



PFAS vs. Lead and Copper Rule Compliance

Beth Mende, PE
Pierre Kwan, PE



Agenda

- 01** Project Background
- 02** Water System Challenges
- 03** Water System Improvements
- 04** Current Project Status and Next Steps



01

Project Background



Gilman Well
Nos. 4 and 5

Rison Well Nos.
1 and 2

Groundwater Wells

- Primary supply is four groundwater wells
- Augmented with purchased regional surface water

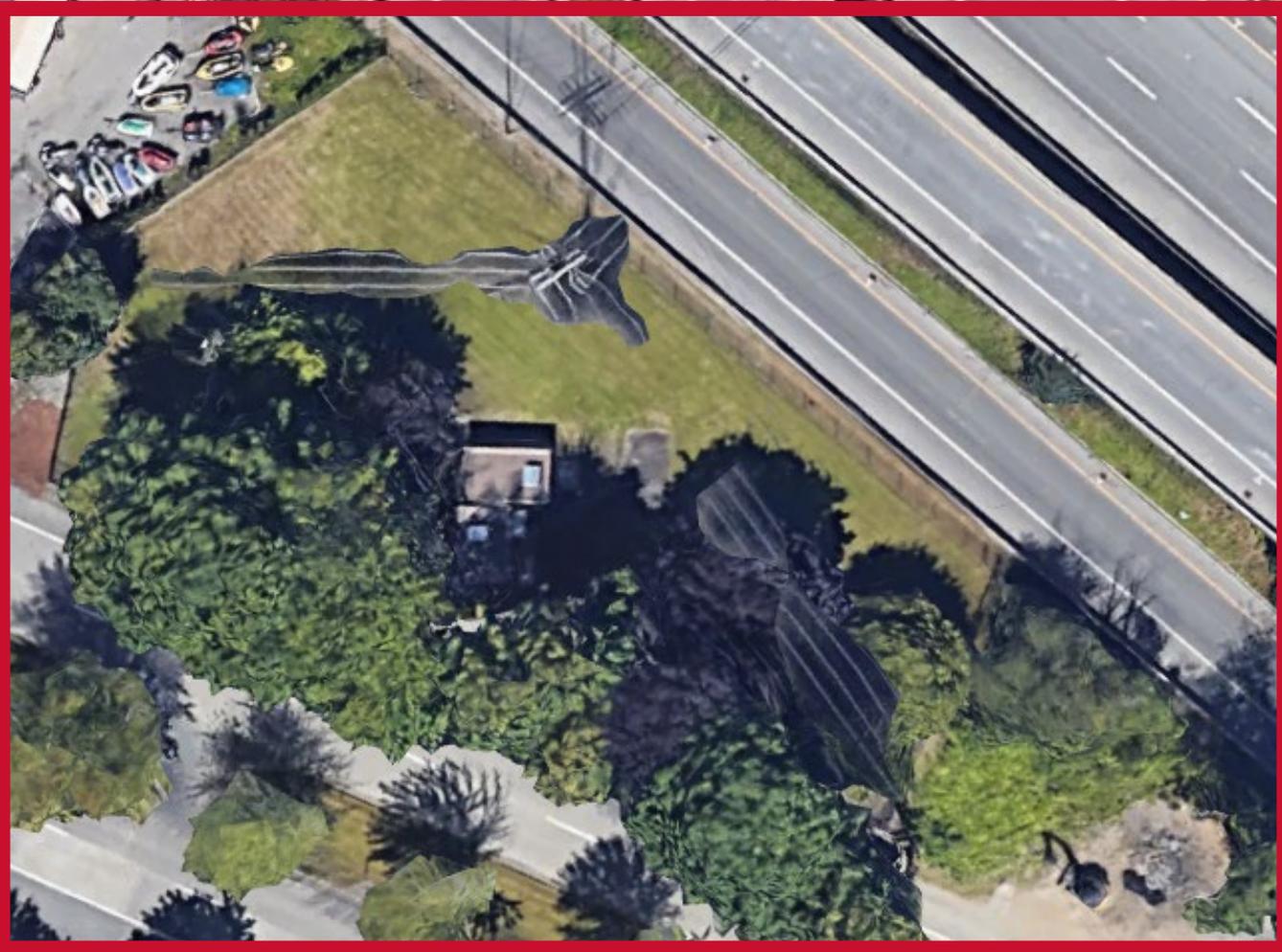
Gilman Site

- Gilman Well Nos. 4 and 5
- Existing Treatment:
 - PFAS treatment for Well No. 4
 - Disinfection
 - Sequestration
- Located adjacent to I-90
- Constrained site – accessed through Medical/Dental Center parking lot
- No sewer



Risdon Site

- Risdon Well Nos. 1 and 2
- Existing Treatment:
 - Disinfection
- Located adjacent to I-90
- Transmission lines overhead



Well Capacities

Source	Current Capacity (gpm)
Well 1	542
Well 2	981
Well 4	233
Well 5	1,029

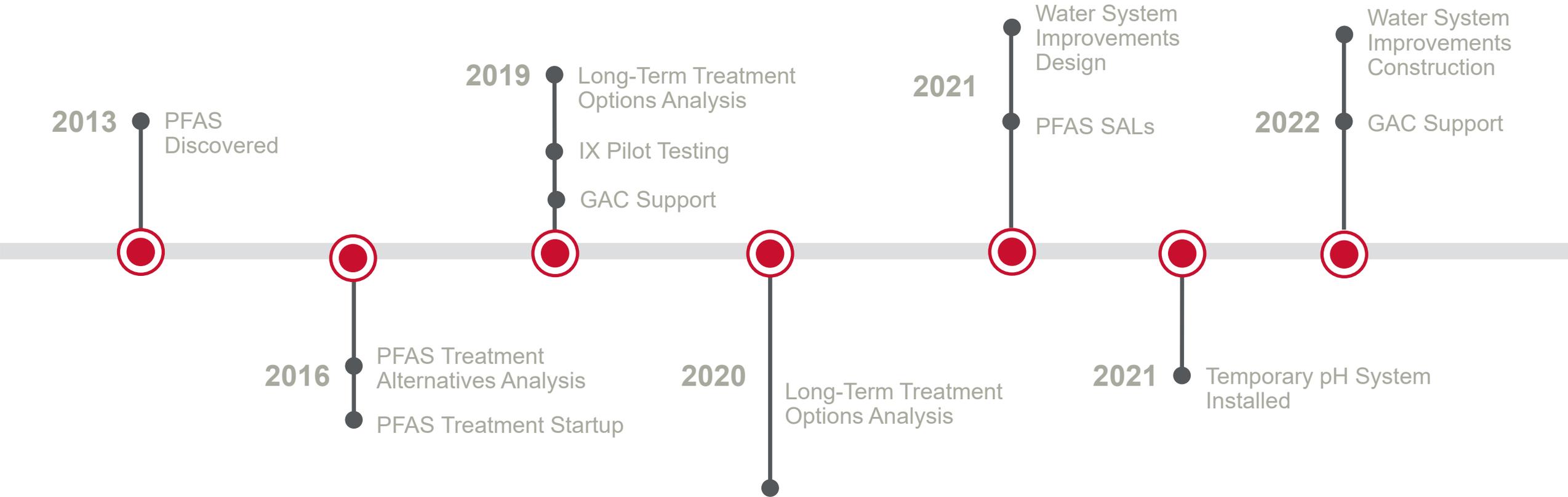
Raw Water Quality

Parameter	Units	Regulated Limit	Well 1 Results	Well 2 Results	Well 4 Results	Well 5 Results
pH	specific units	6.5 - 8.5	6.9	7.0	7.1	8.1
Hardness	mg/L as CaCO ₃	-	56	53	100	87
Iron	mg/L	0.3	<0.1	<0.1	<0.1	<0.1
Manganese	mg/L	0.050	<0.01	<0.01	0.02	0.06
Arsenic	mg/L	0.01	0.002	0.002	0.003	0.009
Alkalinity	mg/L as CaCO ₃	(none)	60	70	103	100
Dissolved Inorganic Carbon (DIC)	mg/L	(none)	19	20	30	24

Current PFAS Levels

PFAS	WA State Action Level	Well 4 Raw Water	Well 5 Raw Water	Lag Vessel (25%)	Finished Water (Well No. 4 and No. 5)
PFOS	15	282	41	ND	32
PFOA	10	9	ND	ND	ND
PFNA	9	10	ND	ND	ND
PFHxS	65	104	21	ND	16
PFHpA	none	15	ND	ND	ND
PFBS	345	29	ND	2	ND

Project History





Water System Challenges

02

Planning for the Future

- Gilman Well No. 5
 - PFAS (blended with Well No. 4)
 - Arsenic (blended with Well No. 4)
 - Manganese (blended with Well No. 4)
- Gilman Well No. 4
 - PFAS (treated)
 - Low pH (blending with Well 5)
- Risdon Well No.1
 - Low pH
- Risdon Well No. 2
 - Low pH



Water Quality Complaints

- Differences in pH has the potential to cause increased copper release in customer plumbing
- Blue-water complaints throughout the City when Gilman wells are offline



Lead and Copper Rule vs. PFAS

- PFAS SALs adopted in October 2021
 - PFOS, PFOA, PFNA, PFHxS
- City decides to take Well No. 5 offline
 - Reduces PFAS exposure
 - Drops water system pH – Potential to lead to LCRR issues
- Water quality options evaluation initiated!



Gilman Well Nos. 4 and 5 Blending

- Blended Wells 4 and 5 to manage:
 - pH
 - Arsenic
 - Manganese
 - PFAS
- What does taking Well 5 offline do to water quality?
 - Reduces arsenic 😊
 - Reduces PFAS 😊
 - Reduces pH 😞

Parameter	Units	Gilman Well No. 4	Gilman Well No. 5	Gilman Well Nos. 4 and 5 Blended
pH	Specific units	7.1	8.1	7.6
Alkalinity	As CaCO ₃	103	100	101
Arsenic	mg/L	0.003	0.009	0.008
Hardness	As CaCO ₃	100	87	73
Manganese	mg/L	0.02	0.06	0.05
DIC	mg/L (calculated)	30	24	26

Alternatives Evaluation



Shut down all City wells and purchase regional water



Build a centralized treatment plant to treat all groundwater supplies



Water System Improvements

- Blend regional water into Valley 297 zone
- Shut down Gilman Well No. 5 and install wellhead treatment at Risdon Wells.



Water System Improvements

03



Risdon Temporary Treatment

- Well No. 5 has highest pH and helps increase pH system-wide
- Well No. 5 went offline October 2021
- Temporary sodium hydroxide system for pH adjustment at Risdon to raise pH
- To be used until new chemical building is constructed next year
- System has been operational since July 2022

Risdon Improvements

- New chemical building
 - New sodium hydroxide storage and feed system
 - Replace sodium hypochlorite storage and feed system
 - New sodium fluoride storage and feed system
- New Structures
 - Chemical injection vault
 - Pressure transducer vault
 - Flow meter vault
 - Sewer vault
- Site/Civil Improvements
 - New Driveway





Gilman Improvements

- Wellhouse upgrades:
 - Sodium fluoride feed system
 - Sequestrant system demolition
 - Process controls and instrumentation upgrades
 - Sewer line and lift station

SR900 PRV Station Improvements

- Vault demolition
- Replace PRVs
- Bring PRV vault above-grade for easier maintenance
 - Existing vault prone to flooding
- Install site security
- Update process controls and instrumentation

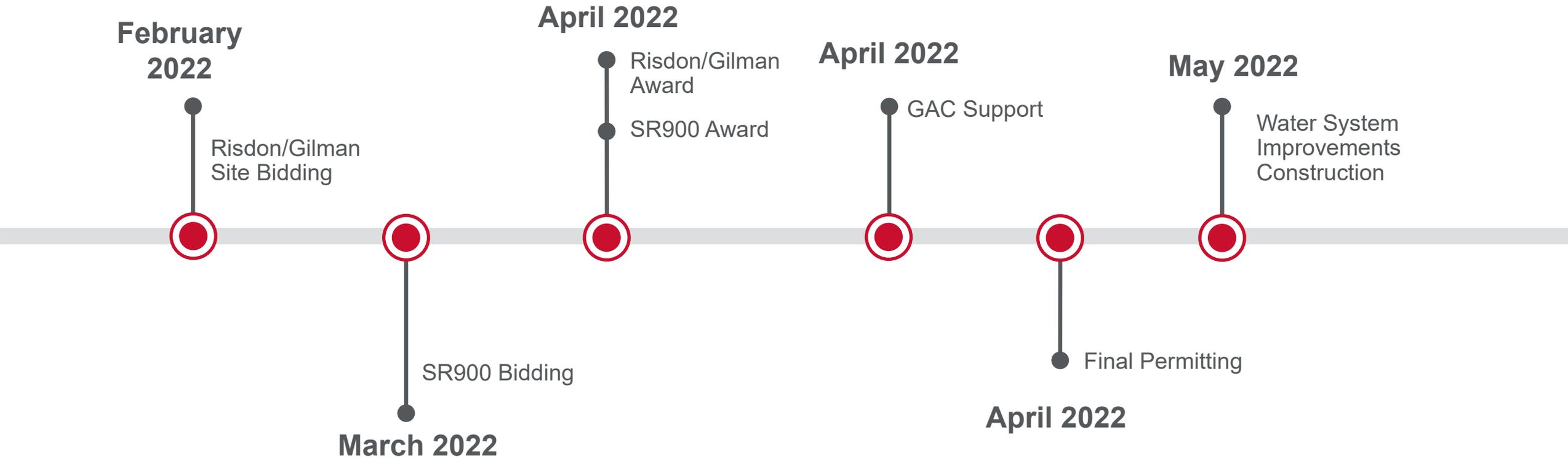




Current Project Status

04

Construction Schedule



Acknowledgements

City of Issaquah

- Public Works Operations
 - Greg Keith, Water System Superintendent
 - Alan Munson, Operator
- Public Work Engineering
 - Bob York, Public Works Director
 - Tony Nguyen, Public Works Engineering Manager
 - Gary Schimek



HDR

Beth Mende, PE | (425) 468-1532 | Elizabeth.Mende@hdrinc.com
Pierre Kwan, PE | (206) 826-4735 | Pierre.Kwan@hdrinc.com

*thank
you*