CLEANWATERPROGRAM

PROTECTING THE BAY FOR A SUSTAINABLE FUTURE

First October Community Meeting Underground Storage Facility Alternatives Process & Progress Update

Tuesday, October 4, 2016

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Agenda

- Team Introductions
- Outreach Process Updates
- Presentation of Five Topic Areas
- Question & Feedback Sessions with Community After Each Topic
- Open House Format at Exhibit Board Stations

Outreach Process Updates

- Two August Community Meetings
- Two September City Commission Meetings
- Neighborhood Meetings
- Receipt of emails & hotline messages
- Summary Report of August Community Meetings on CWP website
- FAQ responses on CWP website
- Two October Community Meeting Notifications sent thru multiple distribution channels
- PW Commission Meeting on October 12th

Question & Feedback Session Guidelines

- Approximately 15 minutes per feedback session after each topic
- Facilitator will acknowledge each speaker
- One speaker at a time
- Focus on questions
- Questions should pertain to topic at hand
- No applauding, booing, or cheering
- Questions & Feedback will be logged
- Be respectful & patient

Two October Community Meeting Topics

- Tuesday, October 4th Specific Topics
  - *Clean Water Program Drivers & Goals*
  - *Wastewater Management & Underground Storage Basics*
  - *Program Approaches*
  - *Alternatives Selection Criteria & Process*
  - *Construction Impacts & Operational Considerations*

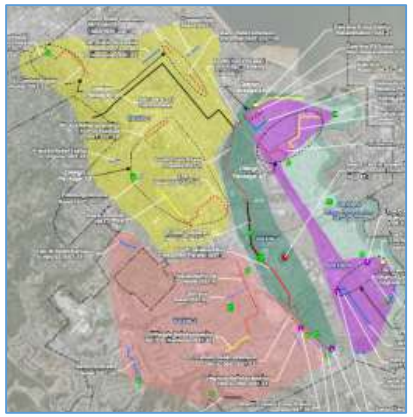
- Thursday, October 6th Specific Topics
  - *Clean Water Program Drivers & Goals*
  - *Wastewater Management & Underground Storage Basics*
  - *Cost of Alternatives*
  - *CEQA Process*
  - *Environmental & Air Quality Mitigations*

Topic 1

Clean Water Program Drivers & Goals

Clean Water Program – Drivers & Goals

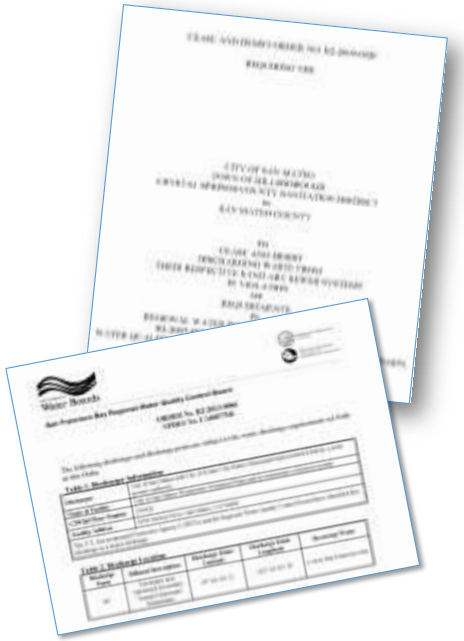
Replace Aging Infrastructure



Collection System

WWTP

Provide Higher Levels of Treatment & Capacity Assurance



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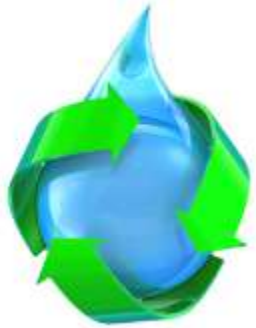
Address Sustainability, Climate Change, & Biosolids/Energy



Water Re-Use Partnerships

Institute for Sustainable Infrastructure

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Infrastructure Sustainability Metrics

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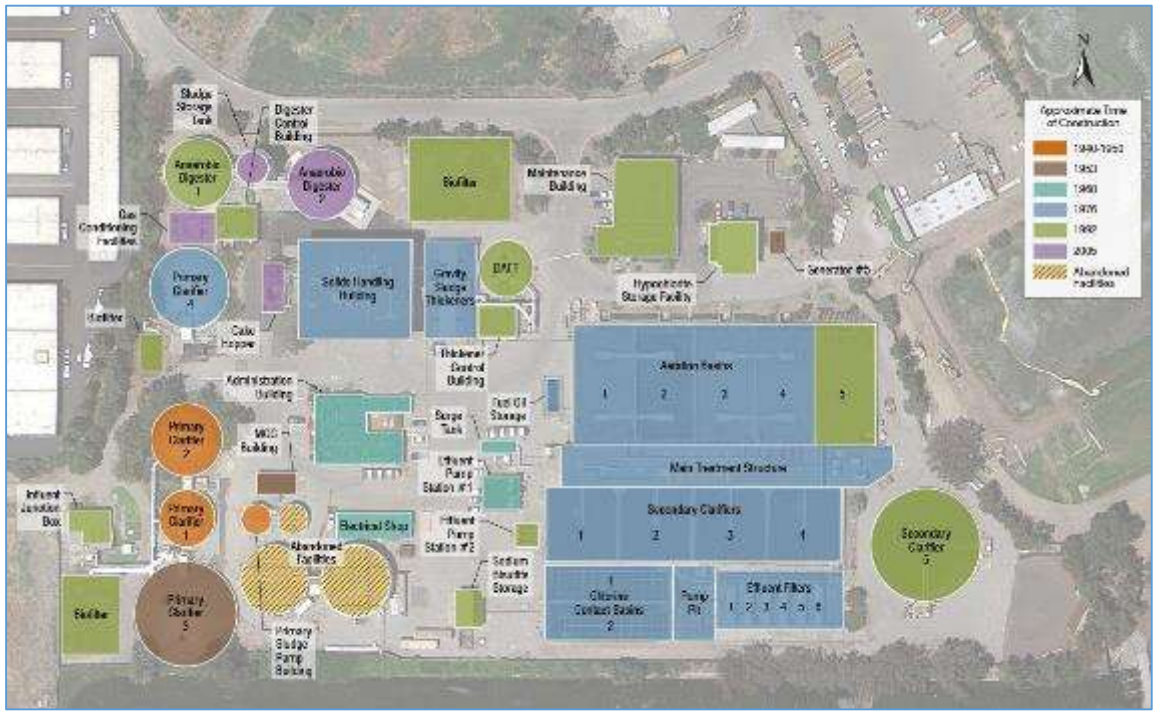
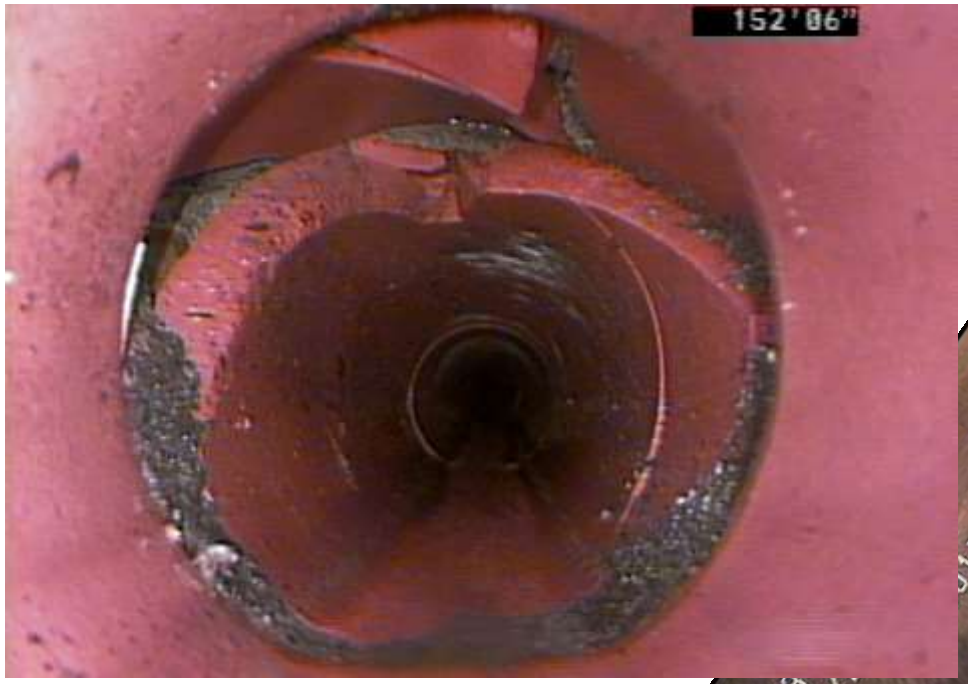
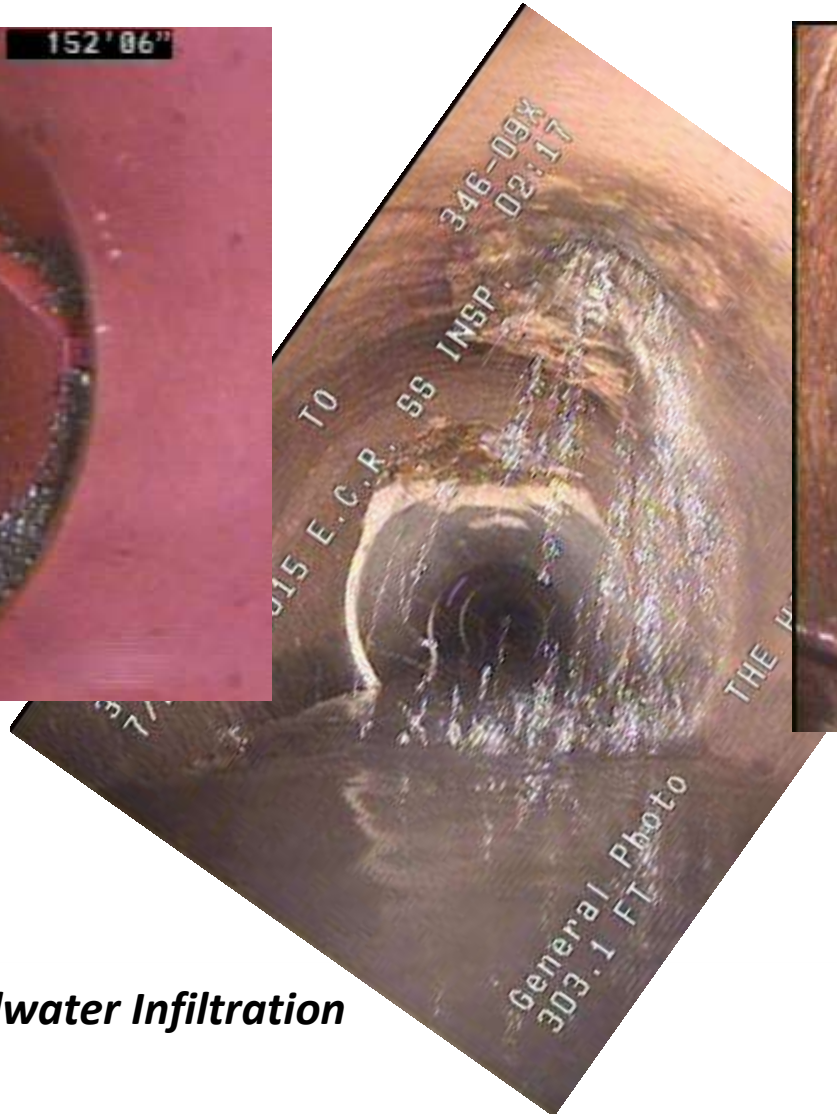
Aging WWTP Facilities



Aging Collection System Facilities



Cracked & Offset Pipe



Rain & Groundwater Infiltration

Root Intrusion in Pipe

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Insufficient Capacity - Sanitary Sewer Overflows (SSO)

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

Delaware Street Corridor

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SSO Impacts to Water Quality at San Mateo Beaches

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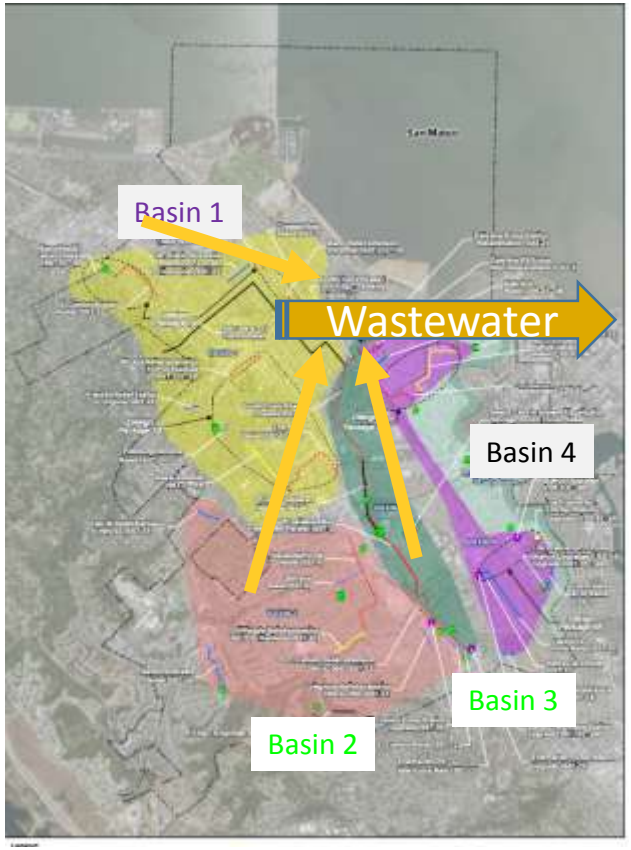
What is the Clean Water Program?

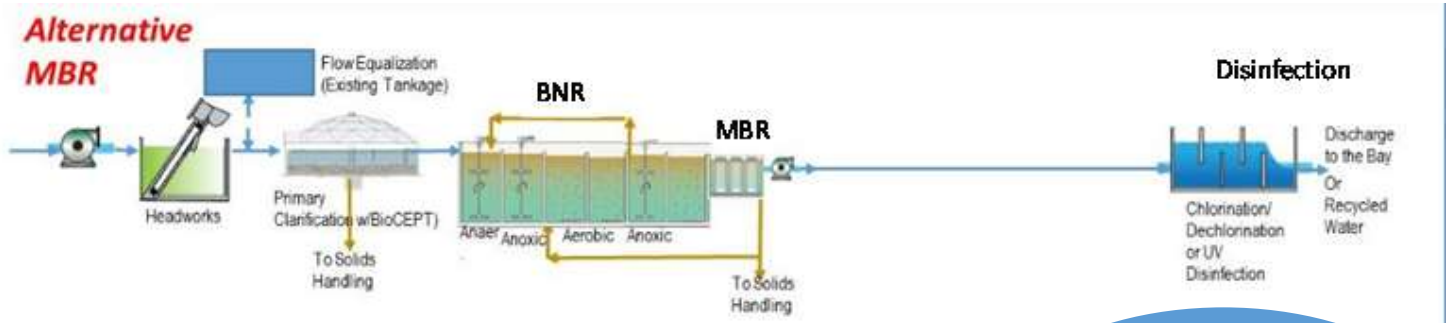
1. Collect

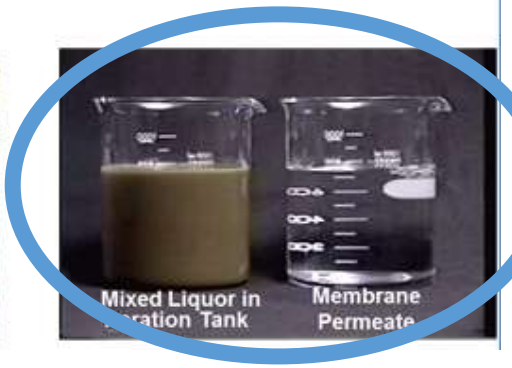


Sewer In-System Storage Upgrades to Prevent SSOs

2. Treat

New WWTP Treatment Approach to Prevent Sewer Overflows to SF Bay





Before & After Treatment

PEIR was Certified in June 2016 & Council Selected this Alternative

3. Discharge

Reusable Clean Water

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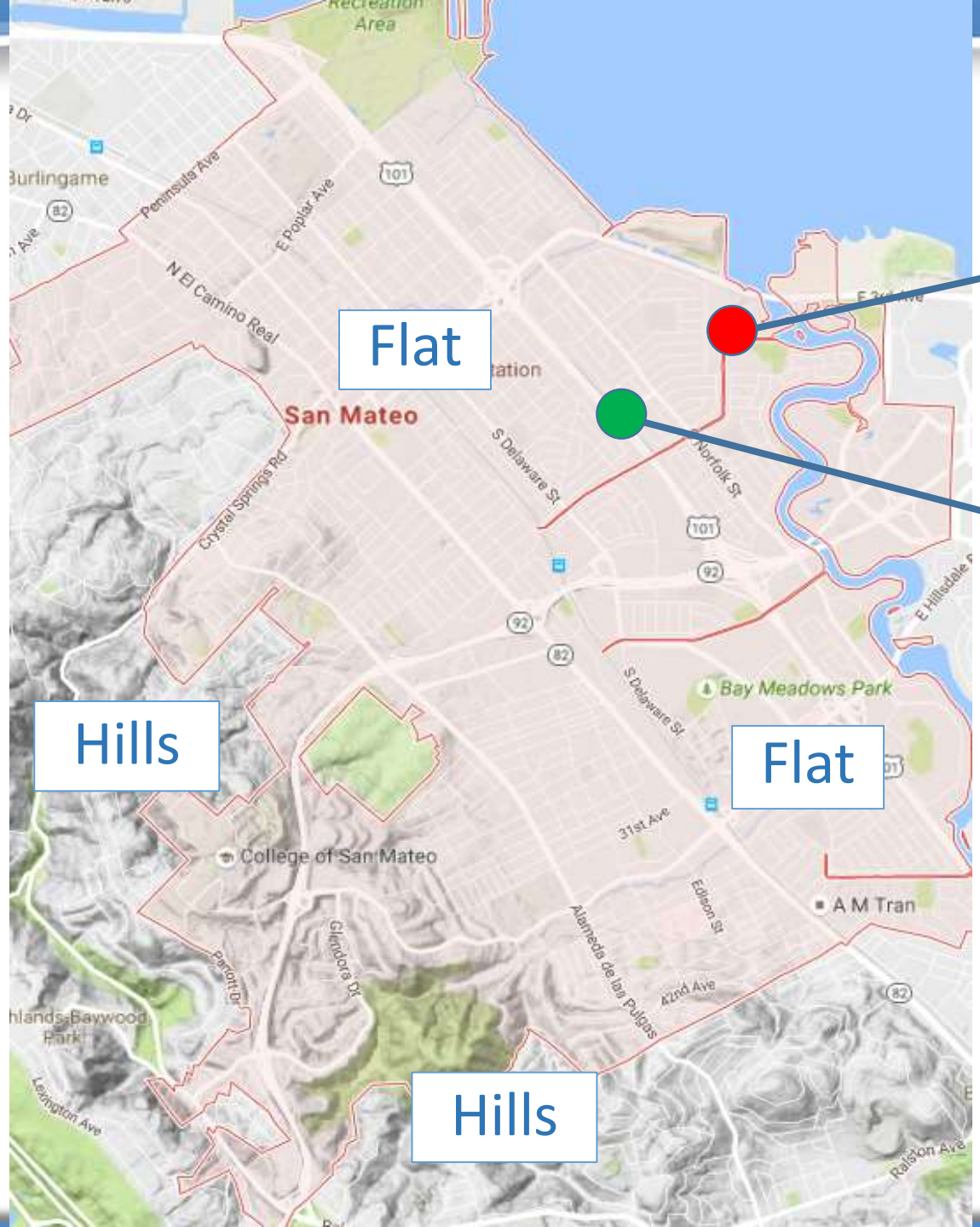
Topic 2

Wastewater Management & Underground Storage Basics

Wastewater Management System

San Mateo Topography



WWTP

Dale Ave Pump Station (DAPS)

Liquids Flow to the Low Areas

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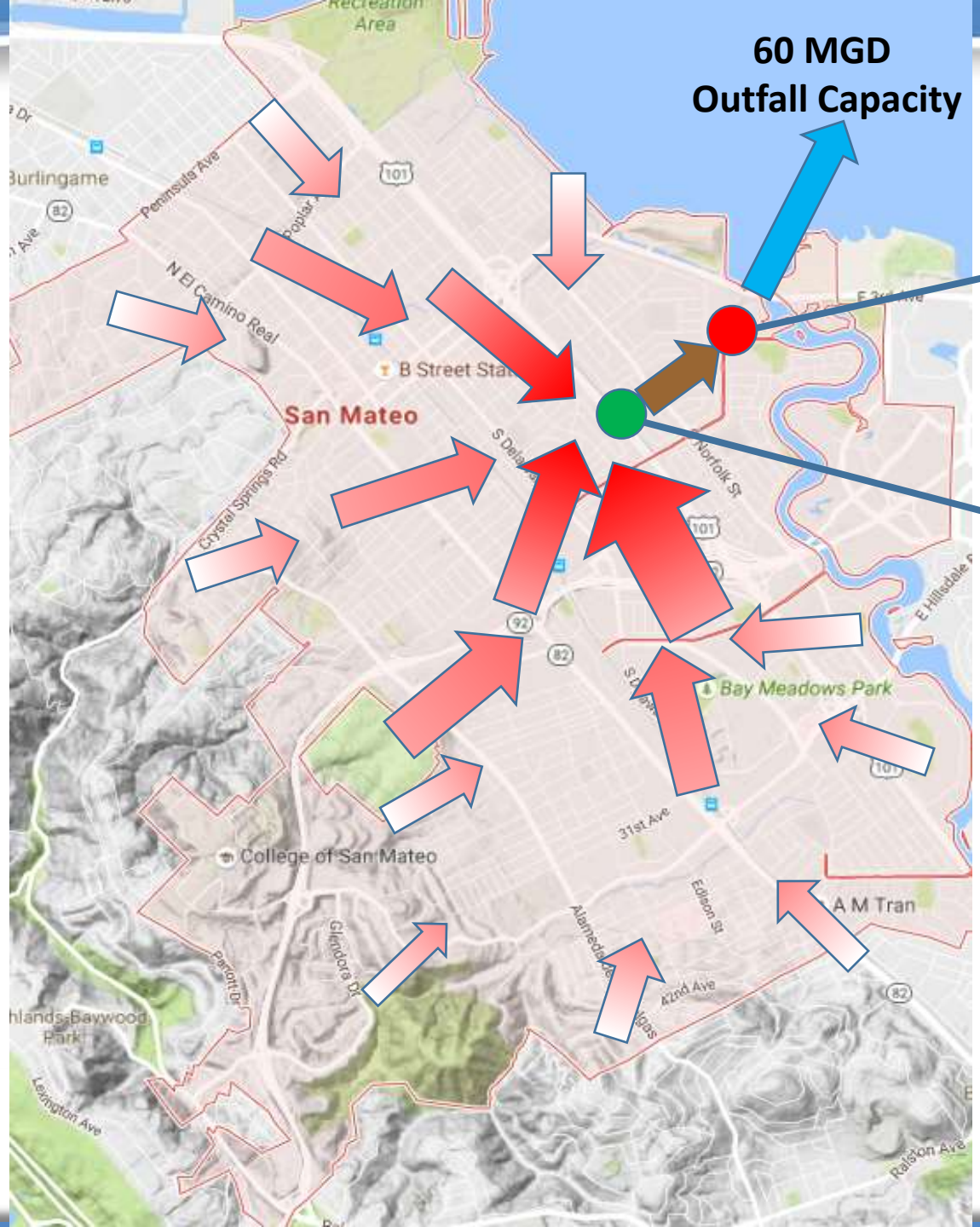
Dry Weather Gravity Sewers and Hydraulic Operations



Most Flows go through DAPS to get to WWTP

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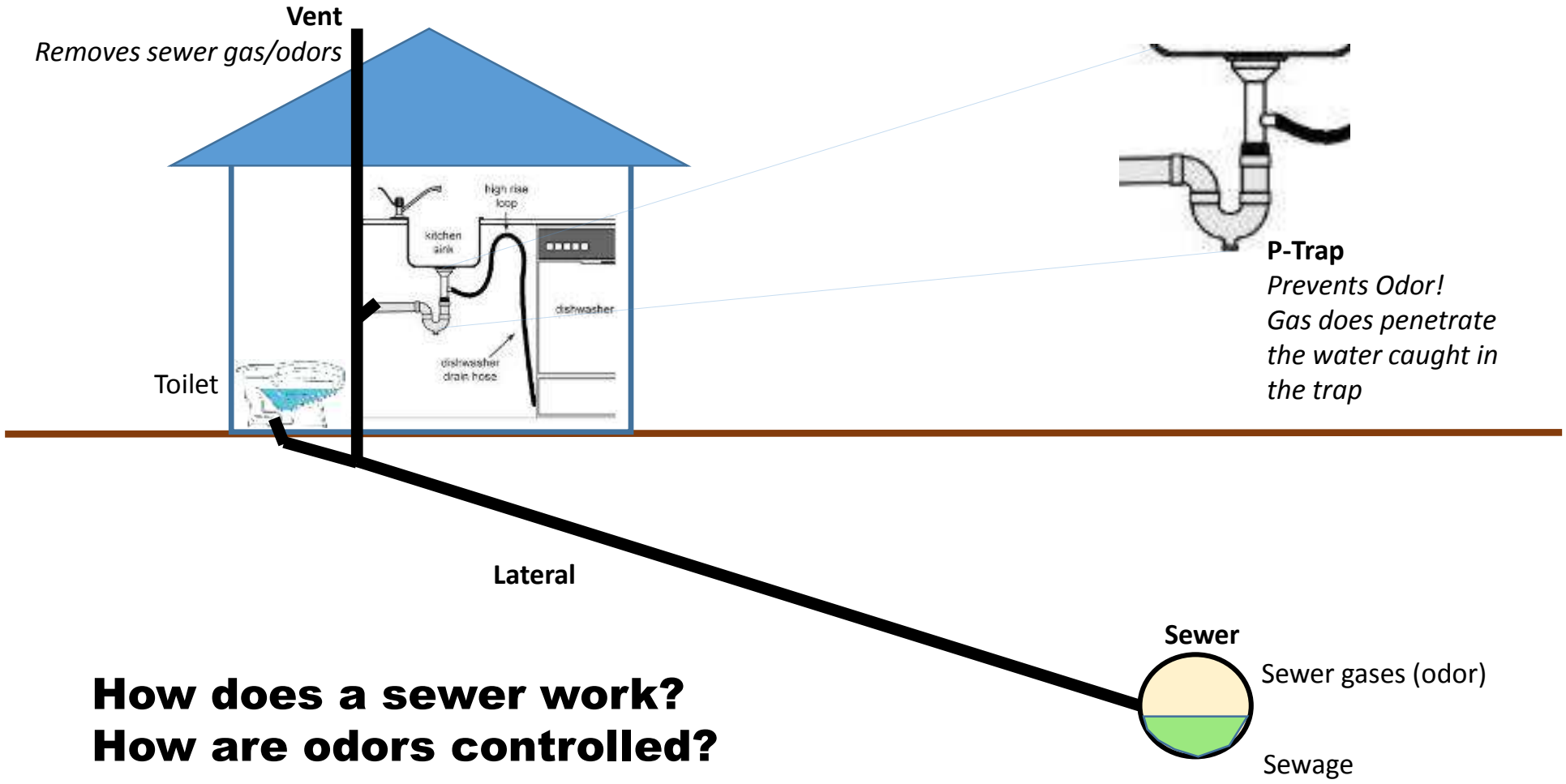
Wastewater Basics: Dry Weather Conditions



How does a sewer work?
How are odors controlled?

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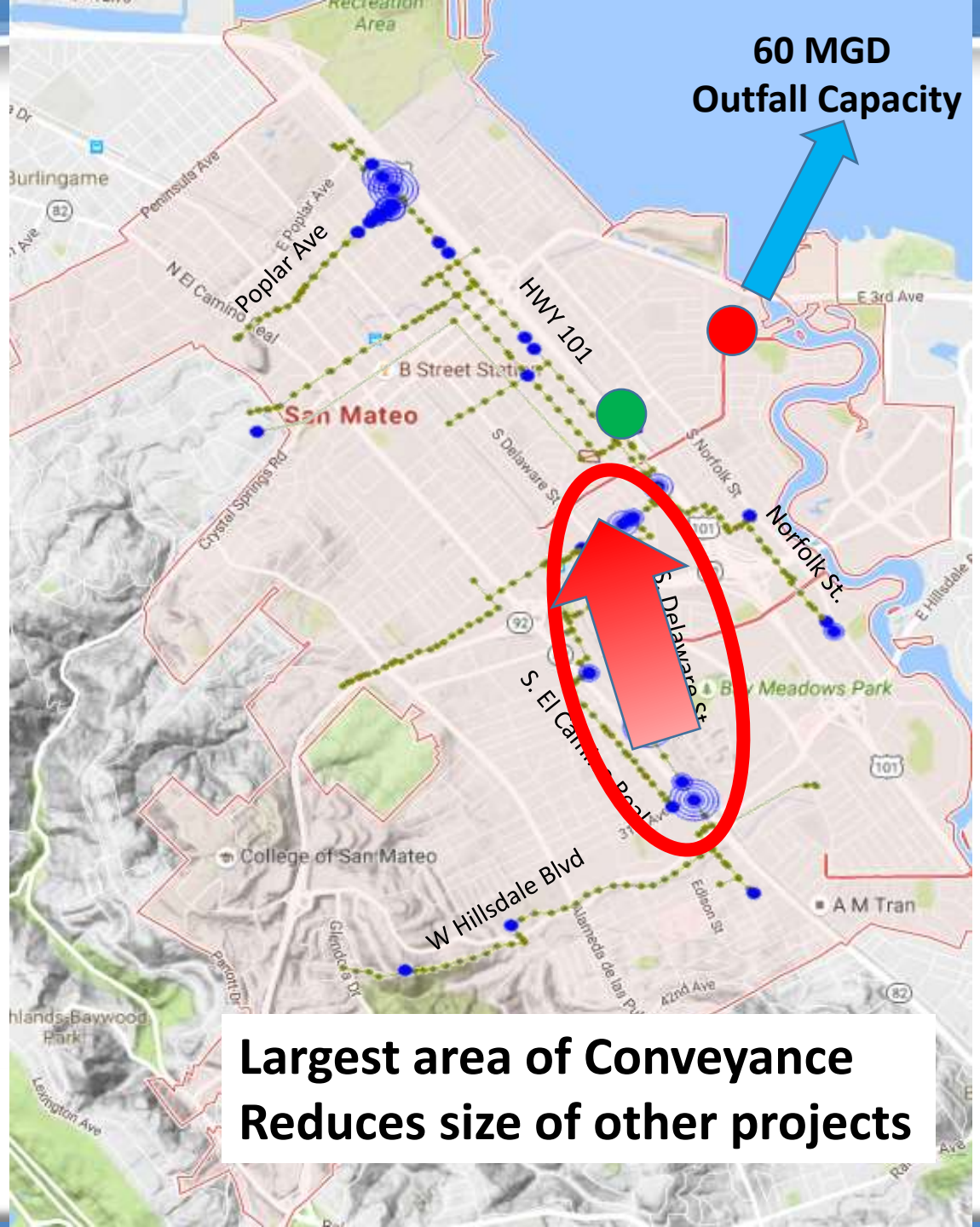
Peak Wet Weather Hydraulic Model and SSOs



Blue Dots are SSOs Identified through Hydraulic Modeling

High Concentration of SSO Occurrences Along Delaware St

Storage is best way to reduce peak flow

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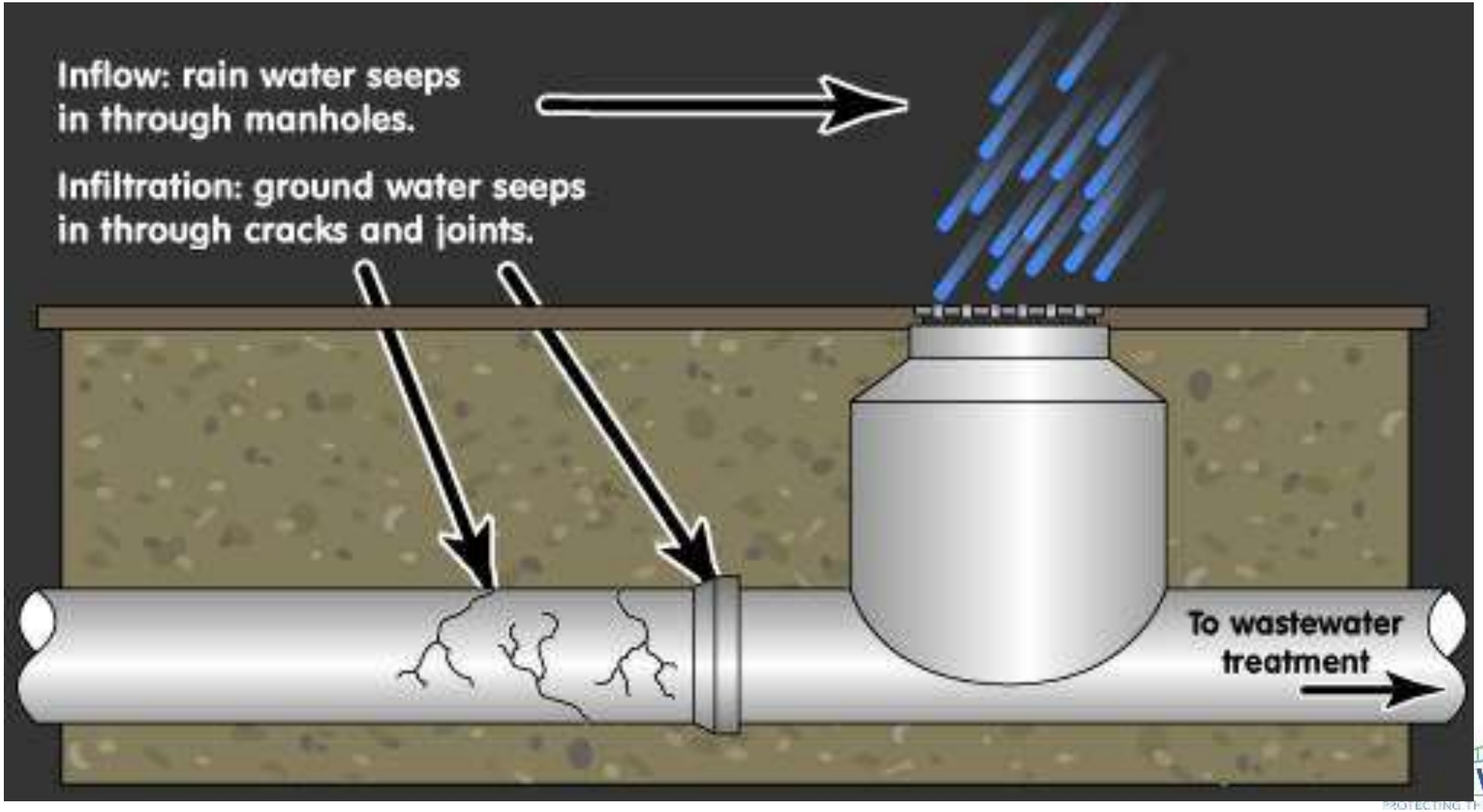
Contributors to SSOs

INFILTRATION & INFLOW (I&I)



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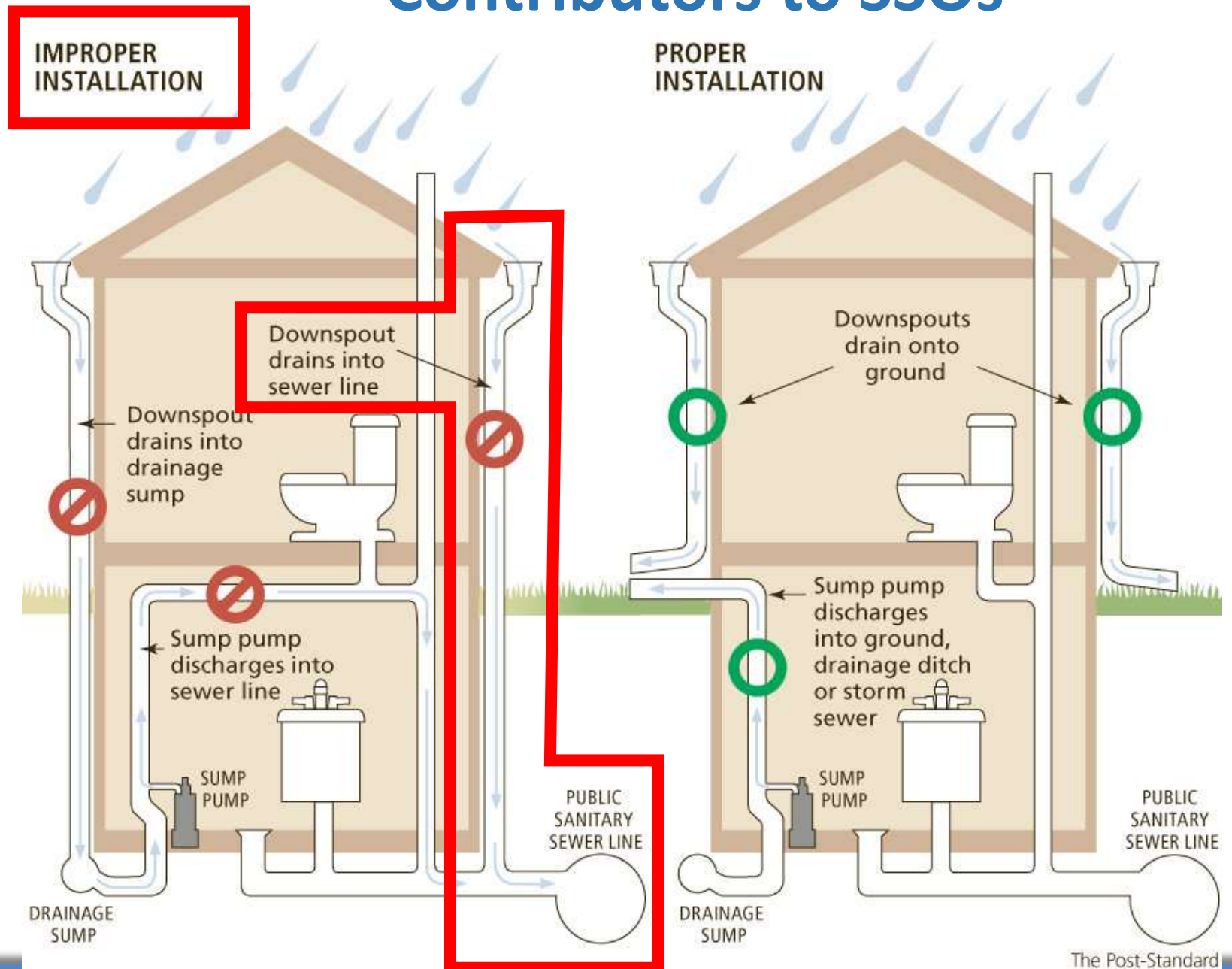

ILLEGAL STORM DRAIN CONNECTIONS

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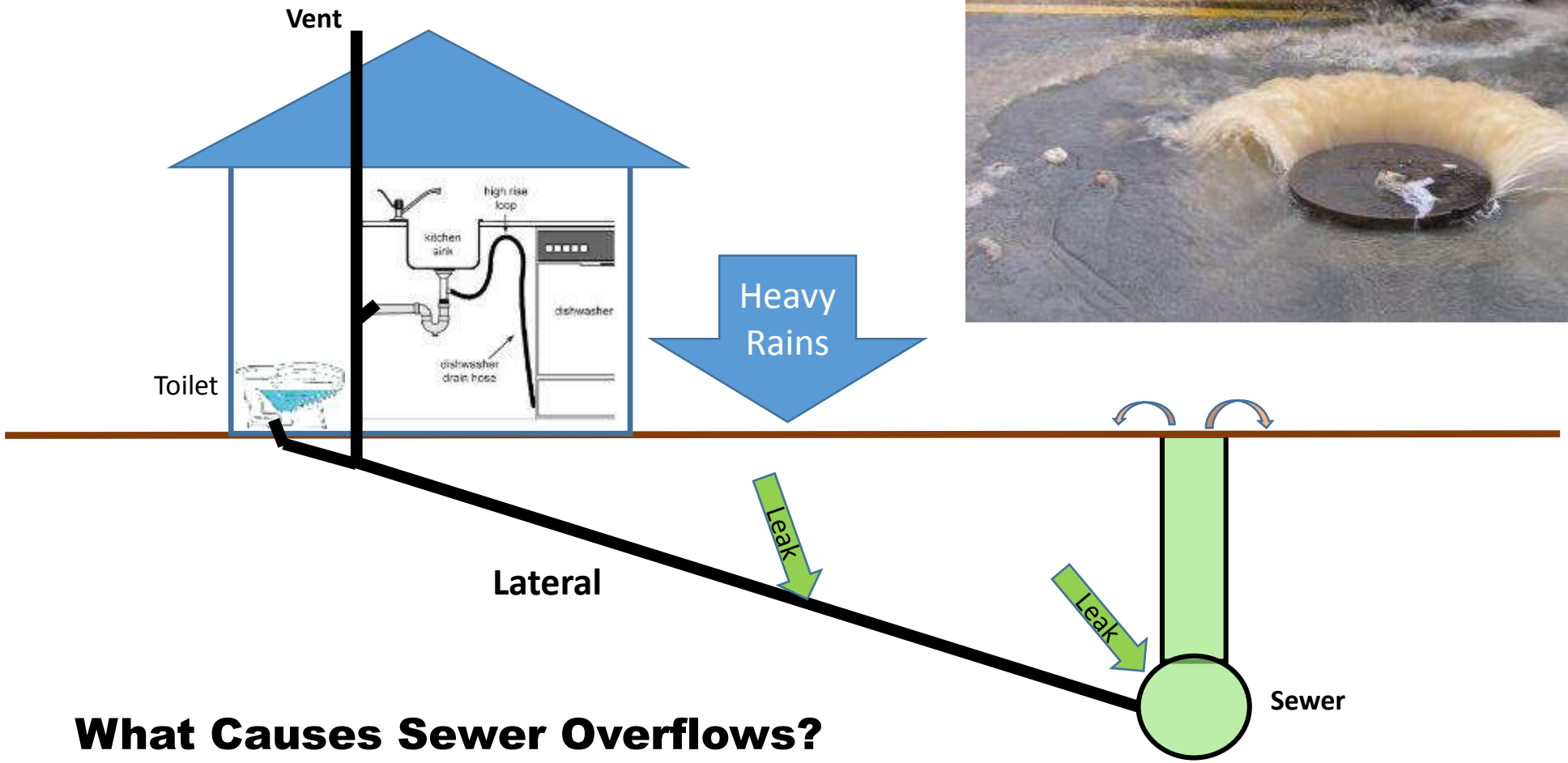
Wastewater Basics: Peak Wet Weather Conditions & SSOs



What Causes Sewer Overflows?

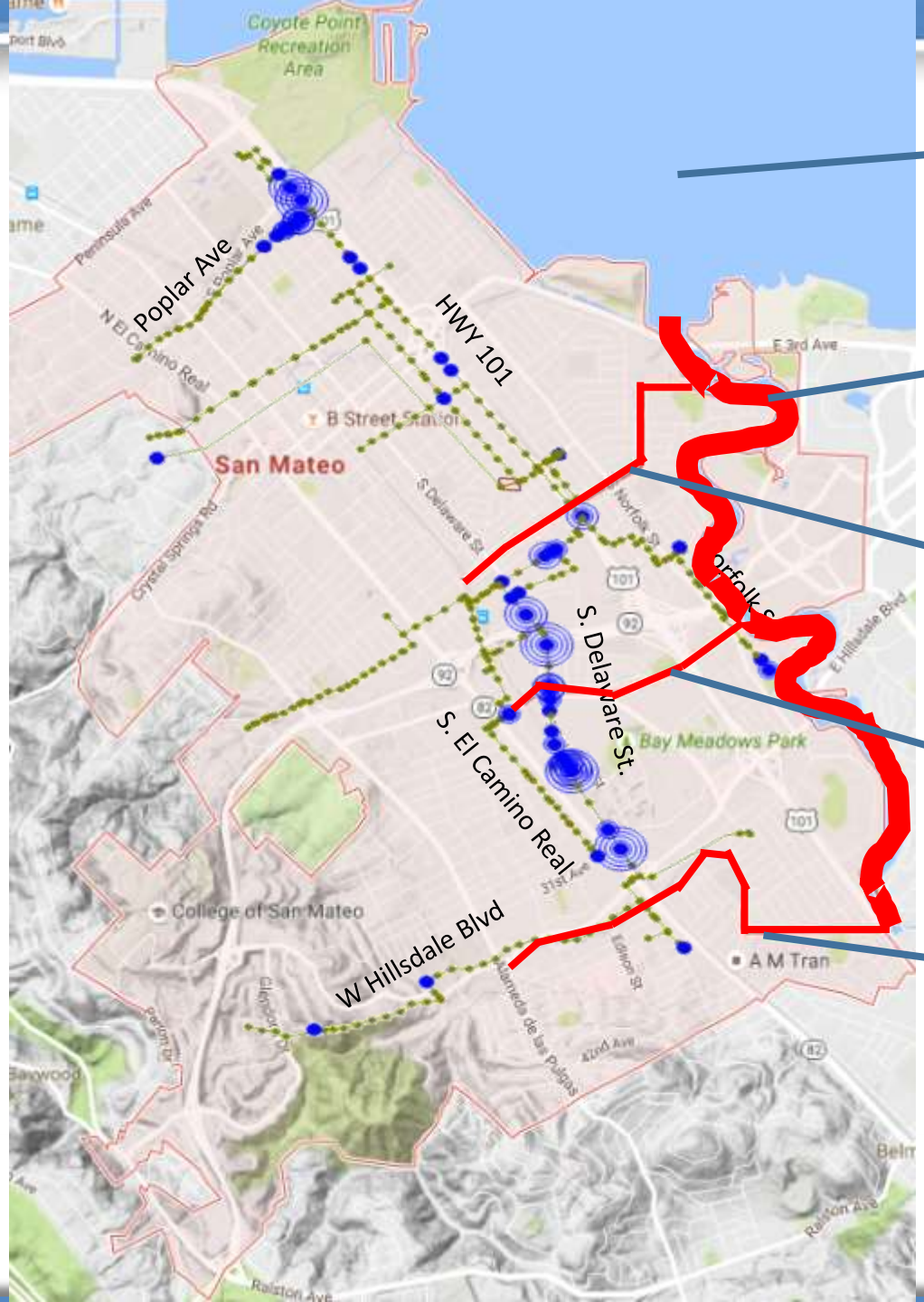
Sewage + Lots of Rain Water

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

Marina Lagoon

Leslie Creek

Borel Creek

Laurel Creek

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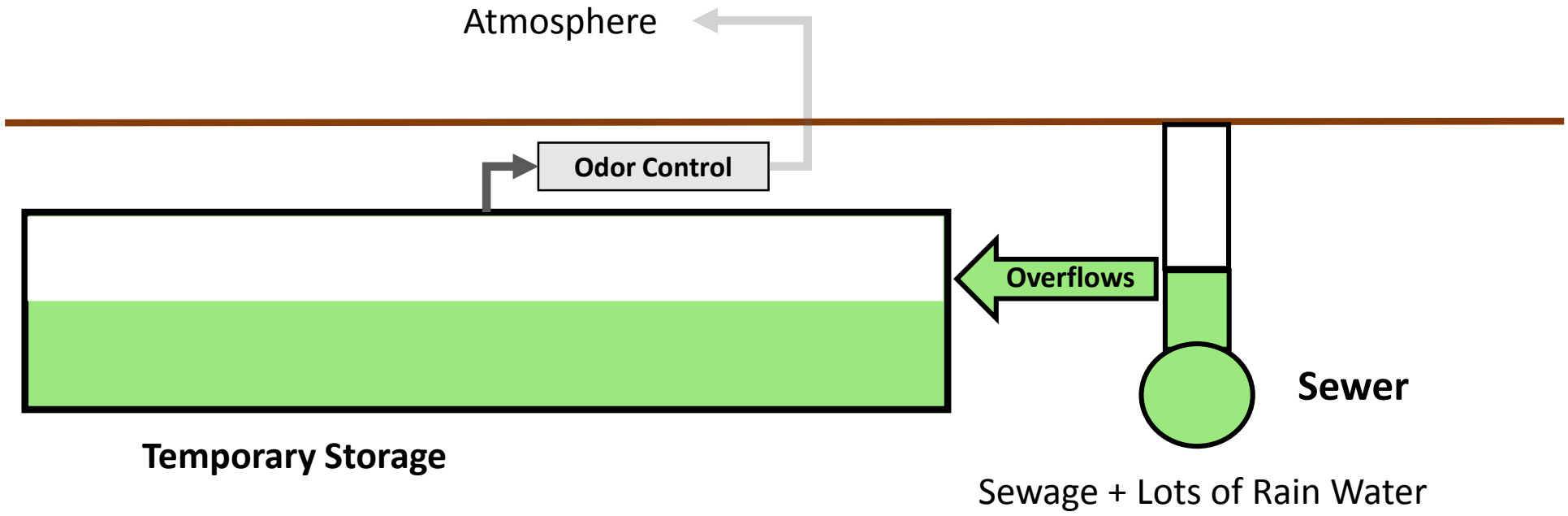
Collection System Improvements

Relief Sewers

Pump Station Upgrades

Storage Facility: Peak Wet Weather Conditions

Preventing Sewer Overflows
During Very Heavy Rain Periods



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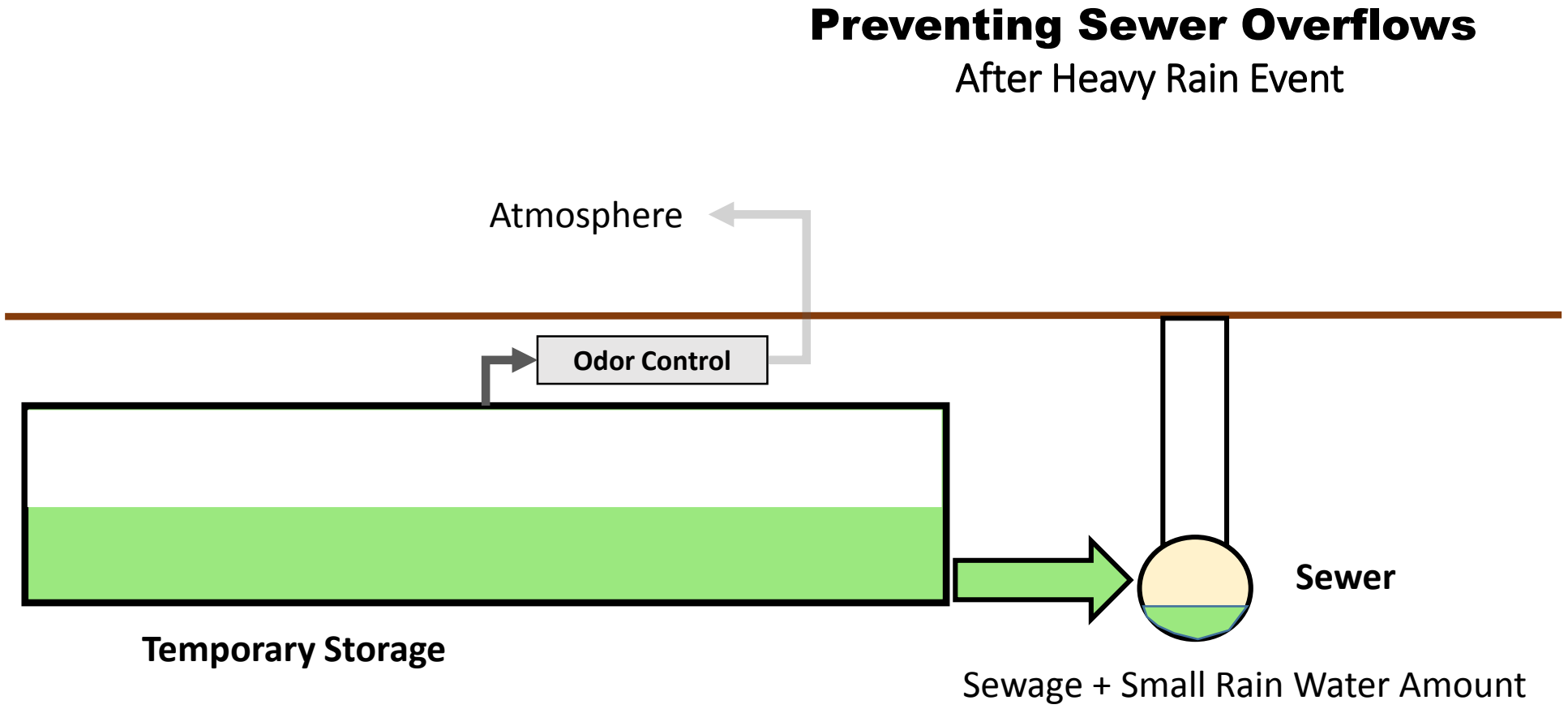
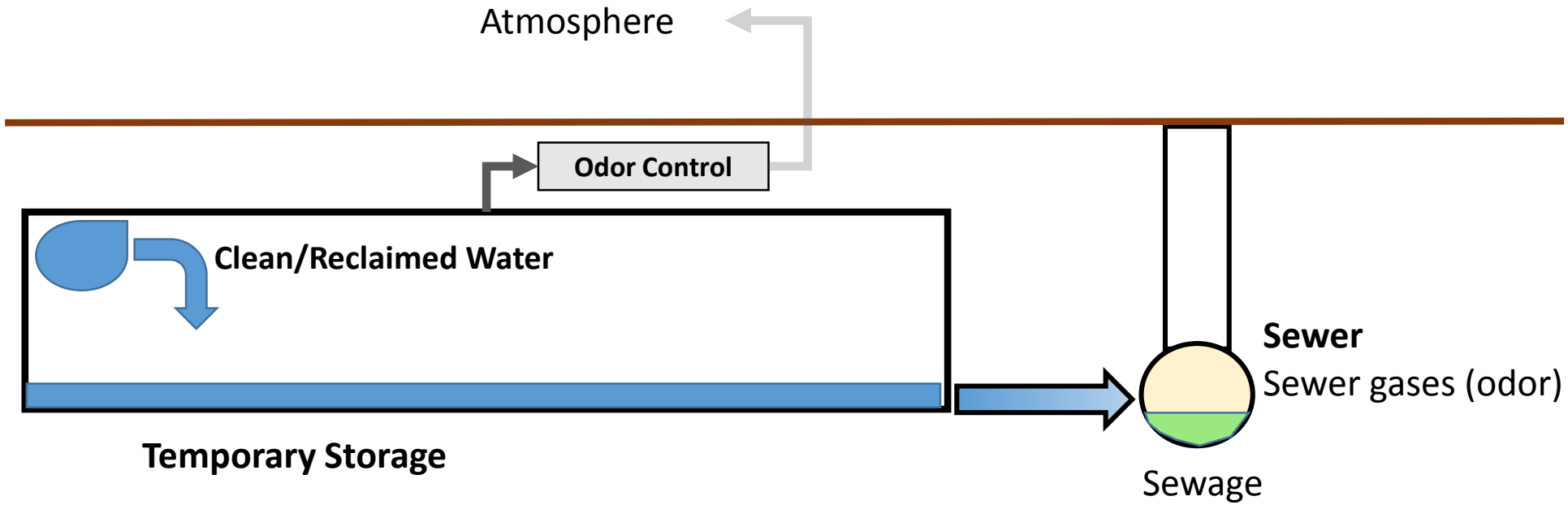
Storage Facility: After Wet Weather Conditions



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

Preventing Sewer Overflows

Cleaning Temporary Storage



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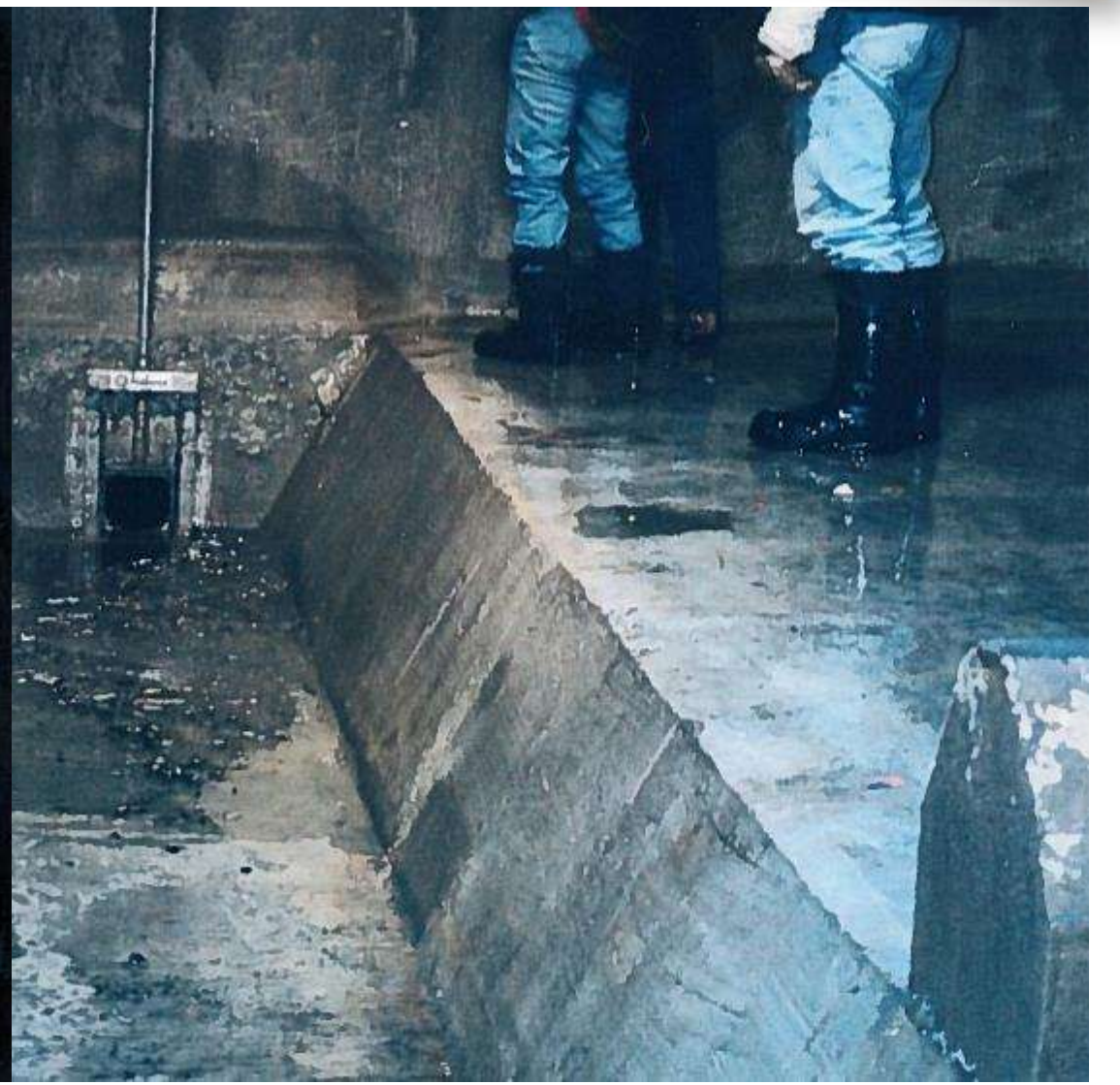
Storage Facility After SSO is Managed

Tipping Buckets Dropping Water Load at 2000 gals/bucket

Storage Facility being Washed

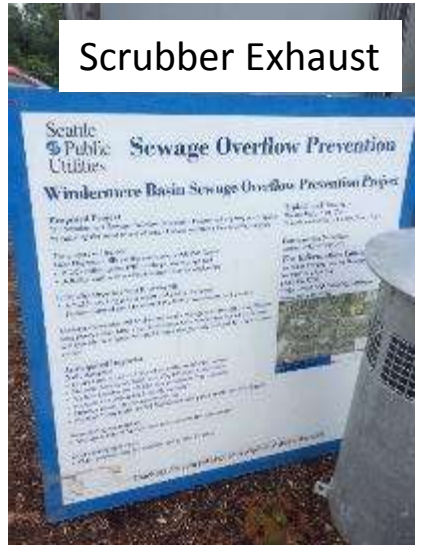


Final Results - Clean Floor

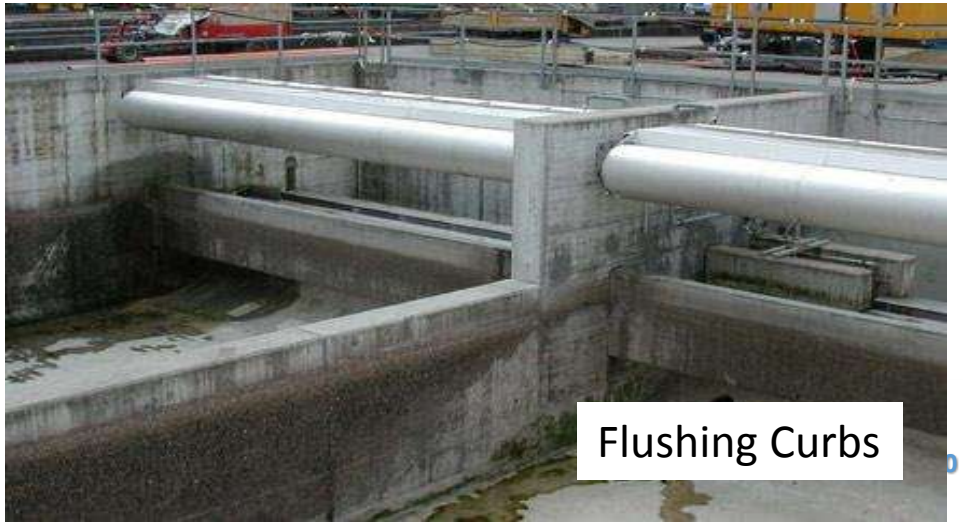
Storage Facility: Odor & Noise Control and Self Cleaning

Air Tight Vaults

Carbon Odor Scrubber



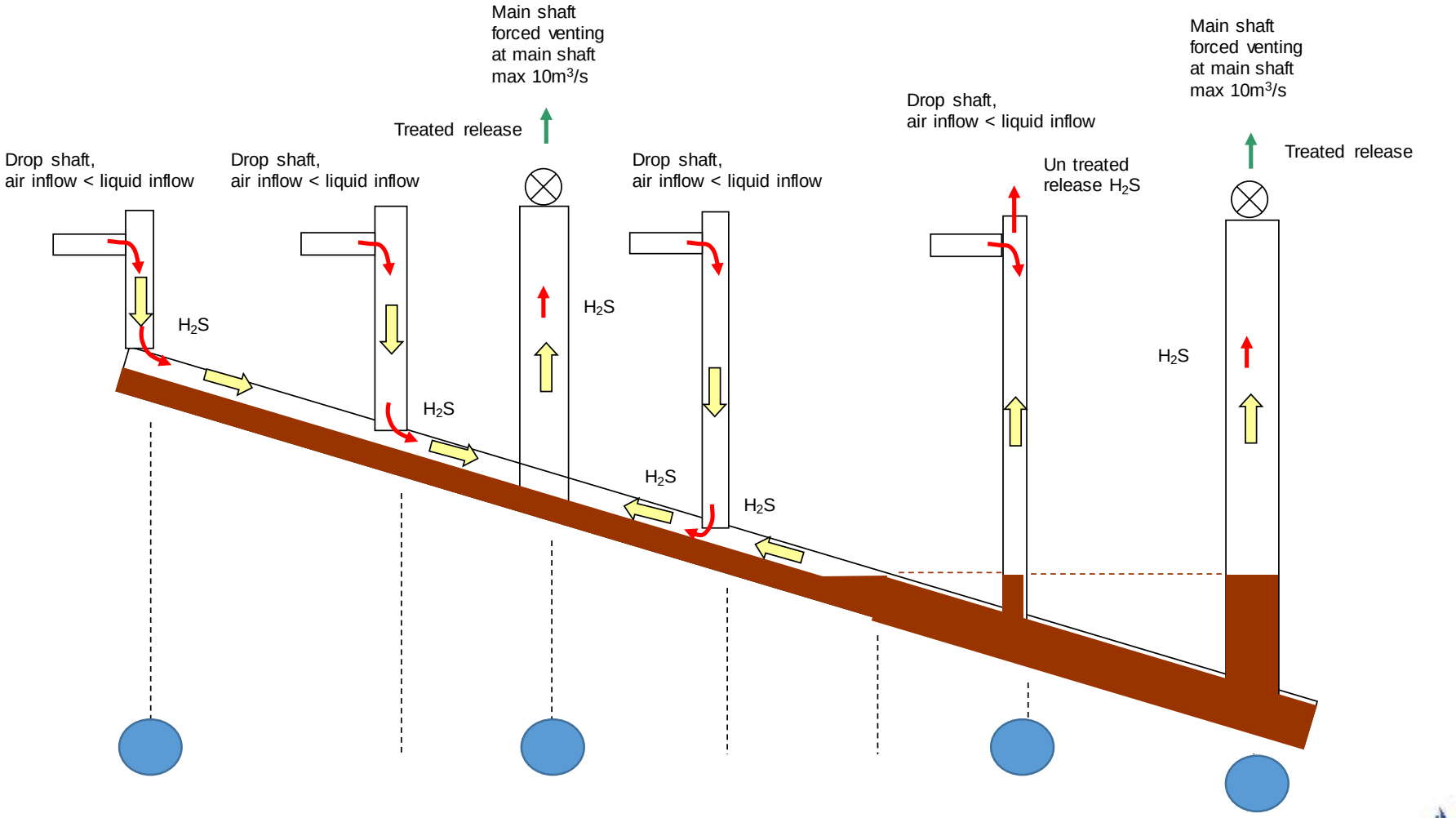
Scrubber Exhaust



Flushing Curbs

Self Cleaning Tipping Buckets

Tunnel Shaft Odor Control Needs



= Odor Control Locations

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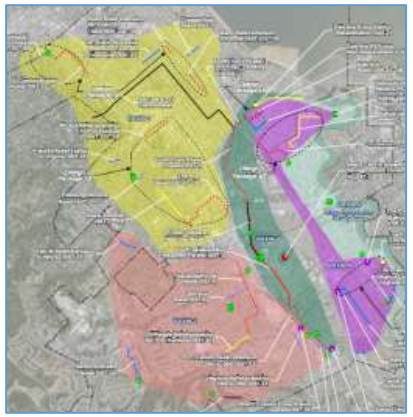
Topic 3

Program Approaches

Clean Water Program – Drivers & Goals

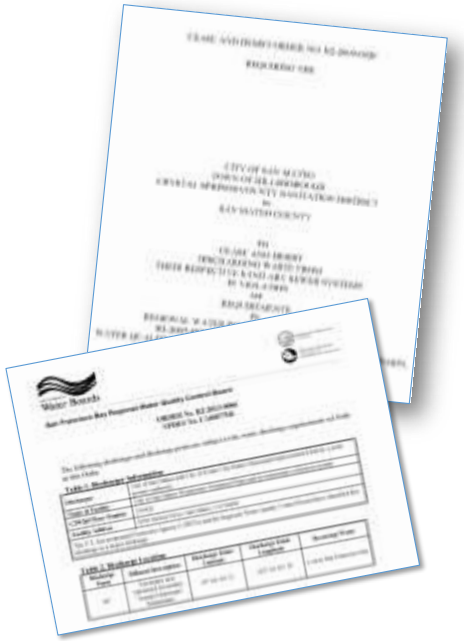
Replace Aging Infrastructure



Collection System

WWTP

Provide Higher Levels of Treatment & Capacity Assurance



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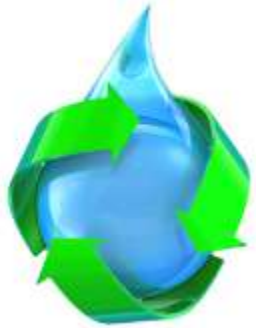

Water Re-Use Partnerships

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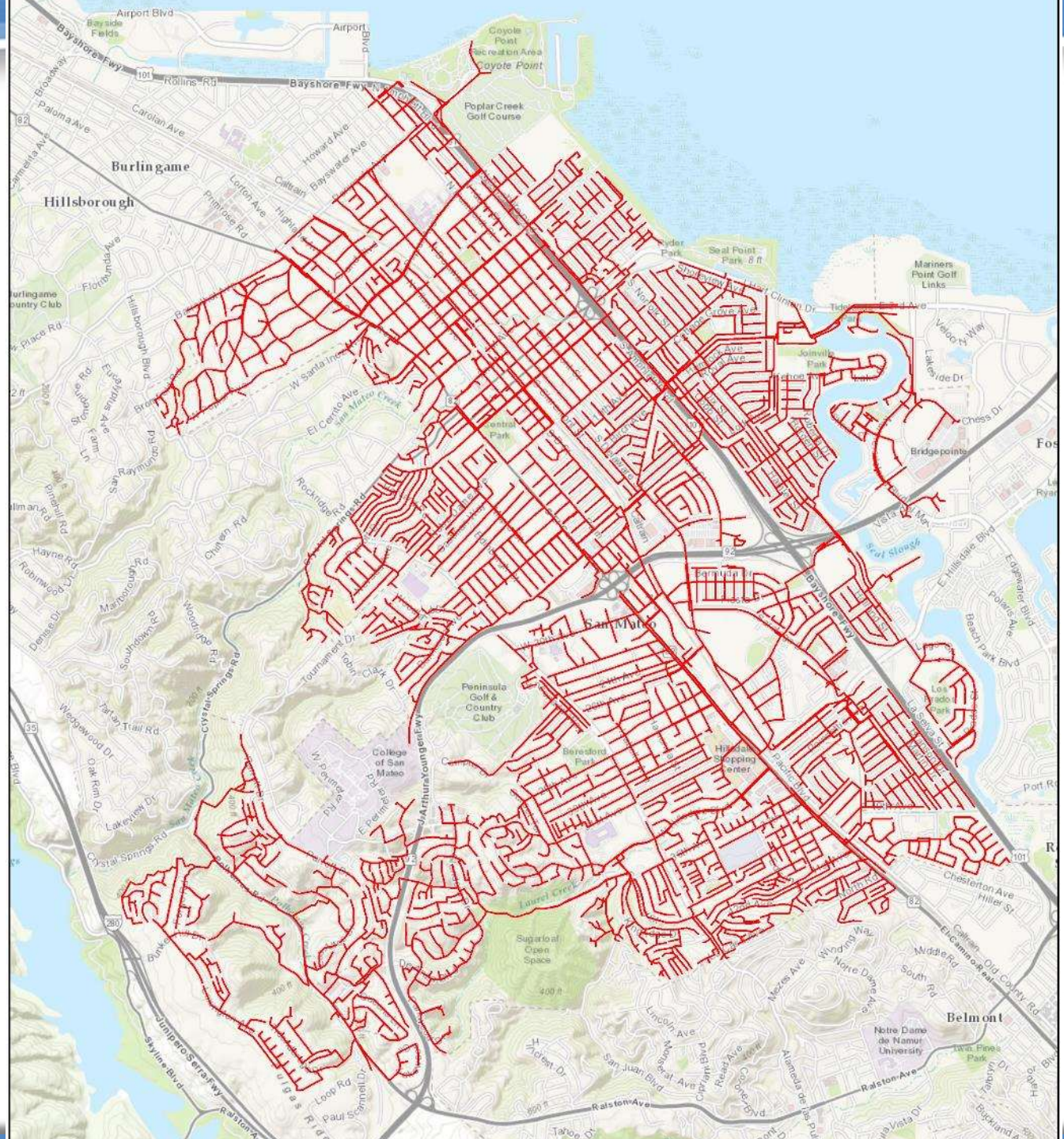
Program Approaches

Alternative	Major Characteristics	Significant Impacts	Meets CWP Objectives?
In-System Storage Program	One or more underground storage basins upstream of the Dale Avenue Pump Station to detain wastewater flows during peak wet weather events	• Significant and unavoidable construction noise and vibration impacts • All other impacts less than significant with mitigation	Yes
Full Conveyance Program	New pump station next to the existing Dale Avenue Pump Station and larger pipelines to deliver peak wet weather flows to WWTP.	• Significant and unavoidable construction noise and vibration impacts. • All other impacts less than significant with mitigation.	Yes
Conveyance system replacement program	Replacement of all pipelines in City's conveyance system.	• Significant and unavoidable construction noise and vibration impacts. • Would not address all SSOs or aging infrastructure at WWTP. • Would not meet current or future regulatory requirements. • Would not support creation of opportunities for recycled water use.	No

Program Approaches – Conveyance System Replacement

"Why don't we just fix all the leaks by replacing all the pipes?"



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Program Approaches – Conveyance System Replacement

Conveyance System Replacement

- Replace ALL pipes
- Does not Include WWTP Improvements

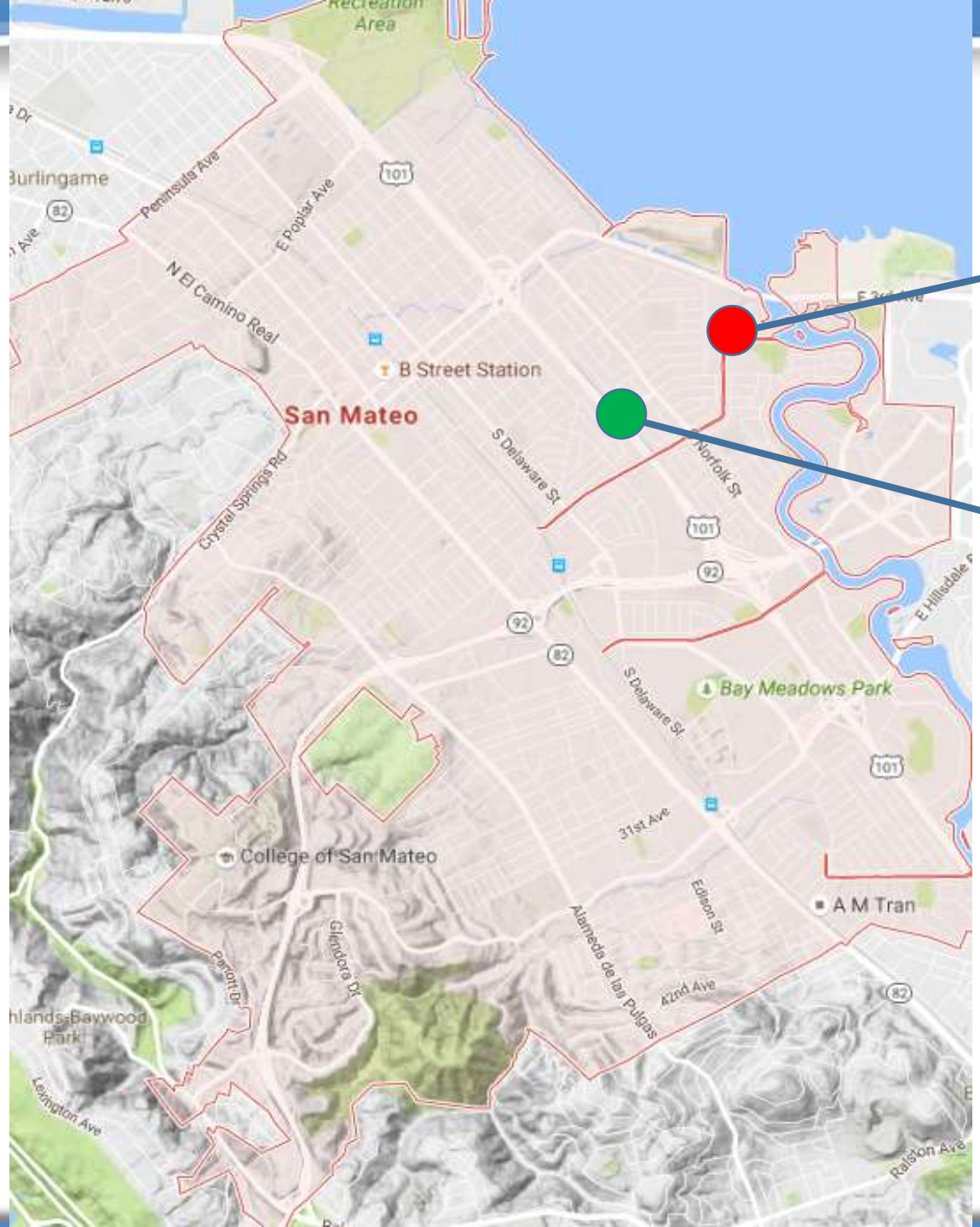
- ~1,235,000 feet (235 miles) of sewer mains
  - 64% mains in roads [~790,400 feet (150 miles)]
  - 36% mains in easements [~444,600 feet (85 miles)]
  - **City Wide Impacts to All Properties**
- ~28,000 lateral connections (~1,400,000 feet)
- **$1.3 Billion** (Conveyance System Only, **without WWTP Improvements**)
- ISS Alternative is $900 M and includes both CS & WWTP Improvements
- Approx. **3 to 4 times longer** construction duration

Full Conveyance vs In-System Storage Alternatives

Full Conveyance	In-System Storage
• All wet weather storage located at WWTP • Bigger pipes and pump station to convey all flow to WWTP • Larger pipes will increase odor • New wet weather pump station and force main at Dale Ave location • WWTP improvements must be completed before Full Conveyance alternatives can be implemented	• Wet weather storage located upstream of WWTP & at WWTP • Smaller pipes to convey controlled amount of wet weather flows • Better odor control • Independent from WWTP improvements • Sooner benefit to reducing SSOs • Preserves space at WWTP for future improvements for recycled water • Estimated at least $30M less expensive than full conveyance alternative for same WWTP Option

Full Conveyance Alternative

New Dale Ave Pump Station



WWTP

Dale Ave Pump Station (DAPS)

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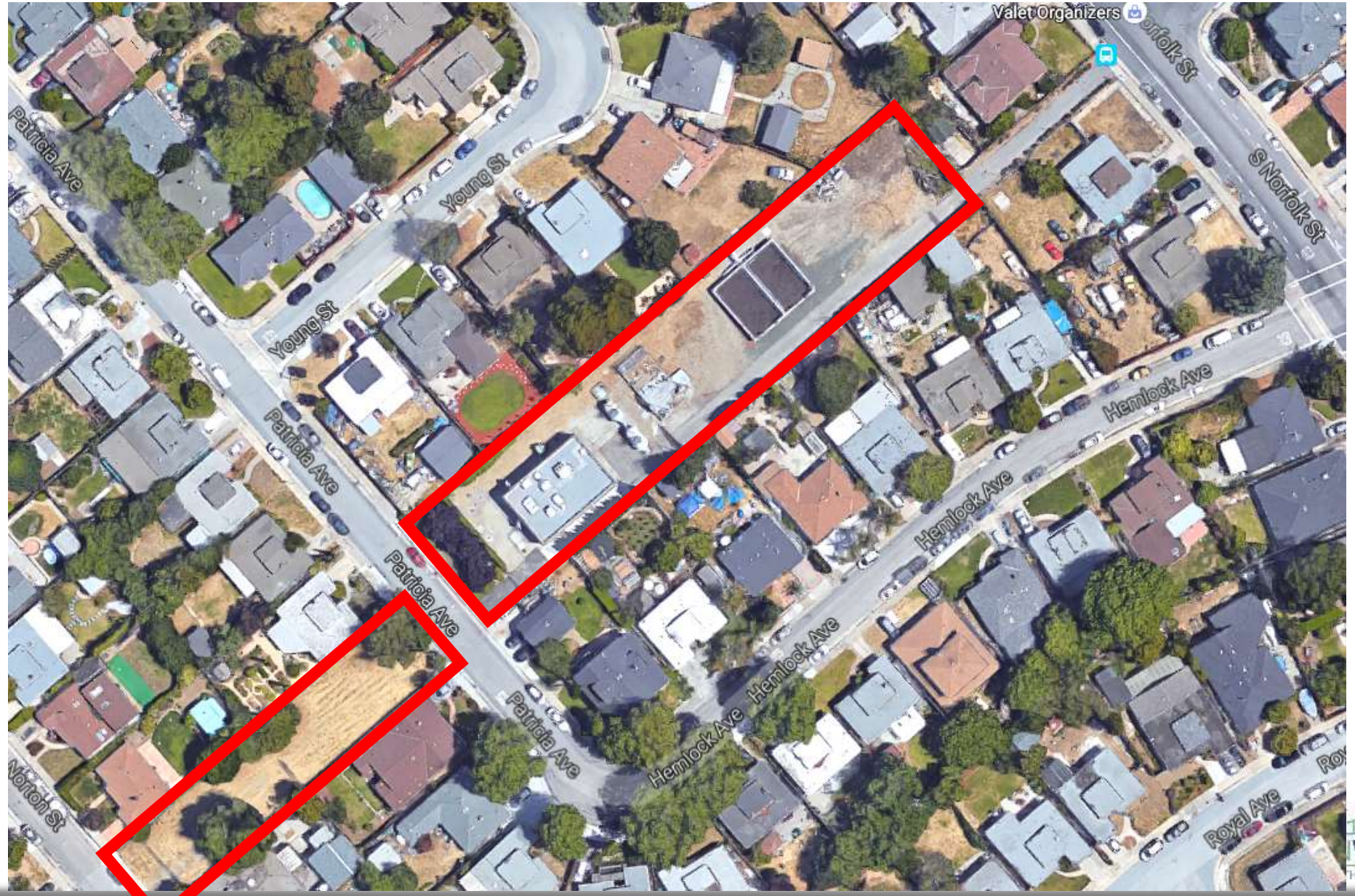
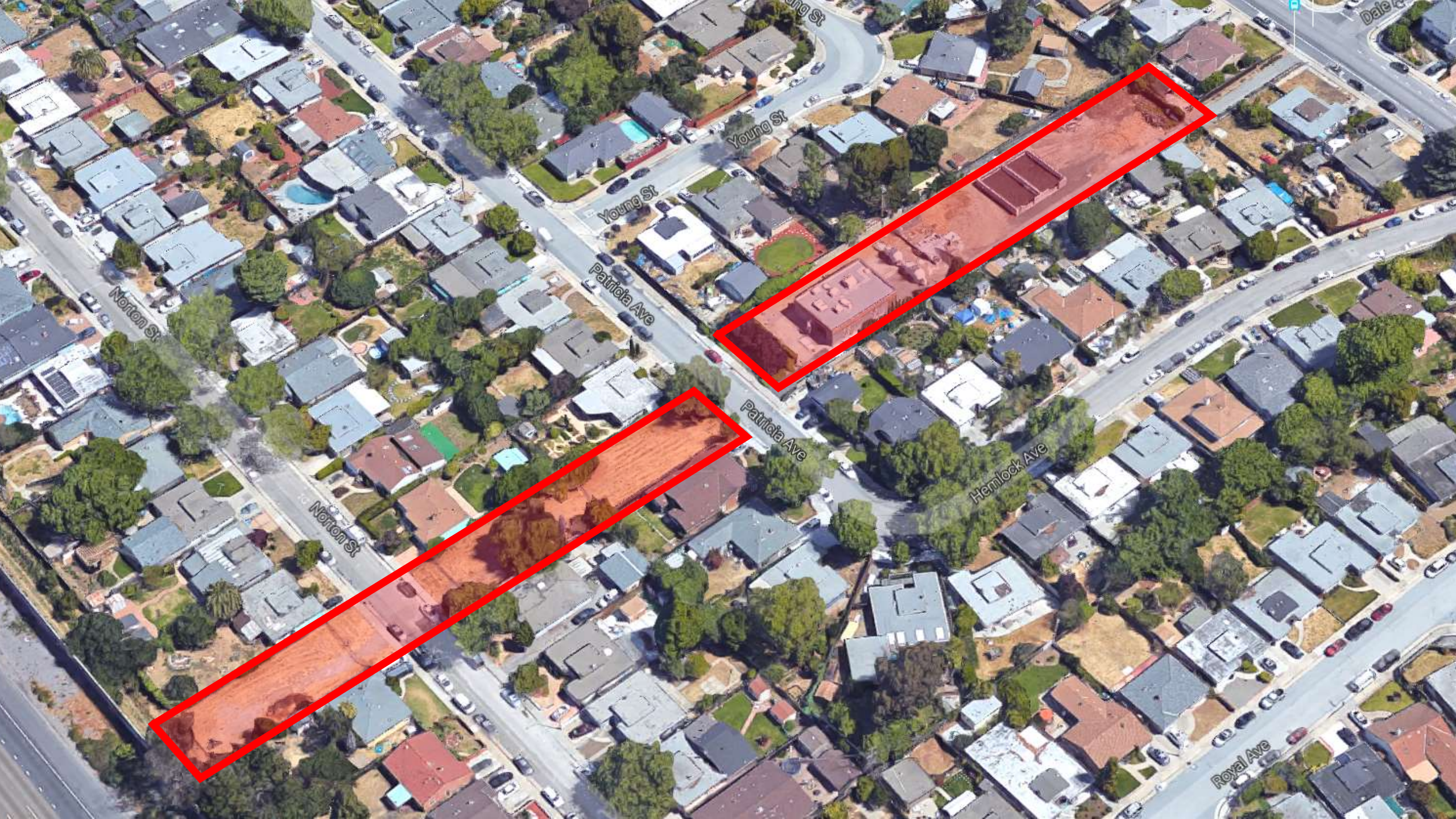
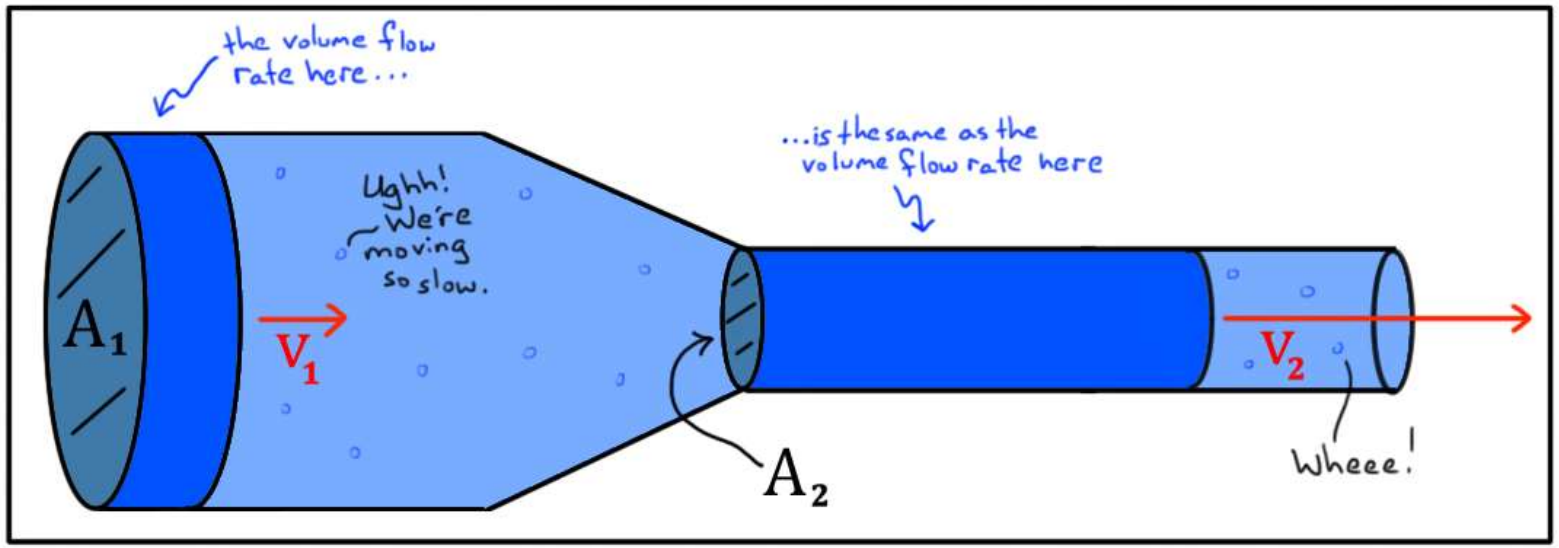
Program Approach - Full Conveyance




Young St
Young St
Young St
Patricia Ave
Patricia Ave
Norton St
Norton St
Hemlock Ave
Royal Ave

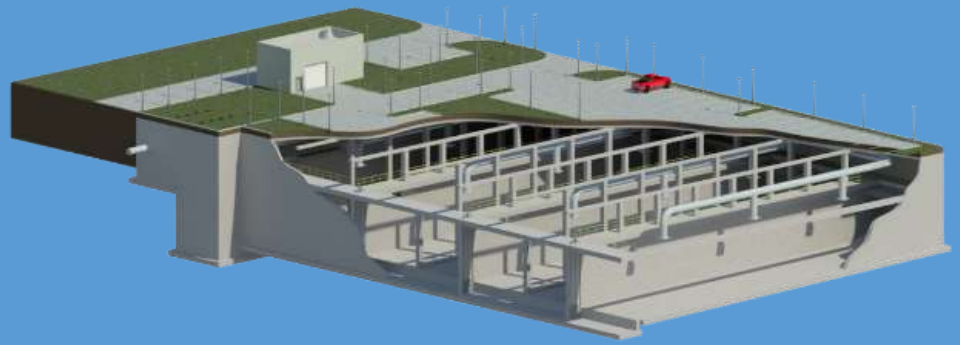
Odor Issues for Full Conveyance

- Solids will settle during lower dry weather flows and cause odors
- Longer residence time = more potential to generate H2S (odors)
- Difficult to control odors with many sewer manholes and longer pipes
- Difficult to maintain negative pressure in system to prevent odors from escaping
- Expensive chemical treatment systems may be required



Full Conveyance vs In-System Storage 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
- Independent from WWTP improvements
- Sooner benefit to reducing SSOs
- Preserves space at WWTP for future improvements for recycled water
- Estimated at least $30M less expensive than full conveyance alternative for same WWTP Option

Questions & Feedback

www.cleanwaterprogramsanmateo.org

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Topic 4

Alternatives Selection Process

55 Original Site Alternatives Identified in PEIR

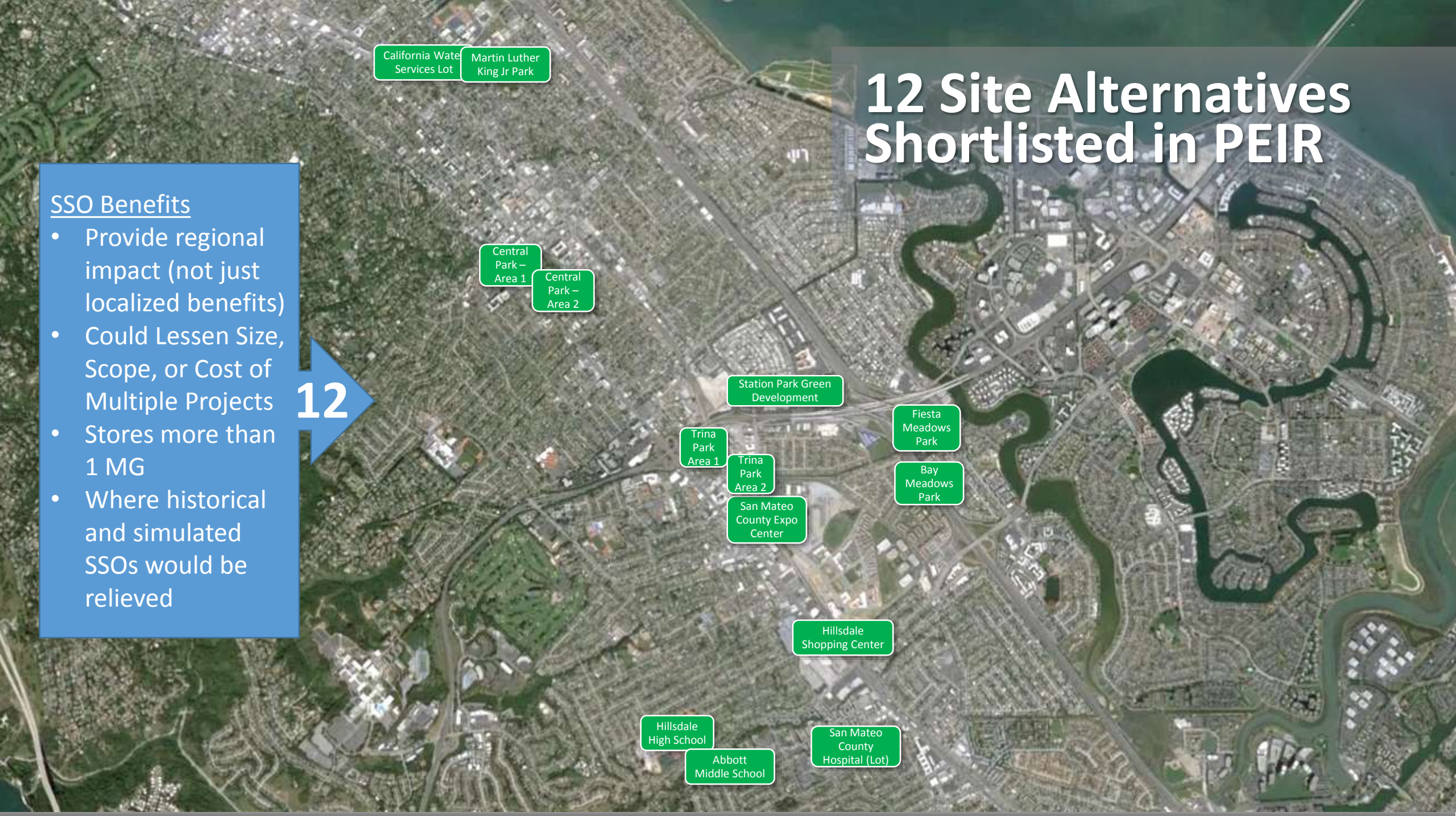
Space

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

55


Space
Municipal property
Schools
Undeveloped property
Private property
No existing residential, state, or federal property included
Proximity
Storage Capacity
55
Unable to Store more than 1 MG
Does not relieve historical & simulated SSOs
Does not lessen size, scope, or cost of multiple projects
Does not provide regional impact
San Mateo High School
College Park Elementary
California Water Services Lot
Martin Luther King Jr Park
North Shoreview Elementary
St Timothy School (Park)
Shoreview Shopping Center (Lot)
Gateway Park
Shoreview Park
Bayside STEM Academy
Joinville Park
Caltrain San Mateo Station
Central Park – Area 1
Central Park – Area 2
Parkside Elementary
Parkside Aquatic Park
Bridgepointe Shopping Center
Sunnybrae Elementary
Fish Market (Lot)
Marriott (Lot)
San Mateo Commons Shopping Center (lot)
Station Park Green Development
San Mateo Area Chamber of Commerce (Lot)
(Lot)
Old Police HQ
Fiesta Meadows Park
Aragon High School
Trina Park Area 1
Corps Yard
Trina Park Area 2
Borel Middle School
Borel Park
Bay Meadows Park
Lakeshore Park
San Mateo County Expo Center
Saratoga Square Park
Junipero Serra High School
Empty Lot
Los Prados Park
Beresford Park
Hillsdale Shopping Center
West Hillsdale Park
Caltrain Station
George Hall Elementary School
Hillsdale High School
Abbott Middle School
San Mateo County Hospital (Lot)
Laurie Meadows Park

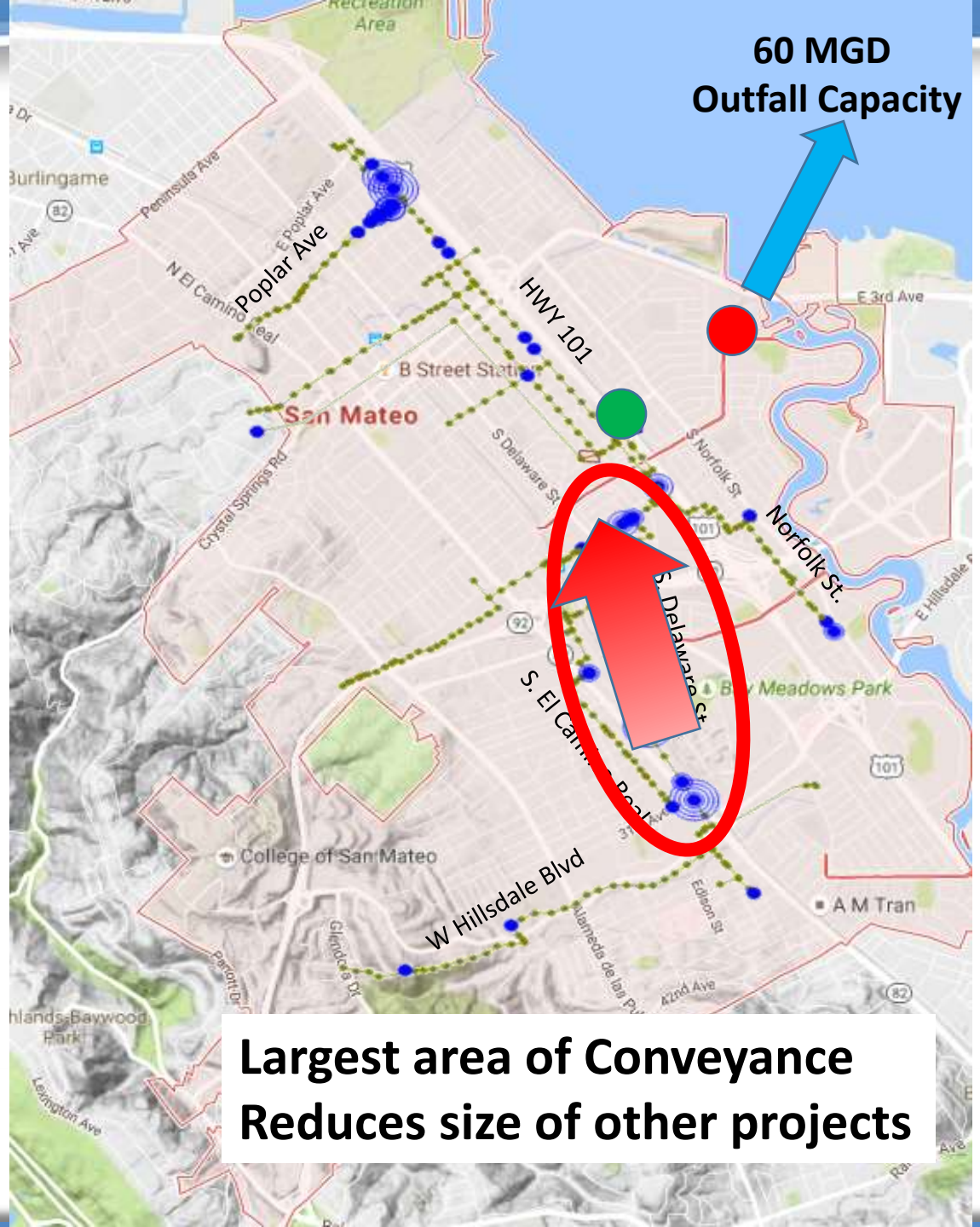
12 Site Alternatives Shortlisted in PEIR



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

Peak Wet Weather Hydraulic Model and SSOs



Blue Dots are SSOs Identified through Hydraulic Modeling

High Concentration of SSO Occurrences Along Delaware St

Storage is best way to reduce peak flow

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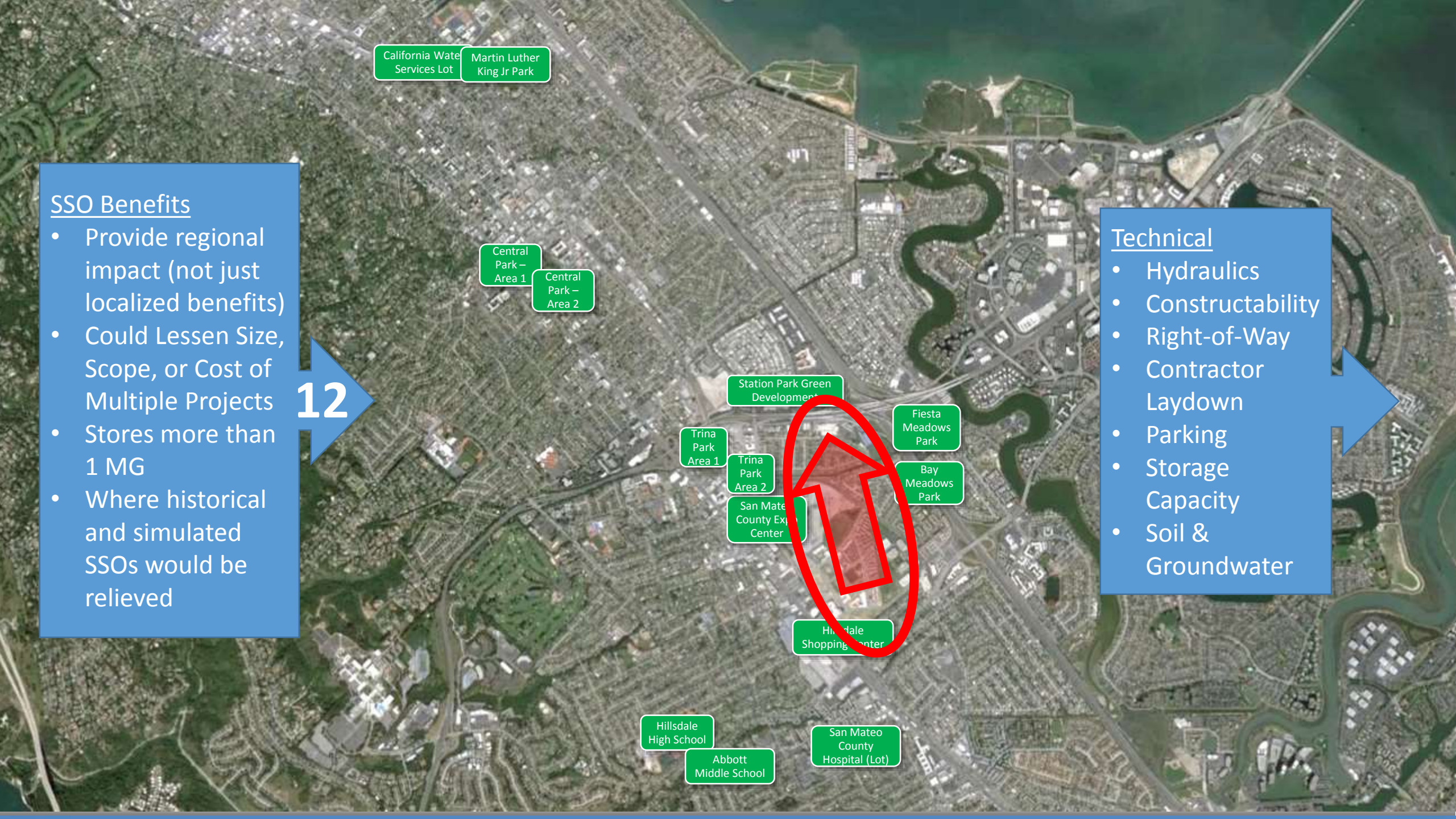
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Bay Meadows Park
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Hillsdale Shopping Center
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San Mateo County Hospital (Lot)
12
SSO Benefits
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• Could Lessen Size, Scope, or Cost of Multiple Projects
• Stores more than 1 MG
• Where historical and simulated SSOs would be relieved
Technical
• Hydraulics
• Constructability
• Right-of-Way
• Contractor Laydown
• Parking
• Storage Capacity
• Soil & Groundwater


Delaware Street Alignment Tank
Fiesta Meadows Park
Corporation Yard
Expo Center Parking Lot
Bay Meadows Park
Hillsdale Plaza
Technical
• Hydraulics
• Constructability
• Right-of-Way
• Contractor Laydown
• Parking
• Storage Capacity
• Soil & Groundwater
6
6 Alternatives

Corporation Yard

City Owned Property

Parking lot repaved over storage facility.

Construction would be coordinated with future Corporation Yard Plans

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

During Construction, minimal traffic impacts to residential streets

During O&M, minimal traffic impacts

Expo Center Parking Lot

Not a City Owned Property

Usage Costs Associated

Same use after construction. Parking lot repaved over storage facility.

During construction, minimal impacts to residential streets

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

During O&M, minimal traffic impacts

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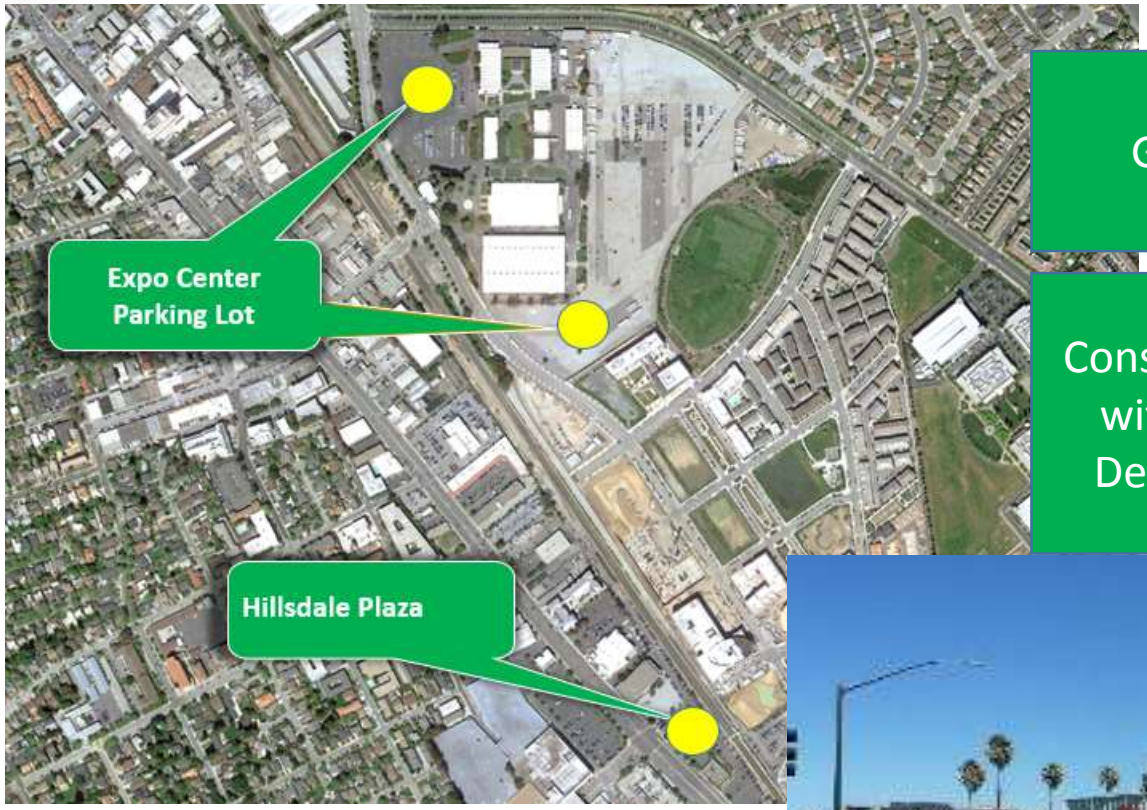
Hillsdale Plaza/Expo Event Center



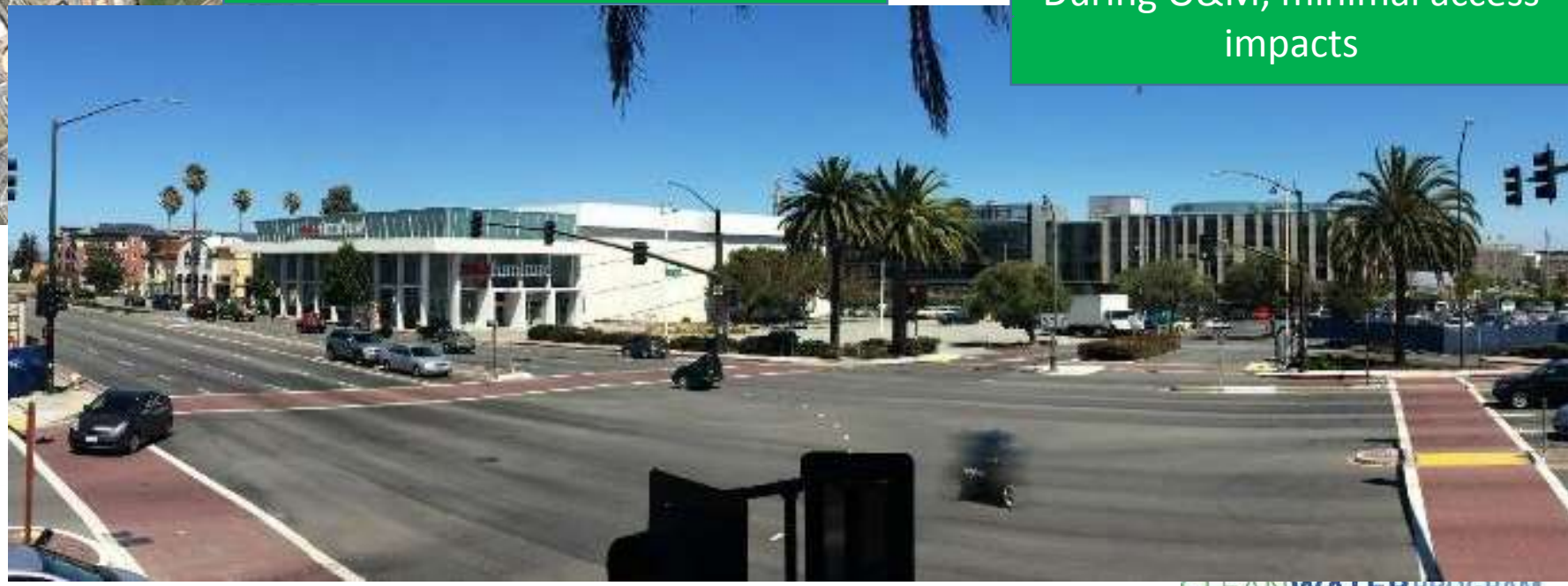
In two commercial areas. Greater impact than a single location.

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

Parking lot repaved over storage facility.

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

During O&M, minimal access impacts



During construction, minimal impacts to residential streets

Not City Owned Properties. Usage Costs Associated.

Fiesta Meadows Park

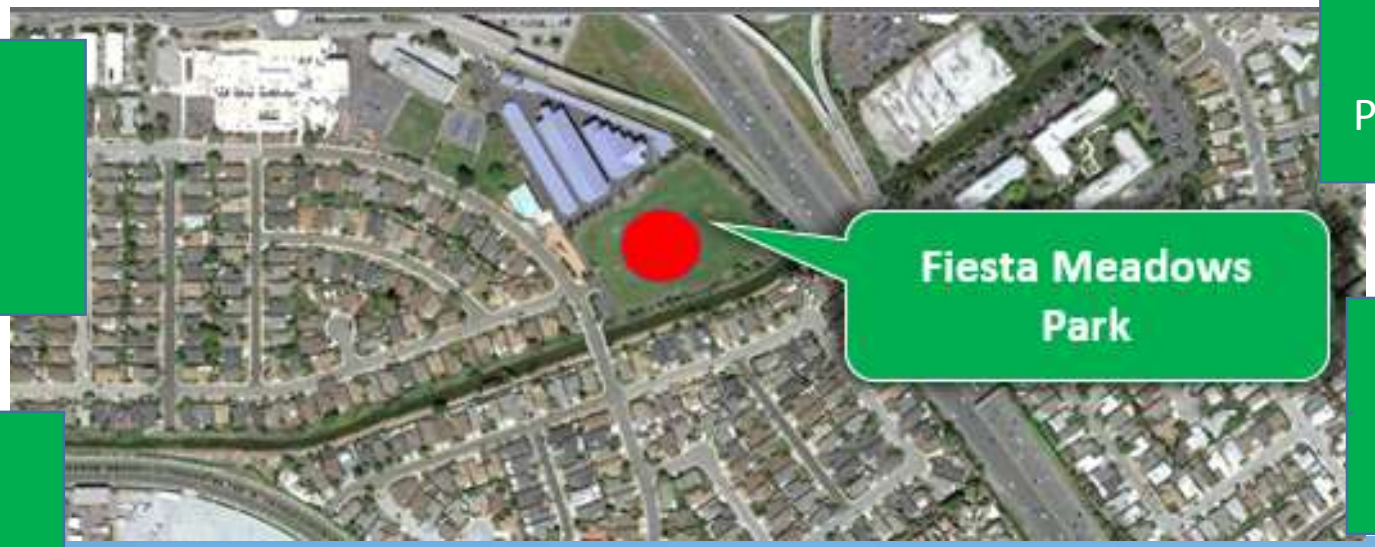
City Owned Property

Usage fees may apply

No park usage during construction

Potential impacts to residential streets.

Alternative construction access routes being investigated.



Opportunity to Redesign Parking Lot to Increase Parking

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

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

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

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

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

During O&M, minimal traffic impacts

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Bay Meadows Park

The City has reviewed the park dedication and the Bay Meadows CC&Rs and concur with Wilson Meany that restrictions exist that could prohibit the location of an in-system storage basin in the Community Park at Bay Meadows.

The Program will no longer consider a basin in this location and have focused our attention and analysis on the other alternatives.

The findings & this determination will be incorporated into the Alternatives Analysis Report.

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

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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
- Where historical and simulated SSOs would be relieved

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Design Team

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

6

Public Input + Design Team

Alternatives Analysis
- Economic
- Environmental
- Technical
- Social

2 or 3

City Council

Final Selection

1

Questions & Feedback

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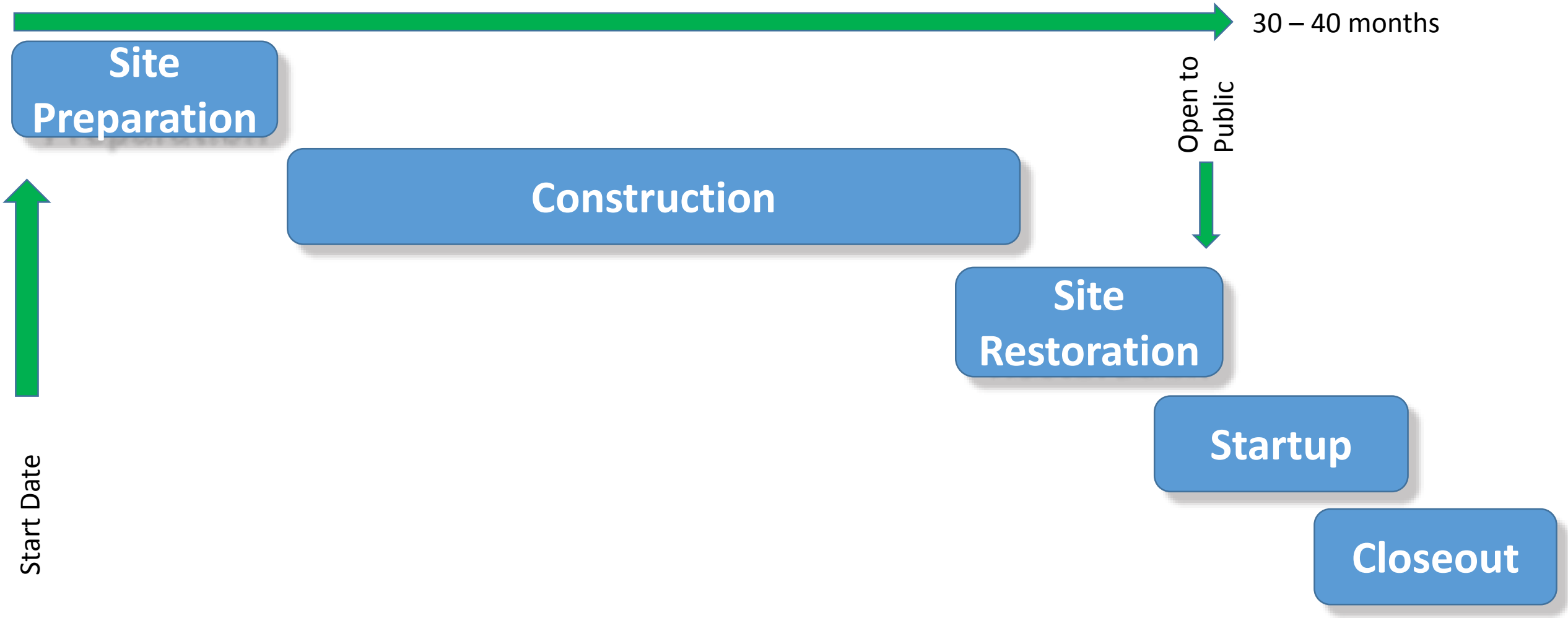
Topic 5

Construction Impacts & Operational Considerations

Underground Storage Construction Schedule



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

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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

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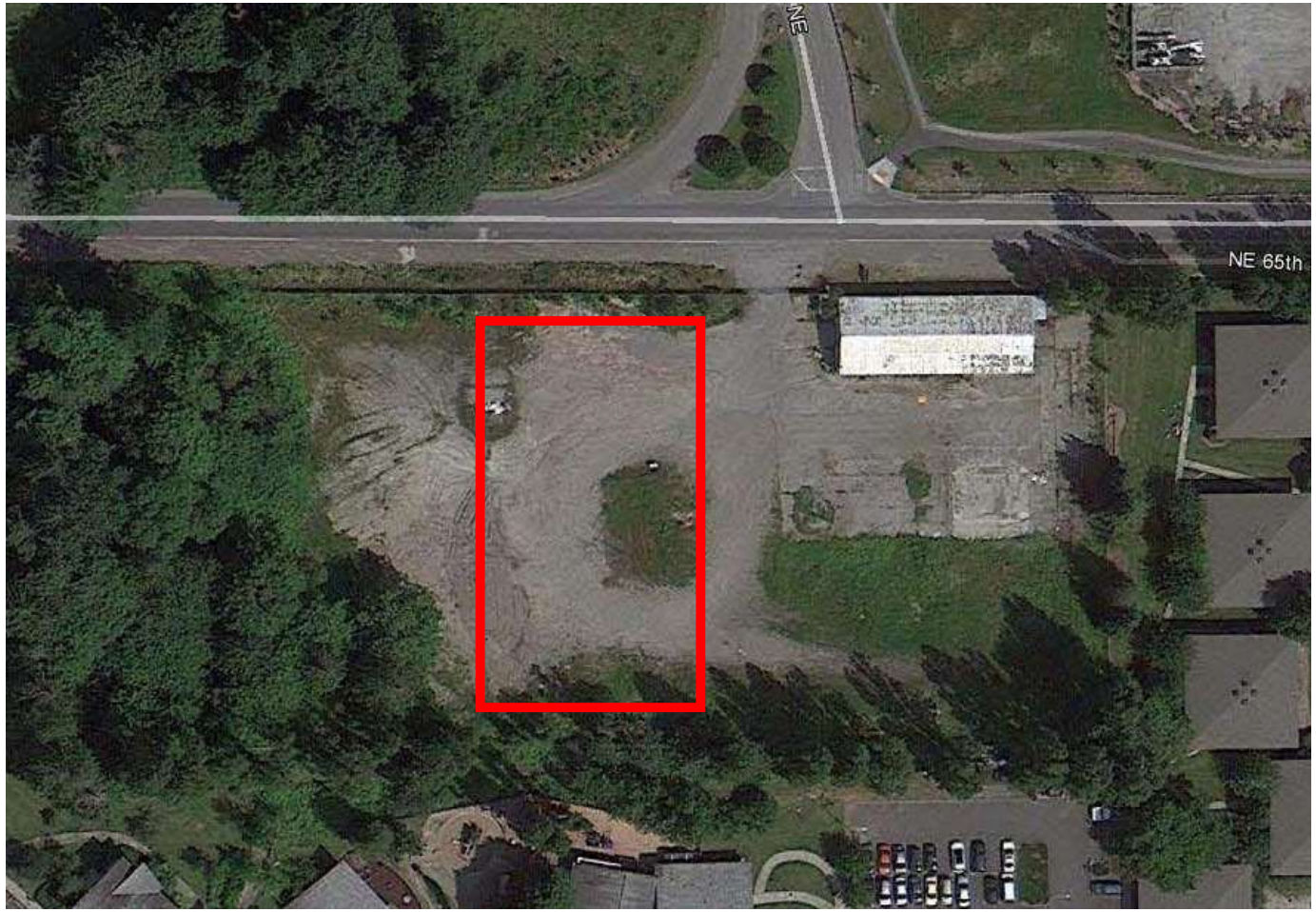
Site Preparation
Windermere Tank (Before Construction)



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Site Preparation

Construction

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

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During Construction
Windermere Tank (During Construction)

Construction

Construction

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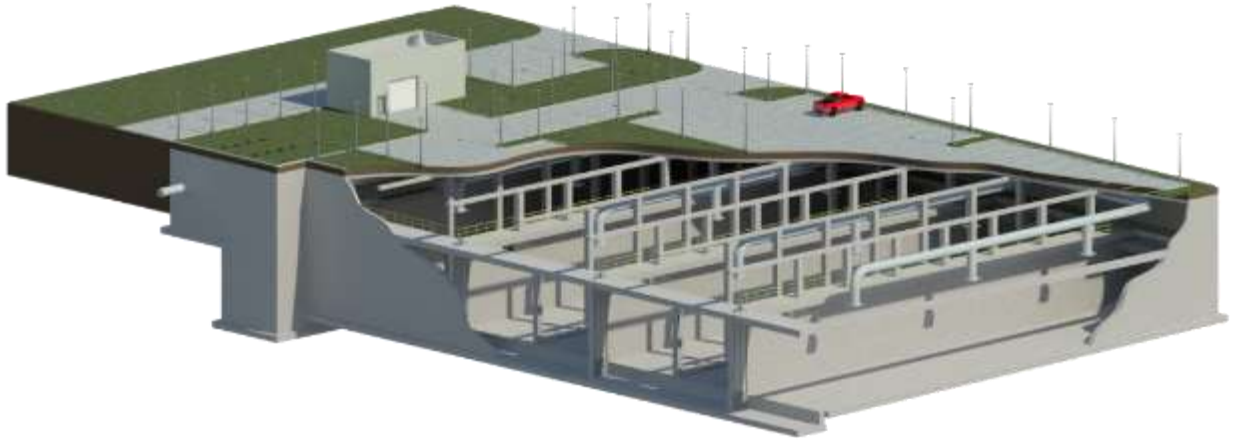
Construction

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



Design Criteria/ Design Consideration	Residential / Commercial	Hospital / Fire Station	Storage Facility
Liquid Tight, Long Term Durability	Goal is water-resistant, not watertight • Architectural Materials used to keep water out	Goal is water-resistant, not watertight • Architectural Materials used to keep water out	Watertight is a primary structural consideration • Structural materials keep water tight • Same as wastewater treatment plant tanks
Seismic Resiliency	Goal is life safety • Significant damage is expected →Relative Strength: 1.0	Goal is immediate use • Minor damage expected; facility must remain operational →Relative Strength: 1.5	Goal is continued operation • Minor damage expected; facility may require minor repairs →Relative Strength: 2.08
Settlement Control	Shallow Reinforced Concrete (RC) foundations common • Strip/wall footings • Thin slabs	Deep Foundations common • Piles or Piers • RC Grade Beams	Deep Foundation Required • RC Piles expected • Thick structural slab over piles

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

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Restoration – Toronto

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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.

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Tunneling – End or Intermediate Shaft

Tunnel Shaft Construction

London, UK

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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*

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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)

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Impacts and Mitigation

Potentially Impacted Areas

- Traffic
- Air Quality
- Land Use
- Recreation
- Noise
- Aesthetics
- Public Services & Utilities

Impacts and Mitigation

Impact Area	Impact	Mitigation
Traffic	• Temporary and intermittent closure of lanes with potential of full closure. • Road closures may impact bike lanes and public transportation.	• Traffic management plan (TMP) would minimize impacts on transit, bike, and pedestrian facilities • Alternate routes provided. • Notification and coordination of closures with stakeholders.
Air Quality	Minimal with mitigation	• Implement Bay Area Air Quality Management Board emission control measures. • Odor control for operating facility

Impacts and Mitigation (continued)

Impact Area	Impact	Mitigation
Land Use	• Below grade structure • Only above grade structures would be hatches and vents	Obtain permit for each affected parcel as required by City code (Special Use Permit)
Recreation	• Recreation space restricted during construction for Fiesta Meadows Alternative • Minor restrictions during operation	Provide park improvements to offset lost uses

Impacts and Mitigation (continued)

Impact Area	Impact	Mitigation
Noise & Vibration	• Construction noise • Limited noise during maintenance	• Implement noise minimization measures • Noise hot line • Resolve noise complaints • Implement vibration minimization measures
Aesthetics	Minimal with mitigation	Above ground structures would match appearance of existing structures.
Public Services	Minimal with mitigation	• Coordinate emergency services during construction.

Impacts to Traffic

- Different types of trucks during construction
- Dump trucks
- Concrete trucks
- Equipment delivery trucks
- Smaller work vehicles and construction worker vehicles

- **Similar to other commercial construction in Bay Meadows and Hillsdale areas**

Impacts to Traffic

- Cumulative trips to and from site
- Vehicle Types: heavy trucks, other construction trucks, worker vehicles

- Estimated Peak Day: 60 Heavy Vehicle Trips, 50 Worker Commute Trips
- Estimated Average Day: 20 Heavy Vehicle Trips, 20 Worker Commute Trips

Operating Impacts

- No permanent onsite staff
- Limited noise
  - No noise while filling
  - Minimal noise while pumps are operating
  - No noise while empty
- Minimal to no odors
  - Odor control systems
  - Underground storage operated during periods of low public use (during heavy rain)

Remote Sensors Reduce On-Site Activity

- Allow for remote monitoring and operation
- Limit presence of staff onsite
- Automatically operate pumps and valves, clean tanks, and open gates
- Monitor for harmful gasses in tank
- Monitor performance of odor control system
- Alert staff to O&M issues

Typical Maintenance Requirements

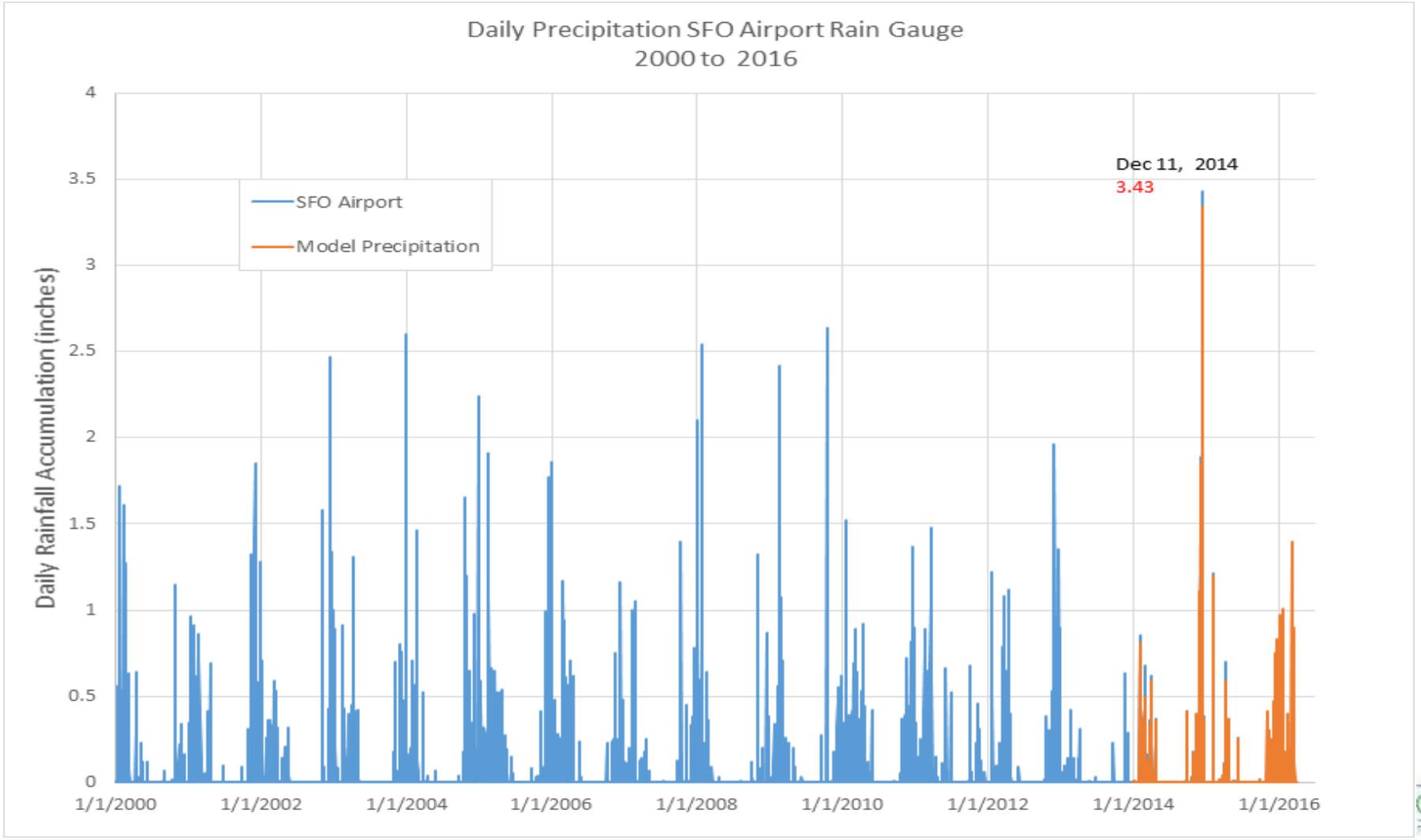
- Quarterly inspections
  - Inspect odor control, tanks, pumps, and tipping buckets
- Semi-Annual Testing
  - Test odor control, lubricate equipment, exercise valves and pumps
- Annual Cleaning
  - Clean tanks, pumps, pipes.
- Every five years
  - Inspect and replace equipment parts
- Every twenty-five years
  - Replace equipment

Maintenance Impacts

- Minimal noise
  - *Less than level of park maintenance activities (i.e. mowing)*
- Quarterly to annual maintenance requires 1 to 4 staff onsite
  - *Parking spaces for trucks*
  - *Limited access around hatches*
- Similar or lower frequencies than the maintenance at other City pump stations

Usage Based on Past Two Years

Historic Rain Fall



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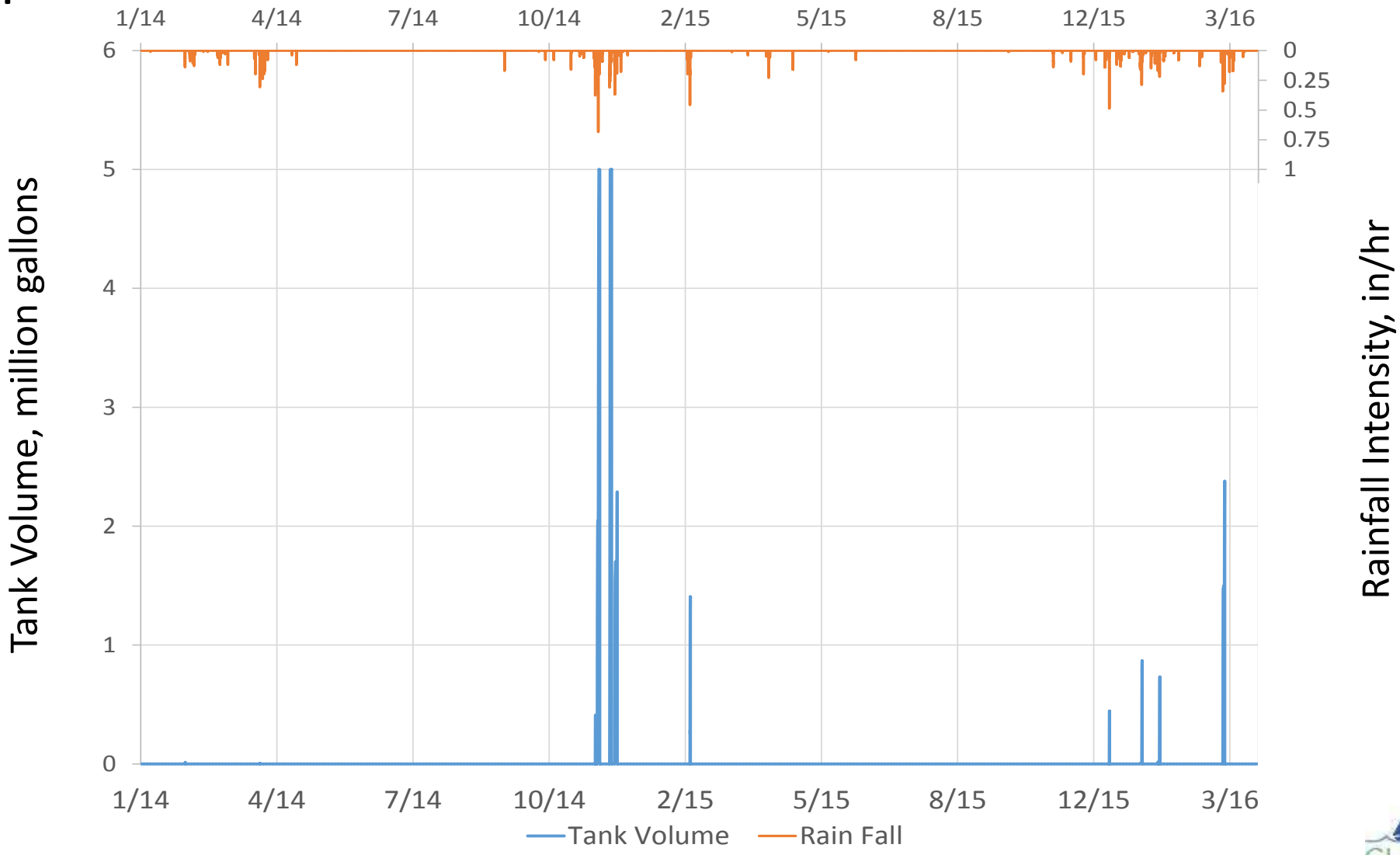
Model Prediction of Storage Use

Site Alternative	Uses Between Jan, 2014 and March, 2016
Fiesta Meadows Park	11
Expo Center	15
Hillsdale Plaza/Expo	10
DPW Yard	13
Delaware Tunnel	12

Corp Yard


1/14
4/14
7/14
10/14
2/15
5/15
8/15
12/15
3/16
6
5
4
3
2
1
0
0
0.25
0.5
0.75
1
Tank Volume, million gallons
Rainfall Intensity, in/hr
Tank Volume
Rain Fall

Water Usage

- Water used to flush tanks after each use
- Water usage during the two year period would be between 0.2 and 0.3 million gallons
- Less than half an Olympic swimming pool
- Represents a 2% to 5% increase in water usage for cleaning during period

Questions & Feedback

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Tentative Outreach Schedule

Community Meetings
October 4th
October 6th

PW Commission Meeting
October 12th

Future Meetings
TBD

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

Frequently Asked Questions

What is the Clean Water Program?

What is a wastewater treatment plant? How does it work?

What are the goals for the Clean Water Program?

What happens if we do not comply with regulatory requirements?

How are the Clean Water Program projects funded?

What is the City's strategy to engage and educate the public about this program?

Questions or More Information? Contact Clean Water Program staff at (650) 727-6870 or info@cleanwaterprogramsanmateo.org

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