

Welcome, and thank you for joining us today.

The workshop will begin at **6:00 PM**.

While you wait, please take a moment to review guidance on using Zoom features posted in the chat.

This meeting will be recorded.

Keller Beach Sanitary Sewer (KBSS) Project

Public Workshop

Wednesday, January 14, 2026

6:00 – 8:00 pm



Introductions

- City of Richmond
- Kearns & West (Facilitation team)
- BKF Engineers
- Vice Mayor Zepeda

Meeting Agenda

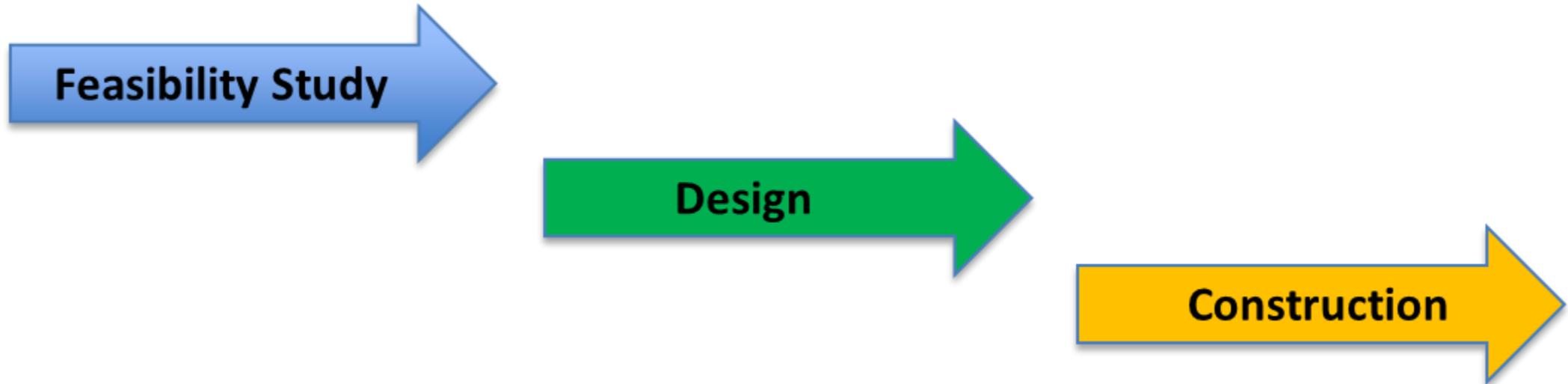
1. Welcome, Introductions, and Agenda Review
2. KBSS Feasibility Study Background, Project Overview, and Discussion of Alternatives
 - Q&A and Public Comment
3. Next Steps
4. Adjourn

Workshop Purpose

- Provide an overview of the Keller Beach Sanitary Sewer (KBSS) Feasibility Study, including current status and overall project timeline.
- The project has 3 major phases: Feasibility Study, Design, Construction. Currently the project is in the Feasibility Study.
- Review Study alternatives along with criteria and weighting that will be used to evaluate them.
- Invite feedback and questions from community members on the alternatives and criteria.

Project Phases

- The project has 3 major phases: Feasibility Study, Design, Construction. Currently the project is in the Feasibility Study.



Participation Guidance

- Workshop is hybrid (in-person and virtual); goal is to ensure everyone can participate equally.
- Q&A/Public Comment will be held after presentation. Please hold questions and comments until then.
- If providing comments, please keep under 2 minutes.
- Please be respectful of different views and perspectives.
- Workshop is being recorded and a summary will be available.

Q&A/Public Comment In-Person

- Please fill out a **Speaker Card** and K&W staff will collect and add your name and question to the queue. Facilitator will ask questions in the order collected and may combine similar questions.
- **Comments Cards** are also available for providing written comments. Please hand in to K&W staff or turn in at the sign-in table.

Guidance for Online Participation

- Participant microphones are **disabled** for this meeting. You will not be able to mute or unmute yourself unless enabled by the moderator.
- Please submit all questions using the **Q&A feature**. Questions will be addressed during the designated Q&A portion of the meeting.
- Use the **Raise Hand** feature to indicate that you wish to comment or speak if prompted by the moderator.
- Use the **Chat** feature for technical issues only (e.g., audio access or connection problems).

Zoom Functions

Zoom Meeting Instructions



Microphone: Participant microphones are disabled. You will not be able to mute or unmute yourself.



Participants: View who is in the meeting, rename yourself, and see raised hands.



Chat: Use the chat for technical issues only.



Q&A: Please submit all questions using the **Q&A feature**.



Closed Captioning (CC): You can show or hide closed captions.



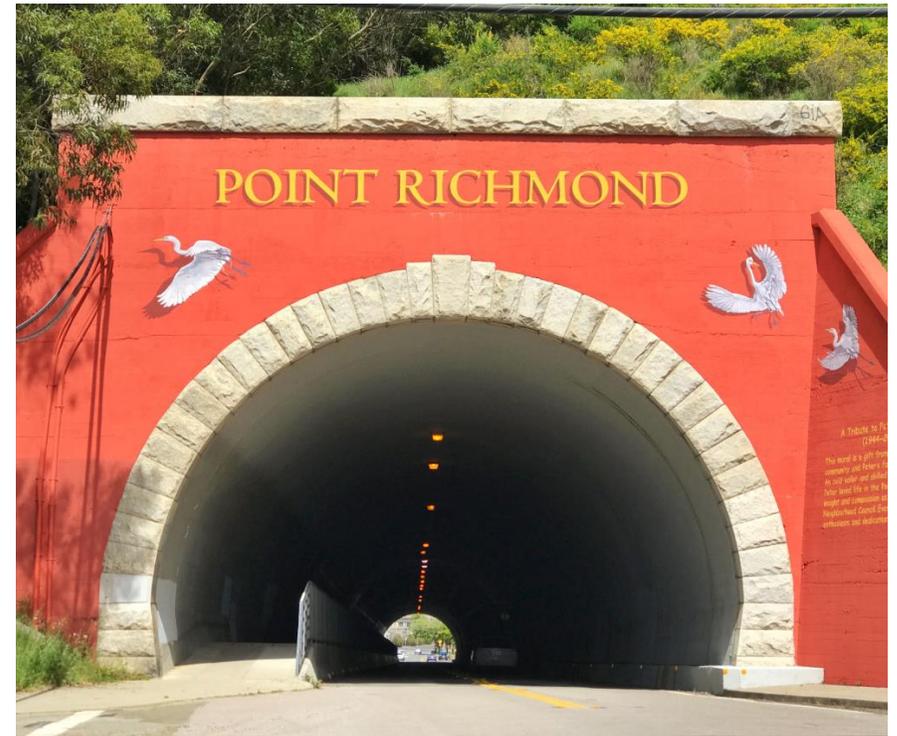
Raise Hand: Use **Raise Hand** to join the speaking queue if prompted by the moderator.

Questions will be addressed during the designated Q&A portion of the meeting.

Project Overview

Project Overview

- Point Richmond Neighborhood
 - Subdivided between 1902 to 1912
 - Sewer lines constructed between 1909 and 1916
 - Sent sewage directly to the Bay
 - Keller Beach Sanitary Sewer (KBSS) Interceptor built in 1959
 - Stopped sending sewage to Bay
 - Conveyed to KBPS



Project Overview

- KBSS Interceptor
 - Constructed in 1959
 - About a mile long
 - 8” to 12” dia.
 - Concrete-encased cast iron pipe
- First inspection in 2021 shows pipe in poor condition
- Comprehensive alternatives analysis to determine the feasibility of **rehabilitating**, **replacing**, or **relocating** the existing KBSS

SEWERAGE CONSTRUCTION DIVISION		
419	CITY OF RICHMOND DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING	
	LINE 'Q' SHORELINE INTERCEPTOR STA. 39+00 TO 46+40	
	DRAWN BY H.T.O. & E.M.H.	SUBMITTED: <i>[Signature]</i>
	CHECKED BY C.G.B.	APPROVED: <i>[Signature]</i> DIRECTOR OF PUBLIC WORKS R.C.E.
		DATE 2-16-59
		DRAWING NUMBER 10-E-1421
SHEET 10 OF 15 SHEETS		

Project Overview



What Has BKF Been Asked To Do?

- Review all provided documentation – **DONE!**
- Define and evaluate up to 6 total alternatives
 - 3 “interim” alternatives, 3 “final” alternatives
 - **Prioritize reviewing feasibility of interim solutions**
- Field Investigations
 - Utility locating, survey, potholing, geotechnical review
- Screening of Alternatives re: Environmental Regulations/Permits
- Collaborate with & support Public Outreach efforts
- **All options** are being considered

Scope Additions / Changes

- Title / Property Research
- Funding Research
- Erosion Analysis
- 2 memos will now be combined into **one** report

Presentation Agenda

Agenda

- Project Objectives
- Existing Conditions
- Pipeline Cleaning and Inspections
- Evaluation Criteria
- Description of Alternatives
- Funding Opportunities
- Next Steps

Project Objectives

Project Objectives

- The City's collection system must comply with:
 - Federal Clean Water Act
 - California Porter-Cologne Act
 - State Water Resources Control Board's Sanitary Sewer Systems (SSS) Waste Discharge Requirements (WDR)
 - City's National Pollution Discharge Elimination System (NPDES) permit

How Does This Relate to BayKeeper?

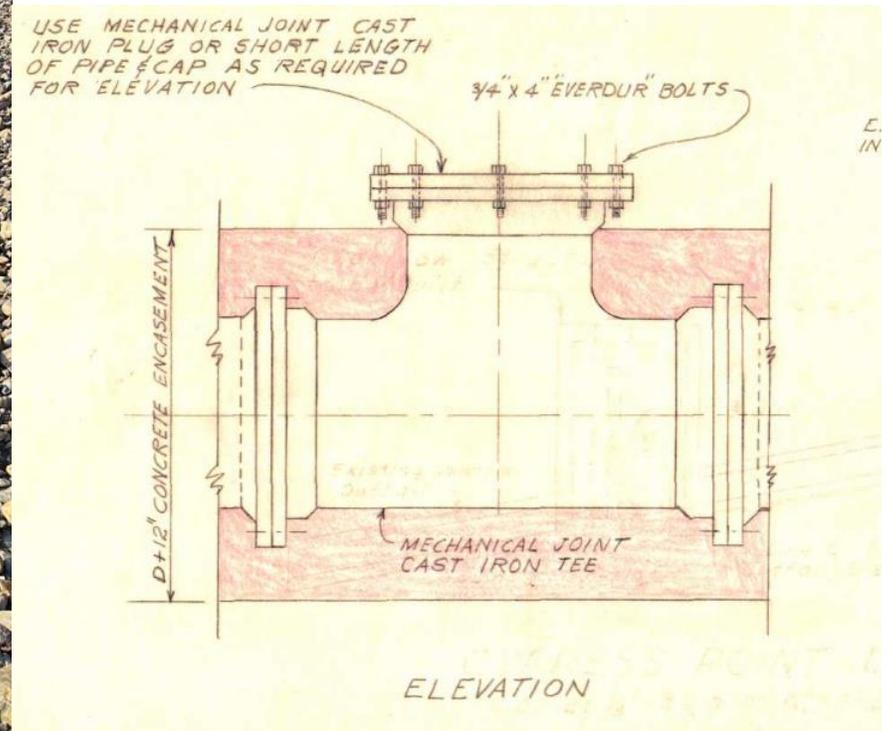
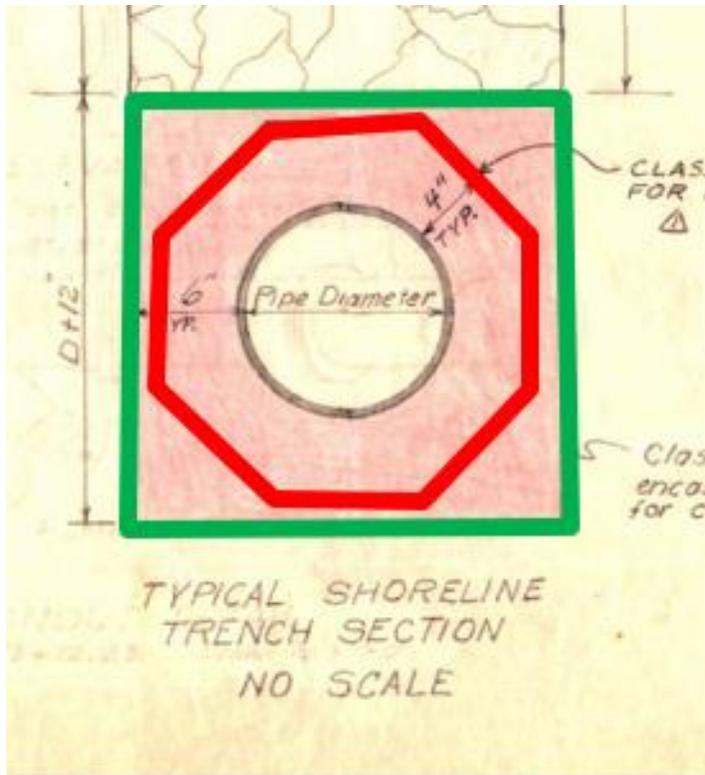
- Forces compliance with **existing** Federal/State laws
- Applies to the Citywide sewer system, not just KB
- Any solution must be fully accessible, inspectable, maintainable, and repairable.
- Pipeline Assess and Cert Program (PACP) Grade 4 or Grade 5 defects must be addressed or be on a schedule to be addressed
 - Structural and O&M

What Does That Mean?

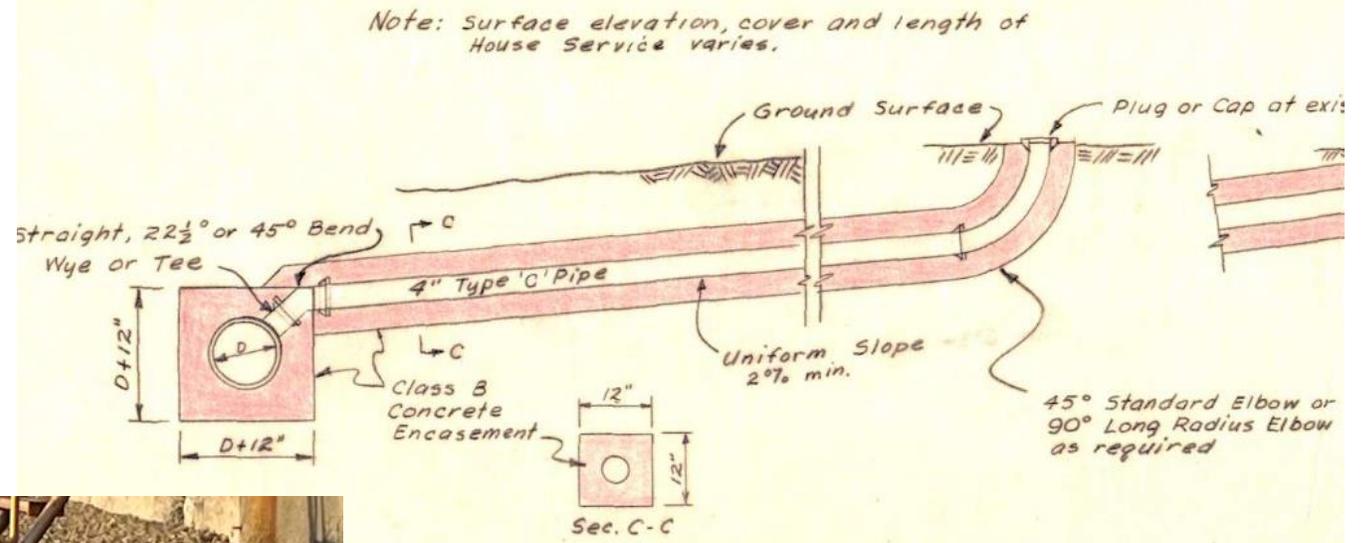
- The entire sewer system (incl. KBSS) must:
 - Not leak or overflow
 - Be able to be thoroughly cleaned and inspected without obstructions or gaps
 - Be free of Grade 4 and 5 defects and be able to be repaired/rehabilitated in the future as necessary
- High consequence of failure must be mitigated
 - Potentially millions in fines if failure occurs

Existing Conditions

Plans and Site Walk



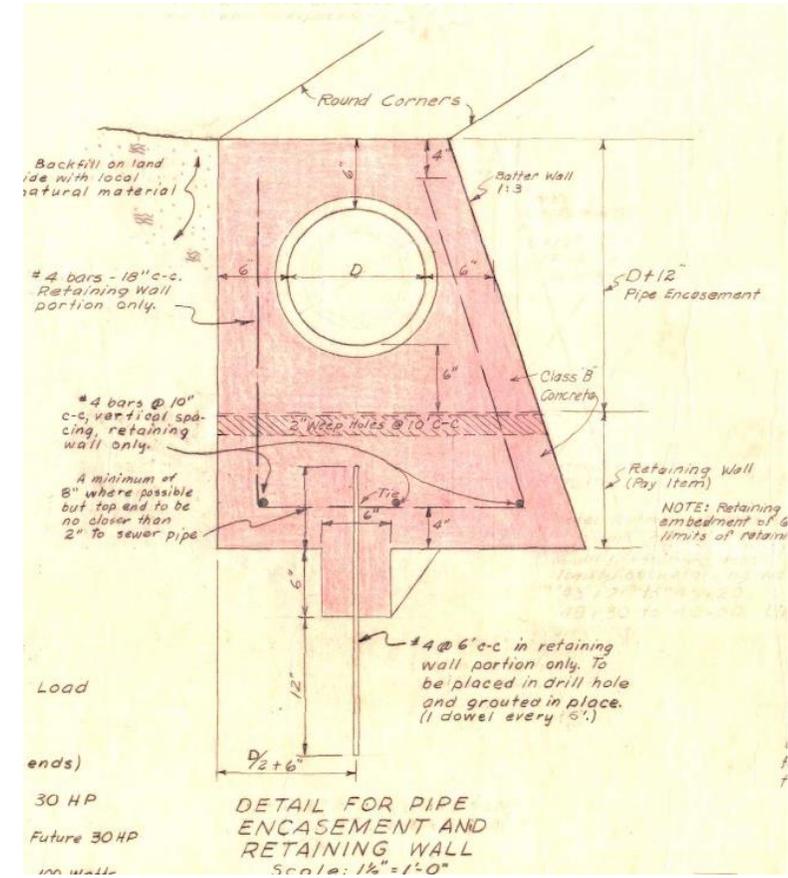
Plans and Site Walk



TYPICAL HOUSE SERVICE FOR LINE Q
Scale: $\frac{1}{2}'' = 1'-0''$



Plans and Site Walk



Pipeline Cleaning & Inspection

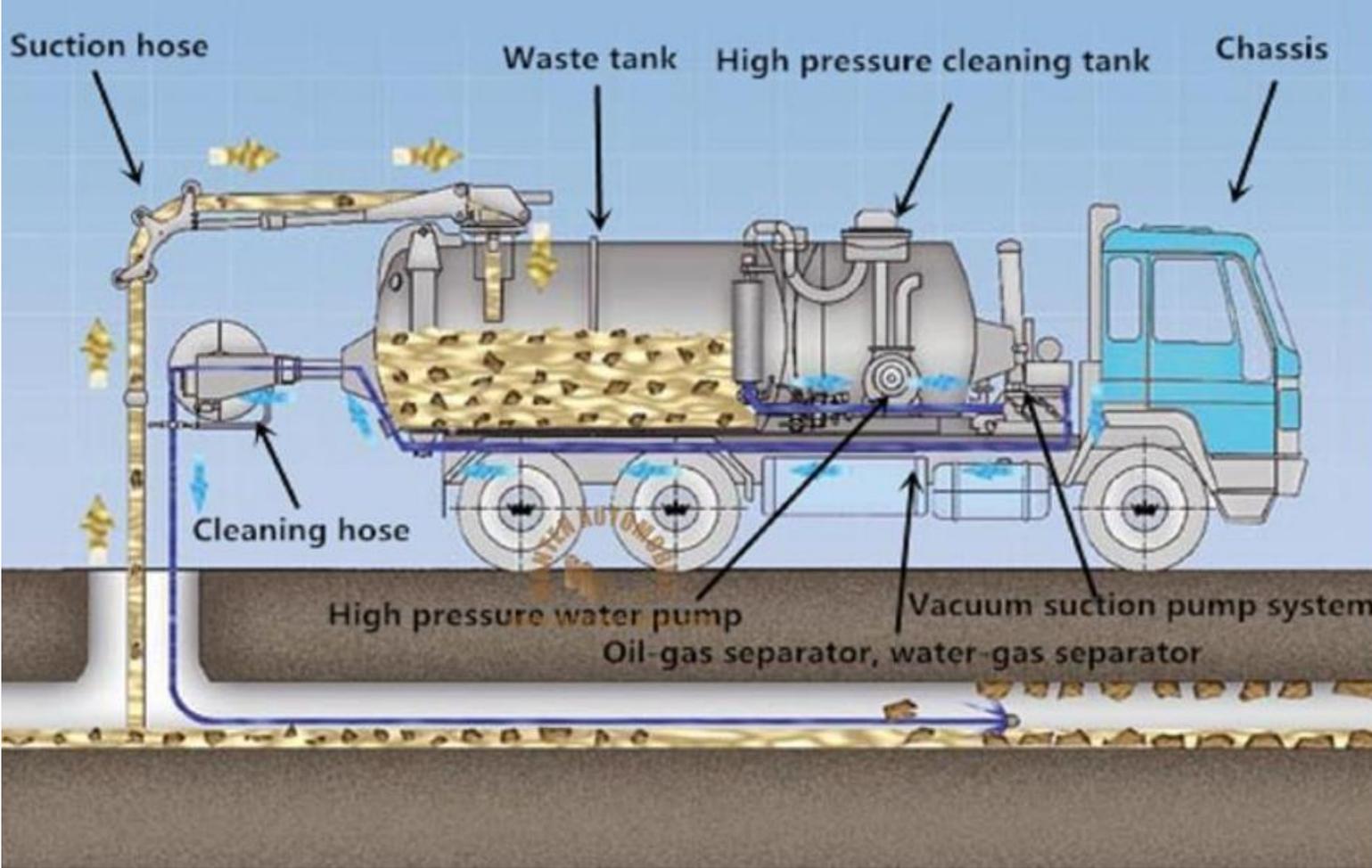
Typical Operations

- Step 1: clean the pipe
- Step 2: inspect using camera
- Step 3: submit report/videos/results
- Step 4: evaluate reports/results for any action needed

Typical Operations: Cleaning



Typical Operations: Cleaning



Typical Operations: Inspection



<https://thedraincamerashop.com/product/h7/>

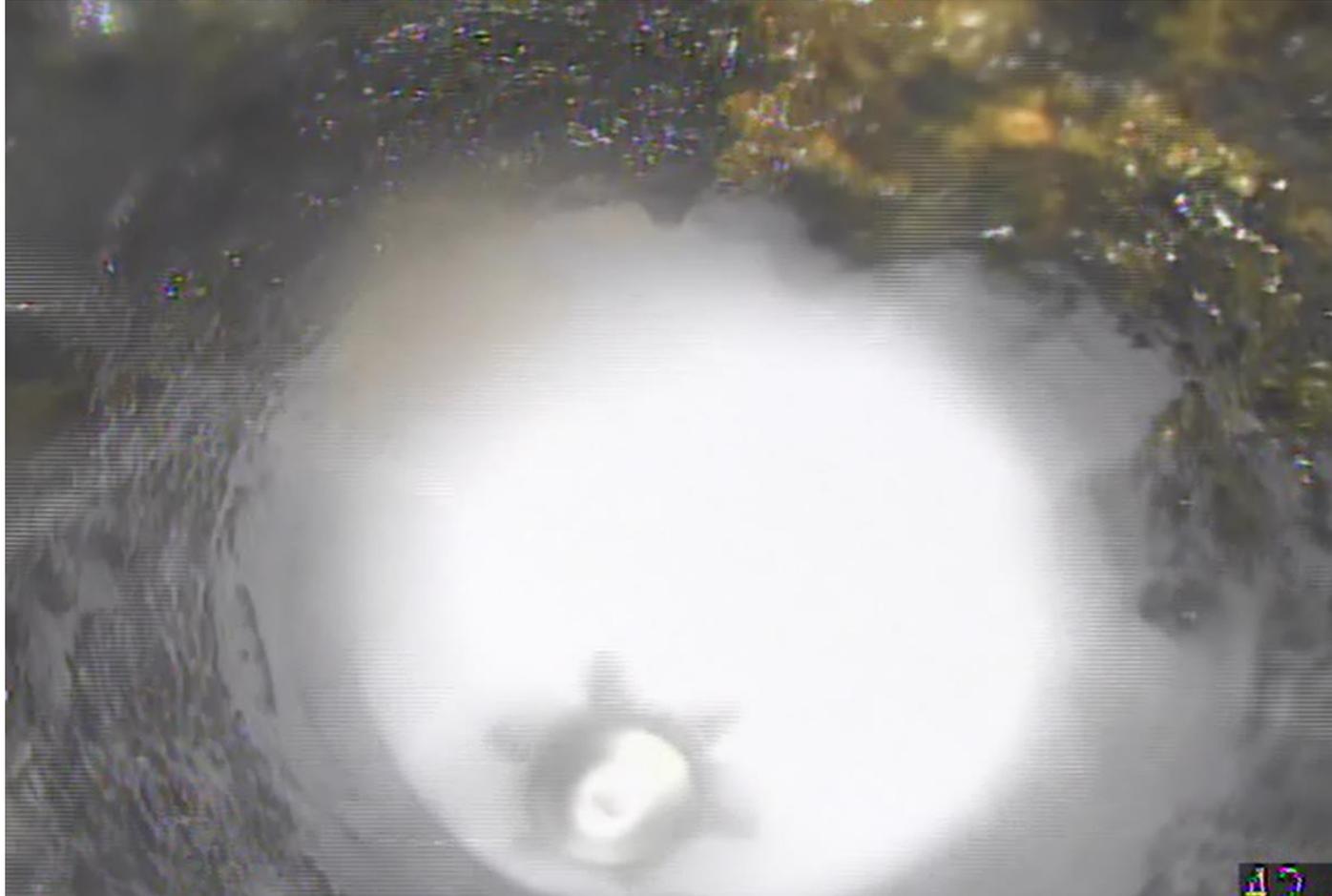


<https://haaker.com/products/sewer-inspection-cameras/envirosight-rover-x/>

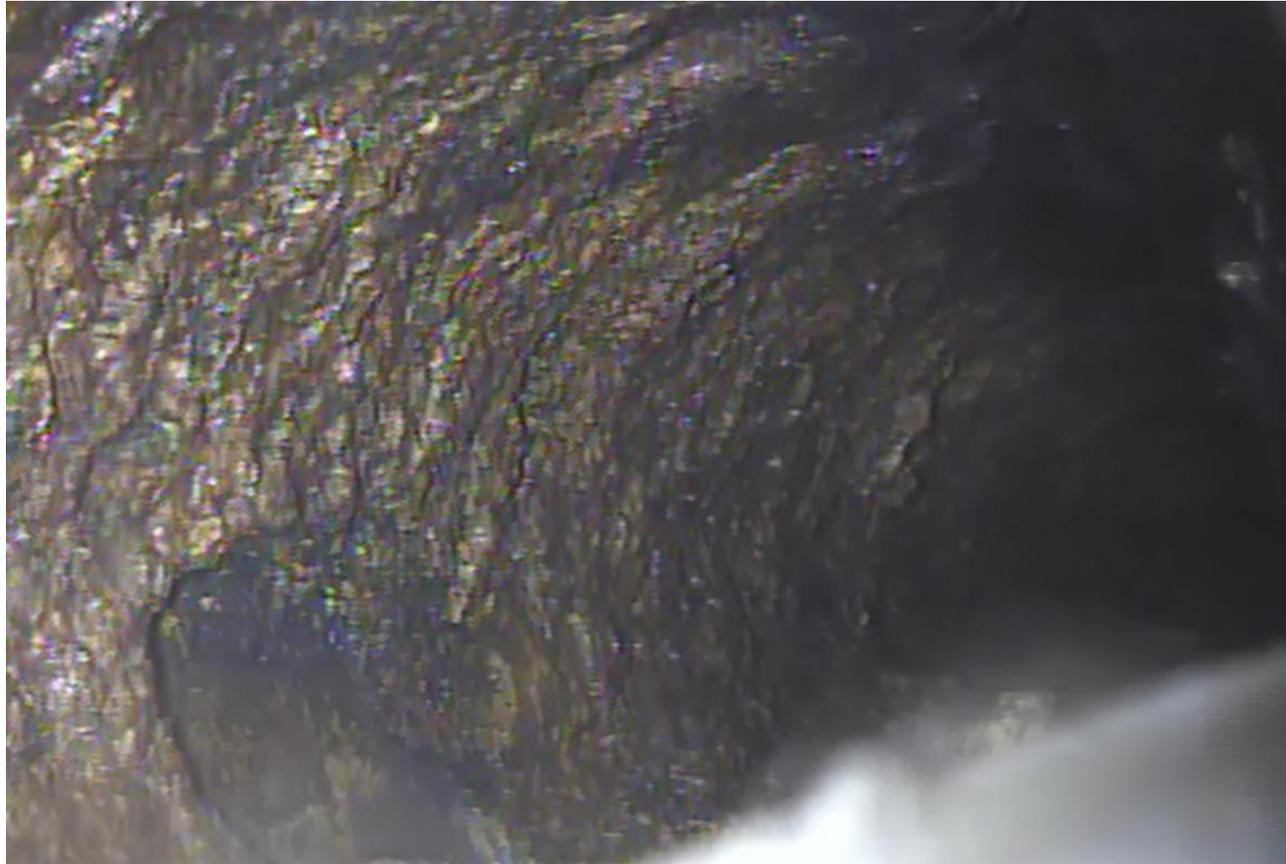
KBSS Cleaning & Inspection

- First inspection was in 2021
- Lots of poor video due to sags / water level / access
- Extremely costly and challenging
 - Poor access (trucks parked on roads and pulled host/cable through private property to reach manholes)
 - Tuberculation was hard to remove; could not remove all of it
 - Infiltration brought sand back into pipe after removal
 - Limited work hours due to tidal access restrictions

KBSS Cleaning & Inspection



KBSS Cleaning & Inspection



KBSS Cleaning & Inspection



KBSS Cleaning & Inspection

Description	Length (ft)	Percentage of Total
Total Length	5,392 (per as-builts)	100%
Successfully Inspected	3,842	70%
Incomplete Inspection	379	8%
Not Inspected	1,171	22%
Total of Incomplete Inspections or Not Inspected	1,550	30%

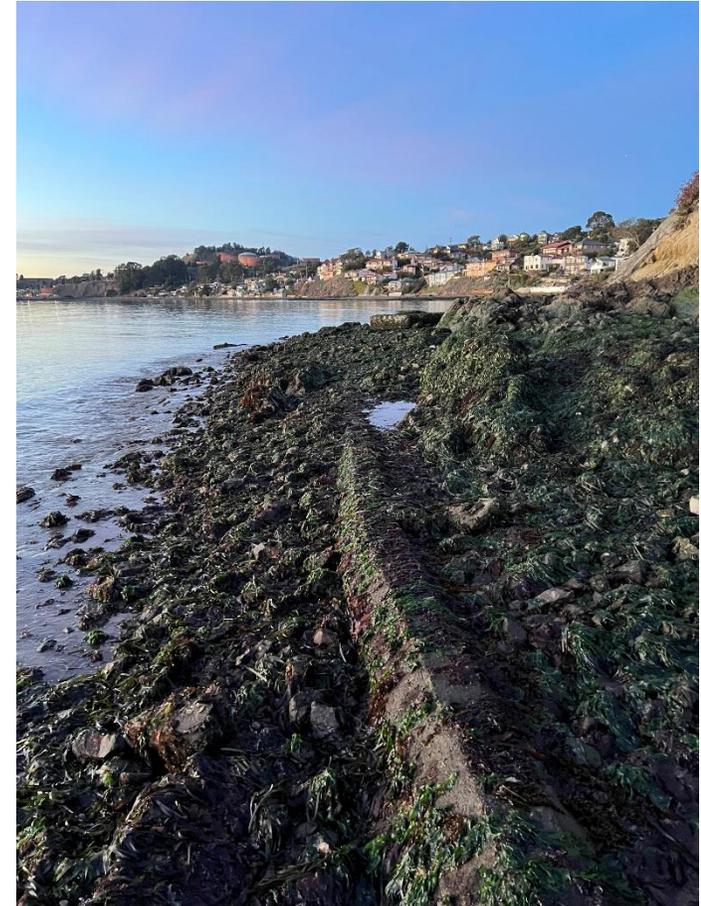
Is more inspection needed?

- Short answer: No
- Very costly and time consuming
- Visible condition of pipe is fairly consistent
- Condition has likely only gotten worse, not better
- Low probability that new inspection provides valuable info

Evaluation Criteria

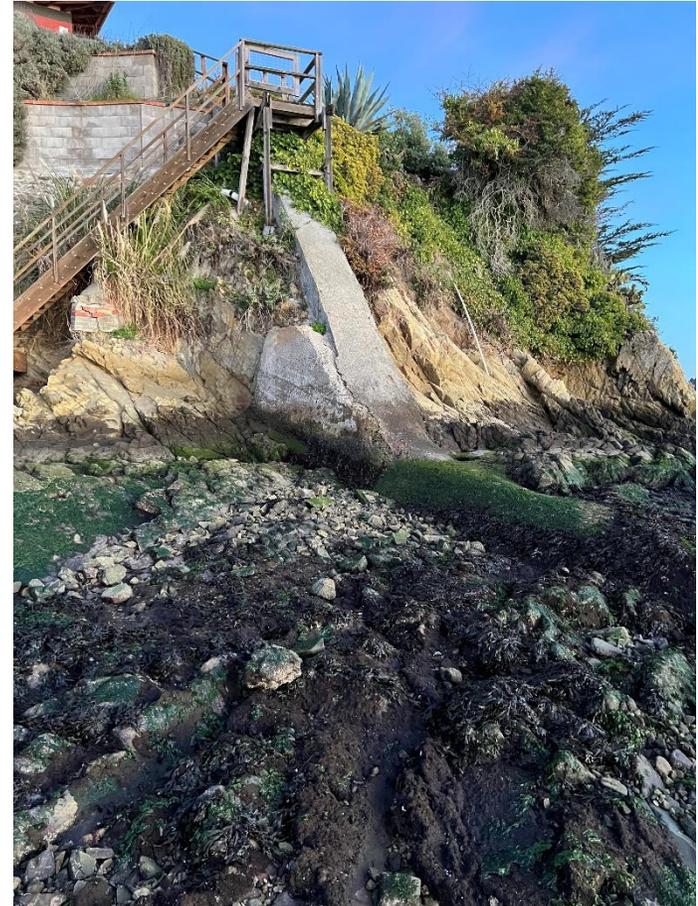
Evaluation Criteria

- Hydraulics
- Constructability
- Environmental & Regulatory
- Construction Cost
- Operations & Maintenance
- Social & Community Impacts
- Risk & Resilience
- Right-of-Way



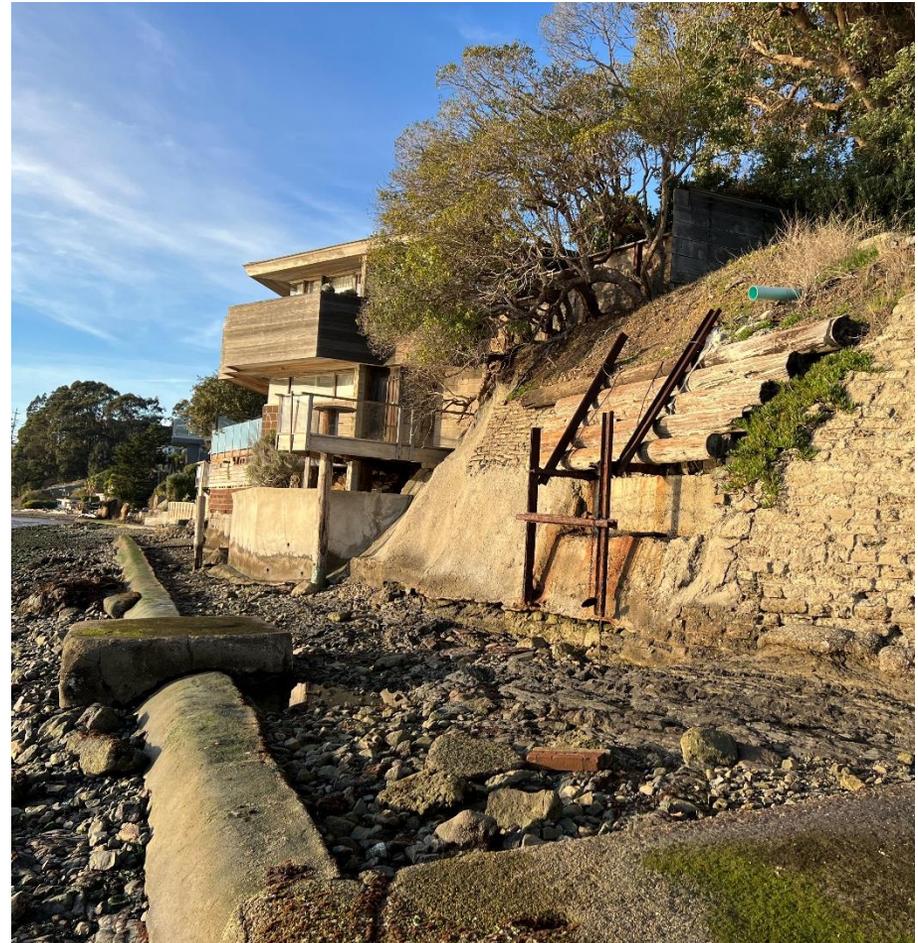
Hydraulics

- Downstream sewer capacity
 - for flow diversion options
- Magnitude of flow reduction from KBSS
 - More diversion = positive
- KBPS modifications



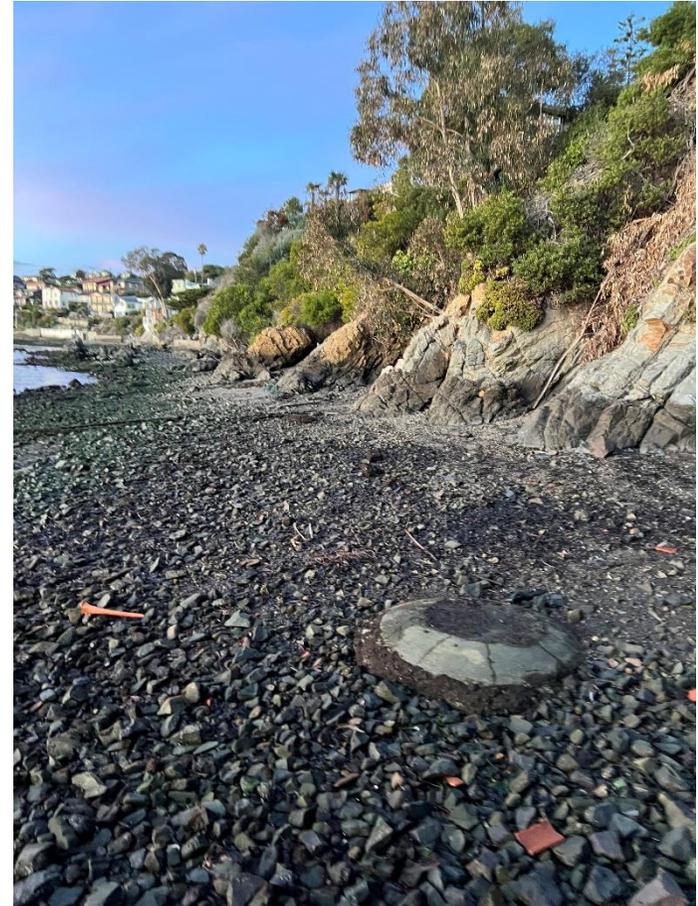
Constructability

- Construction Difficulty
- Site access
- Material/equipment staging
- Geotechnical (soils) risks
- Lateral reconnections
- Pre-install pipe cleaning/inspections
- Dewatering / tidal work



Environmental & Regulatory Compliance

- Feasibility study will consider:
 - Federal, state, and local permitting requirements and anticipated timelines
 - CEQA and NEPA requirements and anticipated review durations
 - How alternative selection influences permitting complexity and environmental review



Environmental & Regulatory Compliance

- Key considerations informing alternative screening:
 - Thoroughly evaluating upland alternatives and impacts to San Francisco Bay
 - Limiting in-water fill and disturbance within San Francisco Bay (including below the substrate)
 - Reducing duration and extent of in-water construction
 - Improving long-term resilience to sea level rise and shoreline erosion

Environmental & Regulatory Compliance

- CEQA/NEPA environmental review requirements vary by alternative type:
 - Upland alternatives generally reduce environmental review complexity and review duration
 - Shoreline/in-water alternatives trigger additional federal and state review and longer timelines
 - CEQA and NEPA both require demonstrating that upland alternatives were fully evaluated

Environmental & Regulatory Compliance

- Permits/approvals for in-water construction may be required from:
 - U.S. Army Corps of Engineers
 - San Francisco Bay Regional Water Quality Control Board
 - San Francisco Bay Conservation and Development Commission
 - National Marine Fisheries Service
 - U.S. Fish and Wildlife Service
 - California State Lands Commission
 - California Department of Fish and Wildlife

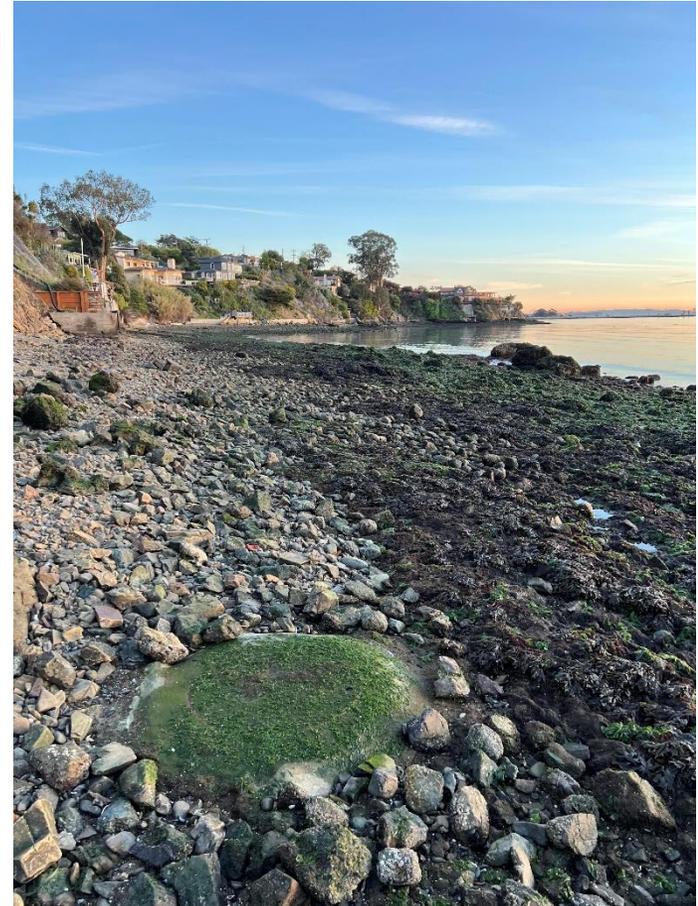
Construction Costs

- Cost of construction
- Potential throw-away costs
- Risk of cost overruns
- Anticipated design costs



Operations & Maintenance

- Access requirements
- Inspection/cleaning requirements
- Anticipated energy use
- Operational/staffing costs
- Lifecycle costs



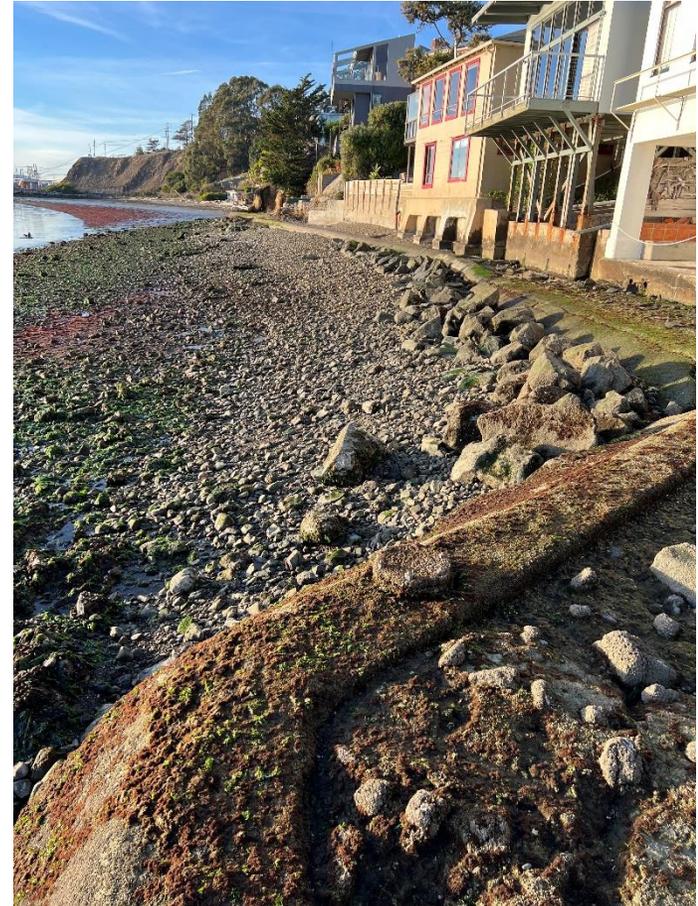
Social & Community Impacts

- Private property impacts
- Private pumping requirements
- Resident preferences
- Traffic disruption



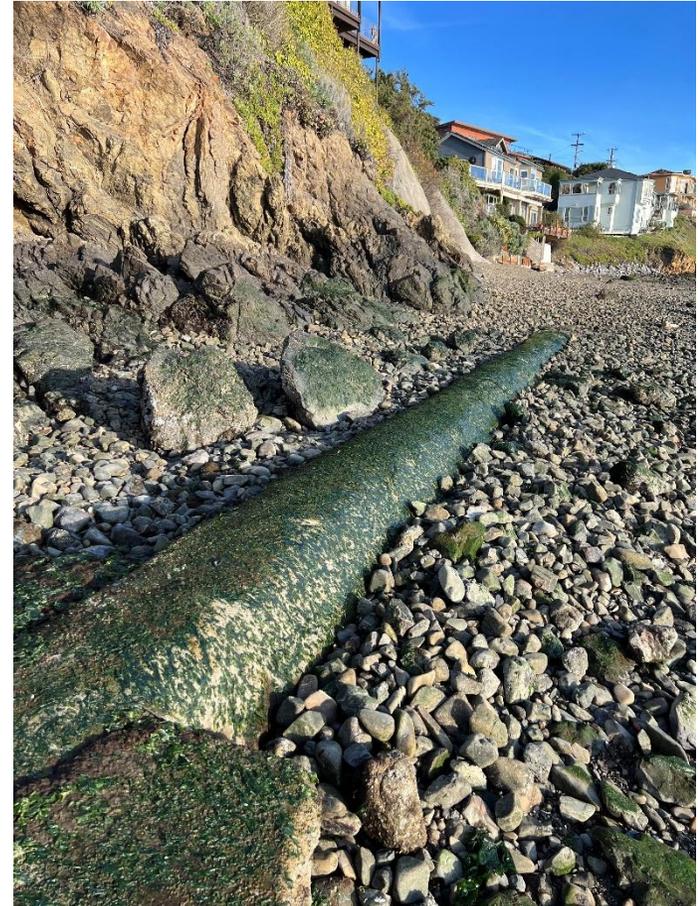
Risk & Resilience

- Failure modes/consequences
- Redundancy
- Reliability
- Environmental Risks (erosion, sea level rise, etc.)
- Emergency Response / Repairs



Right Of Way

- Land acquisition req'd?
- Acquisition timeline
- Acquisition complexity



Example

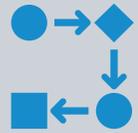
Criterion	Weight (%)	Alt 1		Alt 2		Alt 3	
Hydraulics	20	3	0.6	2	0.4	1	0.2
Constructability	10	2	0.2	3	0.3	1	0.1
Environmental & Regulatory	20	1	0.2	3	0.6	2	0.4
Construction Costs	15	2	0.3	1	0.15	3	0.45
Operation & Maintenance	15	1	0.15	2	0.3	3	0.45
Social & Community Impacts	10	2	0.2	3	0.3	1	0.1
Risk & Resilience	5	3	0.15	1	0.05	2	0.1
Right-of-Way	5	2	0.1	3	0.15	1	0.05
TOTAL	100		1.9		2.25		1.85

Alternatives

FAQ: why not focus on only one option?

- City Council has mandated looking at multiple options
- Regulators may not buy in without...
 - Seeing all other options available
 - Being convinced why the sewer needs to stay on the beach
- Environmental compliance (CEQA/NEPA)
 - The process requires consideration of other alternatives
 - City has not ruled out any funding sources (Federal dollars)
- No silver bullet; all options have challenges

Categories



Group A: Flow Diversion

Alt A1: Gravity Flow (Interim)

Alt A2: Pumped Flow (Interim)

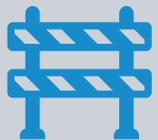
Alt A3: Pumped Flow (Final)



Group B: Beach Alternatives

Alt B1: Rehabilitate Existing Pipe

Alt B2: Construct New Pipe



Group C: Roadway Alternatives

Alt C1: Open-Cut w/ Pumps

Alt C2: Trenchless; Less Pumps

Interim vs Final

- Council mandated looking at near-term vs long-term

Interim	Final
Doesn't meet all objectives	Meets all objectives
May have near-term benefits	Likely to take longer to implement
Involves flow diversion (Group A only)	Rehabilitate, Relocate, or Flow Diversion (Groups A, B, and C)

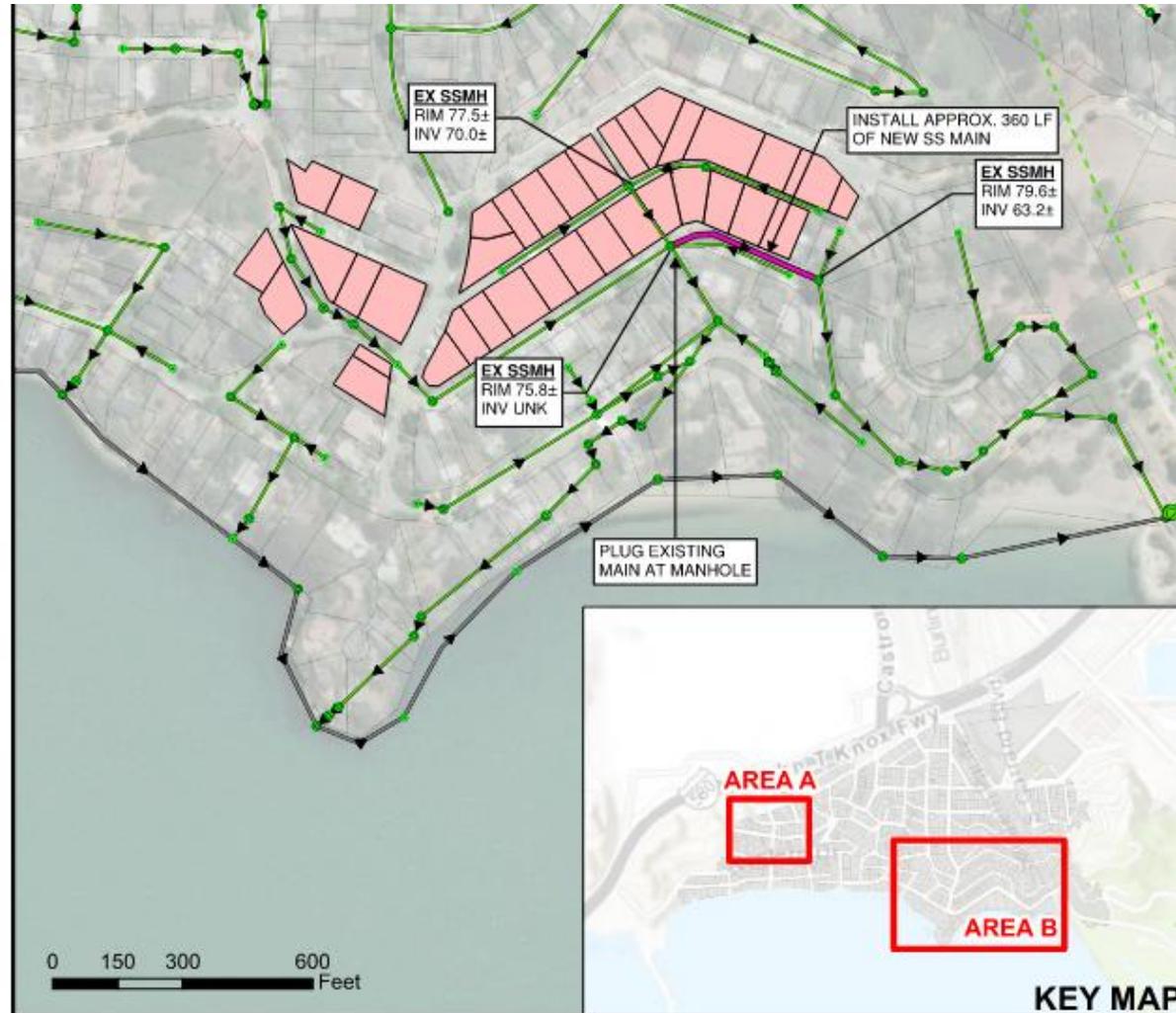
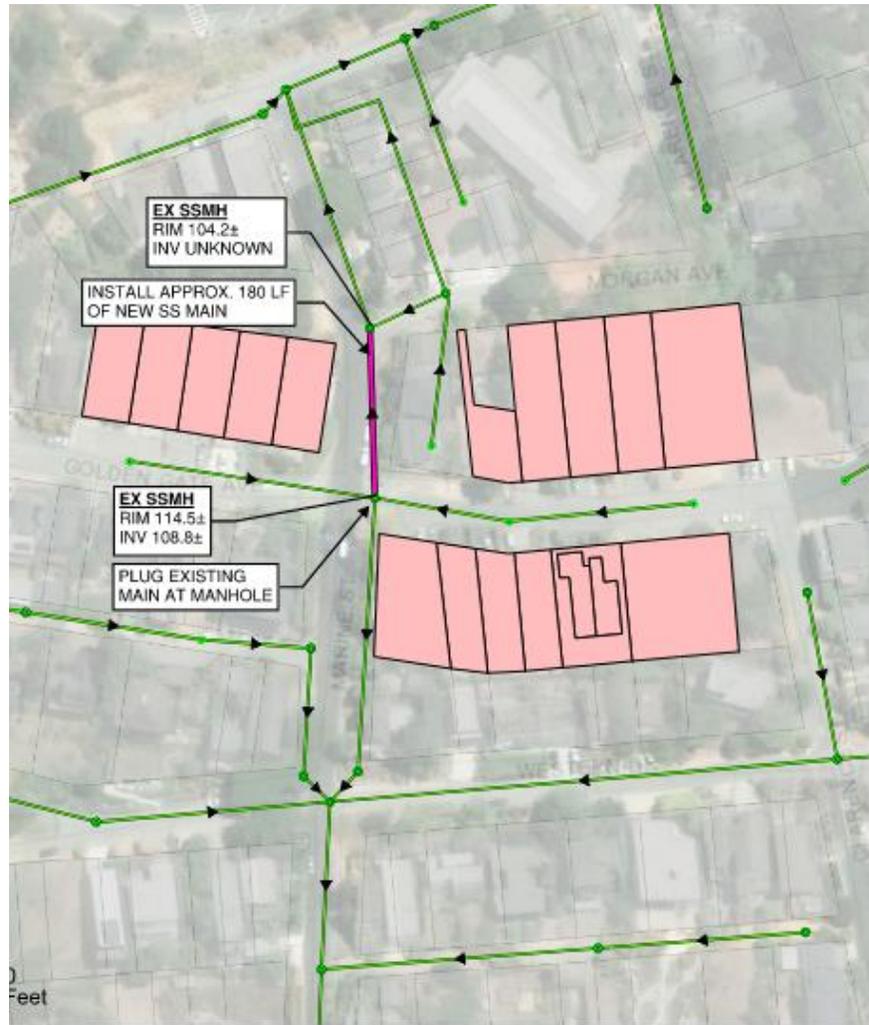
Group A: Flow Diversion

- Purpose: to reduce the flow in the KBSS
- Pros:
 - Limits the sewage spilled during a possible KBSS failure
 - Reduces pumping requirements (current and/or future)
 - May be implemented more quickly without Beach/Bay work
 - Interim options could be compatible with final solution

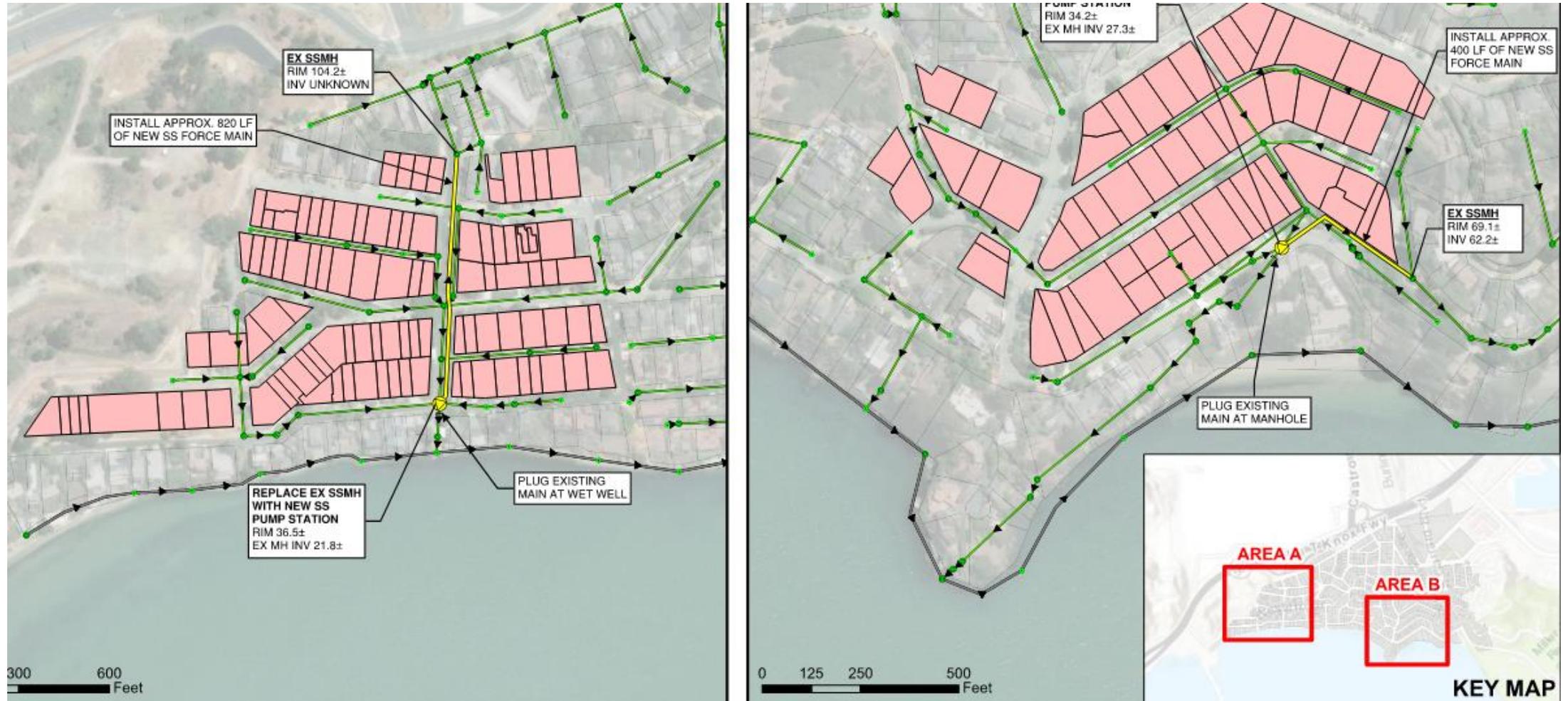
Group A: Flow Diversion

- Cons:
 - Interim options don't meet req'd objectives
 - KBSS may still be active
 - KBSS would remain in poor condition
 - KBSS still costly/challenging to inspect/maintain
 - May incur throw-away costs if not compatible with final alt
 - 2 of 3 alternatives require pumping

Alternative A1: Gravity Flow (Interim)



Alternative A2: Pumped Flow (Interim)



Alternative A3: Pumped Flow (Final)



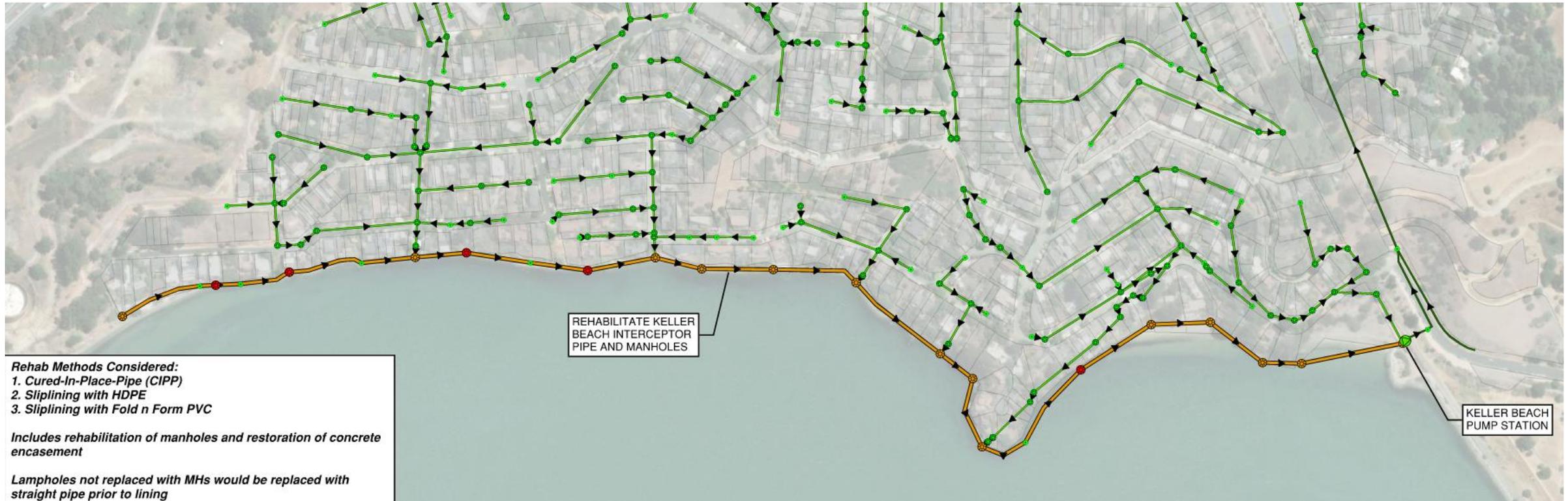
Group B: Beach Alternatives

- Purpose: keep it as a gravity system; no add'l pumps
- Pros:
 - Limits impacts to private property & homeowners
 - Doesn't increase current pumping costs
 - Could be less costly than in-road alternatives
 - May be able to mix/match rehab/replacement methods

Group B: Beach Alternatives

- Cons:
 - Likely challenging to permit
 - May have limited work hours due to tides
 - Requires groundwater dewatering / inflatable dams
 - Remains difficult and expensive to inspect/maintain
 - Remains susceptible to natural forces (erosion, corrosion)
 - Existing bellies will remain in the pipe (unless fixed first)

Alternative B1: Rehabilitate Existing Pipe



Rehabilitation Concerns

- May not be able to clean pipe thoroughly
- Regulators may not allow a chemically-cured product
- Too much diameter reduction could hinder inspection
- Excavation will be required with all options
 - Once you have permits, whole new pipeline may be better

Rehabilitation Concerns

- Re-building concrete encasement would likely be req'd with all options
- Tunneling through Cypress Point
 - Reconnect laterals?
 - Easements/access?
 - Liability?
- If “bellies” remain, sewer could function, but may not be able to be inspected due to water levels

Rehabilitation Options

- CIPP
- Sliplining with HDPE
- Sliplining with Fold n Form PVC

CIPP



<https://www.springfieldmo.gov/5854/Cured-in-Place-Pipe-Lining>

CIPP



https://www.epd.gov.hk/epd/misc/construction_noise/contents/index.php/en/home2/quieter-construction-methods/item/241-cured-in-place-pipe-cipp-lining-with-enhanced-curing-technology.html

CIPP

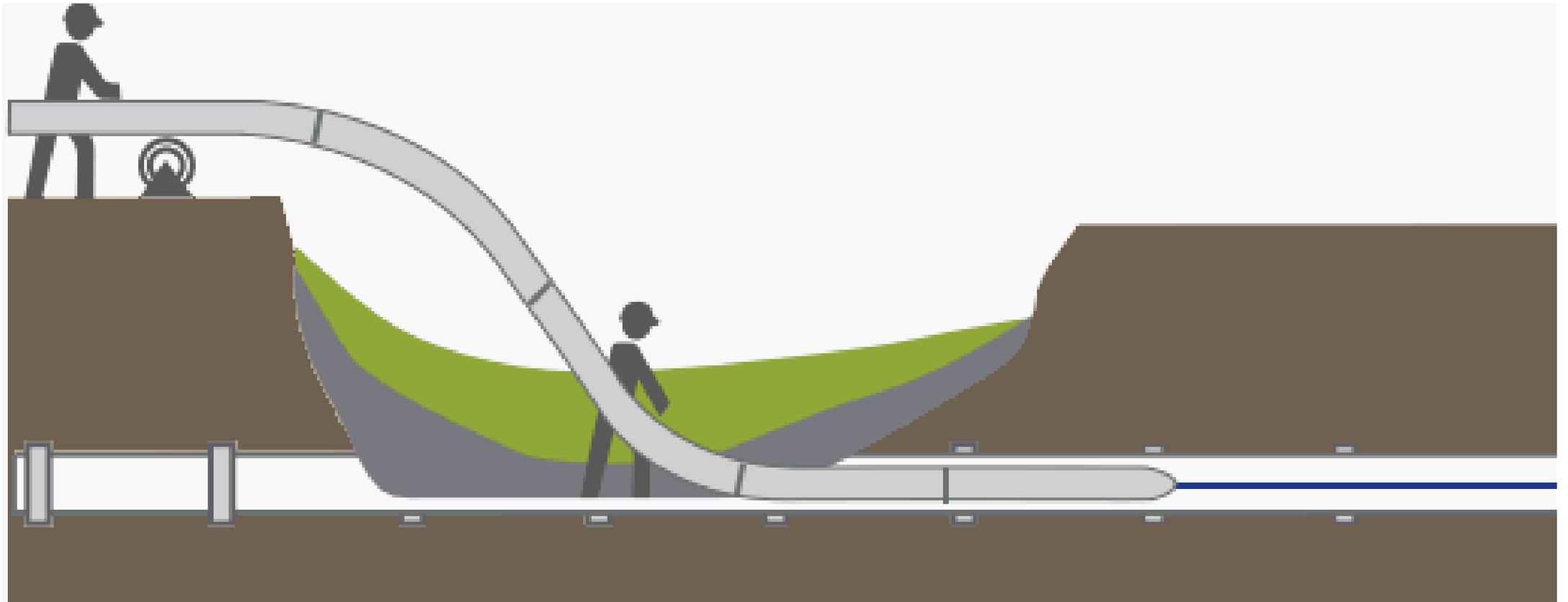


<https://neopoxy.com/epoxy-products/cured-in-place-pipe/>

CIPP

Pros	Cons
Typically is a fully structural solution	Need to have a clean pipe
Minimal diameter reduction	Needs to cure (i.e. chemicals or light)
Small staging footprint	Cure can be negatively affected by infiltration
Can use manholes for installation access	

Traditional Sliplining



<http://infra-sa.pl/de/dienstleistungen/renovation/continuous-pipe-sliplining.html>

Traditional Sliplining



<https://www.murphypipelines.com/sliplining-case-studies>

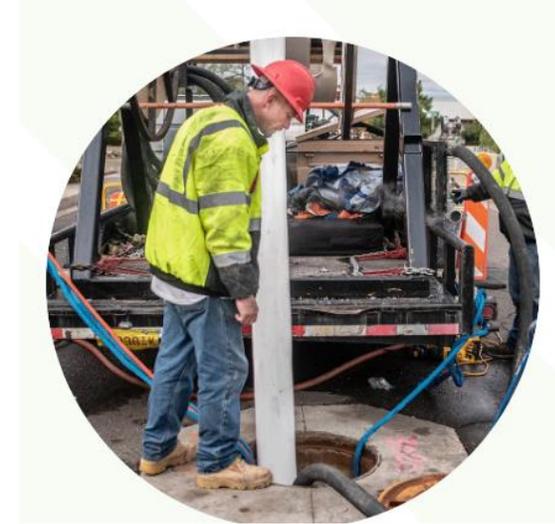
Traditional Sliplining

Pros	Cons
Result is a new pipe	Joint deflections or tuberculation can prevent insertion
Does not need to cure	Need staging area to string pipe (fusible, continuous)
	Need annular space for couplings (segmental)
	Can't be installed through manholes (need to excavate pits)
	Requires the largest diameter reduction (any pipe less than 8" is more difficult to inspect/rehab)

Fold and Form Sliplining



Thermoform Brochure



Fold and Form Sliplining



Fold and Form Sliplining

Pros	Cons
Result is a new pipe	Need to have a clean pipe, but less than CIPP
Does not need to cure (heat softens material; cooling hardens it)	Likely not quite as strong as traditional pipe or CIPP
Can be installed through manholes	
Arrives on a spool (no need to string pipe; limits staging required)	
Should be easier to navigate bends than HDPE	

Alternative B2: Construct New Pipe



Group C: Road Alternatives

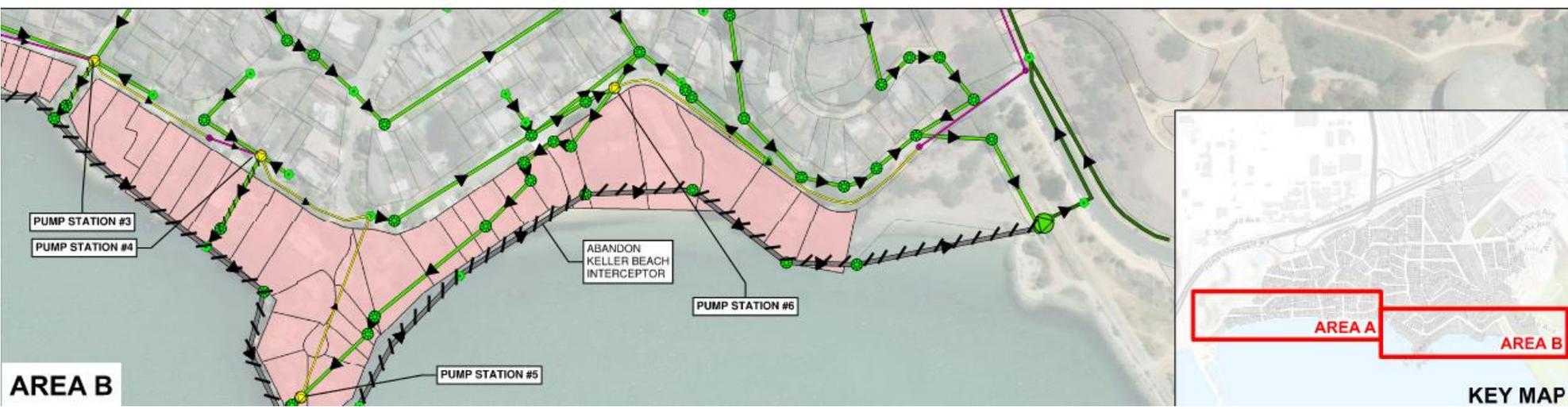
- Purpose: most protected / most accessible
- Pros:
 - Eliminates impacts due to waves, erosion, sea water
 - Inspection / maintenance with standard equipment
 - May restore the beach to its natural state (if pipe removed)
 - Likely lesser environmental/permit requirements
 - May eliminate the existing KBPS

Group C: Road Alternatives

- Cons:
 - Likely adds private pumps to many oceanfront homes
 - May not have adequate room for pumps
 - Feasibility of pump installs must be reviewed lot-by-lot
 - Highest impact to private property (side yards, d/w, back yards)
 - Likely the most expensive
 - Asphalt sawcutting/replacement, pumps, specialty trenchless work
 - May still require removal of pipe on beach (env permits)
 - Easement acquisitions required

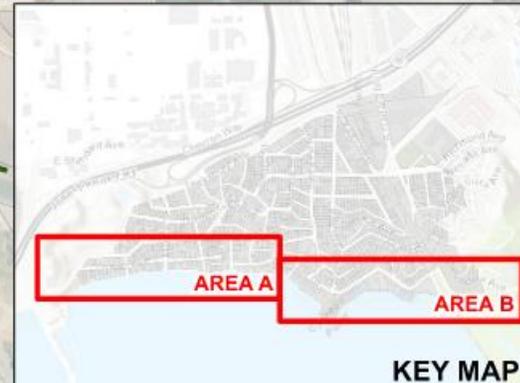
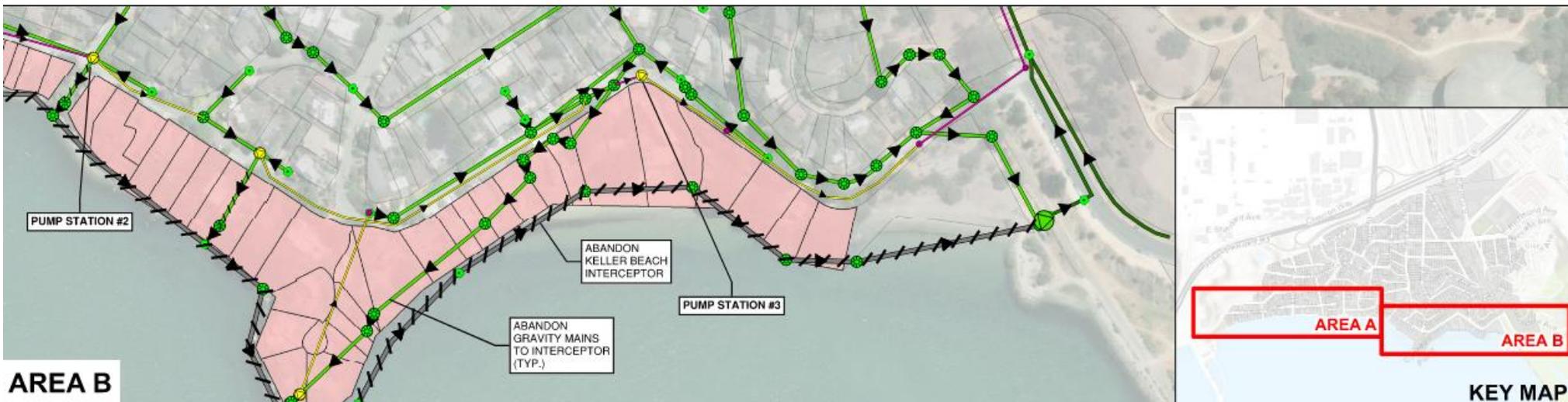
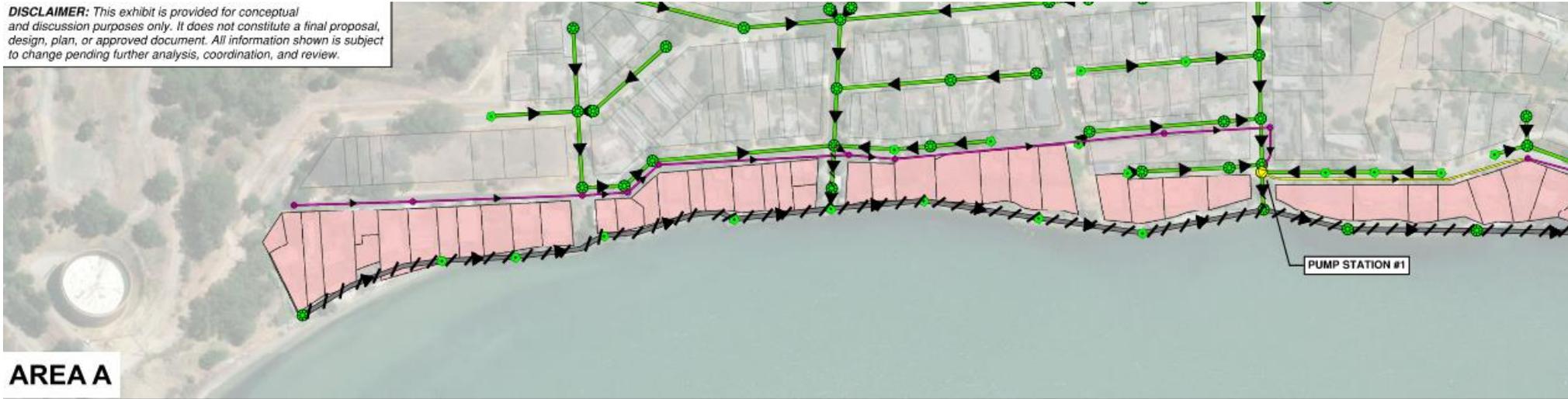
Alternative C1: Traditional Open-Cut

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Alternative C2: Trenchless Open-Cut

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Funding Opportunities

Funding Opportunities

- Grants
 - **EPA San Francisco Bay Water Quality Improvement Fund**
 - EPA Sewer Overflow and Stormwater Reuse Municipal Grants
 - FEMA Building Resilient Infrastructure and Communities (BRIC)
 - Community Development Block Grants (CDBG)
- Loan and Forgivable Loan Programs
 - California Clean Water State Revolving Fund (CWSRF)
 - EPA Water Infrastructure Finance and Innovation Act (WIFIA)

Questions and Comments

Next Steps

Next Steps

- Workshop recording, materials, and summary will be available on project website:
<https://ci.richmond.ca.us/4928/01C10---Keller-Beach-Sanitary-Sewer-Asse>
- Next public workshop will focus on evaluation results
- Contact team any time with questions or requests

Thank You

Please reach out with questions and comments:

Keller_Beach-Project@ci.richmond.ca.us