Agenda

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2. Preview of Guiding Questions
3. Palo Alto Water Supply Overview
4. Recycled Water 101
5. Local Recycled Water Program Overview
6. Northwest County Recycled Water Strategic Plan
   A. Overview
   B. Preliminary Results – Concept Options
7. Q & A – Guiding Questions
8. Next Steps
9. Adjourn
1. Do you think Palo Alto should remain 100% dependent upon imported water?

2. When do you think Palo Alto should incorporate local water sources into its water portfolio?

3. How do you view the benefits of recycled water?

4. How do you view the benefits of non-potable reuse (i.e., landscape irrigation, cooling towers, etc.)?

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6. How do you view the benefits of direct potable reuse?
Palo Alto - Water Supply Overview

- **100%** of potable water *imported* from City & County of San Francisco’s Regional Water System
  - ~85% from Tuolumne River
  - Palo Alto potable demand is ~11,000 acre-feet per year (AFY) or 10 million gallons per day (MGD)
  - Currently ~$1,800/AF

- Local water reuse could provide ~50% of Palo Alto water demand but investments are needed for additional treatment and conveyance
What is Recycled Water?

- Highly treated wastewater that is **locally produced** and can be **sustainably and safely reused** for various water demands

  **Non-potable reuse (NPR)**
  - Enhanced recycled water for irrigation and commercial uses

  **Indirect potable reuse (IPR)**
  - Purified water used to augment groundwater supplies

  **Direct potable reuse (DPR)**
  - Purified water used to augment drinking water distribution system
Current Local Recycled Water Program

- Regional Water Quality Control Plant (RWQCP) treats wastewater for:
  - Palo Alto
  - Mountain View
  - Stanford University
  - Los Altos
  - Los Altos Hills
  - East Palo Alto Sanitary District

- ~5% of wastewater currently used to produce non-potable recycled water for Mountain View & Palo Alto
  - Landscape irrigation
  - Toilet flushing
Regional Water Quality Control Plant (~20,000 AFY)

- City of Mountain View: 39%
- City of Palo Alto: 36%
- Los Altos: 10%
- Stanford: 7%
- EPASD: 7%
- Los Alto Hills: 2%

Lower South San Francisco Bay (~18,000 AFY)

- Renzel Marsh (~1,000 AFY)
- Irrigable Reuse (~1,000 AFY)

Mountain View & Palo Alto
Northwest County Recycled Water Strategic Plan

- How best to expand RWQCP Recycled Water Program given:
  - Recent regulatory developments
  - Prolonged drought
  - 1992 Recycled Water Master Plan recommended projects

- Study Area:
  - RWQCP service area
  - Additional areas within Menlo Park & East Palo Alto

- Time Period
  - Through 2030
Right Water Quality for the Right Purpose
NW County Recycled Water Strategic Plan

Water Reuse Opportunities

Countywide Water Reuse Master Plan

Regional Interests

Non-potable Reuse

Concept Options
- A1 (800 AFY)
- A2 (1,100 AFY)
- A3 (1,200 AFY)
- A4 (200 AFY)
- A5 (900 AFY)
- A6 (500 AFY)

Satellite Non-potable Reuse

Concept Option
- B1 (900 AFY)

Indirect Potable Reuse

Concept Options
- C1 (5,900 AFY)
- C2 (6,100 AFY)
- C3 (5,900 AFY)

Direct Potable Reuse

Concept Option
- D1 (5,300 AFY)
Non-potable Reuse Concept Options (A1 – A6)

**Opportunities**
- Near term implementation
- Applicable to all Study Area
- Clear regulations

**Obstacles**
- Limited uses (200-1,200 AFY)
- Pipeline infrastructure
- Enforcement & administrative oversight of customers
NPR Satellite Treatment Plant Concept Option (B1)

**Opportunities**
- Near term implementation
- Clear regulations

**Obstacles**
- Limited uses (900 AFY)
- Pipeline infrastructure
- Treatment infrastructure
- Operational oversight
- Cost prohibitive ($8,900/AF)
Indirect Potable Reuse Concept Options (C1-C3)

Opportunities

• Unlimited uses
• Utilizes RWQCP as larger source of water (5,900 – 6,100 AFY)
• Potential to combine with NPR demands
• Clear regulations

Obstacles

• Treatment, pipeline, injection, & extraction infrastructure
• Requires increased use of groundwater
• Public acceptance
Direct Potable Reuse Concept Option (D1)

**Opportunities**
- Unlimited uses
- Utilizes RWQCP as larger source of water (5,300 AFY)

**Obstacles**
- Treatment & pipeline infrastructure
- Public acceptance
- Undeveloped regulations (2023 or later)
Concept Option Cost Estimates

Non-potable reuse (NPR) (excluding satellite)
- $6M - $85M for infrastructure
- $2,100 – 4,600/AF

Indirect potable reuse (IPR)
- $92M - $198M for infrastructure
- $3,300 - $4,400/AF

Direct potable reuse (DPR)
- $105M for infrastructure
- $2,500/AF

SFPUC Potable Rate (2030)
~$3,000/AF

Groundwater Extraction Rate
~$3,000/AF
## Preliminary Results – Concept Option Costs

<table>
<thead>
<tr>
<th>Concept Option</th>
<th>Yield (AFY)</th>
<th>Capital Cost</th>
<th>O&amp;M ($/Y)</th>
<th>Unit Cost ($/AF)</th>
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<tbody>
<tr>
<td>A1: NPR Palo Alto Phase 3</td>
<td>800</td>
<td>$48M</td>
<td>$0.3M</td>
<td>$3,400</td>
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<td>A2: NPR Palo Alto Phase 3 Extended to Foothills</td>
<td>1,100</td>
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<td>A3: NPR Palo Alto Phase 3 Extended to Foothills and Los Altos</td>
<td>1,200</td>
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<td>A4: NPR Mountain View</td>
<td>200</td>
<td>$6M</td>
<td>$0.1M</td>
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<td>A5: NPR Mountain View Extended to Los Altos</td>
<td>900</td>
<td>$73M</td>
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<td>A6: NPR East Palo Alto</td>
<td>500</td>
<td>$21M</td>
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<td>B1: NPR Satellite Treatment Plant</td>
<td>900</td>
<td>$130M</td>
<td>$1M</td>
<td>$8,900</td>
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<td>C1: Palo Alto Dedicated IPR</td>
<td>5,900</td>
<td>$92M</td>
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<td>C2: Palo Alto IPR with NPR</td>
<td>6,100</td>
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<td>C3: Palo Alto IPR and NPR from Phase 3 Pipeline</td>
<td>5,900</td>
<td>$198M</td>
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<td>D1: Palo Alto Dedicated DPR</td>
<td>5,300</td>
<td>$105M</td>
<td>$8M</td>
<td>$2,500</td>
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Note: Costs based on an ENR CCI San Francisco index for June 2018 of 12015, and represent Class 5 (AACE) estimates with accuracy of -50% to +100%.
Other Criteria Used to Evaluate Concept Options

- Amount of Water Supplied
- Public Acceptance
- Adaptability
- Level of Agency Coordination
- Level of Customer Retrofits/Coordination
- Regulatory Complexity
- Regional Perspective
- Social & Economic Benefit
- Environmental Benefit
Guiding Discussion Questions

1. Do you think Palo Alto should remain 100% dependent upon imported water?

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Next Steps

- Presentation posted to project website:
  https://www.cityofpaloalto.org/gov/depts/utl/residents/resources/water_resources/recycled_water.asp

- Finalize Northwest County Recycled Water Strategic Plan Report

- September 3, 2019 Utilities Advisory Committee

- September 23, 2019 Palo Alto City Council Meeting - Tentative

- 2020 Update Water Integrated Resources Plan

- Questions/comments? Email recycledwater@cityofpaloalto.org
Thanks for Coming!