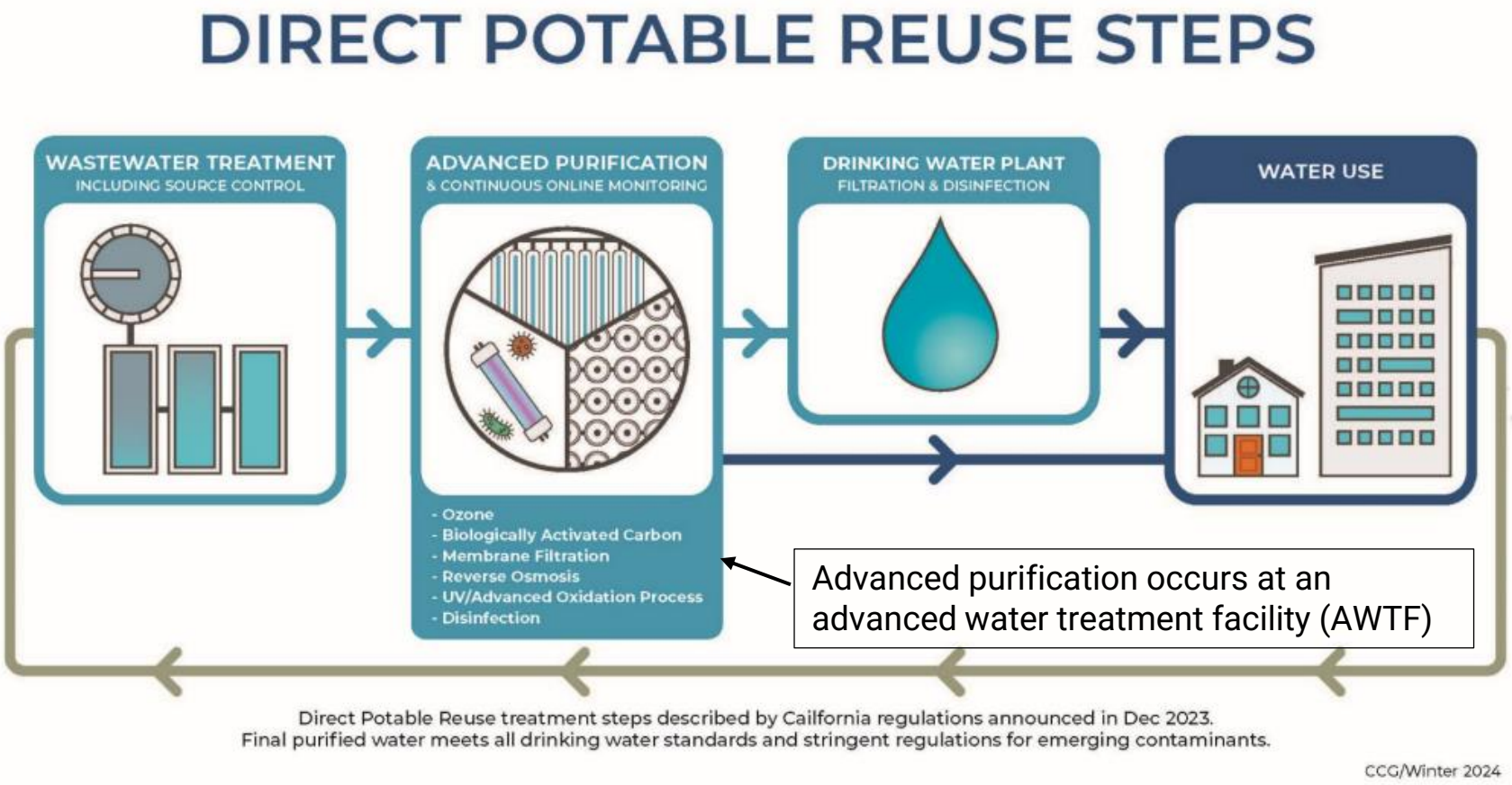
Recap from 2024 Recycled Water Strategic Plan

- Maintain recycled water goal of 20 MGD, extend to 2050
  - Will need to add potable reuse (purified water) in the long-term to meet goal
  - By 2033 through the comprehensive Water Supply Management Program Update, re-evaluate need for water and supply options, and determine when potable reuse is needed
  - Revise the goal in the future as needed



Recycled Water

Potable Reuse Advanced Water Treatment Requirements



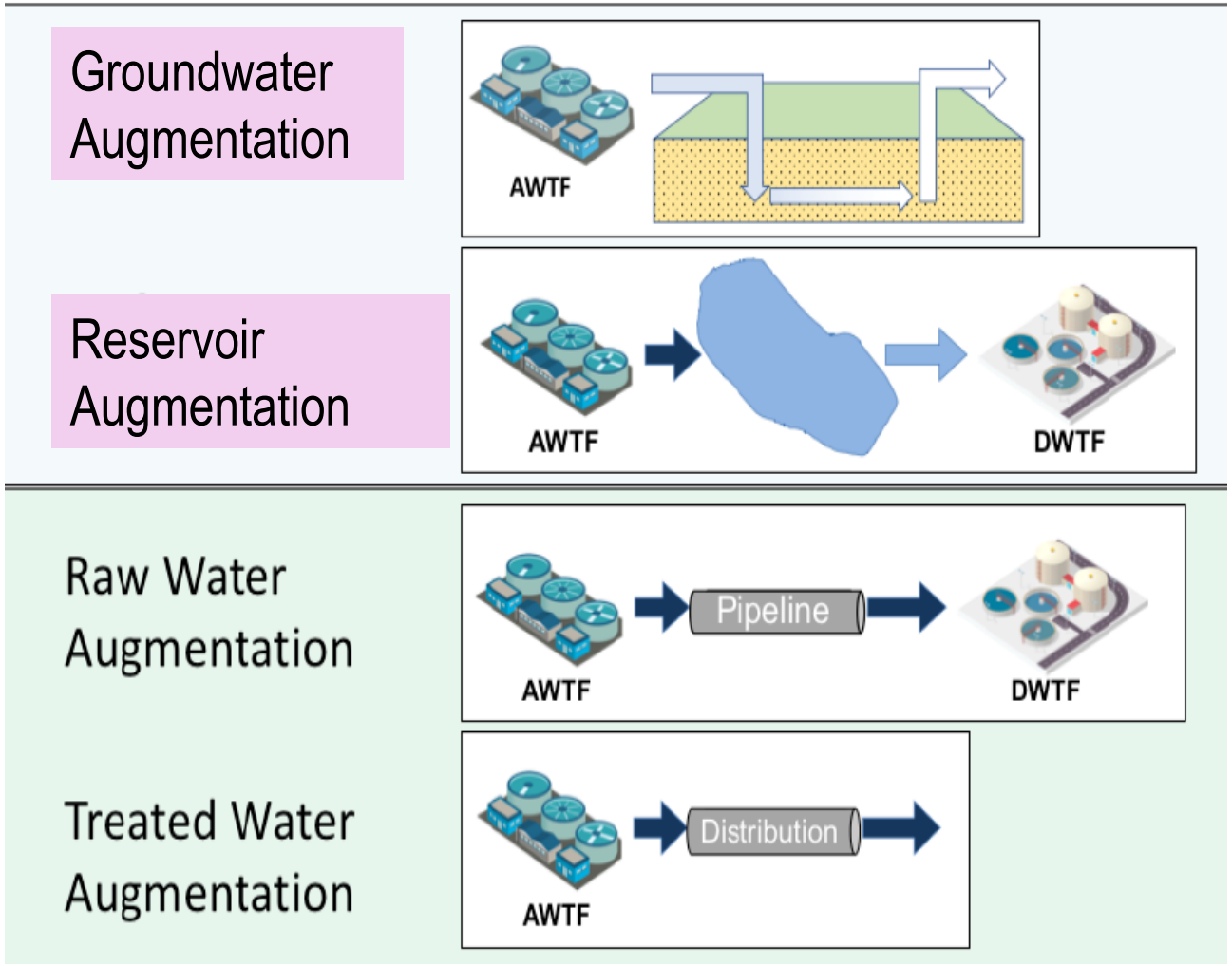
Graphic courtesy of WateReuse California

Recycled Water

All Types of Potable Reuse = Purified Water

INDIRECT POTABLE REUSE (IPR)

DIRECT POTABLE REUSE (DPR)



AWTF = Advanced Water Treatment Facility
DWTP = Drinking Water Treatment Facility

Recycled Water

Potable Reuse Regulations and Significant Projects

- Indirect Potable Reuse (IPR)
  - Groundwater Augmentation approved June 2014
  - Reservoir Augmentation approved October 2018
- Direct Potable Reuse (DPR)
  - Raw and Treated Water Augmentation approved December 2023

Agency	Type	Capacity	Status
Orange County Water District and Orange County Sanitation District	Groundwater Augmentation	130 MGD	Operating since 2008
Monterey One Water	Groundwater Augmentation	5 MGD	Operating since 2020
City of San Diego	Reservoir Augmentation (future)	Up to 83 MGD	Demonstration facility operating since 2011. 7.5 MGD Phase 1 operational in 2027, full operation by 2035.
Pure Water Southern California	Groundwater/Raw Water Augmentation (future)	60 MGD/ 55 MGD	Groundwater and Phase 1 raw water operational in 2032; Phase 2 raw water operational in 2036
Valley Water (Pilot)	Groundwater Augmentation with potential for	18 MGD	8 MGD demonstration project operating since 2014. Additional 10 MGD

MGD = Million Gallons per Day

Recycled Water
Potential Purified Water Alternatives

Purified water added to raw water reservoir to be further treated:

- Special District 1 (SD-1) to Briones Reservoir (30 MGD; $1,210 M) 1
- Central San to Briones Reservoir (17.9 MGD; $740 M) 3

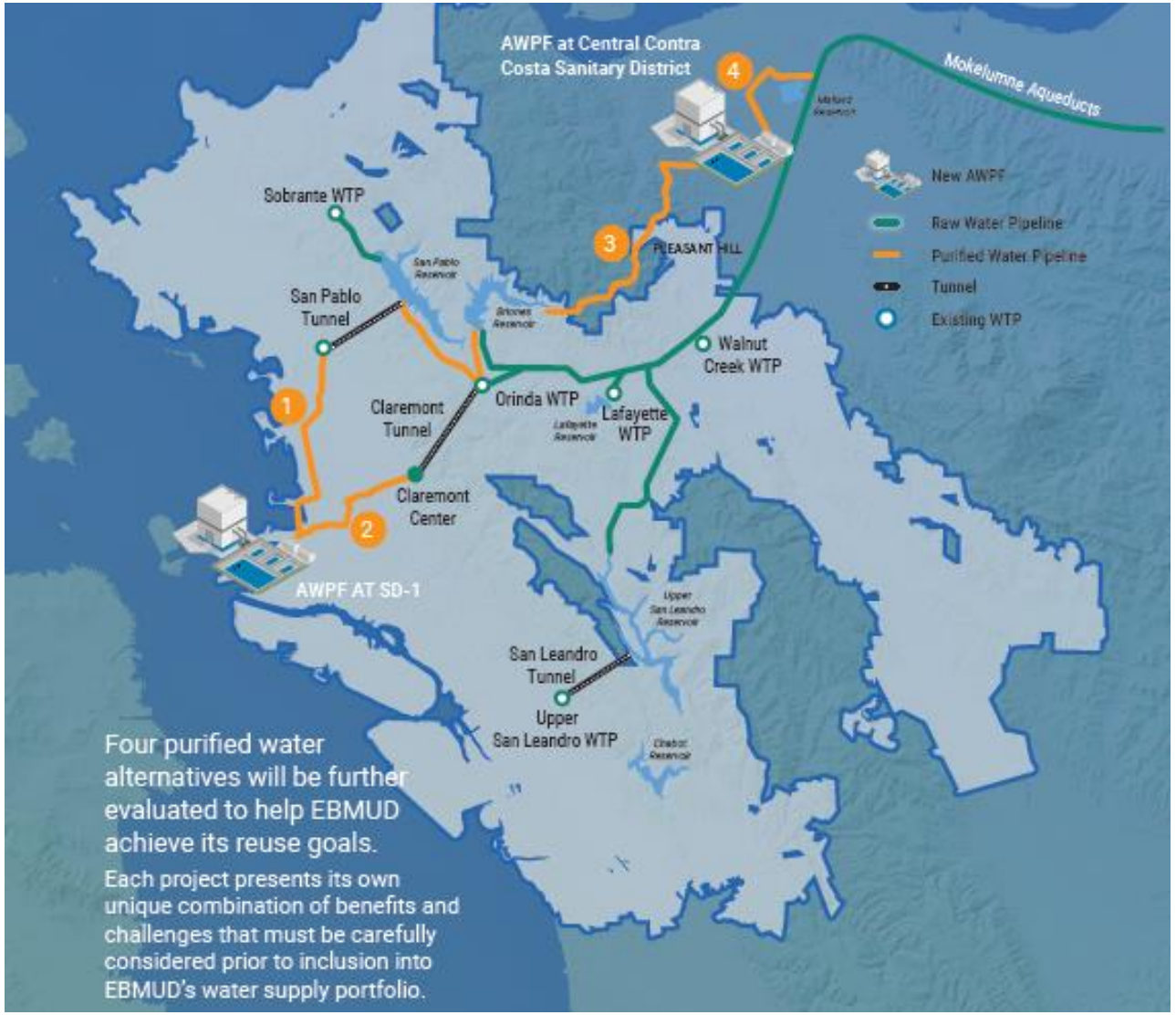
Purified water added to treated water distribution system or added upstream of treatment plant:

- SD-1 to Claremont Center (30 MGD; $990 M) 2
- Central San to Mokelumne Aqueduct (17.9 MGD; $655 M) 4

MGD = million gallons per day
Central San = Central Contra Costa Sanitary District

1 See map on the next slide

Recycled Water
Potential Purified Water Alternatives



Central San - Central Contra Costa Sanitary District
AWPF - Advanced Water Purification Facility

Recycled Water

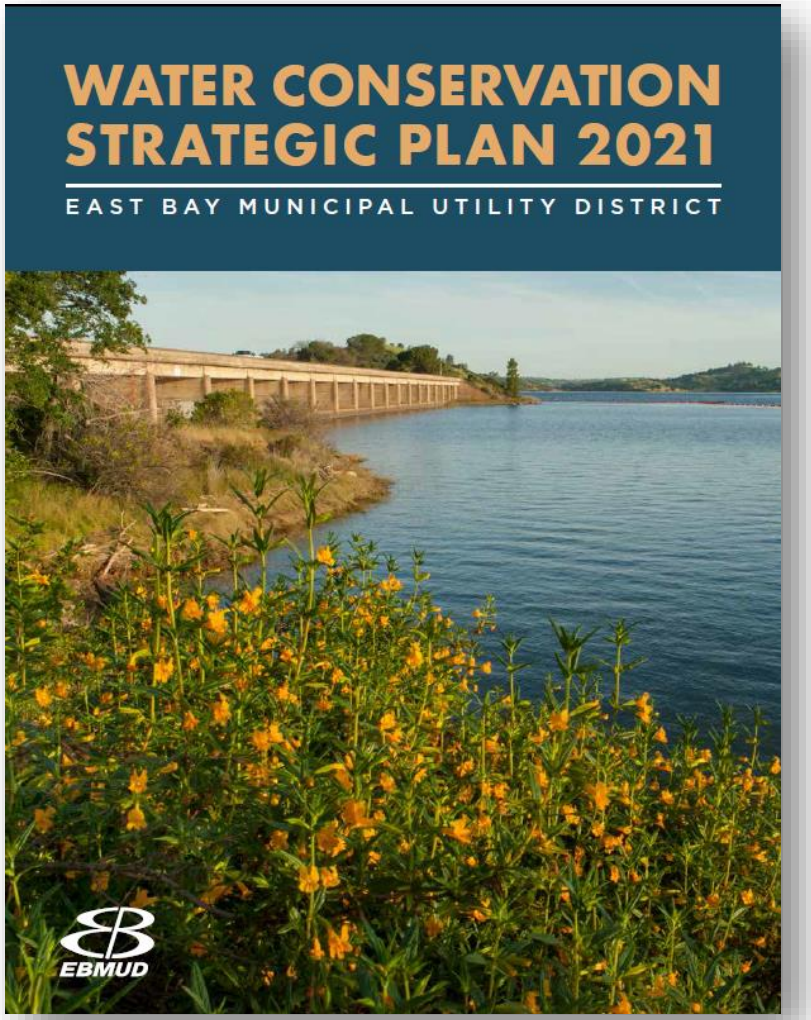
Plan for the Potential of Potable Reuse in the Future

- Learn from other agencies
  - EBMUD toured San Diego Pure Water Project in 2024
  - Continue discussions to learn from other agencies that have implemented or are actively developing purified water projects
- Messaging, outreach and education in advance is key to success
  - Create consistent water messaging
  - Develop outreach and education plans for EBMUD staff, elected officials, cities, customers and Non-Governmental Organizations
- Develop familiarity and trust with potable reuse (purified water)

Water Conservation

Water Conservation

Overview



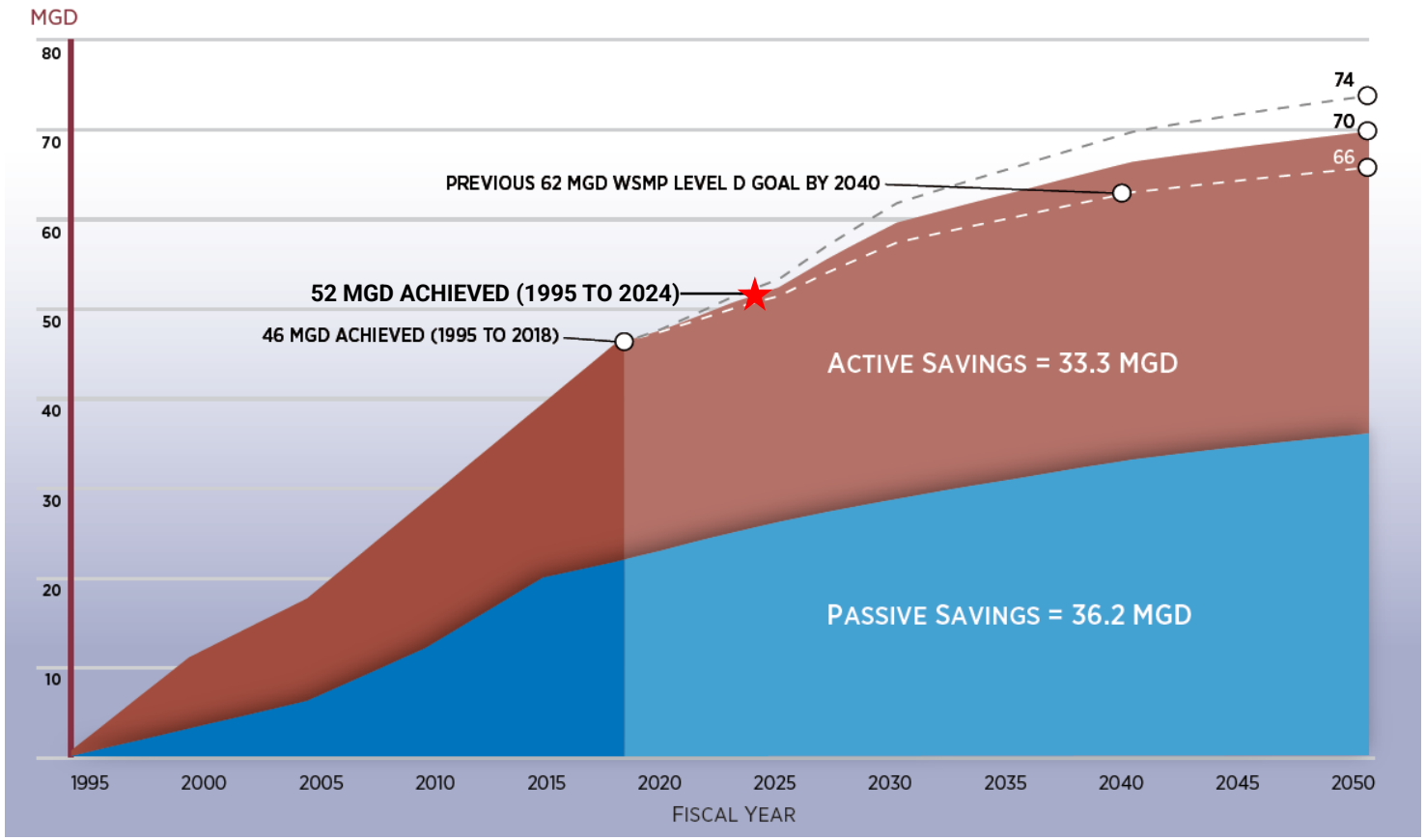
- Strategic plan outlines long-term conservation goals
- Areas of focus
  - Water management services
  - Rebates and incentives
  - Education and outreach
  - Regulation and legislation
  - Supply side conservation
  - Research and development
- Program elements created for each customer class

Water Conservation

EBMUD's Water Conservation Forecast

Goal: EBMUD plans to save 70 MGD by 2050 with conservation from all customers

FIGURE 6-2 EBMUD WATER CONSERVATION FORECAST



MGD: million gallons per day

Water Conservation

Conservation Program Portfolio

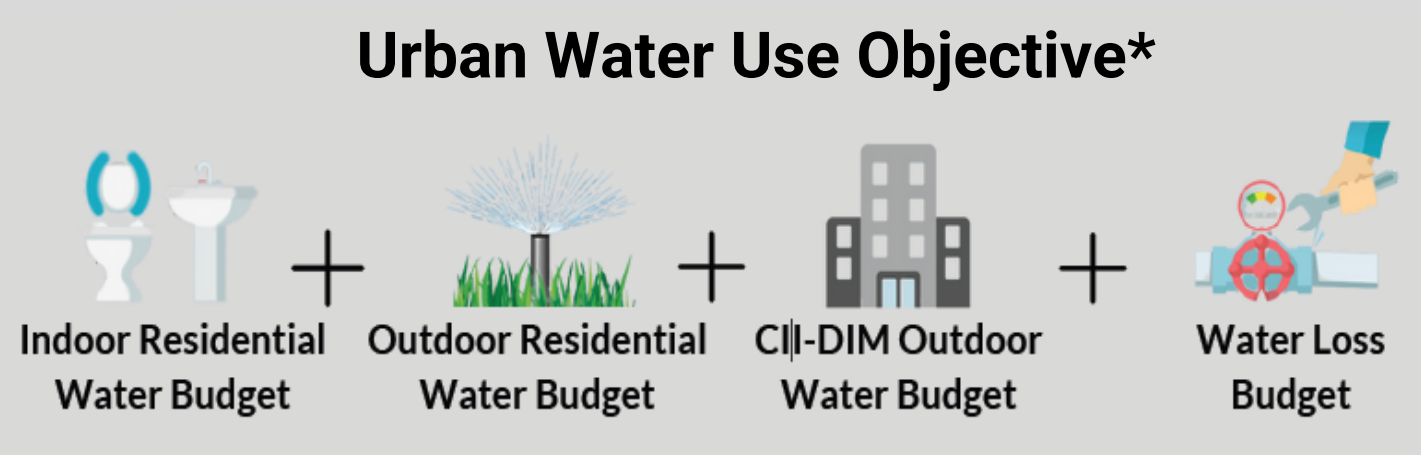
EBMUD offers a large portfolio of conservation programs for every sector

Residential	Non-Residential	
SINGLE FAMILY	COMMERCIAL	INSTITUTIONAL
AMI Meter Installation	AMI Meter Installation	AMI Meter Installation
Bath Faucet Aerator	Custom Rebate Level 1	Landscape Pressure Regulator Rebate
Graywater Rebate	Custom Rebate Level 2	Large Landscape Irrigation Controller
High Efficiency Irrigation Nozzle Rebate	Custom Rebate Level 3	Large Landscape Survey
Home Survey Kit	Dipper Well	Large Landscape Turf Replacement
Irrigation Controller	High Efficiency Irrigation Nozzle Rebate	Survey
Kitchen Faucet Aerator	Landscape Pressure Regulator Rebate	WATER LOSS CONTROL
Landscape Pressure Regulator Rebate	Large Landscape Irrigation Controller	Water Reports
Residential Surveys	Large Landscape Survey	IRRIGATION
Showerhead	Large Landscape Turf Replacement	AMI Meter Installation
Turf Replacement	Pre-Rinse Spray Valve	High Efficiency Irrigation Nozzle Rebate
Water Reports	Survey	Landscape Pressure Regulator Rebate
MULTI FAMILY	Water Reports	Large Landscape Irrigation Controller
AMI Meter Installation	INDUSTRIAL	Large Landscape Turf Replacement
Bath Faucet Aerator	AMI Meter Installation	Large Landscape Water Budgets
Common Area Coin-Operated 4.0 Water Factor Washers	Large Landscape Irrigation Controller	
Kitchen Faucet Aerator	Survey	
Residential Surveys	Water Reports	
Showerhead		
Water Reports		

AMI: Advanced Metering Infrastructure

Water Conservation

California Water Conservation Framework
EBMUD Water Use Objective



*Does not include total water use, excludes indoor CII water use such as from refineries

	Framework Water Use Objective for EBMUD (MGD)
2025 Estimate	146.0
2030 Estimate	135.4
2035 Estimate	118.1
2040 Estimate	112.4

- EBMUD's current water use of 121.7 MGD in these categories is about 24 MGD less than the estimated water use objective for 2025, which is 146 MGD.
- EBMUD on track to reduce water use in these categories by about 9 MGD by 2040, to meet the State's conservation objectives

CII: Commercial, industrial, institutional
DIM: Dedicated irrigation meter

Demand Update

Mid-Cycle Demand Update

Demand Study Purpose

- Facility and pipeline sizing
- Water conservation planning
- Recycled water planning
- System Capacity Charges and Water Rates
- **Water supply planning**


Recycled Water Pipeline


Distribution Reservoir


Freeport Intake Facility

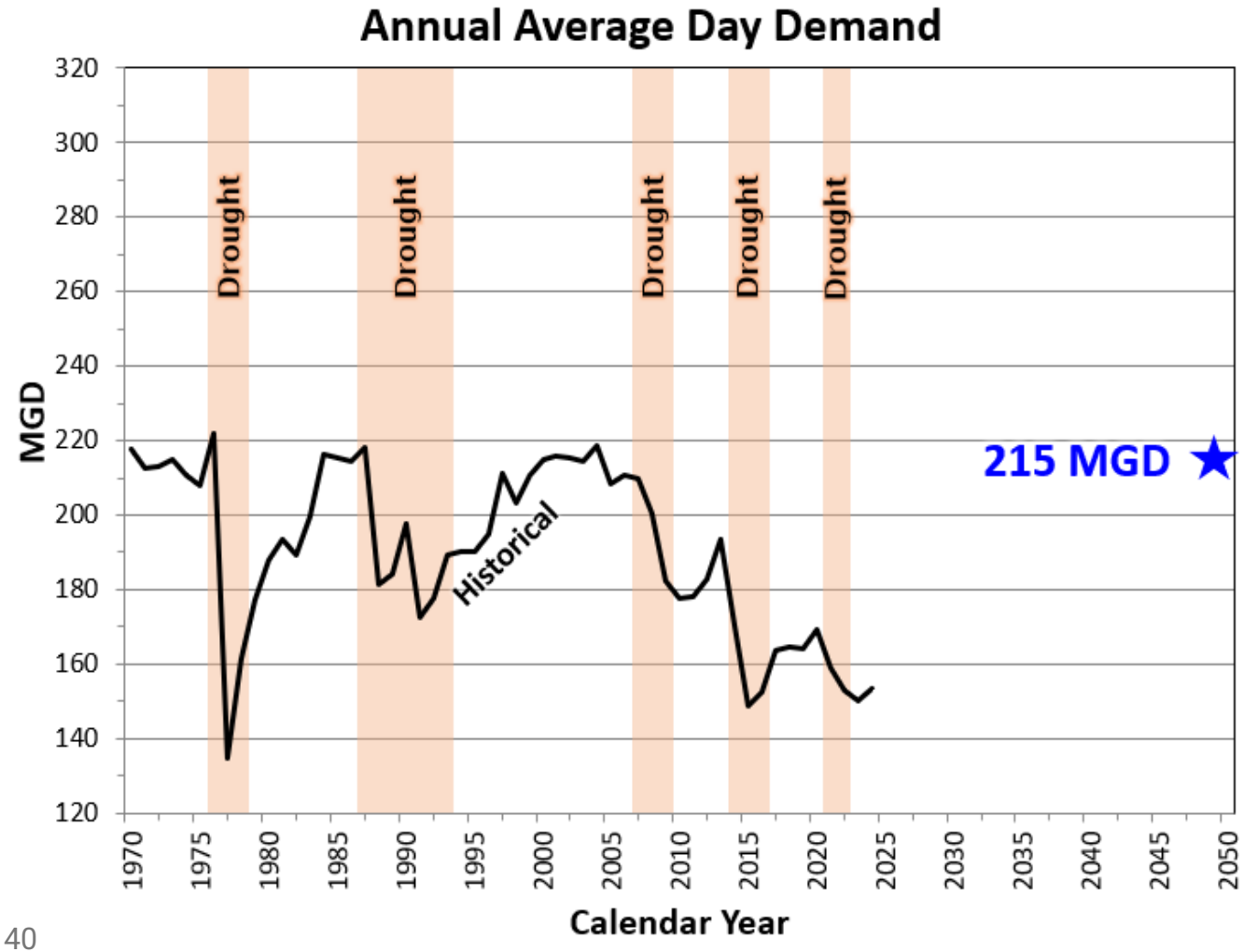
Mid-Cycle Demand Update

Demand Study Background

- In-depth Demand Study completed every 10 years
- Mid-Cycle Demand Updates in the interim 5 years to capture changes in development trends, conservation, recycled water, high water users, non-revenue water, and climate change
- Supports the 2025 Urban Water Management Plan and Facility Sizing
- Report completed December 2024

Mid-Cycle Demand Update

2050 Demand Study Mid Cycle Update



Long-term forecasted demand does not account for temporary changes in demand including:

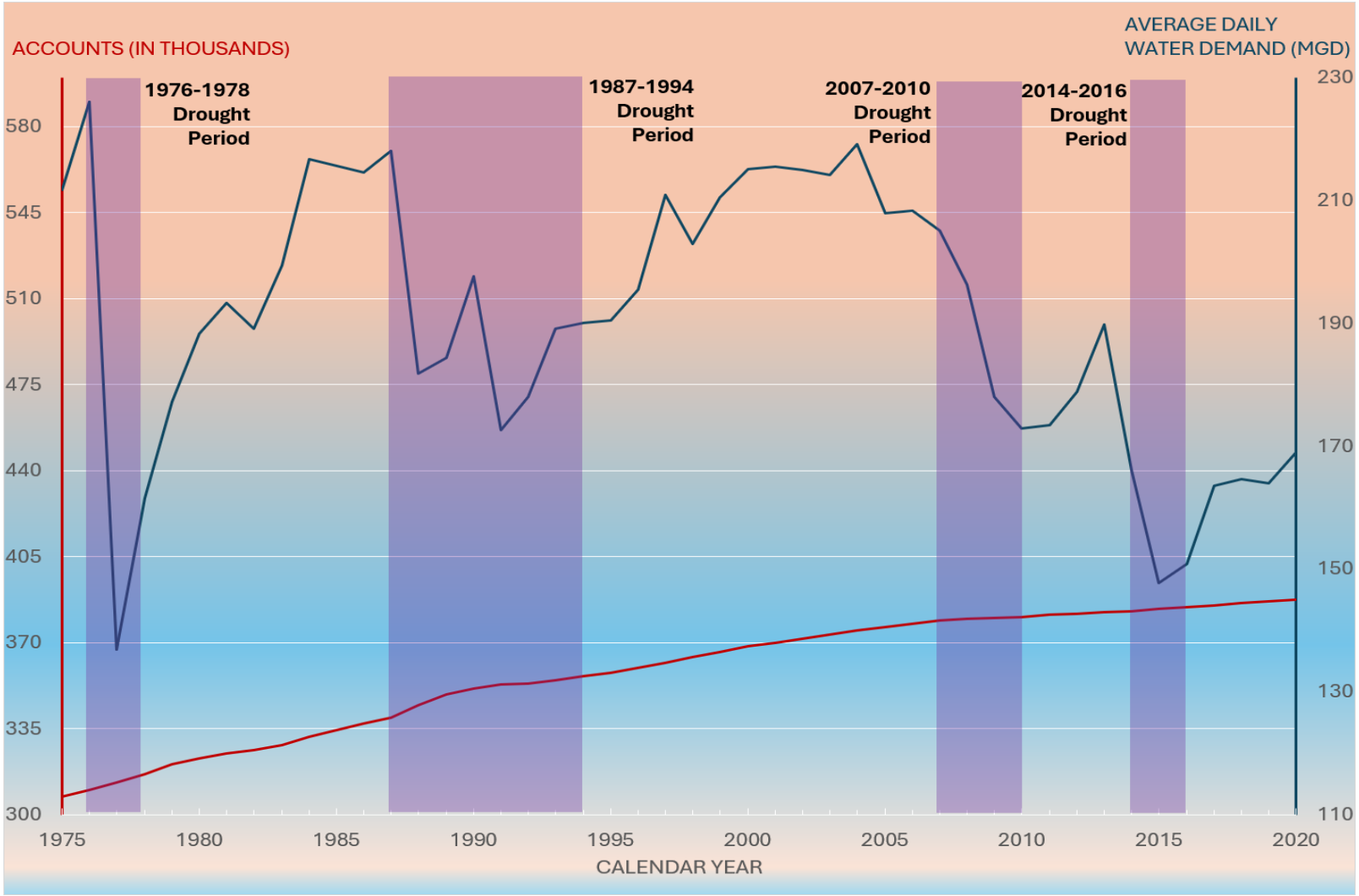
- Rationing and effect of drought
- Pandemic
- Changes in economy
- Changes in weather

Accounts for uncertainty in WC and RW savings and subtracted from the forecasted demand

Decreases Need for Water:
Forecasted water demands are decreasing
(218 MGD by 2050 in 2020 UWMP, now estimated to be 215 MGD)

WC: Water Conservation
RW: Recycled Water

Mid-Cycle Demand Update
EBMUD Accounts and Total Demand



Water use has declined as population and accounts have increased

From 2020 UWMP

Drought Management Program

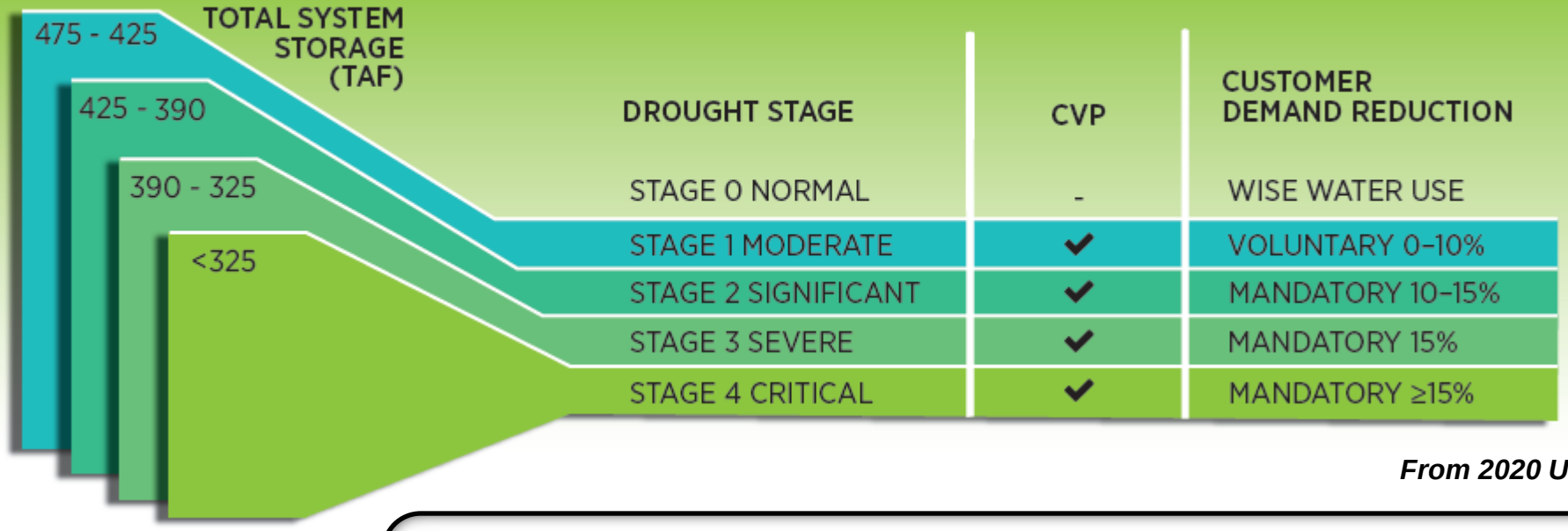
Drought Planning Sequence

Preliminary Need for Water

Supplemental Supply Sources

Drought Management Program

FIGURE W-5 DROUGHT MANAGEMENT PROGRAM GUIDELINES

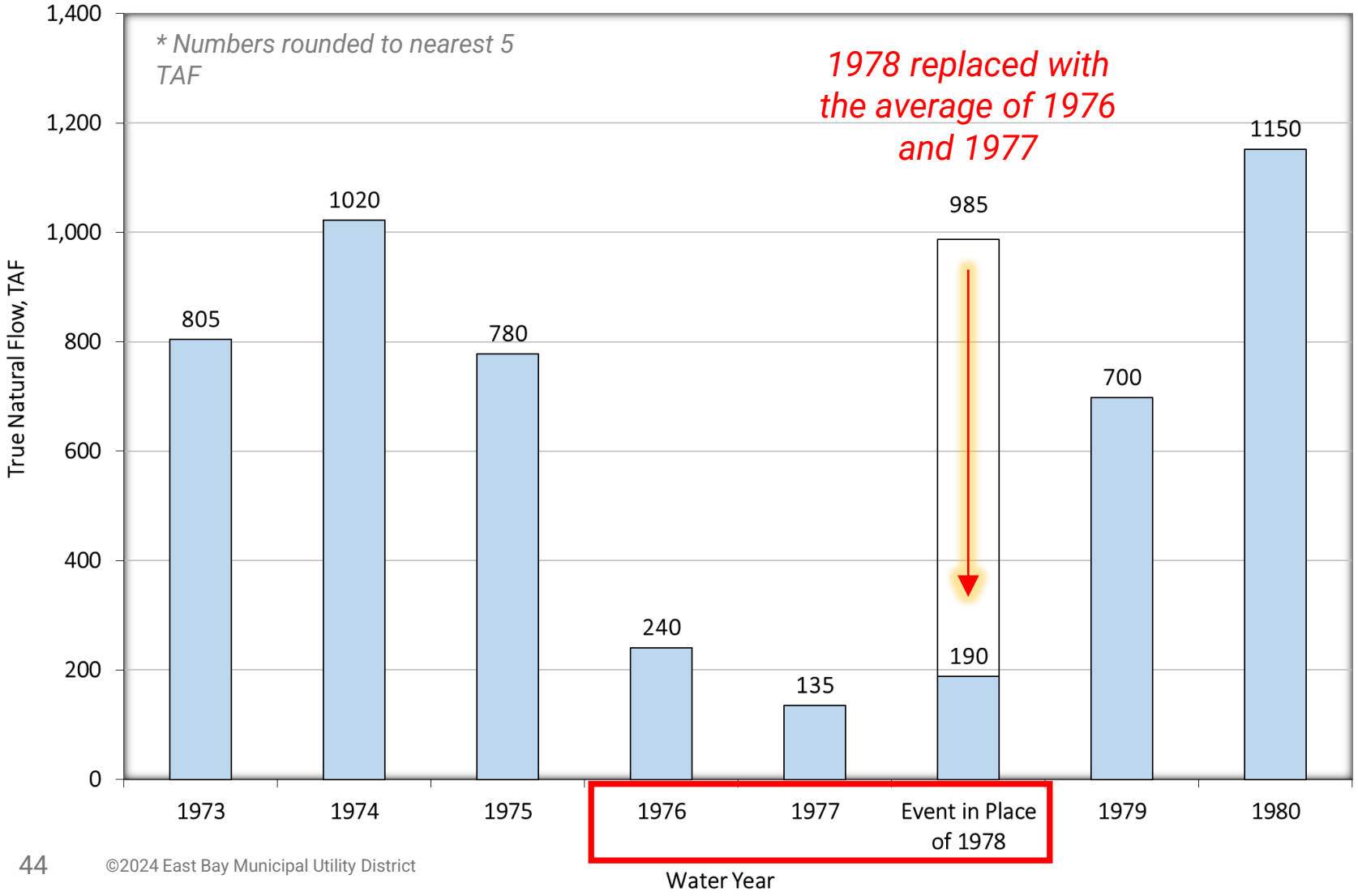


DROUGHT STAGE	CVP	CUSTOMER DEMAND REDUCTION
STAGE 0 NORMAL	-	WISE WATER USE
STAGE 1 MODERATE	✔	VOLUNTARY 0–10%
STAGE 2 SIGNIFICANT	✔	MANDATORY 10–15%
STAGE 3 SEVERE	✔	MANDATORY 15%
STAGE 4 CRITICAL	✔	MANDATORY ≥15%

From 2020 UWMP

Updates to the Drought Management Program will be part of the Urban Water Management Plan Update in 2025/2026 for Board input

Drought Planning Sequence (DPS)



- EBMUD uses a 3-year design drought
- Modeling targets dead pool at end of Year 3

Board feedback on design drought.

Will be re-evaluated as part of the Urban Water Management Plan Update in 2025/2026.

Supply Portfolio Options for 3-Year Drought Planning Sequence

Dry Years 1, 2, and 3 [1]	Dry Year 3 [1,3]
Existing and Future	**Potential Future**
• Conservation	• San Joaquin County (SJC) Groundwater Banking
• Recycled Water (non-potable and potential potable reuse)	• Bayside Phase 2
• CVP Contract [2]	• Short-term Water Transfers
• Long-term Water Transfers	

Board feedback: Re-evaluate as part of Urban Water Management Update whether to take supplies earlier in year 1 or 2 of a drought when available to have enough supply for year 3 and beyond.

[1] Availability or reliability for some options will decrease as drought continues into multiple years or deepens.
[2] CVP reliability has decreased.
[3] Groundwater banking projects in San Joaquin or potentially Sacramento counties may require deliveries in years 1 and 2 in order to provide expected yields.

Preliminary Need for Water Estimates

- Need for water in the **third year of a drought**; accounts for conservation, recycling, and 15% rationing
- 2020 UWMP
  - Need for water: 75 TAF to 84 TAF by 2050
- Preliminary 2024 update
  - Need for water: 56 TAF to 115 TAF by 2050
  - Reduced District demands, reduced CVP supply, range of upcountry demands
- Upcoming 2025 UWMP
  - Need for water to be updated, likely to be on the lower end of the range
  - The need for water analysis drives the priorities for the supplemental water supply projects.

CVP: Central Valley Project
UWMP: Urban Water Management Plan

Potential Future Supplemental Supply Sources

Supply Alternatives	Yield (TAF)	Key Considerations
Water Transfers	Up to 47 TAF per year when available	• Long-term partnerships for drought supply; backstop for Central Valley Project supply • Quantities variable; market transfers less reliable as drought deepens.
Future Non-potable Reuse	Up to 14 TAF (13 MGD)	(Included in the need for water analysis) • Leverage federal funding to expand program. • Difficult to achieve goal due to declining wastewater flows and recycled water demands.
Potable Reuse (Purified Water)	20 to 34 TAF (17.9 to 30 MGD)	• Future opportunity with locally controlled supply. • Long lead time for education and outreach and to develop project; complex permitting and operations.
SJC Groundwater Banking	Up to 20 TAF	• Opportunity to develop long-term storage project. • Permits, wells, groundwater levels, and blending ratios in aqueducts may limit extraction capacity and require spreading over multiple years to achieve yield.
Bayside	Up to 5 TAF	• Water supply for deeper droughts and emergency. • Outreach to address community concerns.

Summary and Next Steps

- Mokelumne supply is variable and vulnerable to droughts and uncertainties
- EBMUD's need for water (in 3rd year of a drought) depends on a number of factors. While forecasted demand has decreased, CVP supply reliability is also decreasing.
- A diverse supplemental supply portfolio is critical to meet the need for water
  - Pursue water transfer arrangements
  - Develop long-term groundwater banking partnerships
  - Continue to expand non-potable reuse while preparing for the potential for potable reuse in the future
  - Continue to focus on achieving water conservation goal
- Update the need for water analysis and supplemental supply strategy through the 2025 Urban Water Management Plan

Next Steps – Prepare for 2025 UWMP

- **Key Upcoming Policy Decisions & Direction for Board Consideration**
  - Reassess Need for Water (design drought, climate change, level of demand, scenarios)
  - Update Water Shortage Contingency Plan (e.g., drought management plan, supply triggers)

- **Preliminary Schedule**

DWR: Department of Water Resources
UWMP: Urban Water Management Plan
WSCP: Water Shortage Contingency Plan

Board and Public Comments