Subregional Approach to Water Reuse

Presented by:
Andrew Gilmore, P.E.
Who is Victor Valley Wastewater Reclamation Authority?
Who is VVWRA?
VVWRA Service Area

- 215 sq. miles
- 200,000 residents
- 40.5 miles sewers
- 2 pump stations
- 1 regional WRP
- 18 mgd
VWWR from Centralized Treatment to Subregional Approach
Subregional Approach

Objectives

To conserve potable water

To reduce dependency on groundwater

Implement regional water planning goals
Subregional Approach Objectives

- Relieve pressure on main interceptors
- Benefit Member Agencies - reuse
- Provide additional treatment and collection capacity
- Reduces need to expand Regional WRP
Elements of the Subregional Project
Subregional Project Elements

Town of Apple Valley

01. WRP, 1 mgd initial 4 mgd ultimate
02. Modifications to existing Lift Station
03. Conversion force main to reuse line
04. Sewer force main (WAS and excess)
05. Percolation basins at golf course
Apple Valley WRP Was Sited in Brewster Park

Existing Homes

Existing Park
Otoe Rd lift station

Existing sewer force main to be reused for reclaimed water

Apple Valley WRP

New reclaimed water force main to Golf Course

New sewer forcemain

POC to existing sewer
Subregional Project Elements
City of Hesperia

01 WRP, 1 mgd initial 4 mgd ultimate
02 Diversion from interceptor
03 Lift Station
04 Force Main
05 WAS force main
06 Percolation basins
07 Offsite Improvements
Hesperia WRP Will be Located in Residential Area

- Offsite Improvements
- Future Homes
- Existing Homes
- Existing Retention Basin
Subregional WRPs Will Produce High Quality Recycled Water

CA Title 22
Disinfected Tertiary Recycled Water
## Title 22 Reclaimed Water Quality with a Twist

<table>
<thead>
<tr>
<th>Parameter</th>
<th>VWWRA Proposed Effluent Limit</th>
<th>Title 22 Water Recycling Criteria</th>
<th>Draft Regulation for Groundwater Recharge Reuse</th>
<th>Recommended Effluent Design Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH</strong></td>
<td>6.5 - 8.5</td>
<td>--</td>
<td>--</td>
<td>6.5 - 8.5</td>
</tr>
<tr>
<td><strong>BOD₅ (mg/L)</strong></td>
<td></td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Avg. Monthly</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Avg. Weekly</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Max. Daily</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>TSS (mg/L)</strong></td>
<td></td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Avg. Monthly</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Avg. Weekly</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Max. Daily</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Total N (mg/L)</strong></td>
<td></td>
<td>--</td>
<td>5</td>
<td>8 / 4</td>
</tr>
<tr>
<td><strong>Turbidity (NTU)</strong></td>
<td></td>
<td>--</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>24-hr 5% of time sample max.</td>
<td></td>
<td>0.2</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Any time max.</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td><strong>Total Coliform (CFU/100 mL)</strong></td>
<td></td>
<td>--</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>7-day median max.</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>30-day one sample max.</td>
<td>23</td>
<td>23</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Single sample max. any time</td>
<td></td>
<td>240</td>
<td>240</td>
<td></td>
</tr>
</tbody>
</table>
Unique Design Approach Used
One-Plant Concept

1. Two separate plants
2. One set of construction documents & One Contractor
3. One design for both Member Agencies
4. Benefits
   - Streamlined design development & reviews
   - Reduced design & construction costs
   - Common operations & maintenance
   - Shared training, spare parts, consumable
Both WRPs Were Developed as One Design Model
Brief History of the Path to the Subregionals

1994

Sewer Master Plan
Includes Subregional WRPs
Logan Olds
Hired as General Manager

RFP Issued for WRP Design

Carollo
Carollo Begins Prelim Design
Percolation and Reuse Design Added

WRPs at 100% Design

2011

2012

Member Agency Conditional Use Permit Conditions Addressed

2013
Bidding Phase Commences

Funding Obtained

2014 June

2014 July
2011
WRPs at 100% Design

2012
Percolation and Reuse Design Added

2013
Member Agency Conditional Use Permit Conditions Addressed

June 2014
Funding Obtained

July 2014
Bidding Phase Commences

20 Years in the Making
Funding Approach

- State Revolving Funds
- Bureau of Reclamation
- Prop 84
- Mohave Water Agency
VWVRA Obtained $12M in Funding

- Prop 84: $3,000,000
- SRF: $4,000,000
- BOR: $5,000,000
Public Outreach and Member Agency Approvals
Apple Valley WRP Incorporated Existing Facilities
Focus on Blending into Park Settings
What will I smell?

What will I hear?

What are the chemical hazards that could spill into our communities?

What will I see?

Will there be fecal matter in the air?

Hesperia Community Comments
Odor Control Approach
Screens and screening dumpster enclosed in building with odor control

Bleach and citric acid inside building with full containment

Biological treatment basins fully covered

Full odor control utilizing natural processes no chemicals required

Membrane blowers in sound enclosures below ground and within a concrete basement

Submerged membrane feed pumps to reduce noise

Aeration blowers in sound enclosures below ground and within a concrete basement
Hesperia WRP Proximity to Homes
Illustration of Height of WRP
Site of Screening of Perc Ponds
View of WRP
Entrance
View as Residents
Leave for Work
View as Residents Head Home from Work
Questions
agilmore@carollo.com
Thank You