DERWA (DSRSD-EBMUD Recycled Water Authority)

Recycled Water Supply and Operations Plan Update

September 25, 2023

Brown AND Caldwell

Agenda

1. Background
2. Preliminary Results – Part I
   - Supply and Demand
   - Alternatives and Demand Management
   - Evaluation
   - Policy Discussion
3. Next Steps

Speakers

Jan Lee
DERWA
Authority Manager

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Project Manager

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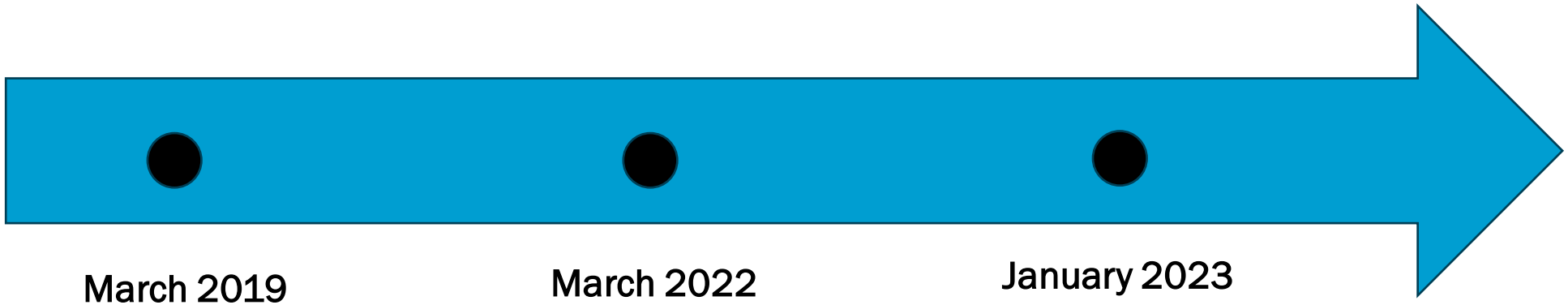
Brown and Caldwell
Regional Bay Area 1Water Lead

Background



March 2019
DERWA Connection Moratorium Request

March 2022
Interim Agreement formalizing "pause period"

January 2023
Recycled Water Supply and Operations Plan Update

Project Objectives

- **Update** supply and demand projections to reflect changed conditions
- **Evaluate** supplemental supply alternatives and demand management strategies
- **Utilize** updated hydraulic model to optimize operations
- **Develop** an implementation roadmap for meeting future demands

Goals for Today's Presentation

Understand the shortage causing the moratorium and DERWA's level of acceptable risk

Confirm recommended supplemental supply alternatives and demand management strategies

Get direction from the Board on policy questions

Defining Shortage that Drove Moratorium

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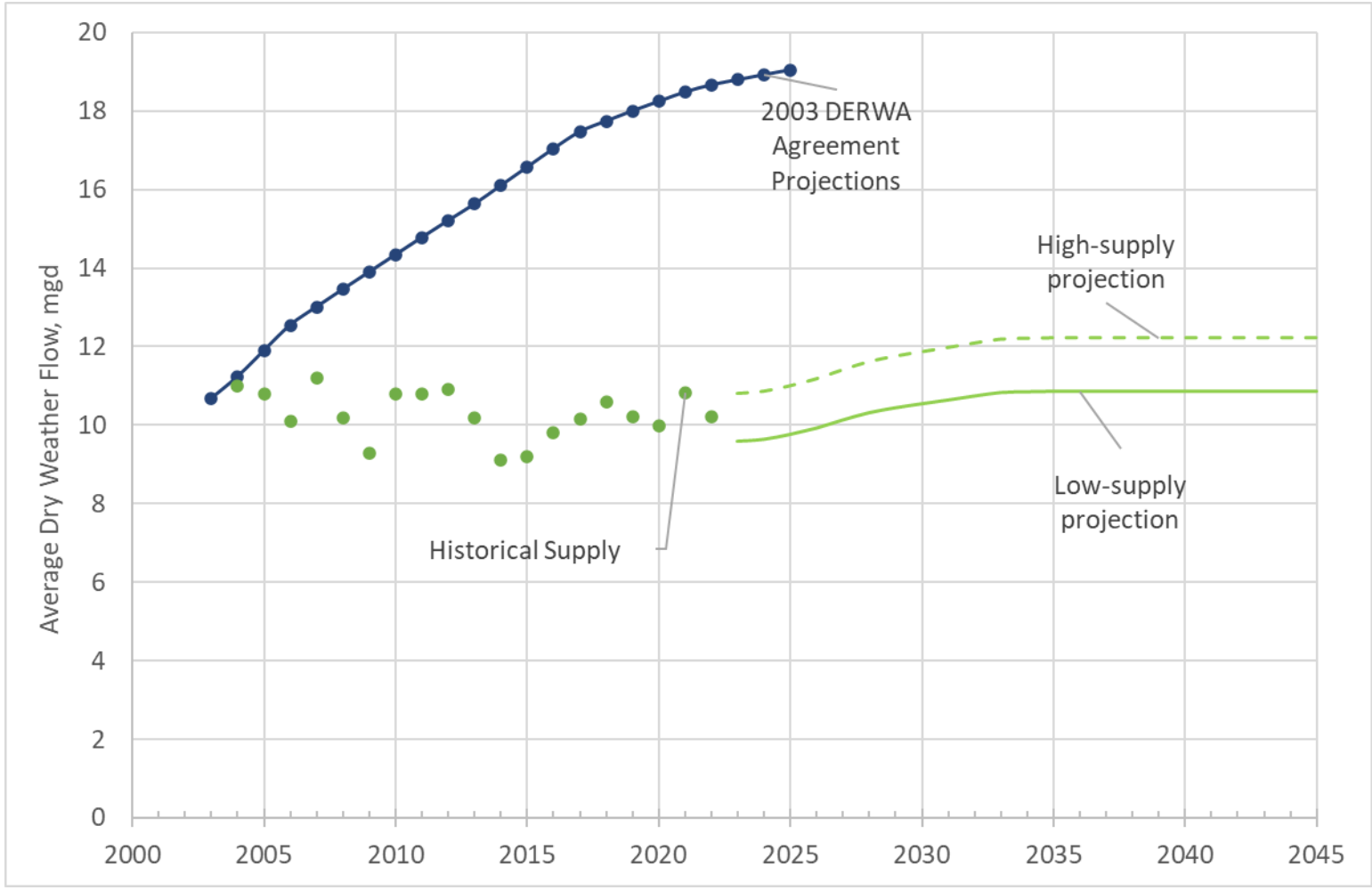
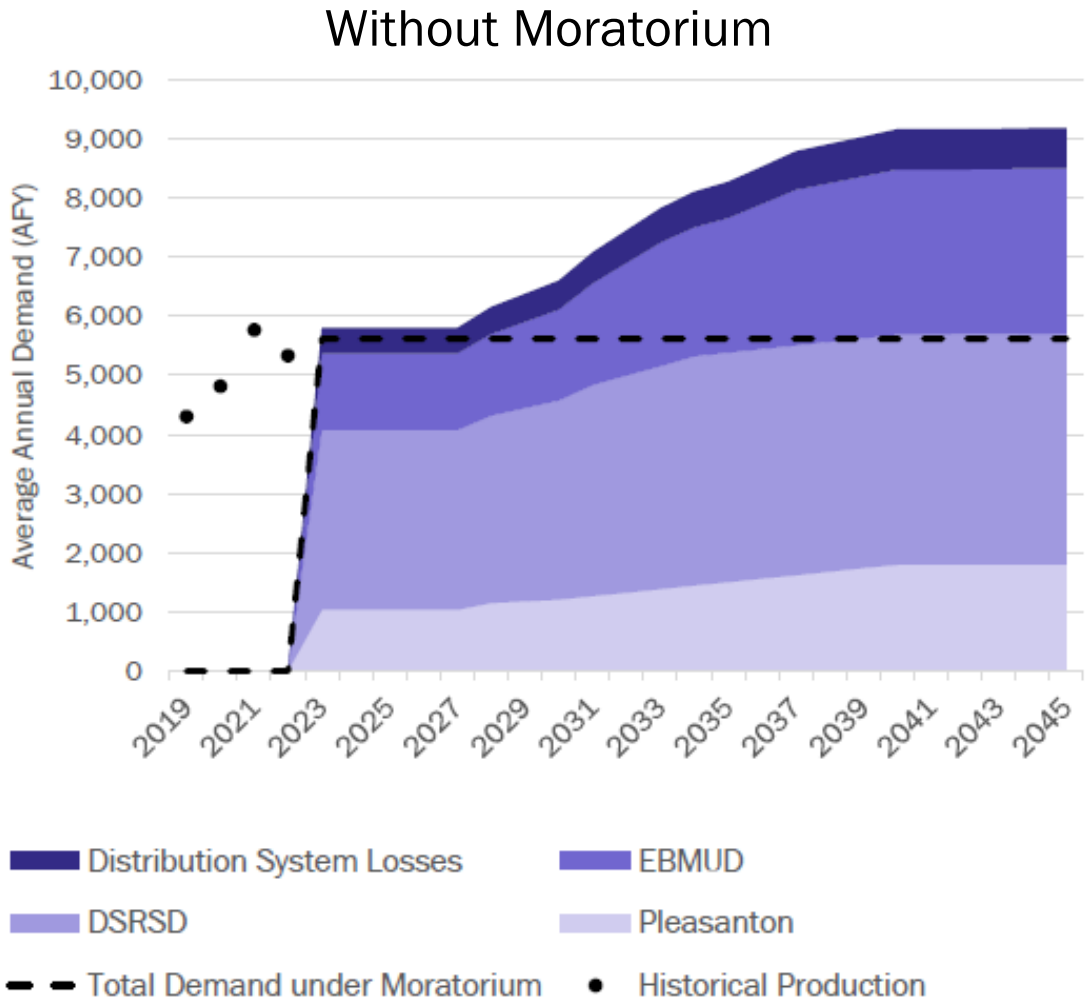
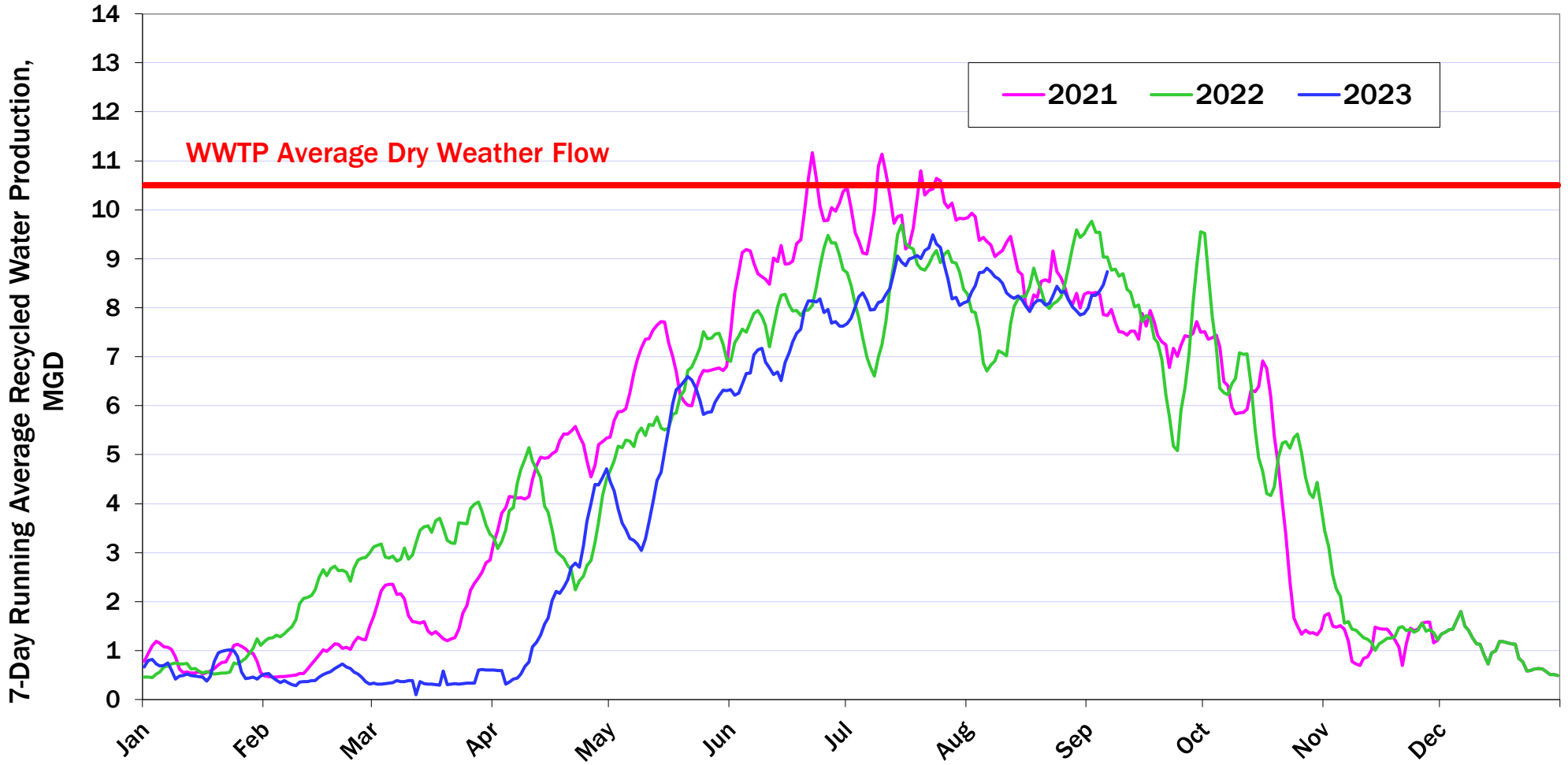
Supply Projections



Total Demand Projection – Average Annual (AFY)

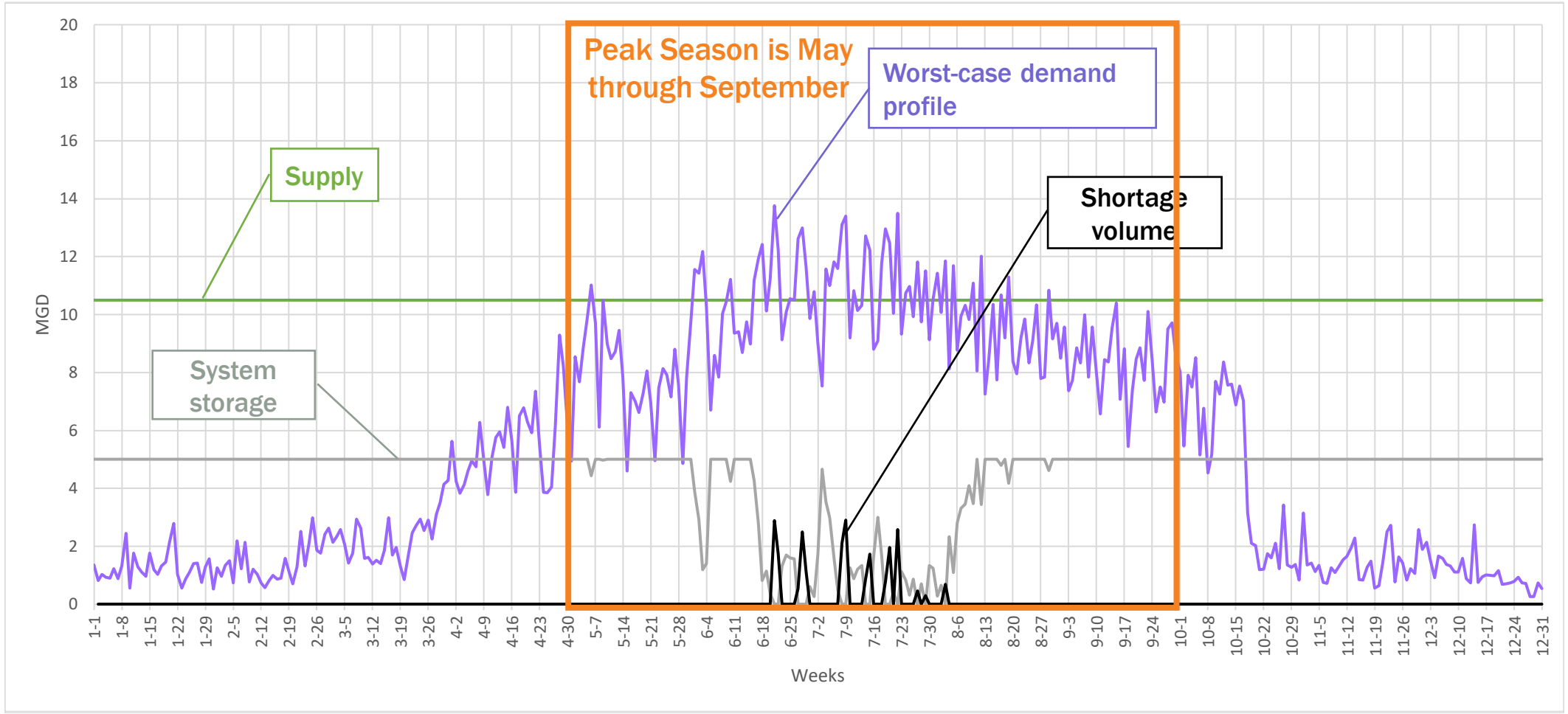


Variability in Demands



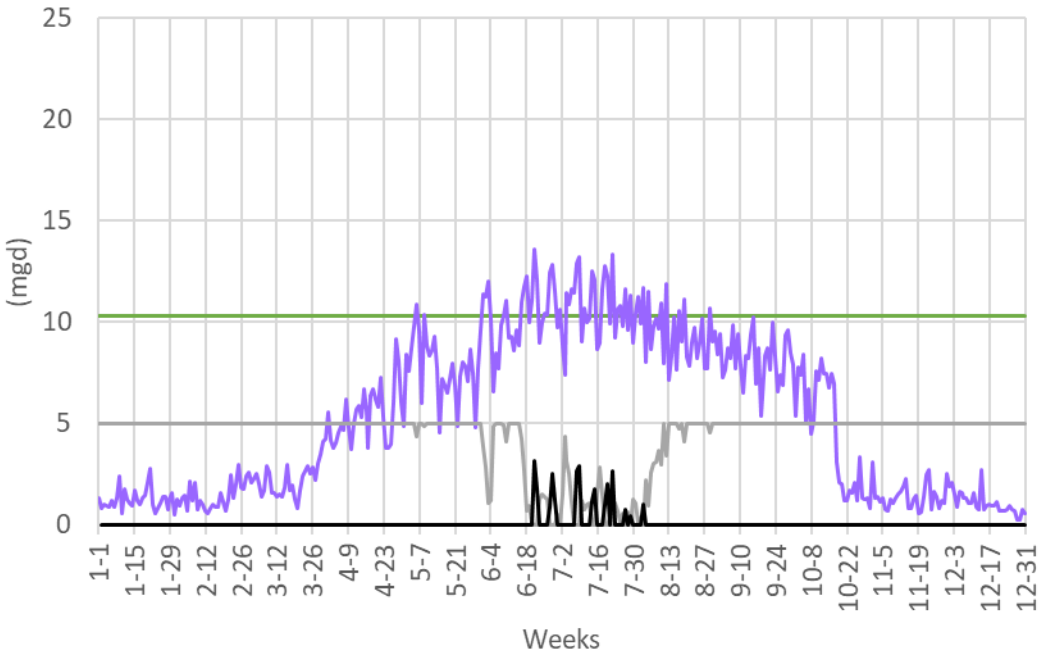
Note: 2021 demands do not include Crow Canyon and Canyon Lakes golf courses

A **SHORTAGE** Occurs when SUPPLY (with storage) < DEMAND

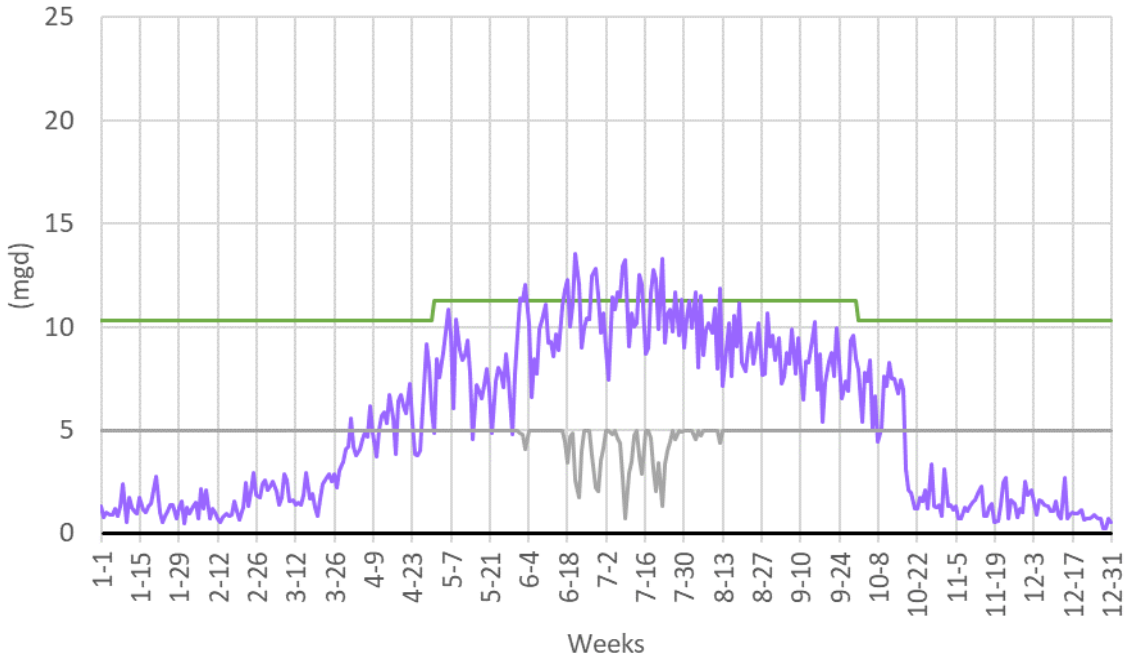


Supplemental Supply to Address Shortage – Existing Conditions

Existing Conditions: Baseline Results

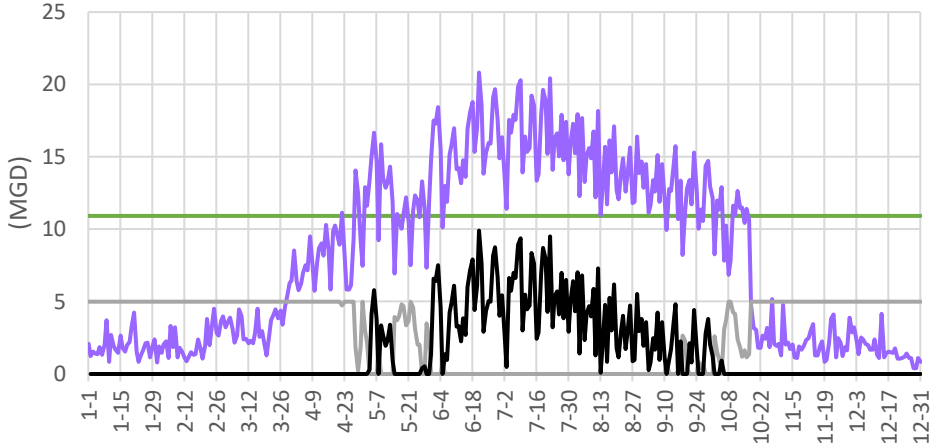


Add 1 MGD during peak season

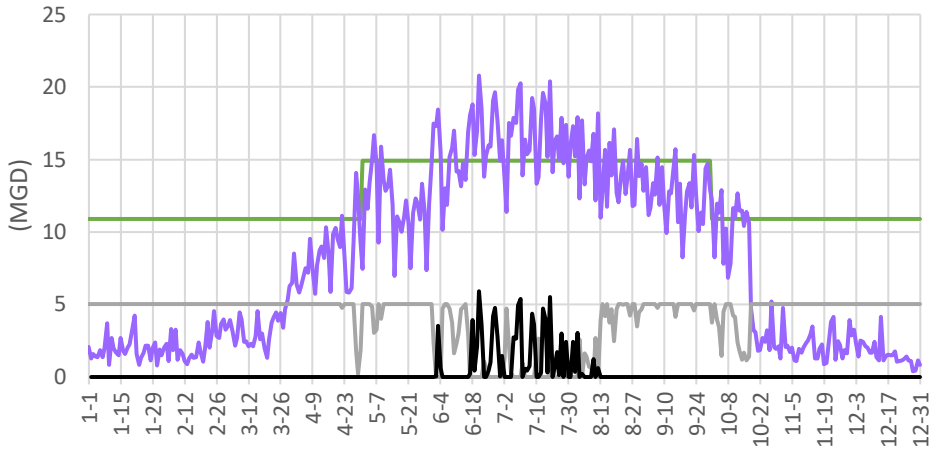


Supplemental Supply to Address Shortage – Future Conditions

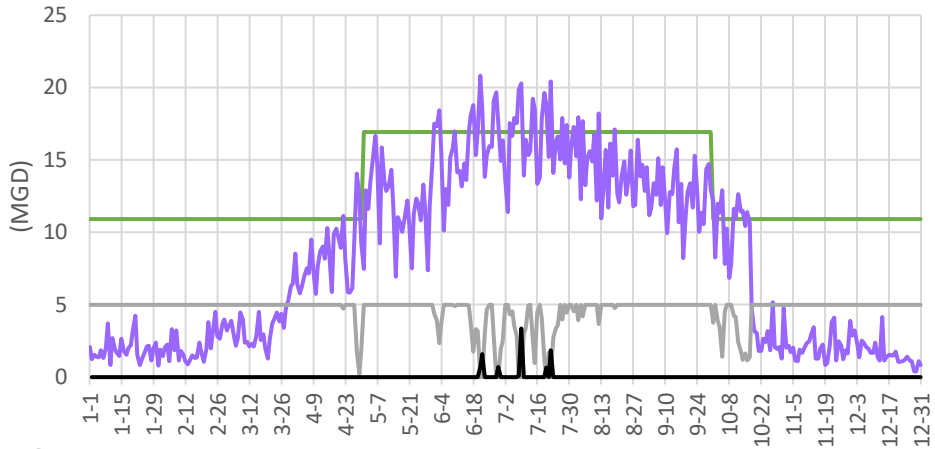
2045 Conditions: Baseline Results



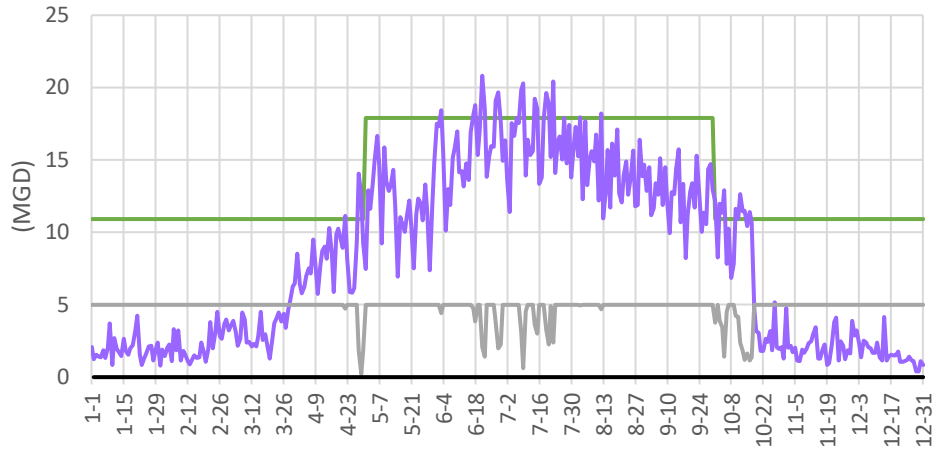
Add 4 MGD



Add 6 MGD



Add 7 MGD



Supply Demand Storage Shortage

Shortage Risk Increases Over Time

- Current:
  - Average demand conditions → no shortage
  - High demand conditions → ~1 MGD shortage
- At buildout (2045):
  - Shortage of 5 to 7 MGD
- Rate and magnitude of shortage is dependent on buildout of recycled water systems

Options to Address the Shortage

1) Demand Management
2) Storage
3) Supplemental Supply

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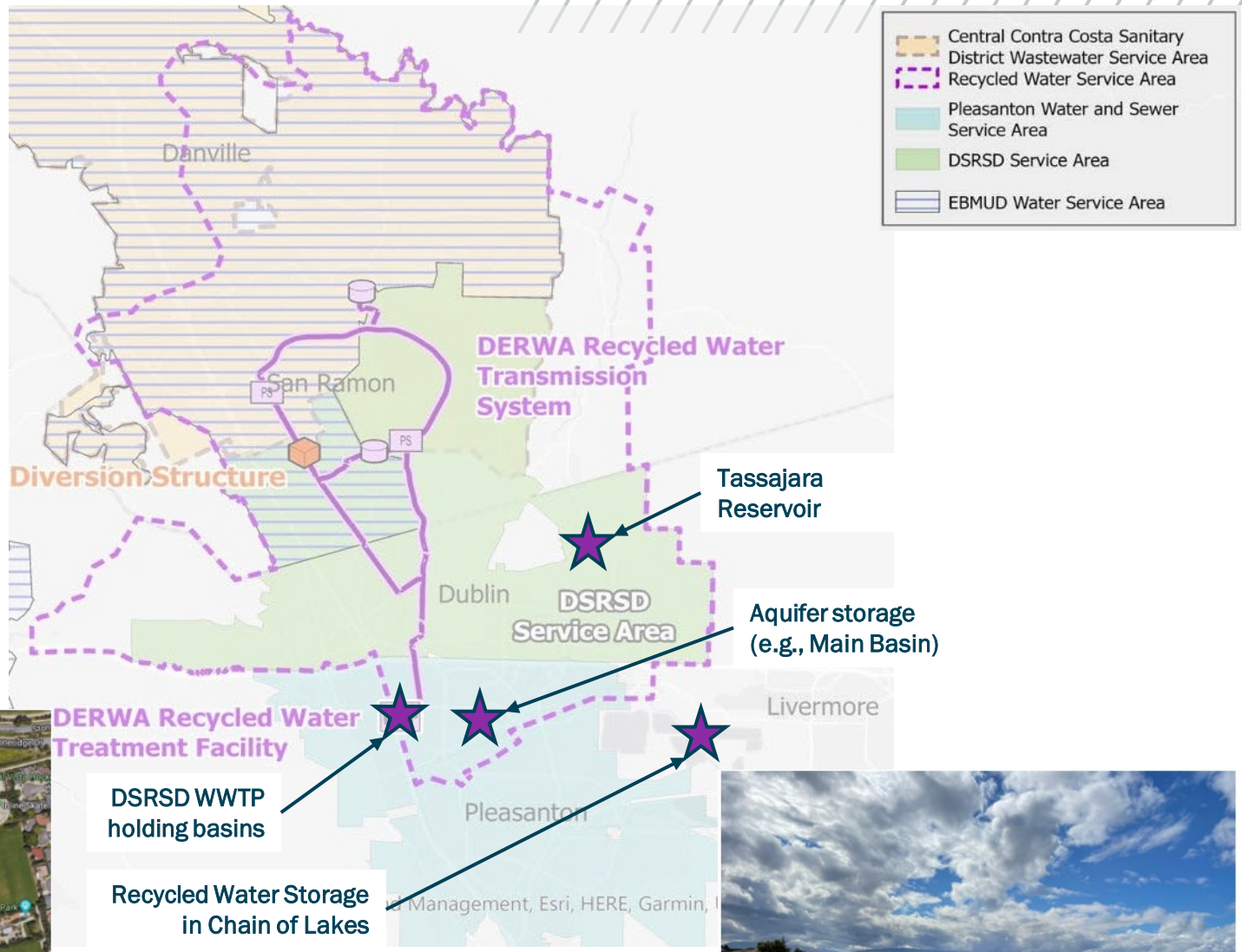
1) Demand Management

Possible measures (could reduce recycled water use by ~5%):

- **Best management practices** – e.g., site inspections, leak alerts
- **Rebates** for turf replacement, irrigation controllers
- **Recycled water budgets** for Cities of Dublin and San Ramon
  - Savings could be reallocated to new City sites

2) Storage

- Addressing the shortage requires substantial storage:
  - ~70 MG (near-term, through 2030) to ~520 MG (longer term, through 2045)
- Existing storage (Tassajara and WWTP) is not a solution to recurring/seasonal shortages but will be part of Operations Plan



DSRSD WWTP Storage (~ 20 MG)

Pleasanton Tassajara Reservoir (8 MG)

2) Storage Alternatives Screening Process

Operational storage (holding basins at WWTP and Tassajara Reservoir)	→	**Not further evaluated,** since not enough volume to address recurring/seasonal shortages (Will include in Operations Plan)
Storage in Chain of Lakes	→	**Not further evaluated,** since timing is too far off for water supply needs and early acquisition would be costly
Recycled water storage in aquifer	→	**Not further evaluated,** since advanced treatment needed for injection and the Tri-Valley agencies are studying this separately

3) Supply

- Evaluating various opportunities for supplemental supply
  - *Options shown in gray eliminated through initial screening process*

3) Supply Alternatives Screening Process

Raw wastewater from neighboring agency	→	**1. Supply from Central San** is under evaluation
	→	**Ruby Hill** option screened out since no net supply increase
Secondary effluent from neighboring agency	→	**2. Supply from Livermore to DERWA** is under evaluation
	→	**3. Supply from EBDA** is under evaluation
Recycled water from neighboring agency	→	**4. Supply from Livermore to Pleasanton** is under evaluation
Rainwater capture/reuse	→	**Not further evaluated,** due to seasonality and lack of year-to-year availability

3) Supply Alternatives Screening Process

New or existing wells	→	**5. Drilling two new higher-yield wells in the Fringe Basin** is under evaluation
	→	**6. Drilling a wellfield of lower-yield wells in the Fringe Basin** is under evaluation
	→	**Drilling new wells in the Main Basin** screened out due to groundwater pumping quota (GPQ) impacts and PFAS concerns
	→	**Using existing Zone 7 Hopyard 7 well** screened out due to water quality (arsenic, PFAS) and GPQ concerns
Potable water supplementation	→	**7. Potable water supplementation in Peak Season** is under evaluation
Treating RO concentrate from groundwater demineralization facility	→	**Not further evaluated,** due to PFAS concerns, expensive re-treatment, and unpredictable flow quantity & patterns

Supply Alternatives Summary

Alternatives

1. Raw wastewater from Central San
2. Secondary effluent – Livermore to DERWA
3. Secondary effluent from EBDA
4. Treated recycled water – Livermore to Pleasanton
5. Wells – Fringe Basin (Higher Yield)
6. Wells – Fringe Basin (Lower Yield)
7. Peak Season Potable Water Supplementation

Screened Out Alternatives*

- Raw wastewater from Ruby Hill
- Zone 7's Hopyard #7 Well
- New well(s) – Main Basin
- Zone 7's RO concentrate
- Stormwater capture
- Storage in Chain of Lakes
- Recycled water storage in aquifer

**Eliminated during pre-screening process (not carried forward for further evaluation).*

Evaluation Process

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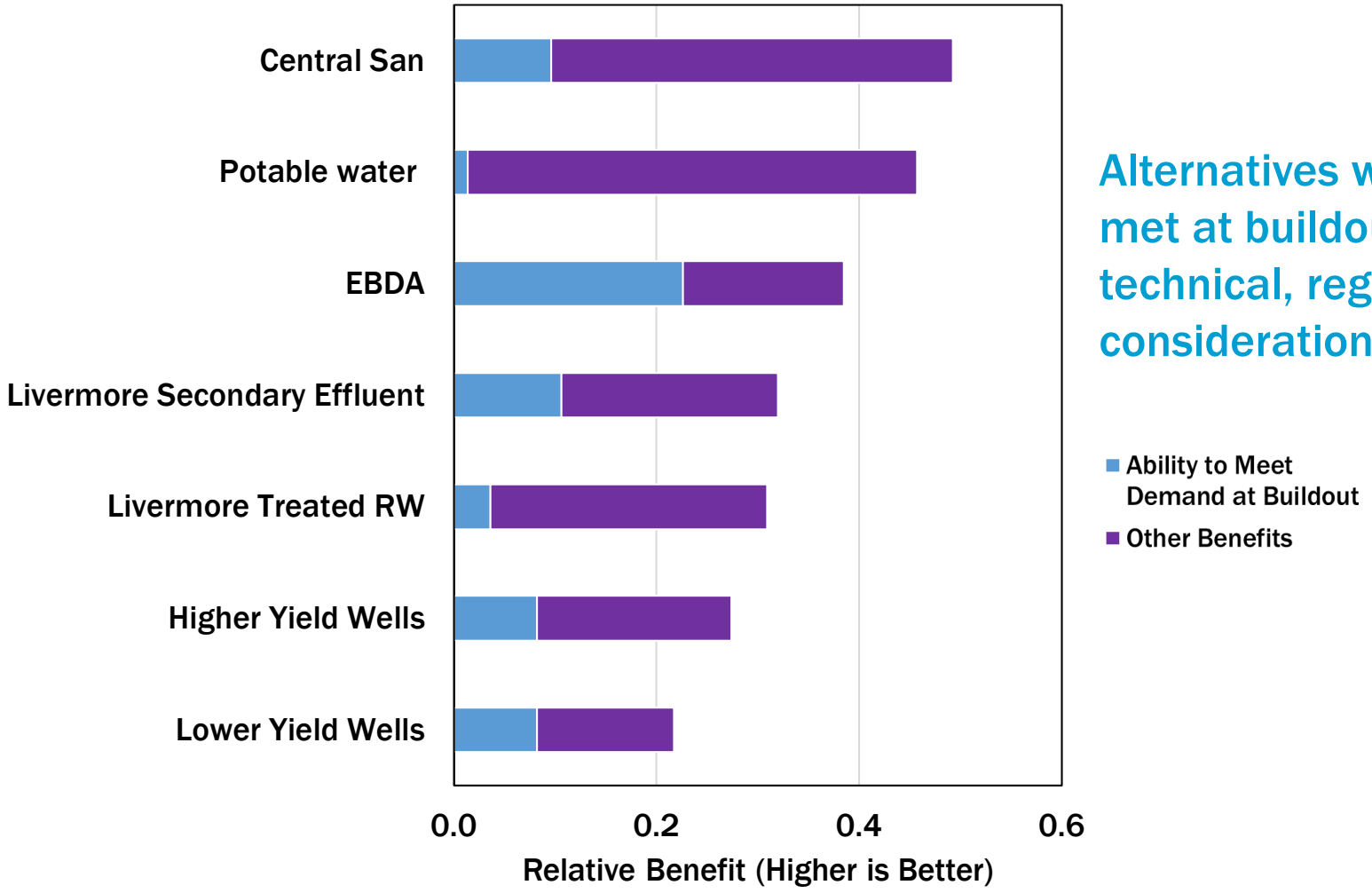
Supply Varies for Each Alternative

Alternative	Supply (MGD)
Raw Wastewater from Central San	2.7
Potable Water Supplementation	3 (with minimal improvements)
Raw Wastewater from East Bay Dischargers Authority (EBDA)	Up to 7 (the max shortage at buildout)
Secondary Effluent - Livermore to DERWA	2 to 3
Treated Recycled Water - Livermore to Pleasanton	1
Wells – Fringe Basin (Higher Yield)	2.3 (assumes 2 wells)
Wells – Fringe Basin (Lower Yield)	2.3 (assumes 7 wells)

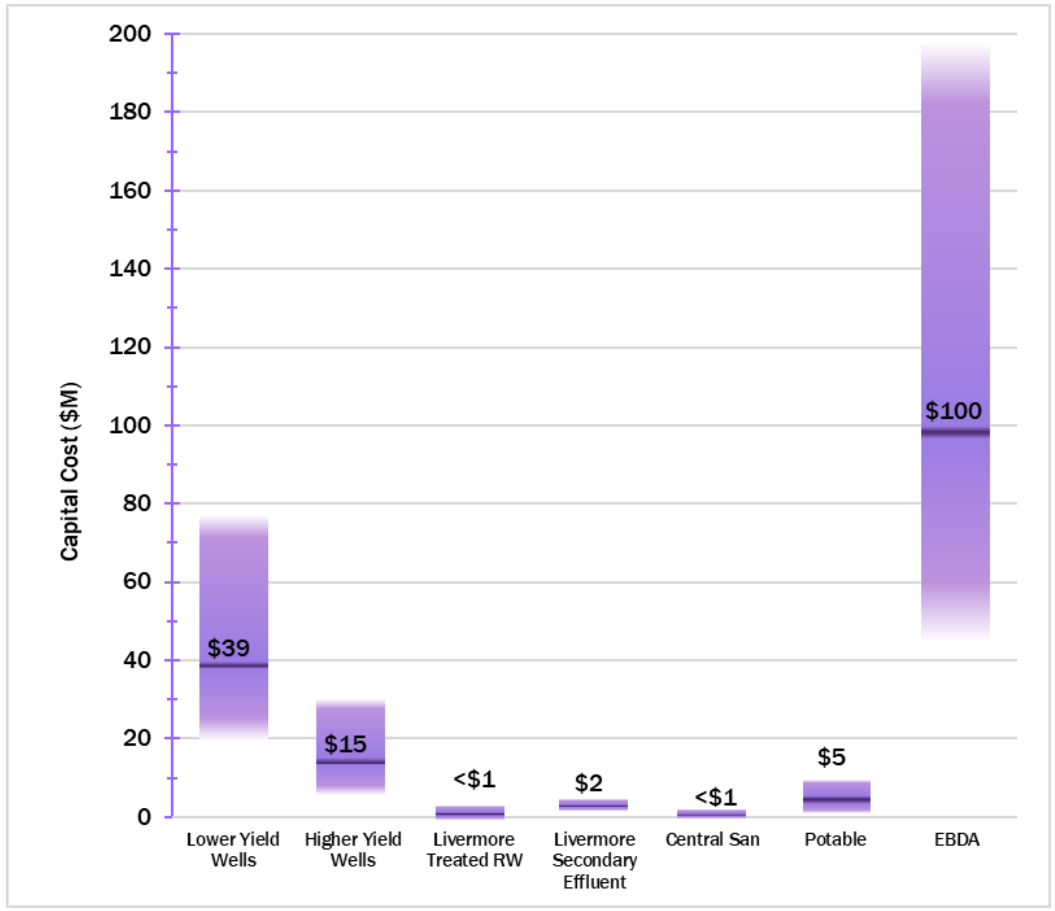
- At buildout, supply required = 5 to 7 MGD
- Actual annual supply will vary
- Likely need multiple supply projects to meet buildout demands

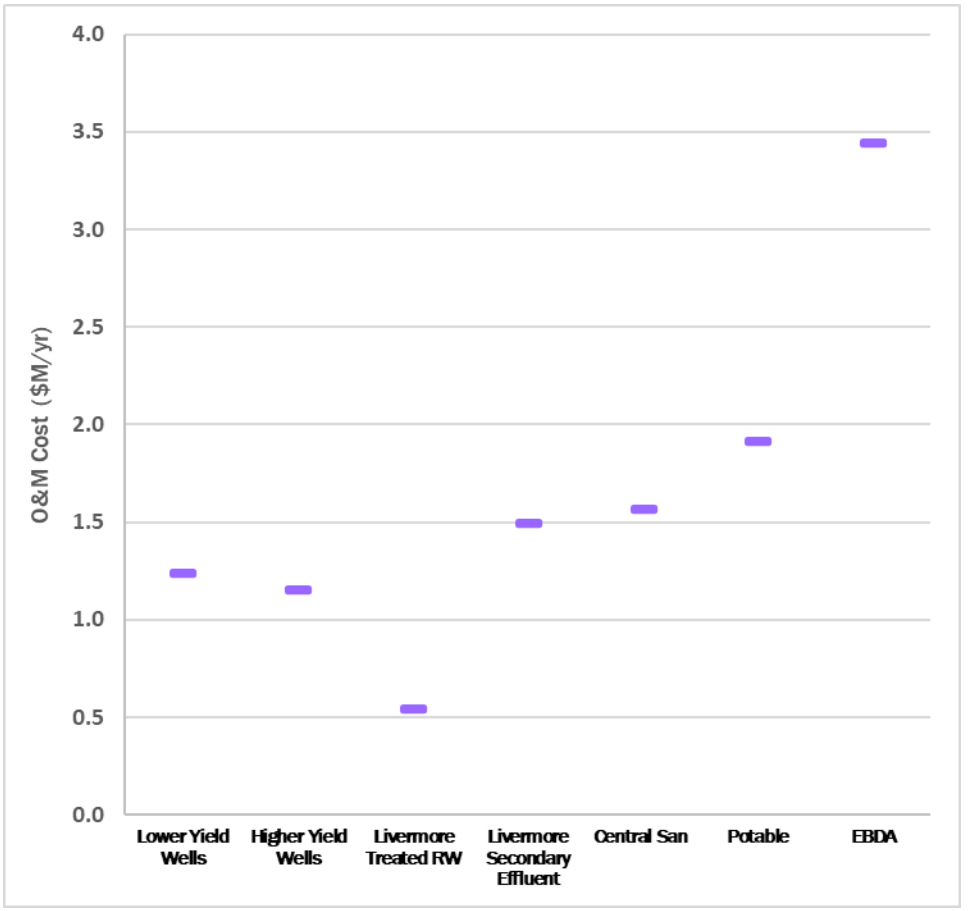
Alternatives Evaluation – Benefits



Alternatives were scored based on demand met at buildout and other criteria; such as technical, regulatory, and institutional considerations

Cost Estimates

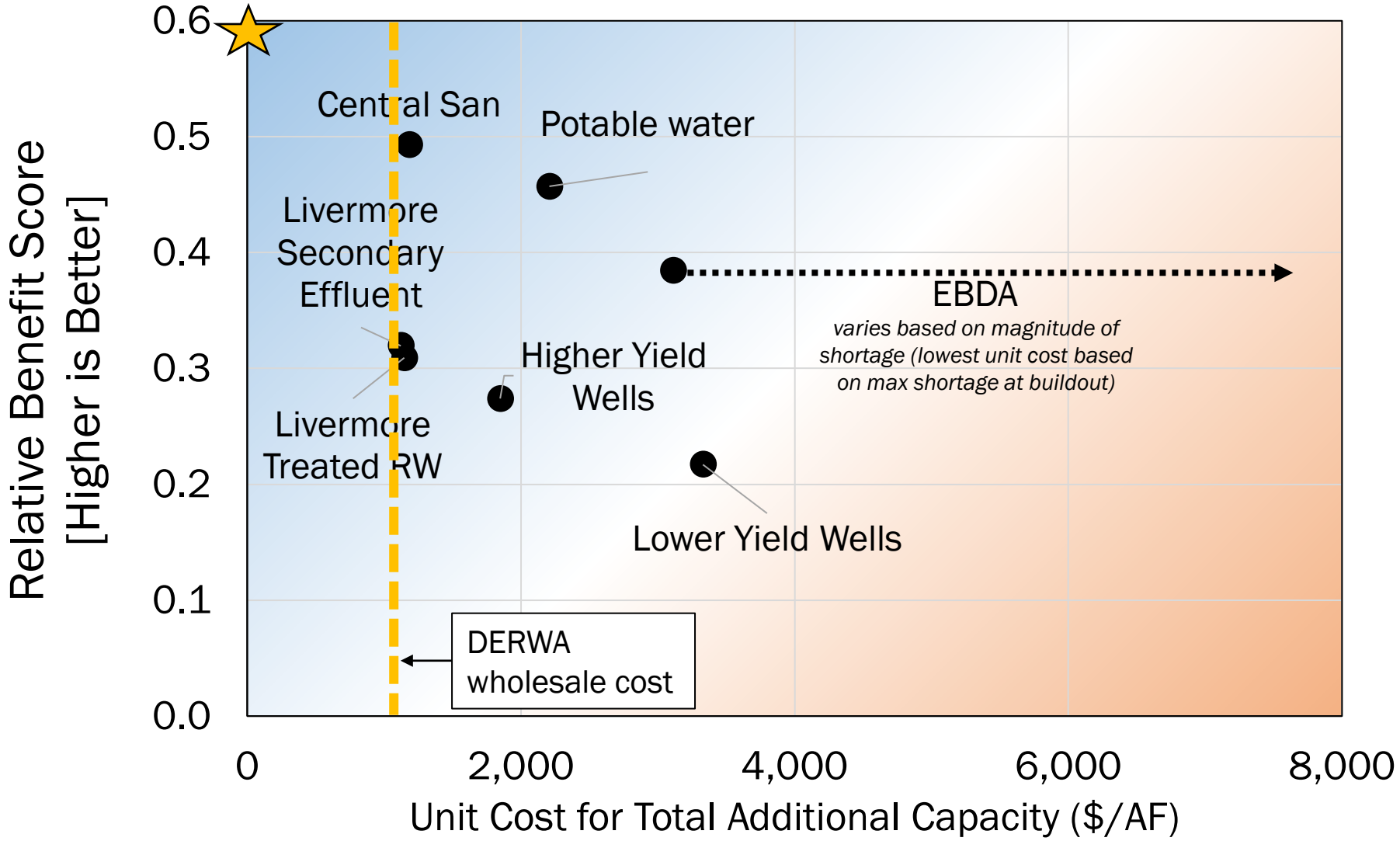




Note on Capital cost: Level of certainty for AACE Class 5 ranges from -50% to +100%.

Note on O&M cost: Shows at maximum yield of the supplemental supply. At lower amount of supplemental flow, the O&M cost will decrease.

Benefits and Costs of Supply Alternatives



Policy Discussion

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Policy Discussion

1. Peaking with potable water
2. Rationing recycled water customers
3. Non-peak and/or interruptible customers
4. Groundwater options

Policy Concept #1 –Using Potable Water to Meet Peak Demands (All Years/Non-drought Years?)

Benefits and Opportunities

- Near-term solution for lifting moratorium and connecting new customers
- Enables increased use of recycled water year-round (positive water supply benefit)

Challenges and Issues

- Public messaging
- Consistency with existing policies and agreements
- Requires determining where to connect and which agency feeds potable water
- Potential water rights issues

Policy Concept #2 –Rationing Recycled Water Customers (All Years/Drought Years?)

Benefits and Opportunities

- Allows DERWA and member agencies to cease potable supplement during droughts
- Addresses risk of supply shortages, while allowing new connections to recycled water system

Challenges and Issues

- Inconsistent with concept of recycled water as “drought-proof” supply
- Requires determining how to equitably implement rationing between DERWA member agencies
- Overall reduction in recycled water supply reliability for all recycled water customers

Policy Concept #3 – Non-Peak and/or Interruptible Customers

Benefits and Opportunities

- Allows member agencies to connect new customers without impact to existing customers
- Enables increased recycled water deliveries in shoulder months (positive water supply benefit)

Challenges and Issues

- Technical feasibility and cost
- Requires member agencies to be responsible for enforcement
- Requires procedure for prioritizing customers that may receive year-round supply when it becomes available

Policy Concept #4 – Groundwater

Benefits and Opportunities

- Near-term solution for lifting moratorium and connecting new customers
- Enables increased use of recycled water year-round (positive water supply benefit)
- Operational flexibility
- Commitment to install groundwater wells could address current Central San and Livermore concerns with DERWA becoming reliant on interim supplies

Challenges and Issues

- Uncertainty on yield and water quality
- Unknown requirements to address SGMA and Zone 7 requirements
- Staffing
- Cost

Policy Discussion

1. Peaking with potable water
2. Rationing recycled water customers
3. Non-peak and/or interruptible customers
4. Groundwater options

Next Steps

- Receive Board feedback and incorporate into alternatives evaluation
- Prepare roadmap and present results to DERWA Board at December meeting
- Summarize results and recommendations in a project report

Thank you

Questions?

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Supplemental Supply Alternatives

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Contents

Alternatives

1. Raw wastewater from Central San
2. Secondary effluent – Livermore to DERWA
3. Secondary effluent from EBDA
4. Treated recycled water – Livermore to Pleasanton
5. Wells – Fringe Basin (Higher Yield)
6. Wells – Fringe Basin (Lower Yield)
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- Storage in Chain of Lakes
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**Eliminated during pre-screening process (not carried forward for further evaluation).*

Abbreviations

- AF = acre-feet
- AFY = acre-feet per year
- EBDA = East Bay Dischargers Authority
- gpm = gallons per minute
- LAVWMA = Livermore-Amador Valley Water Management Agency
- MGD = million gallons per day
- O&M = operations and maintenance
- RO = reverse osmosis
- RW = recycled water
- WW = wastewater
- WWTP = wastewater treatment plant

Terminology

- **Daily yield (MGD)** = daily flow available from supplemental source
- **Peak season yield (AFY)** = Daily yield * 150 days (in AF)
- **Total additional RW yield (AFY)** = total additional recycled water (RW) demand that DERWA could meet (peak season + shoulder months)
- **Total annual cost** = Annualized capital cost (30 years, 5% interest) + Annual O&M (at full supplement capacity)
- **Unit cost ($/AF)** = Total annual cost / Total additional RW yield

1) Raw Wastewater–Central San

Description: Diversion of raw wastewater (WW) from Central Contra Costa Sanitary District (Central San). In 2019, DERWA and Central San executed a temporary agreement for the diversion of a portion (approximately 1 MGD) of Central San's wastewater upstream of the San Ramon Pumping Station. The additional Central San wastewater is diverted to DSRSD's collection system where the wastewater is treated at DSRSD's WWTP and used to supplement DERWA recycled water supplies during the summer months. The initial term of the agreement is three years with the option for two, 1-year extensions, which results in a final expiration date of January 21, 2026. Construction of the diversion project was completed in 2020 and the project was successfully used during the 2021 peak irrigation season. This Alternative would explore the option for a long-term partnership with Central San, including the potential to increase the diversion quantity to 2.7 MGD, which is the estimated flow to the San Ramon Pumping Station.

Daily Yield: 2.7 MGD // **Peak Season Yield:** 1,250 AFY

Total Additional RW Yield: 1,320 AFY at buildout (2045)

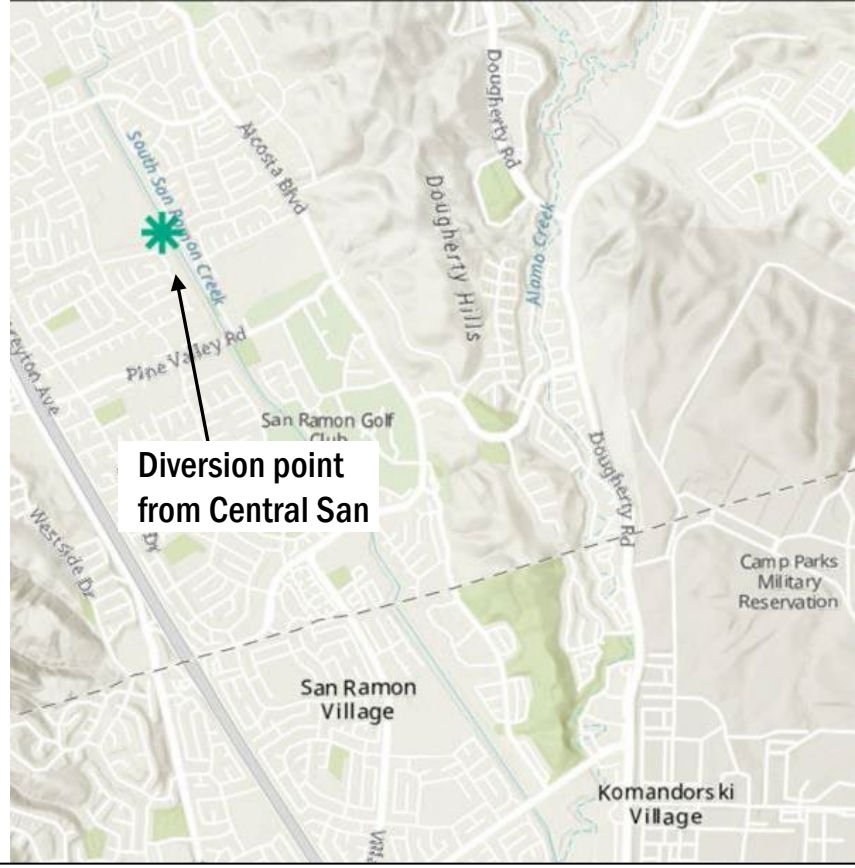
Capital Cost: <$1M // **O&M Cost:** $ 1.6M /year

Total Annual Cost: $1.6M/year

Unit Cost: $1,200/AF

Benefits: Reuses WW otherwise discharged to San Francisco Bay and reduces nutrient loading during peak summer months when the risk of algal blooms in the Bay are highest.

Challenges/Considerations: Uncertain long-term availability. Temporary agreement requires DERWA to report on progress to reduce reliance on Central San's wastewater supply. Central San is currently exploring options to utilize their WW for their own future reuse projects, which could include potential partnership opportunities with EBMUD.

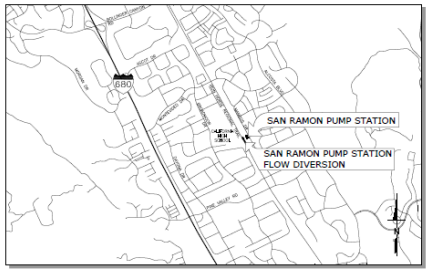


Dublin San Ramon Services District
Water, wastewater, recycled water

CONSTRUCTION PLANS FOR:
SAN RAMON PUMP STATION FLOW DIVERSION

JANUARY 2021
RECORD DRAWINGS

CIP NO. 16-R018



LOCATION MAP
NOT TO SCALE

2) Secondary Effluent–Livermore to DERWA

Description: Divert City of Livermore secondary effluent to DSRSD's WWTP for recycled water treatment. Livermore secondary effluent flows from the Livermore Water Reclamation Plant by gravity to the Livermore-Amador Valley Water Management Agency (LAVWMA) Export Pump Station for discharge to the San Francisco Bay. Flow would be intercepted at an existing junction box across from DSRSD's WWTP and diverted to DSRSD Holding Basin No. 4 for recycled water treatment.

Daily Yield: 2 - 3 MGD // **Peak Season Yield:** 1,380 AFY

Total Additional RW Yield: 1,460 AFY at buildout (2045)

Capital Cost: $3M // **O&M Cost:** $1.5M/year

Total Annual Cost: $1.6M

Unit Cost: $1,100/AF

Benefits: Relatively minimal infrastructure required. Reduces wastewater discharges and nutrient loading to SF Bay when risk of algal blooms is highest. Avoided LAVWMA pumping costs.

Challenges/Considerations: Long-term availability uncertain, any agreement would likely be on an interim basis. Livermore flows have declined due to conservation and Livermore is currently exploring other recycled water projects that would utilize their wastewater effluent long-term. Further evaluation of Livermore effluent water quality needed.

3) Secondary Effluent from EBDA

Description: Diversion of secondary effluent from EBDA's Marina dechlorination facility to DSRSD WWTP for recycled water treatment. Would require a new pump station and 15-mile pipeline (parallel to the existing LAVWMA pipeline) to convey water eastward over the hill.

Daily Yield: Up to 7 MGD (sufficient volume to address shortage) // **Peak Season Yield:** Up to 3,200 AFY

Total Additional RW Yield: 3,100 AFY at buildout (2045)

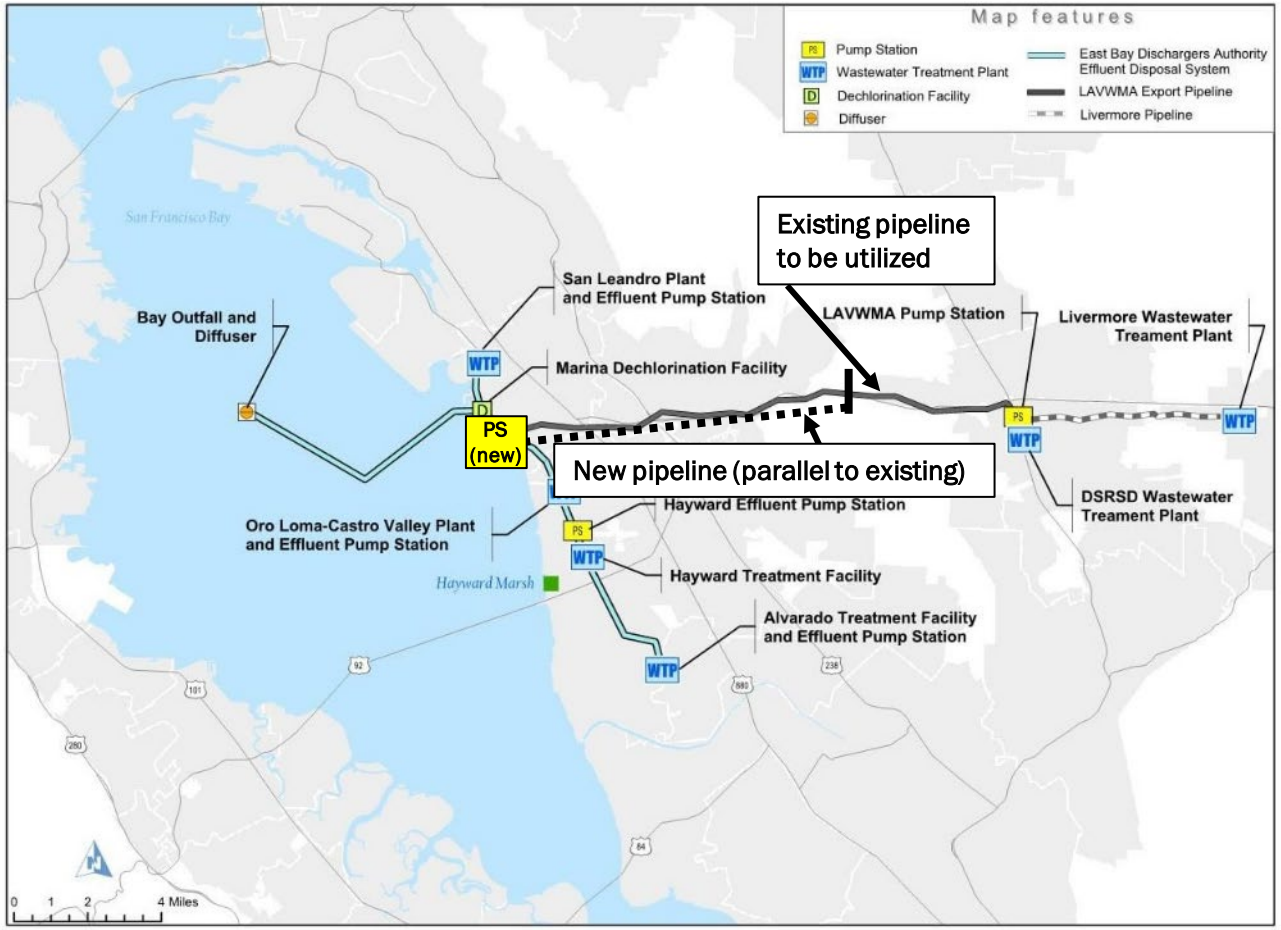
Capital Cost: $100M // **O&M Cost:** $3.4M/year

Total Annual Cost: $9.7M

Unit Cost: $3,100/AF at 7 MGD; $7,700/AF at 3 MGD

Benefits: Uses wastewater otherwise discharged to Bay.

Challenges/Considerations: Most expensive alternative by a wide margin (capital cost of $100M+). Significant institutional issues, and potential constructability challenges (pipeline would pass through developed areas).



4) Treated Recycled Water–Livermore to Pleasanton

Description: Livermore and Pleasanton currently have an agreement for Livermore to provide recycled water service to Pleasanton in the El Charro vicinity in an amount that corresponds to the amount of wastewater to be discharged by the Ruby Hill development at build-out (see screened out Alternative - "*Raw wastewater from Ruby Hill*"). With minimal system improvements, Livermore could increase the amount of recycled water served to Pleasanton, thus reducing Pleasanton's supply from DERWA. The freed up DERWA recycled water supply could be used to serve new DERWA customers. Livermore's recycled water rate is currently higher than DERWA's recycled water rate. Therefore, any arrangement would also need to account for the difference in recycled water rates.

Daily Yield: 1 MGD // **Peak Season Yield:** 460 AFY

Total Additional RW Yield: 500 AFY at buildout (2045)

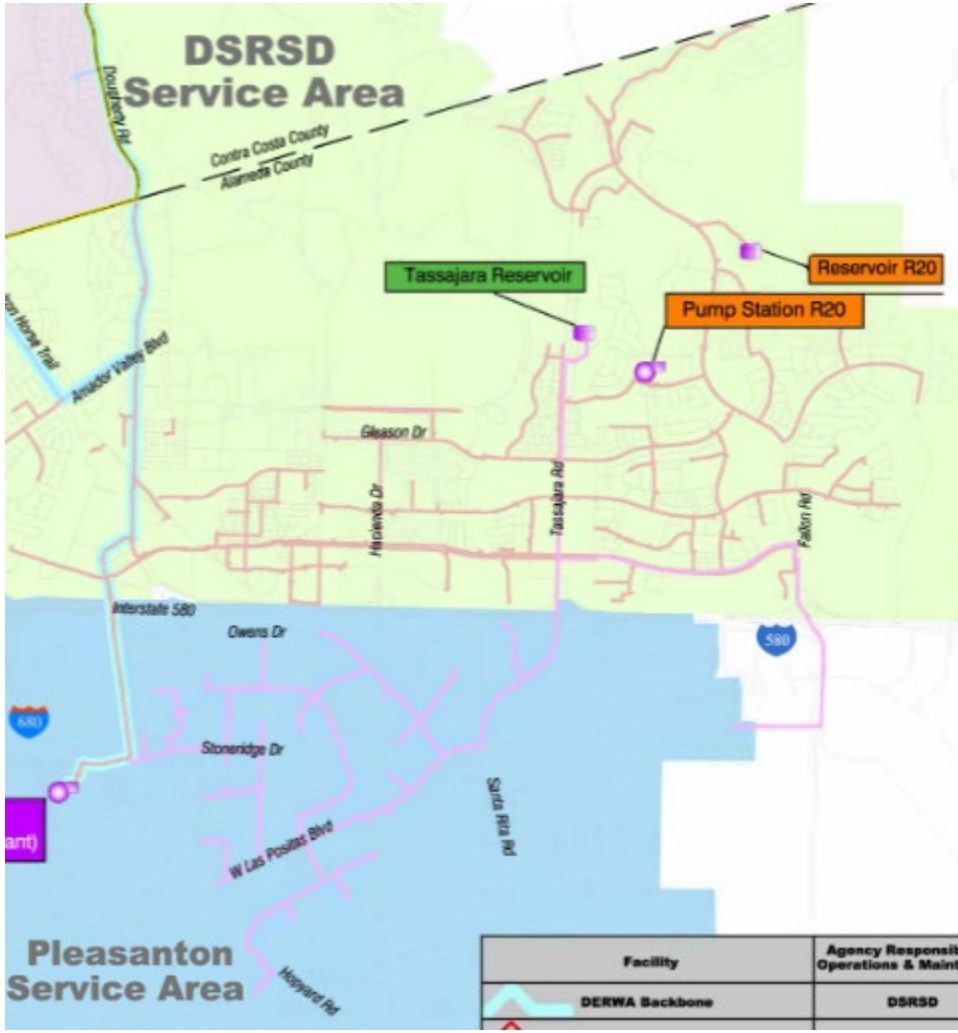
Capital Cost: <$1M // **O&M Cost:** $0.5M/year

Total Annual Cost: $0.6M

Unit Cost: $1,100/AF

Benefits: Minimal system modifications required. Could be implemented near-term. Reduces wastewater discharges and nutrient loading to San Francisco Bay.

Challenges/Considerations: Long-term availability uncertain. Livermore is currently planning to use their effluent long-term for other recycled water projects. Further studies needed to identify and mitigate potential water quality impacts due to blending of DERWA recycled water and Livermore recycled water within Pleasanton's distribution system.



5) Wells–Fringe Basin (Higher Yield)

Description: Although the Fringe Basin is less productive and has lower-quality groundwater than the Main Basin, it may be sufficient for non-potable uses. This Alternative would involve two Fringe Basin wells to supplement recycled water supply in summer months. Past groundwater studies evaluated multiple potential well locations. This Alternative proposes to site wells on property owned by a member agency that have the highest potential yield: (1) DSRSD Office and (2) DSRSD WWTP. Prior to the mid-1960s, DSRSD operated groundwater wells at and around the DSRSD Office. These wells were abandoned once DSRSD began purchasing better-quality water from Zone 7, a State Water Project contractor.

Daily Yield: Total of 2.3 MGD (1,000 gpm DSRSD Office well and 600 gpm WWTP well) // **Peak Season Yield:** 1,060 AFY

Total Additional RW Yield: 1,130 AFY at buildout (2045)

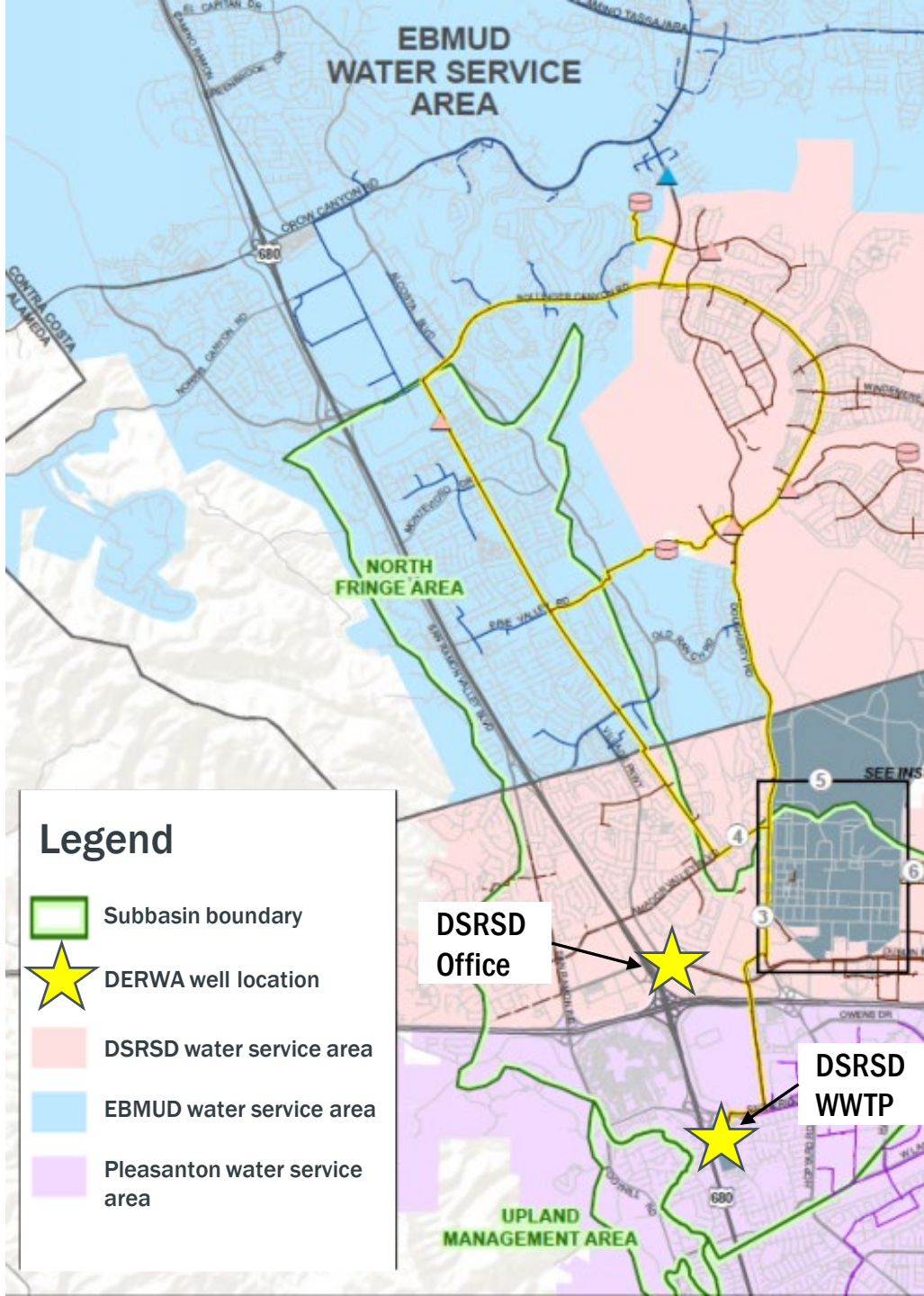
Capital Cost: $15M // **O&M Cost:** $1.2M/year

Total Annual Cost: $2.1M

Unit Cost: $1,800/AF

Benefits: Proposed well locations are highest production areas historically found in Fringe Basin, located on DSRSD-owned land, wells can be operated to match DERWA's peak summer demands.

Challenges/Considerations: Uncertain yield and water quality. Would require additional investigation and coordination with Zone 7, the Groundwater Sustainability Agency, to identify and fully understand requirements for operating wells in the Fringe Basin. Additionally, O&M of new wells would increase staff workload.



6) Wells–Fringe Basin (Lower Yield)

Description: This Alternative assumes that DERWA would install additional wells in the Fringe Basin after higher yield well locations have been exhausted. It is assumed that these lower yield wells could have a production rate of approximately 230 gallons per minute (based on prior studies).

Daily Yield: Total of 2.3 MGD (7 wells) // **Peak Season Yield:** 1,060 AFY

Total Additional RW Yield: 1,130 AFY at buildout (2045)

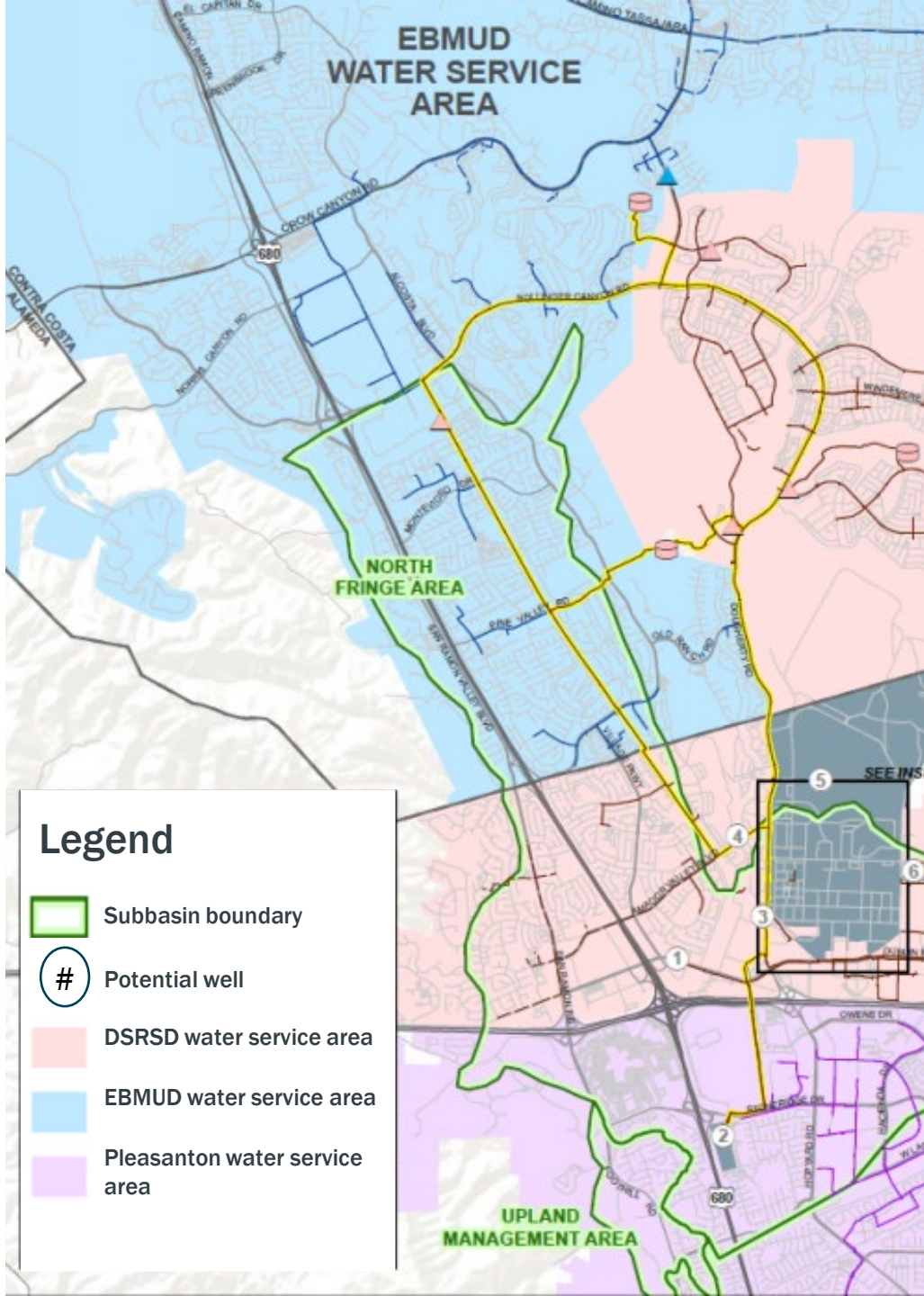
Capital Cost: $39M // **O&M Cost:** $1.2M/year

Total Annual Cost: $3.8M

Unit Cost: $3,300/AF

Benefits: Wells can be operated to match DERWA's peak summer demands.

Challenges/Considerations: Uncertain yield and water quality. Would require additional investigation and coordination with Zone 7, the Groundwater Sustainability Agency, to identify and fully understand requirements for operating wells in the Fringe Basin. Operating a wellfield would require significant staffing resources to operate and maintain.



7) Peak Season Potable Water Supplementation

Description: Supplement with potable water from EBMUD or DSRSD into the DERWA recycled water distribution system during shortage. Includes a new 0.5-mile DSRSD pipeline, and an EBMUD pump station and pipeline. Assumes existing connection at DSRSD's WWTP cannot be used near term (due to lack of peak season supply available from Pleasanton).

Daily Yield: 3 MGD // **Peak Season Yield:** 1,380 AFY

Total Additional RW Yield: 1,460 AFY at buildout (2045)

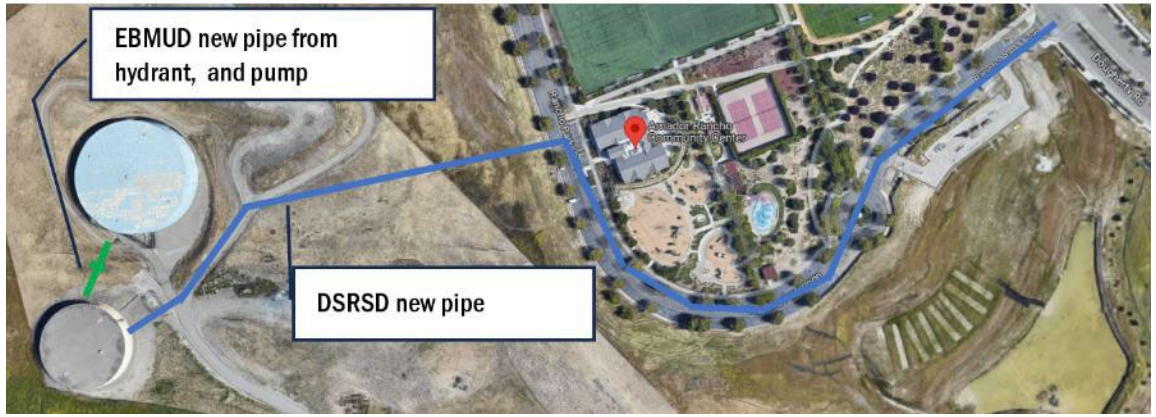
Capital Cost: $5M // **O&M Cost:** $1.9M/year

Total Annual Cost: $2.2M

Unit Cost: $2,200/AF

Benefits: Relatively minimal infrastructure required. Ability to add potable supplement only as-needed to address peak shortages.

Challenges/Considerations: Challenges with public messaging. Requires determining which agency provides the potable water to address potential water rights issues. Supply may not be available during drought years.



Screened Out Alternatives

Brown AND Caldwell

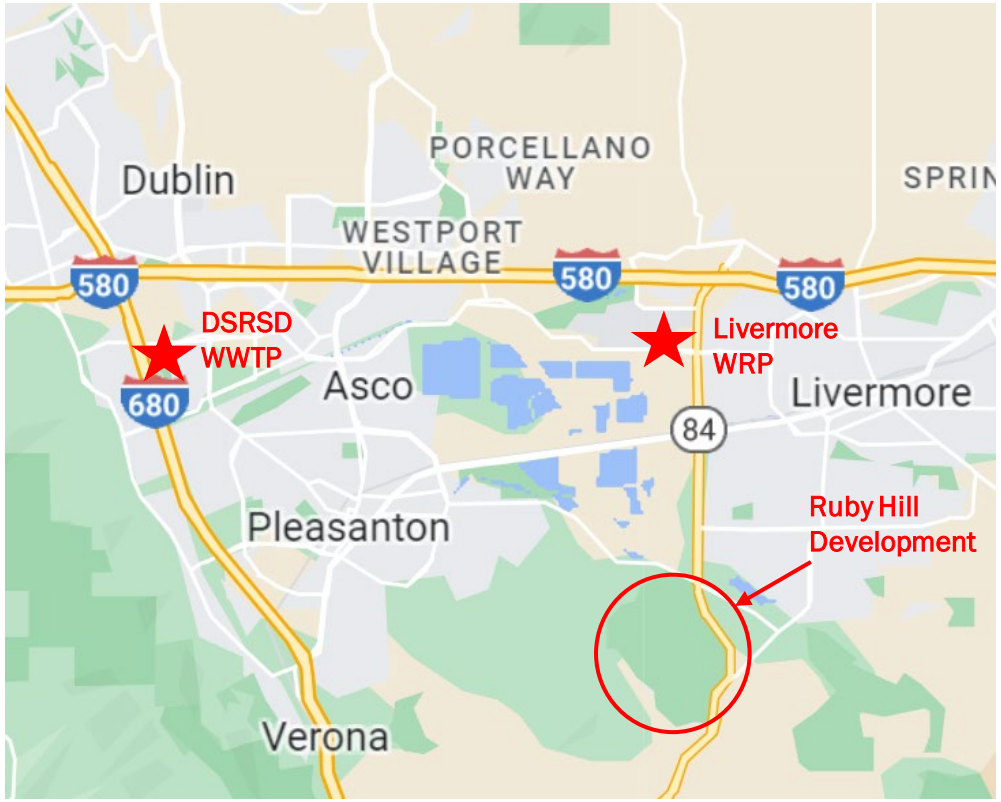
Raw Wastewater from Ruby Hill - *Screened Out*

Description: Diversion of raw wastewater (WW) from Pleasanton's Ruby Hill development to the DSRSD WWTP, instead of the Livermore Water Reclamation Plant (WRP). Wastewater from Ruby Hill development is currently treated at the Livermore WRP. In exchange, Livermore and Pleasanton have an interim agreement for Livermore to supply recycled water for Pleasanton customers in the eastern portion of Pleasanton. The annual volume corresponds to the amount of wastewater projected to be discharged by the Ruby Hill development at buildout.

Daily Yield: 0*

Benefits: Increased wastewater flow to DSRSD WWTP.

Reasons for screening out: This alternative provides no net supply. If Pleasanton were to begin sending Ruby Hill wastewater flows to the DSRSD WWTP, it would be expected that Livermore would no longer provide recycled water to Pleasanton customers in the eastern portion of Pleasanton and those recycled water customers would need to be supplied by DERWA.



**Although Ruby Hill produces about 180 AFY of wastewater, this alternative would provide no net increase in DERWA supply due to the current agreement between Livermore and Pleasanton.*

Reference: 2017 Pleasanton-Livermore Agreement to Provide Recycled Water Service through El Charro Pipeline

Zone 7's Hopyard #7 Well - *Screened Out*

Description: Use of non-potable supply from Hopyard #7, a Zone 7 well in the Main Basin that is not currently connected to Zone 7's potable distribution system due to elevated levels of arsenic, manganese, and boron. Well water could be conveyed to DSRSD's WWTP via a nearby sewer, diluting the concentration of contaminants to a level that may be acceptable for irrigation.

Daily Yield: 1.9 MGD

Benefits: Makes use of existing infrastructure, additional supply.

Reasons for screening out:

- This Alternative was identified as part of DSRSD's 2021 Alternative Water Supply Study through discussions with Zone 7 staff. However, since those early discussions occurred, Zone 7 is looking at additional well sites and considering adding arsenic treatment and reactivating Hopyard #7 for drinking water.
- DSRSD's use of Hopyard #7 for non-potable uses would count against DSRSD's allocated groundwater rights (e.g., Groundwater Pumping Quota), which is fully utilized for the benefit of DSRSD customers.
- Potential outreach and education may be needed to address public concerns with water quality.

References: DSRSD Alternative Water Supply Study (2021))

New Well(s) Main Basin – *Screened Out*

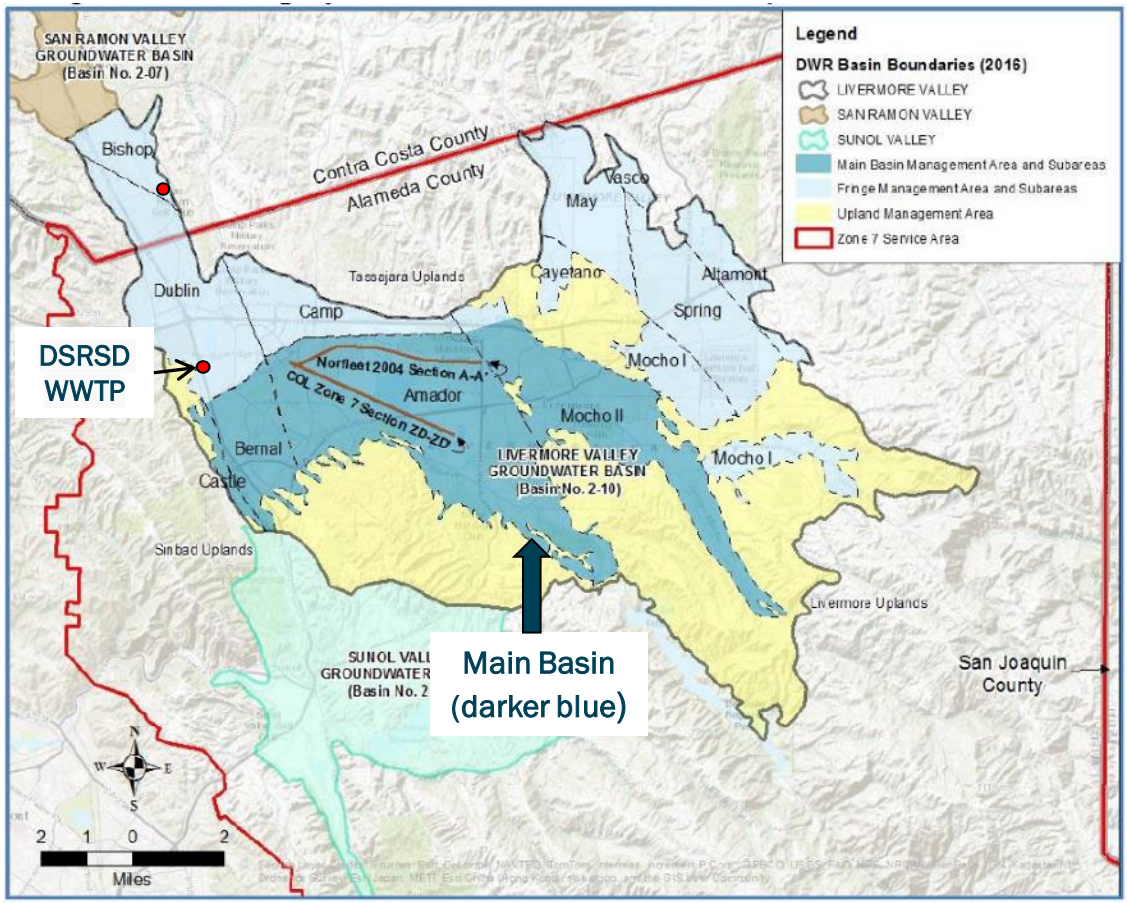
Description: Drilling and installation of new well(s) in the Main Basin.

Daily Yield: Approximately 2 MGD

Benefits: Additional supply.

Reasons for screening out:

- DERWA has no water rights to pump groundwater from the Main Basin and DSRSD's Groundwater Pumping Quota (GPQ) is fully utilized for the benefit of DSRSD customers.
- Main Basin is a municipal drinking water source for the Tri-Valley. Natural groundwater yield is fully allocated. Therefore, Zone 7 would need to artificially recharge the groundwater basin with additional surface water to account for new groundwater pumping.
- Wells would need to be located in areas not impacted by PFAS contamination at a time when both Pleasanton and Zone 7 are evaluating siting new wells in the Main Basin.
- Offers similar benefit as supplementing with potable water but with significantly more cost, regulatory, staffing, and institutional issues.



Intercept & Treat RO Concentrate from Zone 7's Groundwater Demineralization Facility - ***Screened Out***

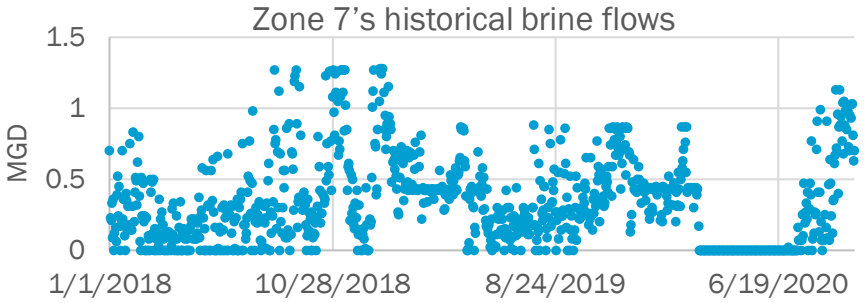
Description: Zone 7's Mocho Groundwater Demineralization Plant (MGDP) uses reverse osmosis (RO) to lower salts and remove PFAS in groundwater. The RO concentrate, or brine, is conveyed via the Clean Water Revival line to the DSRSD WWTP and LAVWMA export pipeline for discharge to SF Bay. This Alternative would intercept and further treat Zone 7's RO concentrate to a level suitable for blending with recycled water. Prior to 2023, Zone 7 did not operate the MGDP during drought years to minimize supply losses. However, due to PFAS detected in the Mocho wellfield, Zone 7 plans to operate the MGDP during future dry years to treat for PFAS.

Daily Yield: up to 1 MGD on average

Benefits: Additional supply.

Reasons for screening out:

- High cost of adding treatment for relatively low yield that varies year to year.
- Future regulations may require treatment of RO concentrate for PFAS.



Reference: 2021 DSRSD AWSS

Stormwater Capture - *Screened Out*

Description: Capture rainwater and/or stormwater runoff to supplement recycled water system.

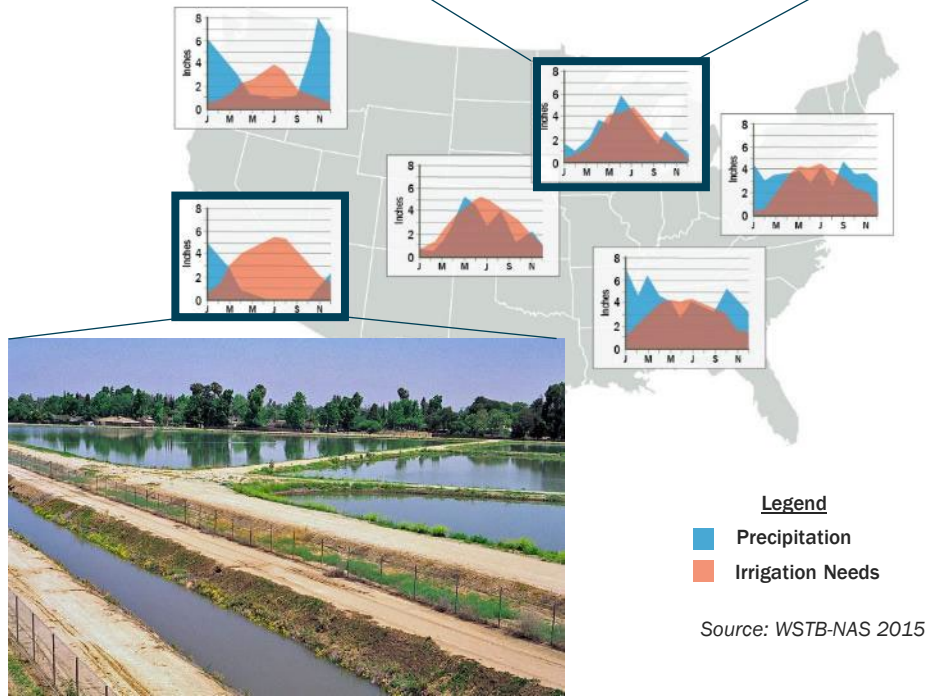
Daily Yield: Negligible during peak season

Benefits: New water source.

Reasons for screening out:

- Rain and runoff occur during periods of year outside peak season shortage.
- Substantial storage volume required to address peak season shortage.

City of Chicago's 25,000 AF storage basin



Source: WSTB-NAS 2015

City of Fresno's Leaky Acres

Storage in Chain of Lakes - *Screened Out*

Description: A 2004 MOU between DSRSD and Zone 7 includes collaborative efforts to find up to 1,200 AF of recycled water (RW) storage. Zone 7 identified Lakes F and G as suitable. However, these lakes are still being mined for gravel, and Zone 7 may not acquire them until as late as 2060. Earlier acquisition may be possible, but it would require negotiating with the quarry owners and operators, which is likely to be costly. The Alternative includes constructing a pipeline to convey tertiary treated RW to/from Lake G seasonally – water would be pumped to lake in winter, for later use in summer.

Storage Volume: 1,200 AF

Benefits: Large enough storage to address shortage needs.

Reasons for screening out:

- Timing is too far off to meet water supply needs (estimated available by 2060).
- Potential water quality challenges with surface storage (e.g., algae growth).

Recycled Water Storage in Aquifer - *Screened Out*

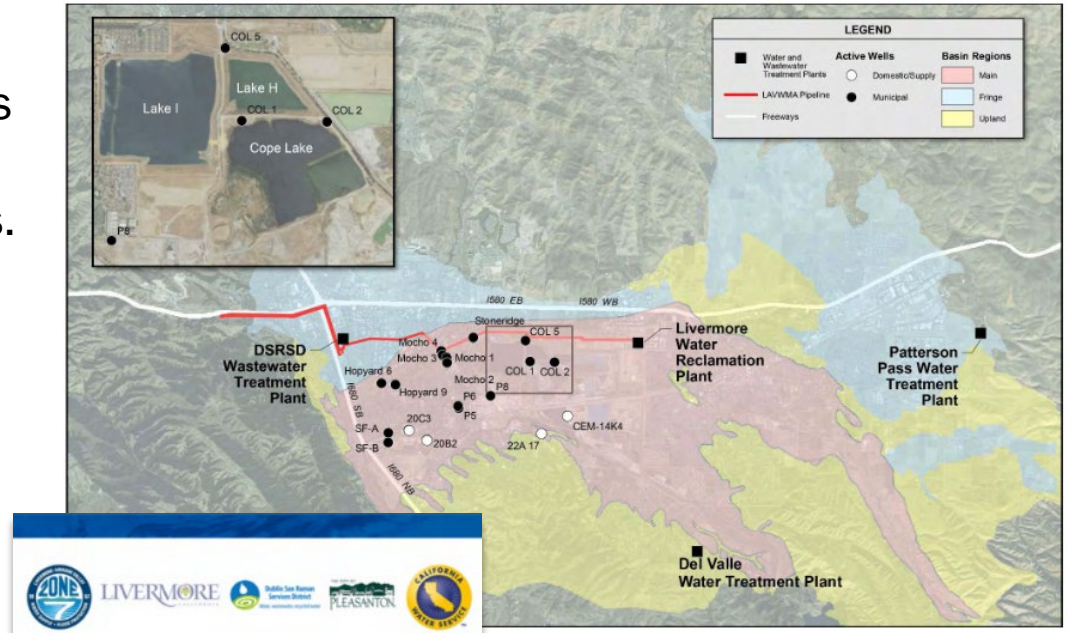
Description: Groundwater recharge of purified (advanced treated recycled) water via Tri-Valley Potable Reuse among Zone 7 and its retailers. A 2018 feasibility study demonstrated concept to be technically feasible and recommended several additional studies.

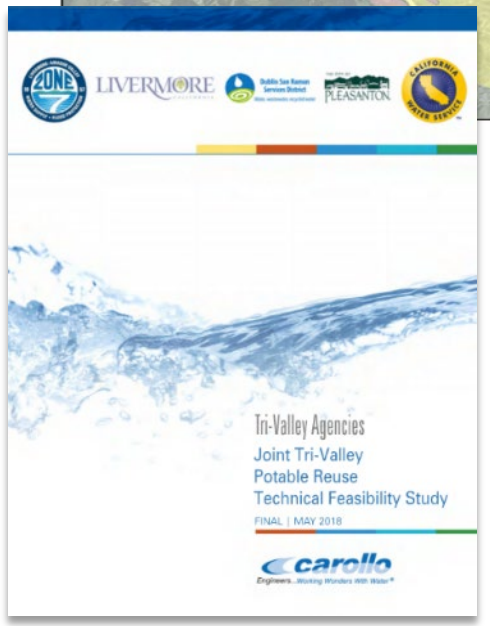
Storage volume: 200,000 AF

Benefits: Local storage opportunity for conjunctive use.

Reasons for screening out:

- Tri-Valley agencies are conducting separate effort to jointly study feasibility of potable reuse.
- Stakeholder concerns regarding storing purified water in aquifer, despite proposed advanced treatment.
- High capital cost of $135M to $275M, primarily for advanced treatment.
- Requires additional studies on conjunctive use and contaminant mobilization.





Joint Tri-Valley Potable Reuse Technical Feasibility Study, May 2018