



EBMUD

Water Supplies during Drought and Deluge

Reena Thomas, Associate Civil Engineer

Grace Su, Senior Civil Engineer

Northern California/Central California WaterReuse
Joint Chapter Meeting

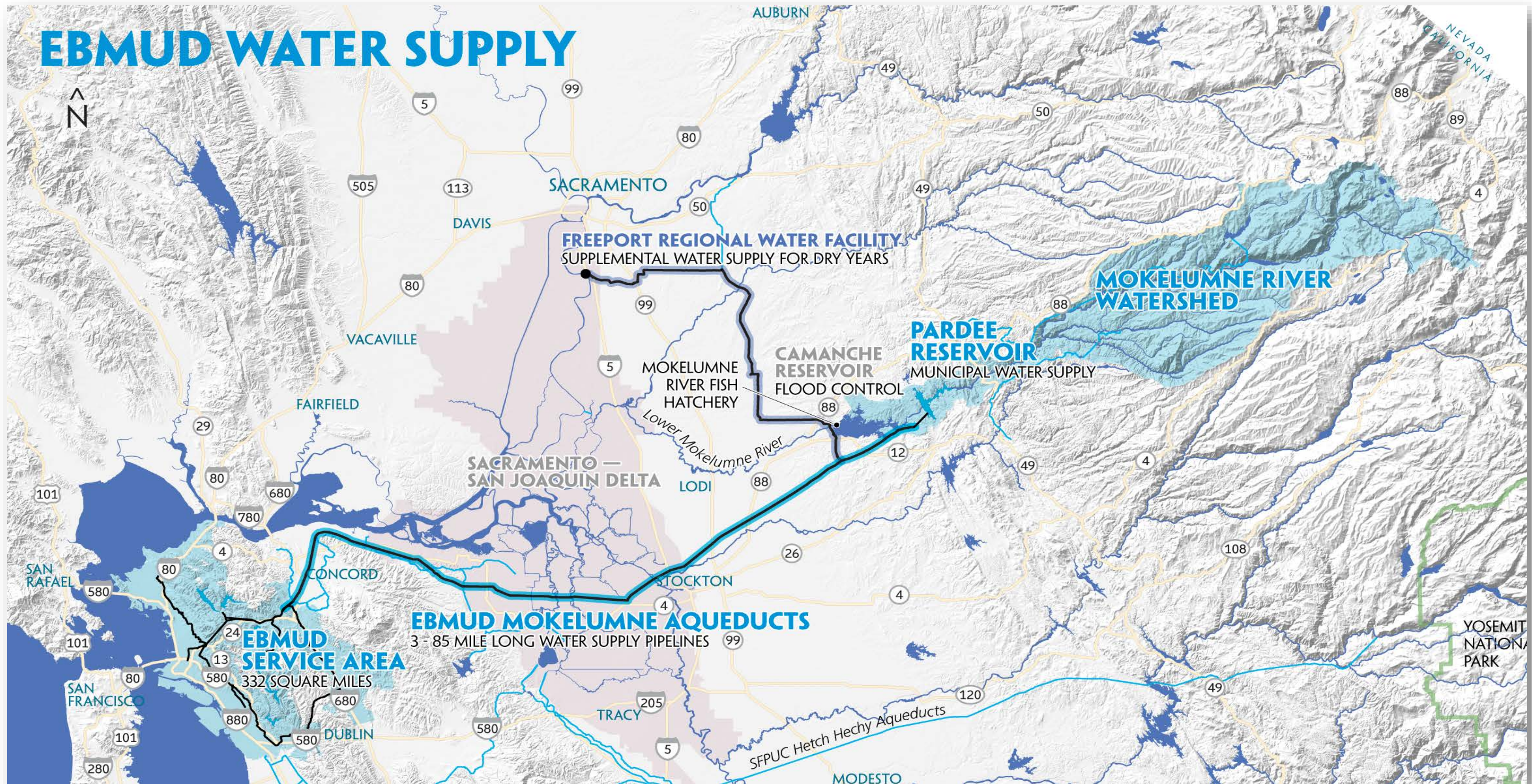
May 19, 2023

Agenda

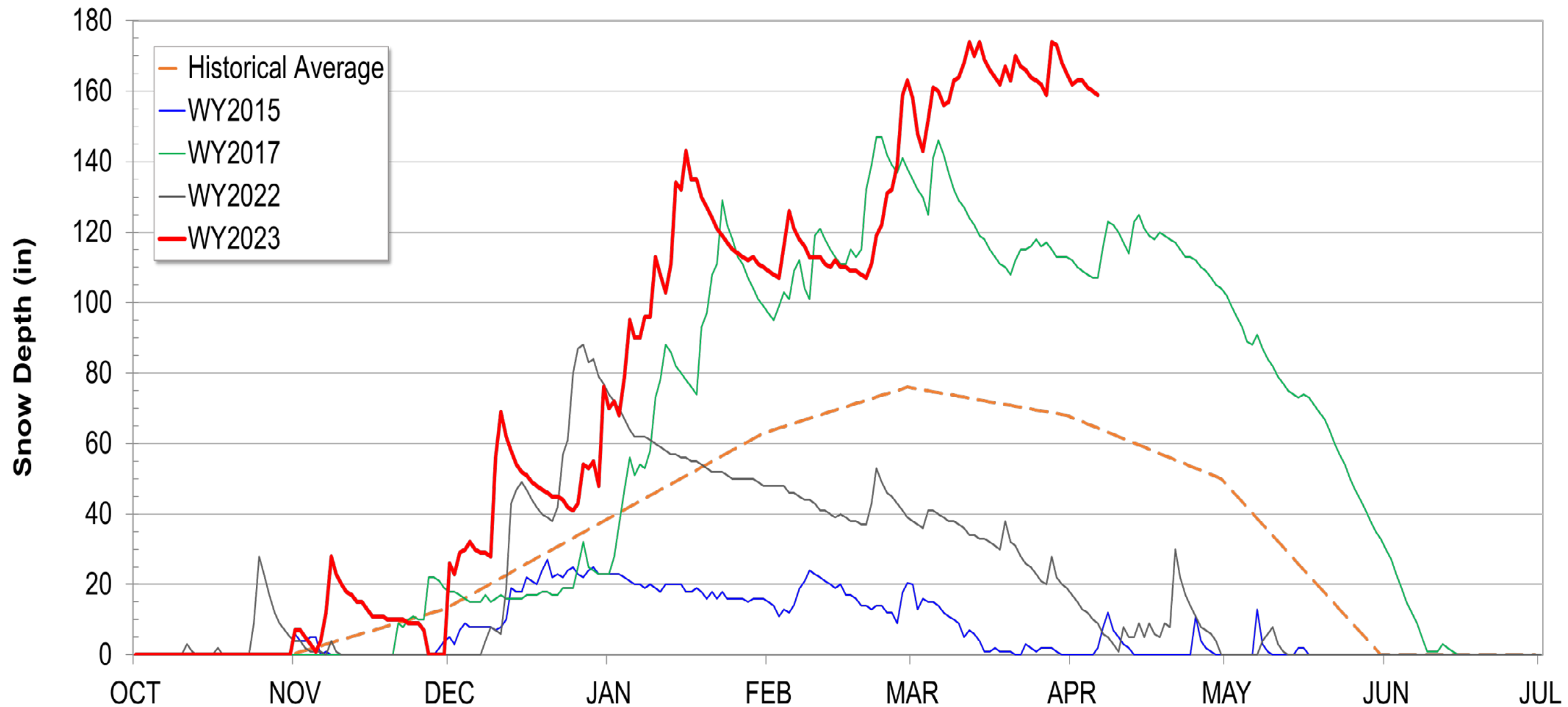
- EBMUD Water Supply
- Challenges
- EBMUD Water Supply Strategy and Portfolio

EBMUD Water Supply

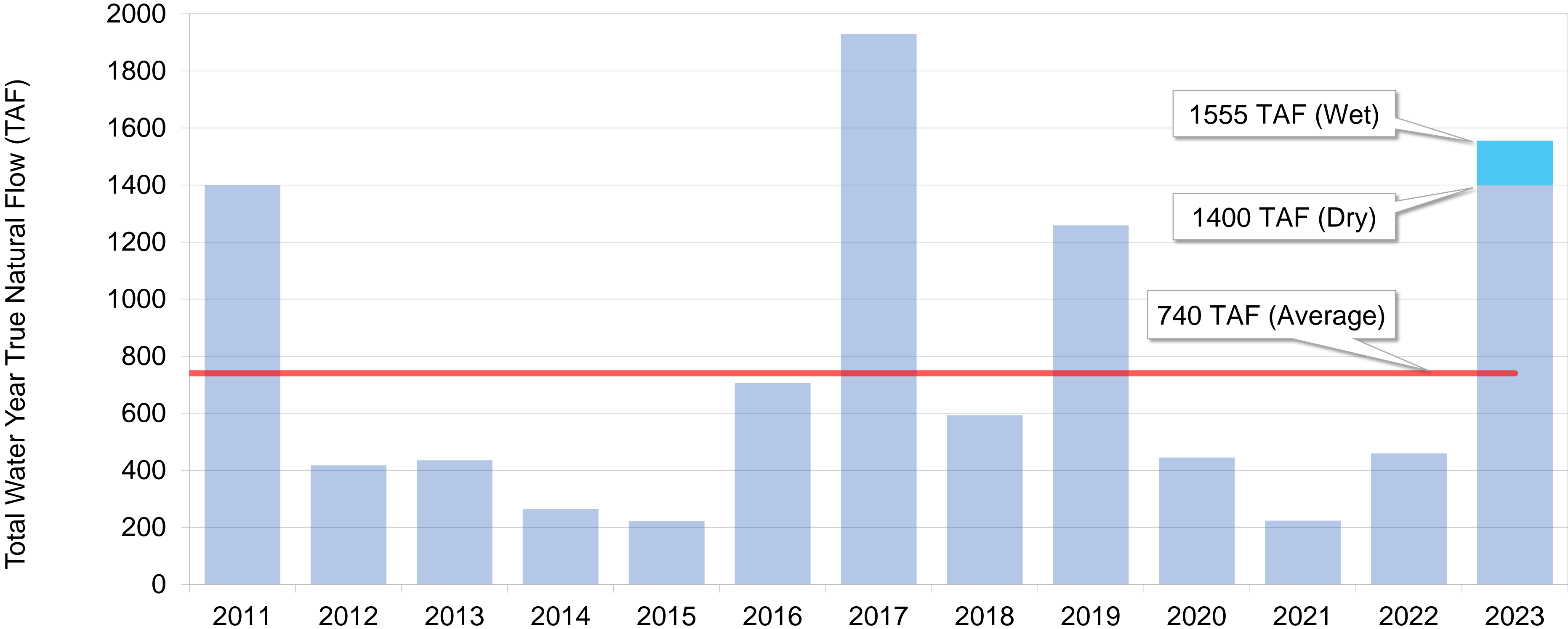




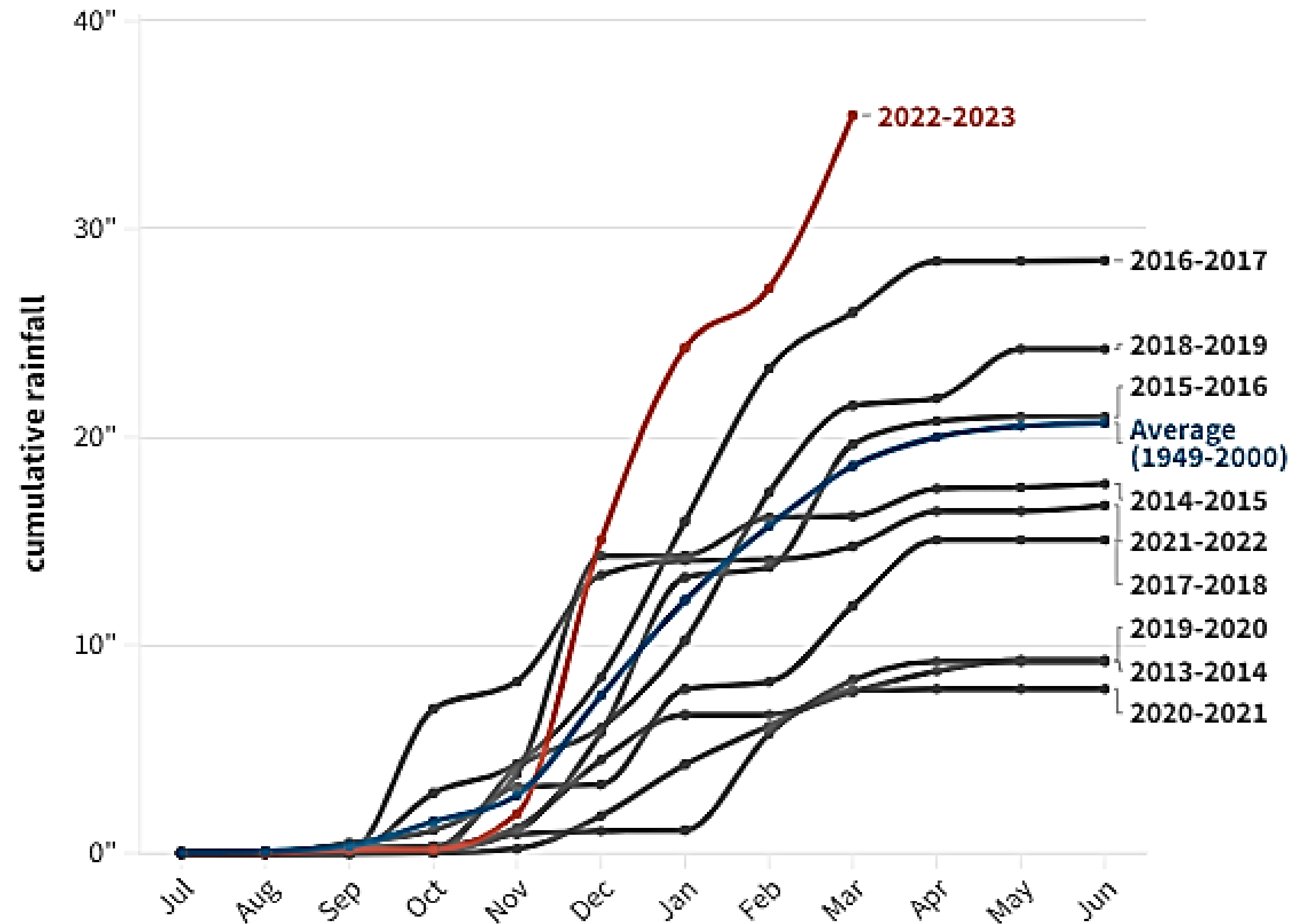
Caples Lake Snow Depth (8,000 feet, near Kirkwood Ski Resort)



Historical & Projected Mokelumne River Runoff



City of Oakland Rainfall

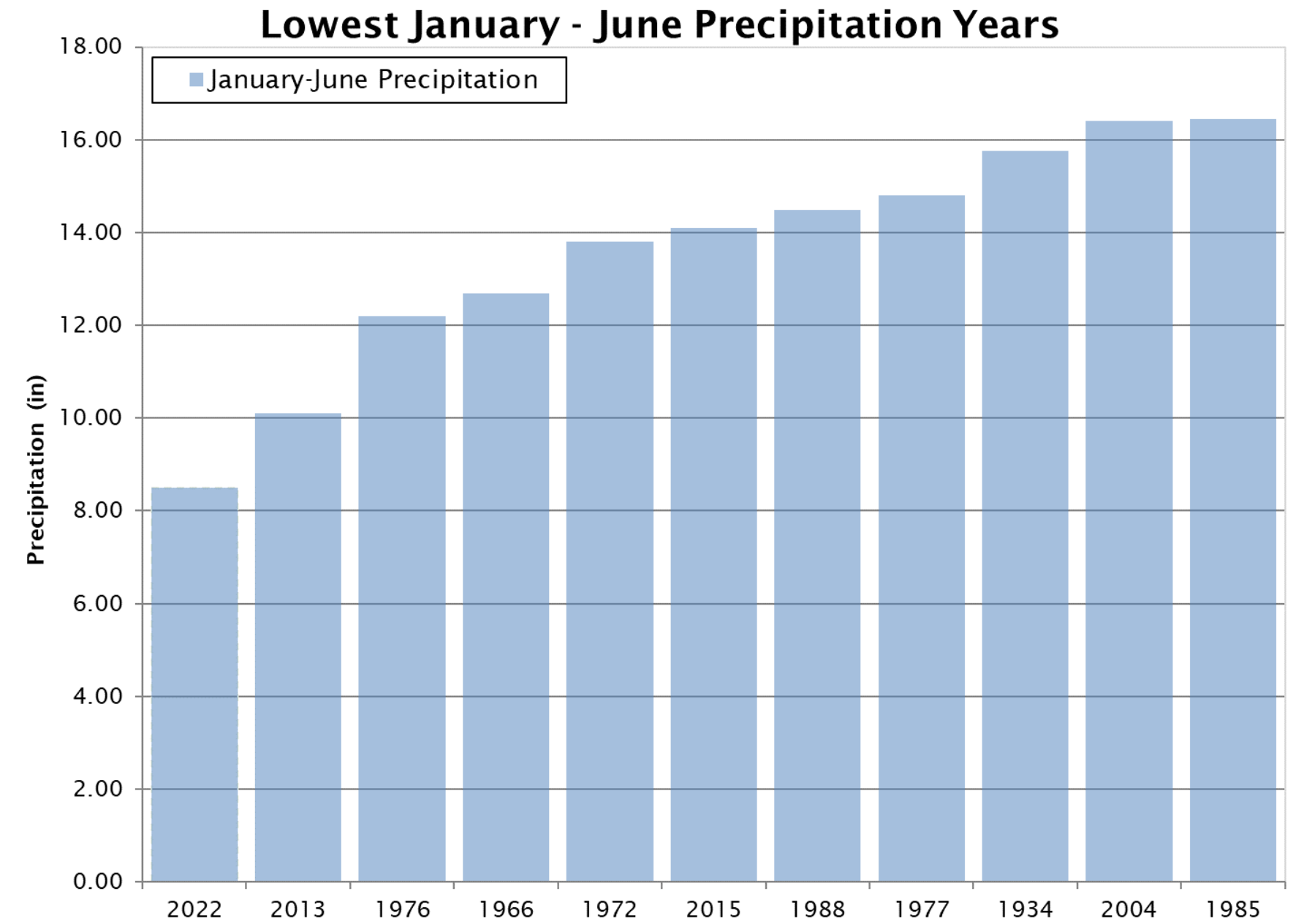
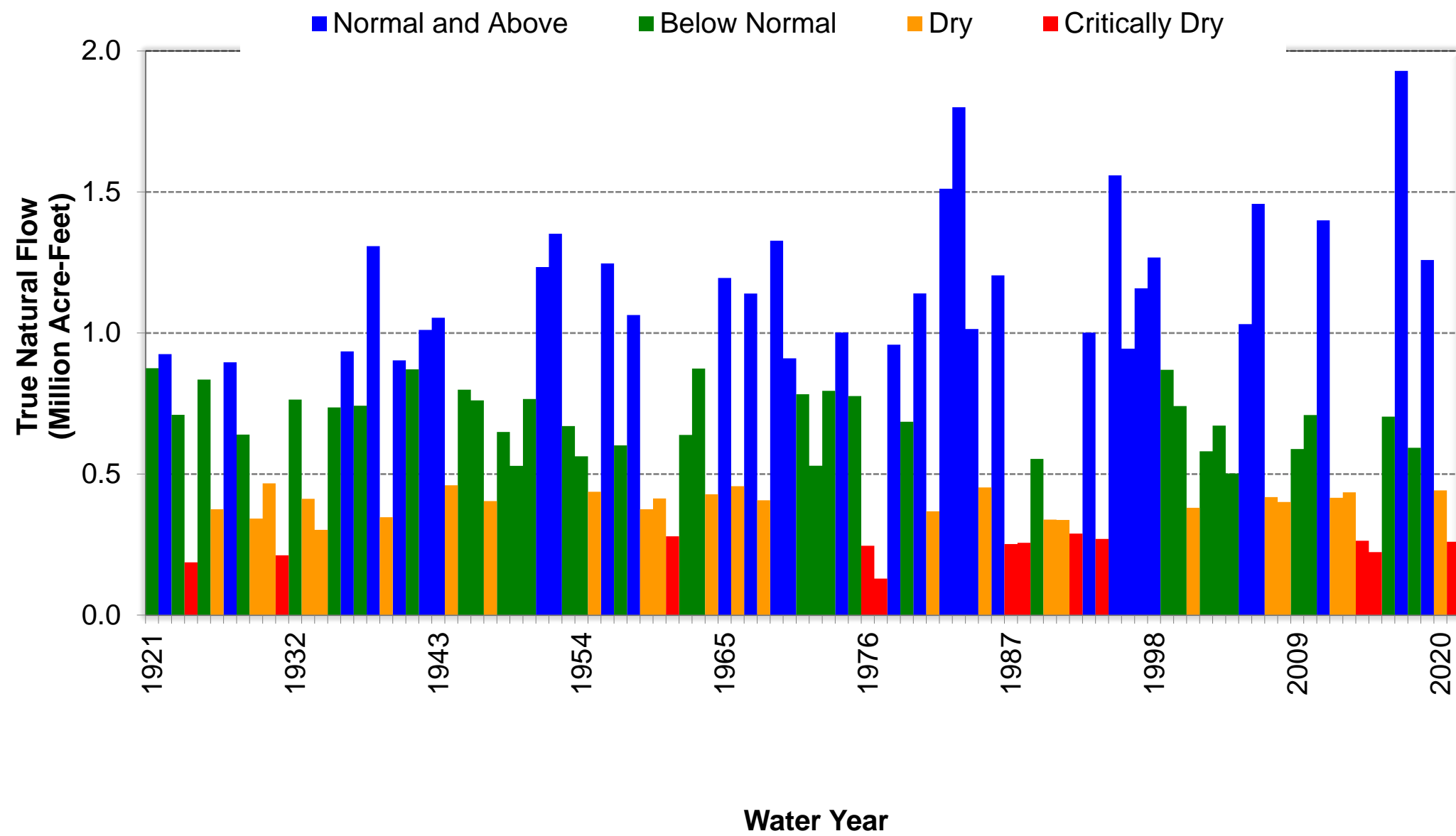


Source: NOAA's National Center for Environmental Information • *Average calculated using monthly totals from 1949-1950 through 1999-2000. The rain year starts July 1, and data is through March 31, 2023.

By: Harriet Blair Rowan - Bay Area News Group

Historical Precipitation

Mokelumne River Historic Water Supply Variability



Climate Change and Water Supply Planning



Water Supply Challenges

Climate Change



Extreme Drought



Extreme Rainfall



Earthquakes



New Laws & Regulation



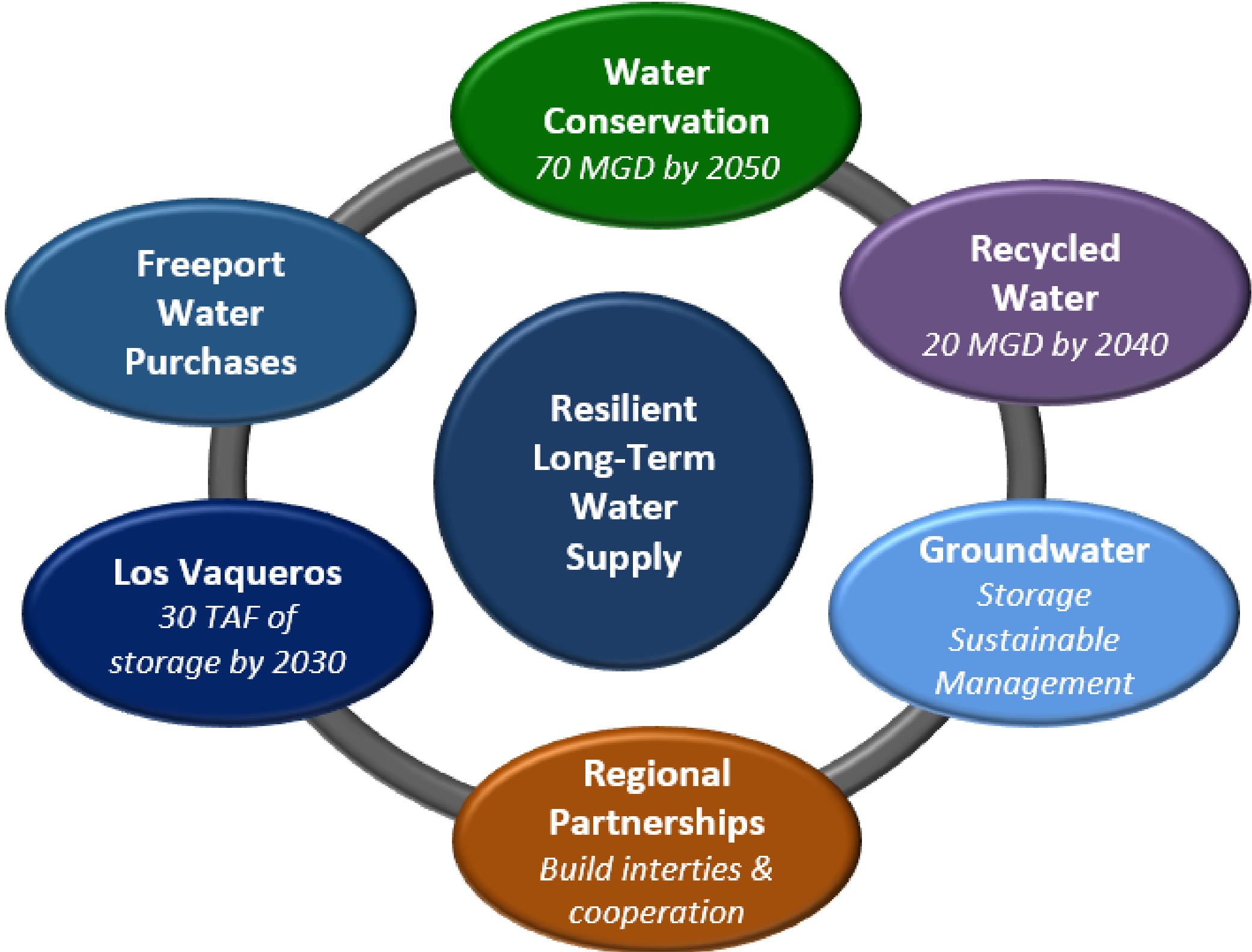
More Wildfire



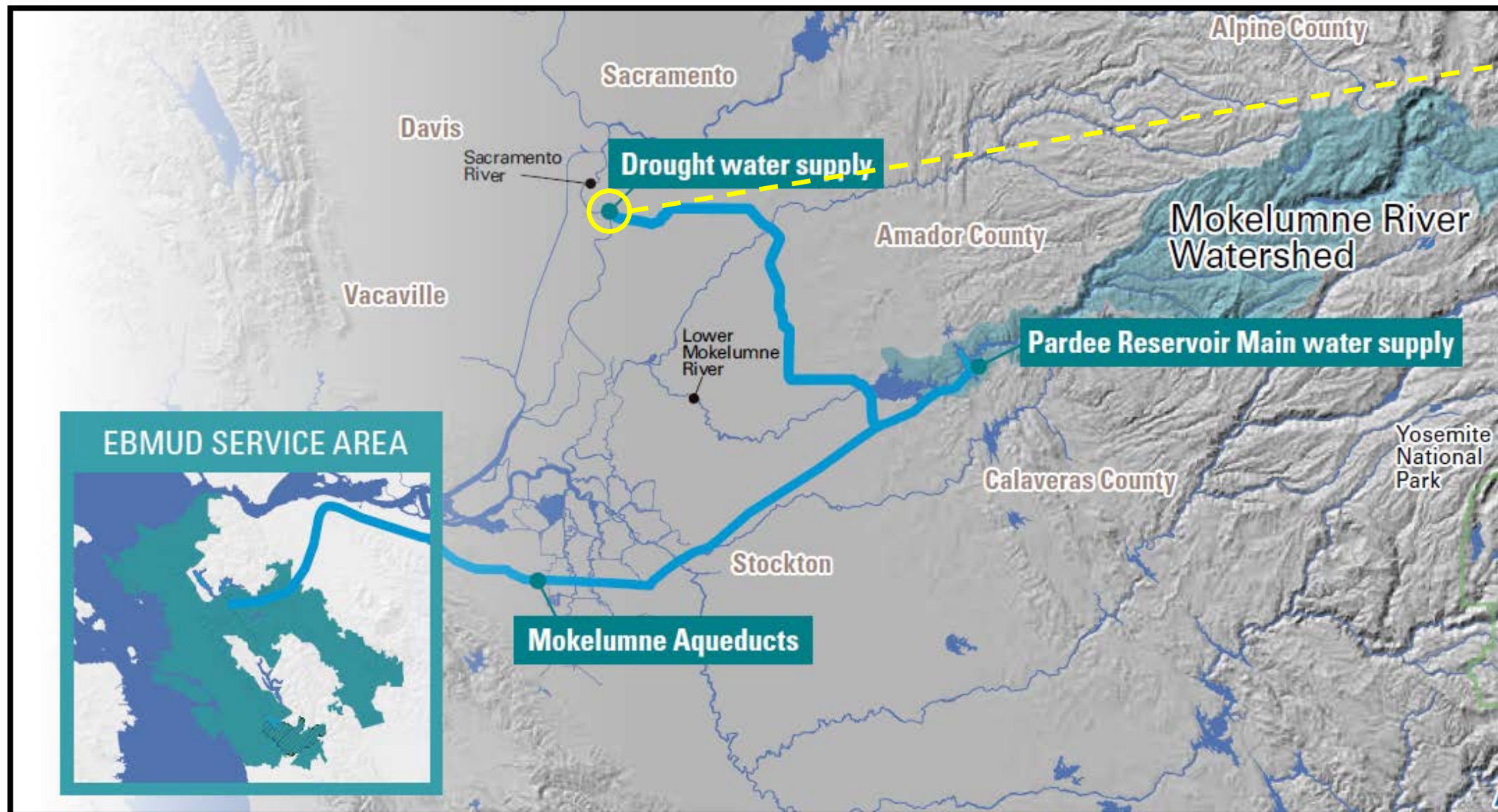
EBMUD Water Supply Portfolio

Strategy

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



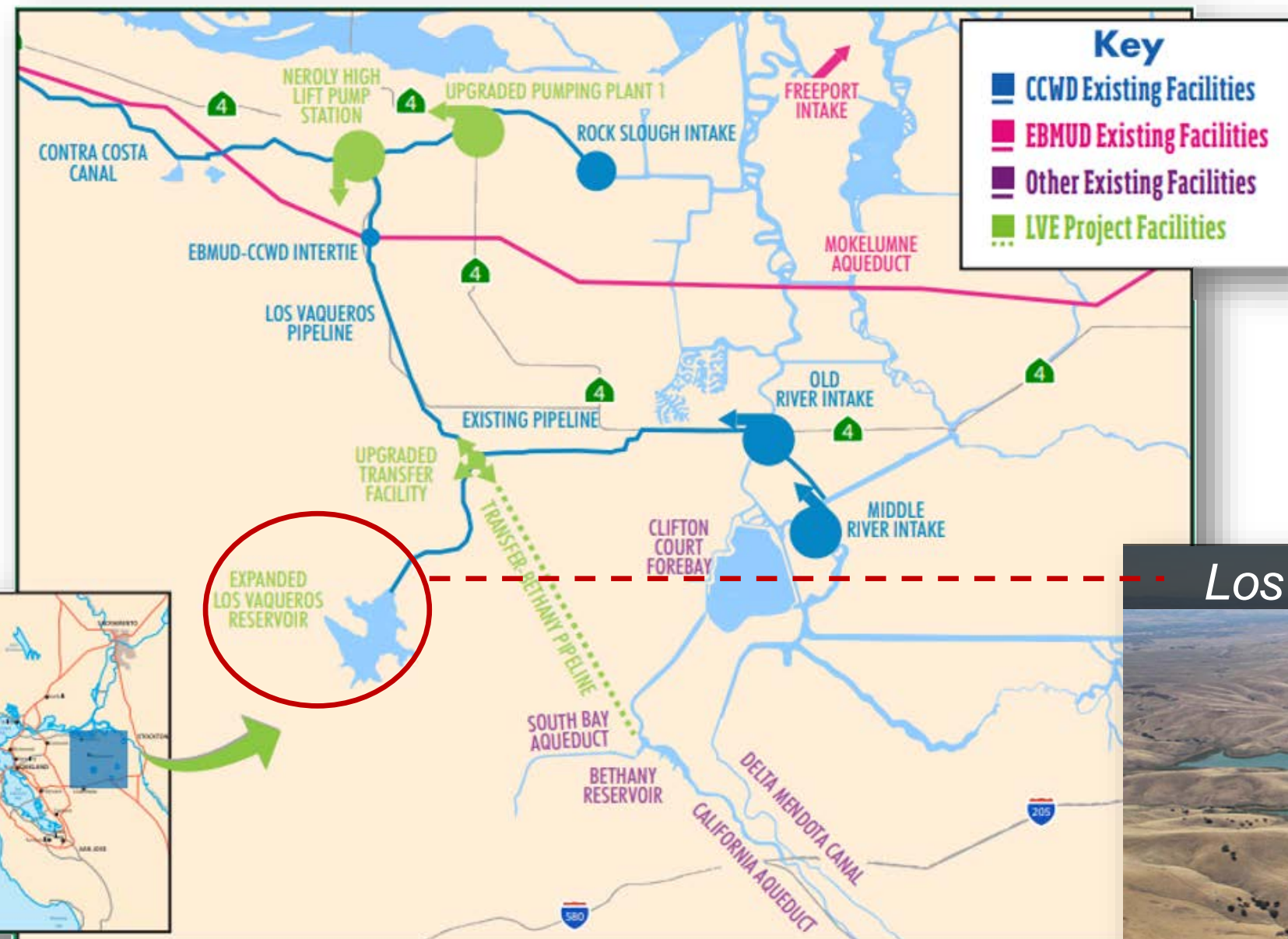
The Freepoint Regional Water Project



Drought Water Supplies From Freeport Project

- Sacramento River
- Federal Central Valley Project Contract
 - Maximum of 165,000 AF in 3 years
- Purchases from Water Agencies
 - Placer County Water Agency
 - Yuba Water Agency
 - Sacramento River Irrigation Districts

Los Vaqueros Reservoir Expansion Project



Key		Voting Members	
Joint Powers Authority (JPA) formed in 2021	1	ACWD	5 San Luis DMWA
	2	Contra Costa WD (w/ Brentwood)	6 SF PUC (w/ BAWSCA)
	3	EBMUD	7 Valley Water
	4	Grasslands	8 Zone 7



Item	Capital, \$M (2022 \$)
Project	\$980
CWC Grant	(\$477)
Local Share	\$503

CWC: California Water Commission

Purpose	WATER FOR REFUGES	WATER FOR PARTNERS	REGIONAL INTEGRATION	WATER QUALITY	RECREATION

ACWD: Alameda County Water District

BAWSCA: Bay Area Water Supply & Conservation Agency

DMWA: Delta-Mendota Water Authority

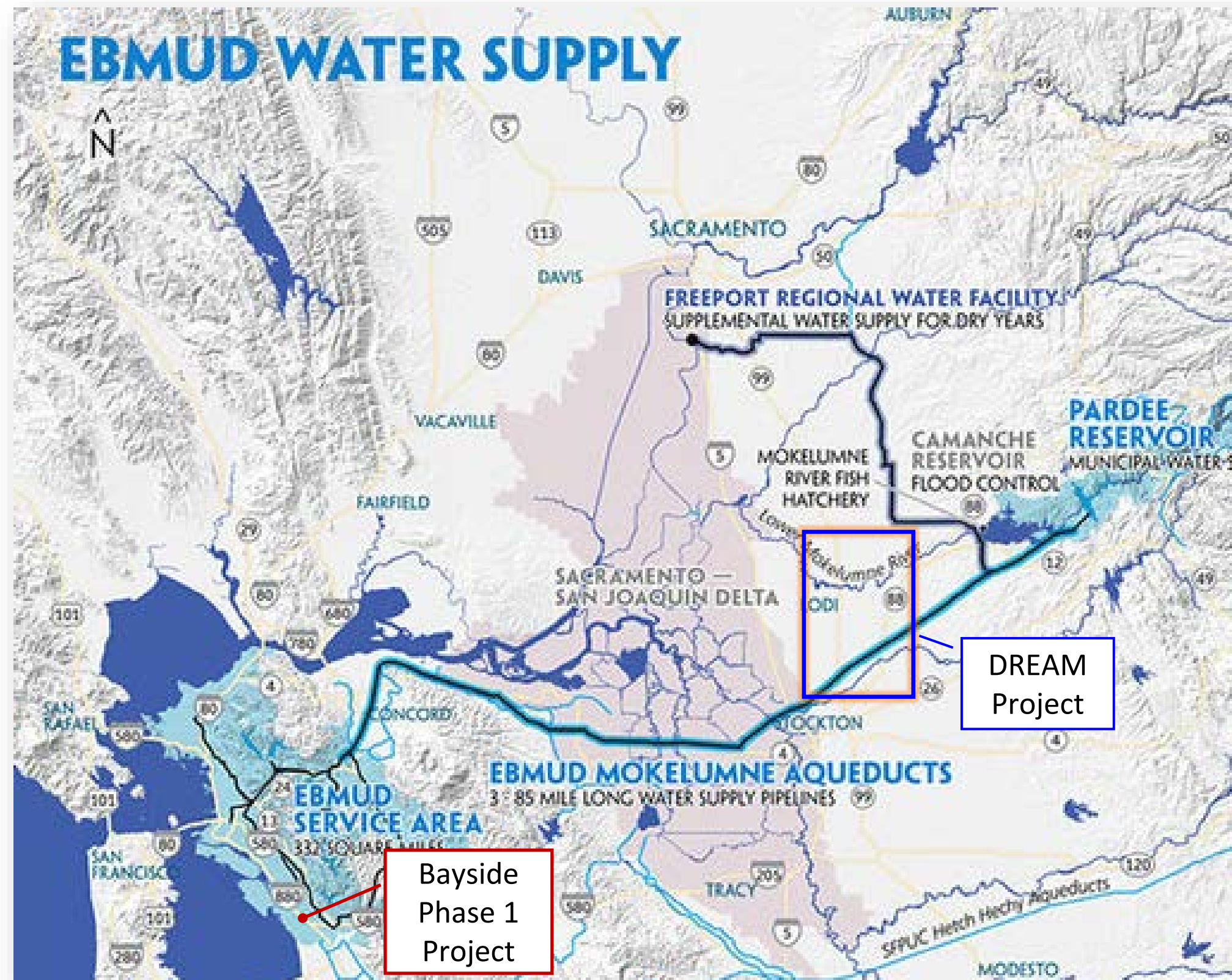
SF PUC: San Francisco Public Utilities Commission

WD: Water District

Groundwater



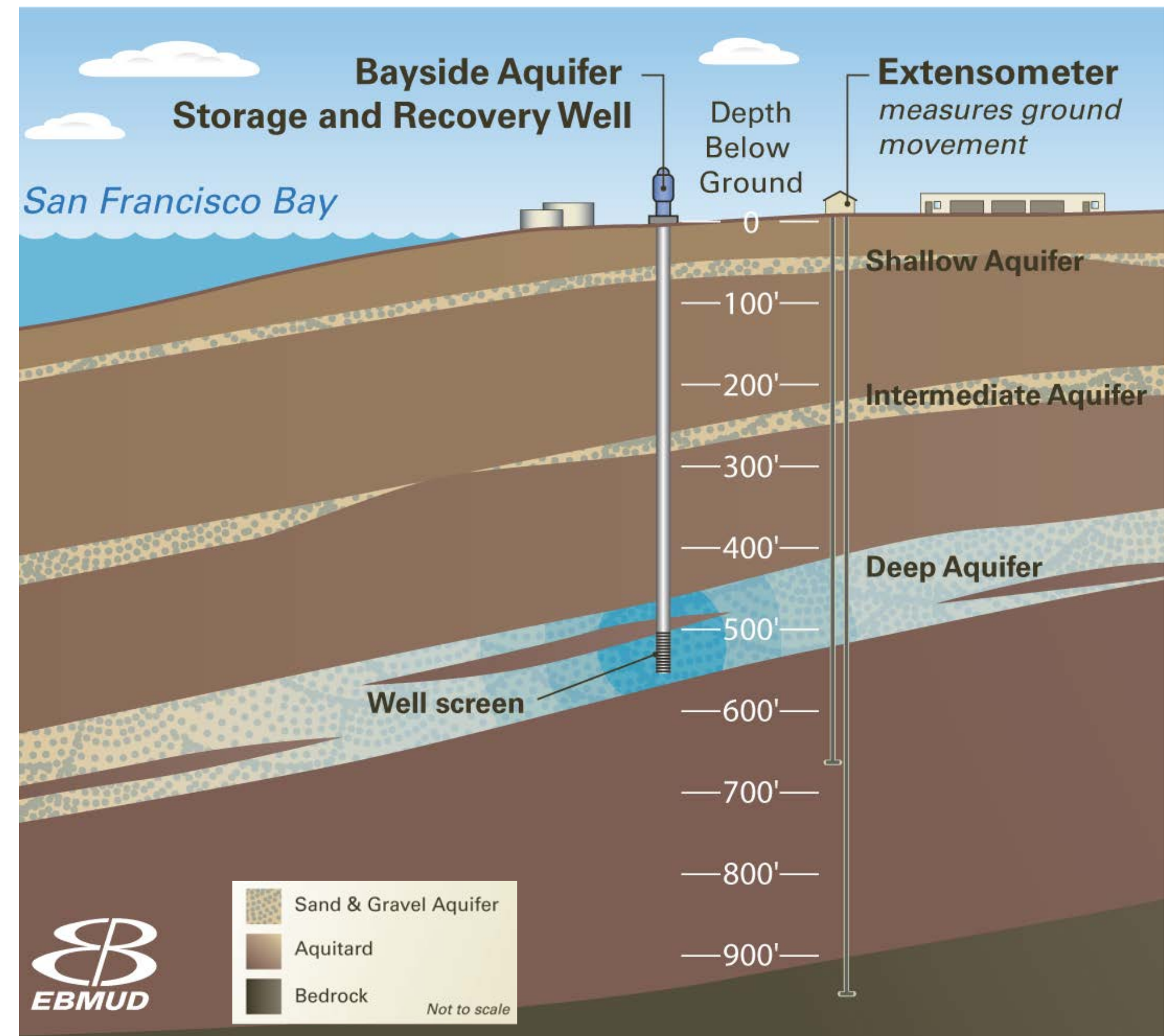
Groundwater: Bayside and DREAM



DREAM: Demonstration, Recharge, Extraction, Aquifer Management

Groundwater: Bayside

- Water captured during years with surplus water and stored for severe droughts or emergencies
- Located about 600 feet deep and is protected from shallow groundwater impacts and sea level rise by thick clay layers
- An extensometer and network of over 20 monitoring wells are used to monitor land subsidence, groundwater levels and water quality



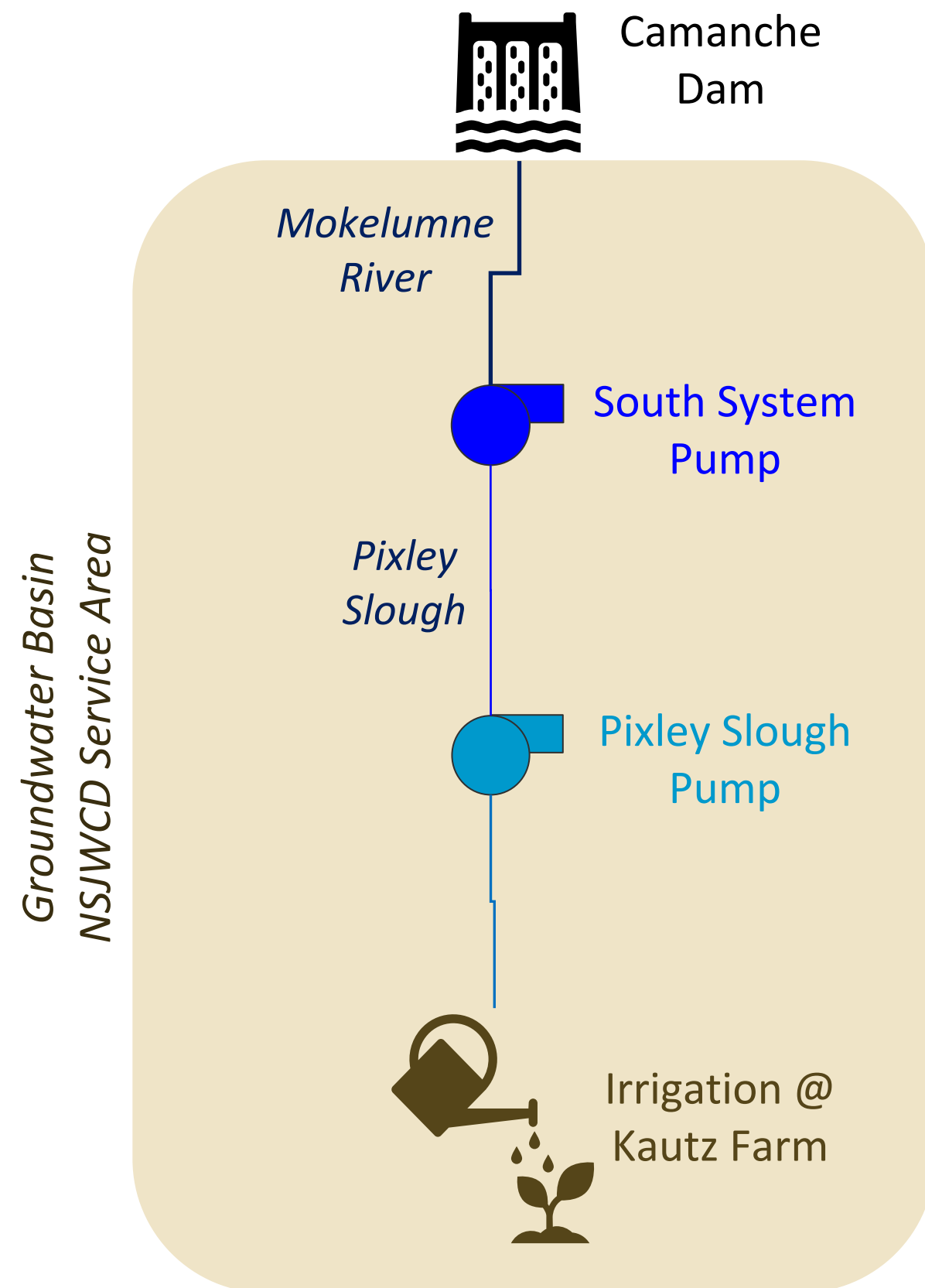
Groundwater: Bayside

- Capacity
 - Injection: 0.3 to 0.5 MGD annually
 - Extraction: Up to 1 MGD annually
- 18 million gallons recharged with surplus water between 2017 – 2019
- Extraction for drought or emergency water supply has not yet been needed

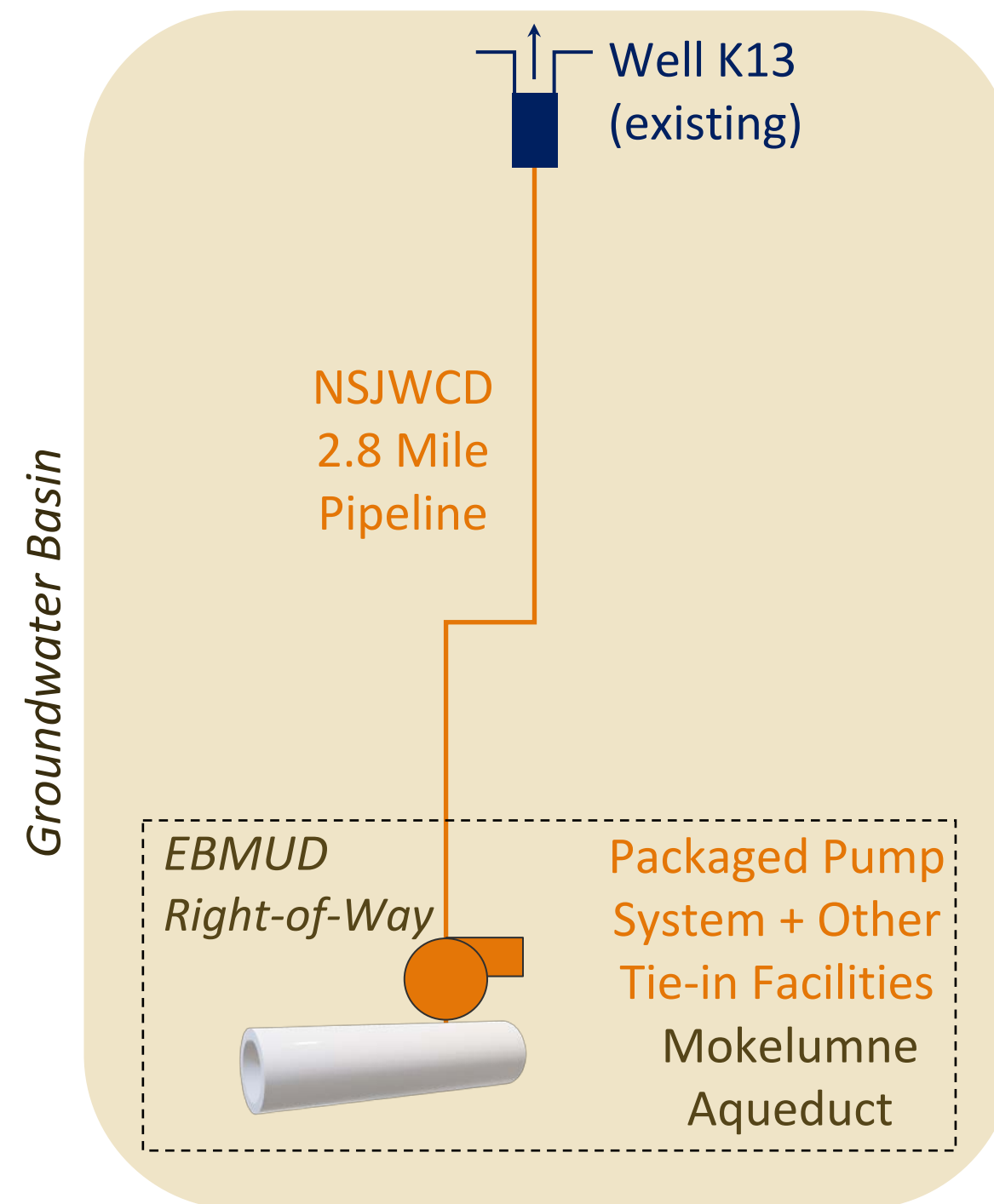


Groundwater: DREAM Project

Existing Facilities for Recharge



New Facilities Constructed for Extraction



Background

- Pilot Groundwater Banking Project
- San Joaquin County, NSJWCD, EBMUD, and Eastern Water Alliance Partnership
- Release up to 1,000 AF of Mokelumne River water
- Extract up to 500 AF of banked groundwater

Groundwater: DREAM Project

Recharge

- 342 AF of Mokelumne River water released in 2018 and 2019
- Additional releases are anticipated this year

Extraction

- Startup operational testing of new facilities completed in February 2023
- 40 AF of banked groundwater extracted and delivered to the East Bay

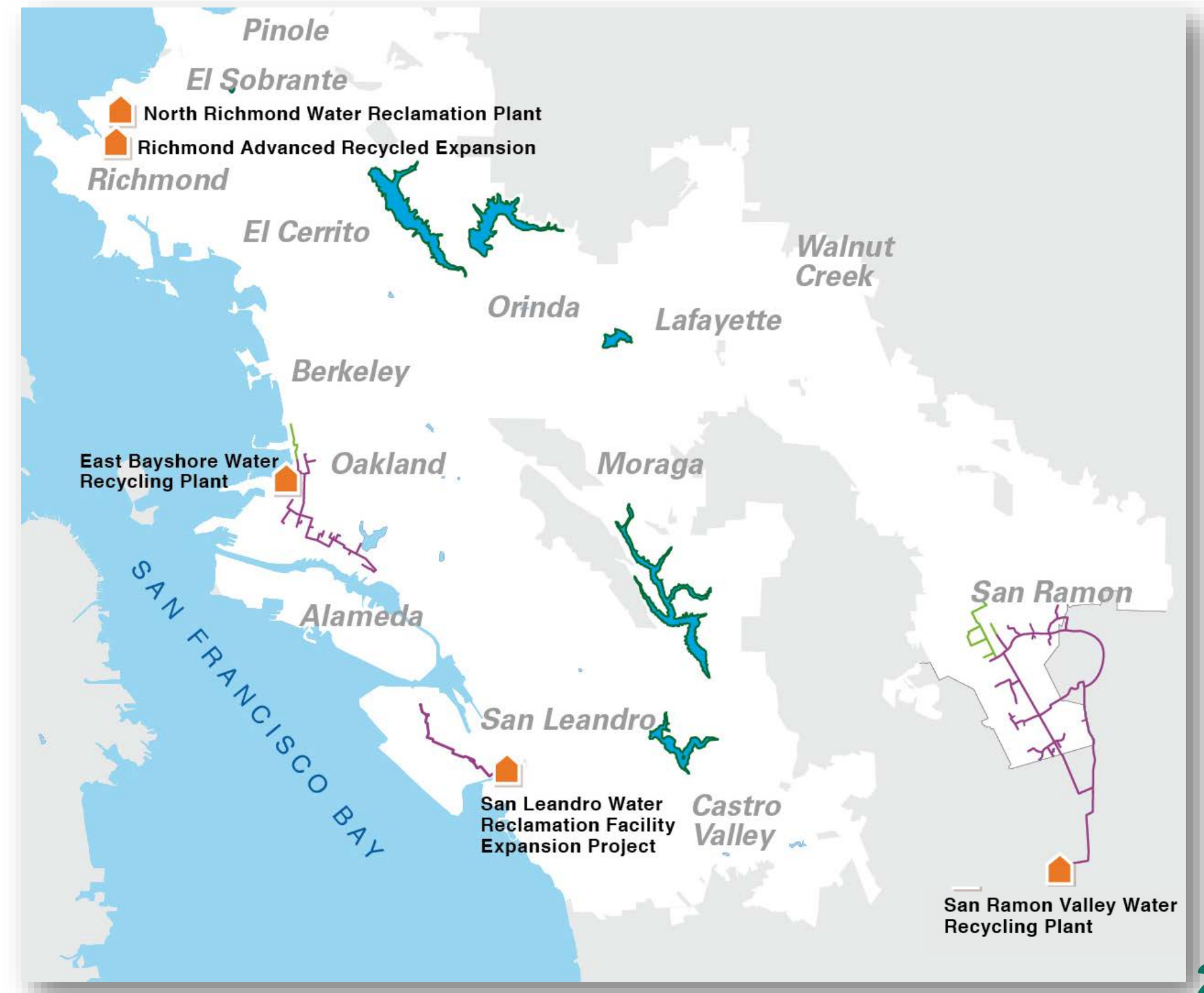


Recycled Water Program



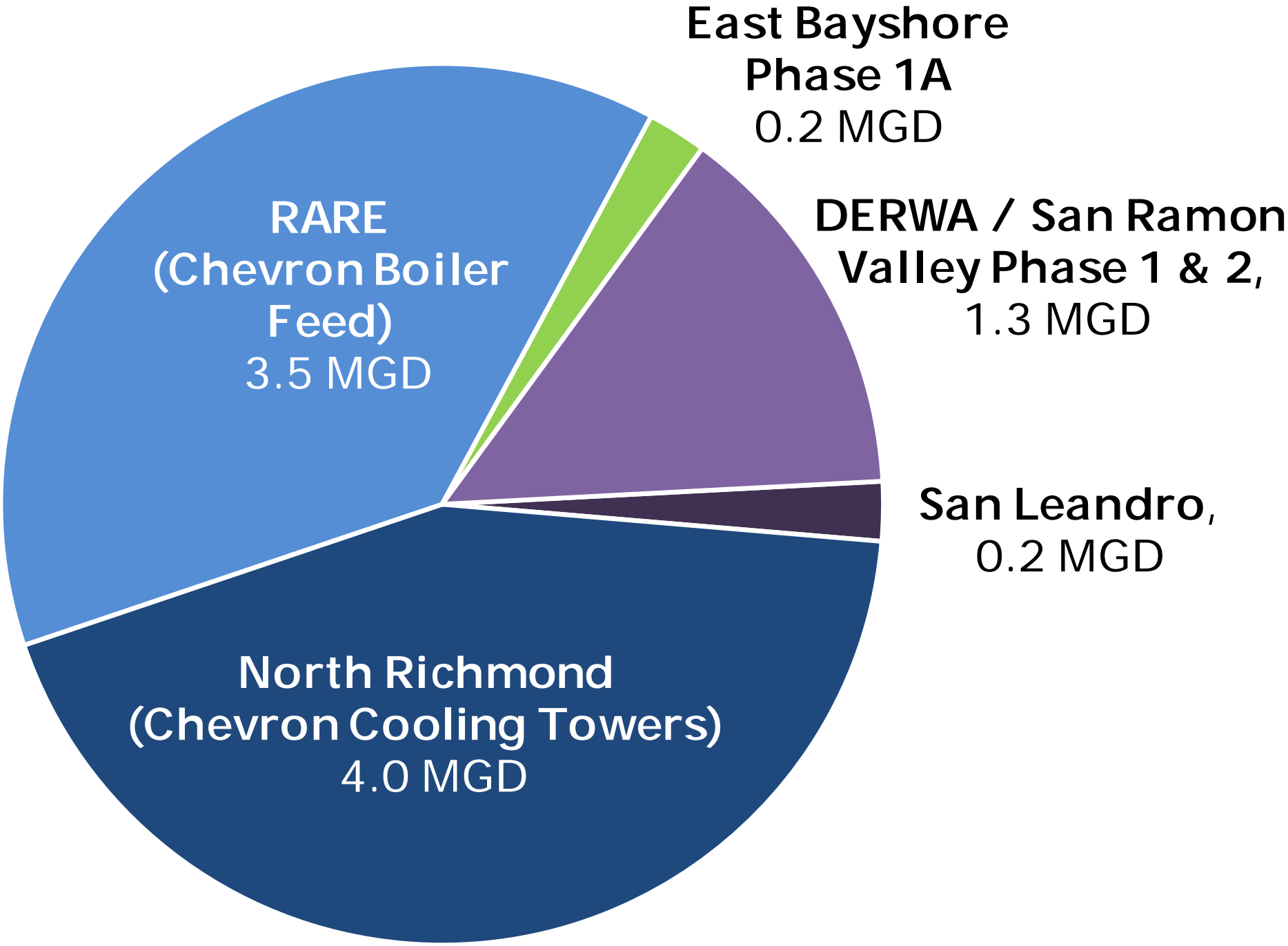
Recycled Water Program: Existing Customers

- Refinery
 - Cooling towers (North Richmond)
 - Boiler makeup water (RARE)
- San Ramon Valley Recycled Water Program (SRVRWP)
- San Leandro/Alameda
- East Bayshore Recycled Water Project (EBRWP)



Current Recycled Water Program

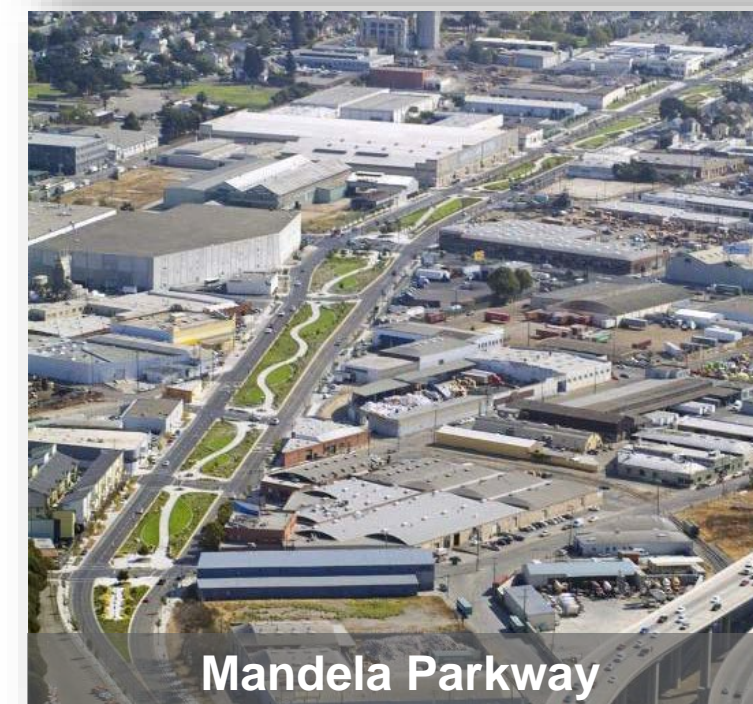
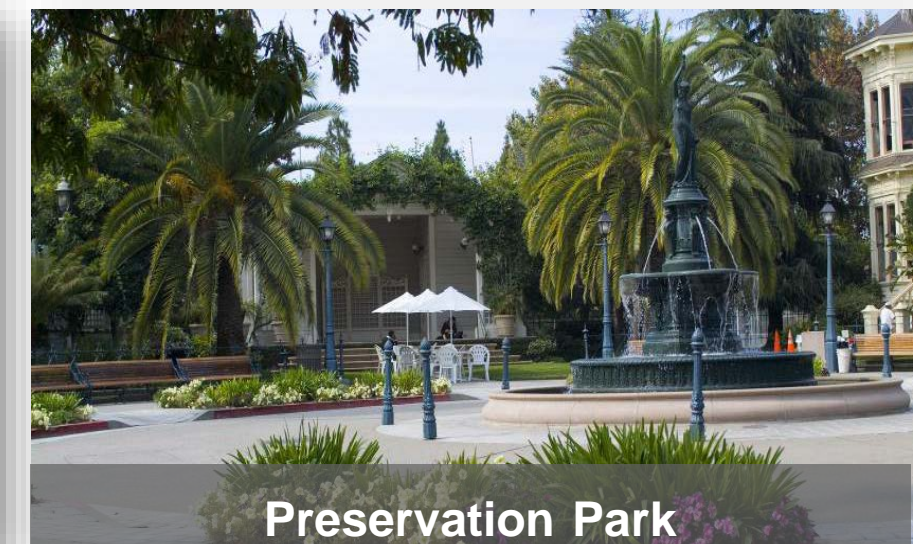
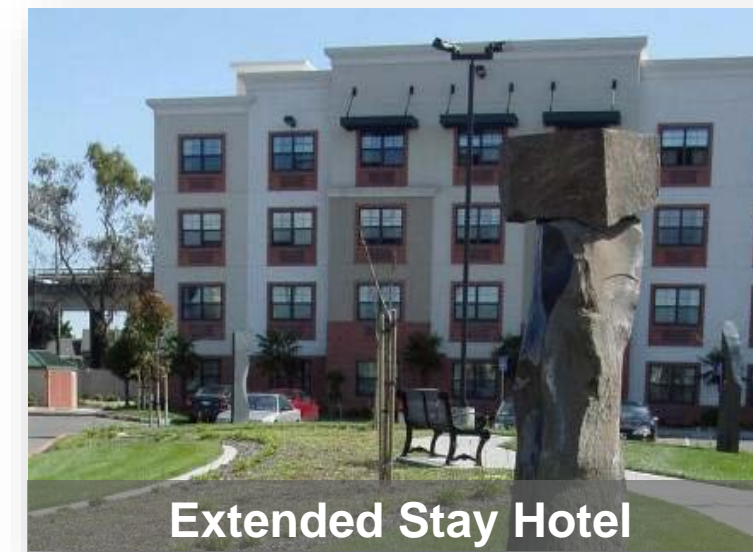
- 5 non-potable projects
- Production capacity 9 MGD
- Goal of 20 MGD by 2040
- Future projects to provide additional 11 MGD non-potable water (\$343M)
- \$280 M invested to date state/federal/private funding



Current Recycled Water Program

East Bayshore Recycled Water Project (Since 2008)

- Pilot Study
 - 45 customers connected to date
 - Evaluate advanced treatment alternatives
 - Final recommendations available in 2023
 - Recommend upgrades to increase customer base



Current Recycled Water Program

San Ramon Valley Recycled Water Project (Since 2006)

- San Ramon Valley Retrofits
 - Continue to connect irrigation sites, 77 customers to date
- DERWA
 - JPA with DSRSD
 - Demand Management (AMI)
 - Supplemental supplies for future expansion



Courtesy of: Crow Canyon Country Club Golf Course



Current Recycled Water Program

North Richmond and RARE
(Since 2010)

- North Richmond
 - Capital improvements to replace aging infrastructure
- RARE
 - RO membrane replacement
Evaluate future expansion opportunities with Refinery



Recycled Water Program Updates

Phillips 66

Rodeo Renewed Project

- Coming in 2024
- 2.8 MGD on-site recycled water facility
- Continue to coordinate with Phillips 66 as they transition to renewable energy



Satellite Recycled Water Projects

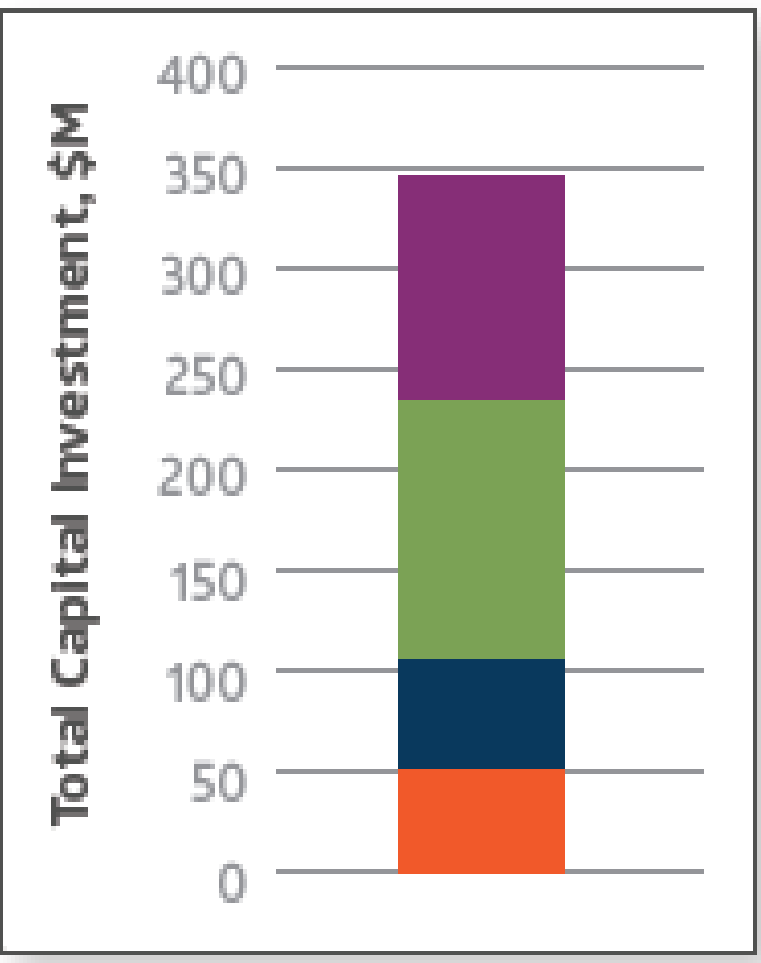
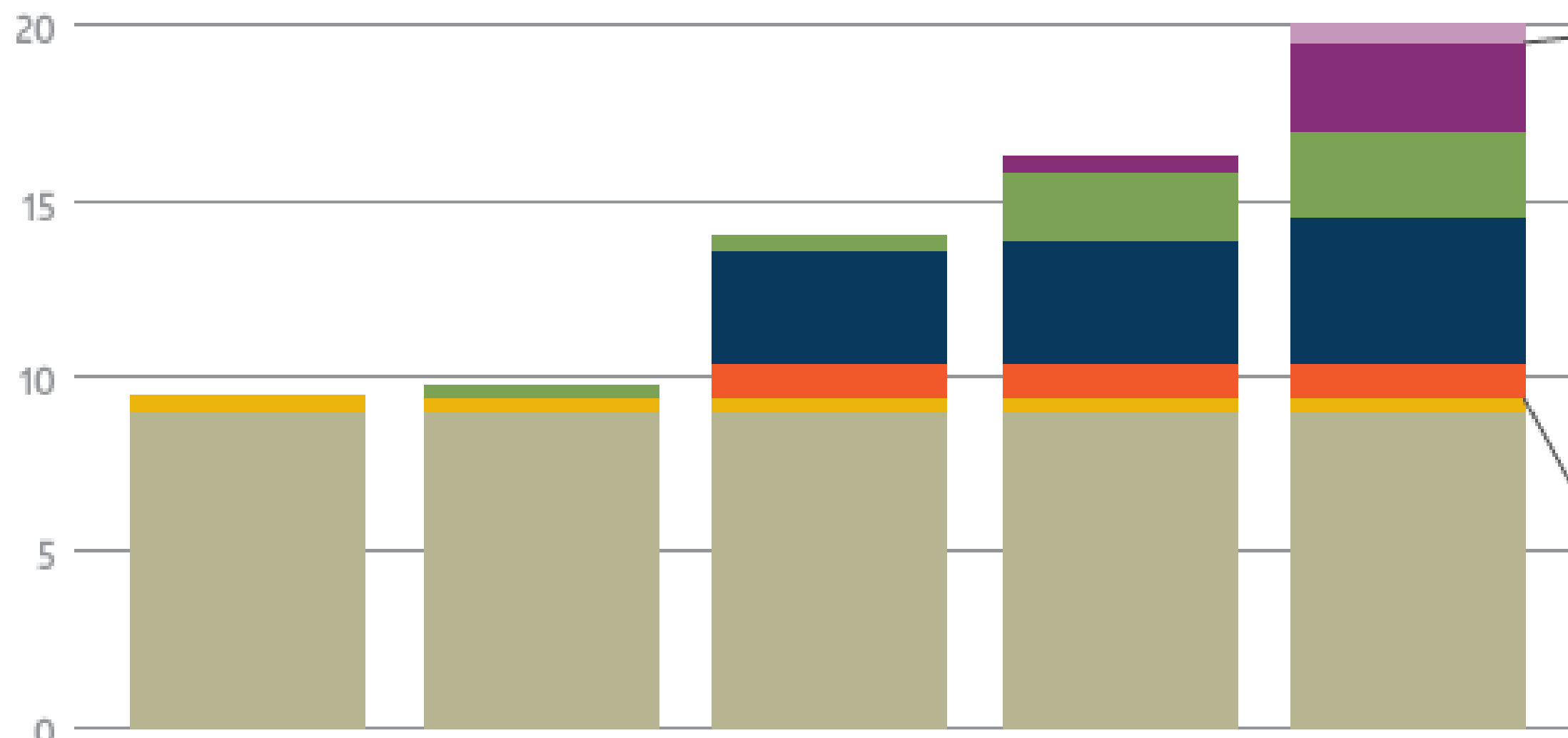
Three potential projects:

- Diablo Country Club
- Rossmoor Community
- Sequoyah Country Club



Estimated Project Phases

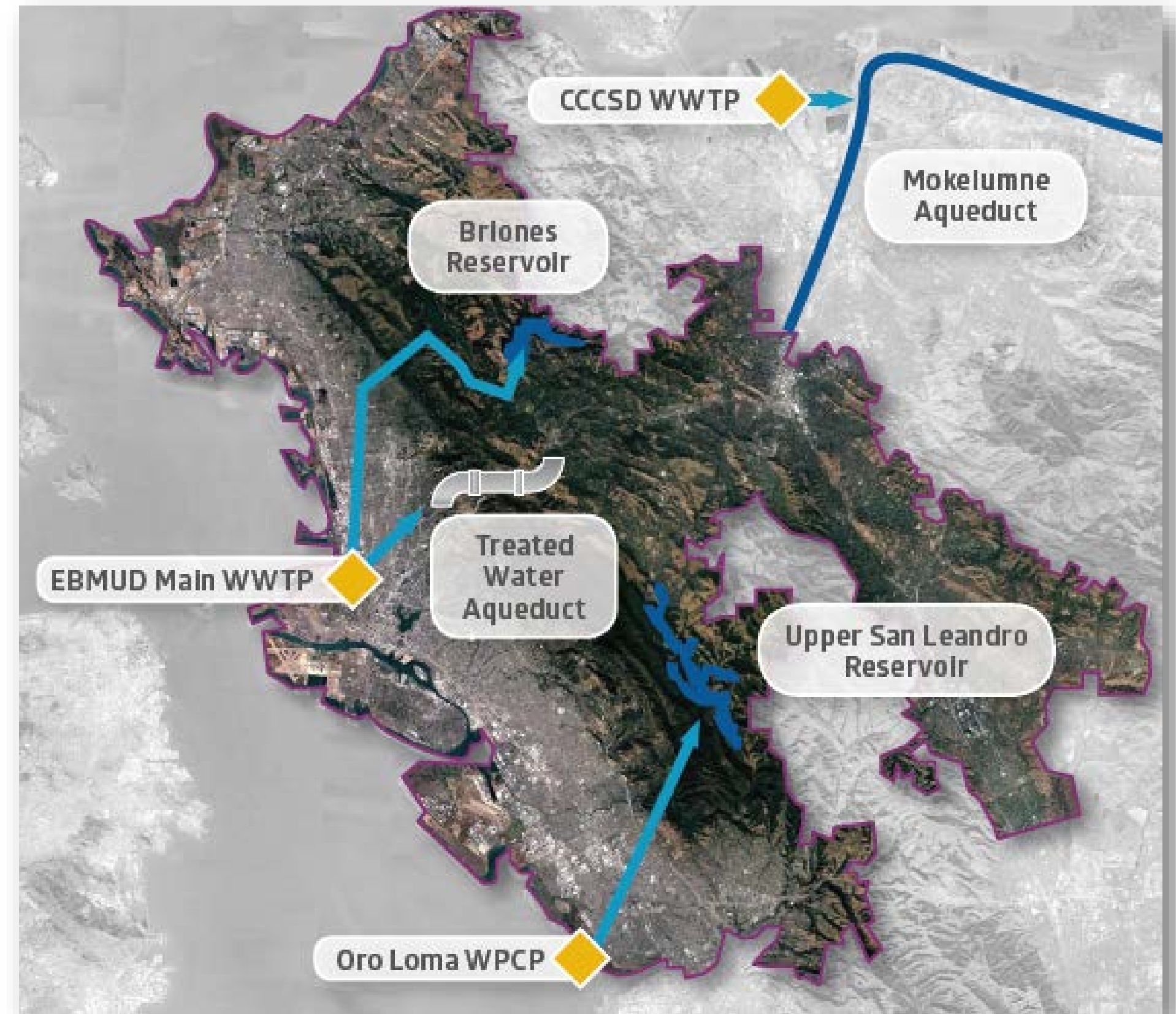
Planned Recycled Water Capacity (Annual Average, MGD)



- Existing Use
- Diablo CC
- DERWA
- Phillips 66
- East Bayshore
- Chevron
- Other

Potable Reuse Alternatives

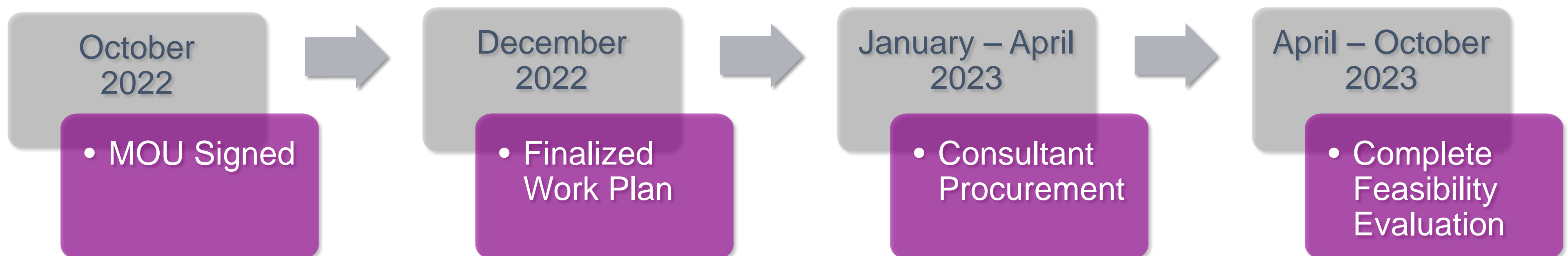
- Potable Reuse will be more promising when:
 - Other District supply options are limited
 - WWTPs are planning upgrades for nutrient removal
 - Statewide recycling criteria are adopted for raw and treated water augmentation
 - Other potable reuse projects have demonstrated success



EBMUD-Central San

Memorandum of Understanding (MOU)

- MOU calls for Feasibility Evaluation of six recycled water partnership opportunities to recommend most promising project(s)
 - Both non-potable and potable reuse project alternatives
 - Study scope includes analyzing information from previous studies, defining feasibility criteria, evaluating each project concept, developing cost estimates



Central San MOU – Project Concepts

- ① Direct Potable Reuse Project
- ② Indirect Potable Reuse Project
- ③ Refinery Recycled Water Exchange Project
- ④ Satellite Water Recycling Facility Projects
- ⑤ Lamorinda Project
- ⑥ San Ramon Valley Recycled Water Program

Water Conservation



Water Conservation Trends

- Conservation (indoor) technology (and practices) becoming common-place, **saturated**
- Focus towards **outdoor** water use and **leaks**
- Moving away from widgets toward **behavior and informational related services technologies**
- **Water management tools/services** used to lock in savings and enhance (passive) code adoption
- State regulations are becoming **more prescriptive**



FREE!



FAMILY FRIENDLY!

100TH BIRTHDAY PARTY and Community Fair

MAY 21, 2023 • 11AM – 4PM
LAKE TEMESCAL, OAKLAND

REGISTER
FREE TICKETS



Food • Live Music
Kids Zone • Touch-a-Truck
Beer & Wine Garden
Lots of Prizes!

ebmud.com/100Party

GETTING HERE:

Due to very limited parking at Lake Temescal, please ride BART or drive to MacArthur or Rockridge stations. Free parking is available in BART parking lots. Free shuttles to the event and back will run every 10 minutes. Bike racks available at event.

Celebrating
100 Years
of Water



Presented by:



Q&A Session

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**FLOWING
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THE
FUTURE**

BACKUPSLIDES

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