



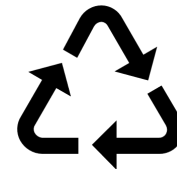
A HOLE IN ONE: A WELL TRANSITIONS FROM GOLF COURSE IRRIGATION TO MUNICIPAL PRODUCTION

Zach Miles, BHC Consultants

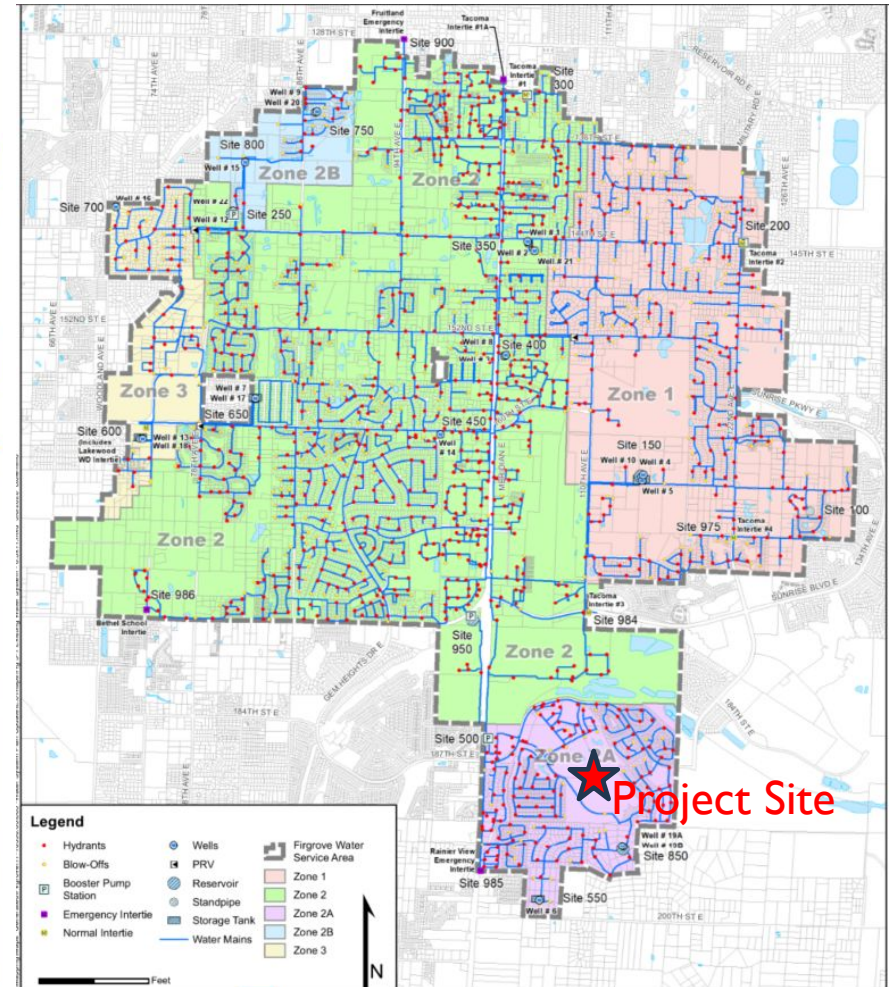
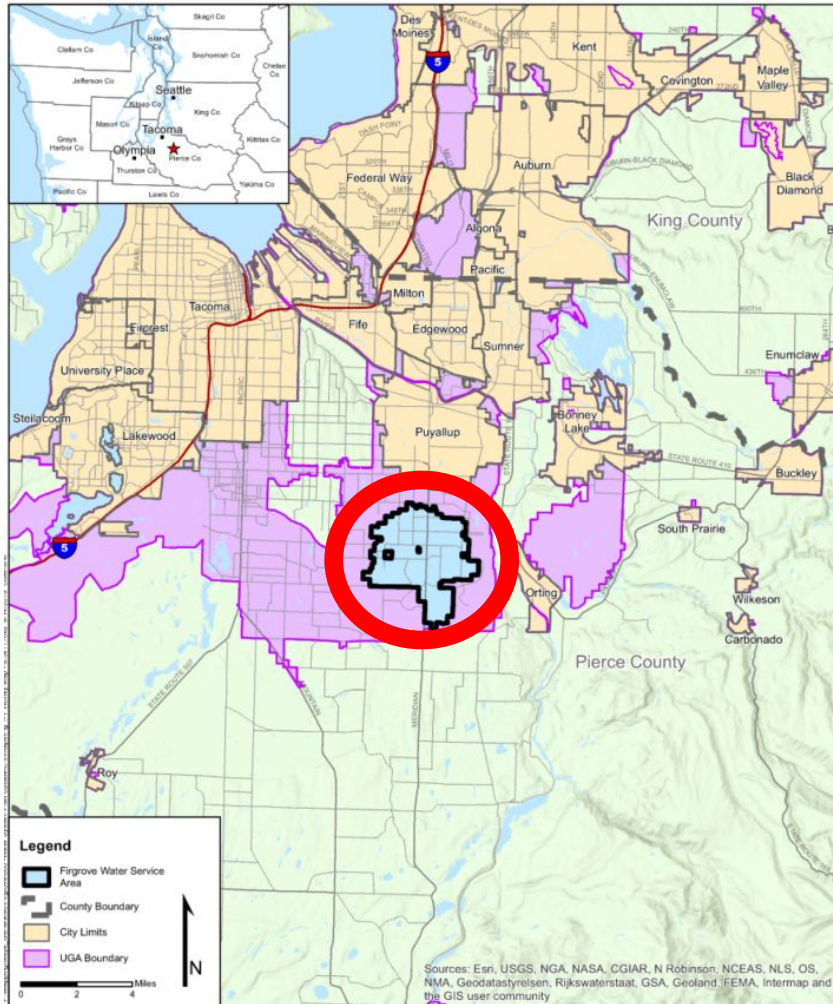
May 9, 2025

PRESENTATION TAKEAWAYS

1. Responding to changing water system demands requires **LONG TERM PLANNING**
2. Look for opportunities for **RE-USE** of existing infrastructure
3. Develop mutually beneficial **PARTNERSHIPS**
4. Something else??

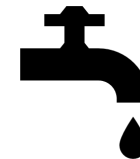
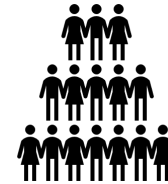


SYSTEM MAPS

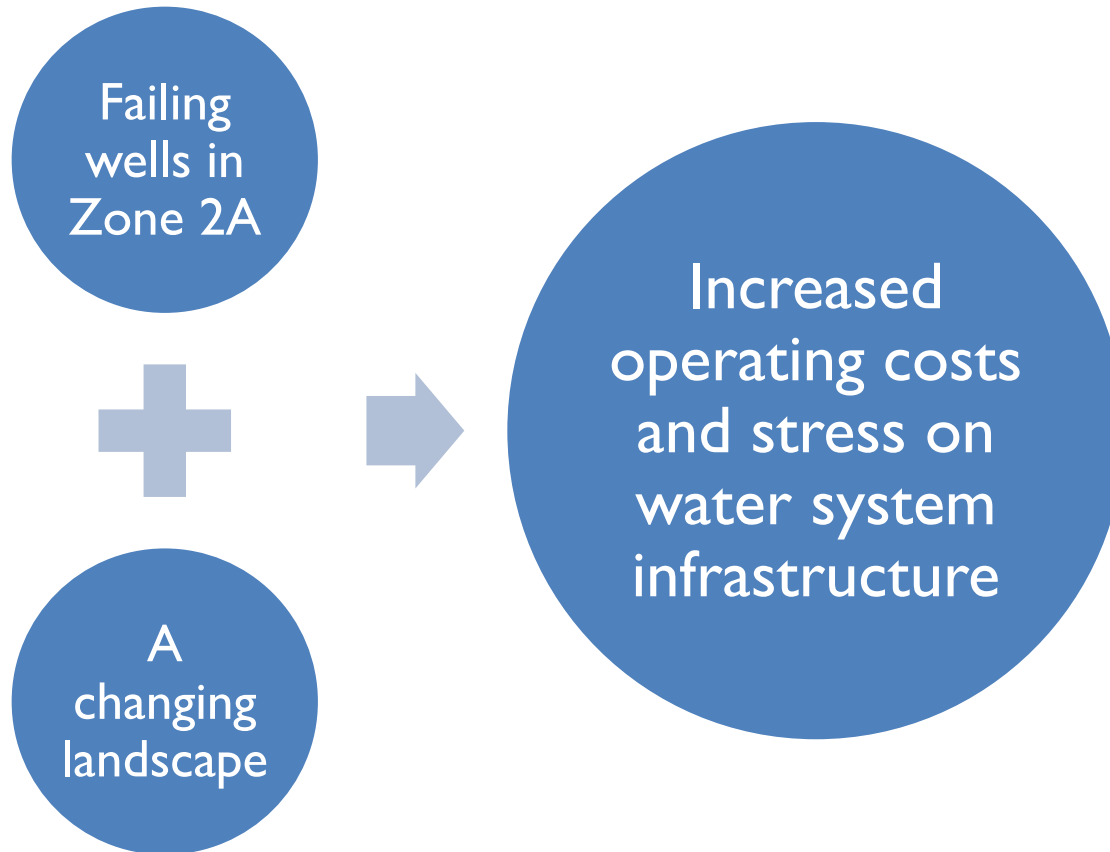


FIRGROVE SYSTEM BACKGROUND

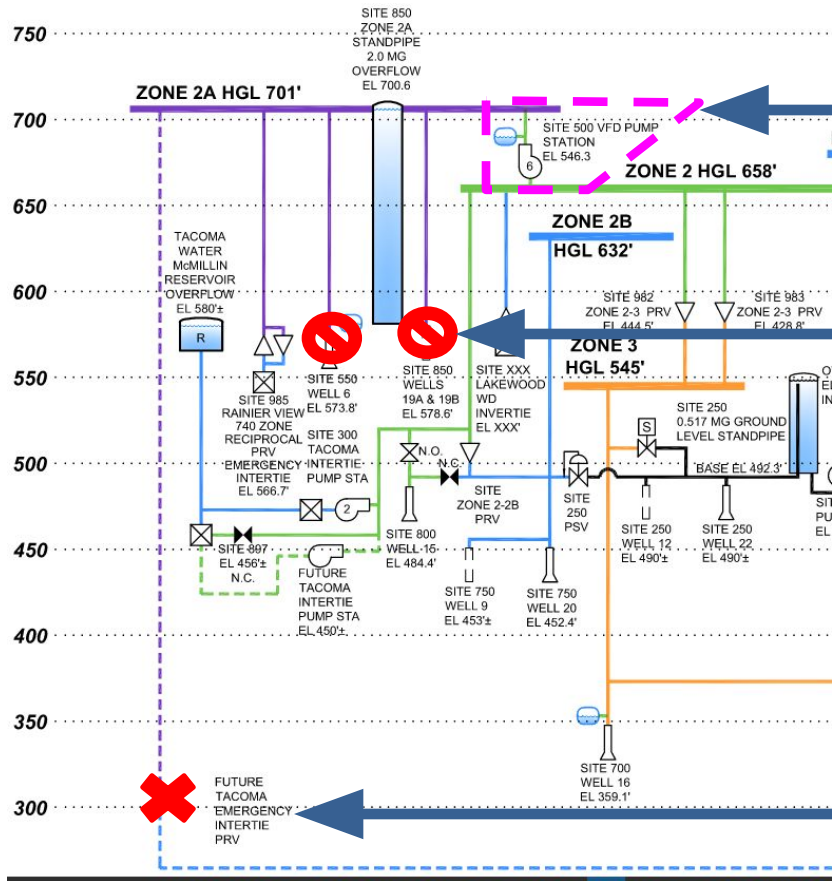
- Started by a group of ~50 farmers in 1952
- ~34,000 People Served
- ~13,000 Connections
- 16 wells
- Interties (Tacoma Water & Lakewood Water District)
- ~80% groundwater wells and ~20% wholesale purchase supply



THE PROBLEM



FAILED WELLS MEANS PUMPING INTO ZONE 2A



Site 500 (Meridian BPS) currently supplying all of Zone 2A

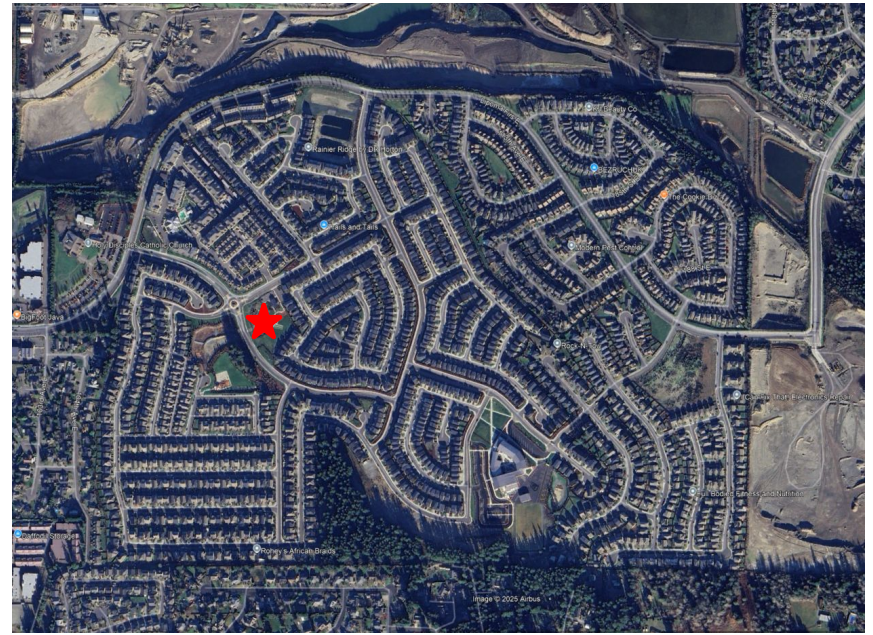
Well 6 & 19B not active

Not yet built

A CHANGING LANDSCAPE



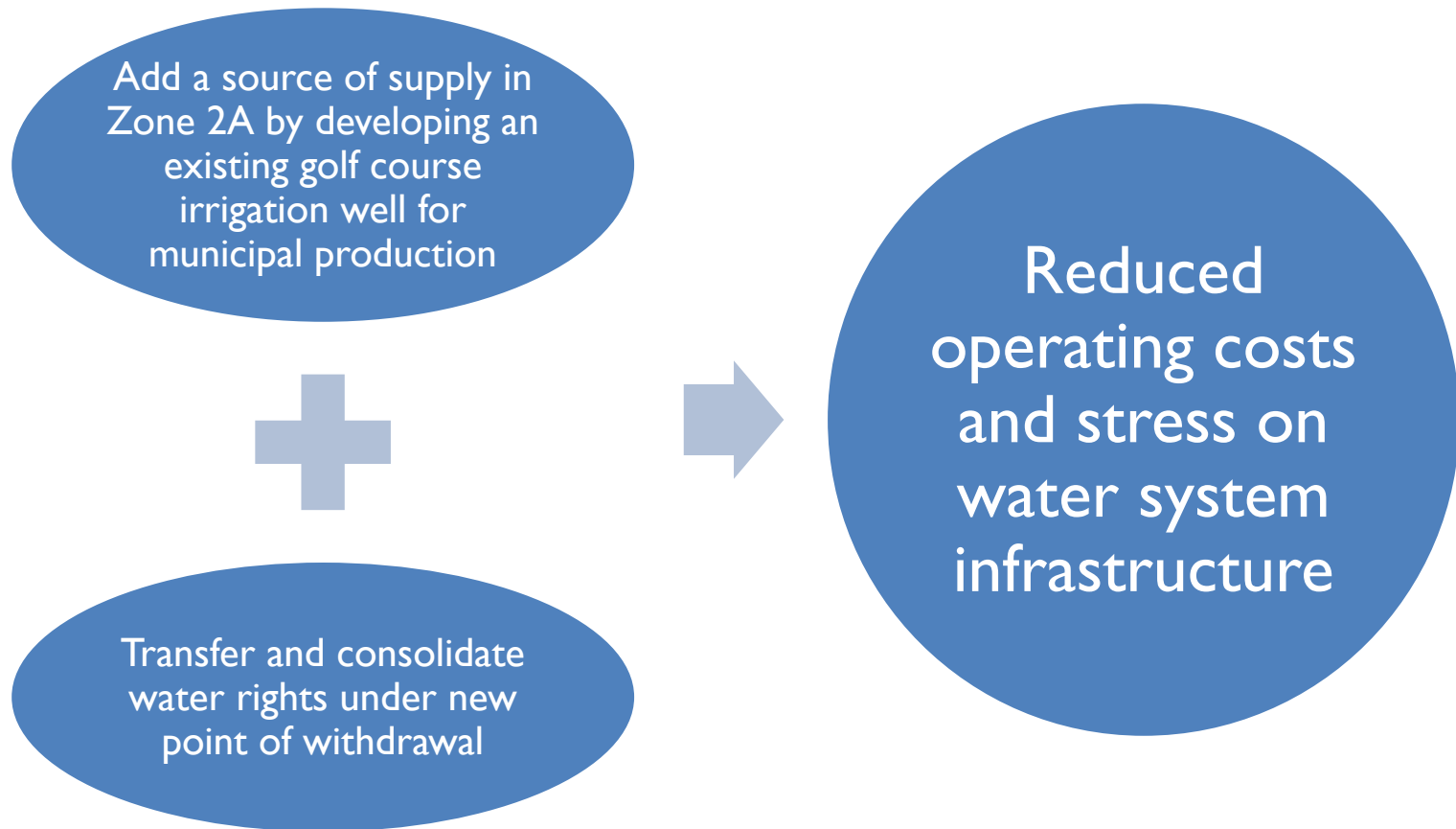
2002



2025

★ Well 23 Site

THE SOLUTION



CONSOLIDATING WATER RIGHTS

- Well 23 (Lipoma Firs Well 3) Water Rights (April 15 to October 15)

$$Q_i = 205 \text{ gpm} + Q_i = 200 \text{ gpm} = Q_i \text{ Total} = 405 \text{ gpm}$$

- Well 6 and Well 19B Water Rights

$$Q_i = 60 \text{ gpm} + Q_i = 160 \text{ gpm} = Q_i \text{ Total} = 220 \text{ gpm}$$

- Original pump design □ well pump capable of 220 – 405 gpm
- Revised pump design after pump testing □ well pump capable of 220 – 350 gpm

WATER RIGHTS TRANSFER

- Change in Purpose and Place of Use from “irrigation/domestic” to “municipal supply” and “200-acre golf course property” to “Firgrove Pressure Zone 2A”

State of Washington
DEPARTMENT OF ECOLOGY
REPORT OF EXAMINATION FOR WATER RIGHT CHANGE
Change in Purpose and Place of Use

PRIORITY DATE: April 6, 1998

WATER RIGHT NUMBER: G2-27328

MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal

WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AF/YR)
205	gpm	97.2

Purpose: Municipal Supply Purposes

PURPOSE	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal Supply Purposes	205		GPM	97.2	--	04/15 to 10/15

State of Washington
DEPARTMENT OF ECOLOGY
REPORT OF EXAMINATION FOR WATER RIGHT CHANGE
Change in Purpose and Place of Use

PRIORITY DATE: April 6, 1998

WATER RIGHT NUMBER: G2-27328

MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal

WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AF/YR)
200	gpm	97.2

Purpose: Municipal Supply Purposes

PURPOSE	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal Supply Purposes	200		GPM	97.2	--	04/15 to 10/15

PRIORITY DATE
April 6, 1998

Long Term Planning

- Change Point of Withdrawal from Wells 6 and 19B to Well 23

State of Washington
DEPARTMENT OF ECOLOGY
Final REPORT OF EXAMINATION FOR WATER RIGHT APPLICATION

PRIORITY DATE: 1/30/2020

WATER RIGHT NUMBER: G2-30758

MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal

WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
60	GPM	48

Purpose: Municipal

PURPOSE	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal	60		GPM	48		01/01-12/31

State of Washington
DEPARTMENT OF ECOLOGY
Final REPORT OF EXAMINATION FOR WATER RIGHT APPLICATION

PRIORITY DATE: 4/23/2020

WATER RIGHT NUMBER: G2-30769

MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal

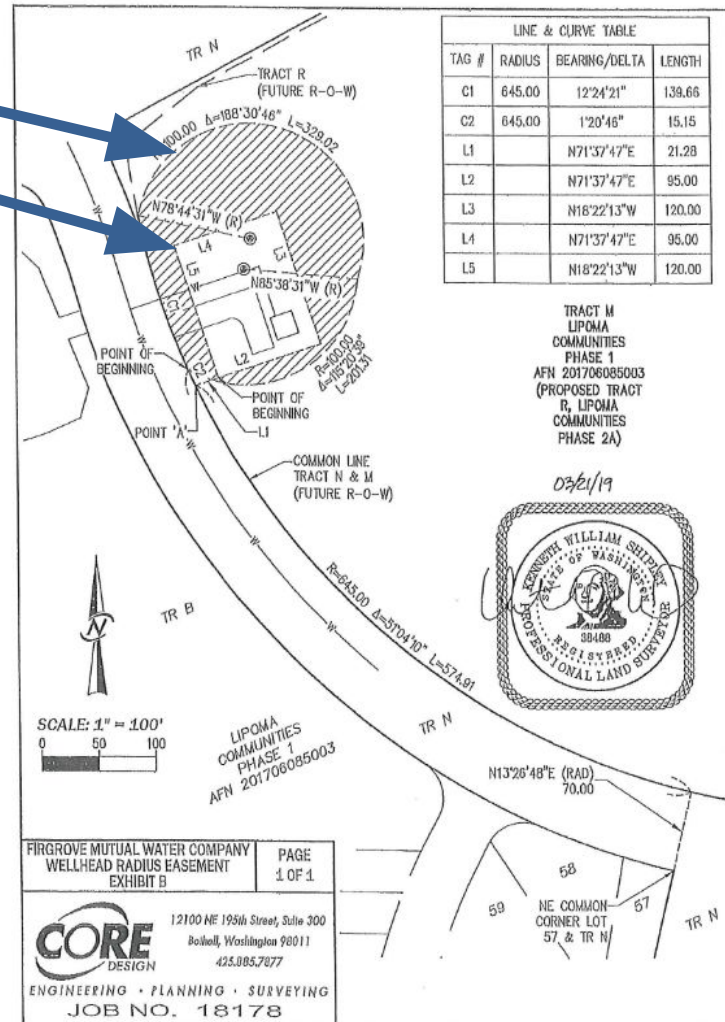
WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
160	GPM	54

Purpose: Municipal

PURPOSE	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal	160		GPM	54		01/01-12/31

EASEMENTS

- Sanitary control area easement
 - Well site easement acquisition
- Partnerships



OTHER STEPS ALONG THE WAY...

- Water quality testing
 - IOCs, SOCs, VOCs, PFAS
- Wellhead protection plan
- Pump testing
 - Step rate completed
 - Issues handling discharge of constant rate pump test
 - Constant rate with new well pump installed during construction

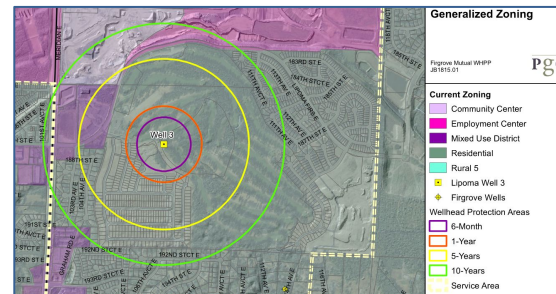
Please Print Plainly
USE HEAVY PENCIL
DO NOT WRITE IN SHADOW AREAS

WATER MANAGEMENT LABORATORIES INC. 1515 80th St. E. Tacoma, WA 98404 (253) 331-3121

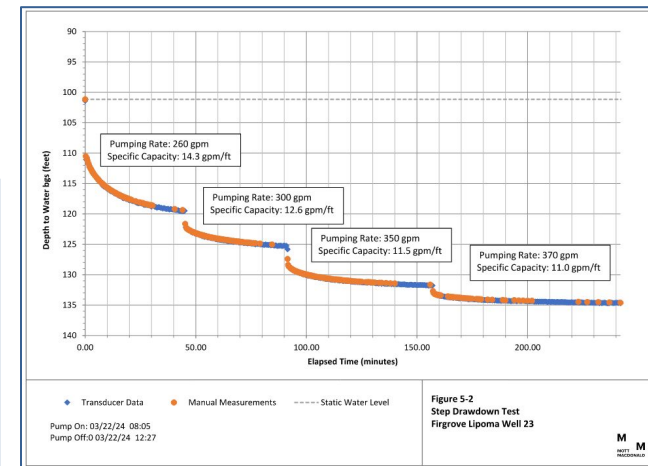
INORGANIC CHEMICALS (IOCS) REPORT

Item ID No: 21314 System Name: Lipoma Well
 Lab Sample No: 0896/241 Date Collected: 05-19-16 DOH Source No: N/A
 Multiple Source Nos: N/A Sample Type: B Sample Purpose: I
 Date Received: 05-19-16 Date Reported: 05-28-16 Supervisor: LK
 County: Pierce Date Digested: NA Group: A B Other PWT
 Sample Location: Wellhead
 Send Results & Bill To: Firgrove Mutual Water 10408 144th Street E Puyallup, WA 98374 Remarks:

DOH#	ANALYTES	RESULTS	UNITS	SRL	TRIGGER	MCL	EXCEEDS	Method/Analyst
EPA REGULATED								
4	Arsenic	<0.001	mg/L	0.001	0.01	0.01	N/D	200.8 JND
5	Barium	<0.1	mg/L	0.1	2	2		200.8 JND
6	Cadmium	<0.001	mg/L	0.001	0.005	0.005		200.8 JND
7	Chromium	<0.007	mg/L	0.007	0.1	0.1		200.8 JND
11	Mercury	<0.0002	mg/L	0.0002	0.002	0.002		200.8 JND
12	Selenium	<0.002	mg/L	0.002	0.05	0.05		200.8 JND
110	Beryllium	<0.0005	mg/L	0.0003	0.004	0.004		200.8 JND
112	Antimony	<0.003	mg/L	0.003	0.006	0.006		200.8 JND
113	Thallium	<0.001	mg/L	0.001	0.002	0.002		200.8 JND
19	Cyanide	<0.01	mg/L	0.01	0.2	0.2		4500-CNF JND
114	Nitrite - N	<0.2	mg/L	0.2	2	4		300.0 JND
20	Nitrate - N	<0.2	mg/L	0.1	0.5	1		300.0 JND
161	Total Nitrate/Nitrite	<0.2	mg/L	0.2	5	10		300.0 JND
EPA REGULATED (Secondary)								
8	Iron	<0.1	mg/L	0.1	0.3	0.3		200.8 JND
10	Manganese	<0.01	mg/L	0.01	0.05	0.05		200.8 JND
13	Silver	<0.01	mg/L	0.1	0.1	0.1		200.8 JND
21	Chloride	1	mg/L	20	250	250		300.0 JND
22	Sulfate	0	mg/L	50	250	250		300.0 JND
24	Zinc	<0.2	mg/L	0.2	5	5		200.8 JND
STATE REGULATED								
14	Sodium	5	mg/L	5				200.8 JND
15	Hardness	57	mg/L	10	2540C	2540C		200.8 JND
16	Conductivity	137	umhos/cm	20	2510B	2510B		200.8 JND
17	Turbidity	<0.1	NTU	0.1	2130B	2130B		200.8 JND
18	Color	<5	color units	15	2120B	2120B		200.8 JND
26	Total Dissolved Solids	NA	mg/L	100	2540C	2540C		200.8 JND
111	Nickel	<0.005	mg/L	0.005				200.8 JND
STATE UNREGULATED								
9	Lead	<0.001	mg/L	0.001				200.8 JND
23	Copper	<0.02	mg/L	0.02				200.8 JND



Long Term Planning



EXISTING SITE CONDITIONS I OF 2

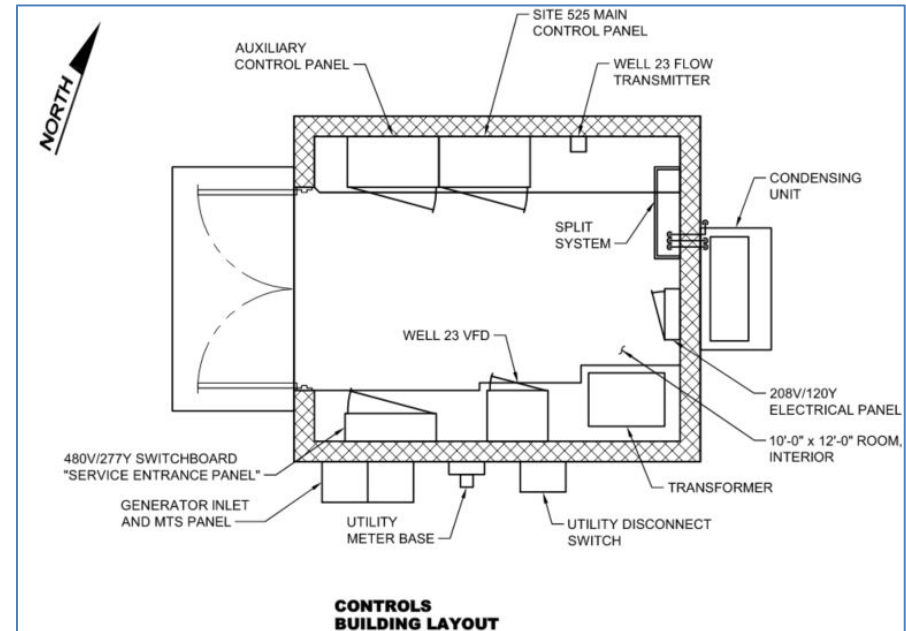
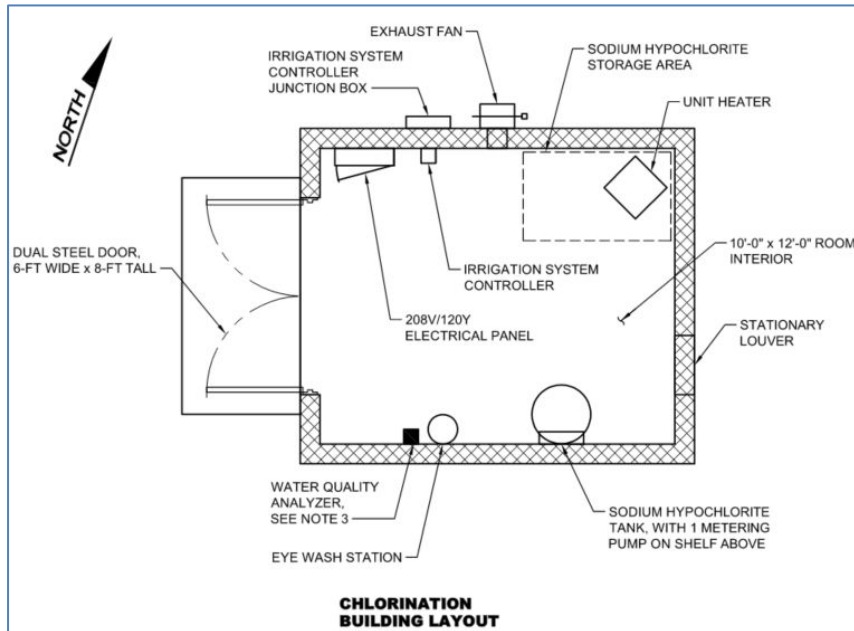


EXISTING SITE CONDITIONS 2 OF 2

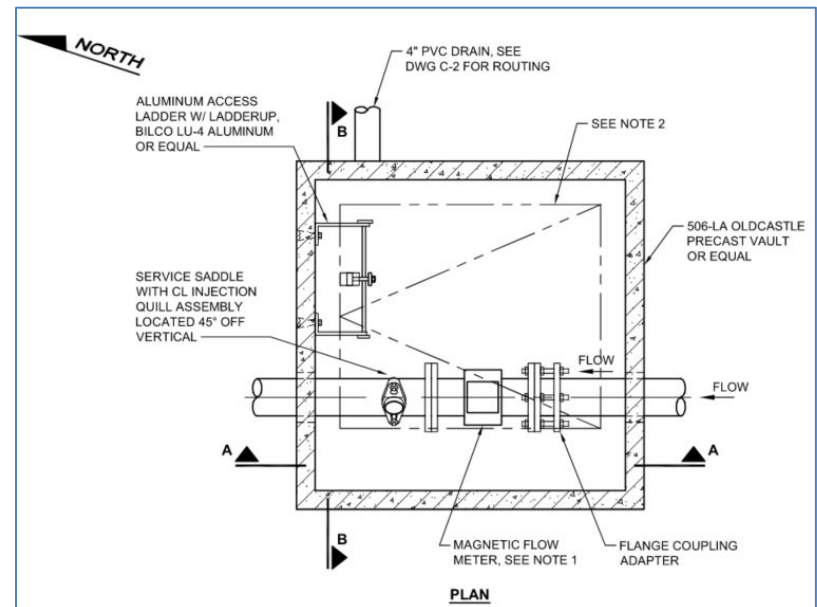
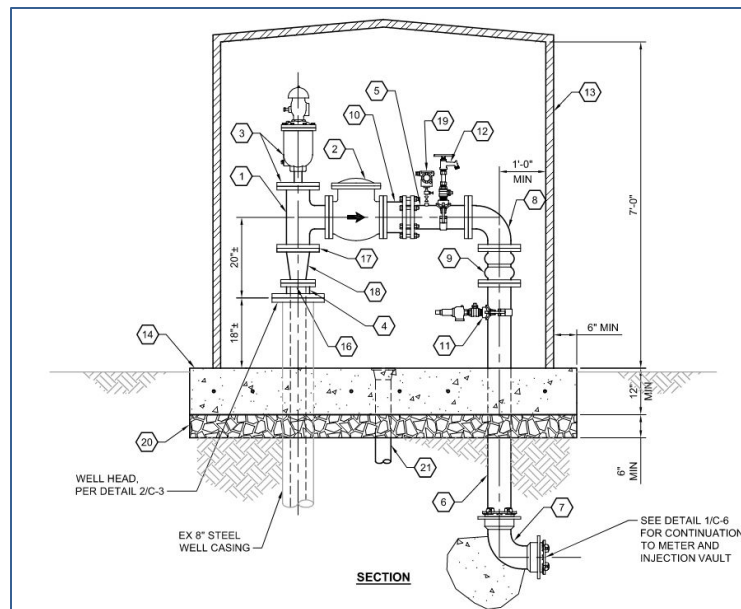


[illegible]

THE DESIGN – BUILDING LAYOUTS

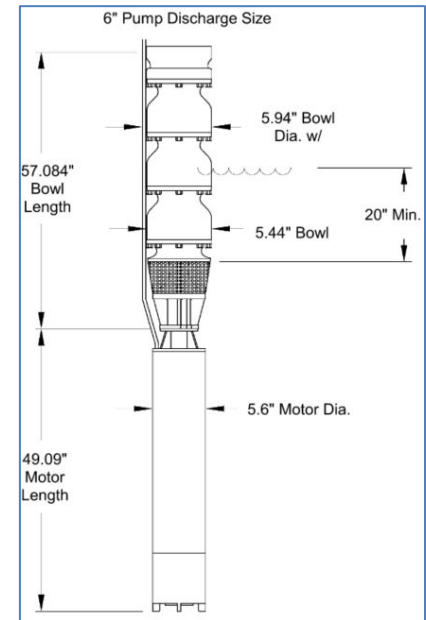
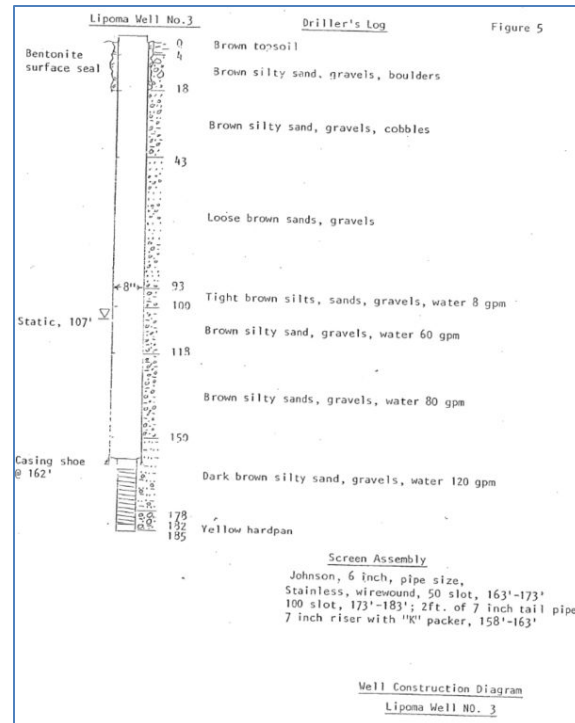


THE DESIGN – WELLHEAD ENCLOSURE & VAULT



WELL CHALLENGES

1. Inaccurate well records
 1. Discrepancies between well log and video inspection
 2. Private well for irrigation not under the same scrutiny as a public well for municipal supply
2. 8-inch well casing size a challenge for submersible pumps
 1. Smaller diameter bowls and longer pump assembly
3. Limited water over pump when operating



Re-Use

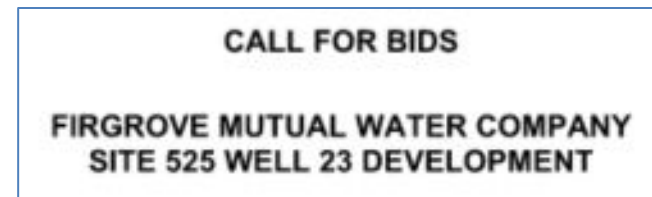
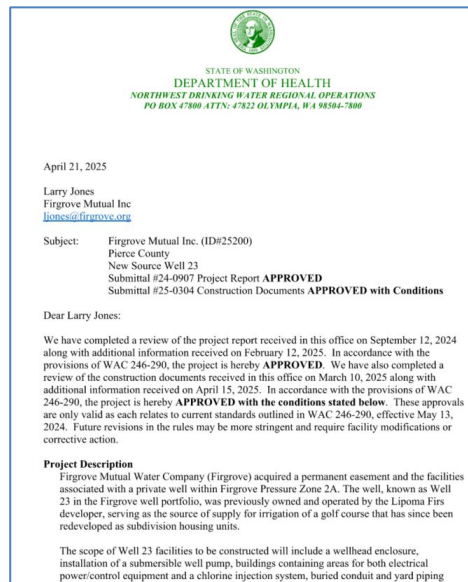
PERMITTING

1. Pierce County Site Development, Mechanical, & Plumbing
2. No building permit required because not over 120 sq. ft.
3. Landscape screening requirements waived
 1. Waived due to existing shrubs already planted and
 2. Federal Bio Terrorism Preparedness and Response Act of 2002
 1. Advocates for open sight lines to above-grade water facilities to dissuade trespassing, vandalism, and potential contamination of public water supply



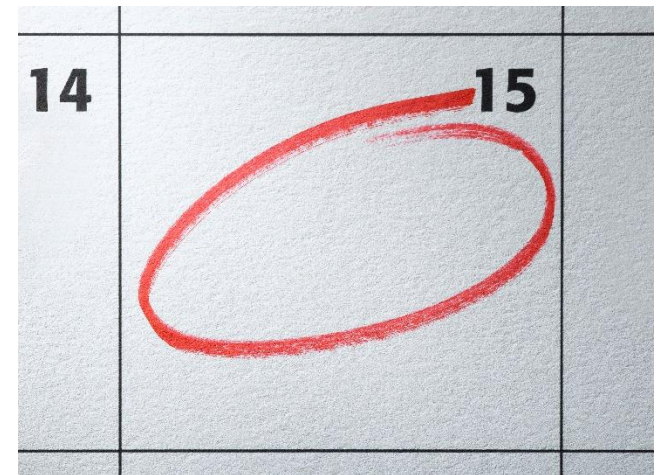
CURRENT PROJECT STATUS

1. Received Conditional Source Approval from WA DOH in April
 1. Full source approval once constant rate pump test completed and reviewed after new pump installed
2. Preparing to bid project in May



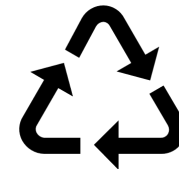
ANTICIPATED CONSTRUCTION SCHEDULE

1. June 2025 – Notice to Proceed
2. November 2025 –Substantial Completion
3. December 2025 – Physical Completion



PRESENTATION TAKEAWAYS

1. Responding to changing water system demands requires **LONG TERM PLANNING**
2. Look for opportunities for **RE-USE** of existing infrastructure
3. Develop mutually beneficial **PARTNERSHIPS**
4. Something else??



ACKNOWLEDGMENTS



Project Owner:

Larry Jones, Ryan Lantz, and Kristen Best



Civil, Structural, & Electrical:

Chris Kelsey, Jordan Zier, Gustavo Franco,
and Nate Palmatier

The logo for PSOMAS. It consists of a dark blue rectangular box with the word "PSOMAS" in white, all-caps, sans-serif font centered inside.

PSOMAS

Survey:

Mike Bowen



Mechanical:

Ola Jarvegren and Soheil Vafa

QUESTIONS?

