PFAS Evaluation & Well 13 Treatment

Project Update

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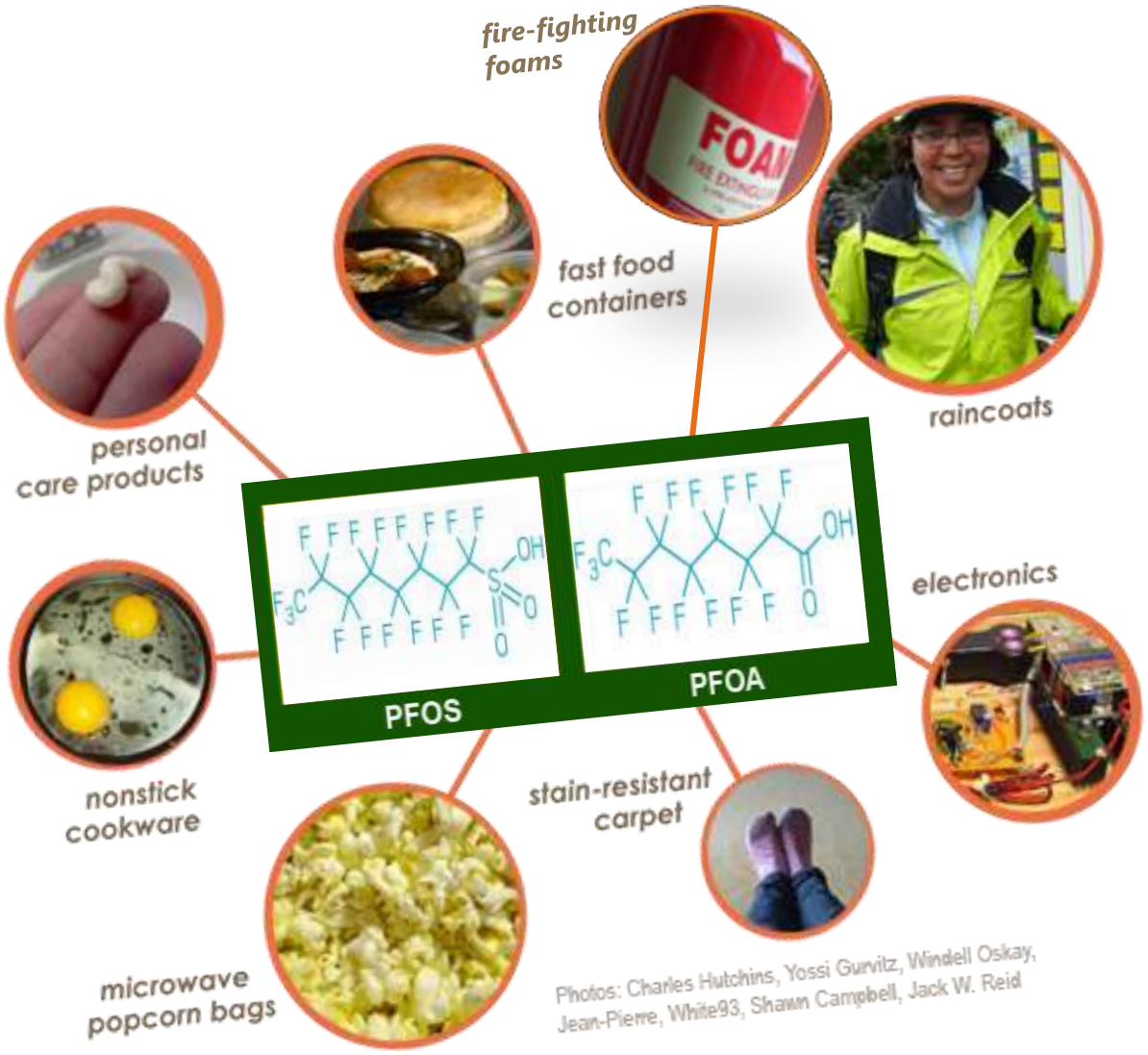
Goals

- Share updates on the City's PFAS response and design project at Well 13.
- Answer questions about the project.

Project Context

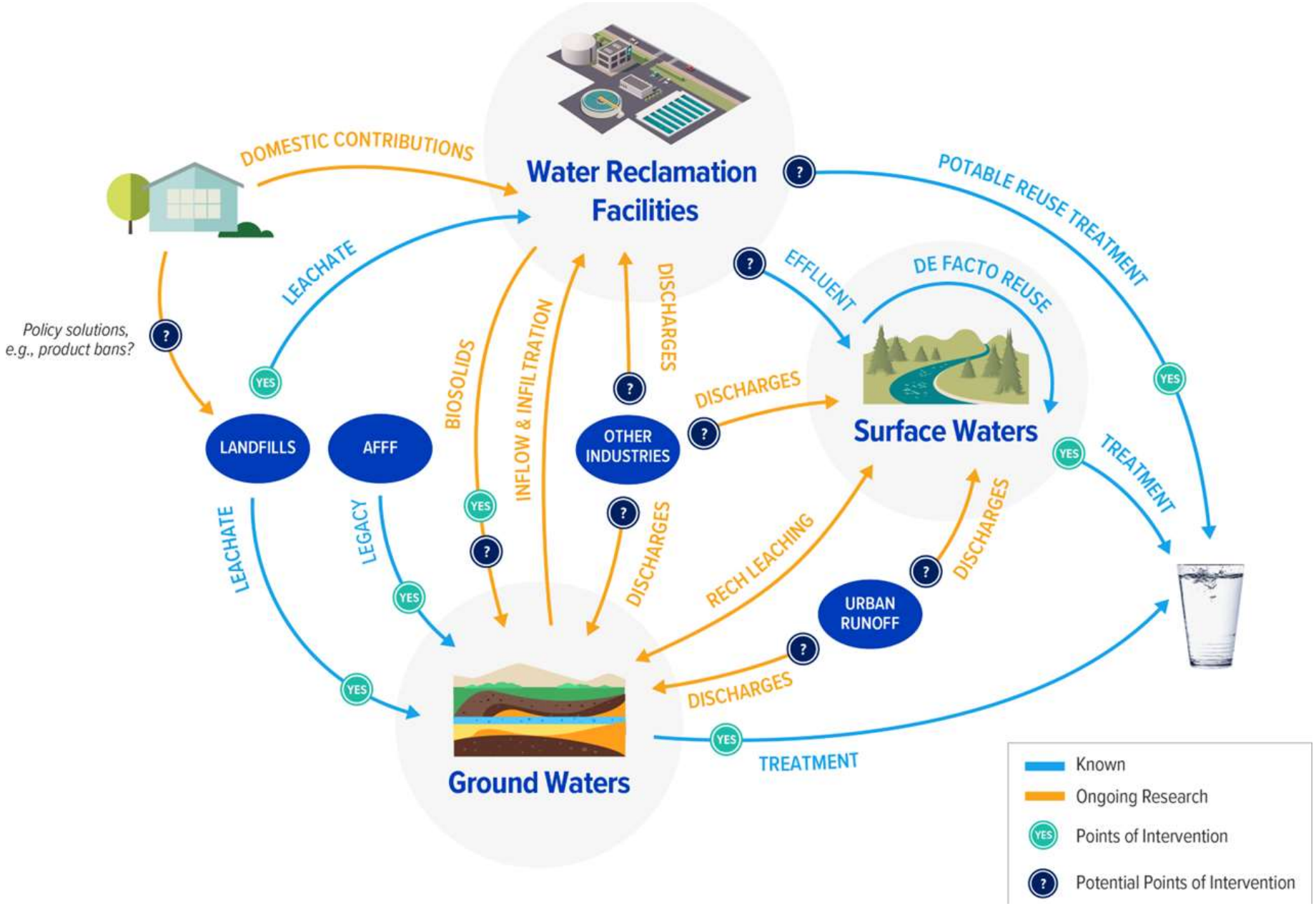
Per- and Polyfluoroalkyl Substances (PFAS) are fluorinated chemicals with many uses and unique properties.



Unique Properties

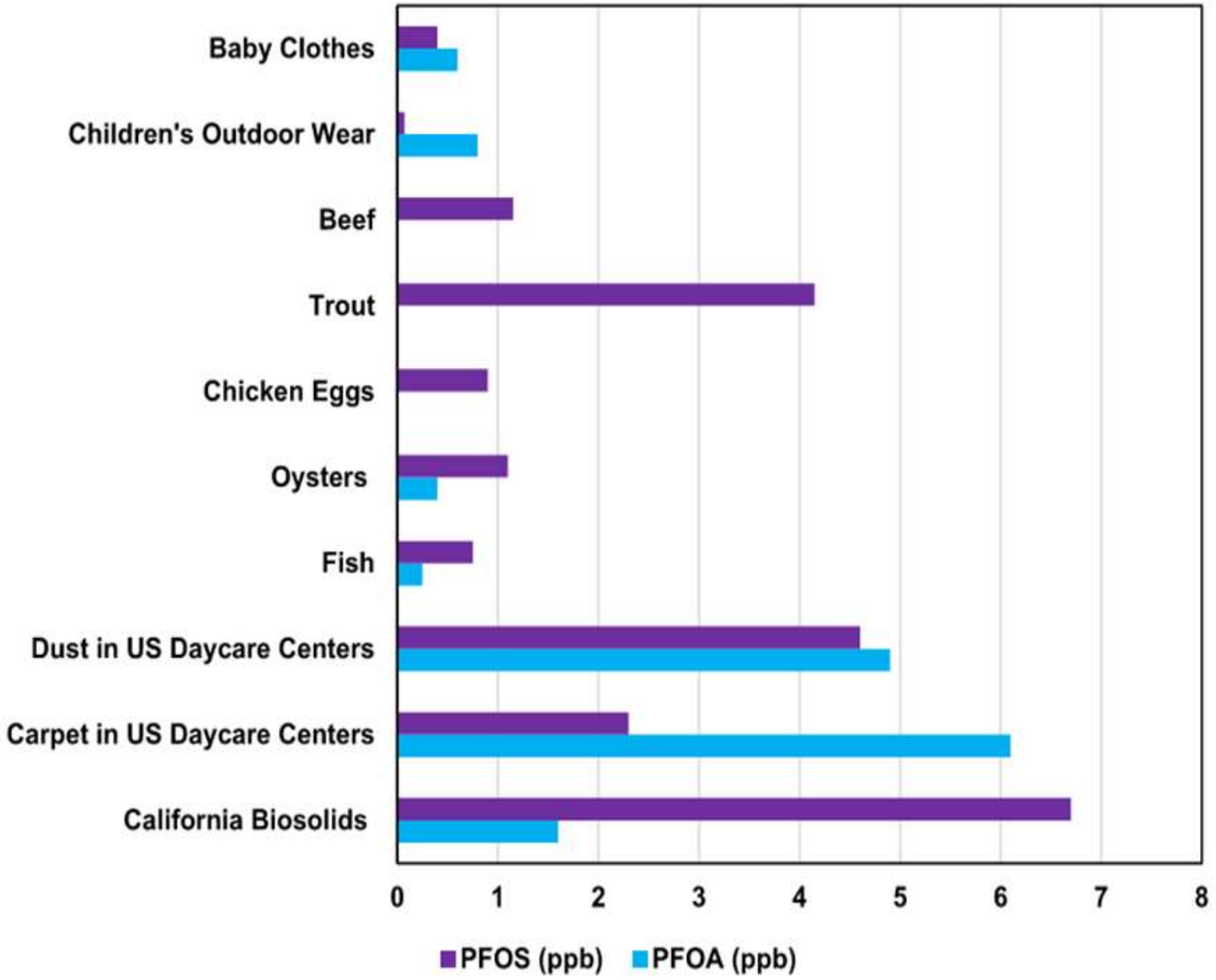
- Stain repellant
- Flame resistant
- Non-stick
- Water resistant
- Good for coatings

PFAS are moving throughout the water cycle.

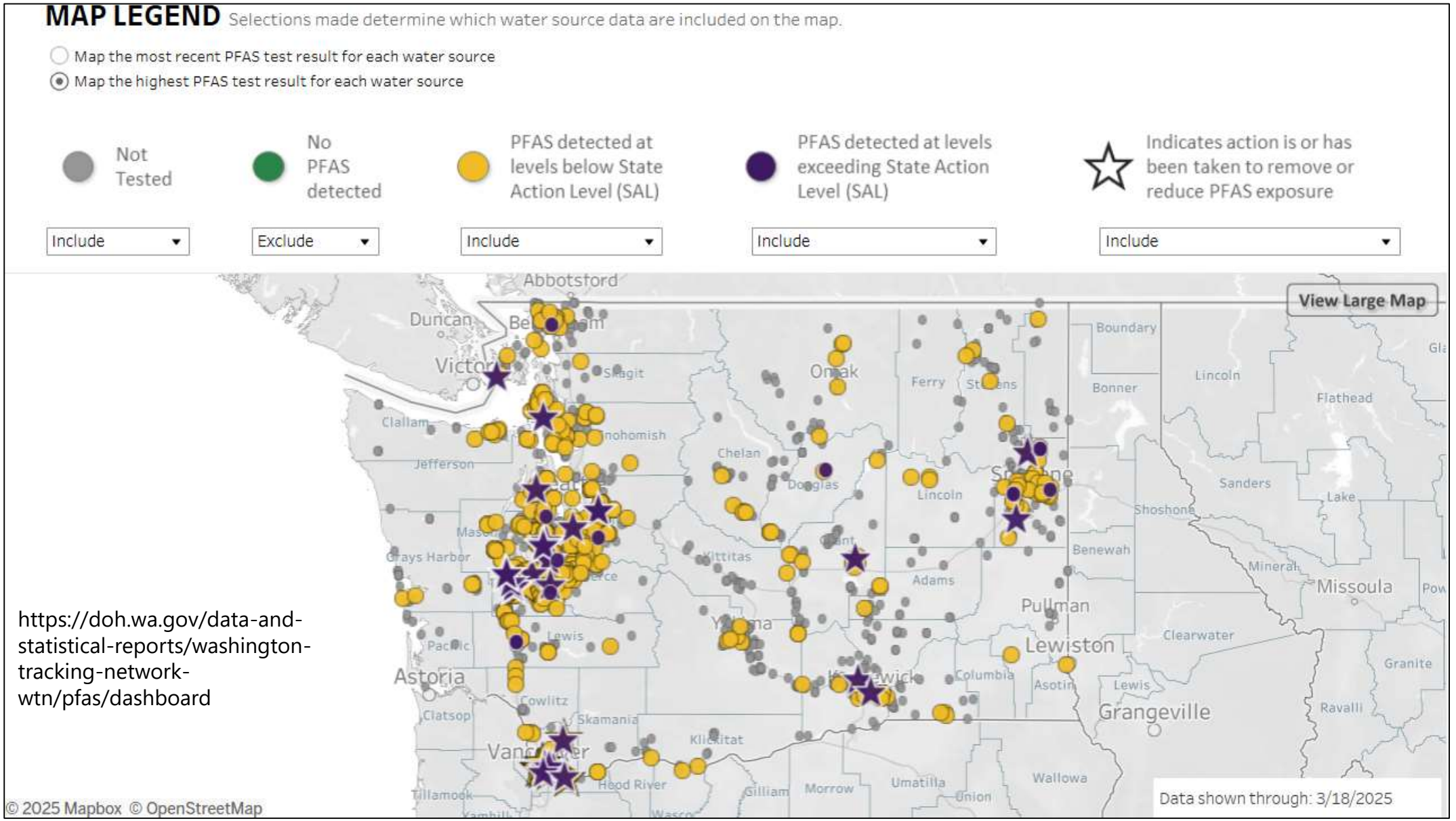


PFAS have many known health effects.

PFAS are present in everyday items.



Many WA towns will be mitigating PFAS in their water supplies.



https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/pfas/dashboard

National Primary Drinking Water Regulation (NPDWR) **finalized** for 6 PFAS on April 10th, 2024

Compound(s)	Final MCL
PFOA	4.0 ng/L
PFOS	4.0 ng/L
PFHxS	10 ng/L
PFNA	10 ng/L
HFPO-DA (aka GenX)	10 ng/L
Hazard Index (HI) for mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless)

PFAS are contaminants of ~~emerging~~ emerged concern

2024 Rule Finalization

2027 Complete Monitoring

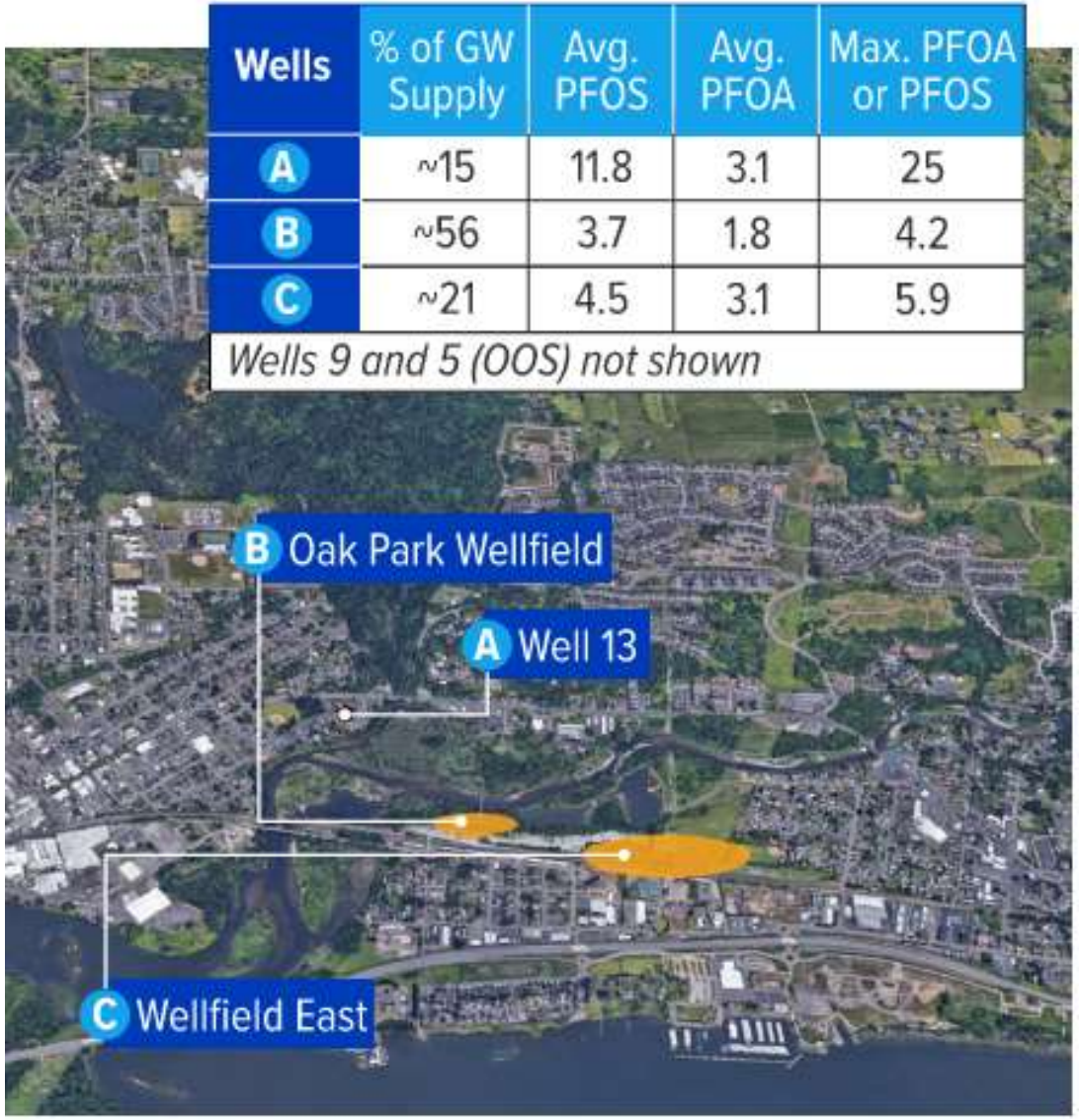
2029 Install Treatment

Project Objectives

Objective No. 1:
Quickly develop Near-Term Treatment Plan at Well 13 to Reduce the Presence of PFAS below the State Action Levels/ National MCLs.

Objective No. 2:
Thoughtfully Develop Long-term Mitigation Plan.

Objective No. 3:
Secure and Maintain Key Stakeholder Support.



Project Approach

- Advance design of PFAS treatment at Well 13.
  - Design Report, 60%, 90%, Final Engineering
  - Permitting

- Develop a risk assessment and plan for system-wide mitigation.
  - Hydrogeological efforts
  - Site master planning
  - Alternatives screening

Project Timeline

Early Design Efforts
WQ & PFAS sampling; Site survey; Geotech.

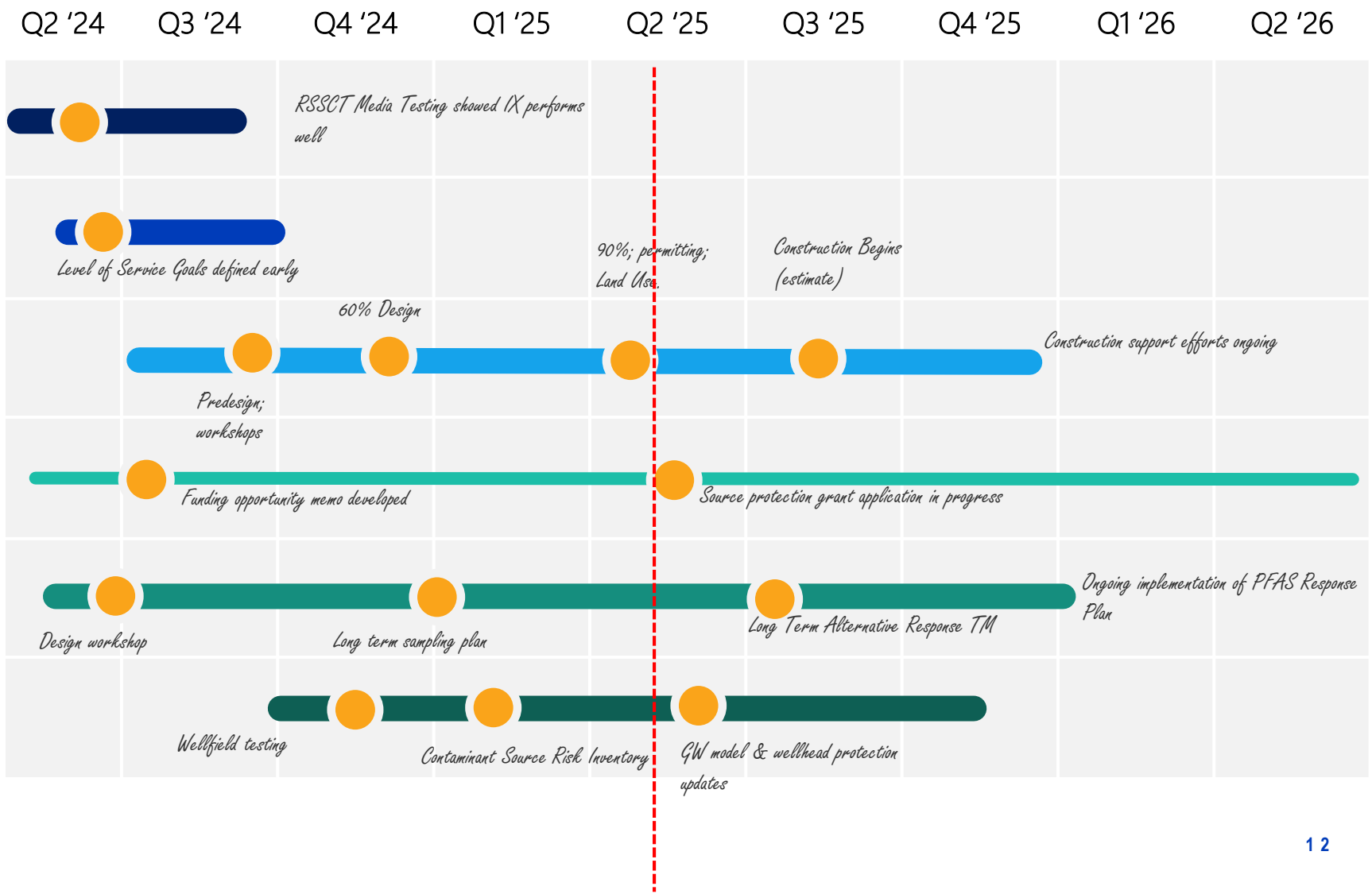
Site Utilization Efforts
Site Utilization workshop; future planning
Well 13 site, Oak Park evaluations

Well 13 Design Efforts
Pre-design, workshops

Ongoing Support
Near-term operations support; funding opportunity tracking, etc.

System-Wide Response Plan
Future System Evaluation

Groundwater Model Updates
Final Report and Digital Master Plan



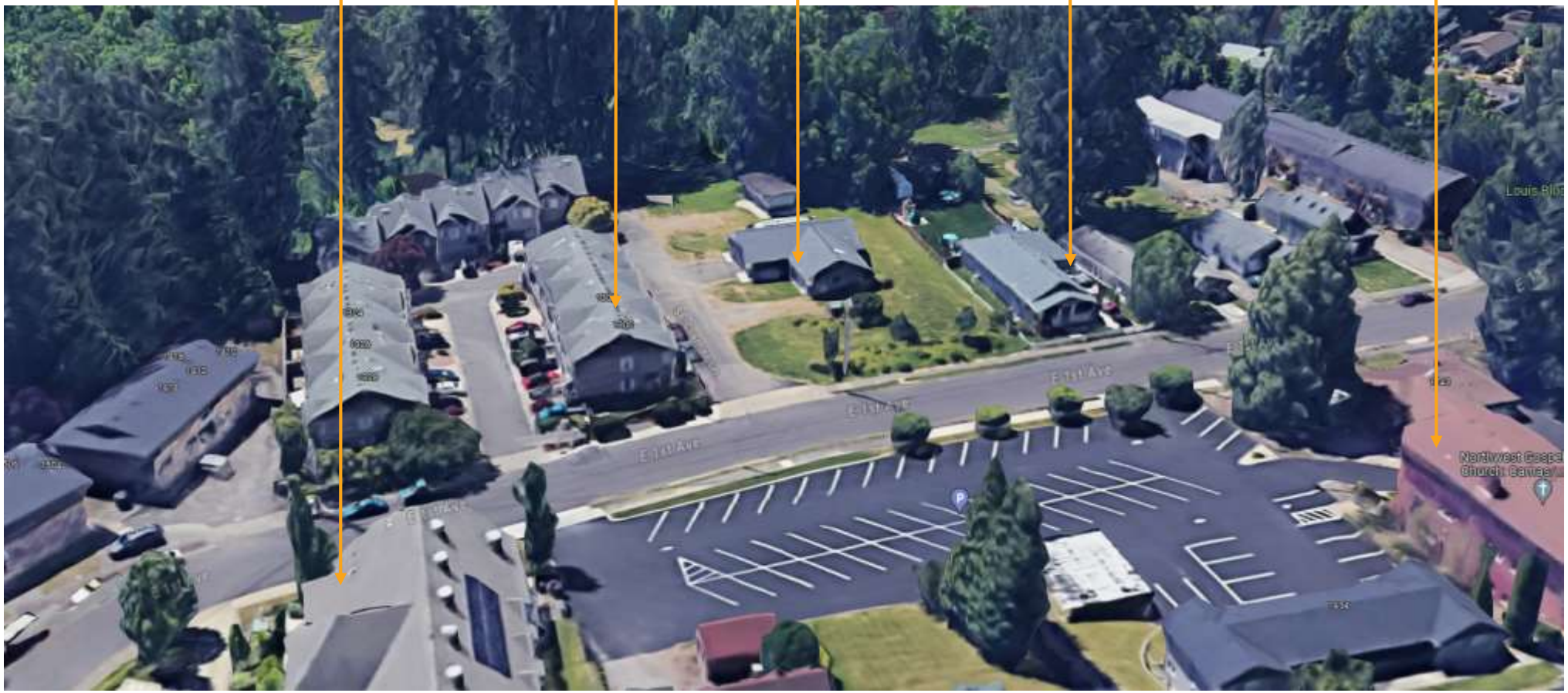
Well 13 Design Principles

- Water production from the Well 13 site should be maximized.
  - I.e., it must not lose capacity as a result of headloss induced by adding PFAS treatment.
  - Investments should be made to maintain existing Well 13 capacity.

- Additional capacity should be planned for and developed at the Well 13 site.
  - Recently obtained approval from DOH for development of additional well.

- Once PFAS treatment and additional capacity is installed, Well 13 will be operated as continuously as feasible.
  - Currently operated seasonally.

Well 13 Design Principles



PFAS Treatment 101

EPA Best Available Treatment Technologies

Granular Activated Carbon

Ion Exchange

Reverse Osmosis

Selection is More Than Technology.

- Space & access limitations
- Neighborhood impacts
- Permitting
- Geotechnical/ structural considerations

Site

- Sediment
- Fouling agents (bio, metals,…)
- Competing parameters (TOC, TDS, sulfate, …)

Water

- Performance
- Finished WQ impacts
  - **<u>Corrosion Control Implications</u>**
- Residuals management
  - Backwash water handling
  - Infiltration/ sewer/ haul
- O&M requirements

Technology

Advantages and Disadvantages of PFAS Treatment

	Operational Complexity	Footprint	CAPEX	OPEX	Waste Stream
	✓✓	✓	–	? Depends on water quality	–
	✓	✓✓	–	? Depends on water quality	✓
	X	–	XX	X	X

The big unknown is in residuals and backwash handling: *Site-specific with an uncertain future*

- Landfill
- Incineration

Spent Media

Landfilling	Incineration
Subtitle D	**Municipal**
$50-$100 per ton	$200-$300 per ton
Subtitle C	**Hazardous**
$300-$500 per ton	>$1,200 per ton

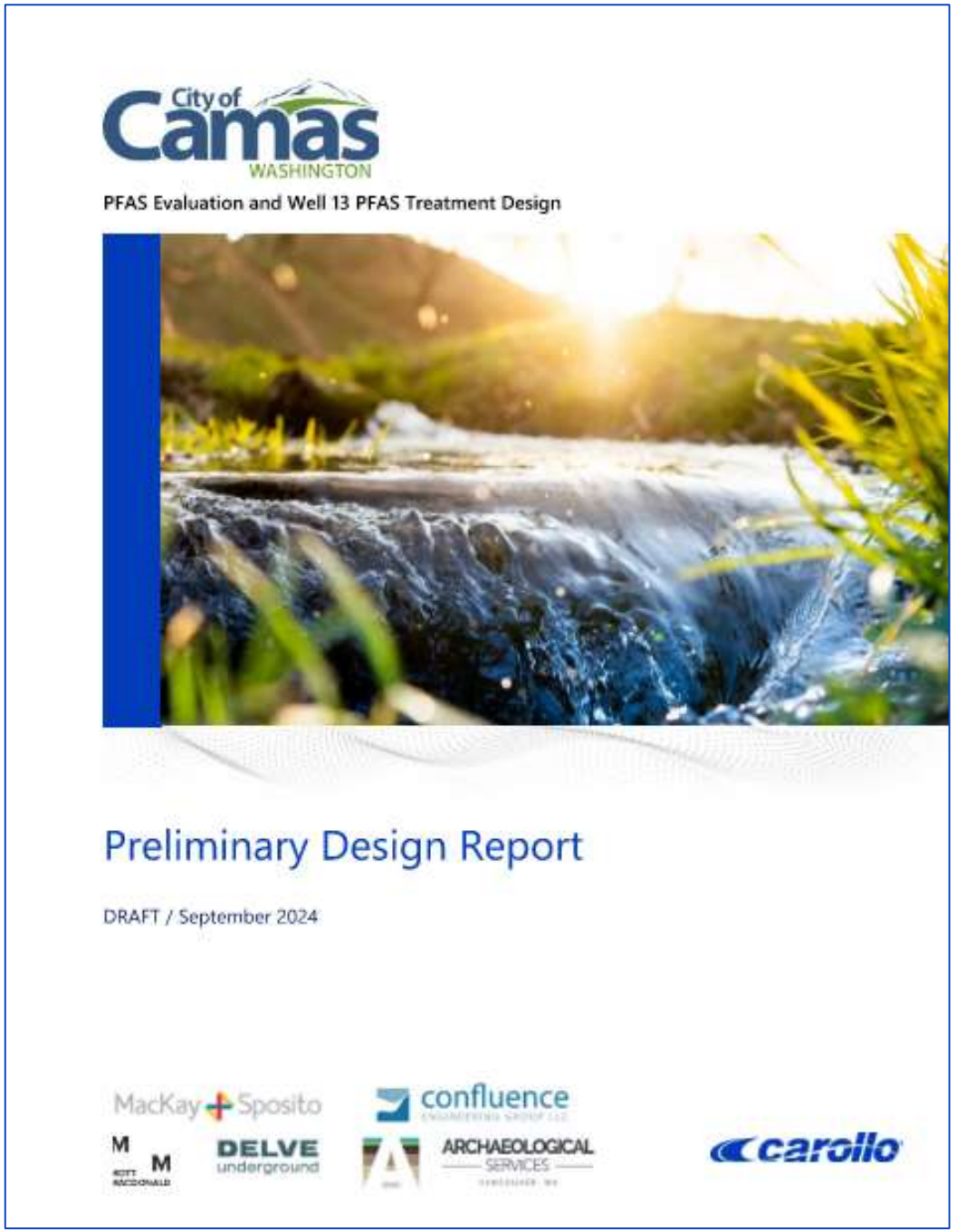
Regulatory Uncertainties

- ***NPDES:*** EPA likely to restrict PFAS discharges in NPDES permits
- ***CERCLA (Superfund):***
  If deemed hazardous under CERCLA
  Joint and several liability increases disposal costs
- ***RCRA:***
  If deemed hazardous under RCRA
  Wastes generated from PFAS treatment facilities to be sent to RCRA Subtitle C permitted treatment, storage, and disposal facilities (TSDF).

Well 13 Design Details

Pre-Design Report

- Report lists rationale for:
  - » Design flow.
  - » Media selection (Ion Exchange).
  - » Site layout (equipment locations, electrical building).
  - » Considerations for future buildout.



Rapid Small-Scale Column Testing (RSSCTs)

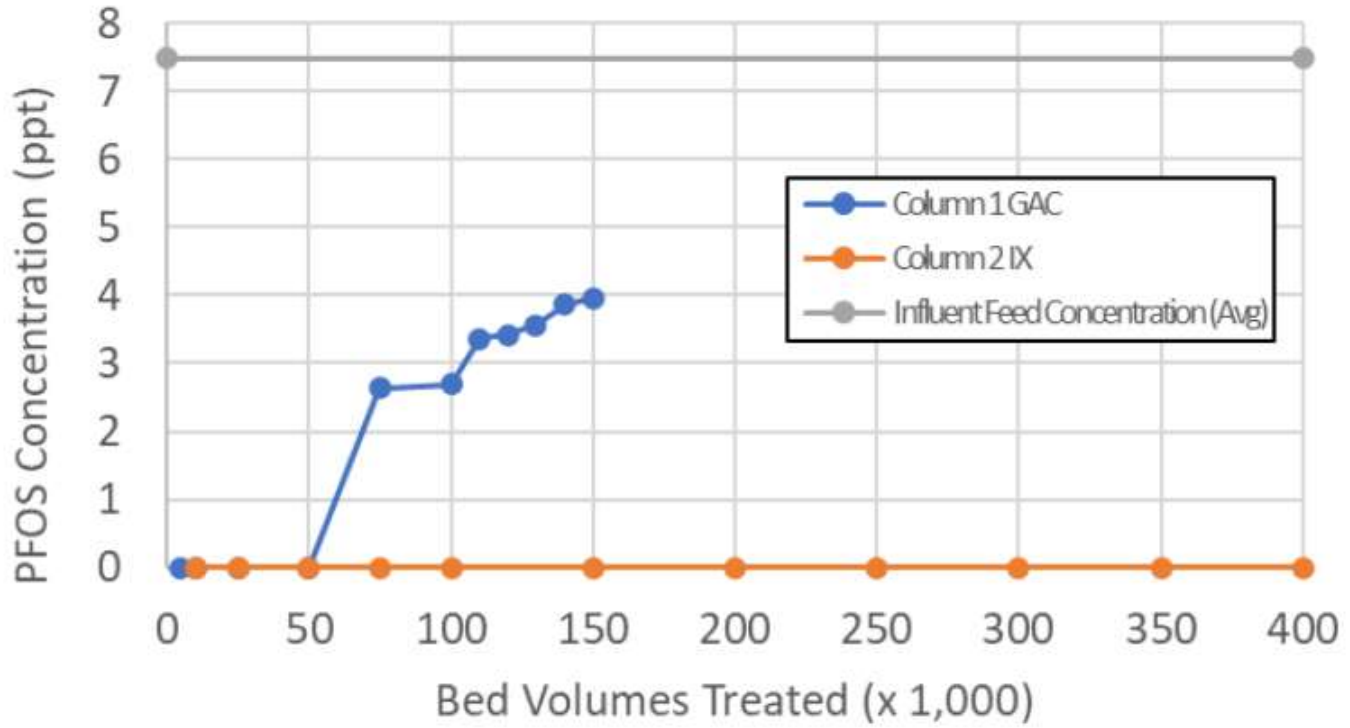
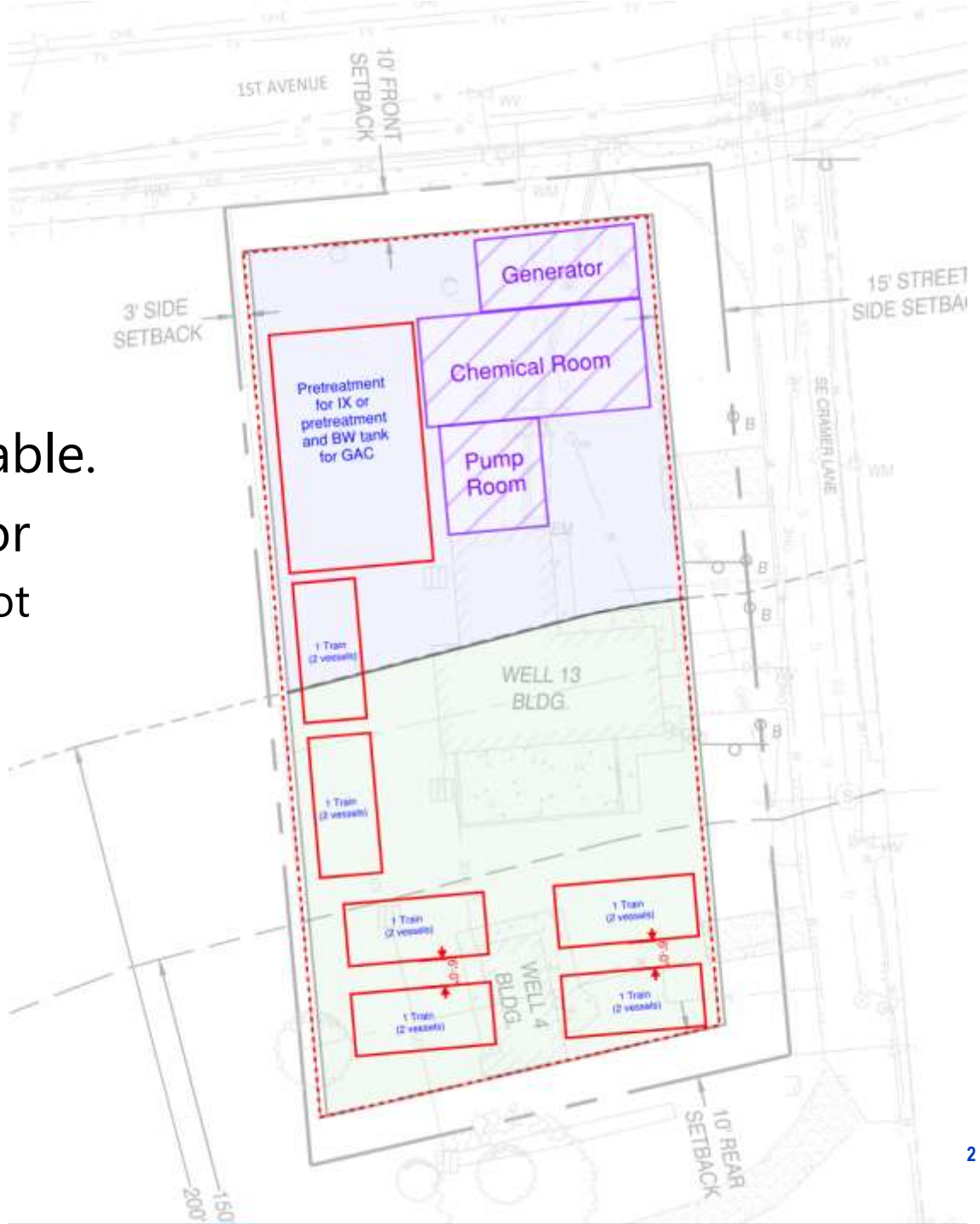


Figure 10 RSSCT Results – PFOS Breakthrough

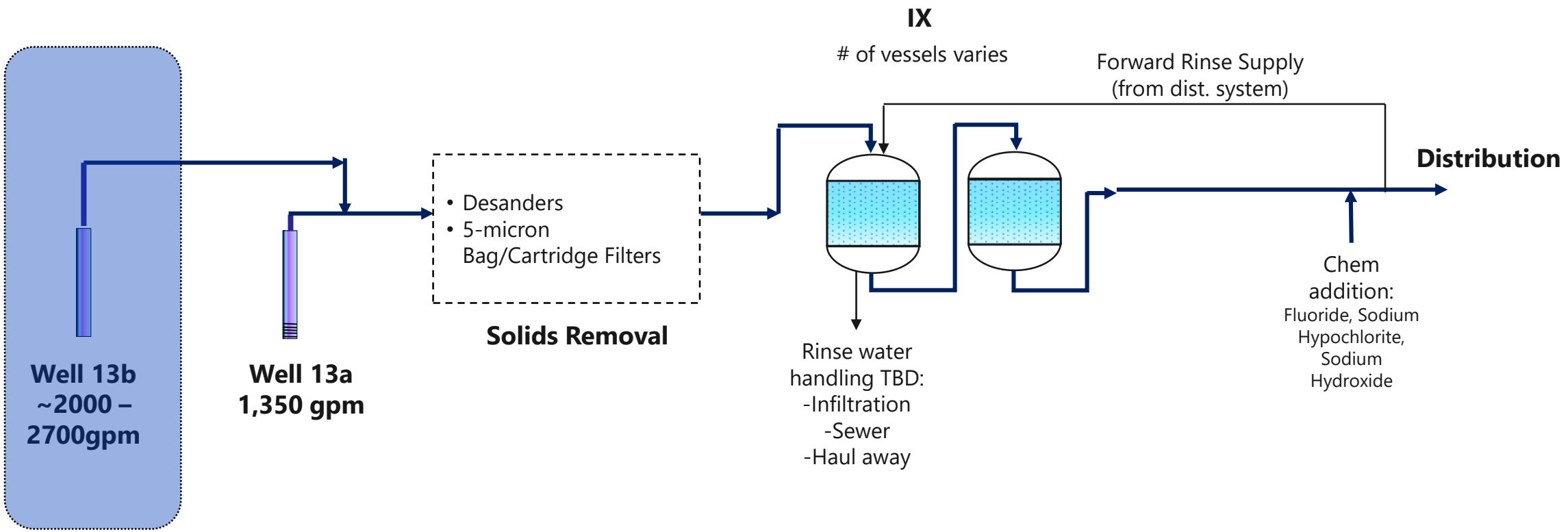
- Breakthrough of PFOS was seen in the GAC column after 75,000 bed volumes of water treated. With an EBCT of 7.4 minutes, this suggests approximately 1 year of runtime before an initial breakthrough of PFOS. PFOS breakthrough close to 4 ppt occurred after the equivalent of approximately two years of runtime. Replacement of media may conservatively occur at around the 1 year duration for GAC.
- No breakthrough was observed in the IX column after 400,000 bed volumes of water treated. With an EBCT of 2.8 minutes, this suggests approximately two years of runtime with no observed breakthrough of PFOS.

Future Buildout Constraints

- Space constraints:
  - » ~6 treatment trains max out space available.
  - » Need space for sediment removal and for potential future backwash tank (though not needed today for IX).
- IX treatment is more space-efficient.
  - 6 IX trains = limited by well yield.
  - 6 GAC trains = limited by treatment capacity.



Preliminary Process Flow for PFAS Treatment - IX



Design Efforts at Well 13 Ongoing

City of Camas
WASHINGTON

CITY OF CAMAS

CAMAS PFAS EVALUATION & WELL 13 TREATMENT

PRELIMINARY
MARCH 2025
VOLUME 1 OF 1

VICINITY MAP

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811
or
1-888-333-9882

LOCATION MAP

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M M MOTT MACDONALD · MacKay Sposito · confluence · DELVE underground · ARCHAEOLOGICAL SERVICES

AGENCY REVIEW SUBMITTAL
NOT FOR CONSTRUCTION

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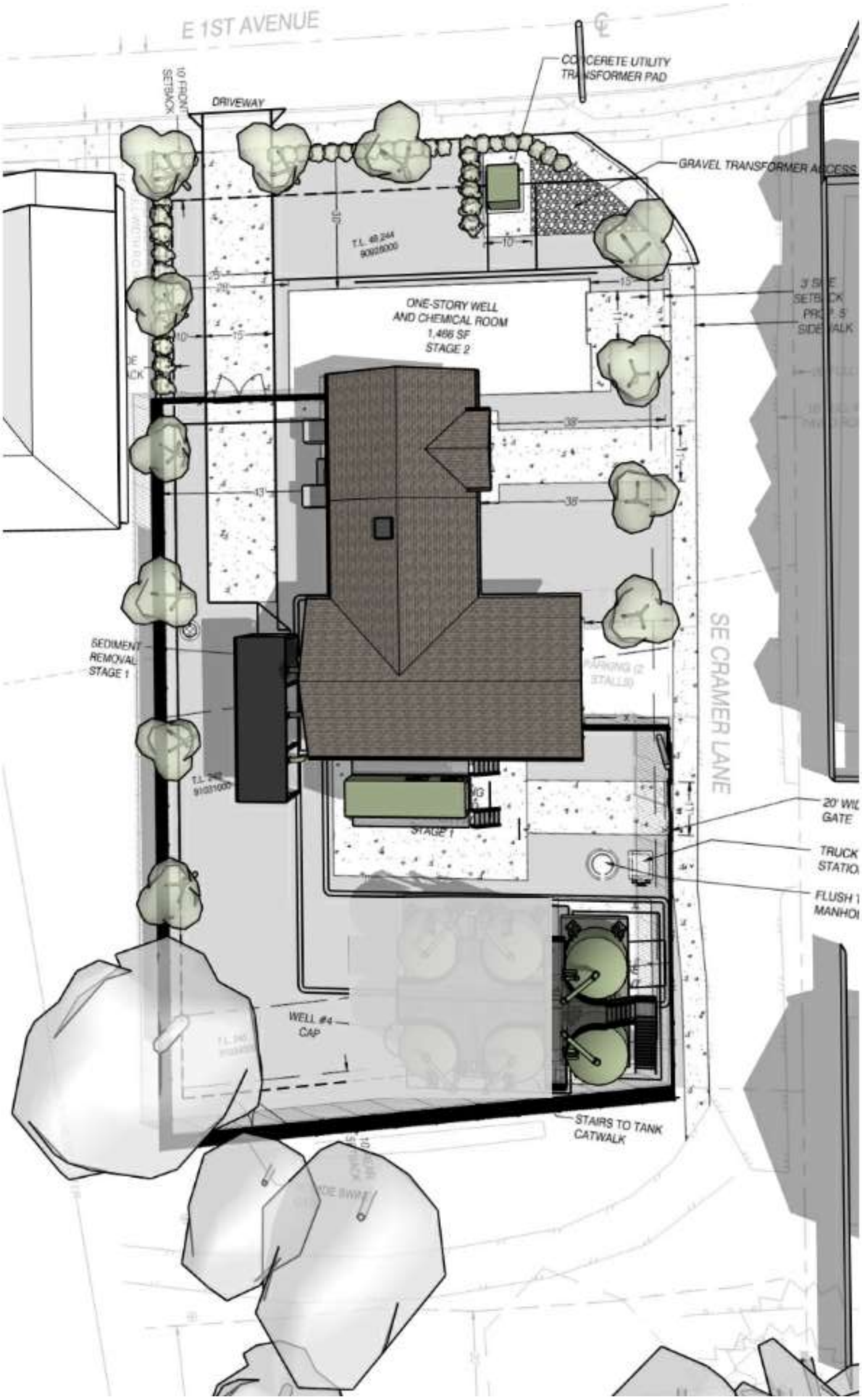
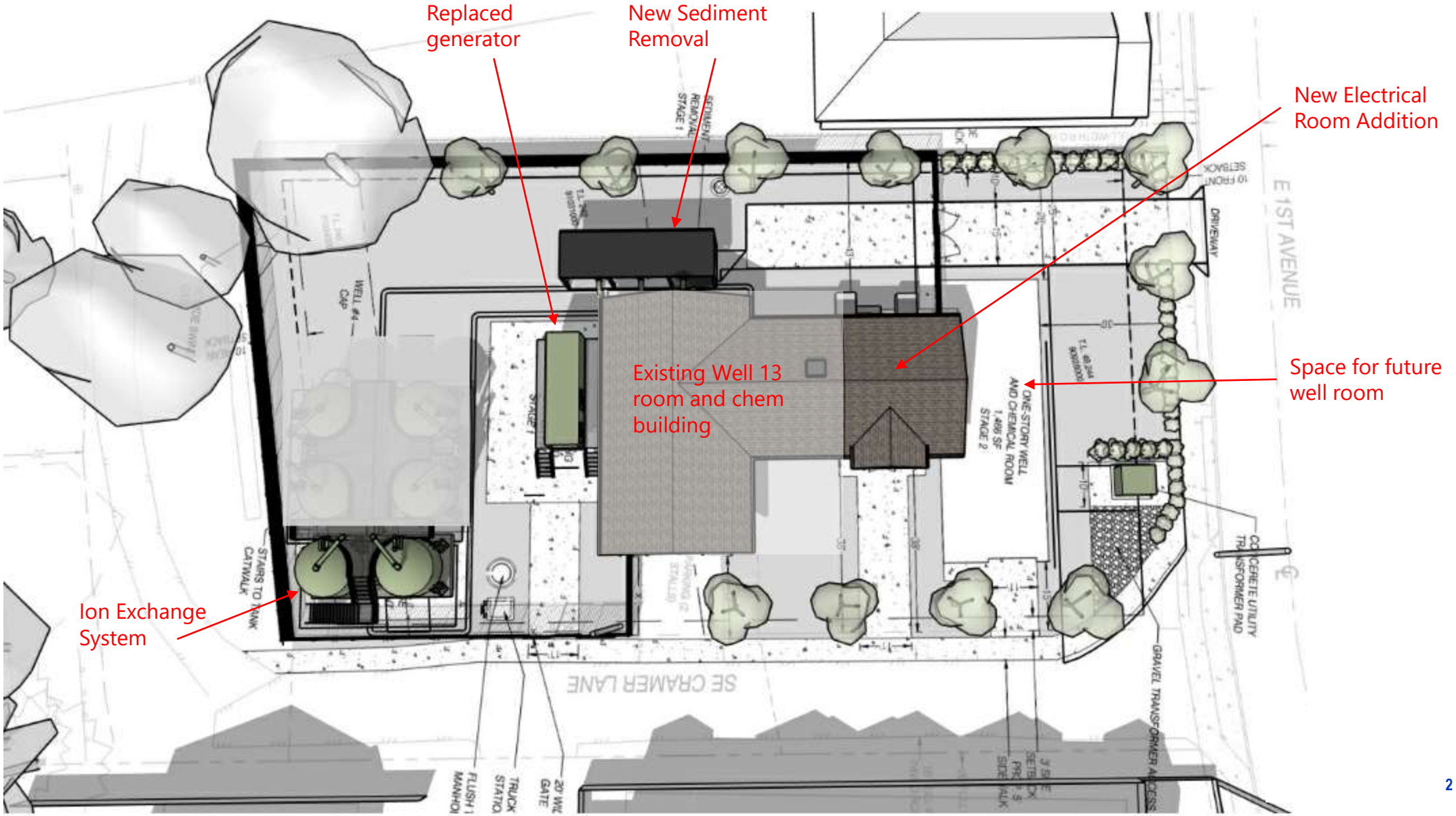
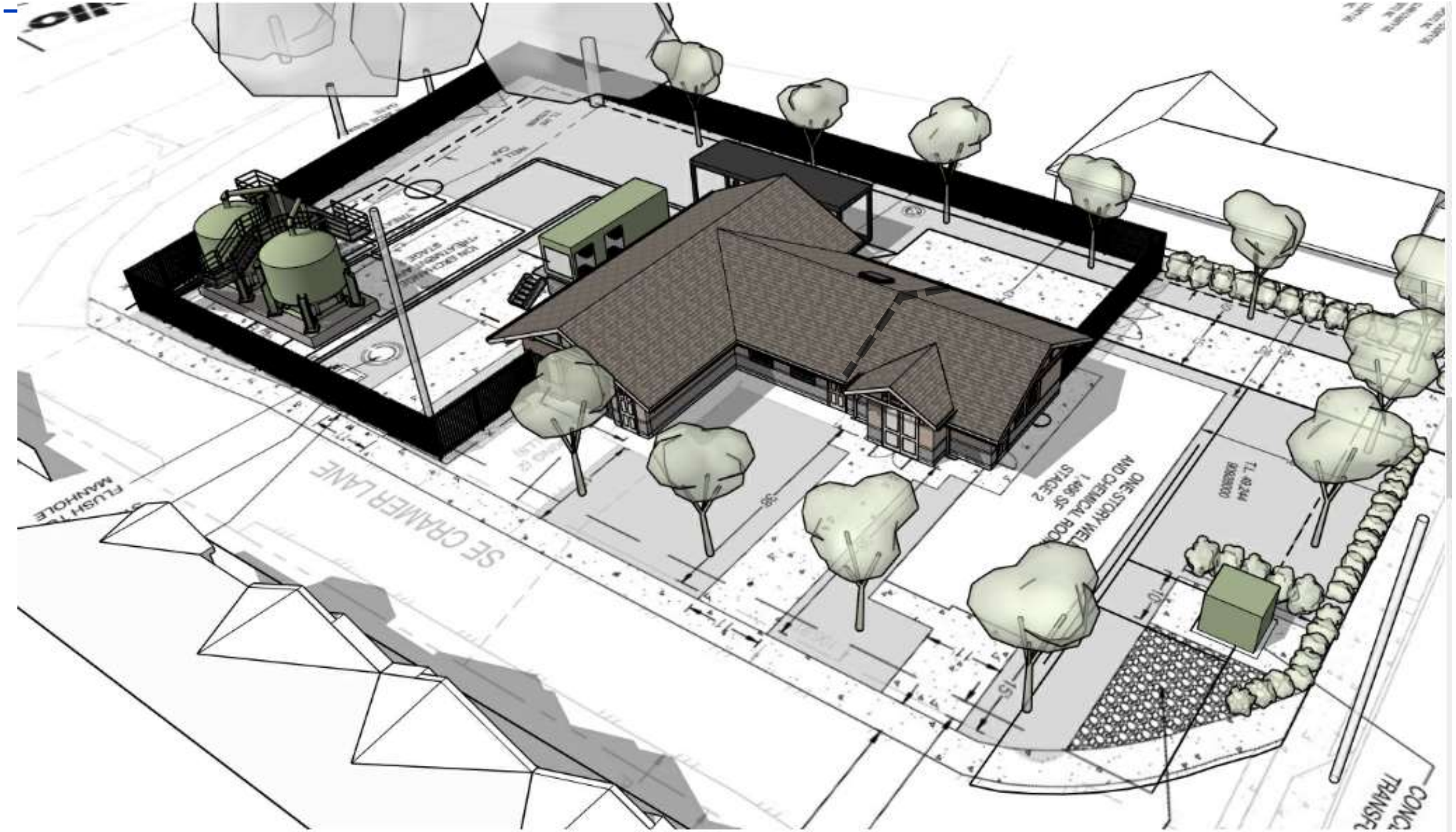
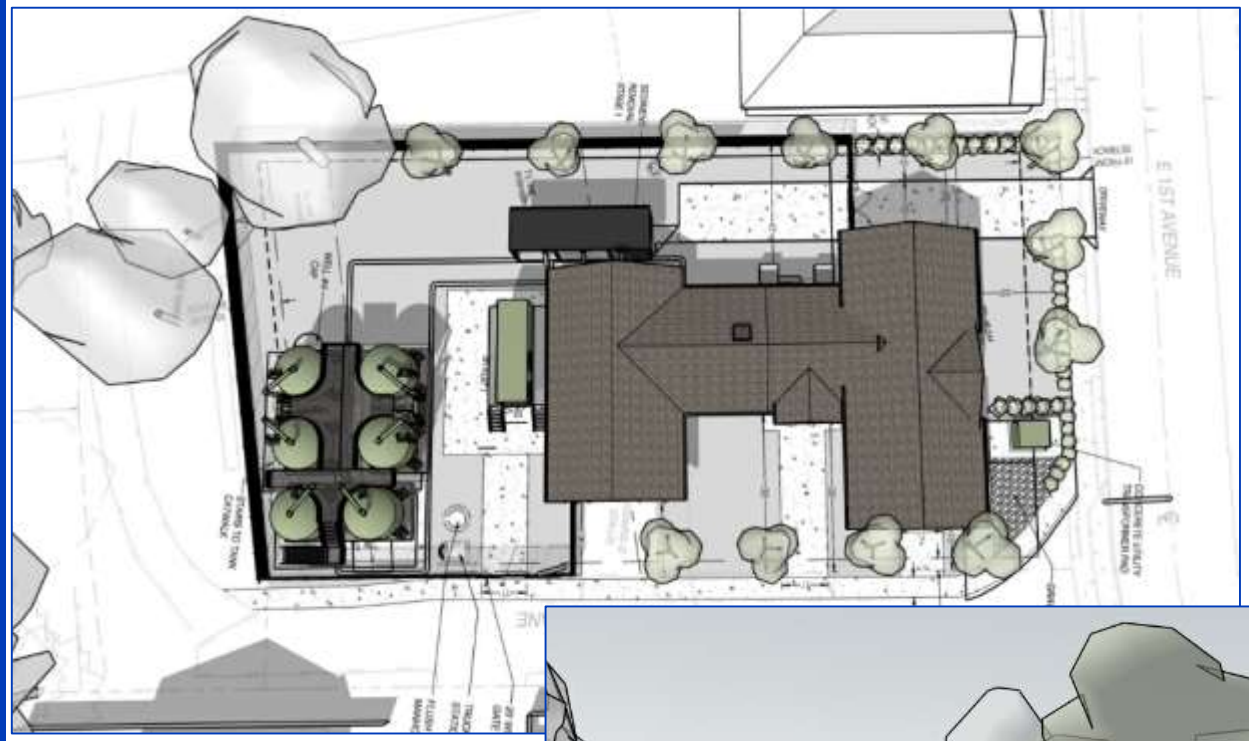

E 1ST AVENUE
CONCERETE UTILITY TRANSFORMER PAD
DRIVEWAY
GRAVEL TRANSFORMER ACCESS
ONE-STORY WELL AND CHEMICAL ROOM
1,466 SF
STAGE 2
SEDIMENT REMOVAL STAGE 1
STAGE 1
SE CRAMER LANE
WELL #4 CAP
STAIRS TO TANK CATWALK


Replaced generator
New Sediment Removal
New Electrical Room Addition
Existing Well 13 room and chem building
Space for future well room
Ion Exchange System
E 1ST AVENUE
SE CRAMER LANE
DRIVEWAY
ONE-STORY WELL AND CHEMICAL ROOM
1,486 SF
STAGE 2
STAIRS TO TANK CATWALK
WELL #4
Cap
GRAVEL TRANSFORMER ACCESS
CONCRETE UTILITY TRANSFORMER PAD


SE CRAMER LANE
FLUSH TO
MANHOLE
ONE-STORY WEL
AND CHEMICAL ROO
1,488 SF
STAGE 2


GRAVEL TRANSFORMED

What the Future Holds:



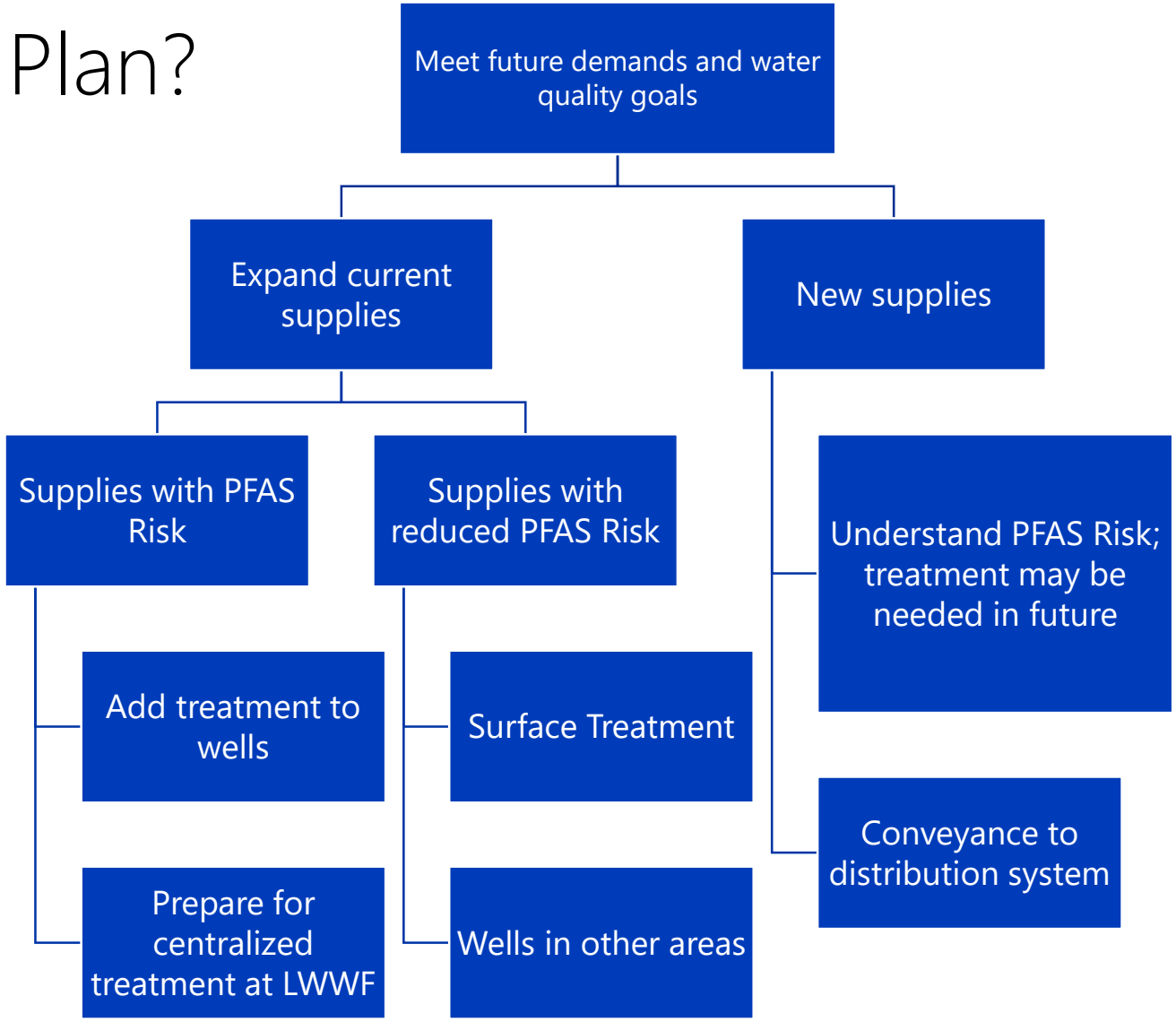
Why Develop a Long-Term Plan?

Objective No. 1:
Quickly develop Near-Term Treatment Plan at Well 13 to Reduce the Presence of PFAS below the State Action Levels.

Objective No. 2:
Thoughtfully Develop Long-term Mitigation Plan.

Objective No. 3:
Secure and Maintain Key Stakeholder Support.

LOS Objective:
Evaluate a high-level strategy for Well 13 to minimize risk of stranded investments and ensure alliance with a long-term PFAS mitigation strategy.



Long-Term Plan

- Align efforts from the Water System Plan update, GW modelling updates, and PFAS sampling to develop alternatives that provide a PFAS-mitigated supply to meet future system demands and WQ goals.
- Use the goals of the Strategic Plan, specifically Stewardship of City Assets, to guide the City's plan to manage PFAS in its water supply and provide safe, clean drinking water to its customers

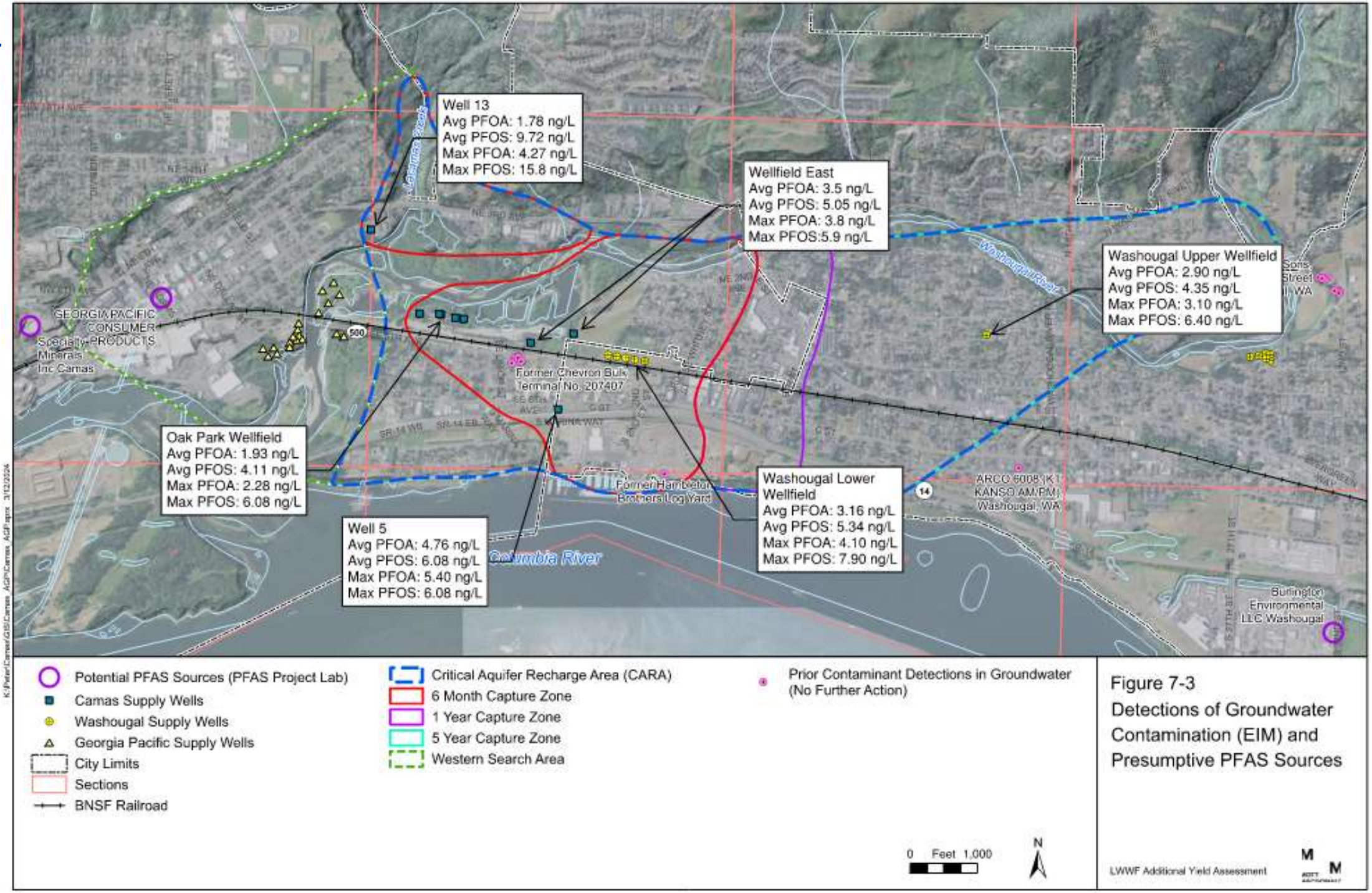


Figure 7-3
Detections of Groundwater Contamination (EIM) and Presumptive PFAS Sources

– PFAS Implementation Schedule

Grouping	Source	PFAS Levels Above MCL?*	2025	2026	2027 (MCL monitoring begins)	2028	2029 (MCL enforcement begins)
Independent	Well 5	**Yes**					
Independent	Well 9	**No**					
Independent	Well 13	**Yes**	Design/ Const.	Construction	Const./ Commissioning		
Oak Park	Well 7	**No**					
	Well 8	**No**					
	Well 10	**No**					
	Well 11	**No***					
	Well 12	**No**					
Wellfield East	Well 6	**Possibly***		Design	Construction	Const./ Commissioning	
	Well 14	**Possibly***		Design	Construction	Const./ Commissioning	
New Well in LWWF?		**Unknown**		Design	Construction	Const./ Commissioning	

*Note the EPA MCLs (max. contaminant levels) are calculated on a running annual average basis. Some wells (such as Well 11) have recorded PFAS levels above 4ppt but sampling suggests it would be below the MCL assuming PFAS levels in the groundwater do not increase. Wells 6 and 14 have shown levels above 4ppt, but continued sampling efforts will confirm the need for treatment.

Long term plan will evaluate opportunities to increase supply and mitigate PFAS.

- Opportunities to increase yield from exiting wells.
  - Oak Park wellfield.
- New Wells.
  - Approval for new well at Well 13 site.
  - Other sites to be investigated.
- Treatment only where necessary.
  - Treatment at wells above MCLs.
  - Consolidated treatment where applicable.

What does the Future Hold?

- Ongoing class action lawsuits.
- More guidance from EPA/ others on media disposal.
- PFAS in wastewater and biosolids generating attention through state actions.
- Advancements in PFAS removal and destruction technology.
- Class Action Lawsuit Settlements

Questions?