PNWS-AWWA | Spring Conference

City of West Linn Bolton Reservoir and Supply Main Replacement

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April 28, 2018

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Overview

01 Project Impetus

02 Siting Analysis

03 Piping and Hydraulic Improvements

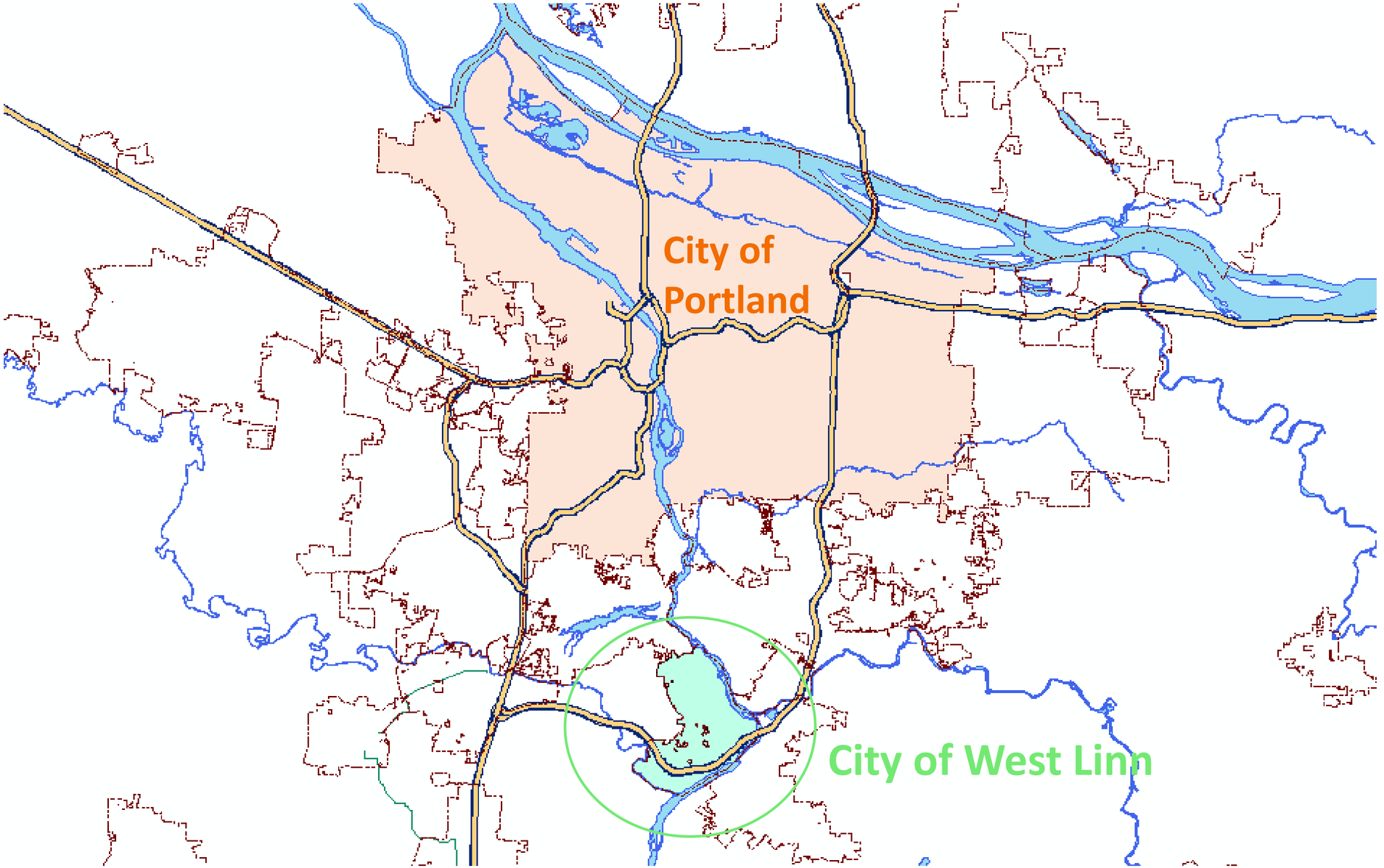
04 Reservoir Features and Construction

05 Associated Improvements

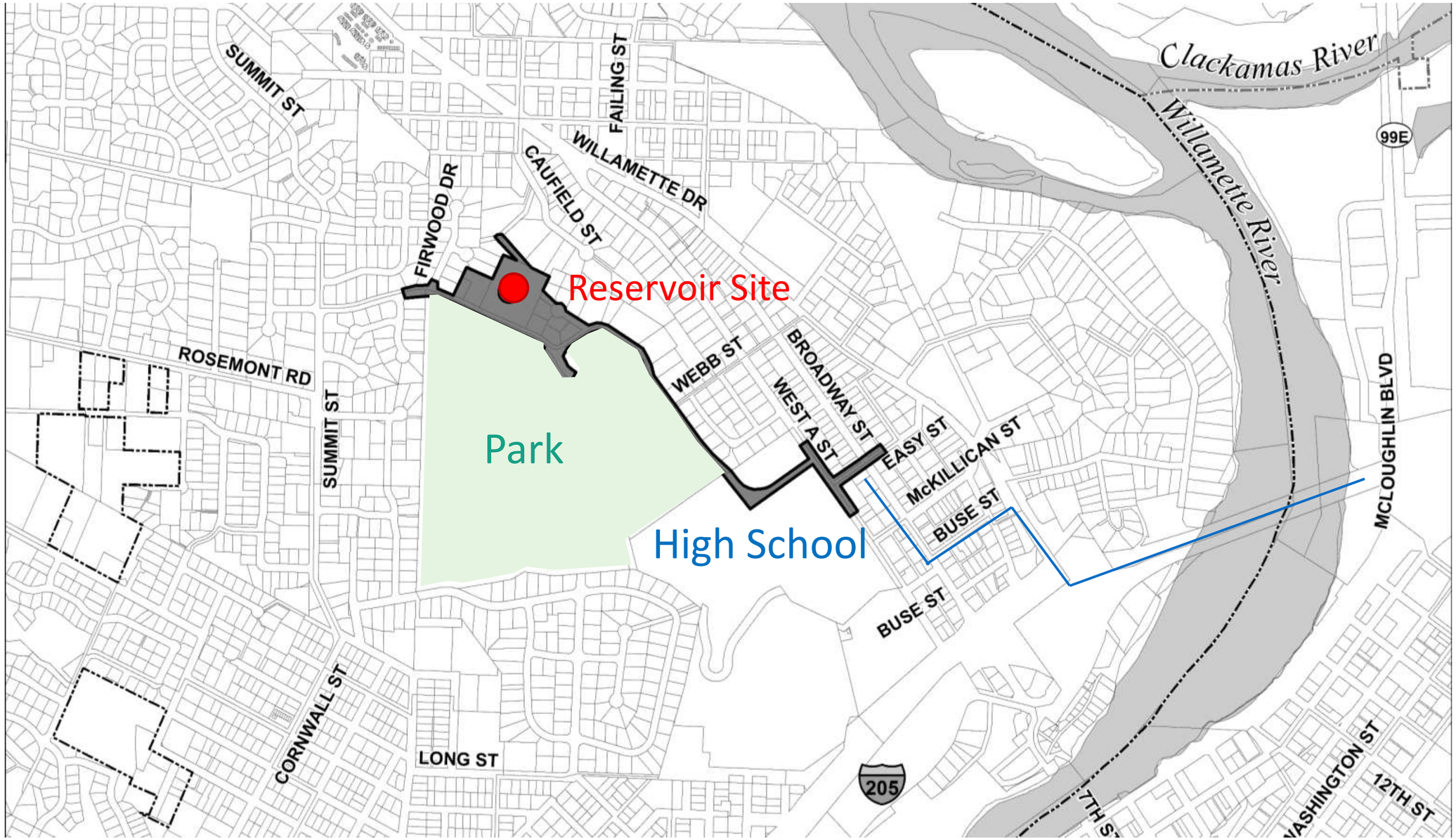
06 Q&A

Project Impetus

Where is West Linn?



Project Area



Reason 1: 100-years-old

- 1915 Construction
- 2.5 MG Hopper Bottom
- 1989 Interior Liner
- 1995 Hypalon Cover

Reason 2: Undersized

Recommended replacement:

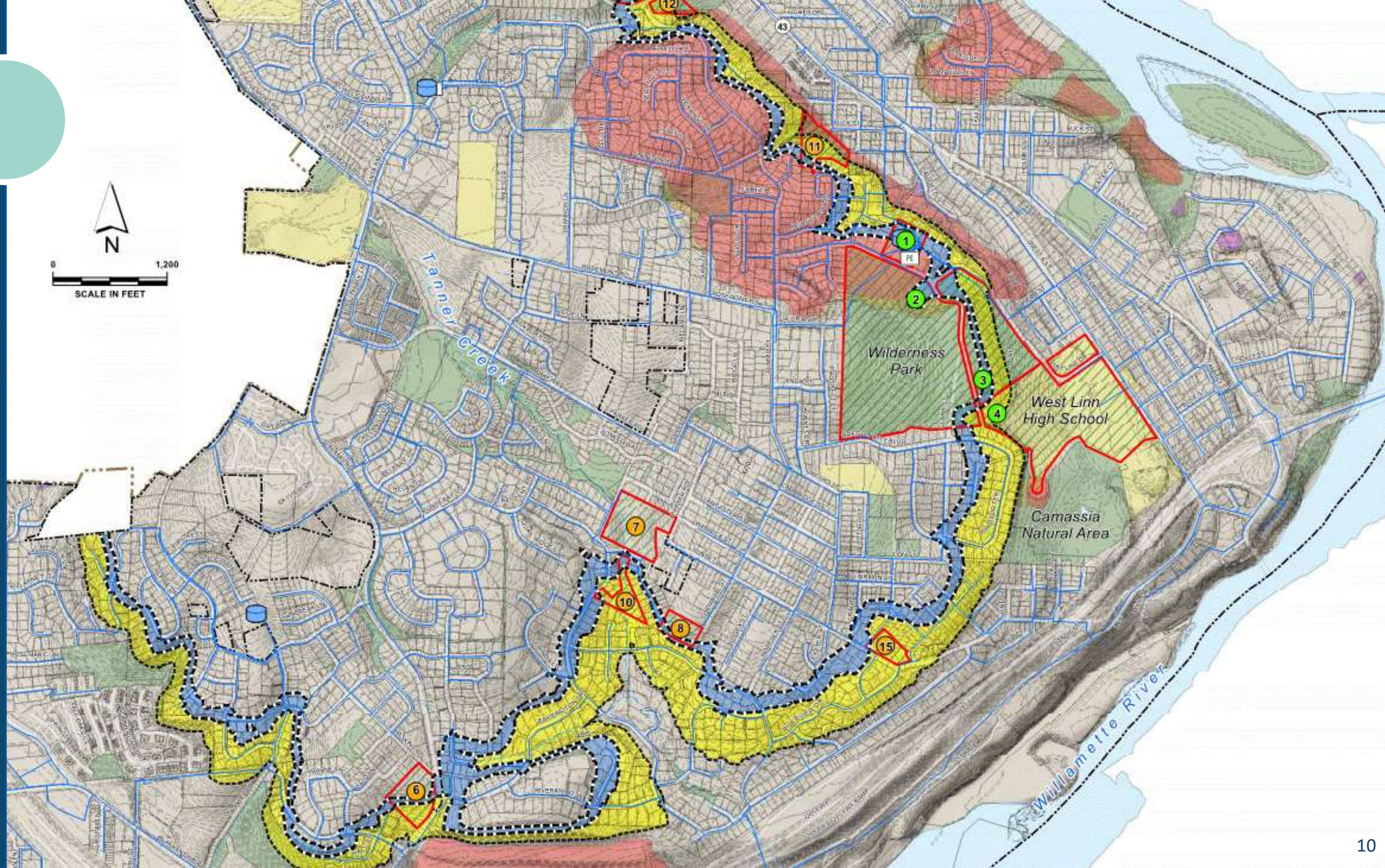
- 2008 WSMP
- 2004 Update
- 1999 WSMP

Maintenance issues:

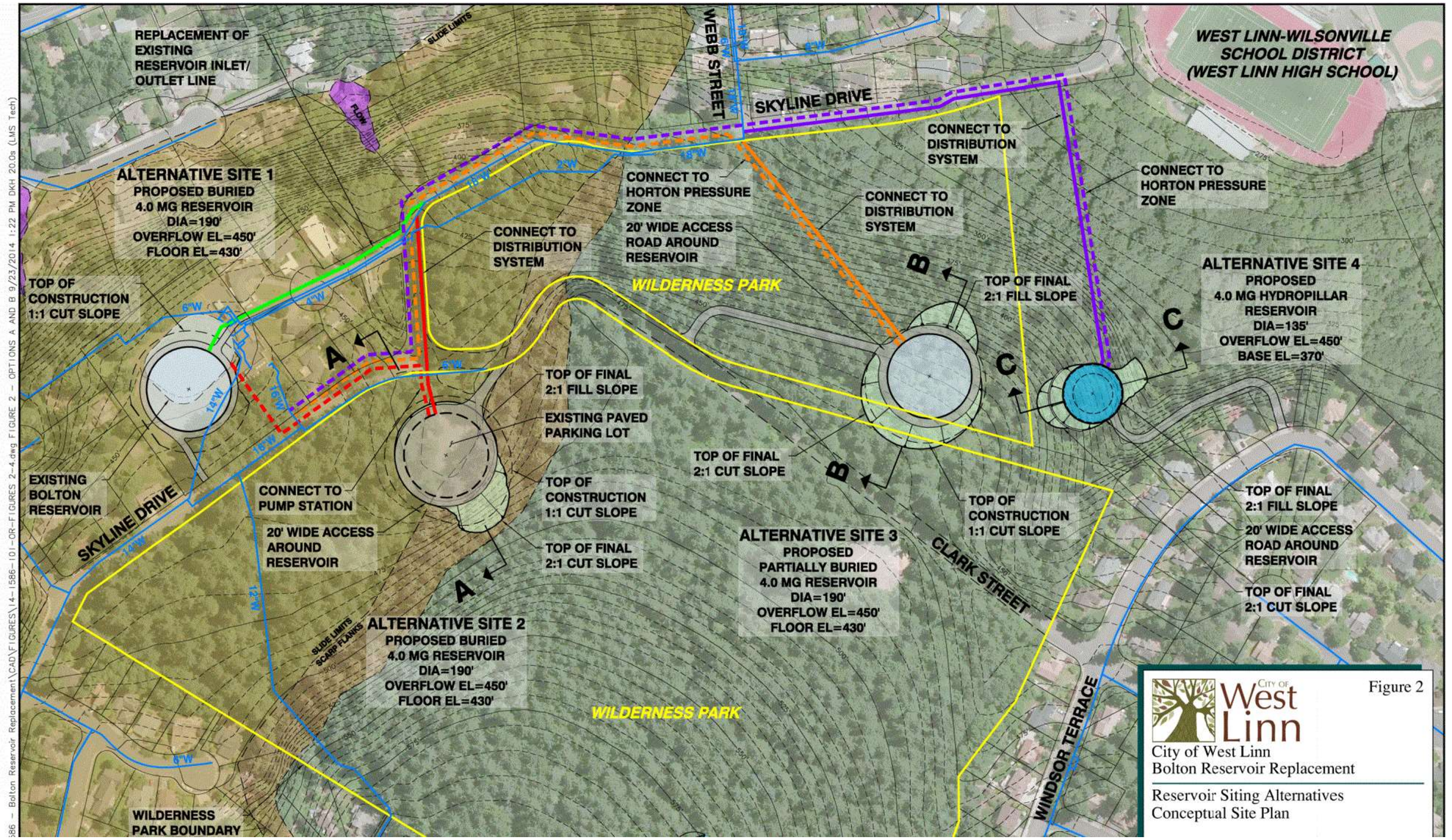
- Failed floating cover
- Moss nuisance

Reason 3: Improve usable storage & hydraulic performance

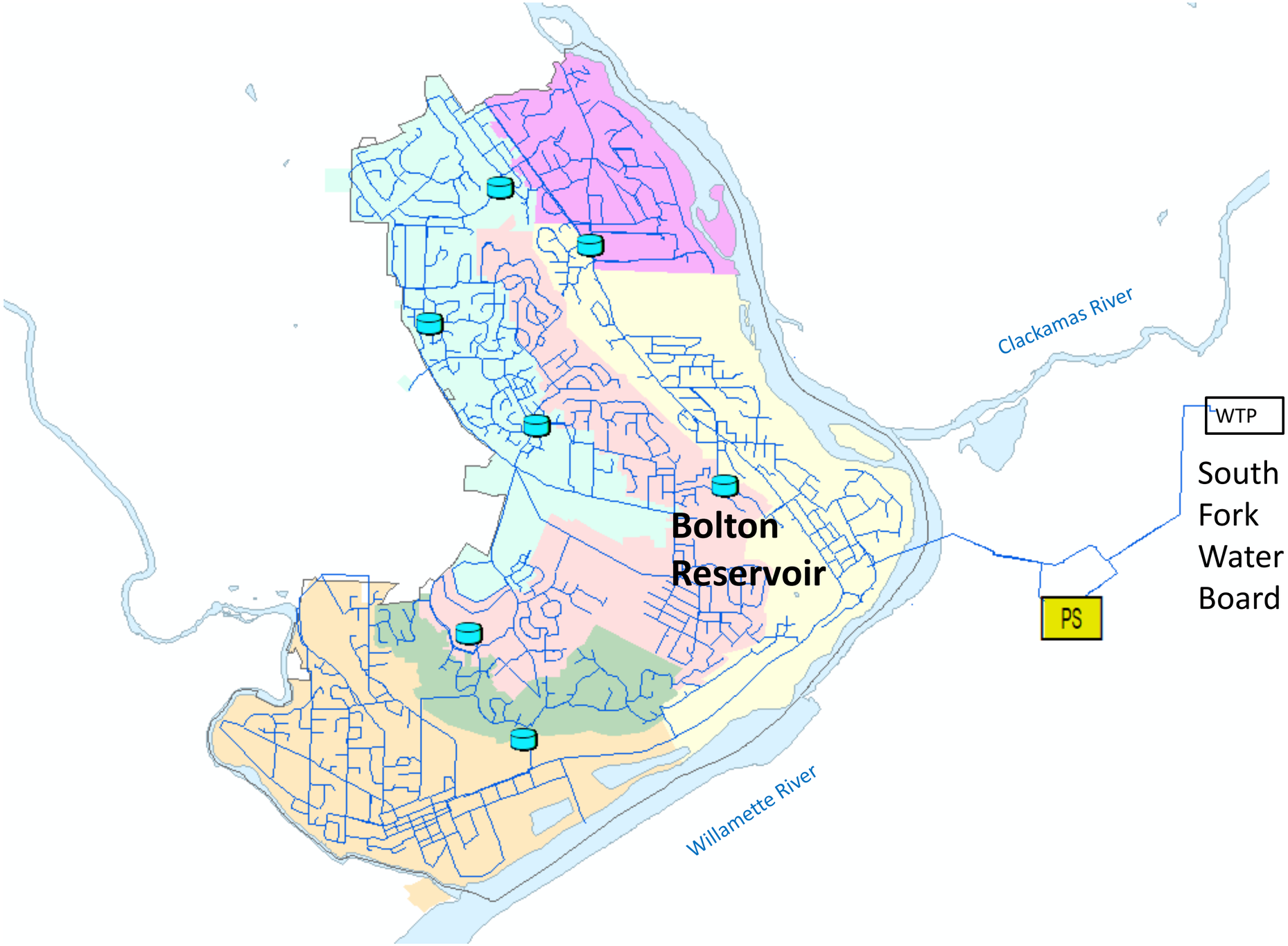
Siting Analysis



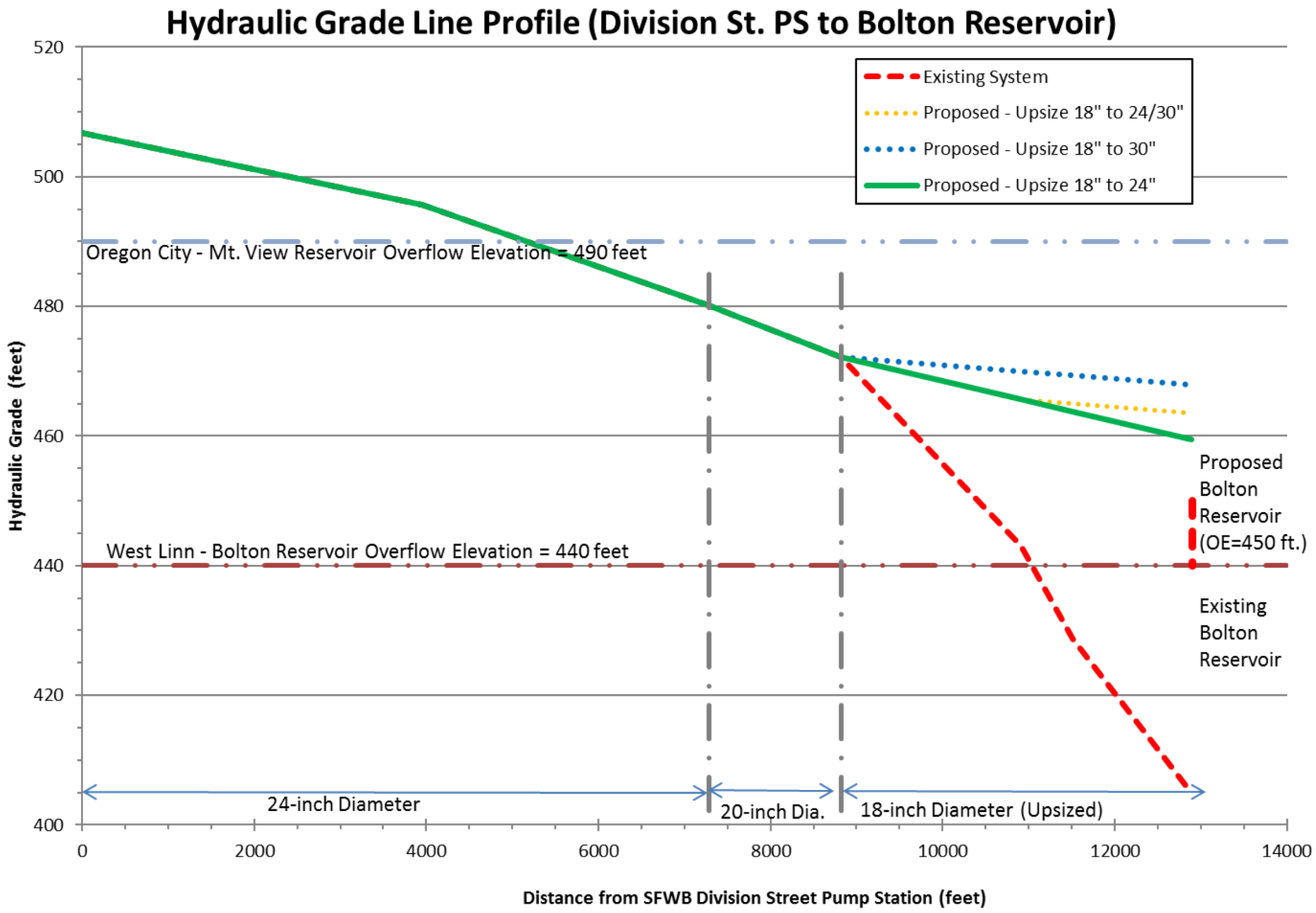
Evaluation of alternatives



Piping and Hydraulic Improvements



Hydraulic analysis – reservoir filling



Supply main - corrosion protection

- High pressure gas main crossings
- Double bagging
- Anodes
- Test stations
- Isolation

Supply main installation

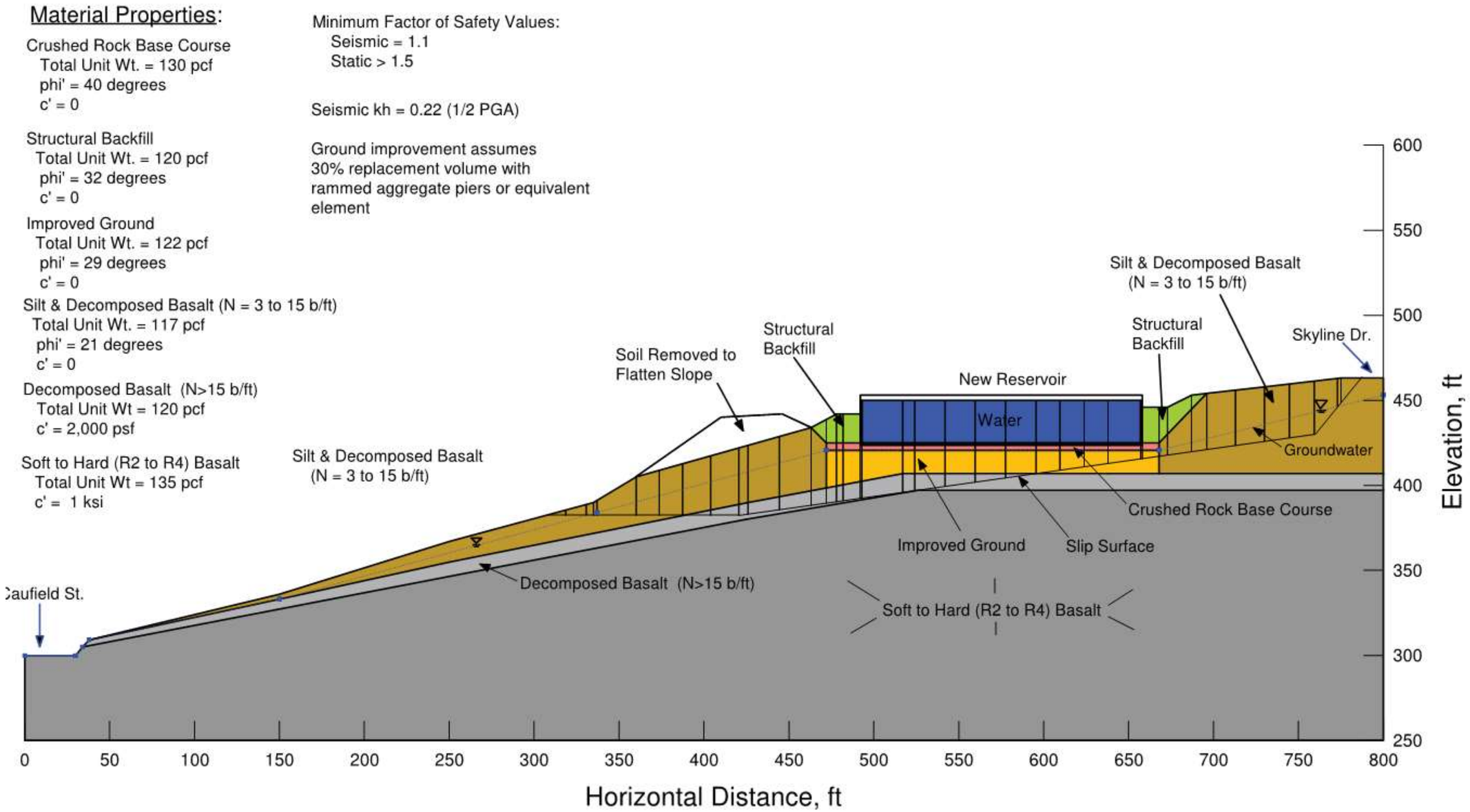
- Owner observed
  - Expertise
  - Budget
- Rock excavation

Hydraulic analysis – available volume for suction

Reservoir Water Surface Elevation	Proposed 20-ft Depth 450-ft Overflow Elev. 430-ft Floor Elev.		Proposed 25-ft Depth 450-ft Overflow Elev. 425-ft Floor Elev.		Existing 14-ft Depth 442-ft Overflow Elev. 426-ft Floor Elev.	
	Pumping	Gravity	Pumping	Gravity	Pumping	Gravity
450	3.0	4.0	2.4	4.0	--	--
445	2.0	3.0	1.6	3.2	--	--
440	1.0	2.0	0.8	2.4	1.0	2.0
435	0	1.0	0	1.6	0	1.3
430	--	0	--	0.8	--	0.6
425	--	--	--	0	--	0

Reservoir Features and Construction

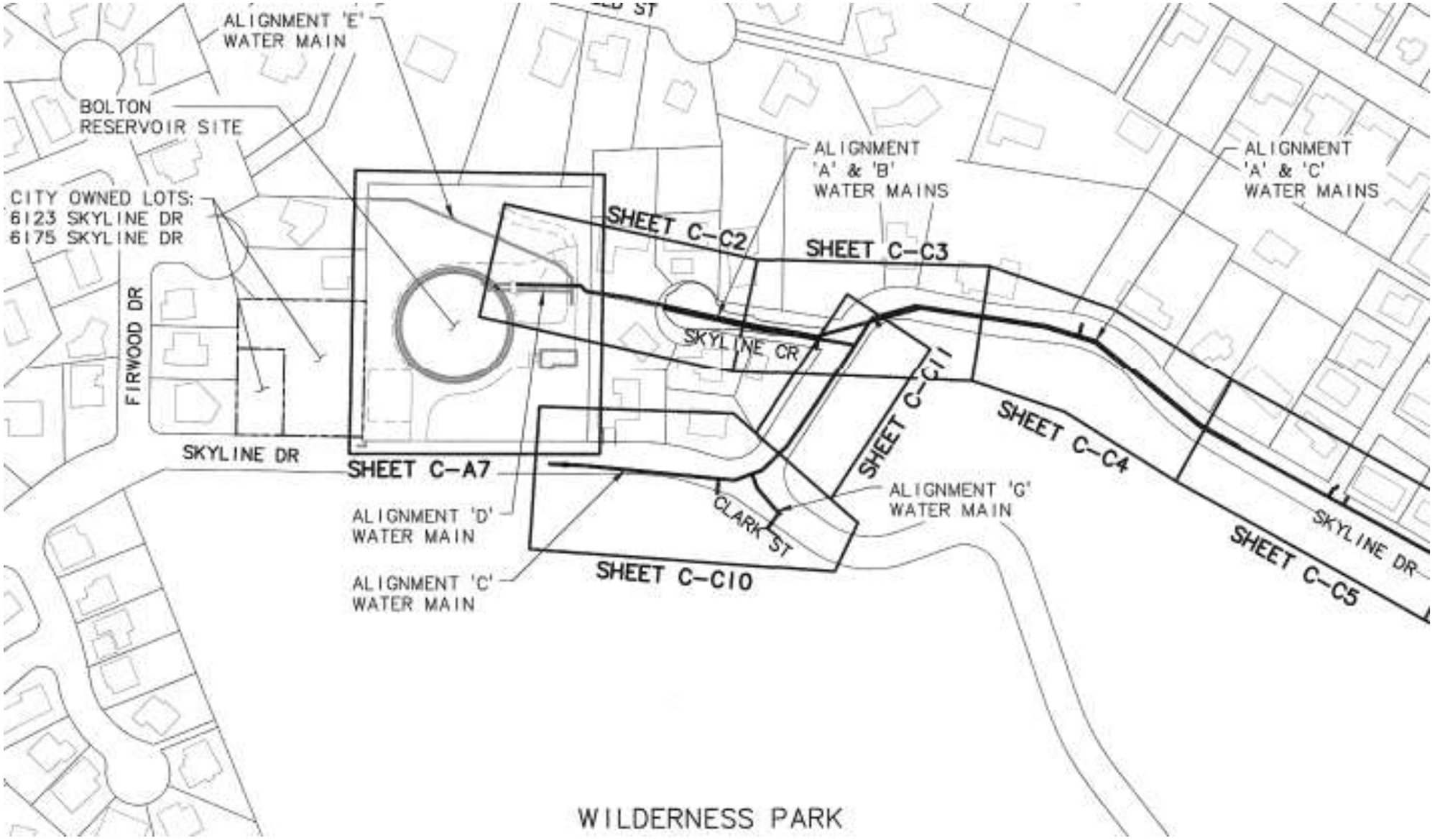
Improved slope stability



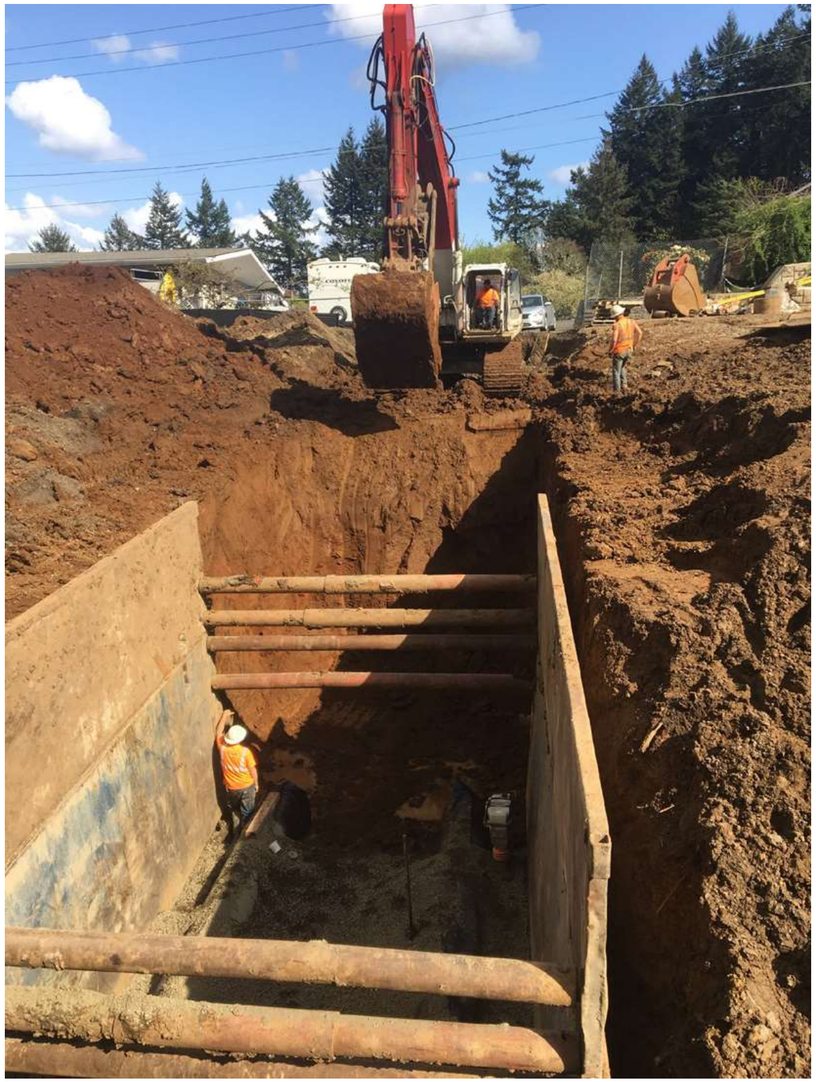
Foundation improvements

Vibration monitoring & pre/post surveys

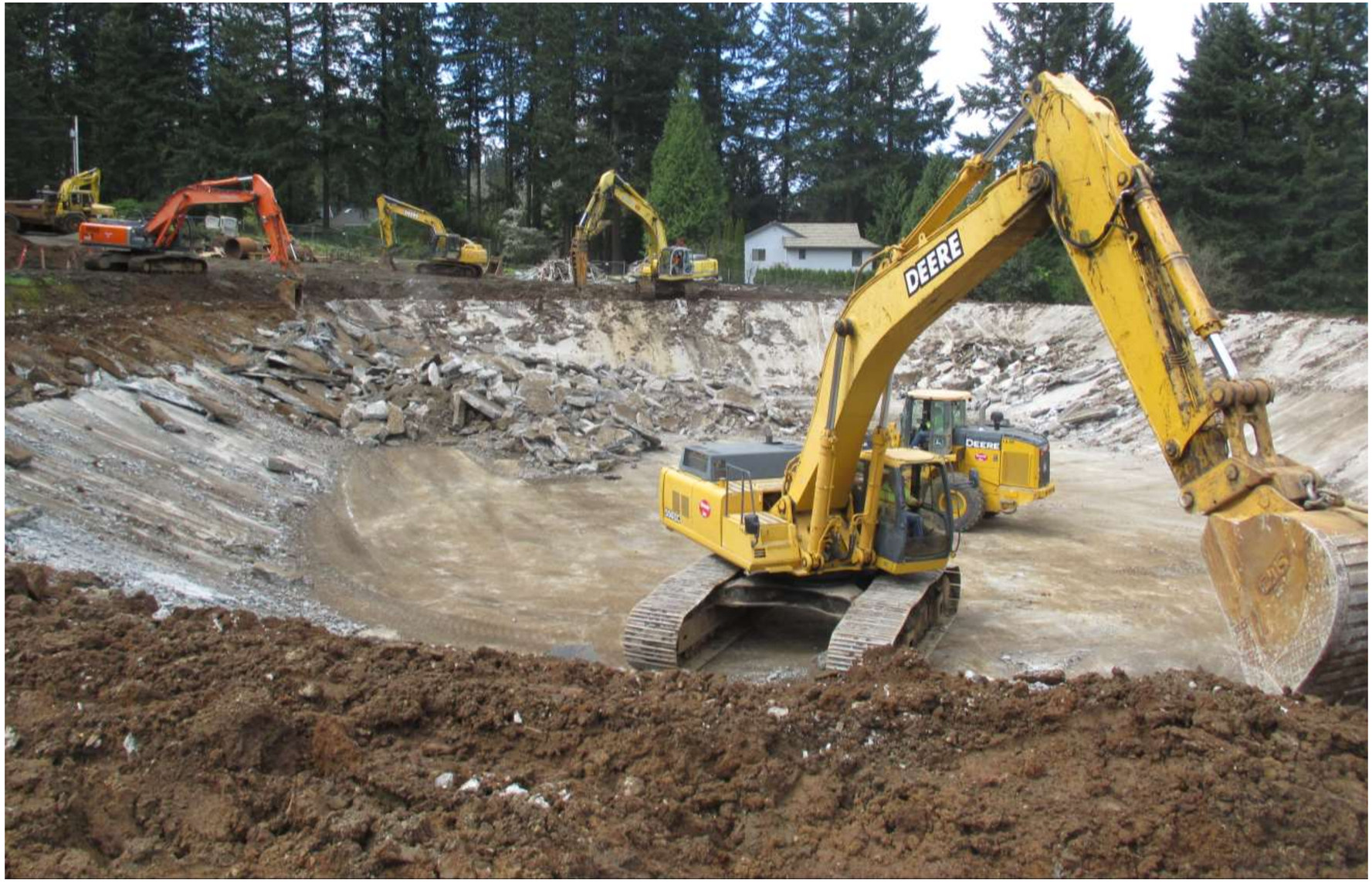
Sequencing


ALIGNMENT 'E'
WATER MAIN
BOLTON
RESERVOIR SITE
CITY OWNED LOTS:
6123 SKYLINE DR
6175 SKYLINE DR
FIRWOOD DR
SKYLINE DR
SHEET C-A7
ALIGNMENT 'D'
WATER MAIN
ALIGNMENT 'C'
WATER MAIN
SHEET C-C2
SHEET C-C3
ALIGNMENT
'A' & 'B'
WATER MAINS
ALIGNMENT
'A' & 'C'
WATER MAINS
SKYLINE CR
SHEET C-C11
SHEET C-C4
SHEET C-C10
CLARK ST
ALIGNMENT 'G'
WATER MAIN
SKYLINE DR
SHEET C-C5
WILDERNESS PARK

Deep pipe considerations



100-year-old concrete



Tideflex hydraulic mixing system

Traditional drainable-frame access hatches

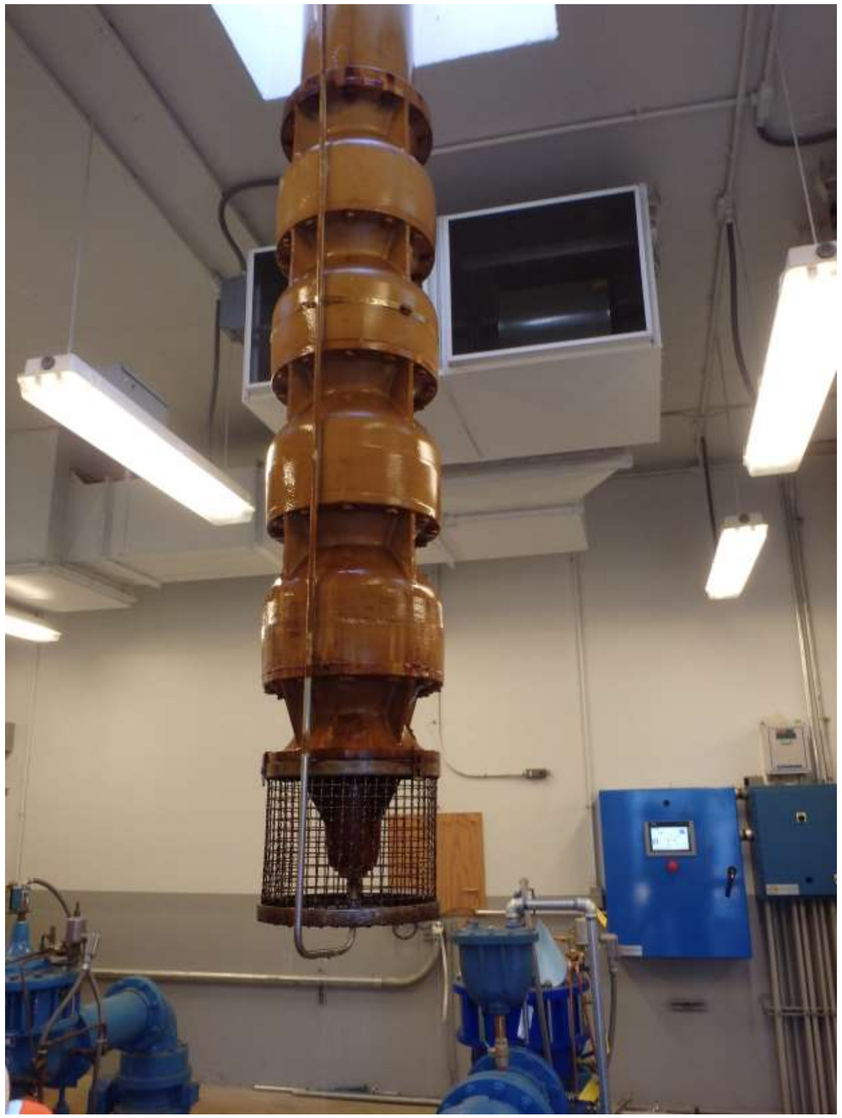
New “shoe box lid” access hatches

Excavation and access

Associated Improvements

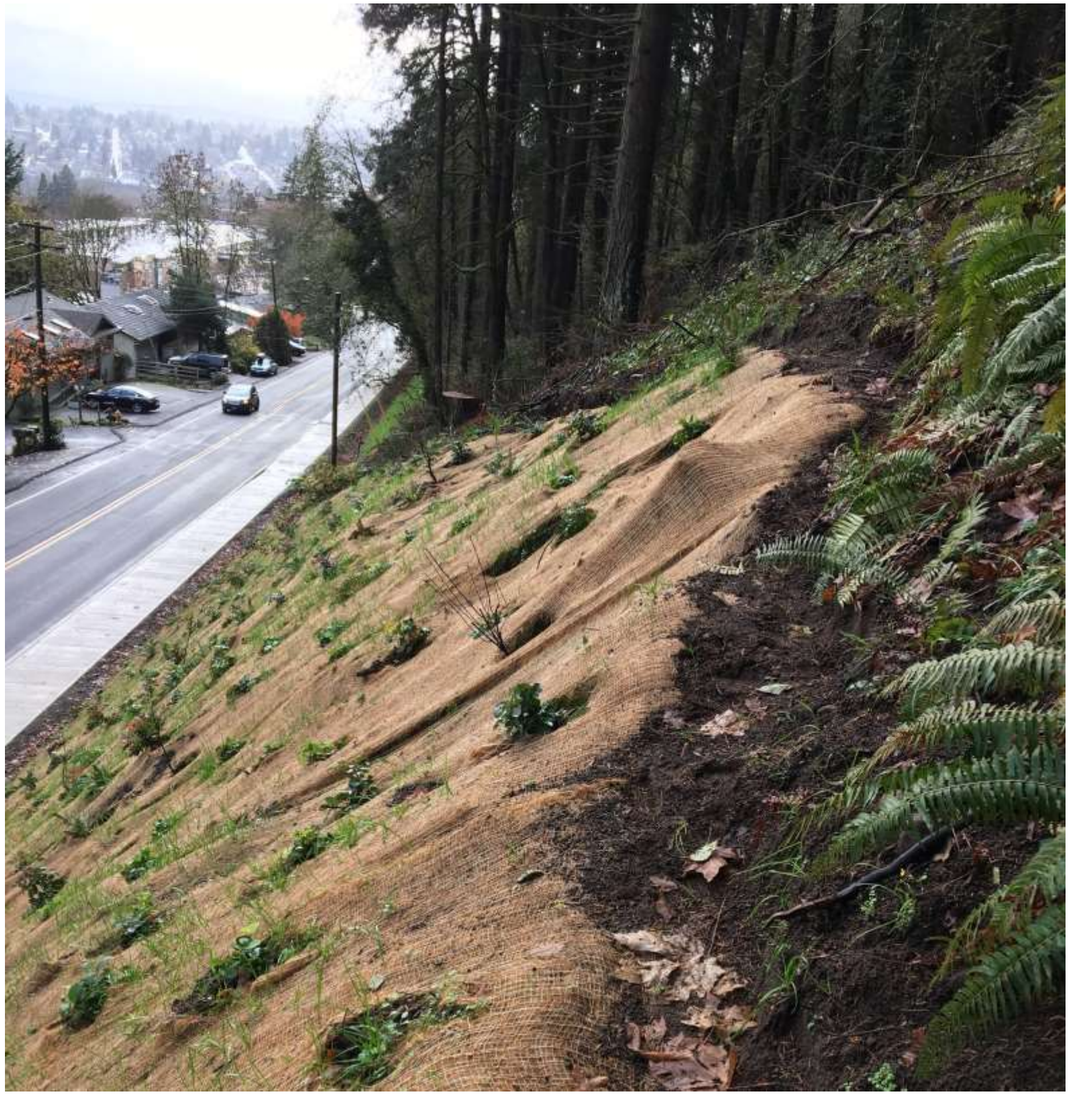
Pump improvements

Pump relocation and new pump



Multimodal improvements

Skyline drive slope improvements



Pump station roof replacement

Finished roof

Careful orchestra

Q&A

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Thank you!