



**Seattle
Public
Utilities**



King County

Ship Canal Water Quality Project

The Ship Canal Water Quality Project Program Overview

Northwest Construction Consumer Council

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This project is funded in part by the Washington State Department of Ecology and Environmental Protection Agency through State Revolving Fund and Water Infrastructure Finance and Innovation Act loans



EPA

United States
Environmental Protection
Agency



DEPARTMENT OF
ECOLOGY
State of Washington

Seattle Public Utilities



City of Seattle

Today's Topics

1. Seattle Public Utilities
2. SCWQ Program Overview
 - Four construction projects
 - Storage tunnel mining
 - Program complexity and risk
3. Questions



Seattle Public Utilities

Services:

- Drainage
- Wastewater
- Drinking Water
- Solid Waste

~1,350 employees

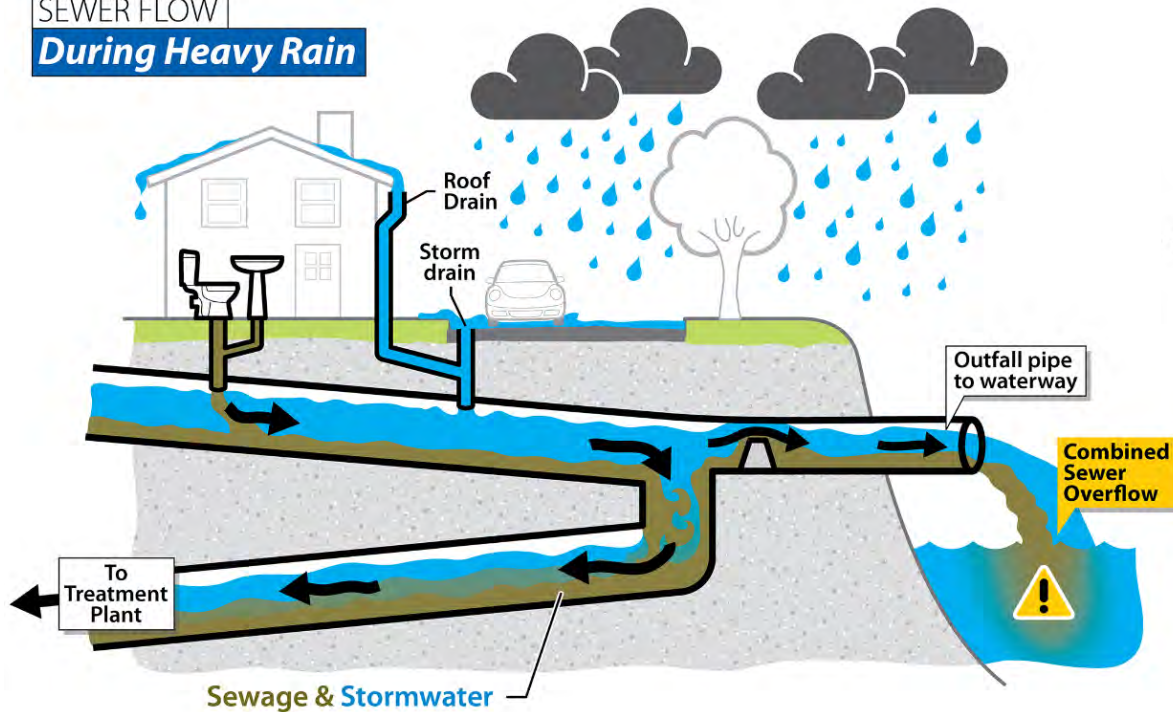


SCWQP Program Overview

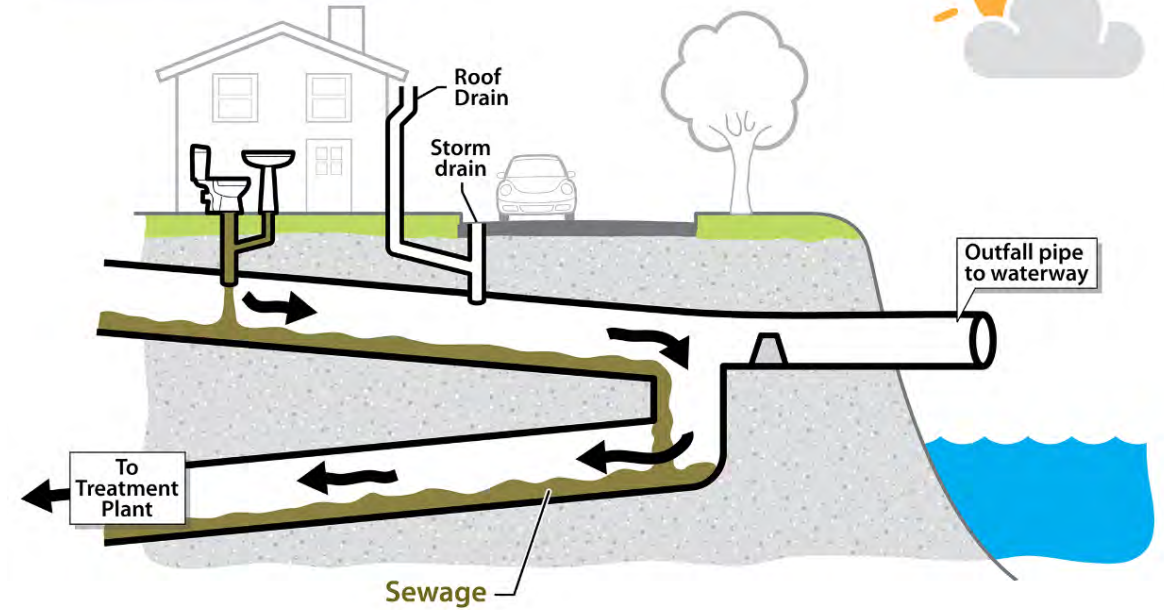


Combined Sewer Overflows (CSOs)

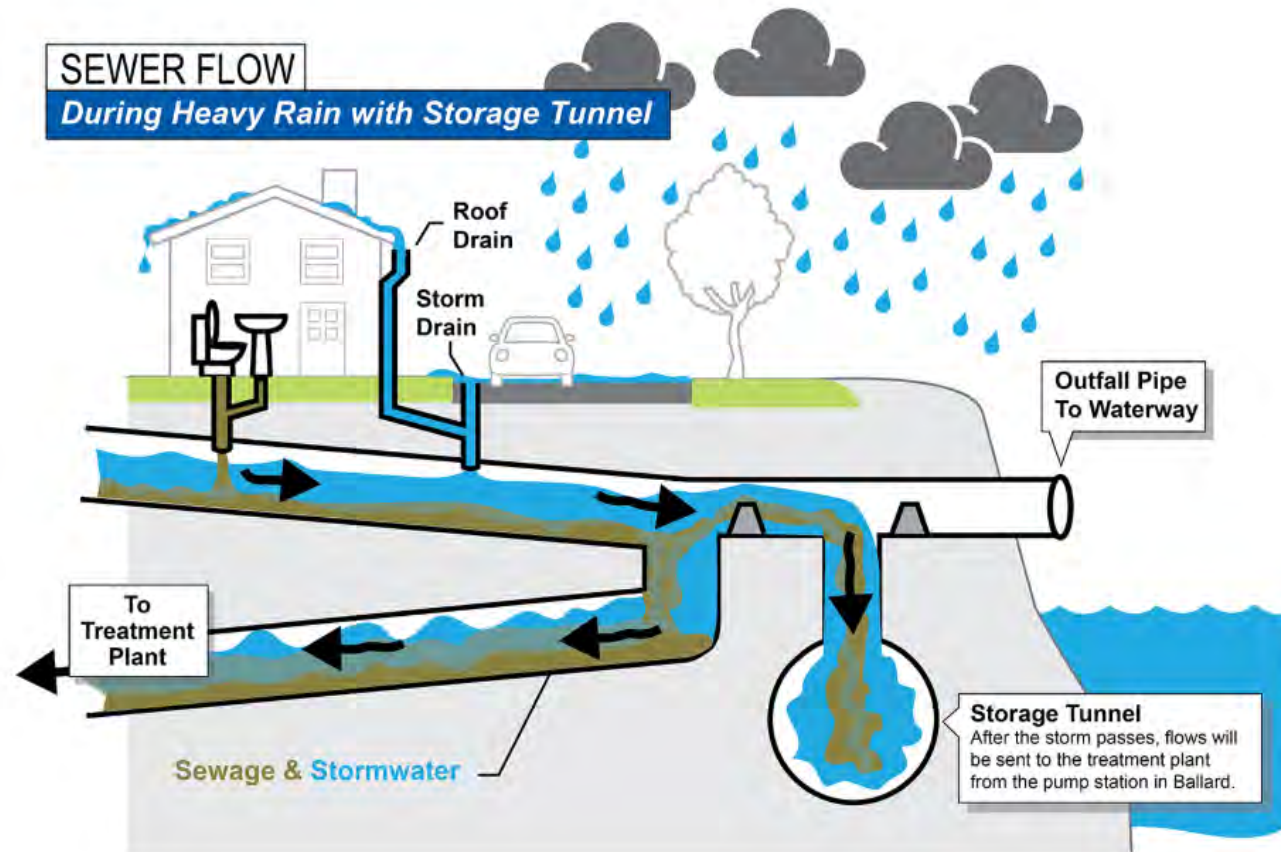
SEWER FLOW
During Heavy Rain



SEWER FLOW
During Dry Weather



How a Tunnel Helps



Ship Canal Water Quality Project

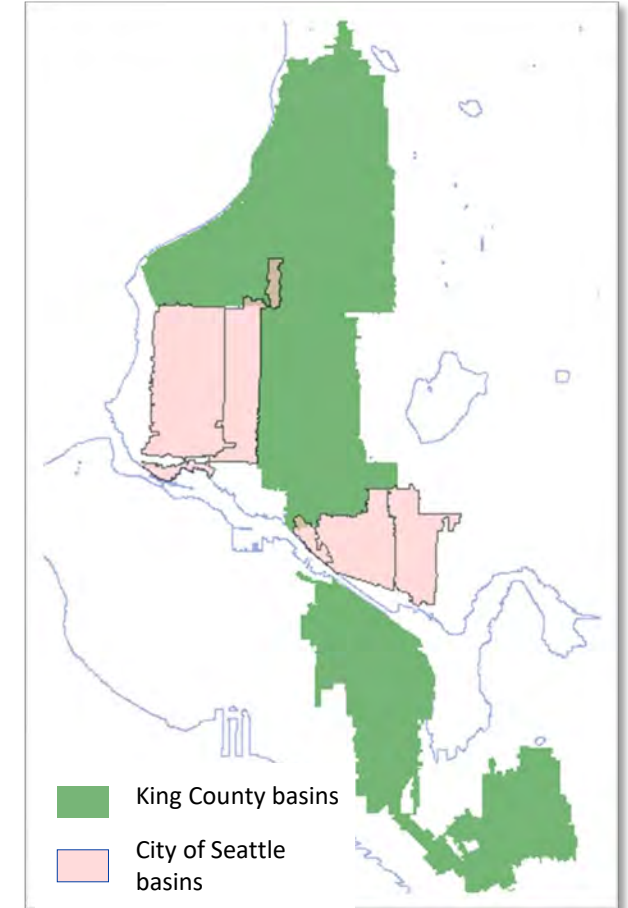
Will improve water quality by reducing CSOs by 75 million gallons each year on average.

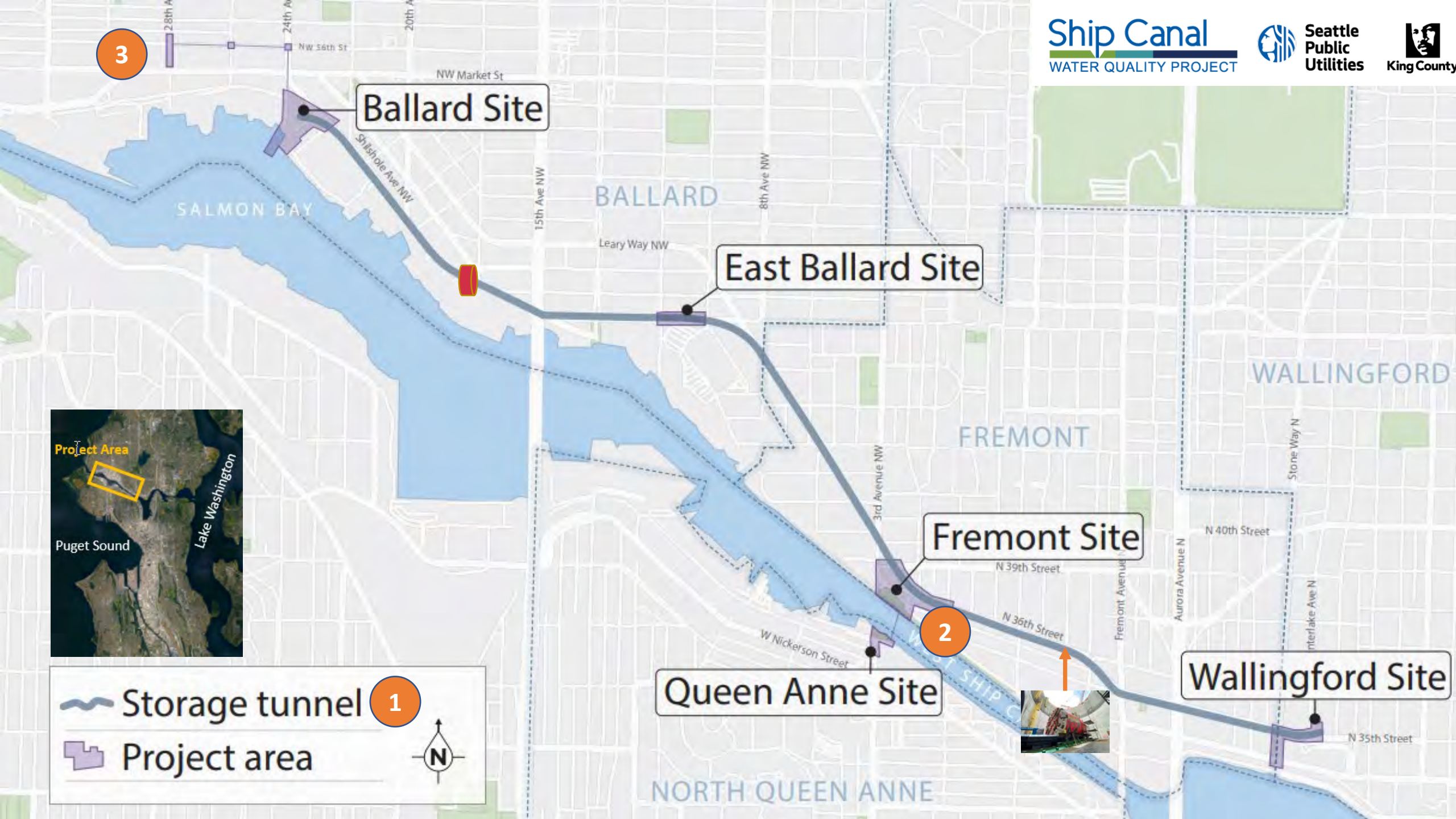
Consent Decree

- With US DOJ, US EPA and WA Dept of Ecology
- Less than 1 combined sewer overflow per outfall per year on a 20-year moving average

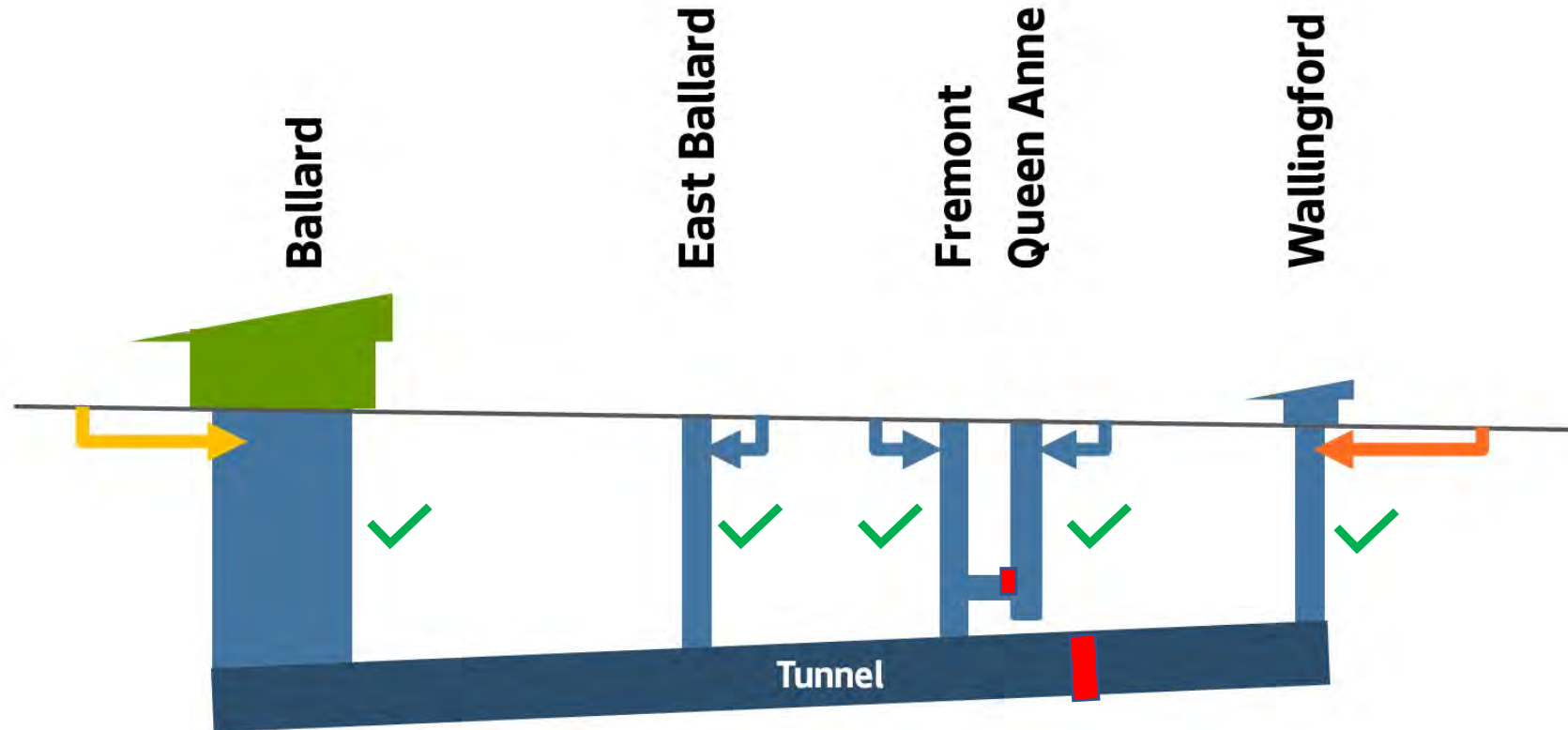
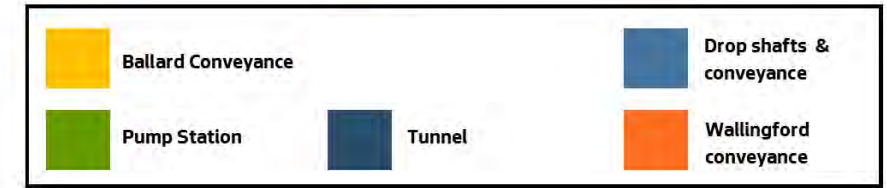
Joint Project: King County & City of Seattle

- 6 Outfalls: 2 KC, 4 Seattle
- Joint Project Agreement: City of Seattle (~65%), King County (~35%)

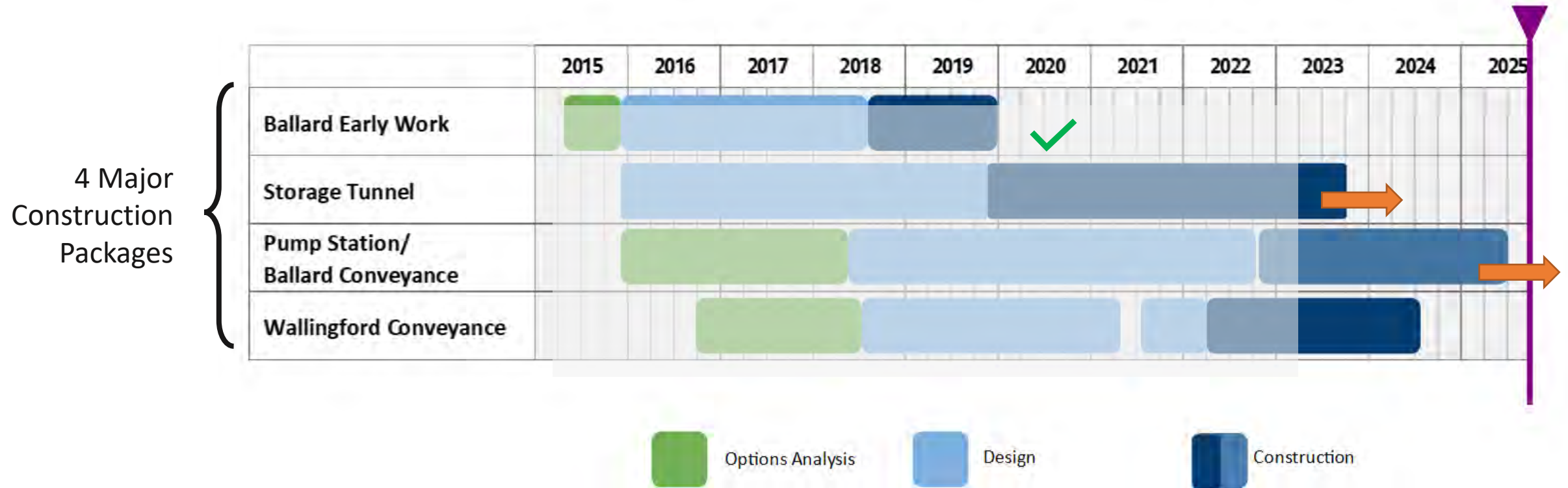




Project Components

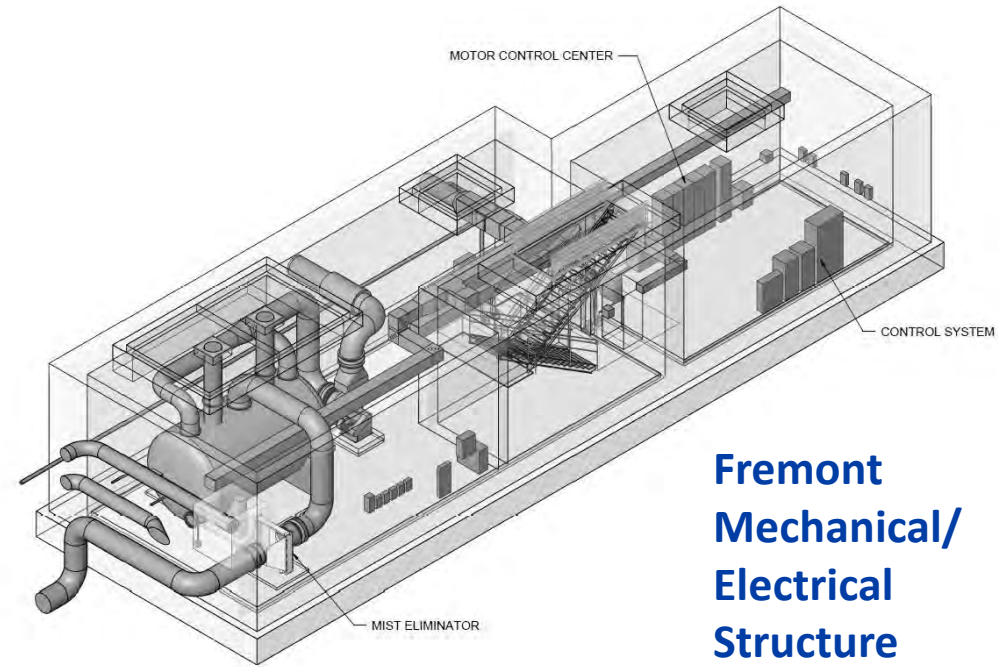
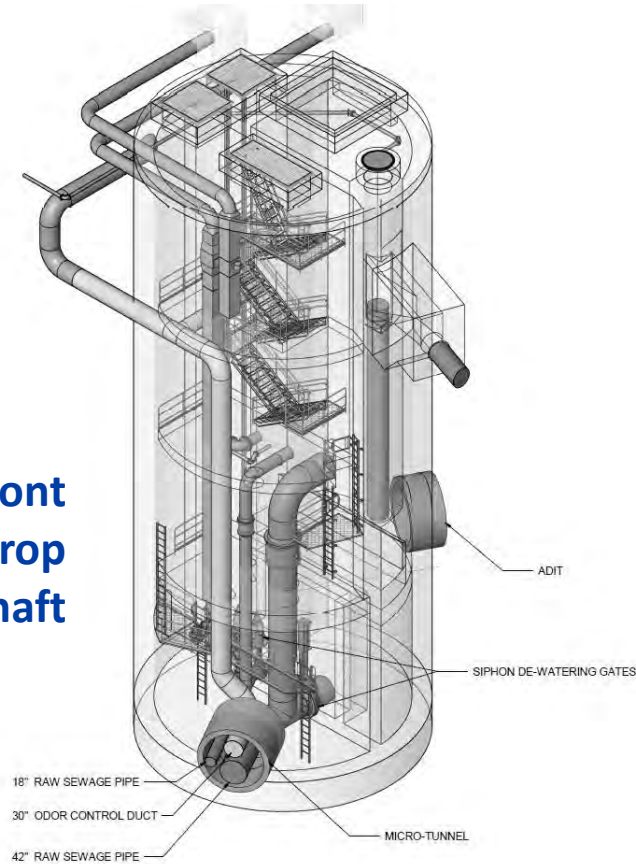


Program Schedule



Project Components Examples

**Fremont
Drop
Shaft**



**Fremont
Mechanical/
Electrical
Structure**

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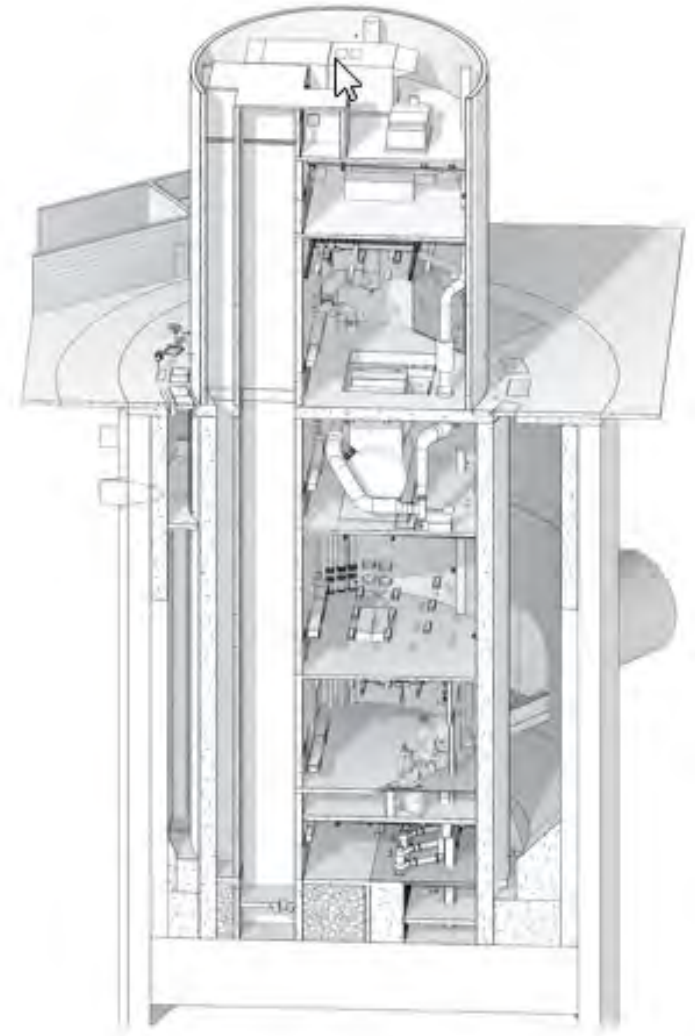
**Ballard
Site**



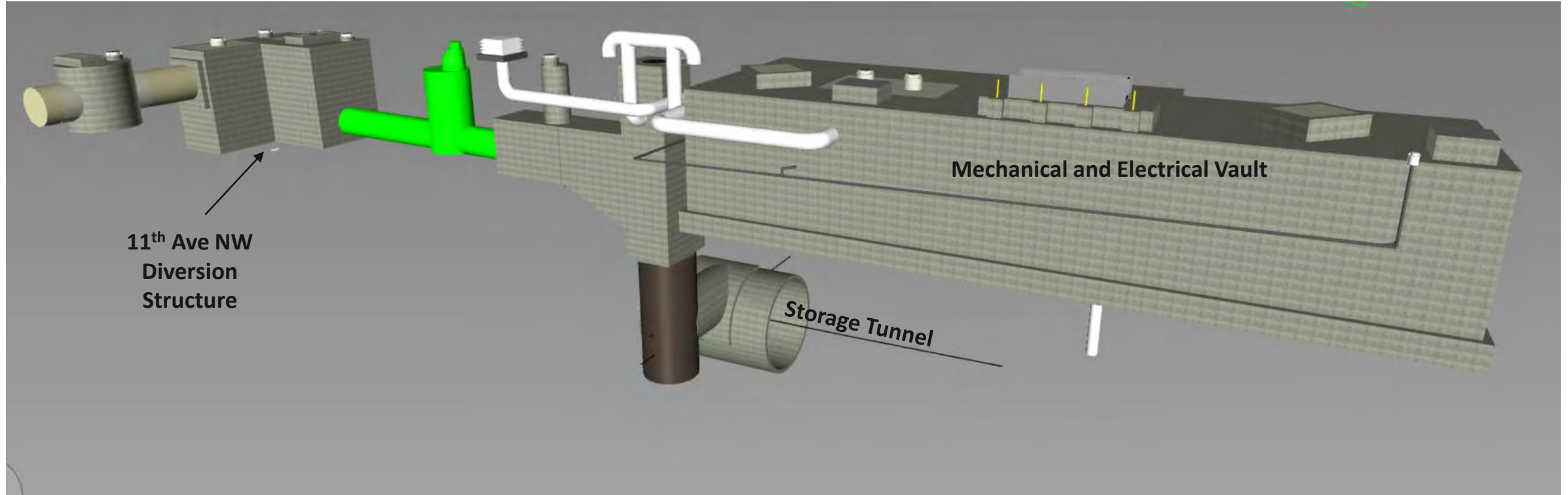
Ballard Site



Ballard: Shaft and Pump Station



Storage Tunnel: 11th Avenue NW (East Ballard)



East Ballard



Fremont Site

- Shaft, underground structures and conveyance piping
- 8 ft. dia. Tunnel to Queen Anne was launched from shaft
- Ground improvement
 - “Safe haven” for TBM inspection/maintenance
 - Adit construction (by SEM)



Wallingford Site

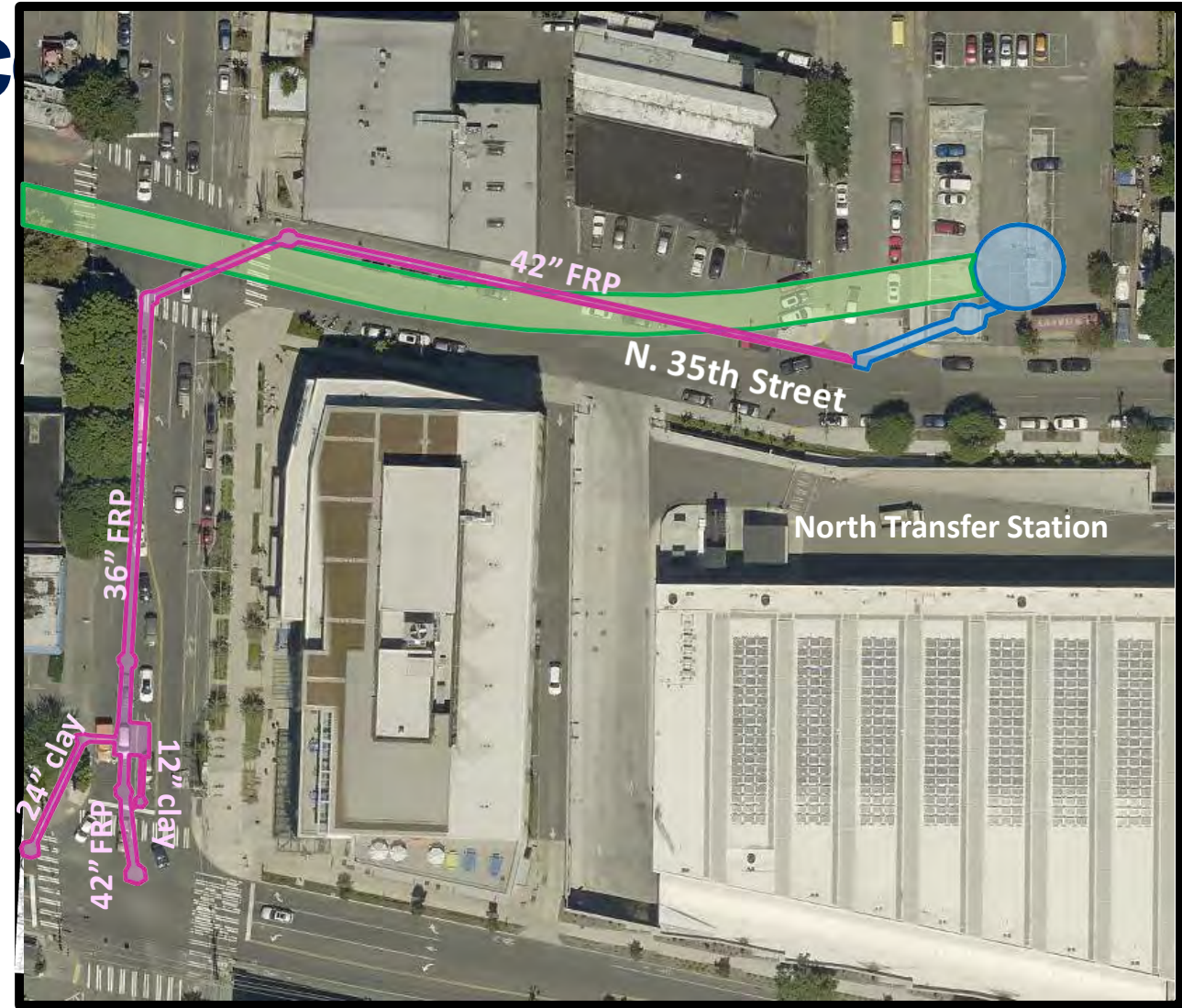


Wallingford Conveyance

Under construction now.

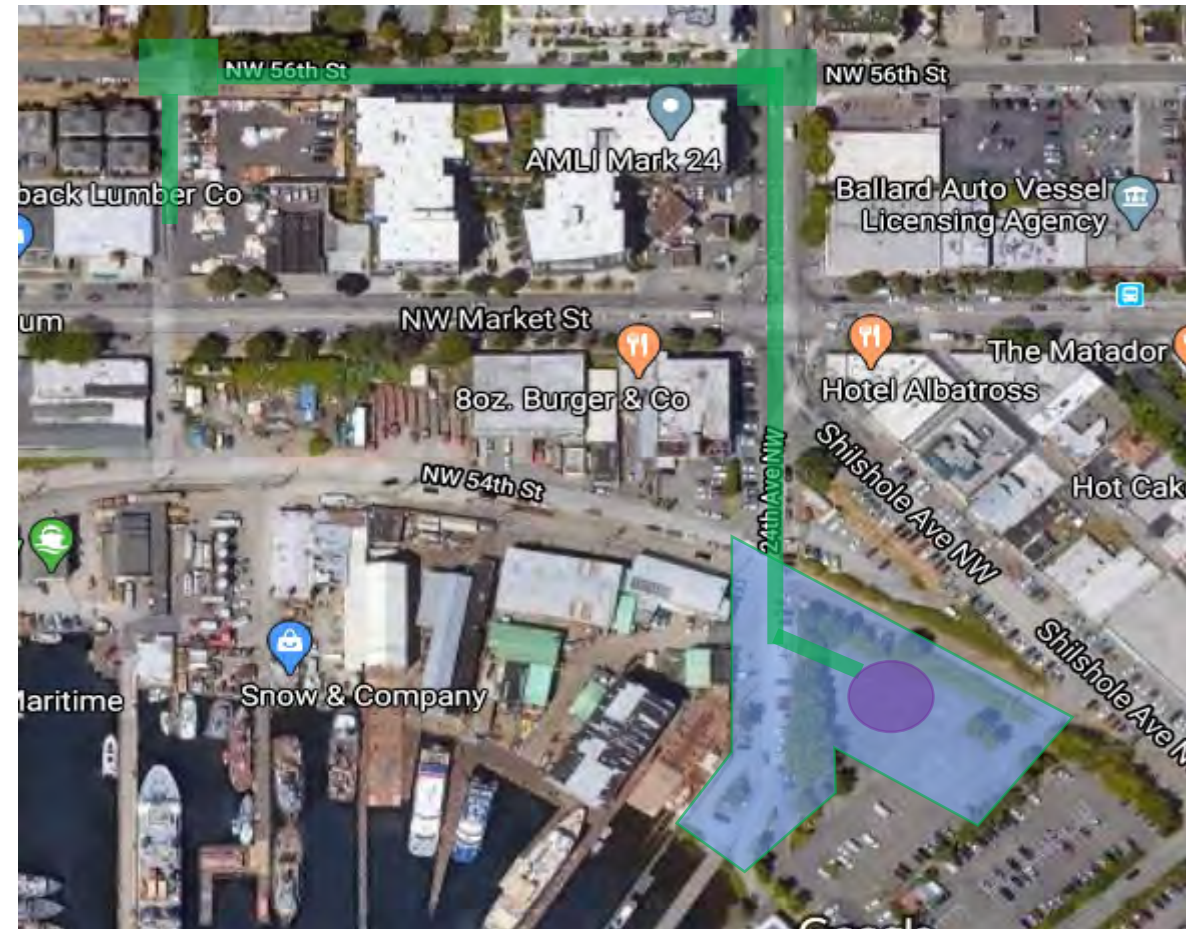
Elements include:

- Conveyance to Storage Tunnel
- Large Diversion Structure
- Watermain relocation
- Extensive Detours



Ballard Pump Station and Conveyance

- Currently on the street
- Main elements:
 - 12 MGD pump station and site improvements
 - 2,000 LF - 7 to 8.5 ft. dia. tunnel with 5 ft. dia. conveyance pipe
 - Diversion and other structures



Storage Tunnel Mining

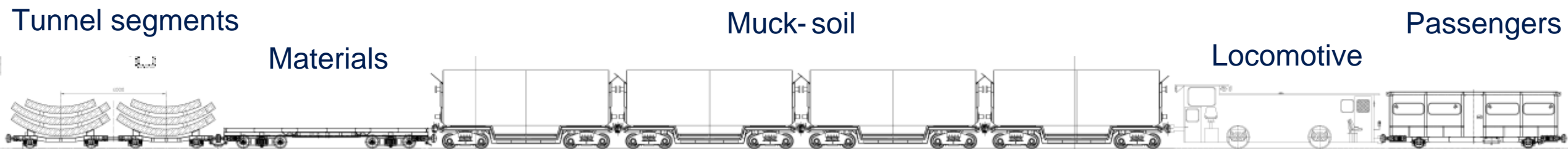


“MudHoney”

The Storage Tunnel’s Tunnel Boring Machine (TBM)



Tunneling Logistics



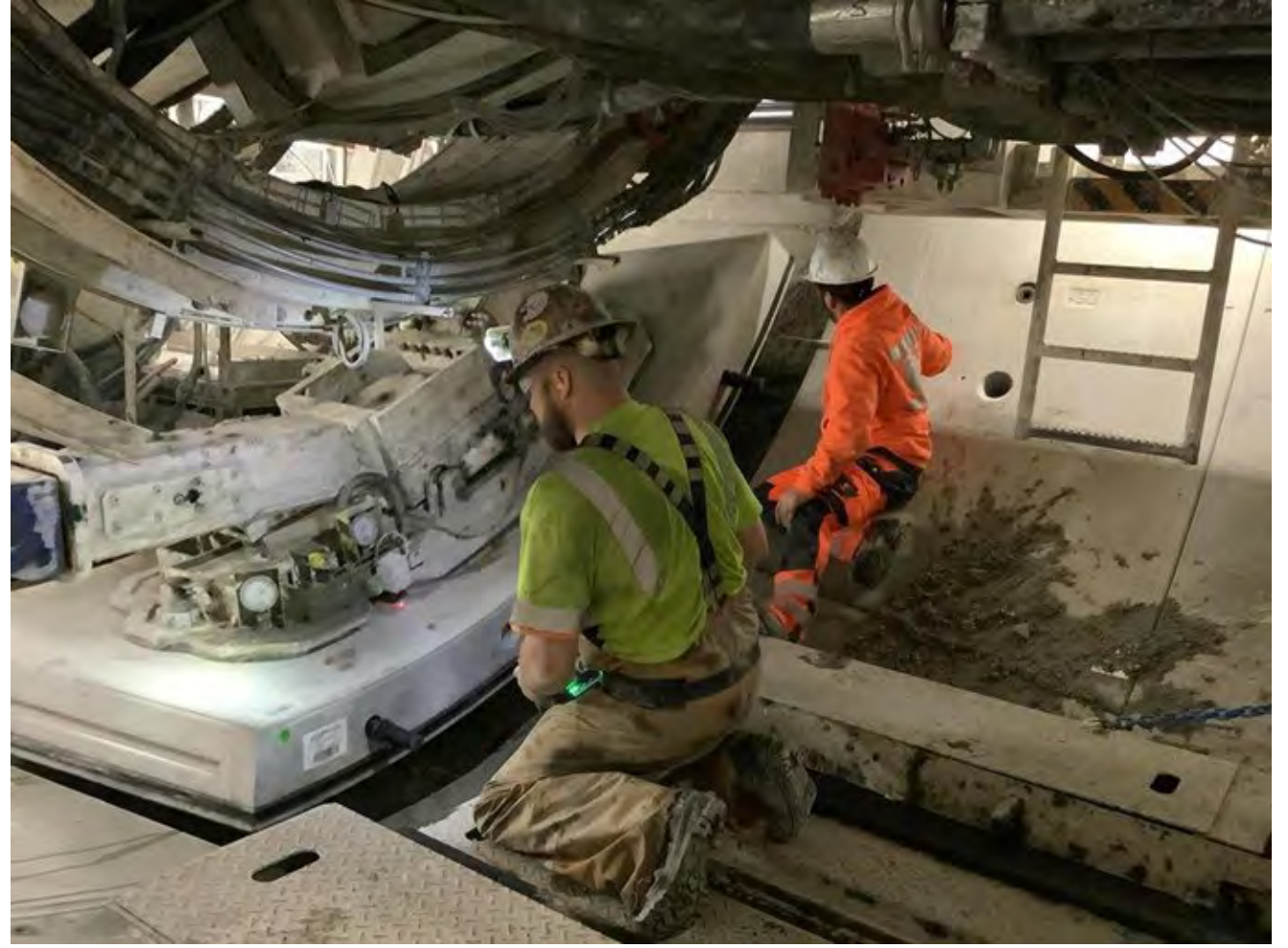
← MudHoney



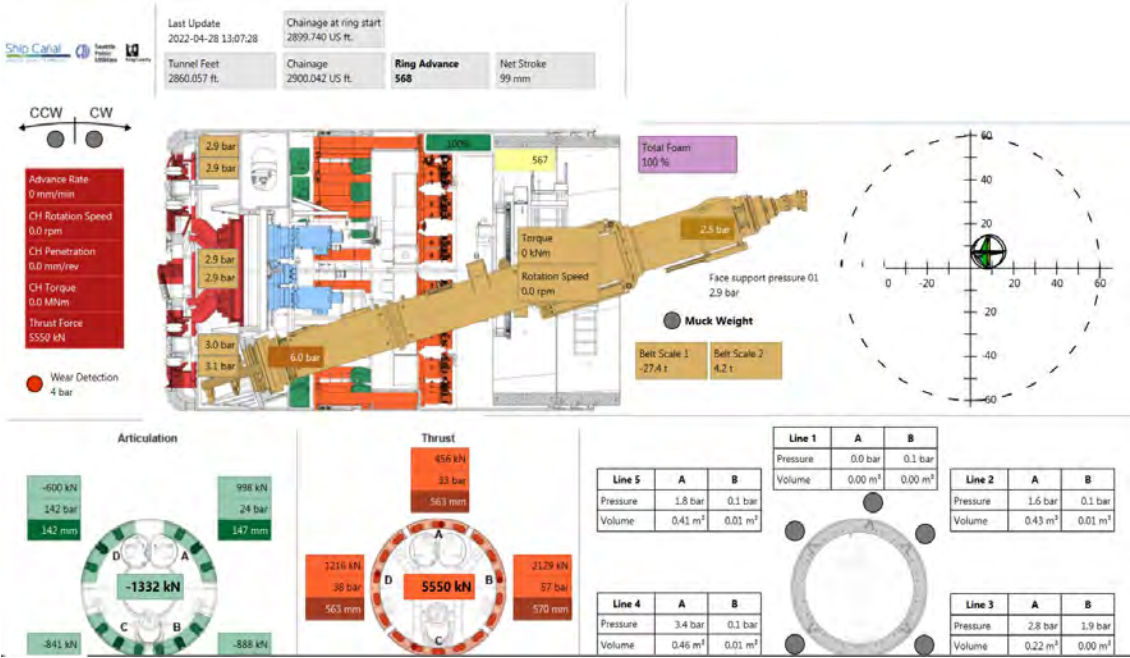
Tunneling



Building the Tunnel

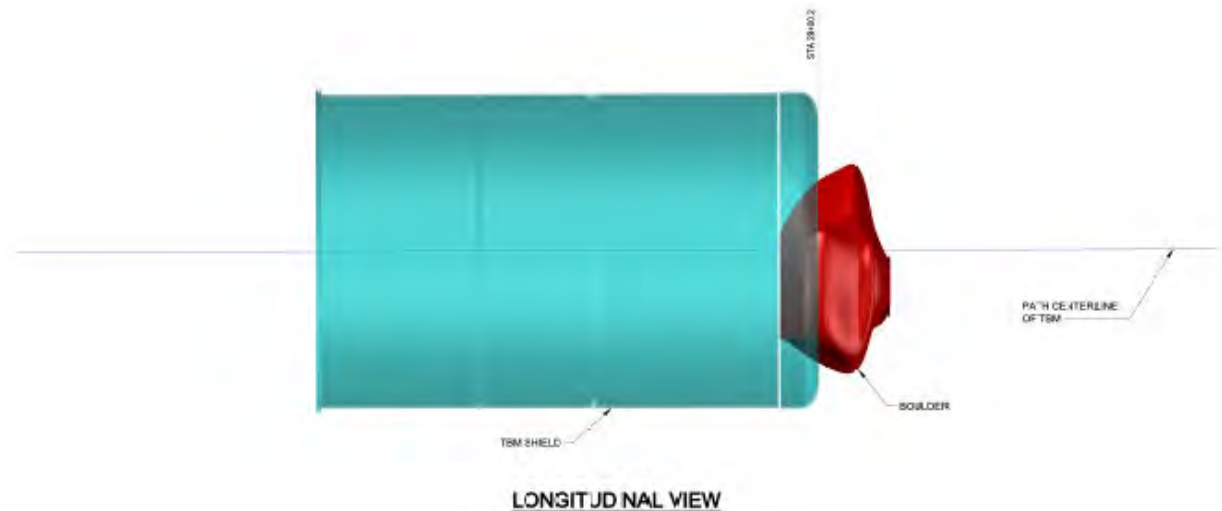
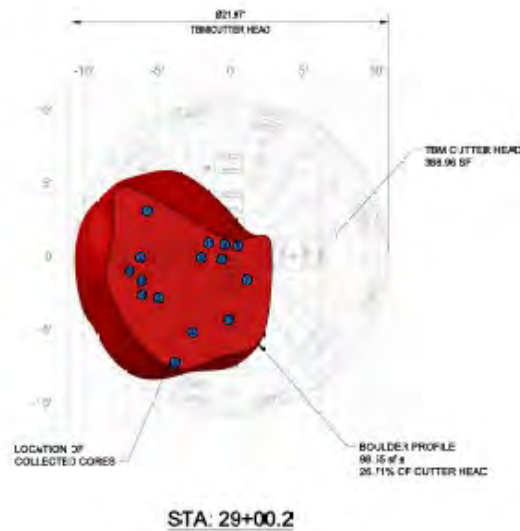


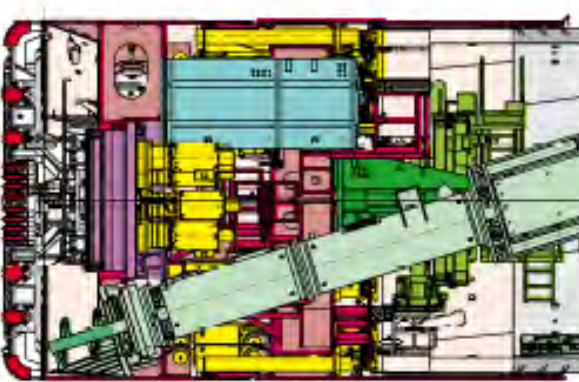
Monitoring while Tunneling



MegaBoulder

- Successfully removed largest boulder in tunnel alignment in at least North America
- Currently reviewing contractor's request for change (RFC):
 - Impact of 91 calendar days and \$16M





East Ballard Safe Haven Work

Program Complexity

1. Two large agencies
 - Political drivers
 - Cultures
2. Technical
3. 11-year long program
4. High degree of integration/coordination between projects
5. Long-term construction work in five neighborhoods



Questions?

