CLWA Recycled Water Master Plan

WateReuse LA Chapter Meeting @ Castaic Lake Water Agency
October 11, 2016
Recycled Water Master Plan

- Introduction and Background
- Recycled Water Supplies
- Recycled Water Market
- Project Alternatives
- Alternatives Evaluation
- Recommended Project
- Next Steps
Study Goal and Objectives

**Goal:** Update the 2002 Recycled Water Master Plan based on recent developments affecting recycled water sources, supply availability and demand, and explore opportunities to maximize the utilization of recycled water in the Santa Clarita Valley.

**Near-Term Objective:**
- Incorporate updates for Phase 2 Recycled Water System expansion.
- Support upcoming design work.
- Assist in pursuit of currently available grants and loans.

**Mid-Term Objective:**
- Optimize expansion of the non-potable recycled water system.
- Further investigate next steps for potable reuse.

**Long-Term Objective:**
- Continue exploration and/or implementation of potable reuse through surface water augmentation and/or direct potable reuse.
Recycled Water Supply

- **Available RW**: Not all flows can be utilized.
  - Limited Saugus after discharge requirement
  - Limited use near Vista Canyon Water Factory
  - Limited use near Newhall Ranch WRP

**Recycled Water Supply (AFY)**

- **Total Existing**: 7,000 AFY
- **Total Future**: 17,000 AFY
- **Total SCV Supply**: 24,000 AFY

**Projected Available Recycled Water Supply**

- **6.3 mgd**
- **15.3 mgd**

**Assumed Required Discharge = 13 mgd**
Recycled Water Market: Non-Potable Reuse

Irrigation Demands (AFY)

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Total Existing</td>
<td>12,500</td>
</tr>
<tr>
<td>Total Future</td>
<td>8,400</td>
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<tr>
<td>Total SCV Demand</td>
<td>20,900</td>
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</table>

- **Existing demands based on 2013 meter data.**
- **Future demands based on includes planned developments through 2035.**
Future Recycled Water Supply and NPR Demand (2050)

- Future Development RW Demands = 8,400 AFY
- Existing Irrigation Demands = 12,500 AFY
- Santa Clarita Valley Supply = 17,140 AFY

Supply Shortfall for Irrigation

Opportunity for Potable Reuse
Recycled Water Market: Potable Reuse

Potential Benefits
- Local, drought-proof, sustainable supply
- Reduce reliance on imported water
- Use of RW in off-peak irrigation months
- Supply redundancy in case of SWP interruption
- Reduce discharges to the Santa Clara River
- Repurpose unused capacity in the SCVSD AWTF
- Recharge groundwater basin(s)
- Maintain lake levels
- Integrated approach solving multiple issues

Potential Challenges
- High treatment and brine disposal costs
- High conveyance costs
- Additional permitting requirements
- Public acceptance
- Development of partnerships and agreements
- Regulatory uncertainty

<table>
<thead>
<tr>
<th>Potable Reuse Opportunities</th>
<th>Ultimate Demand (AFY)</th>
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<tbody>
<tr>
<td>GWRR Surface Spreading</td>
<td>1,100 to 3,700</td>
</tr>
<tr>
<td>GWRR Direct Injection</td>
<td>4,250</td>
</tr>
<tr>
<td>Surface Water Augmentation</td>
<td>4,250</td>
</tr>
<tr>
<td>Direct Potable Reuse</td>
<td>4,250</td>
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</tbody>
</table>

*The ultimate demand is based on anticipated available supply in 2050 after non-potable demands are served.*
# Project Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Range of Annual Demands (AFY)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative 1 - Non-Potable Reuse Expansion (Phase 2)</td>
<td>Phase 2A, 2B, 2C, 2D</td>
<td>186 to 1,374</td>
</tr>
<tr>
<td>Alternative 2 - Non-Potable Reuse Expansion (Future Phases)</td>
<td>Future Expansion North, Future Expansion South, Westside Communities</td>
<td>1,900 to 7,180</td>
</tr>
<tr>
<td>Alternative 3 - Groundwater Recharge (Surface Spreading)</td>
<td>Spreading Site #1 and/or Spreading Sites #3a/b</td>
<td>1,660 to 3,410</td>
</tr>
<tr>
<td>Alternative 4 - Advanced Treatment for Potable Reuse</td>
<td>GWRR Direct Injection, SW Augmentation Direct Potable Reuse</td>
<td>4,250 to 4,810</td>
</tr>
</tbody>
</table>

* Some of the Alternative 2 project demands include serving Phase 2 demands. There is insufficient supply to meet all demands for Alternatives 1-4
Alternative 1 – Non-Potable Expansion (Phase 2)
Alternative 2 – Non-Potable Expansion (Future)

Future Expansion North (Alignments E-H)

Future Expansion South (Alignments A-D)
Alternatives 1 & 2 – Non-Potable Expansion

- Source Water (Tertiary)
  - Valencia WRP……… ..............Existing Phase 1, Phase 2a, 2c, 2d, Future Expansions North/South, Part of Westside Communities
  - Newhall Ranch WRP…….........Part of Westside Communities
  - Vista Canyon Water Factory….Phase 2b

- Limitations
  - Total NPR Demand in SCV
  - Available supply in summer limits future expansion
Alternative 1 – Engineers Opinion of Probable Costs

- Highest flow
- Lowest unit cost

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Capital Cost ($mil)</th>
</tr>
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<tbody>
<tr>
<td>Alt 1 - Phase 2A Bouquet Canyon Road</td>
<td>$20.2</td>
</tr>
<tr>
<td>Alt 1 - Phase 2A Central Park South w/o Tank</td>
<td>$23.6</td>
</tr>
<tr>
<td>Alt 1 - Phase 2A Central Park South w/ Tank</td>
<td>$24.8</td>
</tr>
<tr>
<td>Alt 1 - Phase 2B Combined SCWD + Vista Canyon</td>
<td>$6.7</td>
</tr>
<tr>
<td>Alt 1 - Phase 2C VWC + NCWD Extensions</td>
<td>$23.5</td>
</tr>
<tr>
<td>Alt 1 - Phase 2D VWC Extension</td>
<td>$3.3</td>
</tr>
</tbody>
</table>
Alternative 2 – Engineers Opinion of Probable Costs

- Highest flow
- Lowest unit cost

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Capital Cost ($mil)</th>
<th>Annual O&amp;M Cost ($/AF)</th>
<th>Annualized* Buildout Unit Construction Cost ($/AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alt 2 - Phase 2A + Future Expansion North</td>
<td>$77</td>
<td>$600</td>
<td></td>
</tr>
<tr>
<td>Alt 2 - Phase 2C + Future Expansion South</td>
<td>$71</td>
<td>$490</td>
<td></td>
</tr>
</tbody>
</table>
| Alt 2 - Westside Communities** | $123 | $300 | $1,000

*(Capital Construction Costs are assumed to be paid for by the developer)*

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Alternative 3 – GWRR via Surface Spreading Site #1

- Booster Pump Station (potential site)
- Phase 2a Alignment
- Alignment to IPR
- Pipeline btw Basins
- Recharge Basin
- SCR Diversion
Alternative 3 – GWRR via Surface Spreading Site #3a/b

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Alternative 3 – GWRR via Surface Spreading Site #1, #3a/b

- Pump Stations (potential sites)
- Existing Honby Pump Station
- Recharge Basin
- SCR Diversion
- Proposed Phase 2a Alignment
- Alignment to Recharge Location #3
- Existing 14”-dia Honby Pipeline
- Existing 30-33”-dia Honby Lateral alignment
Alternative 3 – GWRR via Surface Spreading

■ Source Water
  ● Tertiary RW from Valencia WRP
  ● Advanced Treated RW from SCVSD Chloride Compliance Project
    (Valencia Blend = 70% Tertiary + 30% AWTF)

■ Limitations
  ● Available supply of RW
  ● Prioritize stormwater capture for recharge

■ Other Considerations
  ● Diluent water source (underflow)
  ● Interagency agreements (LACFCD)
  ● Groundwater management and operations
  ● Land acquisition
Alternative 3 – Engineers Opinion of Probable Costs

✓ High flow
✓ Lowest unit cost

Capital Cost ($mil)

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<tr>
<th>Alternative</th>
<th>Capital Cost ($mil)</th>
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</thead>
<tbody>
<tr>
<td>Alt 3 - Phase 2A + Spreading Site #1</td>
<td>$76</td>
</tr>
<tr>
<td>Alt 3 - Phase 2A + Spreading Site #3a</td>
<td>$95</td>
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<tr>
<td>Alt 3 - Phase 2A + Spreading Site #3b</td>
<td>$108</td>
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<tr>
<td>Alt 3 - Phase 2A + Spreading Site #3b (Repurpose Infrastructure)</td>
<td>$62</td>
</tr>
<tr>
<td>Alt 3 - Phase 2A + Spreading Sites #1 &amp; #3b (Repurpose Infrastructure)</td>
<td>$98</td>
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</tbody>
</table>
Alternative 4 – GWRR via Direct Injection

- **Source Water**
  - 100% Advanced Treatment of Valencia WRP

- **Other Considerations**
  - Brine disposal
  - AWTF siting
  - Injection well siting
Alternative 4 – Surface Water Augmentation

- **Source Water**
  - 100% Advanced Treatment of Valencia WRP

- **Limitations**
  - Meeting 6-month retention time

- **Other Considerations**
  - Brine disposal
  - AWTF siting
  - Interagency Agreements
  - Regulatory Uncertainty
Alternative 4 – Direct Potable Reuse

- **Source Water**
  - 100% Advanced Treatment of Valencia WRP

- **Other Considerations**
  - Brine disposal
  - AWTF siting
  - Regulatory Uncertainty
Alternative 4 – Engineers Opinion of Probable Costs

- Highest flow
- Lowest unit cost

<table>
<thead>
<tr>
<th>Capital Cost (Smil)</th>
<th>$279</th>
<th>$262</th>
<th>$283</th>
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</thead>
</table>

- Annual O&M Cost ($/AF)
- Annualized Buildout Unit Construction Cost ($/AF)
- Ave Annual Reuse at Startup - 2025 (AFY)
- Ave Annual Reuse at Buildout - 2050 (AFY)
# Alternative Evaluation

<table>
<thead>
<tr>
<th>Considerations</th>
<th>High Performing / Few Issues</th>
<th>Low Performing / More Issues</th>
</tr>
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<tbody>
<tr>
<td><strong>Cost Comparison</strong></td>
<td>Lowest $ = Alt 2 (Westside Com.)</td>
<td>Highest $ = Alt 4 (DPR)</td>
</tr>
<tr>
<td></td>
<td>Low $ = Alt 1 (Phase 2B, 2C, 2D)</td>
<td>High $ = Alt 4 (SWA, Direct Inject)</td>
</tr>
<tr>
<td><strong>Water Supply Availability</strong></td>
<td>Sufficient = Alt 1 and Alt 4</td>
<td>Uncertain / Limited = Alt 2 and Alt 3</td>
</tr>
<tr>
<td><strong>Readiness to Proceed</strong></td>
<td>In Progress = Alt 1</td>
<td>Dependencies = Alt 2 (Supply/New Developments), Alt 3 and Alt 4 (Feasibility Study)</td>
</tr>
<tr>
<td><strong>Permittability</strong></td>
<td>Current Permit = NPR (Alt 1 and 2)</td>
<td>Uncertain Permit Requirements = SWA / DPR (Alt 4)</td>
</tr>
<tr>
<td></td>
<td>New Permit = GWRR (Alt 3 and 4)</td>
<td></td>
</tr>
<tr>
<td>**Required Agency Coordination/</td>
<td>Minimal = NPR (Alt 1 and 2)</td>
<td>Greater = Alt 3 and Alt 4</td>
</tr>
<tr>
<td>Collaboration**</td>
<td></td>
<td></td>
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<tr>
<td><strong>Ease of Implementation</strong></td>
<td>Easiest = NPR (Alt 1 and 2)</td>
<td>Hardest = Alt 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Challenging = Alt 3</td>
</tr>
<tr>
<td><strong>Environmental Considerations</strong></td>
<td>To be addressed in the Programmatic EIR</td>
<td></td>
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Decision Flow Process

Alternative 1 – Non-Potable Reuse Expansion (Phase 2)

- Phase 2A
- Phase 2B
- Phase 2C
- Phase 2D

Alternative 3 – Groundwater Recharge

GRR Feasibility Study

Near-Term Projects (Next 5 years)
**Decision Flow Process**

**Near-Term Projects (Next 5 years)**
- Alternative 1 – Non-Potable Reuse Expansion (Phase 2)
  - Phase 2B
  - Phase 2C
  - Phase 2D
- Alternative 3 – Groundwater Recharge
  - GRR Feasibility Study

**Mid-Term Projects (5 to 10 years)**
- Alternative 2 - Non-Potable Reuse Expansion (Future Phases)
- Alternative 4 – Advanced Treatment for Potable Reuse
  - DPR Feasibility Study

**Westside Communities**
- Is Westside Communities Ready to Go?
  - Yes → Westside Communities
  - No → Future Expansion North

**Surface Spreading Project**
- Is GRR Feasible
  - Yes → GRR Feasibility Study
  - No → No Future Expansion North

**Surface Spreading Project**
- Surface Spreading Project
  - DPR Feasibility Study

**North DPR Feasibility Study**
- Interdependent
Alternative 1 - Non-Potable Reuse Expansion (Phase 2)

Alternative 2 - Non-Potable Reuse Expansion (Future Phases)

Alternative 3 - Groundwater Recharge

Mid-Term Projects (5 to 10 years)

Is Westside Communities Ready to Go?

Yes: Westside Communities

No: Future Expansion North

Is GRR Feasible?

Yes: GRR Feasibility Study

No: Explore other Water Supplies

Long-Term Projects (>10 years)

Is DPR Feasible?

Yes: Direct Potable Reuse

No: Explore other Water Supplies

Other Dependencies
- Future SCR Discharge Requirements
- Stormwater Diversion Requirements
- Timing of New Developments
- Interagency Agreements
- Public Acceptance
- Political Climate
- Land Purchase
Recommended Project

- **Implement Phases 2B, 2C and 2D of Alternative 1 Non-Potable Reuse Expansion Projects**
  - Total Demand = 1,860AFY

- **Complete preliminary design and environmental work for Phase 2A of Alternative 1 - Non-Potable Reuse Expansion Project.**
  - Total Demand = 560 AFY

- **Initiate a GRR Feasibility Study** to evaluate the viability of Alternative 3 GRR projects.
  - Total Recharge = 1,100 to 3,700 AFY
# Phasing Plan

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<tbody>
<tr>
<td>Project</td>
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<td>1Q 2Q 3Q 4Q</td>
<td>1Q 2Q 3Q 4Q</td>
<td>1Q 2Q 3Q 4Q</td>
<td>1Q 2Q 3Q 4Q</td>
<td>1Q 2Q 3Q 4Q</td>
<td>1Q 2Q 3Q 4Q</td>
<td>1Q 2Q 3Q 4Q</td>
<td>1Q 2Q 3Q 4Q</td>
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## Recommended Project

**Phase 2B**
- P
- D
- C
- S

**Phase 2D**
- P
- D
- C
- S

**Phase 2C**
- P
- D
- ROW
- D
- C
- S

**Phase 2A**
- P
- D
- D
- C
- S

**GRR Feasibility Study**
- FS

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**Legend**

Feasibility Study (FS)
- Planning Phase (P)
- Design Phase (D)
- ROW Land Acquisition (ROW)
- Construction (C)
- Conversions-Start-up (S)

Decision Point on Feasibility
- Interdependence

Alternate Path if NOT Feasible
- Explore DPR

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Next Steps

- Implement Phase 2 Projects
- Development of Agreements for Phase 2 Projects
- Initiate GRR Feasibility Study
- Track Chloride Compliance Project outcomes (instream flow requirements)
QUESTIONS