

# Burlingame Recycled Water and Wastewater Discharge Reduction Project



12/01/25 – City Council Alternatives Presentation



*In Association with*



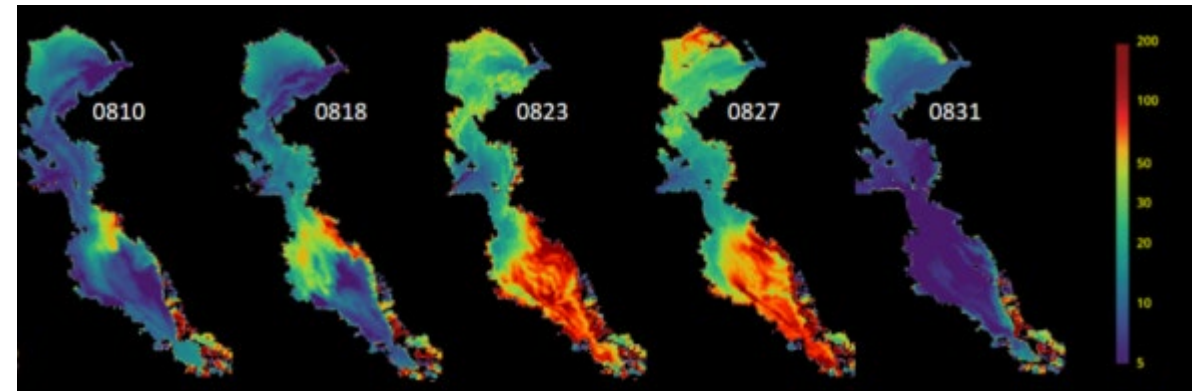
# Agenda

- Project Goals
- Project Status
- Recycled/Purified Water Overview
- Nutrient Removal Overview
- Alternatives Walk-through
- Public Outreach Takeaways
- Q&A

# Project Goals



- Reduce drought vulnerability and supplement water supply via water reuse

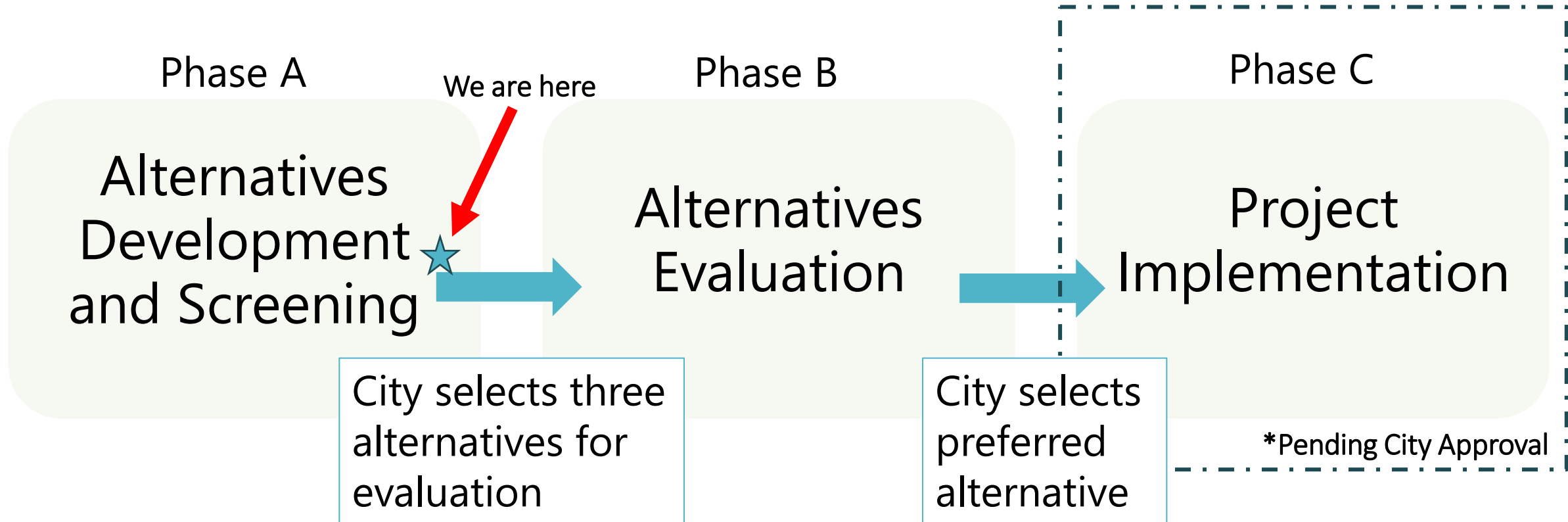


Chlorophyll estimates ( $\text{mg}/\text{M}^3$ ) during August 2022 algal bloom (SFEI, 2023).

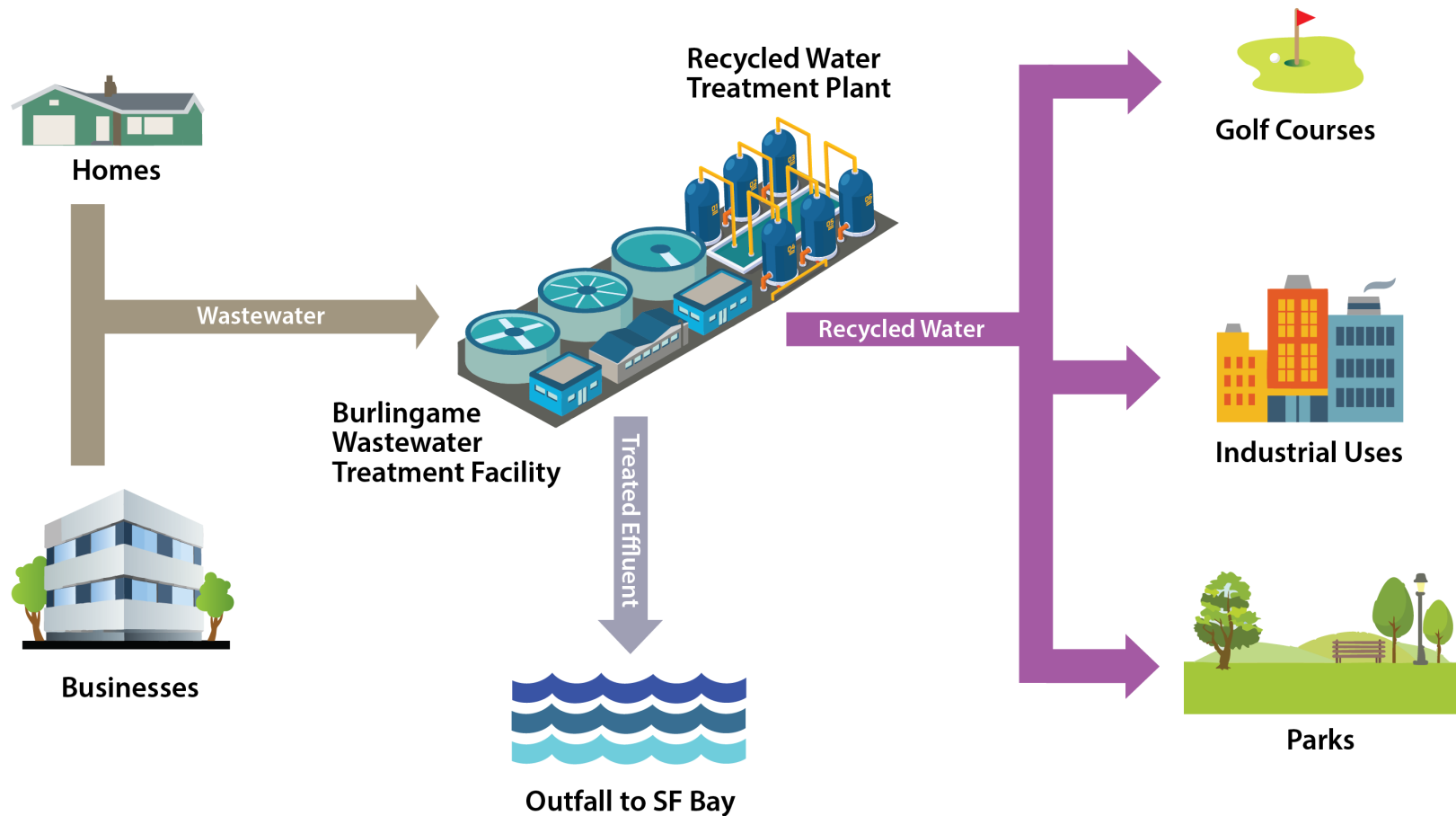
- Improve environment and achieve compliance (RWQCB Order R2-2024-0013) by reducing nutrient discharge to SF Bay by 40%.



# Project Status

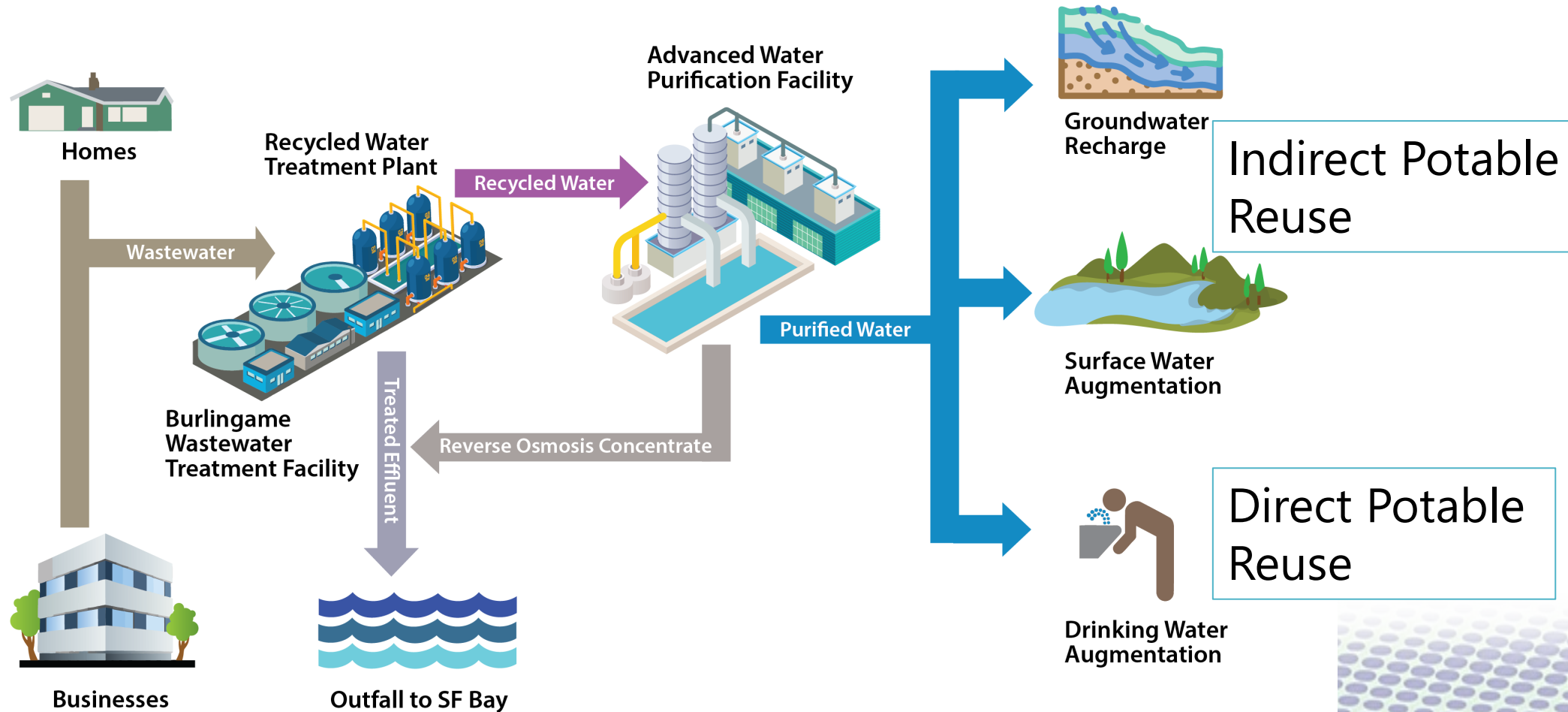


# Recycled Water Overview



Non-Potable  
Reuse

# Purified Water Overview



# Nutrient Removal Overview

- **Wastewater Treatment Process Optimization/Densification**
  - Modify existing treatment processes to increase denitrification
  - May not be sufficient to meet RWQCB requirements
- **Membrane Bioreactor (MBR)**
  - Biologically active membranes filter out and break down solids
    - *Satisfies filtration requirement for Title 22 Recycled Water*
  - More expensive, would meet RWQCB nutrient requirements
- **Nutrient Removal Credit Exchange**
  - Pay other BACWA members for extra N-removal “credits” beyond RWQCB requirement
  - Details of exchange program (costs, availability, etc.) unknown
- **Other treatment options:**
  - Membrane Aerated Bioreactor, Biological Aerated Filter + Denitrification Filters



# Alternatives Development

- Outreach meetings with several potential project partners:
  - *SFPUC, Millbrae, OneShoreline, San Bruno, San Mateo, BAWSCA, SVCW, Cal Water, Poplar Creek Golf Course*
- Nearly 20 potential project scenarios were considered:
  - *10+ Recycled water scenarios*
  - *4 Indirect Potable Reuse scenarios*
  - *3 Direct Potable Reuse scenarios*
- Alternatives ruled out based on feasibility, cost effectiveness, interest of project partners
- Reduced to short-list of 4 alternatives



# Alt. 1 Cloth Filtration Purple Pipe RW

- Treatment: Tertiary cloth filtration/disinfection at Burlingame WWTF
- Infrastructure: New RW distribution system in East side of City
- 0.56 mgd of seasonal demand + 0.25 mgd demand from Millbrae
- Project Partners: Millbrae (potential)
- Nutrient Strategy: Nutrient diversion via RW, coupled with WWTF optimization/densification or credit purchase





# Alt. 1 Cloth Filtration Purple Pipe RW

| Pros   | Cons  | Meets Water Supply Goal?            | Meets Nutrient Removal Goal?   |
|--|---|-------------------------------------|--|
| <ul style="list-style-type: none"> <li>• Low cost</li> <li>• Operationally simple</li> </ul> | <ul style="list-style-type: none"> <li>• Small, seasonal water supply benefit</li> <li>• Requires additional WWTF optimization/densification</li> </ul> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/><br><br>With WWTF optimization or credit purchase |

|                                    | Infrastructure | Treatment   | Total        |
|------------------------------------|----------------|-------------|--------------|
| <b>TOTAL PROJECT COST</b>          | \$39M- \$78M   | \$37M-\$74M | \$76M-\$152M |
| <b>TOTAL O&amp;M COST (ANNUAL)</b> | \$ 334,500     | \$ 140,000  | \$ 474,500   |

Cost projections are preliminary and intended only for comparison purposes.  
Cost estimates to be refined as part Feasibility Study process.





# Alt. 2 MBR Purple Pipe RW

- Treatment: MBR/disinfection at Burlingame WWTF
- Infrastructure: New RW distribution system in East side of City
- 0.56 mgd of seasonal demand + 0.25 mgd demand from Millbrae
- Project Partners: Millbrae (potentially)
- Nutrient Strategy: MBR nutrient removal, sized to treat future WWTP dry weather flow of 3.5 mgd





# Alt. 2 MBR Purple Pipe RW

| Pros   | Cons   | Meets Water Supply Goal? | Meets Nutrient Removal Goal? |
|--|--|--------------------------|------------------------------|
| <ul style="list-style-type: none"> <li>• MBR process fully satisfies RWQCB N-removal requirements</li> <li>• Produces high-quality, "RO-ready" effluent</li> </ul> | <ul style="list-style-type: none"> <li>• Added costs/operational complexity</li> <li>• Small, seasonal water supply benefit</li> </ul> | <div>✓</div>             | <div>✓</div>                 |

|                                    | Infrastructure | Treatment     | Total         |
|------------------------------------|----------------|---------------|---------------|
| <b>TOTAL PROJECT COST</b>          | \$39M- \$78M   | \$211M-\$422M | \$250M-\$500M |
| <b>TOTAL O&amp;M COST (ANNUAL)</b> | \$ 334,500     | \$ 2,050,000  | \$ 2,384,500  |

Cost projections are preliminary and intended only for comparison purposes.  
Cost estimates to be refined as part Feasibility Study process.





# Alts. 3/4 Phase 1: Burlingame WW to San Mateo WWTP

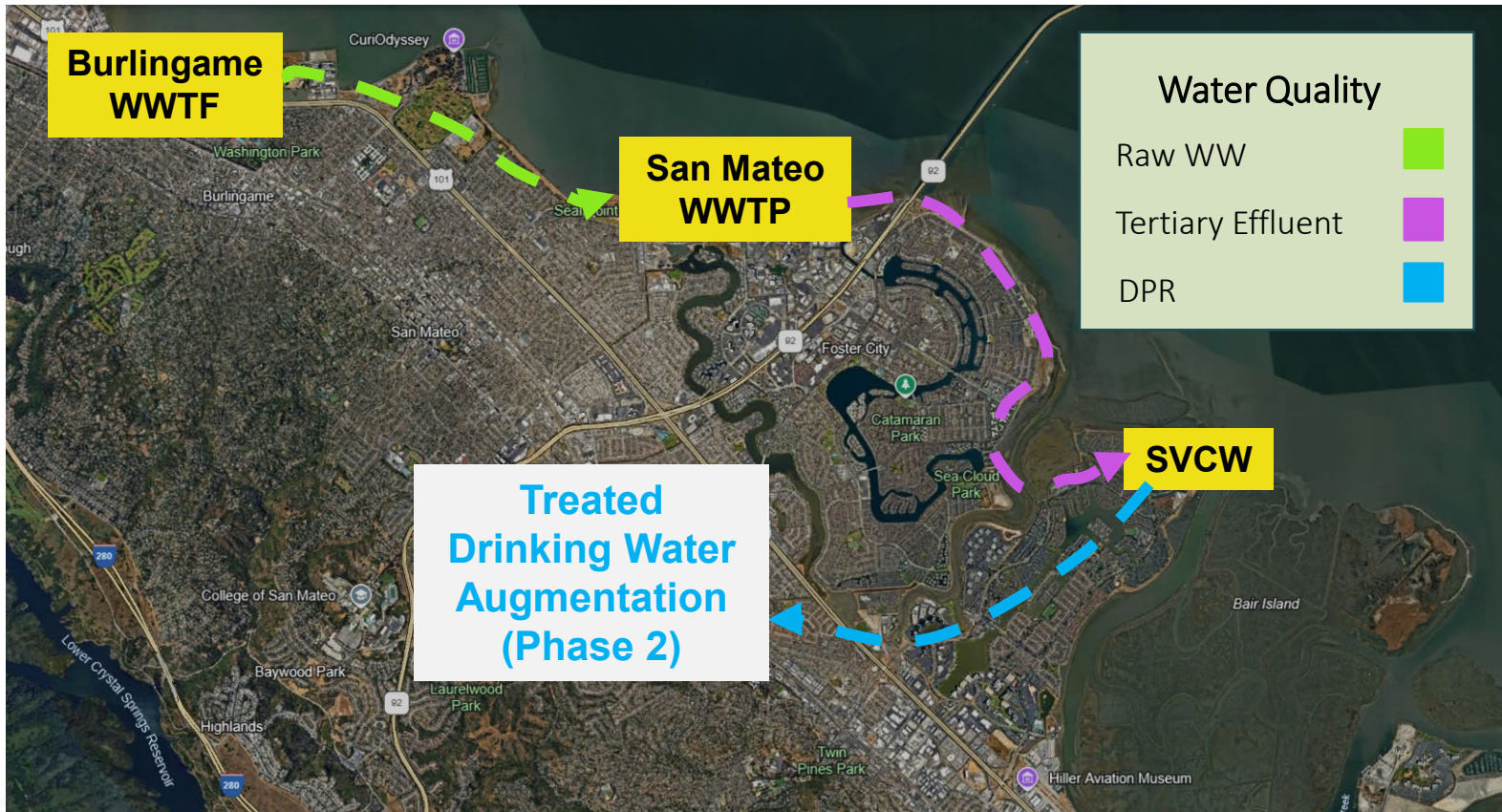
- Infrastructure: New WW force main to San Mateo WWTP
- Project Capacity: **2 mgd**
- Project Partners: San Mateo
- Nutrient Strategy: MBR treatment at San Mateo WWTP during compliance months (May-Sept)
- Dependent on available treatment capacity, analysis underway





# Alt. 3: DPR – PureWater Peninsula Add-on

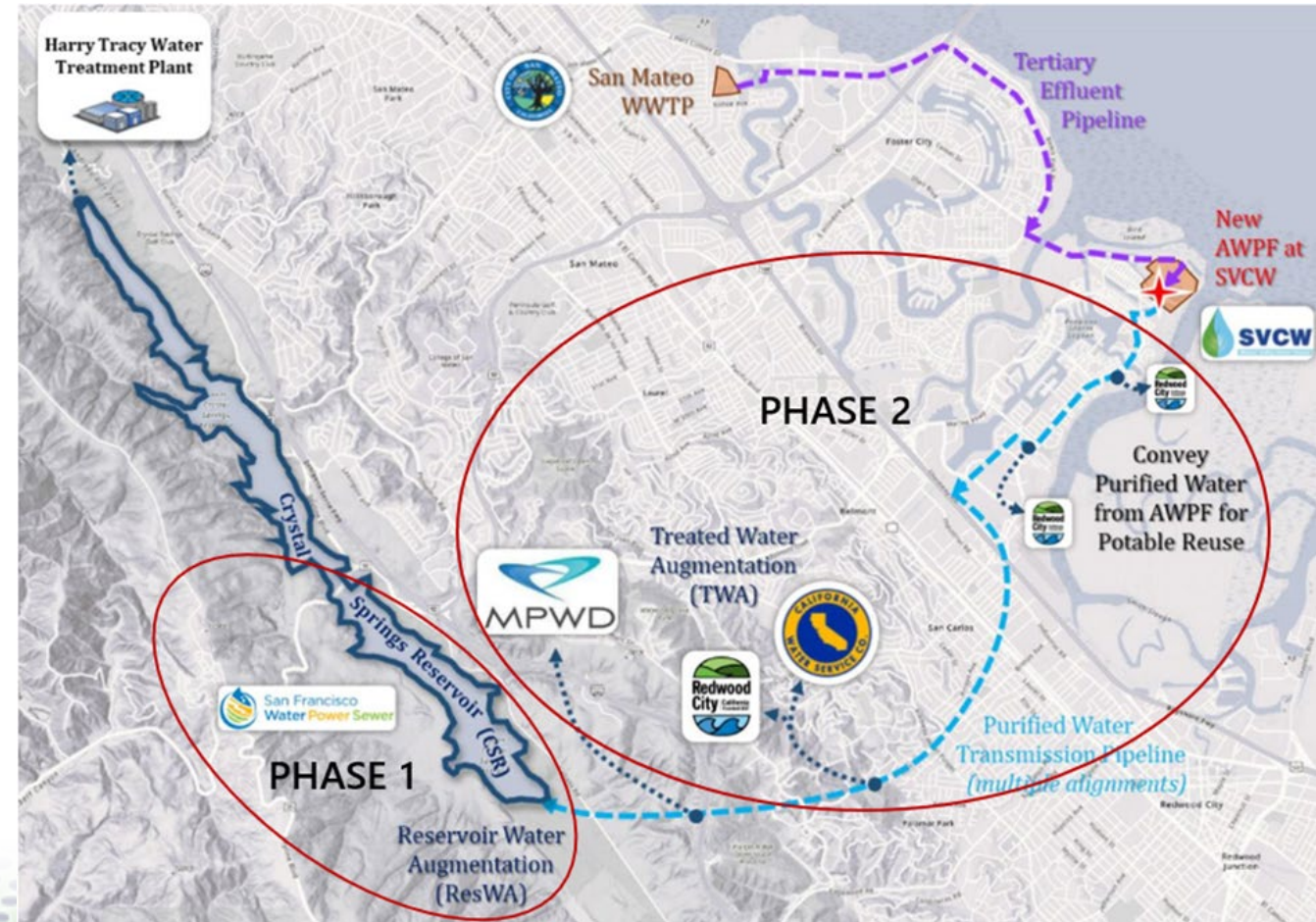
- Treatment: Shared DPR treatment at SVCW
- Infrastructure: New WW force main to San Mateo WWTP
- Project Capacity: **1.5 mgd**
- Project Partners: PureWater Peninsula Partners
- Nutrient Strategy: MBR treatment at San Mateo





# PureWater Peninsula

- [Basis of Design Report](#) completed in 2024
- Phase 2 planned for 2040

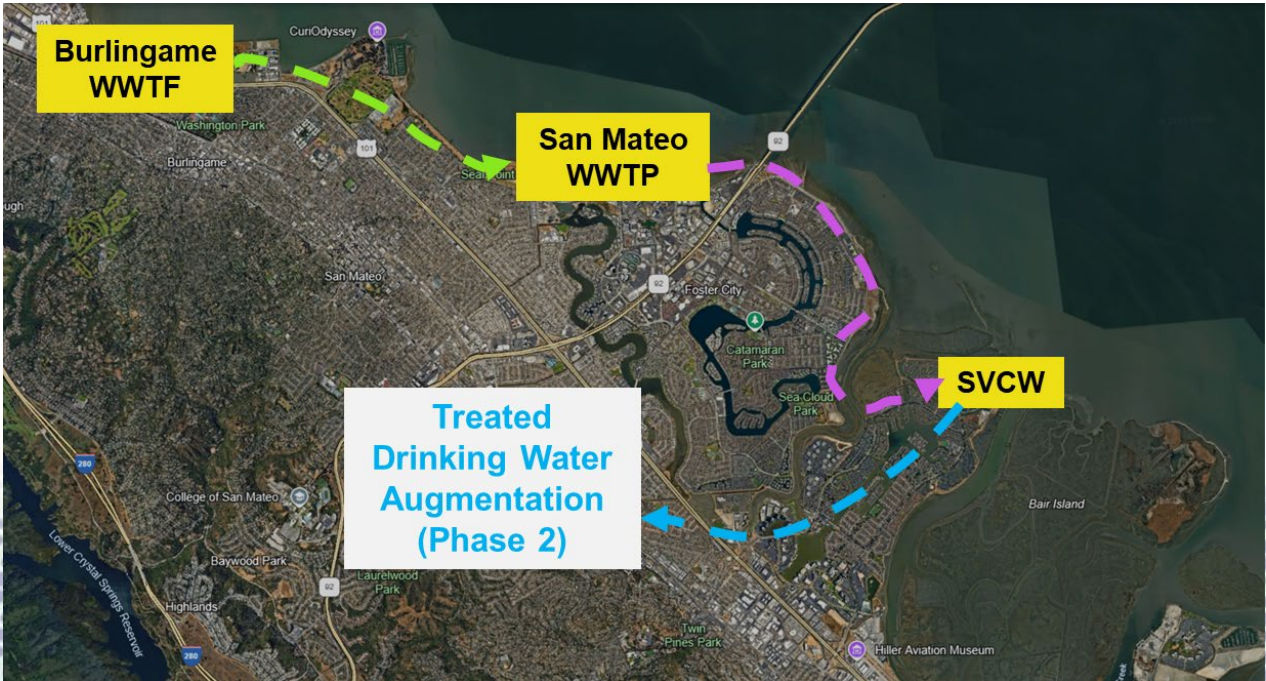




# Alt. 3 DPR – PureWater Peninsula Add-on

| Pros   | Cons   | Meets Water Supply Goal? | Meets Nutrient Removal Goal? |
|--|--|--------------------------|------------------------------|
| <ul style="list-style-type: none"><li>Accomplish nutrient compliance in short term</li><li>PureWater Peninsula is a mature project with momentum</li></ul> | <ul style="list-style-type: none"><li>Reliant on several Agencies' timelines to receive water supply benefit</li><li>Bureaucratic challenges of a project with 7+ partners</li></ul> | ☑                        | ☑                            |

|  | Infrastructure | Treatment    | Total         |
|--|----------------|--------------|---------------|
| TOTAL PROJECT COST   | \$49M-\$98M    | \$55M-\$110M | \$104M-\$208M |
| TOTAL O&M COST (ANNUAL)  | \$ 431,000     | \$ 1,860,000 | \$ 2,291,000  |
| Cost projections are preliminary and intended only for comparison purposes.<br>Cost estimates to be refined as part Feasibility Study process. |                |              |               |





# Alt. 4: DPR – Burlingame + San Mateo

- Treatment: Shared DPR treatment at San Mateo WWTP
- Infrastructure: New WW force main to San Mateo WWTP
- Project Capacity: **1.5 mgd**
- Project Partners: San Mateo, Cal Water
- Nutrient Strategy: MBR treatment at San Mateo





# Alt. 4: DPR – Burlingame + San Mateo

| Pros  | Cons   | Meets Water Supply Goal? | Meets Nutrient Removal Goal? |
|---|--|--------------------------|------------------------------|
| <ul style="list-style-type: none"> <li>• More control over implementation timeline</li> <li>• Avoids costly conveyance from San Mateo to SVCW</li> <li>• SFPUC showed interest</li> </ul> | <ul style="list-style-type: none"> <li>• Larger capital investment</li> <li>• Larger operating expenses</li> </ul> | <div>✓</div>             | <div>✓</div>                 |

|  | Infrastructure | Treatment    | Total         |
|--|----------------|--------------|---------------|
| TOTAL PROJECT COST   | \$49M-\$98M    | \$91M-\$182M | \$140M-\$280M |
| TOTAL O&M COST (ANNUAL)  | \$ 431,000     | \$ 5,640,000 | \$ 6,071,000  |
| Cost projections are preliminary and intended only for comparison purposes.<br>Cost estimates to be refined as part Feasibility Study process. |                |              |               |



# Summary – Viable Alternatives

| Alt. | Description                      | Treatment Capacity (mgd)         | Capital Cost Range (\$M) | O&M Cost (\$/yr) |
|------|----------------------------------|----------------------------------|--------------------------|------------------|
| 1    | Cloth Filtration Purple Pipe RW  | 1 mgd RW + 3.5 mgd Densification | \$76M-\$152M             | \$ 474,500       |
| 2    | MBR Purple Pipe RW               | 1 mgd RW + 3.5 mgd MBR upgrade   | \$250M-\$500M*           | \$ 2,384,500     |
| 3    | DPR – PureWater Peninsula Add-on | 1.5 mgd DPR                      | \$104M-\$208M            | \$ 2,291,000     |
| 4    | DPR – Burlingame + San Mateo     | 1.5 mgd DPR                      | \$140M-\$280M            | \$ 6,071,000     |

Cost projections are preliminary and intended only for comparison purposes.

Cost estimates to be refined as part Feasibility Study process.

\*Cost based on MBR system sized for projected future seasonal effluent of 3.5 mgd. Sizing assumptions and associated costs to be further refined as part of Feasibility Study.



# Public Outreach Takeaways

- Gather input from key stakeholders to understand their unique views on the areas explored, and inform the outreach approach that could most productively accompany each project alternative
- Core Areas Explored
  - Water Supply and Wastewater
  - Non-Potable Recycled Water
  - Potable Reuse
  - Public Outreach
- In general, the stakeholders were receptive to the options explored with the expectation that an outreach strategy is in place to address concerns raised during the discussions.



# Next Steps

- Awaiting treatment capacity analysis from San Mateo WWTP
- Monitor BACWA Nutrient Credit trading program developments
- Further refine candidate alternatives
- Select three alternatives to take forward
- Prepare Feasibility Study and develop detailed cost estimates

# Q & A

- Thank you!