Wastewater Perspectives: The End is Nigh

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Silicon Valley Clean Water

- Wastewater conveyance, treatment, and disposal for 4 member agencies
- 9 miles of conveyance pipeline
- 5 pump stations
- Permitted treatment capacity 29 mgd; currently treat ~ 13 mgd
- Recycled water for Redwood City
- 1.3 miles discharge pipe to S. F. Bay
the process

1. Primary Sedimentation:
   - Setting and removal of solids

2. Primary Treatment:
   - First step of biological treatment where bacteria consume most of the organic material in the wastewater

3. Secondary Treatment:
   - Several steps of biological treatment - air is pumped into the tanks to provide oxygen for microorganisms to consume biodegradable material

4. Aerobic Bacteria:
   - Recycle water to separate activated sludge from wastewater

5. Clarification:
   - Finely susected solids and anaerobic solids remove most of the remaining suspended particles

6. Digestion:
   - Denitri fiert/selector to kill the remaining bacteria

7. Recycled Water:
   - Used for landscape irrigation in the SVCW service area

8. Solids Conditioning:
   - Sludge is thickened with a rotary drum and gravity belt thickener before being put into the digester to generate biogas

9. Anaerobic Digestion:
   - Stabilizes the solids and reduces odor and pathogens - the final product is biogas and methane gas

10. Dewatering Process:
    - Water is removed from the solids before they are used as soil conditioners, compost or AGC.

Landfill Daily Cover
Agricultural Reuse
Landscape Irrigation
San Francisco Bay

Recycled Water

Silicon Valley Clean Water
One Drop at a Time
Efforts Towards Sustainability

- Reducing Energy Use
  - Aerators
  - Battery Storage
  - Gravity Sewer
  - Solar Drying
  - Biosolids

- BioGas Production
  - Digesters
  - Produce Biogas
  - Similar to a Human Stomach

- Electricity from BioGas
  - Cogeneration
  - 75% Plant Electricity Use
  - Export Capability

- Organics from Solid Waste
  - Partner with SBWMA

- Fats Oils and Greases from Restaurant
  - Deliveries from Restaurants
  - Keeping Resources Local

- Biological Drying to BioChar
  - Byproduct of Biosolids Drying
  - Myriad of Uses

- Recycled Water
  - Delivery in Redwood City
  - Partner via PREP
  - Expanding Reuse
Energy Reduction

- Decommission 3 of 5 Pump Stations
- Convert Pumped Flow to Gravity Flow
- New 3.3 mile Tunnel
- Reducing Impact to Community
Sustainability/Response to Climate Change

Sea Level Rise Response

Main Utility Feed

Battery Storage
Thank You...

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Wastewater Perspectives: The End is Nigh!

Hossein Ashktorab, Ph.D.
Manager, Recycled and Purified Water
Santa Clara Valley Water District (Valley Water)

Sustainable Silicon Valley’s Rains to Bay
May 29, 2019
Valley Water: Who we are...

Providing Silicon Valley safe, clean water for a healthy life, environment and economy

- **2 million people**
- **15 cities**
- **4,700 well owners**
- **13 water retailers**
- **5 watersheds**

**CLEAN, RELIABLE WATER**

**FLOOD PROTECTION**

**HEALTHY CREEKS & ECOSYSTEMS**
Wastewater available vs. recycled water use (CY 2018)

Where we are

Recycled Water Goals

- SBWR (11%)
  - Wastewater: 12,572
  - Recycled Water: 2,478
- Palo Alto (12%)
  - Wastewater: 20,166
  - Recycled Water: 803
- Sunnyvale (6%)
  - Wastewater: 13,989
  - Recycled Water: 6,810
- SCRWA (29%)
  - Wastewater: 1,996
  - Recycled Water: 1,996

- 2015: 714,000
- 2020: 1.5 million
- 2030: 2.5 million
Recycled and Purified Water Goals

- Up to 45,000 AFY PR by 2035
- Board Drought Response Target

- 24,000 AFY of PR by 2028
- Draft 2017 WSMP Goal
- Goal E-2, >10% reuse

- Potable Reuse (PR)
- Non-Potable Recycled Water (irrigation, industrial and dual-plumbing)

Rev. MS
2/19/2019
Path to Potable Reuse
Changing the public perception of water reuse

After communicating the safety and benefits of potable reuse, support rises to three-quarters and opposition drops back to under a quarter.

- Initial Support: Support 66%, Somewhat 34%
- Support After Definition: Support 63%
- Support After Information: Support 74%
Path to potable reuse…

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Wastewater as a Resource

Karin North, Manager, Watershed Protection
Regional Water Quality Control Plant
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Current Local Recycled (non-potable) 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 recycled water for non-potable uses in Mountain View and Palo Alto
  - Landscape irrigation
  - Toilet flushing
Regional Water Quality Control Plant (~20,000 AFY)

Los Altos: 10%
Stanford: 7%
EP ASD: 7%
Los Alito Hills: 2%

Mountain View: 39%
Los Altos Hills: 7%
Mountain View & Palo Alto: 7%
Renzel Marsh: 2%

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

Non-potable Reuse (~1,000 AFY)
Considerations for Onsite Reuse Systems

- Utilize existing municipal recycled water system
- Increased load to municipal wastewater
- Decreased flow in collection system
- Decreased flow overall to the treatment plant; increase concentration of pollutants
Loads Increasing – Flows Decreasing
Potential Reuse Alternatives for Palo Alto

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

Indirect potable reuse (IPR)
Å Groundwater Augmentation – Purified water used to augment groundwater supplies

Direct potable reuse (DPR)
Å Treated Water Augmentation – Purified water used to augment drinking water distribution system
Green Stormwater Infrastructure (GSI)

Engineering design – based on natural processes
GSI Plan Vision

GRAY – traditional approach

Transforming / Supplementing SD System

GREEN – natural processes

* Meet regulatory requirements
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