



Public Works Commission Meeting Underground Storage Facility Alternatives Process & Progress Update

September 2016



Purpose – Address Questions

- What is the best SSO prevention alternative?
- Where should Underground Storage Facilities be located?
- Can Underground Storage Facilities be built with proven odor, noise and nuisances controls?
- How often are the Underground Storage Facilities operated?
- What type of wastewater will be handled by these facilities?
- Where are we in the Selection Process?
- Can the construction approach minimize noise, vibrations, odors, public site usage, and traffic impacts?
- Can a Constructed Underground Storage Facilities offer enhanced above ground options for Public and Private use?



Meeting Format

- Open Discussion With Commission After Each of Four Topic Areas:
 - Topic 1 - What is the Clean Water Program
 - Topic 2 - How Does San Mateo's Sewer System Work – Today and with Underground Storage Facility with Odor Control
 - Topic 3 – Location Selection Process for Underground Storage
 - Topic 4 - What are Related Construction Impacts to Parks and Other Locations
- Receive Commissioners Questions and Feedback After Each Topic
- Receive Community Feedback At End Of Presentation
- Input **Both** into Location Selection Process
- Provide Our Team after Commission Meeting to Public for further questions and feedback



Here to Receive
Inputs and
Feedback from
Commissioners
and Public

Recent Public Notification Methods Used



- Mailed Community Meeting Invitations to Properties (City-Wide, property owners & physical addresses) [mailed first-class, delivered to Post Office on 8/4/16]
- Sent Invitations to City Council and Boards/Commission (Public Works Commission, Parks and Recreation Commission, Sustainability Commission, and Planning Commission) [8/9/2016]
- Updated Clean Water Program (CWP) Website “Upcoming Events” Section [8/9/16]
- Updated City Website [8/9/16]
- Emailed CWP Email List (Notify Me) [8/9/16]
- Emailed HOAs and Neighborhood Associations [8/9/16]
- Posted on NextDoor.com Social Media Site [8/9/16]
- Distributed Press Release to Various Media Contacts [8/11/16]



August Public Meetings Input Summary

Overview:

- 100+ attendees at the August public meetings
- 40+ public inquiries by phone, email and CW website

Primary Concerns

- Impacts to park sites/loss of use
- Proximity to residences and schools
- Odor and Health concerns
- Mail notices: content and timeliness of delivery
- Opportunities for public input/decision-making process (why these 5 alternatives?)









Clarifications

- What is the difference in cost between Full Conveyance and In System Storage?
- What is the Underground Storage Construction Schedule?
- Where do we go from here?

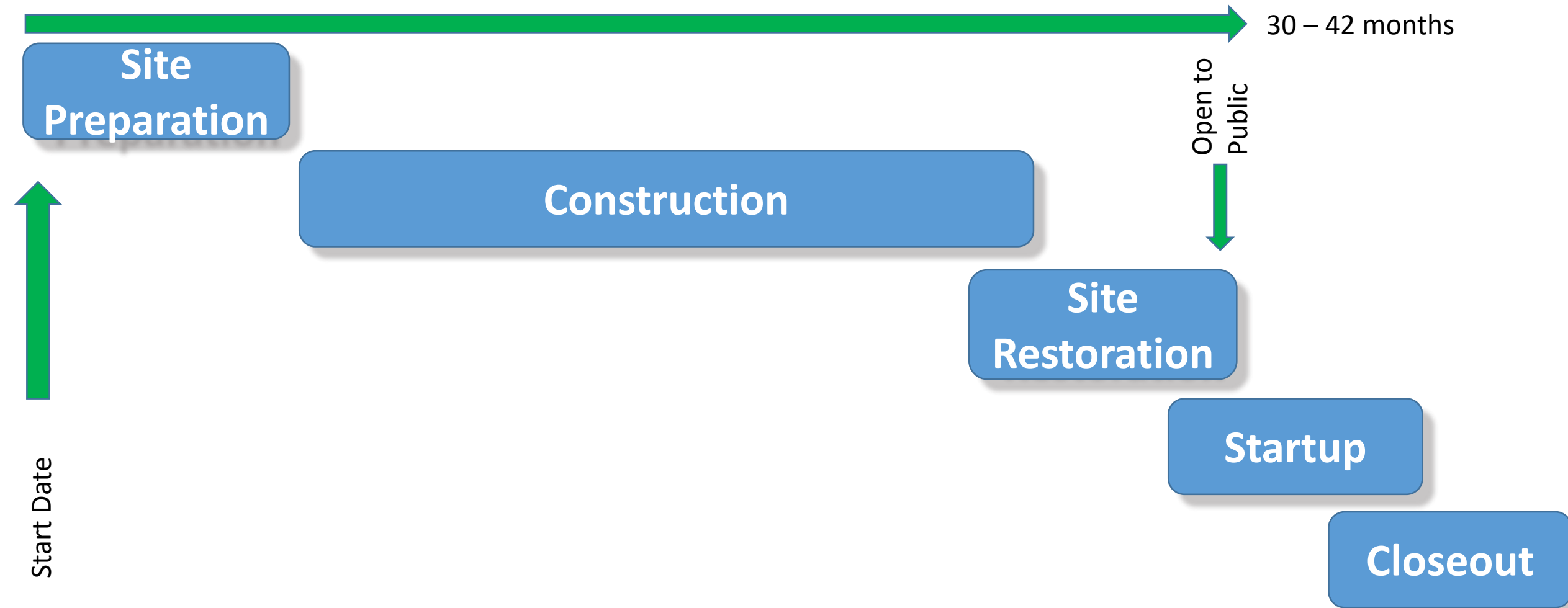


What is the difference in cost between Full Conveyance and In System Storage?

WWTP Alternatives	Full Conveyance	In System Storage	
Alternative 1			
Alternative 2			\$30M
Alternative 3			\$150M



What is the Underground Storage Construction Schedule?



Entire Schedule could vary from 3 to 4 years based on site selected

Where do we go from here?

- Proceed with Community Meetings on October 4th and 6th
- Determine path forward after those meetings



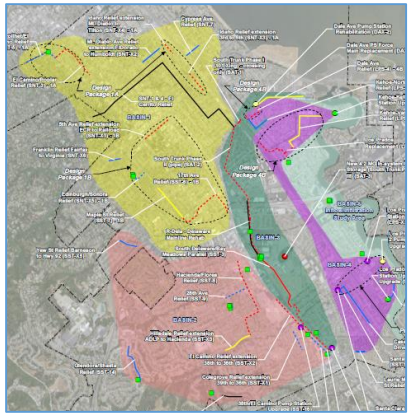
Topic 1

What is the Clean Water Program



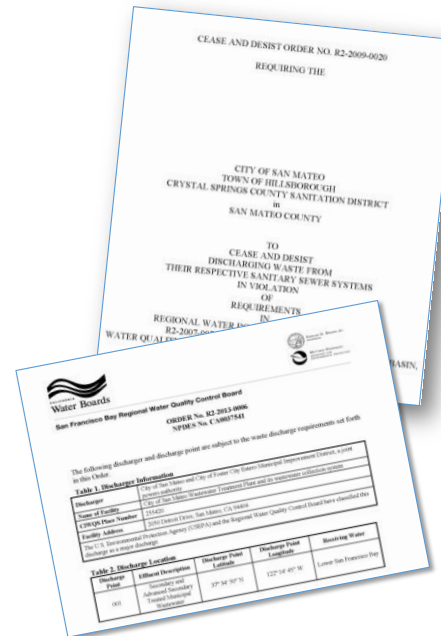
Clean Water Program – Drivers & Goals

Replace Aging Infrastructure



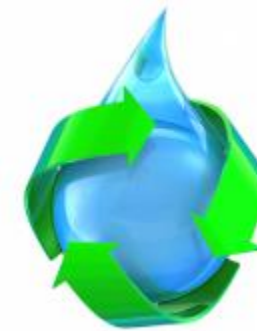
Collection System

Provide Higher Levels of Treatment & Capacity Assurance



RWQCB Cease & Desist Order
NPDES Permit

Address Sustainability, Climate Change, & Biosolids/Energy



Water Re-Use Partnerships

WWTP



Institute for Sustainable Infrastructure

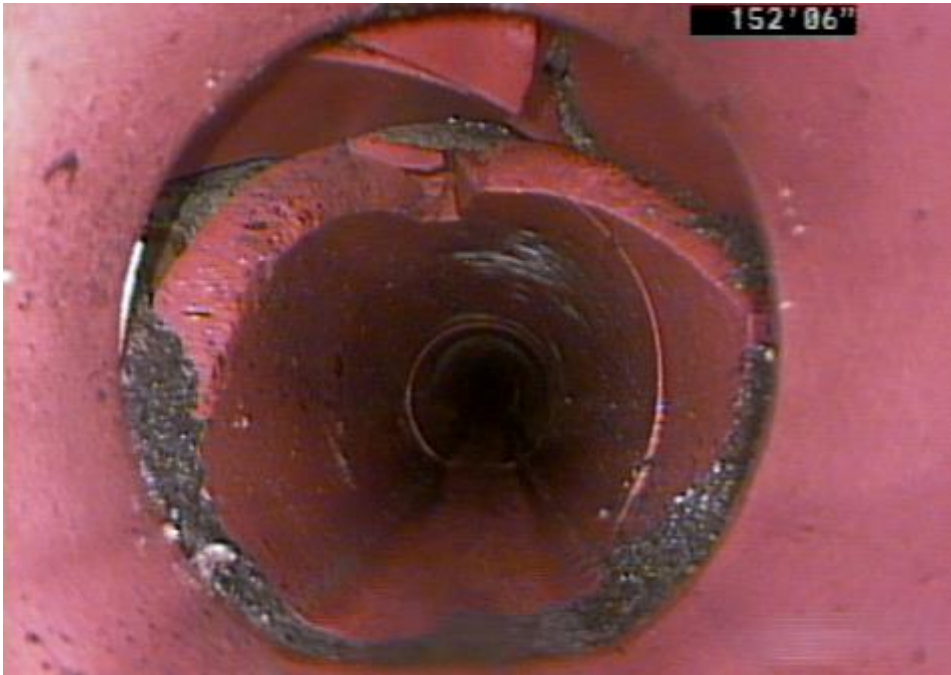


ENVISION™

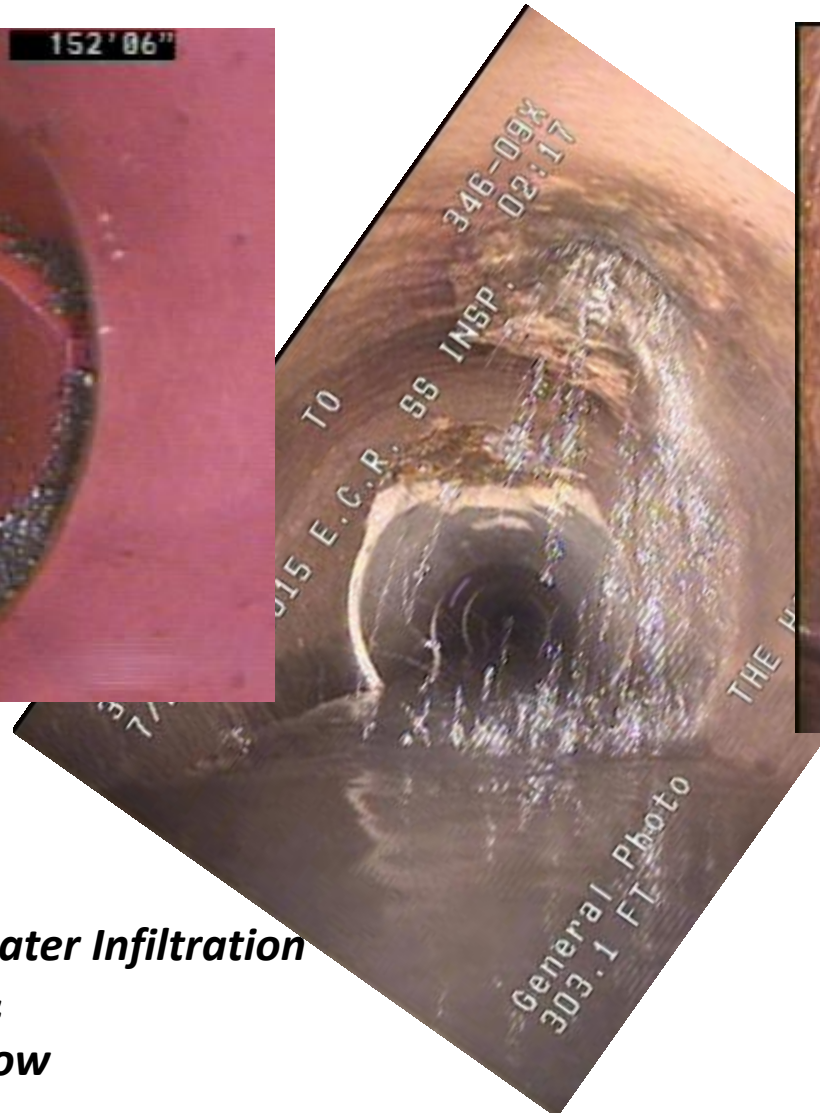
Infrastructure Sustainability Metrics



Aging Collection System Facilities



Cracked & Offset Pipe



***Rain & Groundwater Infiltration
&
Inflow***



Root Intrusion in Pipe

Aging WWTP Facilities



Insufficient Capacity - Sanitary Sewer Overflows (SSO)

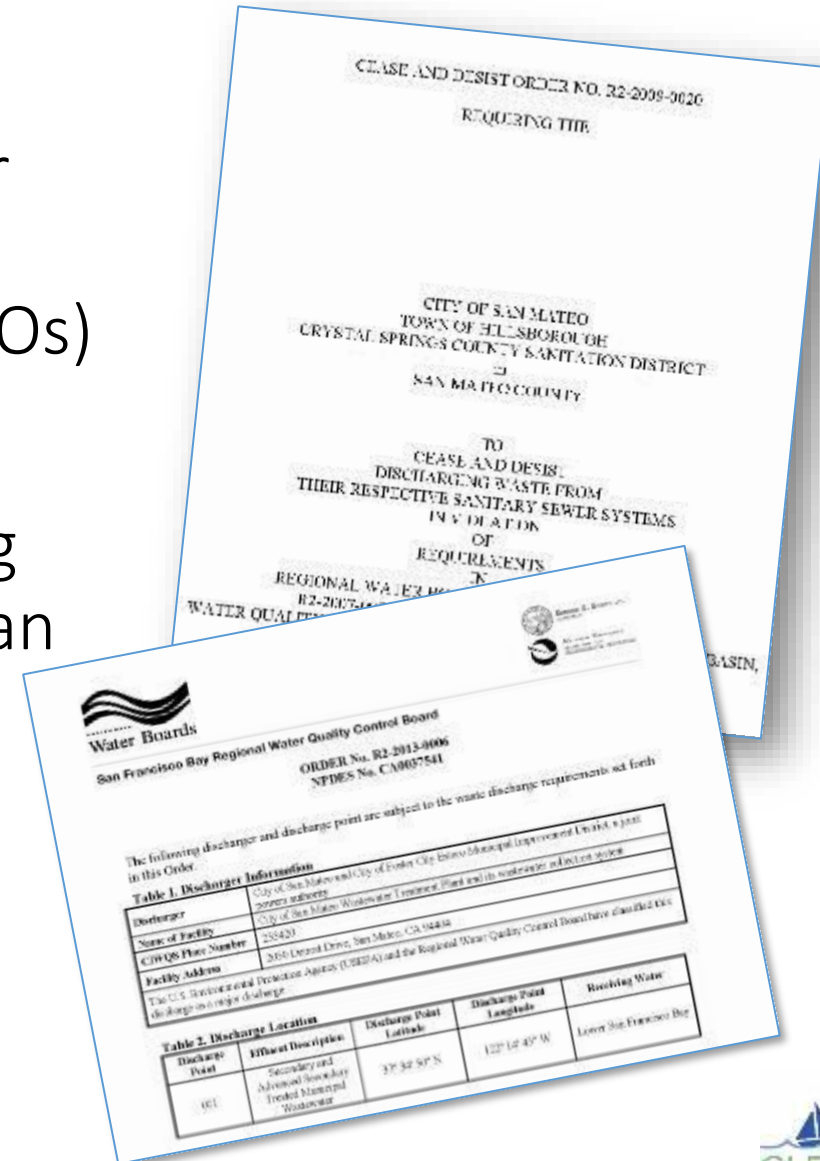
Photos from San Mateo's Wet Weather Events That Flow in the Bay



Delaware Street Corridor

Regulatory Orders & Requirements

- 2009 Cease and Desist Order requiring the elimination of sanitary sewer overflows (SSOs)
- 2013 NPDES Permit requiring elimination of blending and an integrated approach
- Future increased nutrient removal requirements



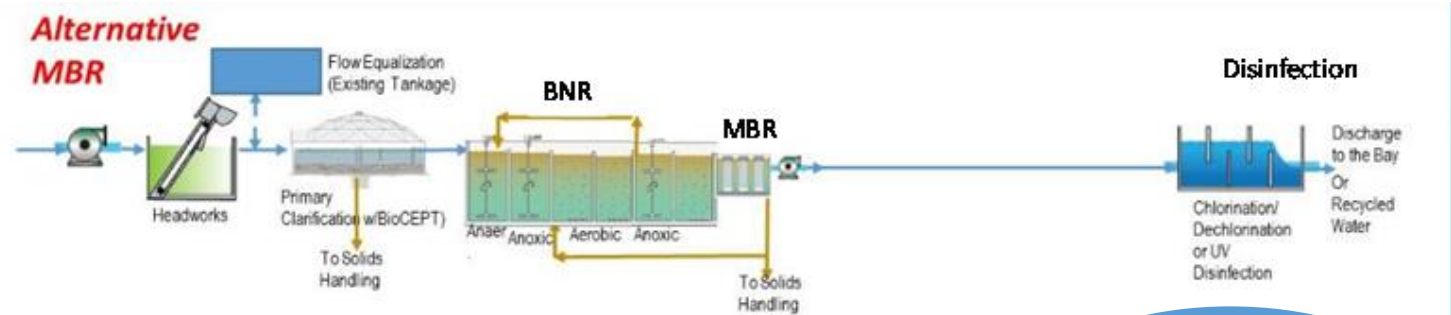
What is the Clean Water Program?

1. Collect

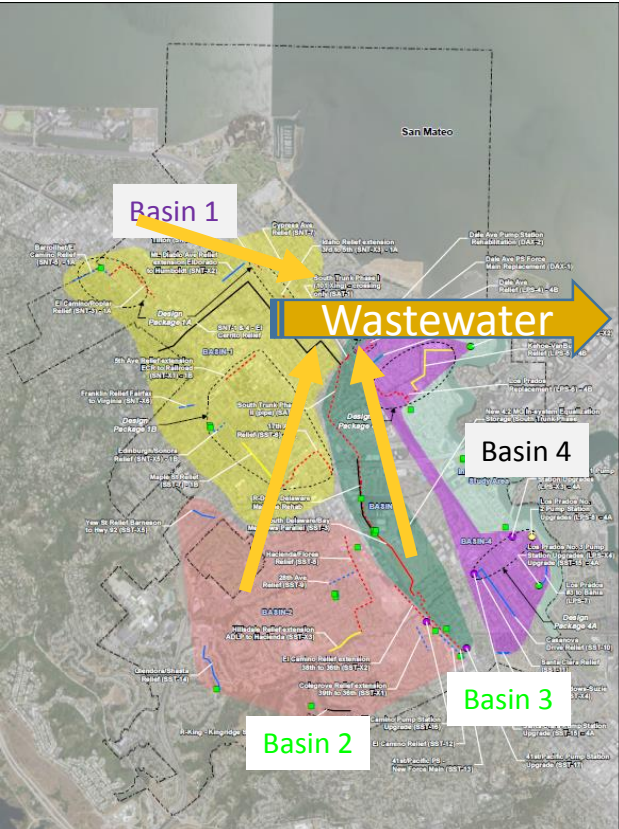
2. Treat

3. Discharge

New WWTP Treatment Approach to Prevent Sewer Overflows to SF Bay



Reusable
Clean
Water



Before & After
Treatment

Sewer In-System Storage
Upgrades to Prevent SSOs

PEIR was Certified in June 2016 &
Council Selected this Alternative



Commissioner's Feedback, Questions and Input



www.cleanwaterprogramsanmateo.org

Topic 2

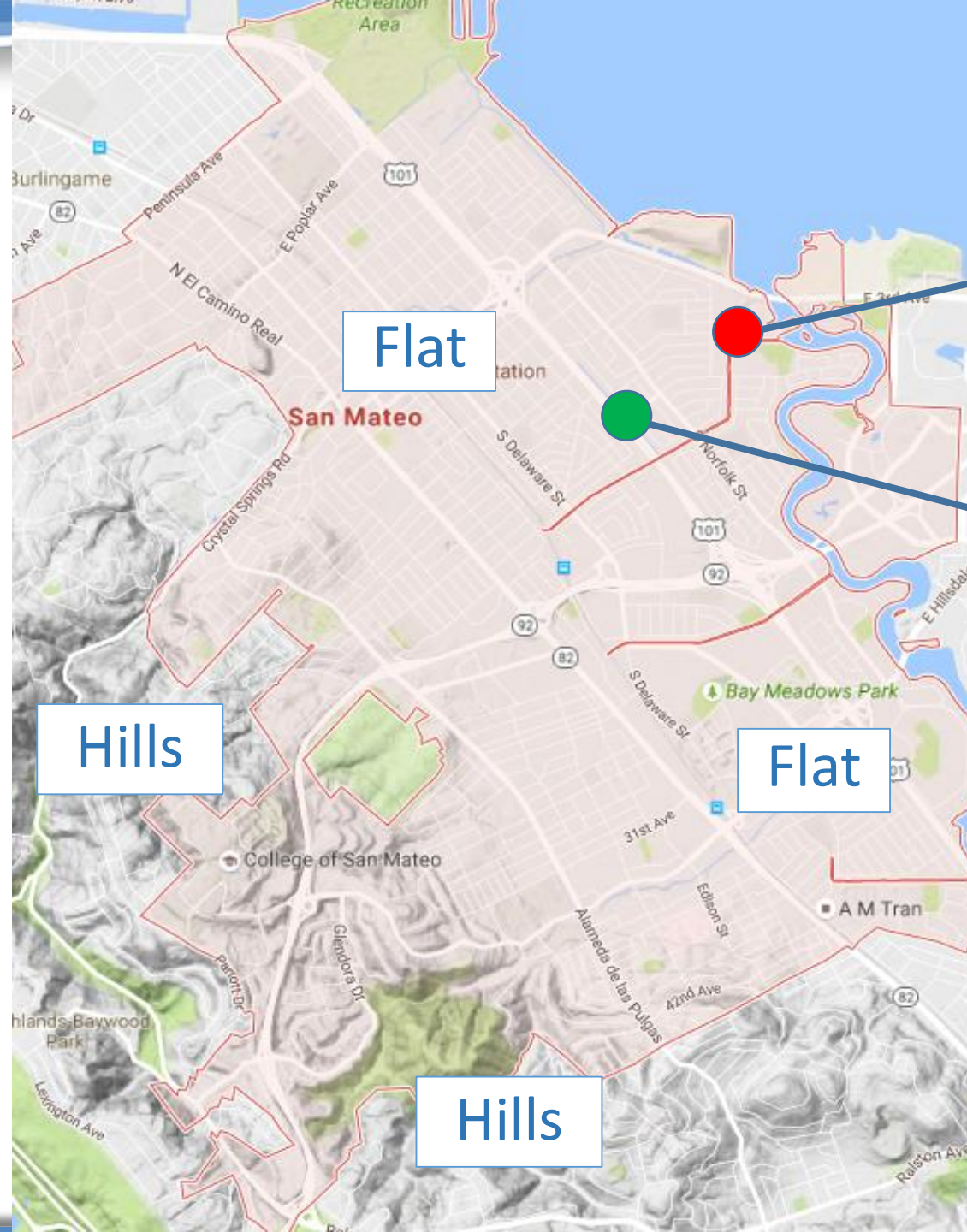
How Sewers Work in San Mateo Today and in the Future with Underground Storage



Wastewater Management System



San Mateo Topography



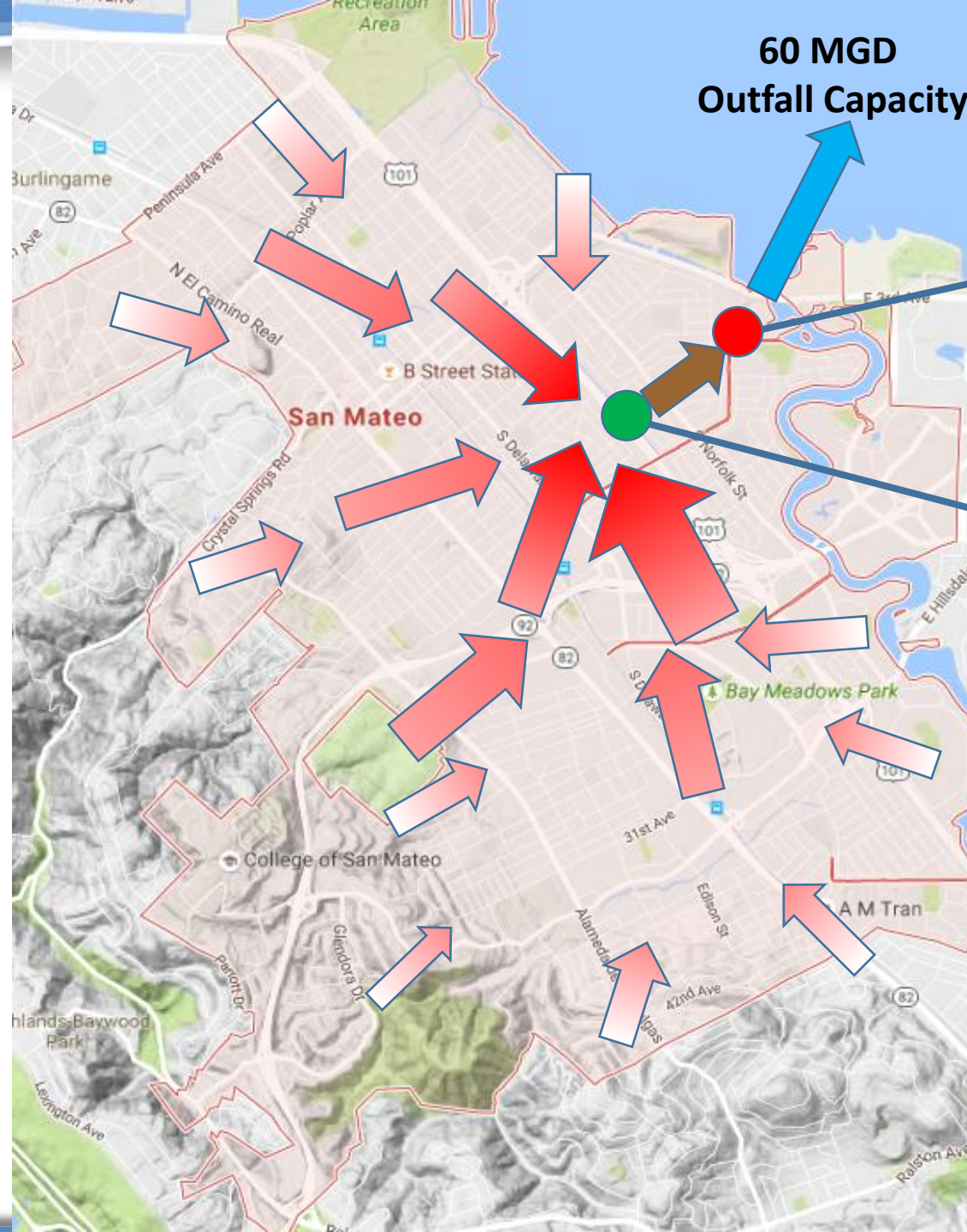
WWTP

Dale Ave
Pump Station
(DAPS)

Liquids Flow to
the Low Areas



Dry Weather Gravity Sewers and Hydraulic Operations



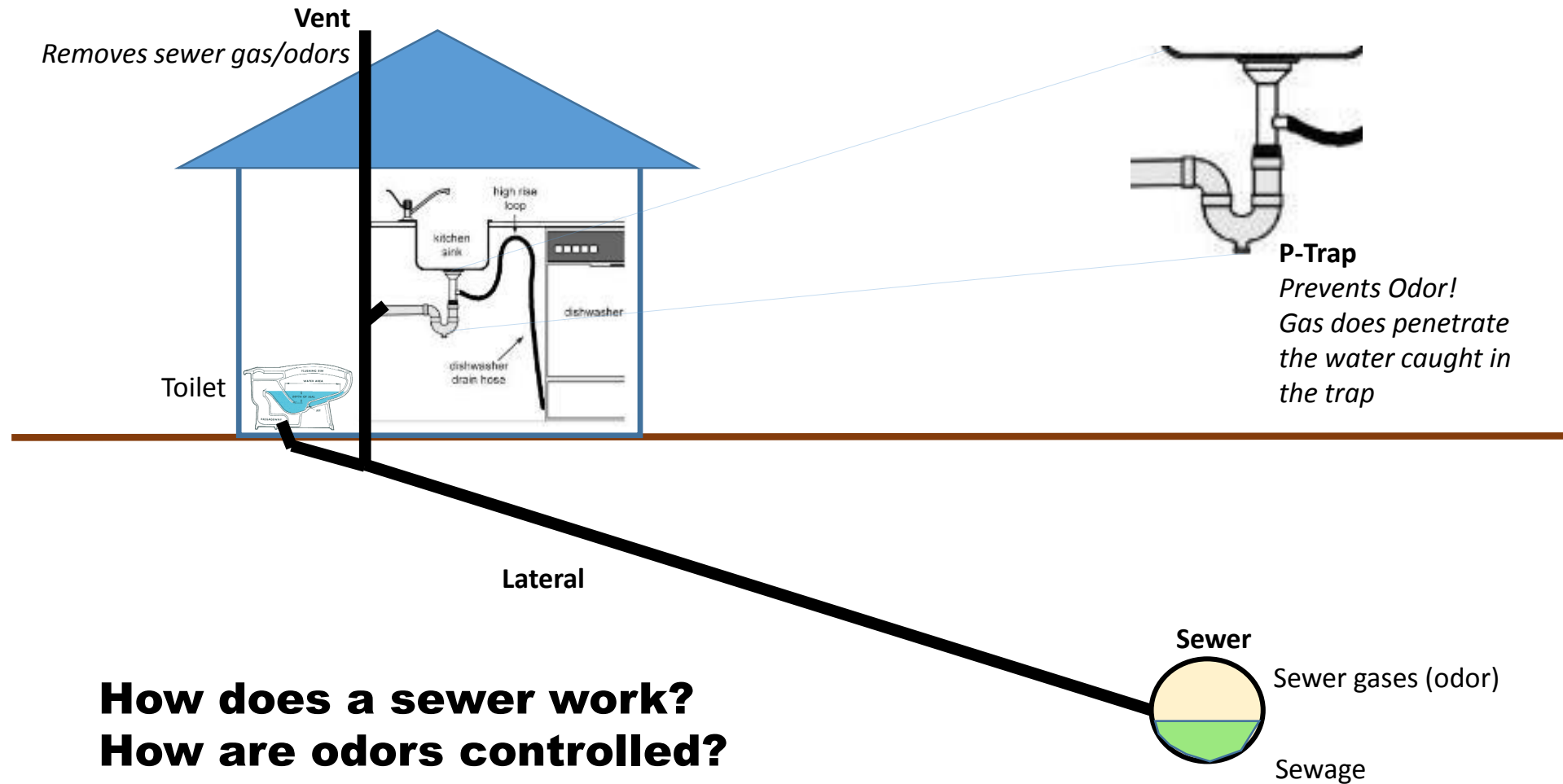
WWTP

Dale Ave
Pump Station
(DAPS)

Most Flows go
through DAPS to get
to WWTP

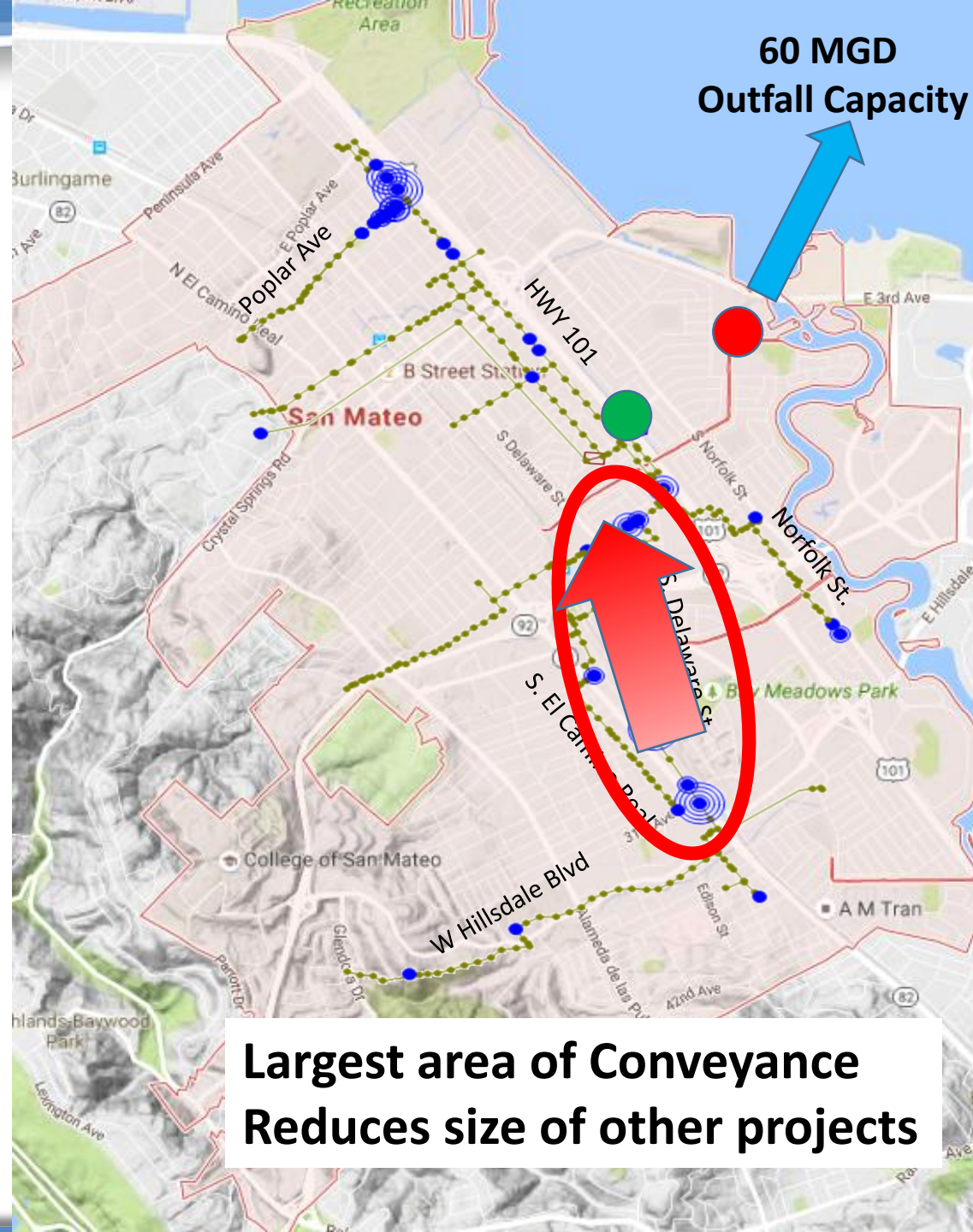


Wastewater Basics: Dry Weather Conditions

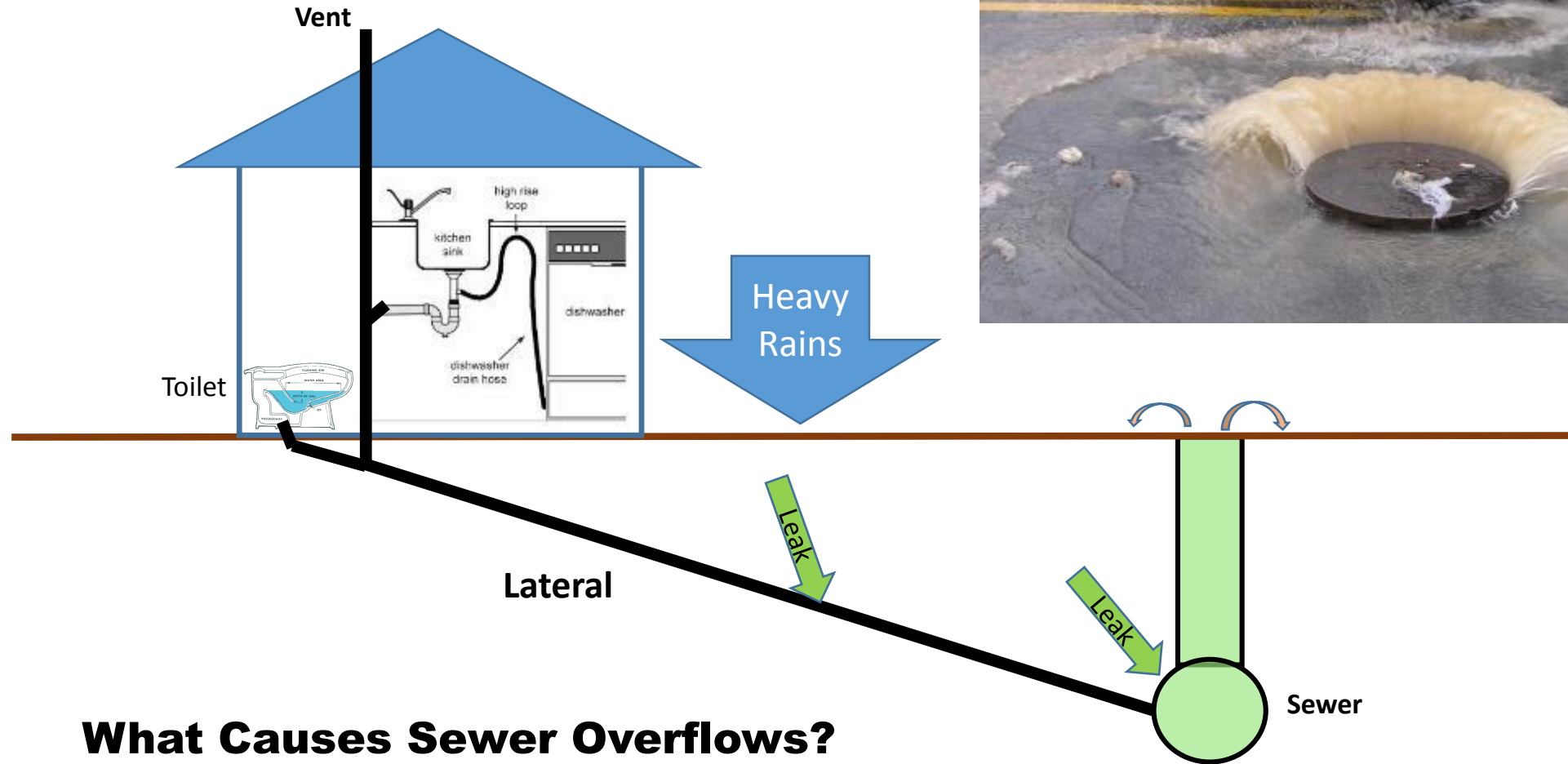


How does a sewer work?
How are odors controlled?

Peak Wet Weather Hydraulic Model and SSOs



Wastewater Basics: Peak Wet Weather Conditions & SSOs



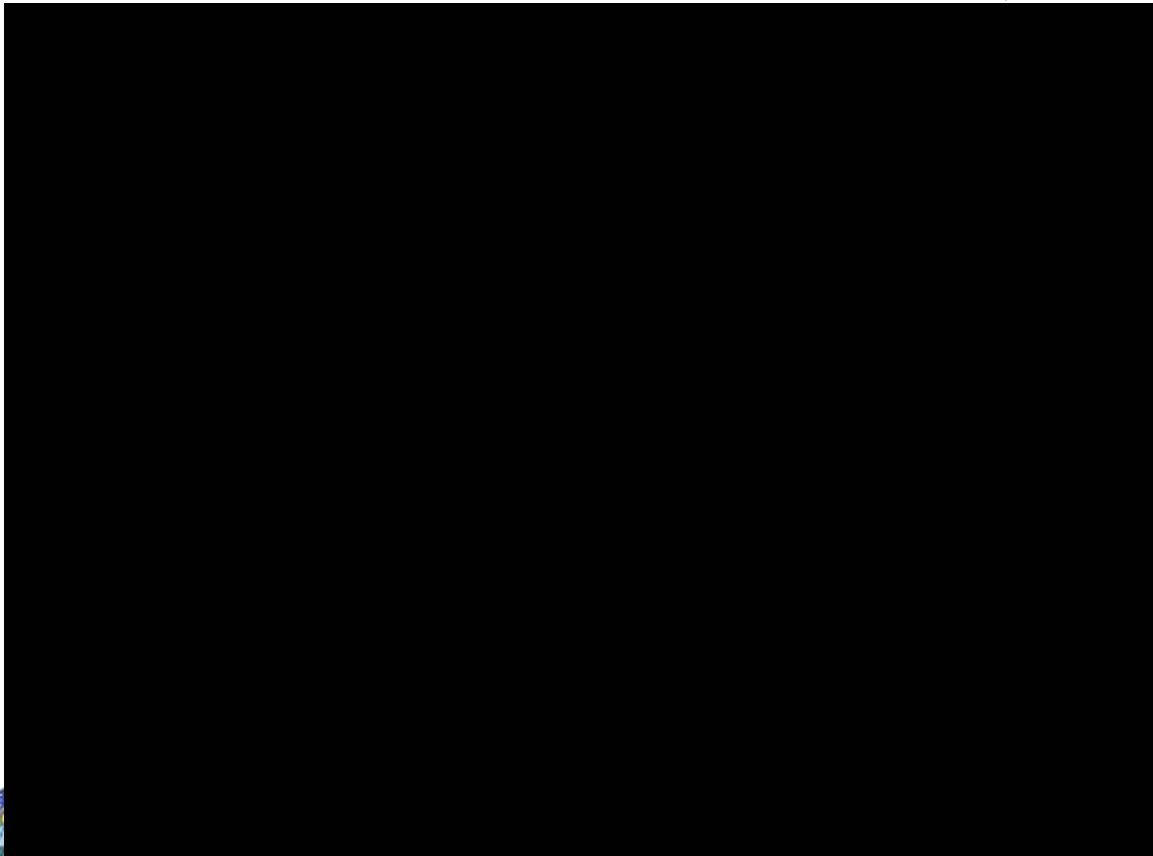
What Causes Sewer Overflows?

San Mateo Sanitary Sewer Overflows (SSO) to the Bay

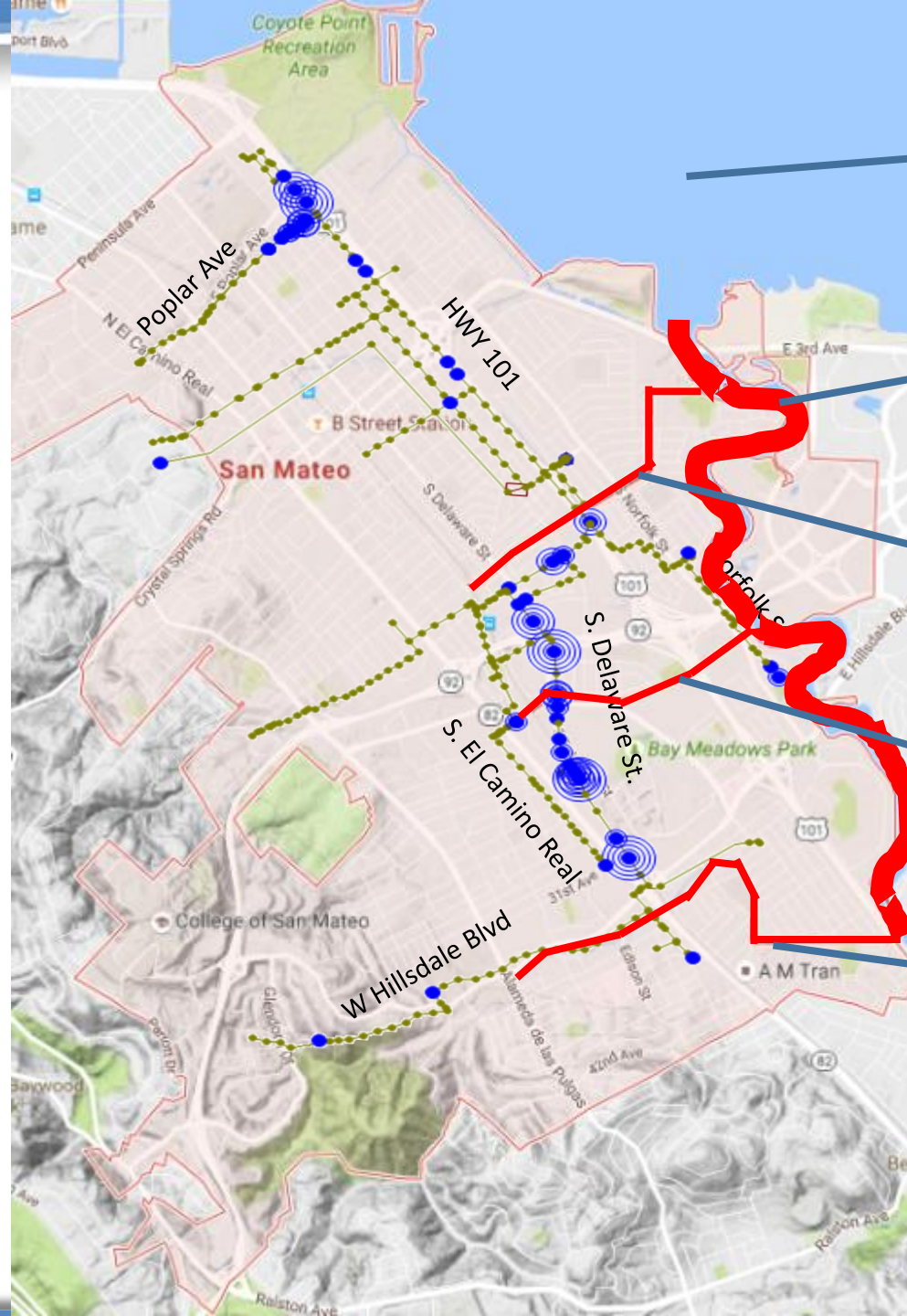
SSO Video at Delaware & Saratoga



SSO Example (Not in San Mateo)



**SSOs Flow
onto Streets
into Storm Drain Inlets
then to Lagoon and Bay**



SF Bay

Seal Slough

Leslie Creek

Borel Creek

Laurel Creek



SSO Impacts to Water Quality at San Mateo Beaches



Program Alternatives

***Council selected the
In-System Storage
Alternative in June 2016***

In-System Storage

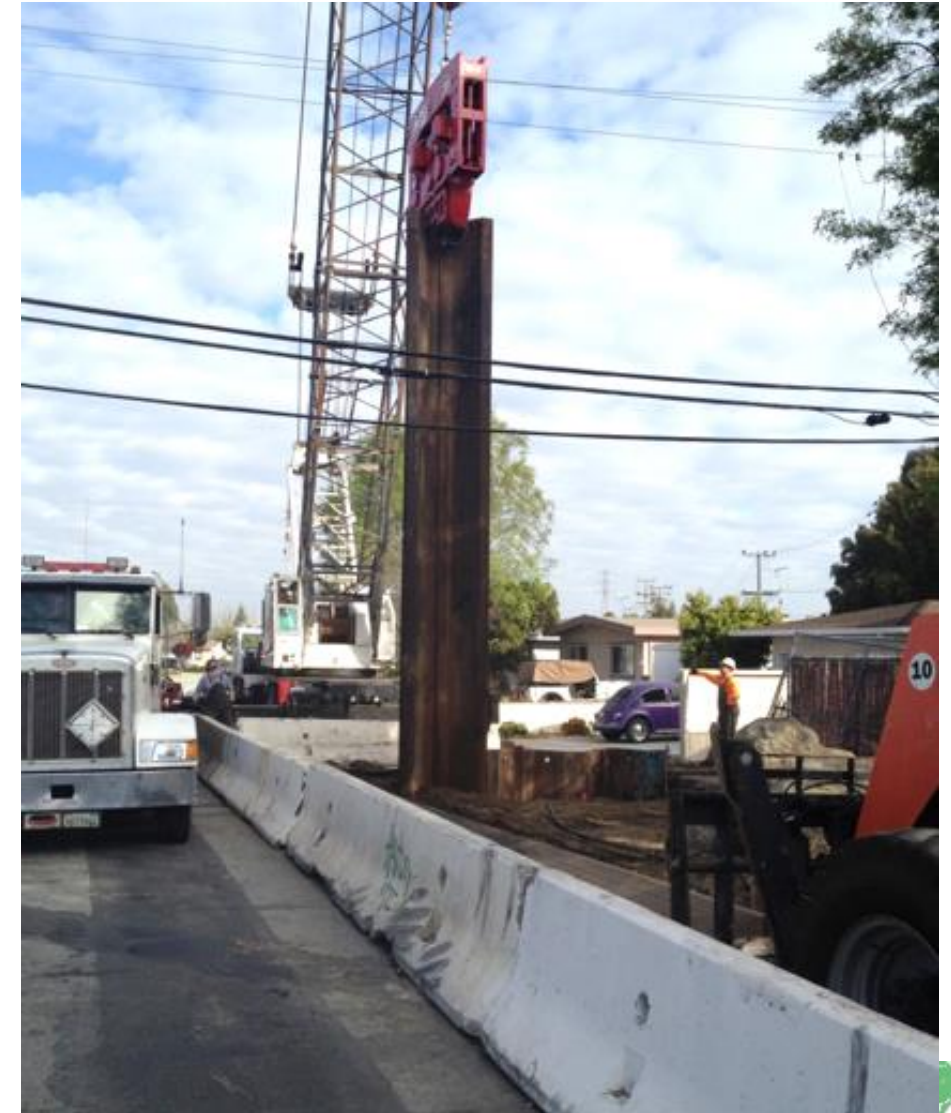
- Wet weather storage located upstream of WWTP & at WWTP
- Smaller pipes to convey controlled amount of wet weather flows
- Better odor control
- \$30M less expensive than full conveyance alternative for same WWTP Option (\$150M for Baseline Full Conveyance vs. Selected WWTP with In System Storage)

Collection System Improvements

Relief Sewers

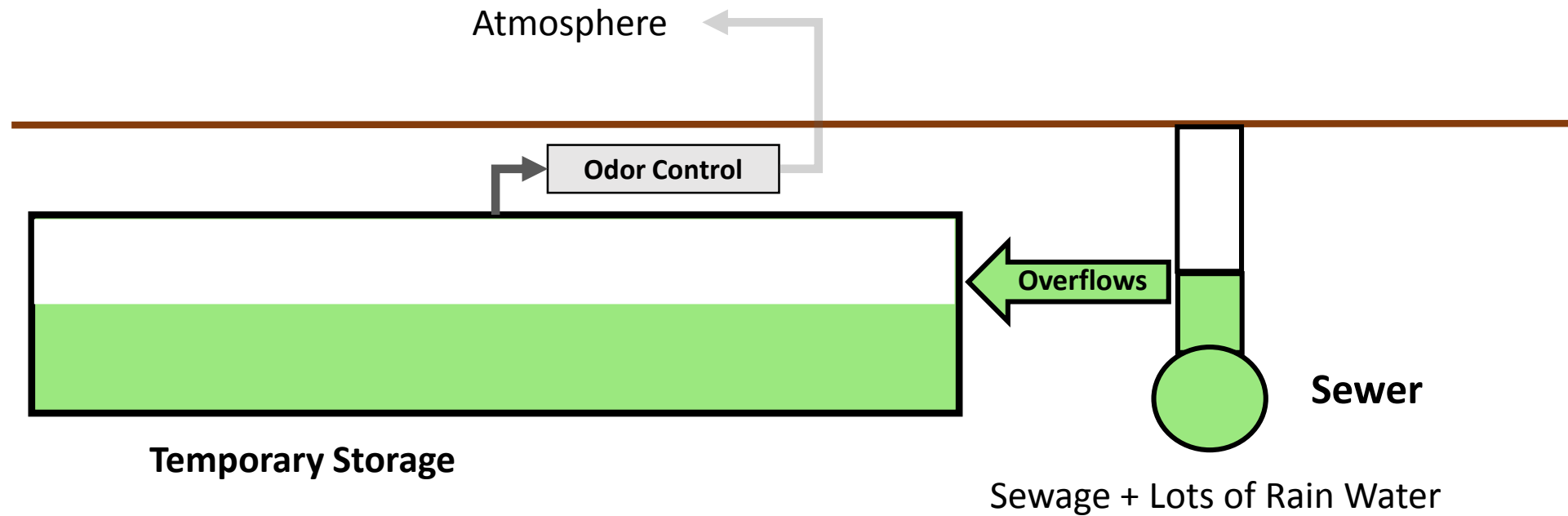


Pump
Station
Upgrades



Storage Facility: Peak Wet Weather Conditions

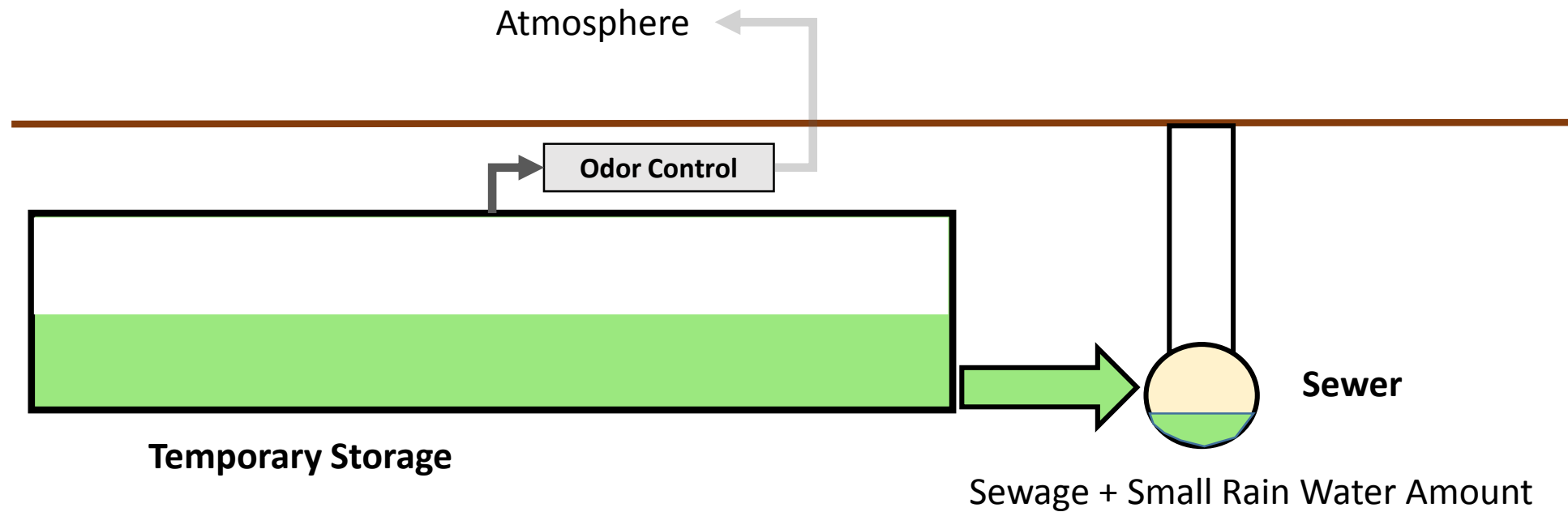
Preventing Sewer Overflows During Very Heavy Rain Periods



Storage Facility: After Wet Weather Conditions

Preventing Sewer Overflows

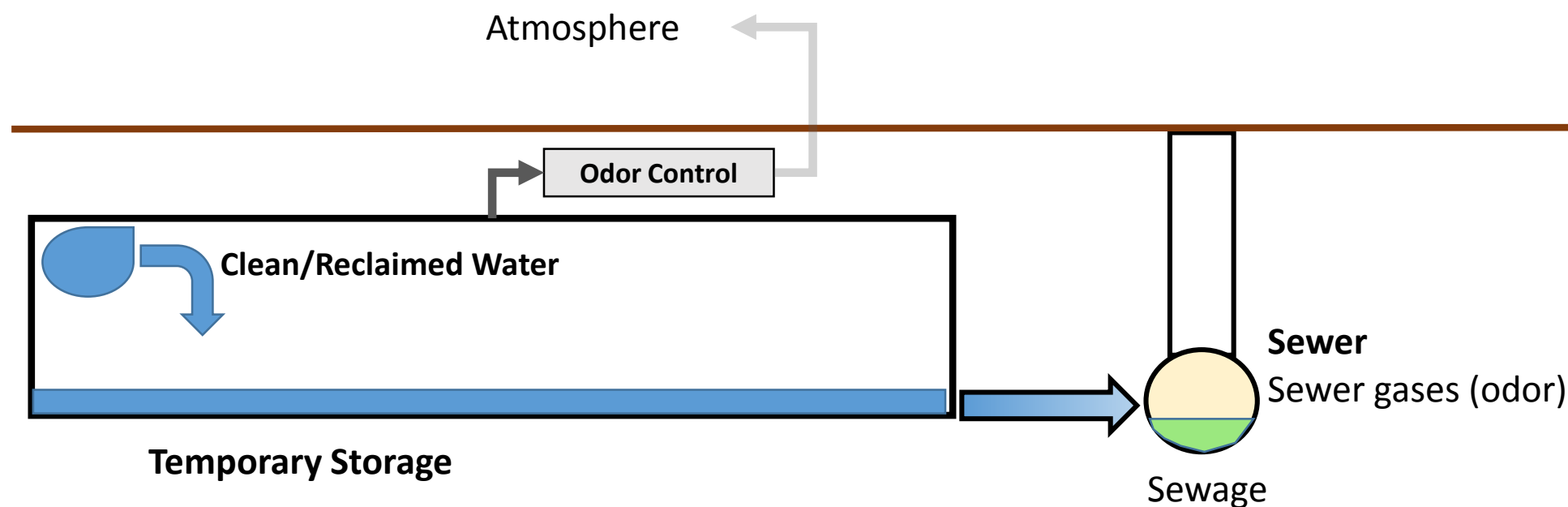
After Heavy Rain Event



Storage Facility: After Wet Weather Conditions Odor Control & Self Cleaning Mechanisms

Preventing Sewer Overflows

Cleaning Temporary Storage





Storage Facility After SSO is Managed



Tipping Buckets Dropping Water Load at 2000 gals/bucket



Storage Facility being Washed



Final Results - Clean Floor



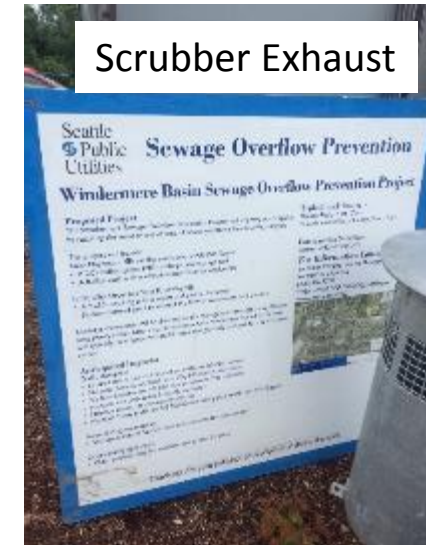
Storage Facility: Odor & Noise Control and Self Cleaning



Air Tight Vaults



Carbon Odor Scrubber



Scrubber Exhaust

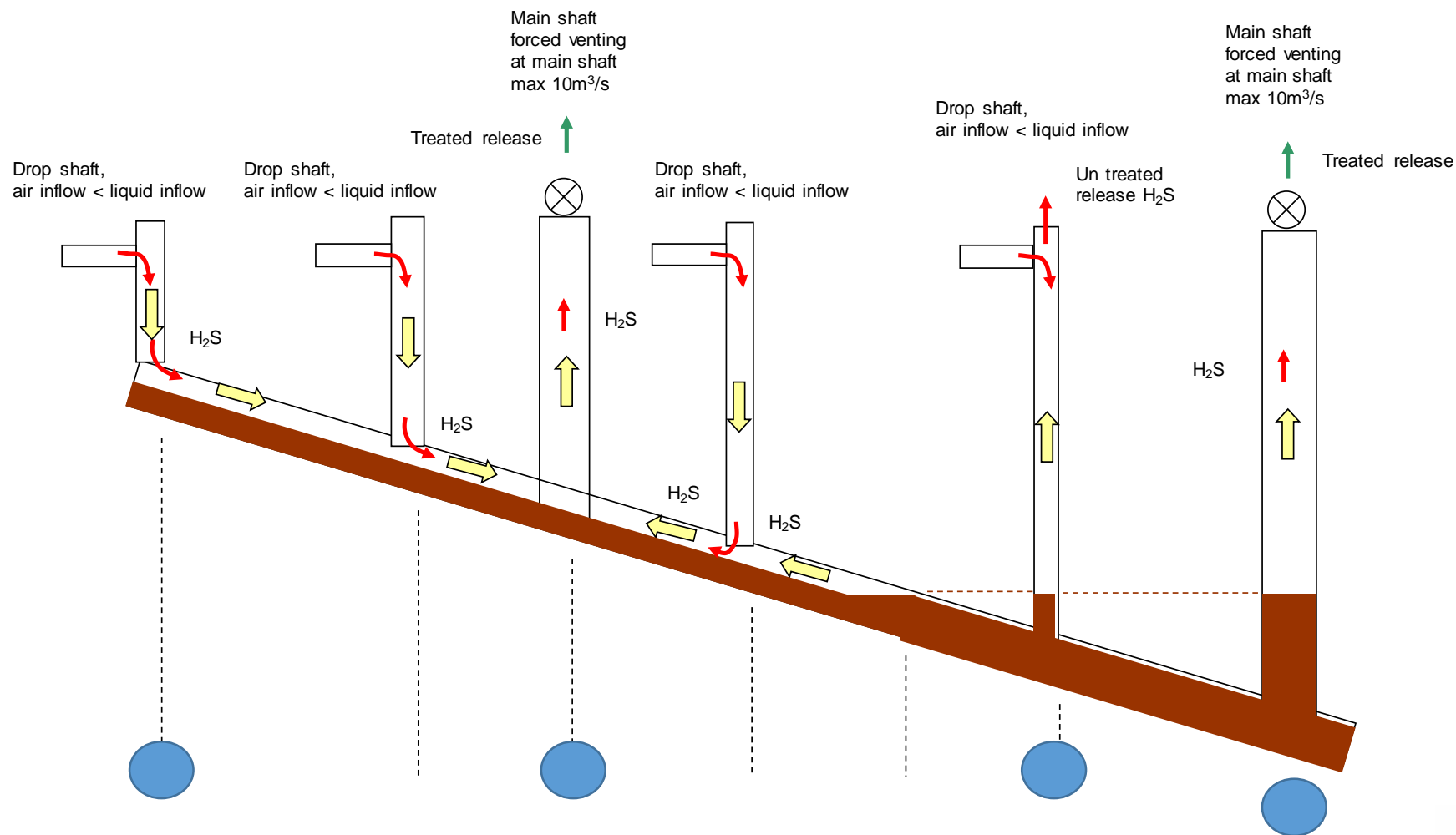


Flushing Curbs



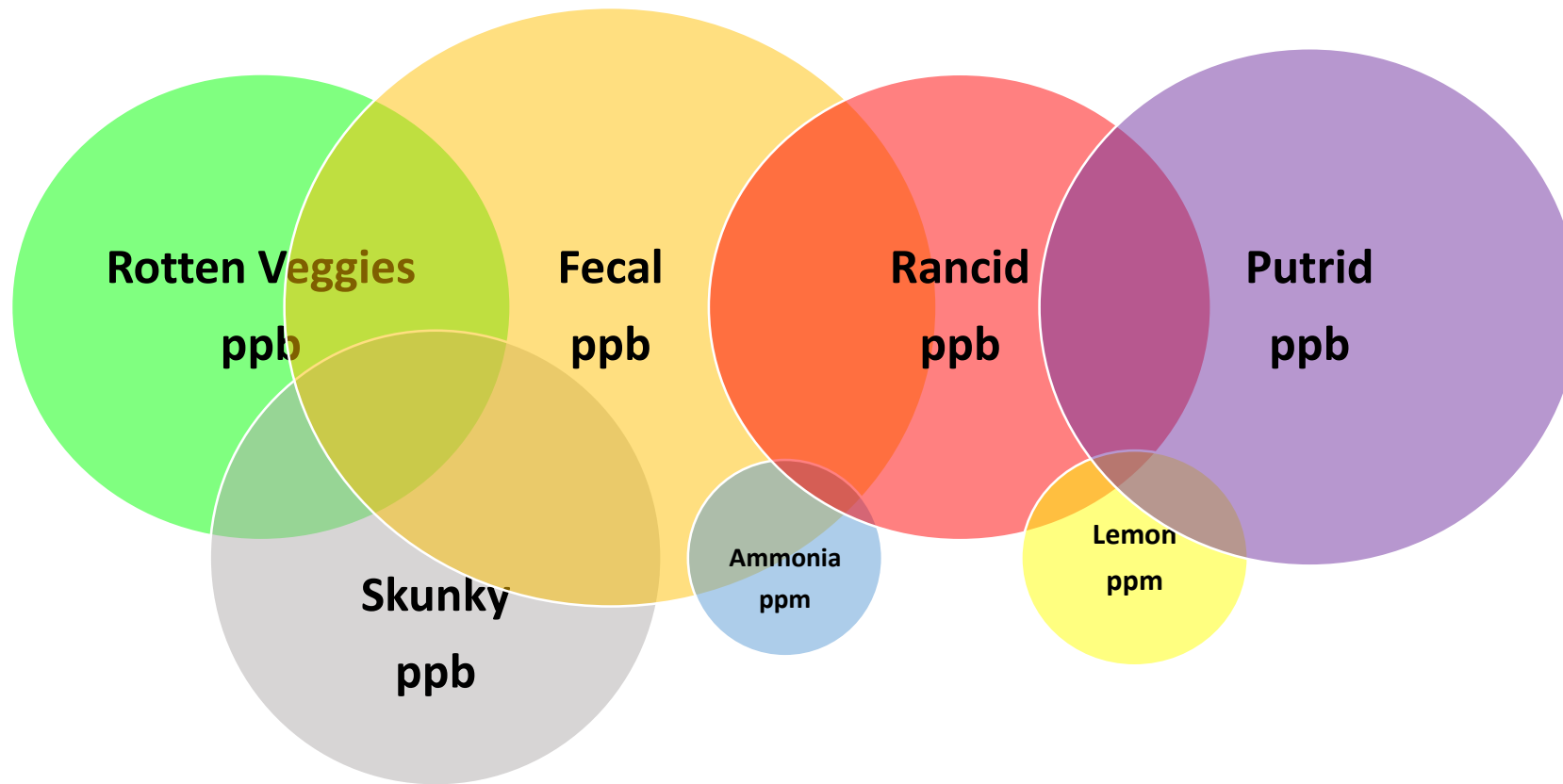
Self Cleaning Tipping Buckets

Tunnel Shaft Odor Control Needs



● = Odor Control Locations

Potential Odorants From In-System Storage



Larger circle = lower the concentration @ Public Nuisance Level
1 ppb = 1 green tennis ball in a pool of 1 billion tennis balls



Managing Odors to Reduce Off-site Odor Impacts

Very, Very Sensitive

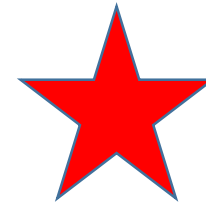
Our Noses

Average Sensitive



CWP Odor Control Goal

*1 in 100 people may
detect a slight odor at property
Potentially 20 times per year*



BAAQMD Regulatory Odor Control Limit

Limit set to protect Human Health and Well Being

Commissioner's Feedback, Questions and Input



www.cleanwaterprogramsanmateo.org

Topic 3

Underground Storage Facility Location Selection Process



Storage Site Evaluation Criteria & Selection Process

PEIR Full List

Space

- Municipal property
- Schools
- Undeveloped property
- Private property
- No existing residential, state, or federal property included
- Proximity
- Storage Capacity

55



55 Original Site Alternatives Identified in PEIR

Space

- Municipal property
- Schools
- Undeveloped property
- Private property
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Storage Site Evaluation Criteria & Selection Process

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PEIR Short List

SSO Benefits

- Provide regional impact (not just localized benefits)
- Could Lessen Size, Scope, or Cost of Multiple Projects
- Stores more than 1 MG
- Where historical and simulated SSOs would be relieved

12



12 Site Alternatives Shortlisted in PEIR

SSO Benefits

- Provide regional impact (not just localized benefits)
- Could Lessen Size, Scope, or Cost of Multiple Projects
- Stores more than 1 MG
- Where historical and simulated SSOs would be relieved

12

California Water
Services Lot

Martin Luther
King Jr Park

Central
Park –
Area 1

Central
Park –
Area 2

Station Park Green
Development

Trina
Park
Area 1

Trina
Park
Area 2

San Mateo
County Expo
Center

Fiesta
Meadows
Park

Bay
Meadows
Park

Hillsdale
Shopping Center

Hillsdale
High School

Abbott
Middle School

San Mateo
County
Hospital (Lot)

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Design Team

Technical

- Hydraulics
- Constructability
- Right-of-Way
- Contractor Laydown
- Parking
- Storage Capacity
- Soil & Groundwater

5



Technical

- Hydraulics
- Constructability
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5

Delaware Street
Alignment Tank

Fiesta Meadows
Park

Expo Center
Parking Lot

Bay Meadows Park

Hillsdale Plaza

5 Alternatives

Expo Center Parking Lot

Parking lot repaved over storage facility

Not a City Owned Property

Usage Costs Associated

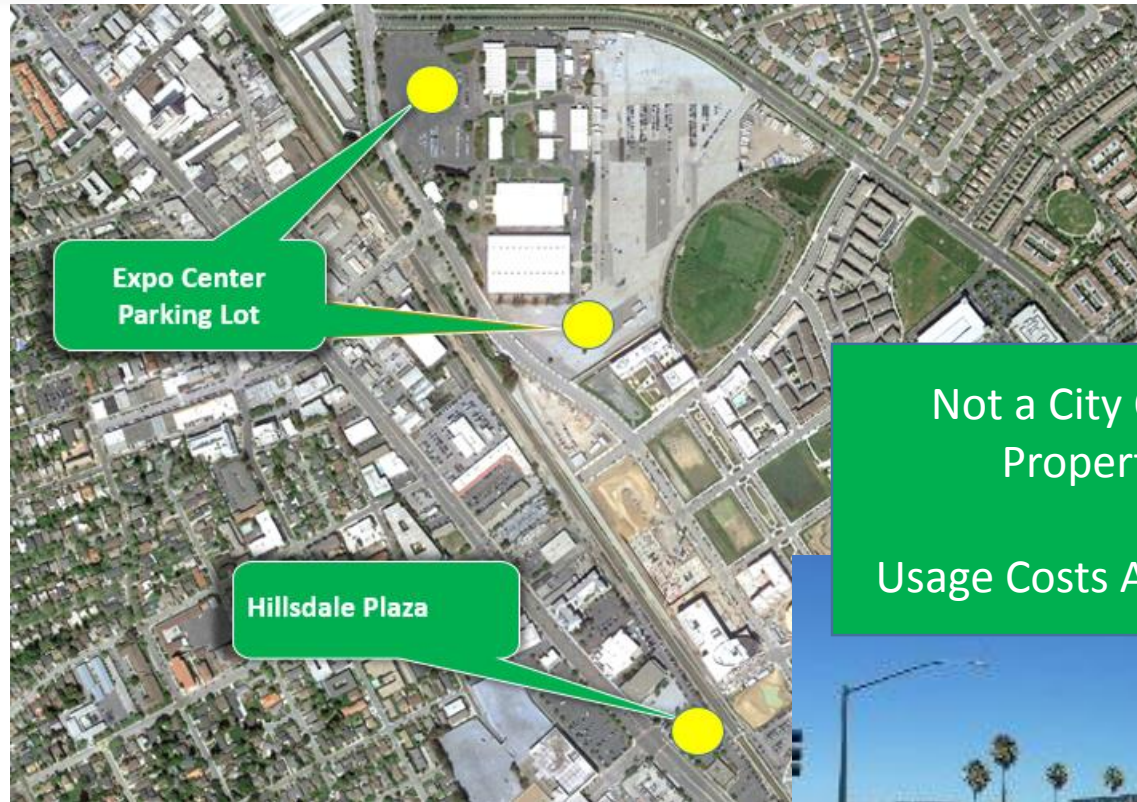
Expo Center Parking Lot

Access hatches installed at pavement grade so traffic can drive on them

Construction would be coordinated with Event Center to avoid conflicts with large events



Hillsdale Plaza/Expo Event Center



Not a City Owned
Properties
Usage Costs Associated

Construction would be
coordinated with Event
Center, Hillsdale Site
Developer & Joint Powers
Board (Caltrain)

Parking lot repaved
over storage facility

Access hatches installed at
pavement grade so traffic can
drive on them



Bay Meadows Park

North Eastern Half of Grass field is currently a below ground storm water overflow facility that cannot be built over and must remain a field

Storage Facility would only utilize North Eastern Half of grass field

Existing Storm Drain Facilities and Sewer Pumping Facility North of the Grass Field would remain intact during Construction

New topsoil and grass would be replaced over storage facility

Access hatches can be located at the edge of the grass field or within the asphalt pathway

City Owned Property

South Western half of grass field would remain open

City is exploring plans to build Community Center at South Western half of field



Fiesta Meadows Park

Opportunity to Redesign
Parking Lot to Increase Parking



Fiesta Meadows
Park

Access hatches located at
edges of grass or within
asphalt paved areas

New Synthetic Turf or Grass
Field can be built over storage
Facility

City Owned Property



Synthetic Turf would reduce
maintenance costs and
provide all-season surface



Delaware Street Alignment Tank

6,300 Feet Long
12 Foot Diameter
60 Feet Deep

Tunnel will be concrete pipe
or lined with concrete
segments

Tunnel Boring Machine
(TBM) & Special Tunneling
Permit Required

Feeling vibrations from TBM
operations is unlikely at the
proposed depths

Delaware Street
Alignment Tank

North End: North of Hwy 92
South End: South of 28th Ave

Deeper Excavations for TBM
Entry/Exit Locations &
Maintenance Access Hatches

Require Property Not Owned
by City for Excavation & Access
Hatch Locations



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PEIR Short List

Beneficial Impacts

- Provide regional impact (not just localized benefits)
- Could Lessen Size, Scope, or Cost of Multiple Projects
- Stores more than 1 MG
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Design Team

Technical

- Hydraulics
- Constructability
- Right-of-Way
- Contractor Laydown
- Parking
- Storage Capacity
- Soil & Groundwater

5

Public Input + Design Team

Alternatives Analysis

- Economic
- Environmental
- Technical
- Social

2

City Council

Final Selection

1

January 2017



Storage Site Evaluation Criteria & Selection Process

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Public Input + Design Team

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2

City Council

Final Selection

1

January 2017

Approach & Schedule Being Re-Evaluated



Original Meeting Schedule

Technical

- Hydraulics
- Constructability
- Right-of-Way
- Contractor Laydown
- Parking
- Storage Capacity
- Soil & Groundwater

5

Two Community Meetings

August 23rd
August 25th

Two Commission Meetings

P&R September 7th
PW September 14

Alternatives Analysis

- Economic
- Environmental
- Technical
- Social

2

Two Community Meetings

October 4th
October 6th

Two Commission Meetings

P&R October 12th
PW November 7th

Final Selection

1

January 2017

PLEASE NOTE:

Due to public input the process is being reevaluated. Refer to www.cleanwaterprogramsanmateo.org for the most current schedule of upcoming meetings.



Original Meeting Schedule

Technical

- Hydraulics
- Constructability
- Right-of-Way
- Contractor Laydown
- Parking
- Storage Capacity
- Soil & Groundwater

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Two Community Meetings

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Commissioner's Feedback, Questions and Input



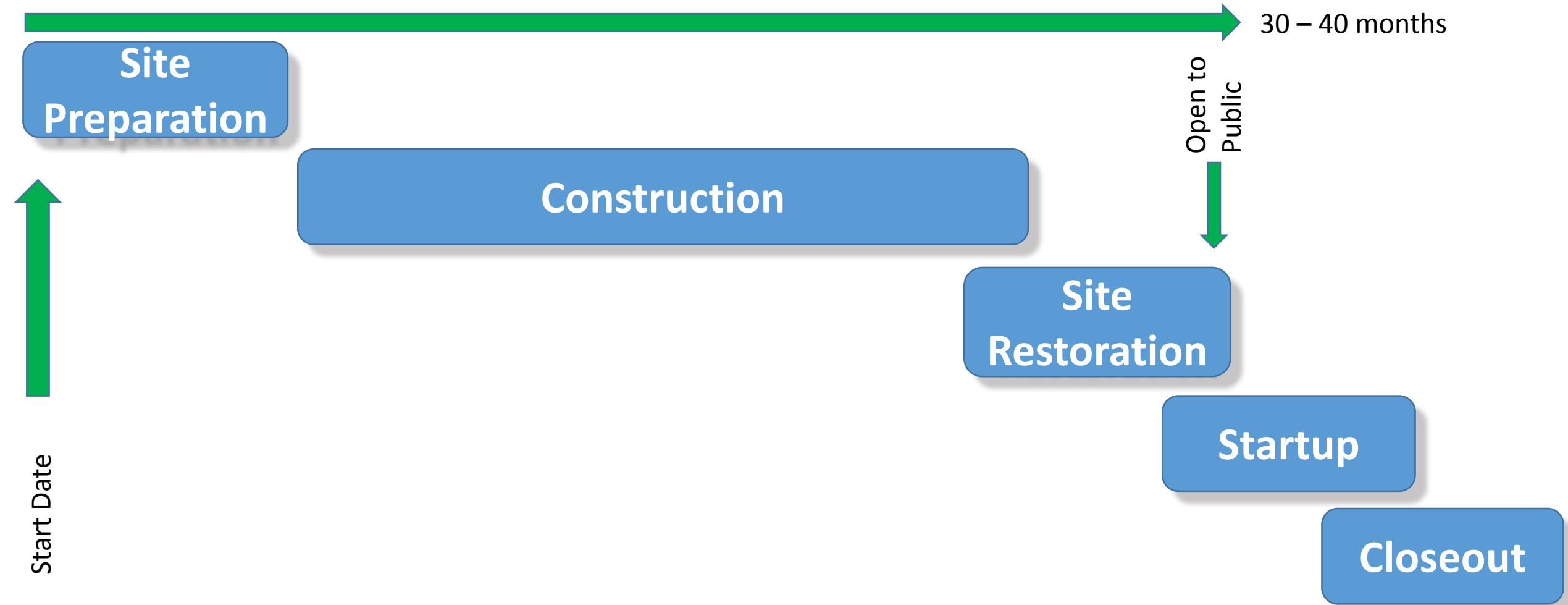
www.cleanwaterprogramsanmateo.org

Topic 4

Underground Storage Facility Construction & Seismic Design Considerations



Underground Storage Construction Schedule



Entire Schedule could vary from 3 to 4 years based on site selected

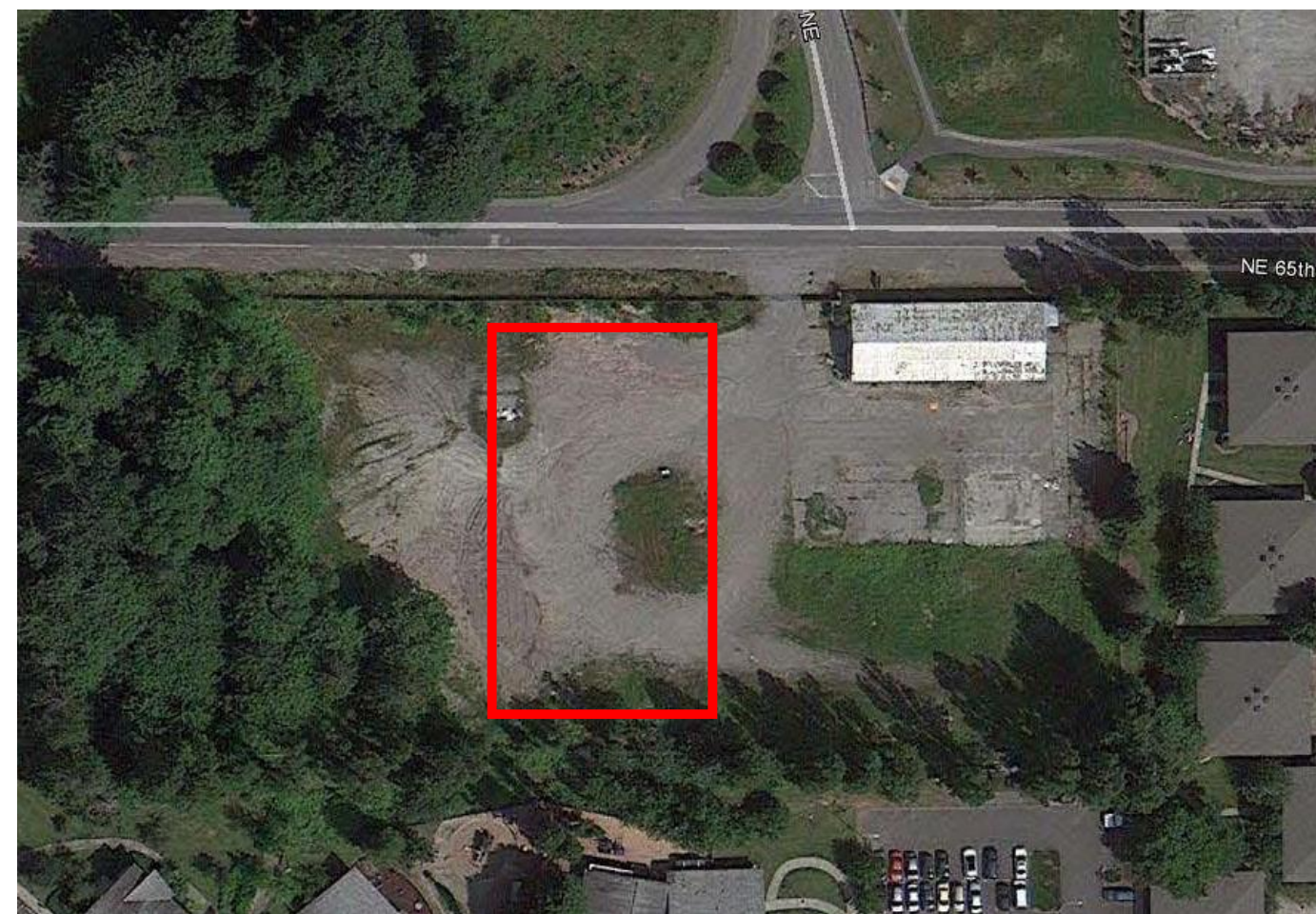
Site Preparation

- Public outreach from the City in advance of site activities
- Set up security and safety features, noise walls, environmental protection systems
- Remove existing structures and other materials
- Signage and notification boards in the area
- Equipment moving onsite



Site Preparation

Windermere Tank (Before Construction)



Site Preparation



Construction

- Shoring installation
- Demolition and earthwork removal
- Concrete and steel work
- Equipment installation
- Dewatering system



During Construction Windermere Tank (During Construction)



Construction



Construction

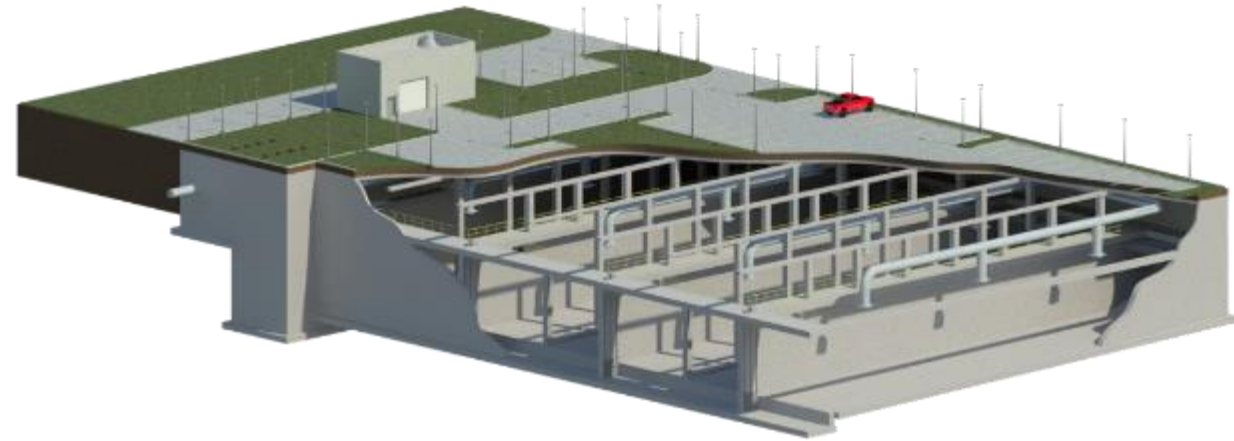


Construction



Seismic & Leak Resistance

- USGS Site Specific Seismic Acceleration 1.9 g
- Ductile Reinforced Concrete Regular Shear Wall Structure
- Governing Codes:
 - Reinforced Concrete ACI 350,
 - California Building Code 2013,
 - Design Loads for Buildings and other Structures, ASCE 7-10



Construction



Restoration

- Remove fencing and any sound walls
- Take large equipment off the site
- Plant trees, shrubs, grass areas, turf
- Paving
- Enhancements to the site (playgrounds, playfields)
- Minimize construction presence for start up



Restoration – Windermere

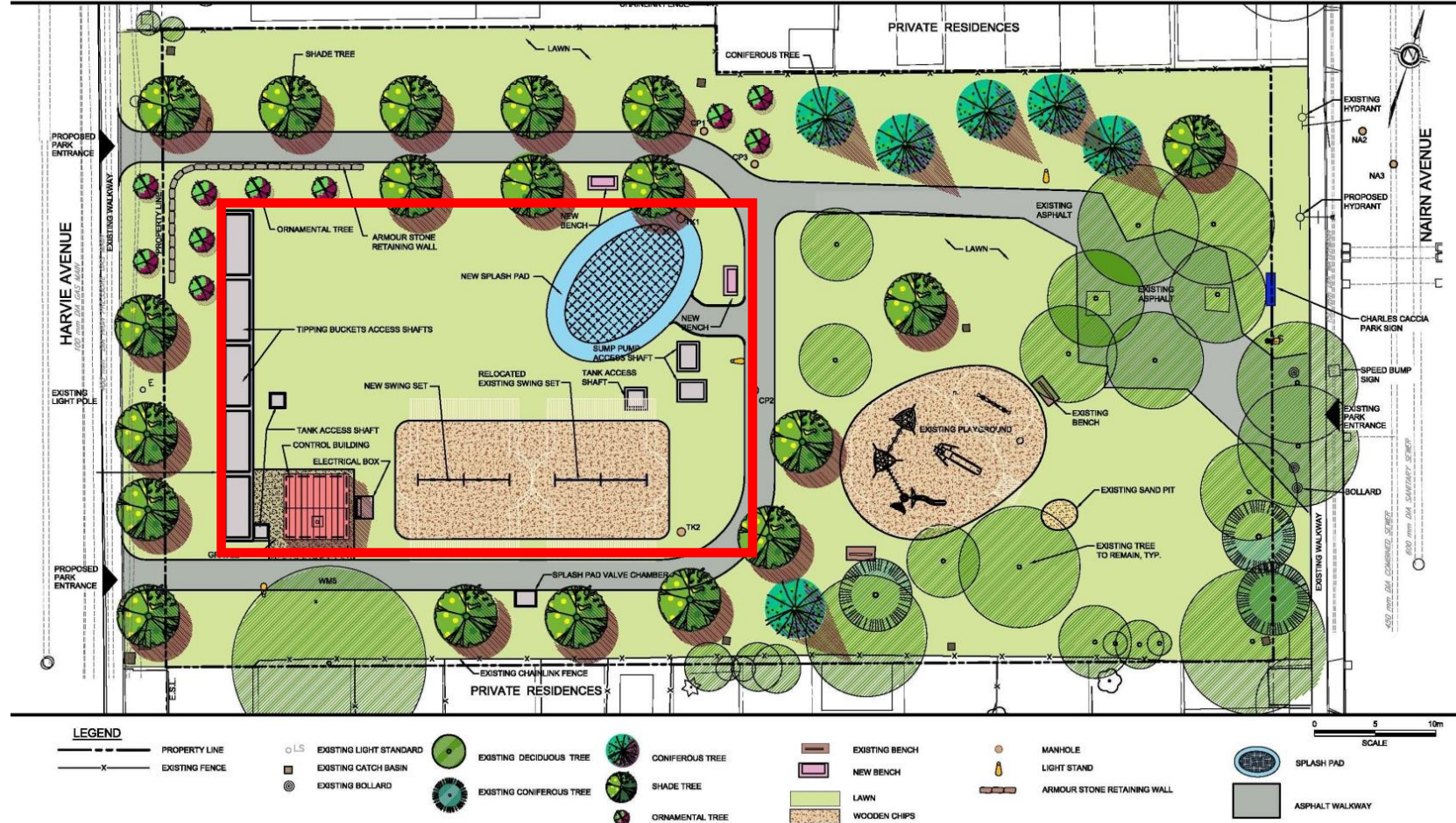


Restoration – Toronto



CHARLES CACCIA PARK RESTORATION PLAN

BASEMENT FLOODING PROTECTION PROGRAM



Restoration – Toronto



Restoration – Genesee (Parking Lots)



Restoration Henderson (Tennis Court)



Tanks will be covered and
new tennis courts and
parking lot will be
installed on top



Tunneling – Main Tunneling Site



Washington, D.C.

Tunneling – End or Intermediate Shaft

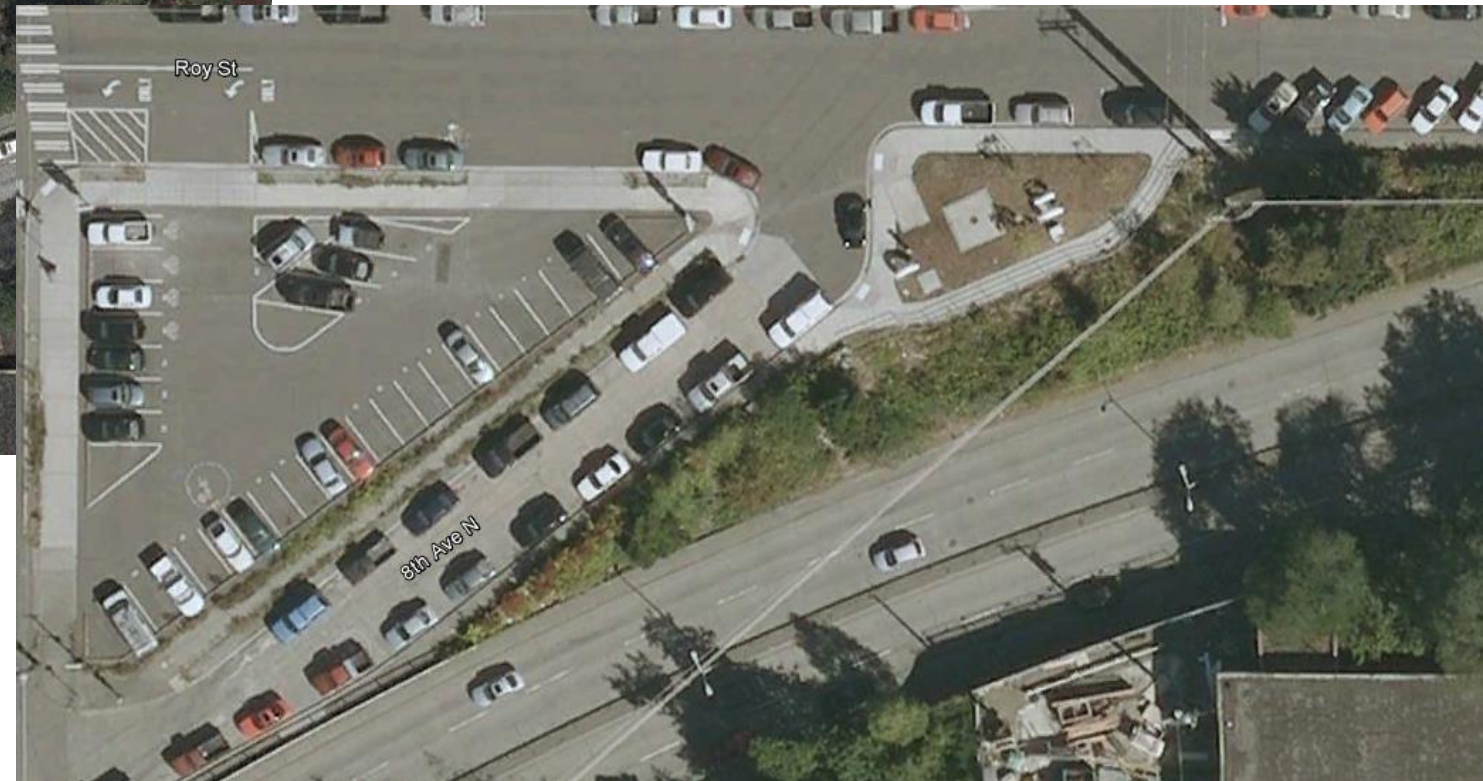
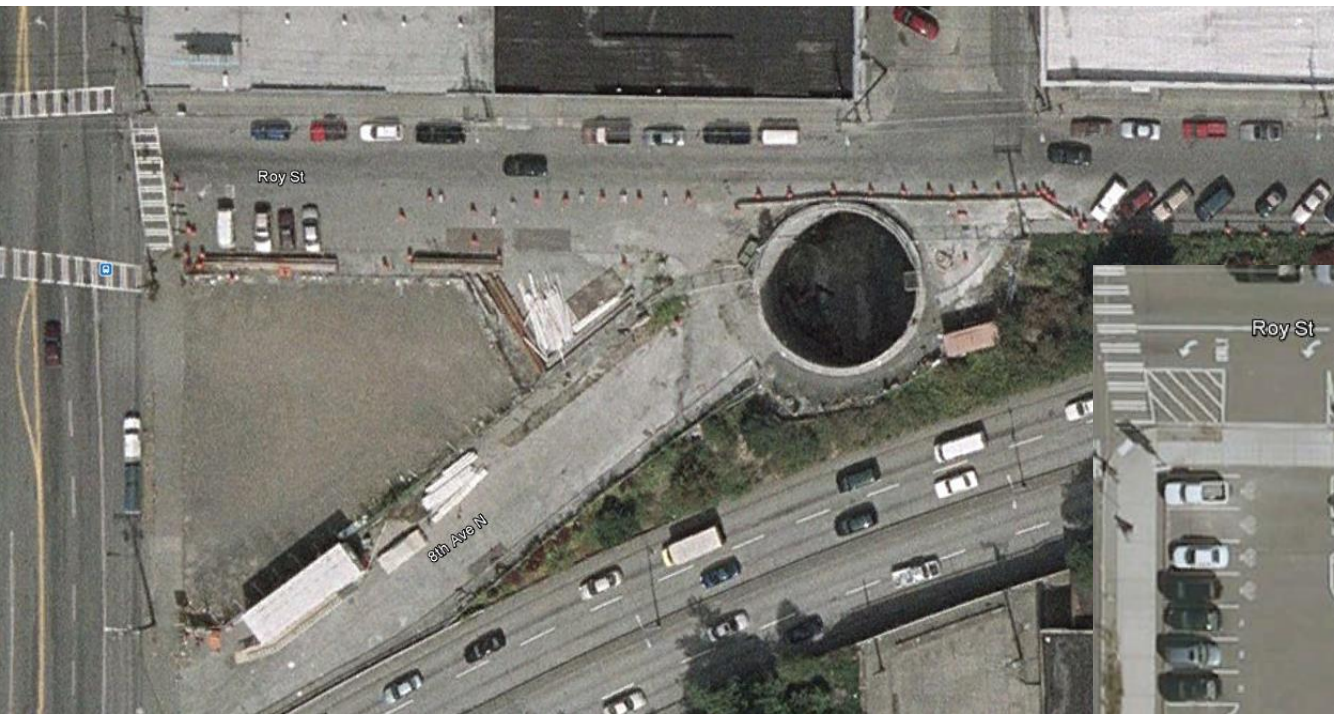
Tunnel Shaft Construction



London, UK



Tunneling – End or Intermediate Shaft



Seattle, Washington

Startup

- Testing the system to make sure it works
- Adjustments to structures and equipment
- Majority of public use is restored
- Smaller group of contractors onsite, smaller presence
- Continues to remove equipment
- Odor control system, all other systems operational
- *Facility approved for use – no sewage in the facility until there is a major storm event*



Closeout

- Everything is working correctly
- Down to small items or, “punch list” of activities
- Typically no on-site presence – site is functional back to previous use or meeting new planned use
- If needed, short-term use restrictions to complete punch list items (e.g., cordoned off areas, parking)



Maintenance Activities

Based on other similar facilities

- As needed for routine maintenance
- After each major storm event to make sure it is clean
- Annual maintenance and inspection
- Responding to remote sensors

Actual schedule will depend on equipment selected and number of peak flow events.



Commissioner's Feedback, Questions and Input



www.cleanwaterprogramsanmateo.org

Summary



Summary

- Underground Storage Facilities is the best SSO prevention alternative for San Mateo
- Underground Storage Facilities can be built with proven odor, noise and nuisances controls that meet all air quality requirements
- Underground Storage Facilities will only be operated at heavy wet weather events
- Underground Storage Facilities will store wastewater that will be diluted 1 to more than 10 times with rain or groundwater
- Final Selection Process is progressing to meet regulatory requirements and include additional analysis, environmental documentation preparation and detailed design
- Construction approach will minimize noise, vibrations, odors, and traffic impacts
- Constructed Underground Storage Facilities offers many above ground options for Public and Private use



Methods to Stay Informed & Provide Input

Sign Up for Email Updates

info@cleanwaterprogramsanmateo.org

Register for Private Neighborhood Updates

www.NextDoor.com

Contact Us

www.CleanWaterProgramSanMateo.org

650-727-6870





CLEANWATERPROGRAM

PROTECTING THE BAY FOR A SUSTAINABLE FUTURE



www.cleanwaterprogramsanmateo.org

