San Francisco Public Utilities Commission

Water: Delivering high quality water every day

Power: Generating clean energy for vital City services

Sewer: Protecting public health and the environment
Our Mission

To provide our customers with high-quality, efficient, and reliable water, power, and wastewater services in a manner that values environmental and community interests and sustains the resources entrusted to our care.
Our Hetch Hetchy Regional Water & Power System

Provides high-quality water for 2.6 million people
197 million gallons per day
Gravity-fed engineering marvel
Generates clean energy for the City’s vital services
Water System Improvement Program

• 4.8 Billion Dollar Program
• Multi-Year Capital Program to Upgrade SFPUC’s Regional and Local Water Systems
• 83 Projects
• San Francisco Groundwater Supply Project
• Regional Groundwater Storage and Recovery Project
Westside Groundwater Basin
2014 Sustainable Groundwater Management Act

- Emphasis on Local Control
- 20 Years to Obtain Sustainability Goals
- SGMA Requirements:
  - Local Agencies form a Local Groundwater Sustainability Agencies (GSAs)
  - High and Medium-Priority Basins must adopt Groundwater Sustainability Plans (GSPs)
SFPUC Groundwater Projects

• San Francisco Groundwater Supply (SFGW) Project
  – Additional water supply
  – 4 MGD Pumping
  – Continuous

• Regional Groundwater Storage and Recovery (GSR) Project
  – Put/Take/Hold Sequence
  – Design Capacity is 7.2 MGD over a 7.5 year drought
  – Full SFPUC Storage Account of 60,500 acre-feet

SF Groundwater Supply Project Overview

Project includes installation of:

- 6 drinking water wells
- 5 miles of new pipelines
- Pumping will start at 1 mgd and slowly ramp up by approximately 1 mgd/yr
- Groundwater will be blended with SFPUC regional water supplies at 2 reservoirs
- Blended water will be distributed throughout the City
Well Station Overview
## Table 4: SFGW Well Treatment Provided

<table>
<thead>
<tr>
<th>Well Name/Number</th>
<th>Site Name</th>
<th>Chlorination</th>
<th>Chromium VI Blending</th>
<th>Nitrate Blending</th>
<th>pH Adjustment</th>
<th>Manganese Blending</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Sunset</td>
<td>GGP/Sunset Well Field</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>West Sunset</td>
<td>GGP/Sunset Well Field</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>GGP Central</td>
<td>GGP/Sunset Well Field</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>South Windmill Replacement</td>
<td>GGP/Sunset Well Field</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>North Lake</td>
<td>GGP/Sunset Well Field</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Lake Merced</td>
<td>Lake Merced</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Notes: GGP = Golden Gate Park
Adaptive Management Approach to Project Operations

- Pumping will start at 1 mgd and ramp up by approximately 1 mgd per year
- We will closely monitor how Lake Merced and the groundwater basin respond
- Pumping rates will be adjusted, as needed, to maintain:
  - Health of Lake Merced
  - Appropriate groundwater levels
  - Groundwater quality in coastal monitoring wells
Community Outreach
• Direct interactions at various venues with over 700 Participants
• Sampling of Groundwater Blend

Media Coverage (print/TV/radio stories)

Currents/Digital Currents (utility bill inserts/newsletter)

Planning Dept. mailings

Fact Sheets
Regional Groundwater Storage and Recovery Project

- Conjunctive Use Project
- Partner Agencies:
  - City of Daly City (6 wells)
  - California Water Service (6 wells)
  - City of San Bruno (4 wells)
- 7.2 MGD dry year supply over 7.5 years
- 60,500 acre feet water savings account – similar in volume to Crystal Springs Reservoir
Project Vicinity Map

Legend
- Partner Agency Wells
- Proposed Project Well Facility Sites
- County Boundary
- Cal Water Service Co. Service Area
- Daly City Water Service Area
- San Bruno Water Service Area
- North Westside Groundwater Basin
- South Westside Groundwater Basin
Water Savings Account is Created by Storing Water in Wet Years, and Pumping in Dry Years.

1. Initial groundwater level
2. Groundwater fills storage space
3. Groundwater is pumped from storage
GSR Operating Agreement

- In-Lieu Water Delivery in Wet and Normal Years
- Water Bill credits for In-Lieu Water Delivered
- GSR Project Pumping in Drought Years
- Emergency Use
- GSR Storage Account – accounting for basin losses
Groundwater Level Responses

1. Initial Conditions, No Project
2. Put/Hold Years
3. Take Years, First Three Years of Drought
4. Take Years, Drought Longer than Three Years
5. Storage after Drought (Put/Hold Years)
In-Lieu Recharge Works in the South Westside Basin

- Background monitoring period: 2.0 mgd pumpage
- Temporary interruption of in-lieu recharge: 2.9 mgd pumpage
- Initiation of in-lieu recharge: 1.1 mgd pumpage
- Resumption of in-lieu recharge: 1.1 mgd pumpage
### GSR Wells Connecting to SFPUC Regional Water System

<table>
<thead>
<tr>
<th>Pipeline</th>
<th>No. of Wells Connecting</th>
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<tbody>
<tr>
<td>SAPL2</td>
<td>5</td>
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<tr>
<td>SAPL3</td>
<td>1</td>
</tr>
<tr>
<td>CSPL2</td>
<td>2</td>
</tr>
<tr>
<td>SSPL</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>9</strong></td>
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</tbody>
</table>
Wells Pumping in Close Vicinity Can Affect Groundwater Levels

Cone of depression for just irrigation well pumping

Lower combined cone of depression for both irrigation well and proposed GSR well pumping
GSR Project Sites in Daly City: Benjamin Franklin Intermediate School Site

Construction Limits

Well Station

Benjamin Franklin Intermediate School
GSR Project Sites in Colma: Serramonte Boulevard
Ben Franklin Site in Daly City
Linear Park Site in South San Francisco
Note: Well CUP-7 in Daly City has been identified as redundant and is not shown on this figure.
Simplified Overall GRS Well Station System Configuration
Typical Individual Well Station Configuration

CV = CHECK VALVE
GV = GATE VALVE
D/S = DOWNSTREAM
U/S = UPSTREAM
# GSR Well Treatment Summary

<table>
<thead>
<tr>
<th>SFRWS-GSR Well Station</th>
<th>Well ID</th>
<th>Chloramination</th>
<th>pH Adjustment</th>
<th>Fluoridation</th>
<th>Manganese Treatment</th>
<th>Chromium VI Treatment</th>
<th>Nitrate Treatment</th>
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</thead>
<tbody>
<tr>
<td>Lake Merced GC</td>
<td>GSR-LGW</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Colma BART</td>
<td>GSR-SBW</td>
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<td>X</td>
<td>X</td>
<td>Provision for Future Filtration</td>
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<td></td>
<td>GSR-CRW</td>
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<td>X</td>
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<td></td>
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<tr>
<td></td>
<td>GSR-CBW</td>
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<td></td>
<td>X</td>
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<tr>
<td>Serramonte</td>
<td>GSR-SRW</td>
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<td>X</td>
<td>X</td>
<td>Provision for Future Filtration</td>
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<td>X</td>
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<tr>
<td>Hickey</td>
<td>GSR-HBW</td>
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<td>X</td>
<td>X</td>
<td>Provision for Future Filtration</td>
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<td>X</td>
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<tr>
<td>TI Trailer Court</td>
<td>GSR-TIW</td>
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<td>X</td>
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<tr>
<td>Funeral Home</td>
<td>GSR-FHW</td>
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<td></td>
<td>X</td>
<td>(Blending Treatment)</td>
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<td>Millbrae Yard</td>
<td>GSR-MYW</td>
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<tr>
<td></td>
<td>GSR-LLW</td>
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<td></td>
<td>X</td>
<td></td>
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</tbody>
</table>
Blending Operations Strategy Approved by SWRCB

- In-line volumetric blending
- Flow meters in transmission pipelines will verify minimum surface water flow is maintained
- If minimum flow is not achieved, well will automatically be shut down
- Periodic WQ sampling will confirm blending meets MCLs
Chrome 6 Blending Treatment in the Regional Transmission Pipelines
## GSR Operational Monitoring

<table>
<thead>
<tr>
<th>Operational Monitoring</th>
<th>Sample</th>
<th>Frequency</th>
<th>Operational Target</th>
<th>Operational Notification Setpoints</th>
<th>DDW Violation Notification Levels</th>
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<tbody>
<tr>
<td>Free Chlorine in GW</td>
<td>Online</td>
<td>-</td>
<td>2.5 mg/L</td>
<td>Lo = 2.0 mg/L Hi = 4.0 mg/L</td>
<td>&gt;4.0 mg/L (in BW)</td>
</tr>
<tr>
<td></td>
<td>Grab*</td>
<td>Weekly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Chlorine in GW</td>
<td>Online</td>
<td>-</td>
<td>2.2 – 2.8 mg/L</td>
<td>Lo = 2.0 mg/L Hi = 4.0 mg/L</td>
<td>&gt;4.0 mg/L (in BW)</td>
</tr>
<tr>
<td></td>
<td>Grab*</td>
<td>Weekly</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Fluoride in GW</td>
<td>Online</td>
<td>-</td>
<td>0.7 mg/L</td>
<td>Lo = 0.6 mg/L Hi = 1.5 mg/L</td>
<td>&gt;10 mg/L (in BW)</td>
</tr>
<tr>
<td></td>
<td>Grab*</td>
<td>Weekly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manganese in GW</td>
<td>Grab</td>
<td>Weekly</td>
<td>&lt;0.015 mg/L</td>
<td>Hi = 0.03 mg/L</td>
<td>&gt;0.05 mg/L (in BW)</td>
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<tr>
<td>Chrome-6 in BW</td>
<td>Calculated</td>
<td>-</td>
<td>&lt;4 µg/L</td>
<td>Hi = 4 µg/L Hi-Hi = 5 µg/L</td>
<td>&gt;10 µg/L (in BW)</td>
</tr>
<tr>
<td></td>
<td>Grab*</td>
<td>Weekly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrate in BW</td>
<td>Calculated</td>
<td>-</td>
<td>&lt;4 mg/L</td>
<td>Hi = 4 mg/L Hi-Hi = 5 mg/L</td>
<td>&gt;10 mg/L (in BW)</td>
</tr>
<tr>
<td></td>
<td>Grab*</td>
<td>Weekly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH in BW</td>
<td>Grab</td>
<td>Bi-Weekly</td>
<td>8.6 – 9.8</td>
<td>Lo = 8.4 Hi = 10.0</td>
<td>&lt;8.2 (in BW)</td>
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</table>
Example at CCP with Variable SAPL2 Flow Rates