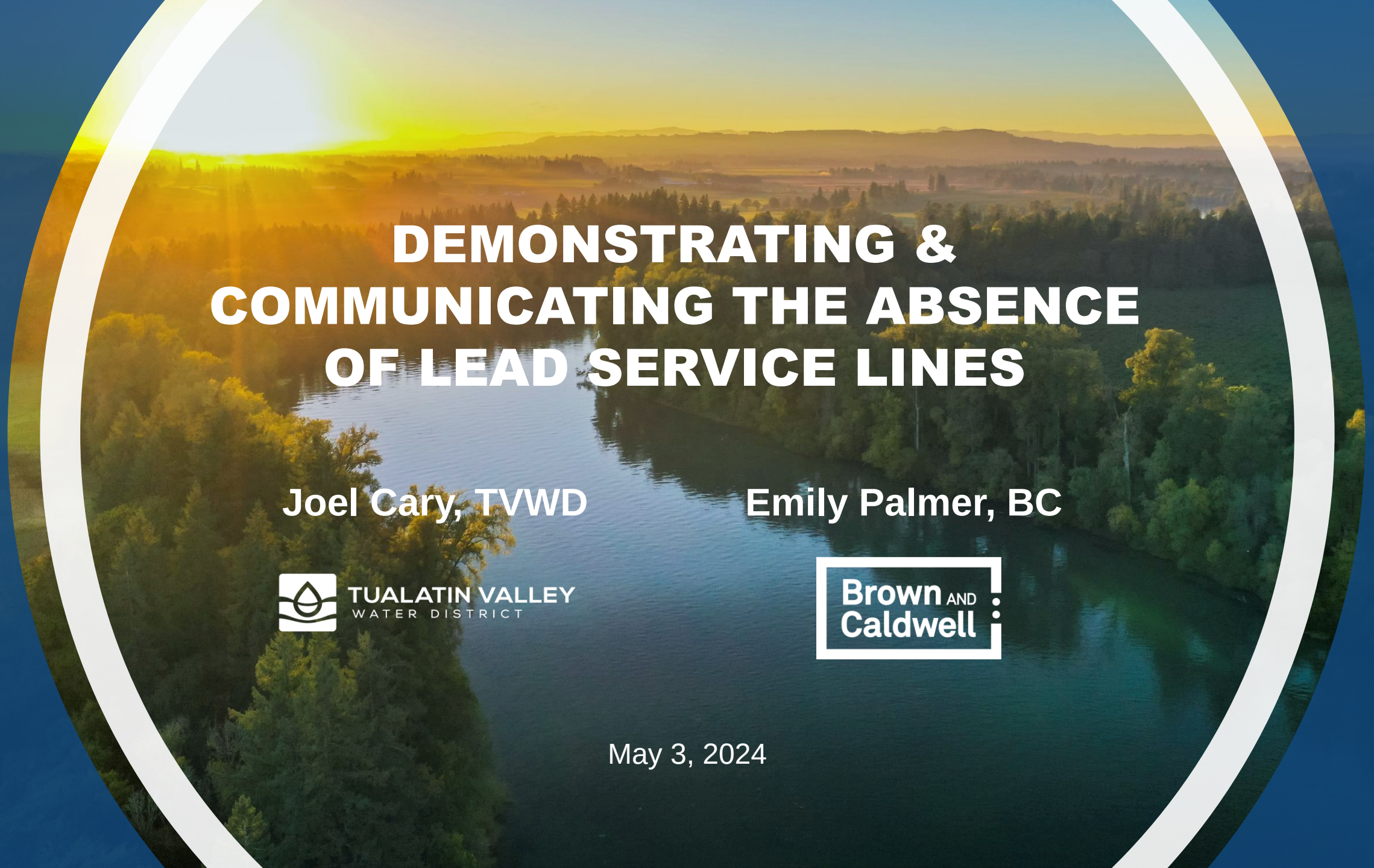


DEMONSTRATING & COMMUNICATING THE ABSENCE OF LEAD SERVICE LINES

Joel Cary, TVWD

Emily Palmer, BC

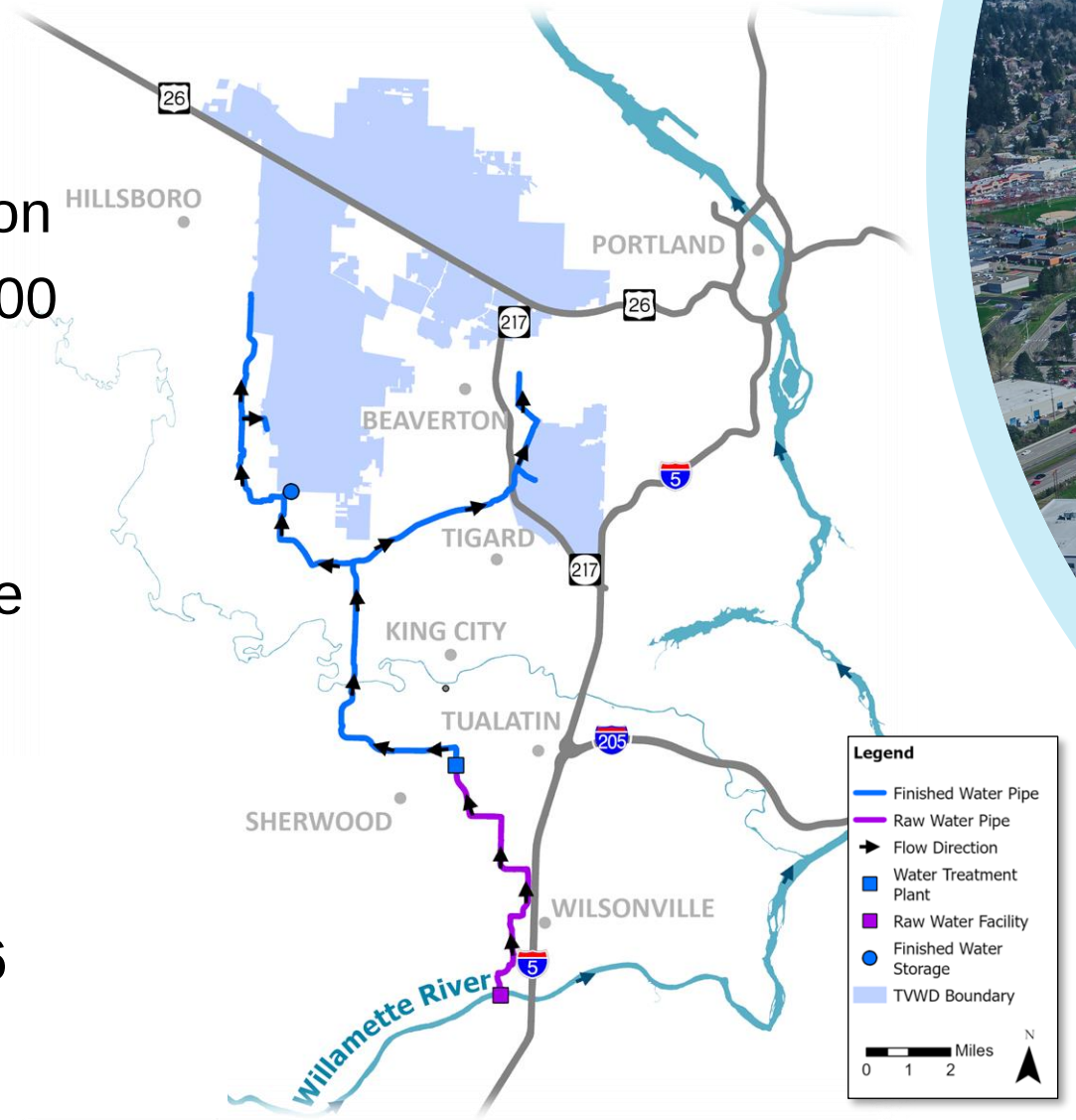
TUALATIN VALLEY WATER DISTRICT

Brown AND Caldwell

May 3, 2024

TVWD OVERVIEW

- TVWD is in Washington County, Oregon
- Serve ~230,000 customers (directly and indirectly)
- 62,000 service connections
- New source (Willamette River) comes online in 2026



TUALATIN VALLEY WATER DISTRICT

KEY PROJECT DRIVERS

- LCRR Service line inventory due October 2024
- TVWD's vision: "Our water sustains thriving communities - every day for everyone"
- Improving TVWD brand awareness in advance of the switch to the Willamette River in 2026
- 2020 service line inspection pilot work

TUALATIN VALLEY WATER DISTRICT

COMMUNICATION CHALLENGES

- Like most PNW utilities, lead service lines were never used (copper is TVWD's standard material)
- Using the term "Lead Service Lines" (LSLs) in communications implies otherwise
- Access to private side – GIS analysis showed ~25% of sites were outside right-of-way

7AM PREVIEW OF INVENTORY OUTCOMES

Nearly 390 service lines were excavated on the public and private side, no lead services were discovered

- Consistent with TVWD's assumptions, all public side services were copper
- Private side services were plastic, copper, or galvanized

TUALATIN VALLEY WATER DISTRICT

PRESENTATION OVERVIEW

Inventory Approach

Communications Strategy and Toolkit

Inventory Implementation

Inventory Approach

TUALATIN VALLEY
WATER DISTRICT

DEVELOPMENT TIMELINE: TVWD'S APPROACH

2021

- Pilot effort informed resource needs (e.g., staffing, hydrovac, technology)
- Allowed inventory methods still unclear

2022

- Michigan statistical method reviewed, OHA engagement
- Developed TVWD evaluation matrix
- Communications plan needed; hired B&C

2023

- Inventory developed parallel to OHA statistical guidance
- Communications plan finalized
- RFP for contract inspections
- Outreach launched (e.g., website, targeted mailers)

2024

- Began physical inventory work with contractor
- Ongoing communications with customers
- Completed inventory; data submission pending

TUALATIN VALLEY WATER DISTRICT

2021-2022: FACTS, UNCERTAINTY, AND LOTS OF QUESTIONS… WHAT A MESS!

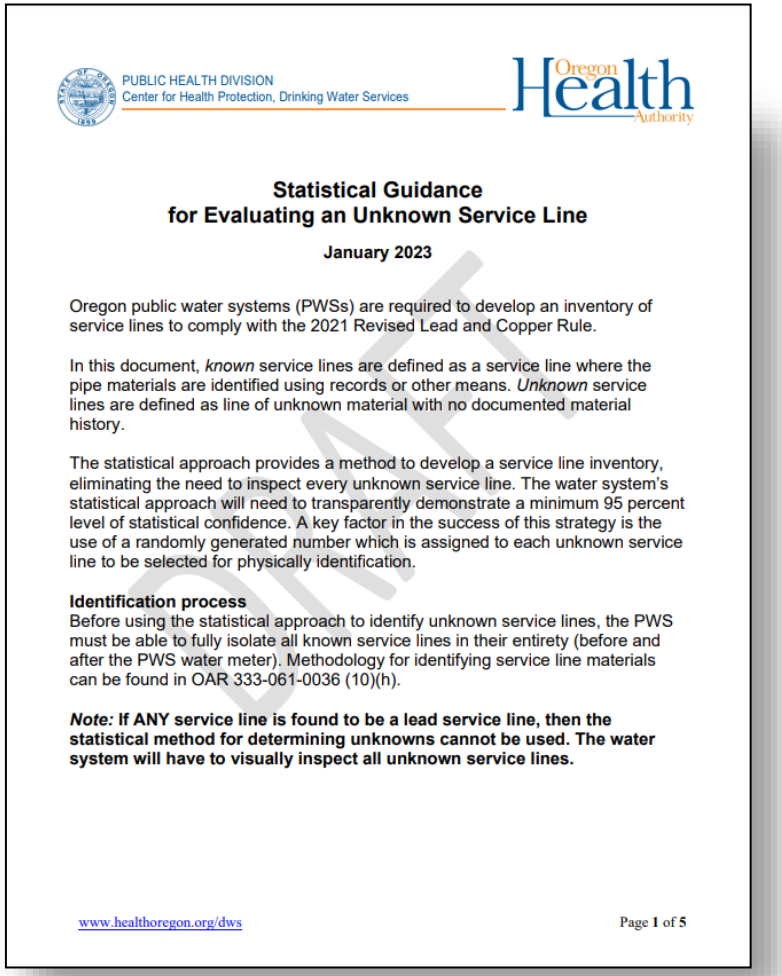
Facts – what we knew

- 62,000 service connections
- No service installation cards
- Archived 70s design standards
- Lead services never used
- **Translation – lots of "unknowns" under the LCRR**

Uncertainty and questions

- What would Oregon allow?
- Would all 62,000 connections need inspection?
- How would the public react?
- **Resources are limited – this work would impact overall operations**

2022-2023 – WERE WE ON THE RIGHT TRACK?



PUBLIC HEALTH DIVISION
Center for Health Protection, Drinking Water Services

Oregon Health Authority

Statistical Guidance
for Evaluating an Unknown Service Line

January 2023

Oregon public water systems (PWSs) are required to develop an inventory of service lines to comply with the 2021 Revised Lead and Copper Rule.

In this document, *known* service lines are defined as a service line where the pipe materials are identified using records or other means. *Unknown* service lines are defined as line of unknown material with no documented material history.

The statistical approach provides a method to develop a service line inventory, eliminating the need to inspect every unknown service line. The water system's statistical approach will need to transparently demonstrate a minimum 95 percent level of statistical confidence. A key factor in the success of this strategy is the use of a randomly generated number which is assigned to each unknown service line to be selected for physically identification.

Identification process
Before using the statistical approach to identify unknown service lines, the PWS must be able to fully isolate all known service lines in their entirety (before and after the PWS water meter). Methodology for identifying service line materials can be found in OAR 333-061-0036 (10)(h).

***Note:* If ANY service line is found to be a lead service line, then the statistical method for determining unknowns cannot be used. The water system will have to visually inspect all unknown service lines.**

DRAFT

www.healthoregon.org/dws

Page 1 of 5

- ✓ TVWD inventory matched OHA's guidance
- ✓ Records research first, then random selection to achieve 95% statistical confidence
- ✓ If a lead service found, consult with OHA
- ✓ Inventory can be performed using contract services
- ✓ Single point inspection for each portion (i.e., public and private side)

TUALATIN VALLEY WATER DISTRICT

2023 – KEY POINTS OF THE INVENTORY PROCESS

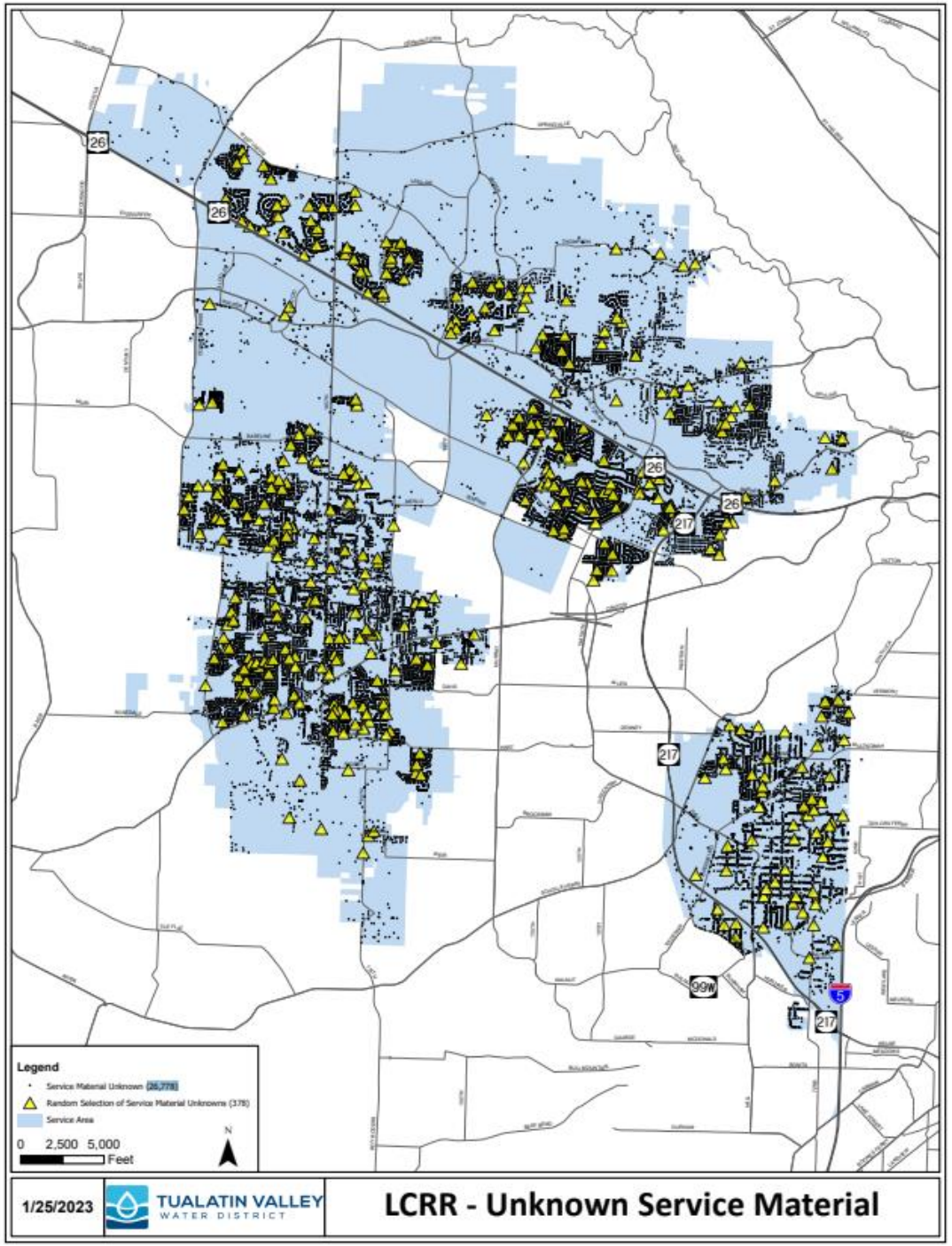
Hierarchy of the process using our GIS data (what's in):

1. Owned by = TVWD
2. Status = Active
3. Service diameter = less than 2-inches
4. Tax lots date + meter sales date = 1985 and older
5. Design standards = 1970s era documents

Data sets not used:

- Year main installed – old services can be attached to new mains
- Utility billing data – unreliable

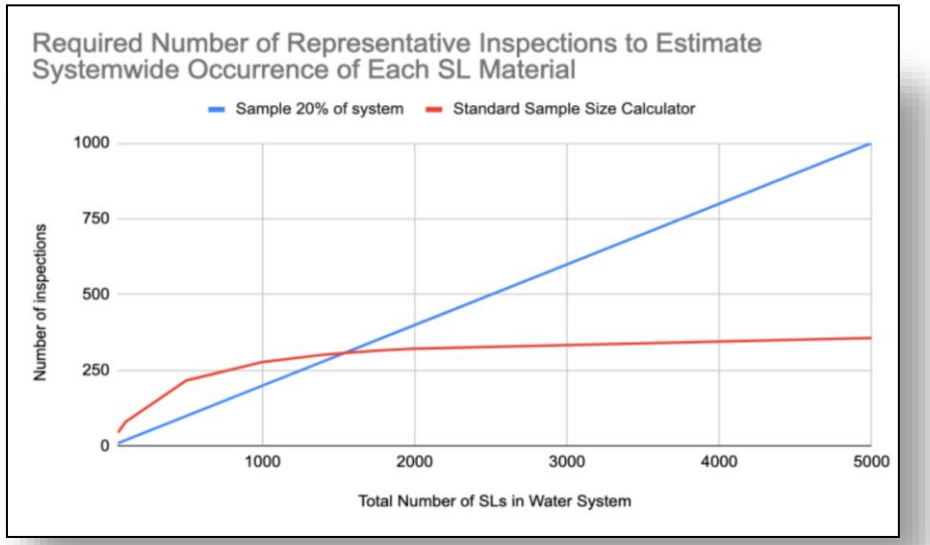
TUALATIN VALLEY WATER DISTRICT



METHOD OUTCOMES

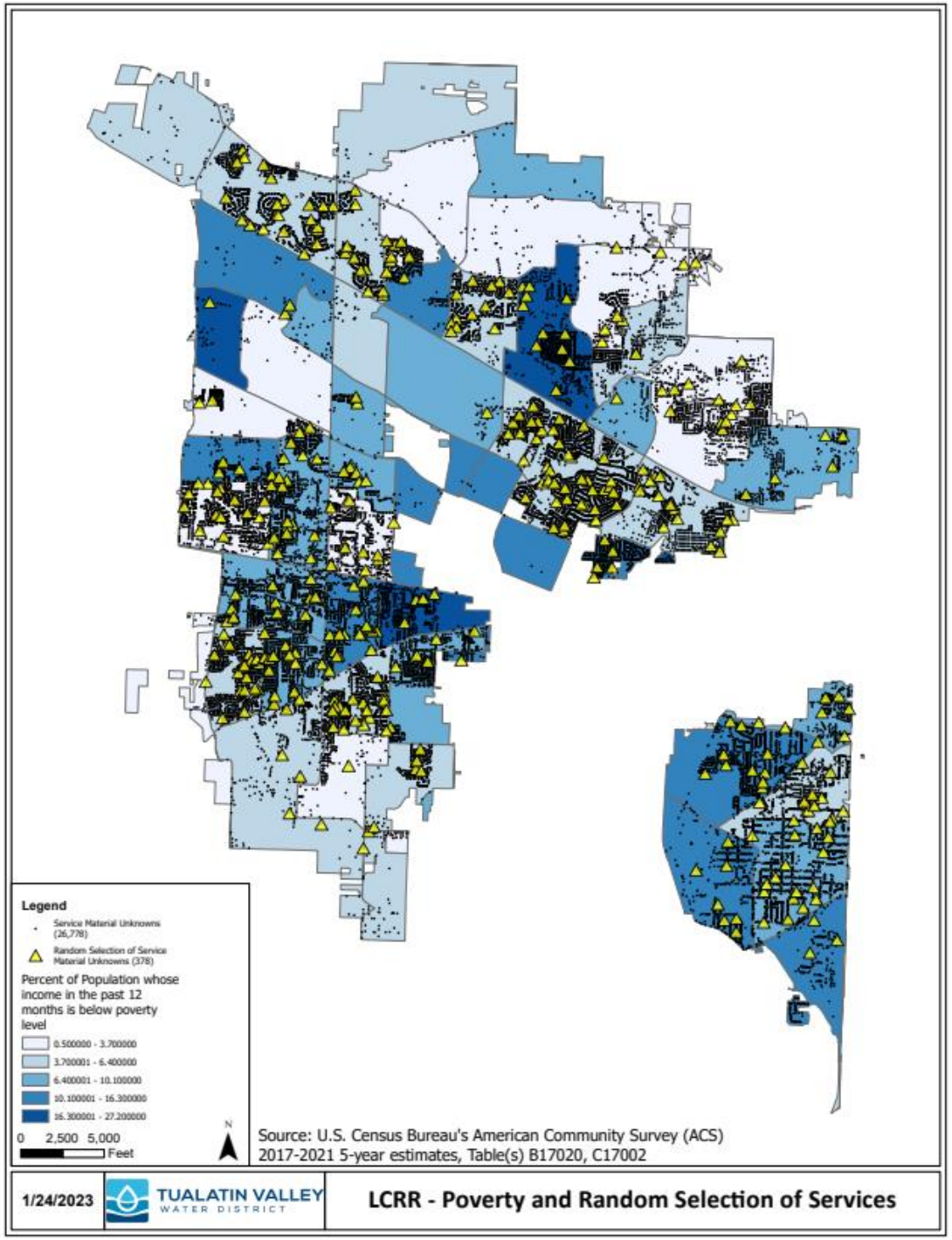
26,788 services classified as "unknown" under OHA methodology

- Minimum of 378 randomly selected sites for inspection



Example curve, ASDWA, 2020

TUALATIN VALLEY WATER DISTRICT



ADDITIONAL ANALYSES

How did the randomly selected inventory sites compare to TVWD's most financially impacted communities?

- Not part of statistical method, but a question worth asking considering the proposed LCRI's focus on disadvantaged communities
- Used most recent Census data
- Results largely aligned with Census data

TUALATIN VALLEY WATER DISTRICT

INITIAL SITE ASSESSMENT – DESKTOP EVAL

Count	AddressID	UniqueID	MeterClassCode	YEARBUILT	Meter Location Notes	(1) Meter is Visible on Street View	Google Streetview Image Year	(2) Utilities in Dig Area	(3) Sidewalk or Driveway or Concrete/Asphalt	Concrete/ Asphalt Type	(4) Large Physical Obstruction	Obstruction Type	(5) Traffic Control Needed	(6) Meter Within Approx. 5ft of tree	(7) Landscaping to Restore?	Notes/Other Observations	6	5	4	3	2	1	ROE Needed	Score
1	27010	SE22859	Residential	1920	EOH			Yes	Yes		Yes		Yes	Yes	Yes		1	1	1	1	1	1	no	1.00
2	4938	SE34814	Residential	1972				Yes	No		No		No	No	Yes		1	0	0	0	0	1	no	0.33
3	5512	SE36606	Residential	1974				No	Yes		Yes		No	No	Yes		0	1	1	0	0	1	no	0.48
4	20337	SE13451	Residential	1980	0	Yes	2014	Yes	Yes	Sidewalk Panels	No	Other	No	No	No	Power Transformer Directly Behind MTR	1	1	0	0	0	0	yes	0.52
5	1055	SE1270	Residential	1960		Yes	2022	Yes	Yes	Road Surface	No		No	No	Yes		1	1	0	0	0	1	no	0.57
6	29203	SE25434	Residential	1963	MB	Yes	2016	No	Yes	Road Surface	No		No	No	Yes		0	1	0	0	0	1	no	0.29
7	17004	SE9384	Residential	1970	S OF DRIVE	Yes	2014	No	Yes	Road Surface	No													0.24
8	21783	SE15434	Residential	1985		Yes	2022	Yes	Yes	Multiple Types	Yes	Other												
9	6401	SE46075	Residential	1974		Yes	2019	Yes	Yes	Multiple Types	No													
10	15784	SE7463	Residential	1972	SOUTH OF LOT	Yes	2014	Yes	Yes	Road Surface	Yes	Oth												
11	18375	SE11086	Residential	1972	S OF LOT	Yes	2014	Yes	Yes	Multiple Types	Yes	C												
12	8923	SE61276	Residential	1955		Yes	2022	Yes	Yes	Road Surface	No													
13	4316	SE32909	Residential	1972		Yes	2016	Yes	Yes	Multiple Types	No													
14	26697	SE22368	Residential	1962	FD BHND HEDGE ON 90TH	Yes	2019	No	No		No													
15	10834	SE1851	Residential	1960		No	2022																	
16	13801	SE5695	Residential	1920	ON KEYLOCK EOL	Yes	2007	Yes	Yes	Multiple Types	Yes													
17	1870	SE10856	Residential	1976		Yes	2019	Yes	Yes	Sidewalk Panels	No													
18	261	SE19378	Residential	1952	30' LFT OF MAILBOX UNDER HEDGE	No	2022	Yes	Yes	Road Surface	Yes													
19	16737	SE9092	Residential	1978	OPPOSITE FRONT WINDOW	No	2014	Yes	No		Yes													
20	20107	SE12557	Residential	1975	15'N OF DRIVE N METER	No																		
21	28029	SE24127	Residential	1978	0	Yes	2019	Yes	Yes	Sidewalk Panels	No													
22	3189	SE26122	Residential	1981	W OF PROP	No																		
23	14163	SE5604	Residential	1975		Yes	2014	Yes	Yes	Sidewalk Panels	No													
24	29815	SE26109	Residential	1983	W EDGE OF HOUSE	No																		
25	633	SE45203	Residential	1965		Yes	2022	Yes	No		No													
26	13442	SE5277	Residential	1978		Yes	2011	Yes	No		No													
27	2871	SE22635	Residential	1966	0	Yes	2014	Yes	Yes	Road Surface	No													
28	23271	SE16607	Residential	1955	5 W OF DR	No																		
29	2807	SE21865	Residential	1971		Yes	2014	Yes	Yes	Sidewalk Panels	No													
30	5245	SE35167	Residential	1972		Yes	2012	Yes	No															
31	16346	SE8559	Residential	1969	WEST OF PROPERTY LINE	Yes	2014	Yes	No		No													
32	12942	SE4739	Residential	1975	OPP PORCH LIGHT	Yes	2014	Yes	No		No													
33	10418	SE1708	Residential	1956		Yes	2022	Yes	No		No													
34	28469	SE24615	Residential	1972		Yes	2016	Yes	Yes	Sidewalk Panels	No													
35	9592	SE441	Residential	1961	0	Yes	2022	Yes	No		No													
36	18329	SE11024	Residential	1972	N EDGE OF FRT DOOR	Yes	2022	Yes	No		No													

J	K	L	M	N
(2) Utilities in Dig Area	(3) Sidewalk or Driveway or Concrete/Asphalt	Concrete/ Asphalt Type	(4) Large Physical Obstruction	Obstruction Type
Yes	Yes		Yes	
Yes	No		No	
No	Yes		Yes	
Yes	Yes	Sidewalk Panels	No	Other
Yes	Yes	Road Surface	No	
No	Yes	Road Surface	No	
No	Yes	Road Surface	No	
Yes	Yes	Multiple Types	Yes	Other
Yes	Yes	Multiple Types	No	
-	Yes	Road Surface	Yes	Other

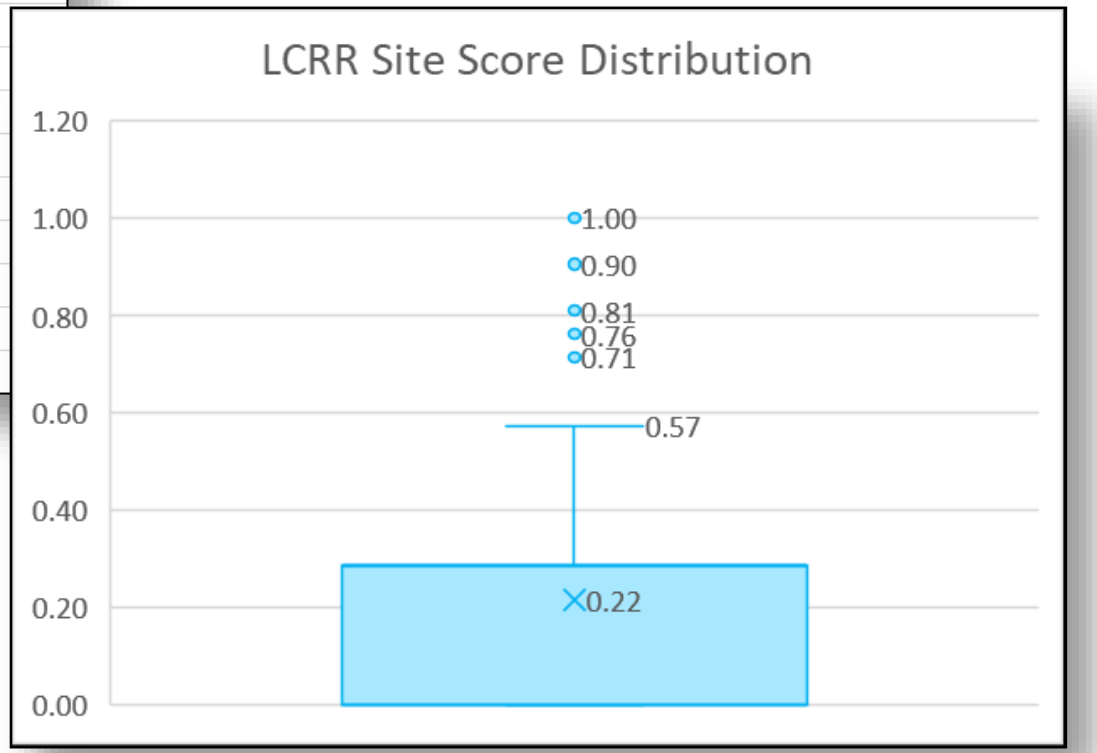
- Qualitative assessment to determine potential difficulty of inspection
- Right-of-entry (ROE) analysis also performed using GIS

TUALATIN VALLEY WATER DISTRICT

INITIAL SITE ASSESSMENT RANKING

		6	5	4	3	2	1
		Utility	Concrete/F	Obstructio	Traffic Con	Trees/Drip	Landscaping
6	Utility	234	33	8	19	37	7
5	Concrete/F	33	46	7	3	6	6
4	Obstructio	--	--	9	2	4	3
3	Traffic Con	--	--	--	20	5	2
2	Trees/Drip	--	--	--	--	60	3
1	Landscapir	--	--	--	--	--	13

		Utility	Concrete/F	Obstructio	Traffic Con	Trees/Drip	Landscaping
	Utility	57%	8%	2%	5%	9%	2%
	Concrete/F	--	11%	2%	1%	1%	1%
	Obstructio	--	--	2%	0%	1%	1%
	Traffic Con	--	--	--	5%	1%	0%
	Trees/Drip	--	--	--	--	15%	1%
	Landscapir	--	--	--	--	--	3%



- Quantitative assessment of qualitative site characteristics to better understand impediments (singular and paired)

TUALATIN VALLEY WATER DISTRICT

Communications Strategy and Toolkit

TUALATIN VALLEY
WATER DISTRICT

APPROACH OVERVIEW

1. Determine project goals
2. Identify and prioritize stakeholders
3. Refine messaging and visual brand
4. Create toolkit and implementation strategy

TUALATIN VALLEY WATER DISTRICT

COMMUNICATION GOALS

Build upon updated vision and mission

Improve upon new TVWD brand

Engage in a different way with customers, beyond billing

Educate audiences on TVWD's water system and work

Lead to a better understanding of Willamette Water Supply System (WWSS) in advance of 2026

STAKEHOLDER IDENTIFICATION AND PRIORITIZATION

Identified people, organizations, and audiences impacted by, responsible for, and supportive of this project

TUALATIN VALLEY WATER DISTRICT

MESSAGE FRAMEWORK

- What do we want each priority stakeholder group to understand?
- How does this relate to TVWD's mission, vision, and values?

Mission

Reliable, resilient, and safe water

Vision

Our water sustains thriving communities – every day for everyone

Values

Respect | Integrity | Service | Equity

Message Framework

Keeping water safe – every day, for everyone

Service Line Inventory Project

Project Message for Audiences

Audiences

- Inventory Participants
- Staff
- Local Partners
- Regulators/ Industry

Message Framework

Keeping water safe – every day, for everyone

Service Line Inventory Project

Project Message for Audiences

Audiences

Inventory Participants

This year, TVWD is conducting an inventory of its service lines to demonstrate that they meet new rules for lead and copper materials…

Staff

TVWD is working to confirm that there are no lead service lines in our system…

Local Partners

TVWD remains compliant with lead and copper regulations …

Regulators/ Industry

TVWD is demonstrating its leadership among drinking water providers…

TUALATIN VALLEY WATER DISTRICT

VISUAL BRAND VISION AND STYLE

Realistic
Accessible
Informative
Clear
Modern
Dynamic
Proactive
Progressive
Professional

Distinct visual style that centers on TVWD's expertise and commitment to service

TUALATIN VALLEY WATER DISTRICT

OUTREACH TOOLKIT

Inventory participants and general customers

Information on the service line inventory project

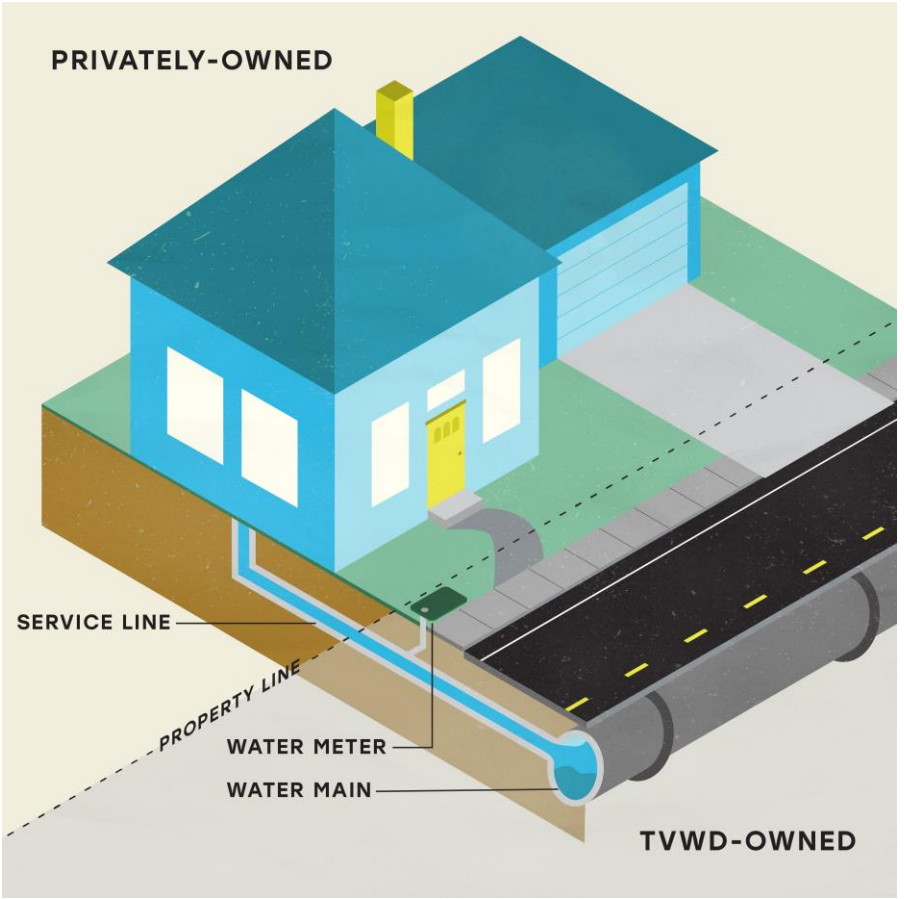
TVWD staff

Materials for interacting meaningfully with curious customers

TUALATIN VALLEY WATER DISTRICT

DEVELOPED GRAPHICS TO CONVEY COMPLEX TOPICS

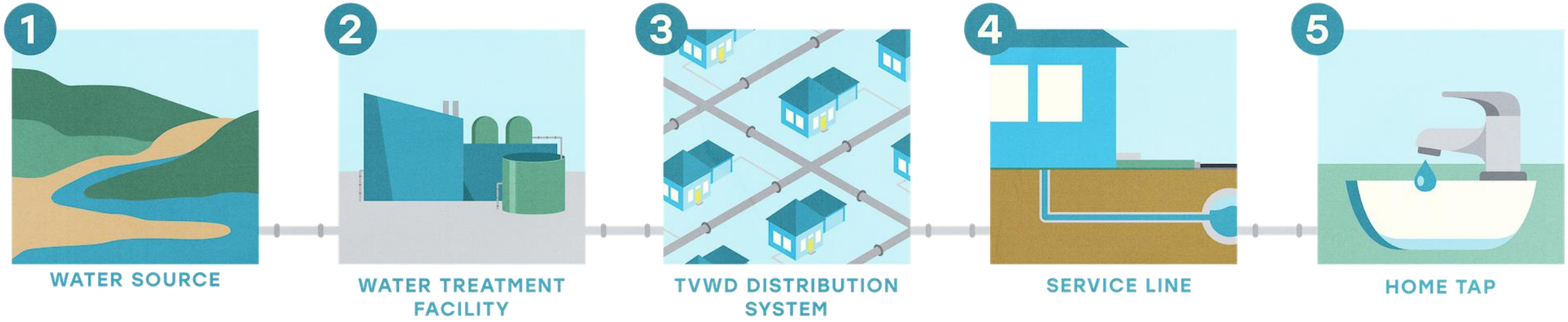
Inventory random sampling



Service line education

TUALATIN VALLEY WATER DISTRICT

CONNECTING INVENTORY EFFORT TO PRIMARY TVWD SERVICES



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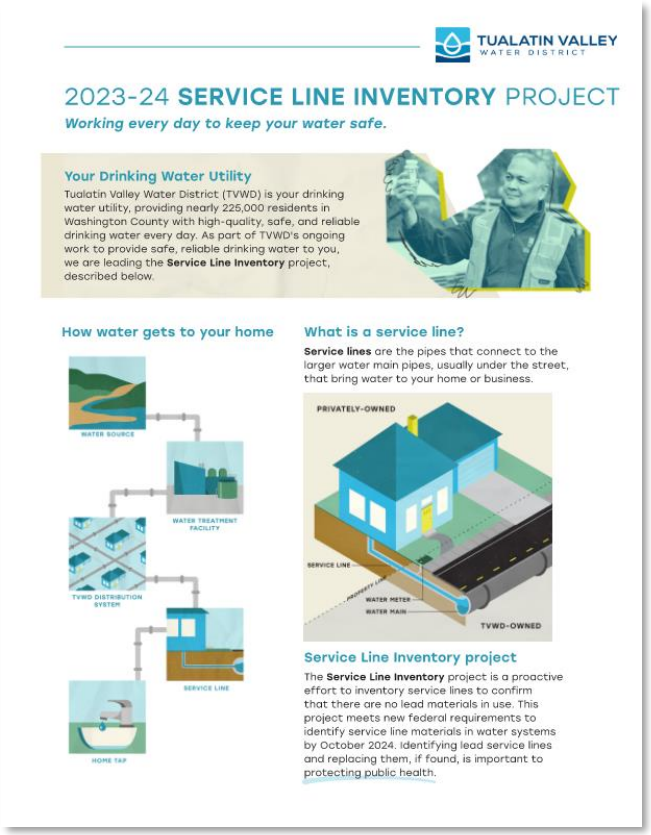
UNDERSTANDING INVENTORY PURPOSE AND PROCESS

Fact sheets about the Service Line Inventory project

Customized for inventory participants as well as general customers

Available in English and Spanish



TUALATIN VALLEY WATER DISTRICT

2023-24 **SERVICE LINE INVENTORY** PROJECT

Working every day to keep your water safe.

Your Drinking Water Utility

Tualatin Valley Water District (TVWD) is your drinking water utility, providing nearly 225,000 residents in Washington County with high-quality, safe, and reliable drinking water every day. As part of TVWD's ongoing work to provide safe, reliable drinking water to you, we are leading the **Service Line Inventory** project, described below.

How water gets to your home

What is a service line?

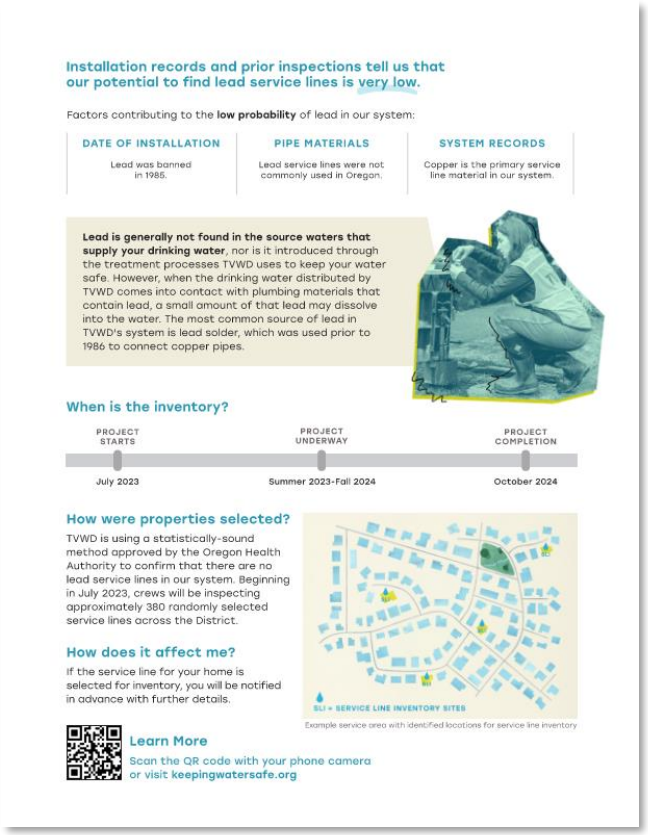
Service lines are the pipes that connect to the larger water main pipes, usually under the street, that bring water to your home or business.

PRIVATELY-OWNED

TVWD-OWNED

Service Line Inventory project

The **Service Line Inventory** project is a proactive effort to inventory service lines to confirm that there are no lead materials in use. This project meets new federal requirements to identify service line materials in water systems by October 2024. Identifying lead service lines and replacing them, if found, is important to protecting public health.



Installation records and prior inspections tell us that our potential to find lead service lines is very low.

Factors contributing to the **low probability** of lead in our system:

DATE OF INSTALLATION	PIPE MATERIALS	SYSTEM RECORDS
Lead was banned in 1985.	Lead service lines were not commonly used in Oregon.	Copper is the primary service line material in our system.

Lead is generally not found in the source waters that supply your drinking water, nor is it introduced through the treatment processes TVWD uses to keep your water safe. However, when the drinking water distributed by TVWD comes into contact with plumbing materials that contain lead, a small amount of that lead may dissolve into the water. The most common source of lead in TVWD's system is lead solder, which was used prior to 1986 to connect copper pipes.

When is the inventory?

PROJECT STARTS	PROJECT UNDERWAY	PROJECT COMPLETION
July 2023	Summer 2023-Fall 2024	October 2024

How were properties selected?

TVWD is using a statistically-sound method approved by the Oregon Health Authority to confirm that there are no lead service lines in our system. Beginning in July 2023, crews will be inspecting approximately 380 randomly selected service lines across the District.

How does it affect me?

If the service line for your home is selected for inventory, you will be notified in advance with further details.

SLI = SERVICE LINE INVENTORY SITES

Example service area with identified locations for service line inventory

Learn More

Scan the QR code with your phone camera or visit **keepingwatersafe.org**

TUALATIN VALLEY WATER DISTRICT

INVENTORY EDUCATION EXTENDED BEYOND PRINT MATERIALS

New “microsite” allowed new branding, imagery, footage, and graphics to be brought to life

TUALATIN VALLEY WATER DISTRICT

COMMUNICATIONS PLAN

Reference for Service Line Inventory outreach strategy

Goals, target audiences, tools, and implementation strategies

Inventory Implementation

TUALATIN VALLEY
WATER DISTRICT

WHY CONTRACT SERVICES?

Pros

1. Allowed TVWD to maintain current CIP efforts
2. Service levels maintained (e.g., leak responses, customer service)
3. Ongoing Willamette Supply work and planning could be maintained
   - UDF, construction support, etc.

Cons

1. More effort up front (e.g., RFP)
2. Increased daily project management needs
3. Greater risk for disconnected customer communications
   - Contractor ≠ TVWD level of customer service

The District has not discovered any full or partial LSLs in its system to-date, nor was the material ever allowed based on historical design records. This is consistent with the water providers across the region and Oregon in general. Based on this information, it is the current belief that the District is at low risk for discovering any LSLs through the Project. Regardless, it is the responsibility of the District to complete this work in the interest of public health protection and to confirm this hypothesis.

District staff will utilize the results from the physical evaluation in a statistically significant model, whereby the remaining "unknown" materials are classified as "non-lead" with a 95% level of confidence. If an LSL is discovered, either partial or full, the District must perform additional investigation and classification to identify the underlying factors that indicate where potential LSLs may exist in other isolated parts of the District's system.

3. Scope of Work

The District requires an Oregon CCB-licensed contractor capable of performing minor excavation work using vactor-truck technology (i.e., potholing) to identify materials on both the public (District) and private (customer) side of approximately 400 randomly selected service lines with "unknown" status, immediately adjacent to the District-owned water meter. This work will occur in both the public and private right-of-way. Additionally, a portion of these excavations will require sidewalk panel removal and repair, or some degree of roadway or asphalt work to access either the District or customer side service line for material identification.

If a full or partial LSL was discovered, the District may require additional locations for inspection to use for further statistical modeling process. The number of additional excavations needed would be determined at that time along with a potential contract amendment to support this work.

To provide an estimated profile of the work locations, the District performed a desktop evaluation of a 409 randomly selected sites, which is more than the minimum excavations needed to account for replacement sites during the inventory process. Based on this evaluation, the District estimates the following:

a. 389 (95%) occur in low-traffic locations and are likely to need only minor traffic control measures.
b. 46 (11%) are likely to require minor to moderate sidewalk or asphalt repair, such as sidewalk panel replacement or patching of existing roadway asphalt after excavation.
c. 234 (57%) have a visually identified above-grade utility box or similar apparatus within 5 feet of the District-owned meter.
d. 60 (15%) occur within 5 feet of a tree or other large bush.
e. 13 (3%) are likely to need some degree of minor to moderate landscape removal and restoration (e.g., trimming and potential replanting of vegetation or hardscaping repair post-excavation).
f. 299 (73%) occur within the public right-of-way; 98 (24%) occur outside the right-of-way and will require site owner approval before excavation begins (i.e., right of entry), which is currently underway by District staff; and 12 (3%) are still being evaluated.

The required excavation is only enough to visually confirm approximately 2 feet of the service line material on either side of the meter. The details from the desktop evaluation are provided to help proposers understand the potential resources needed to complete the work. In general, these are still considered minor excavation sites. The minimum excavations needed by the District is 380 to perform the statistical analysis. The additional sites included in the desktop evaluation are intended to provide pre-evaluated replacement sites should an individual site present too many challenges once a proposer's team is on site. The District, at its discretion, will evaluate these situations with the selected proposer and provide an alternate site from the randomly selected list upon agreement that the excavation and overall site restoration are too difficult to pursue further work.

RFP PROCESS

Creating a biddable package was a unique challenge

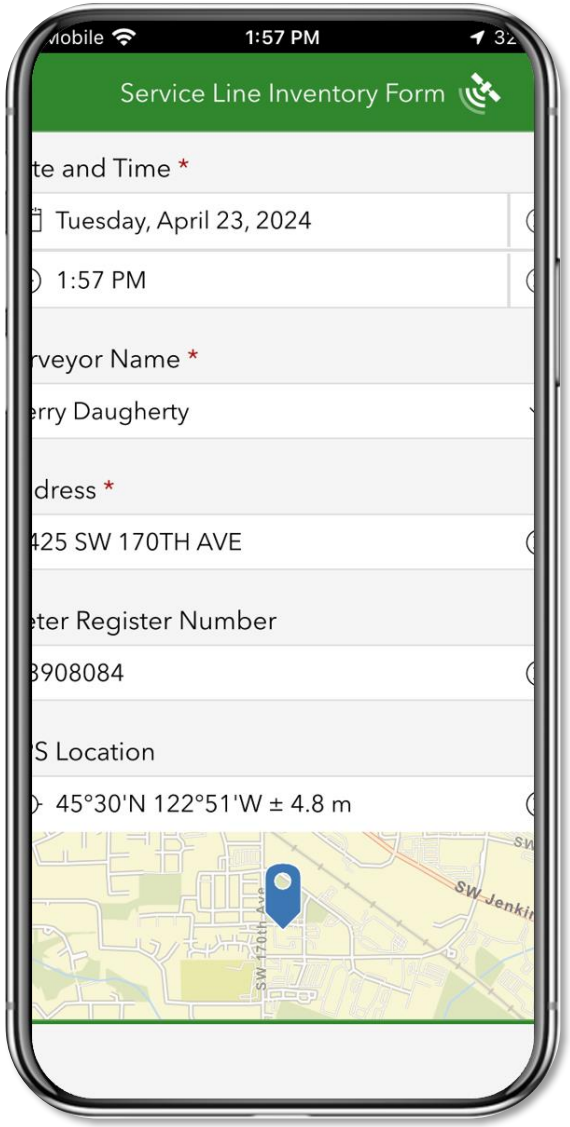
- Front loaded with as much detail as possible
  - Used our matrix to define the scope
  - Time and materials vs. unit cost – landed on unit cost
  - Requirement to have plumbing services (on staff or on call)
- Outreach to woman and minority owned contractors

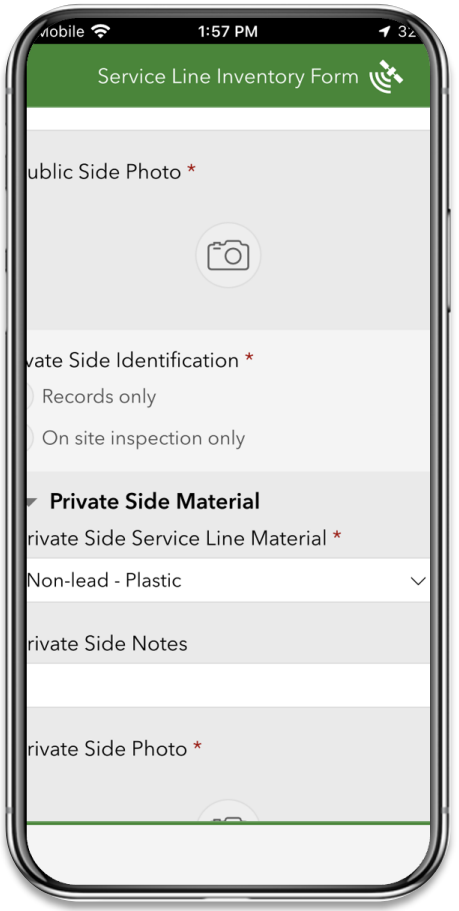
TUALATIN VALLEY WATER DISTRICT

LEVERAGING TECHNOLOGY

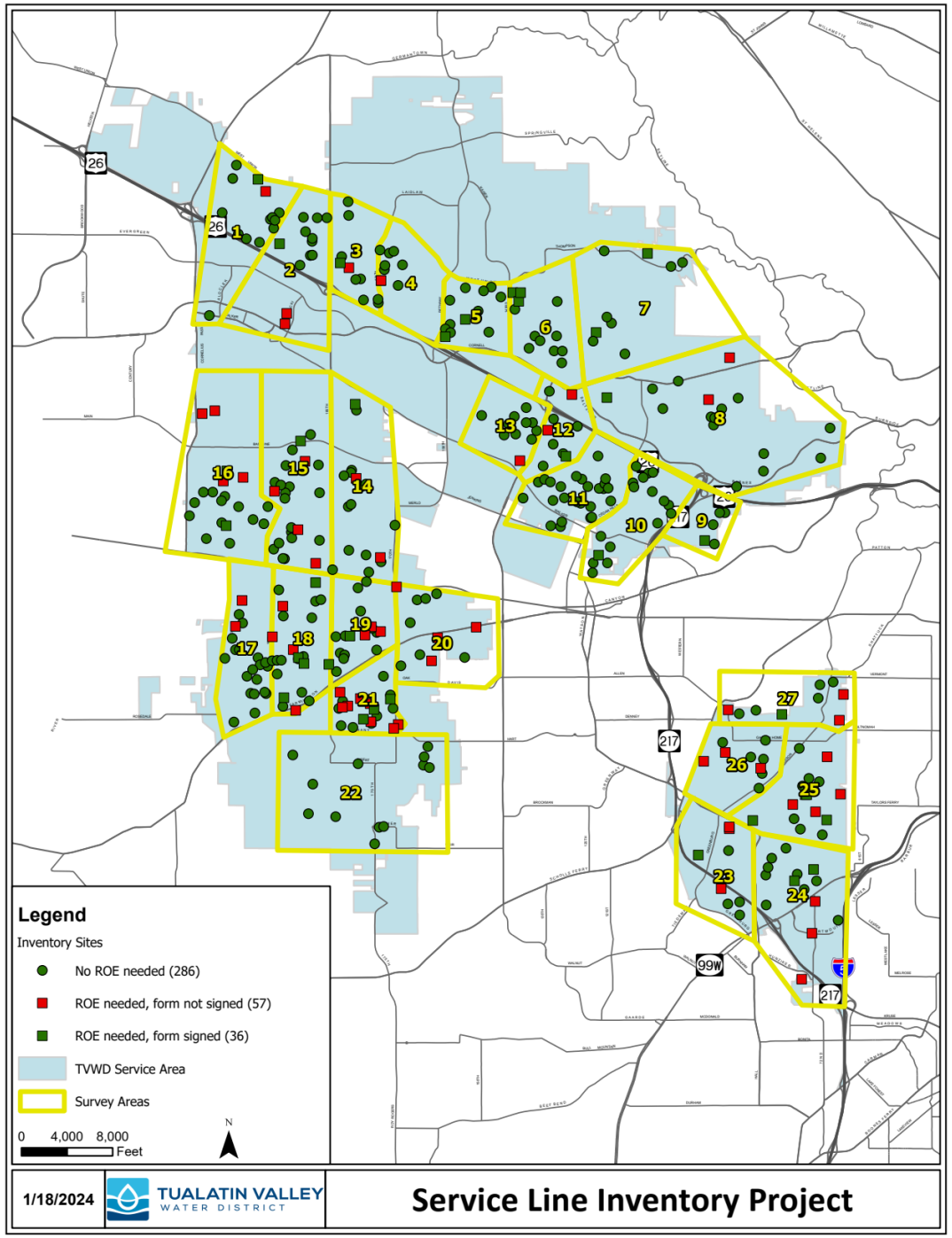
2020-2021 Pilot effort helped to establish data collection in the field

- Used mobile based field application called Survey123
- Aligned terminology to LCRR/OHA language
- Provided iPads to contractor
  - Security, minimize technology “hiccups,” etc.





TUALATIN VALLEY WATER DISTRICT



INVENTORY DEPLOYMENT

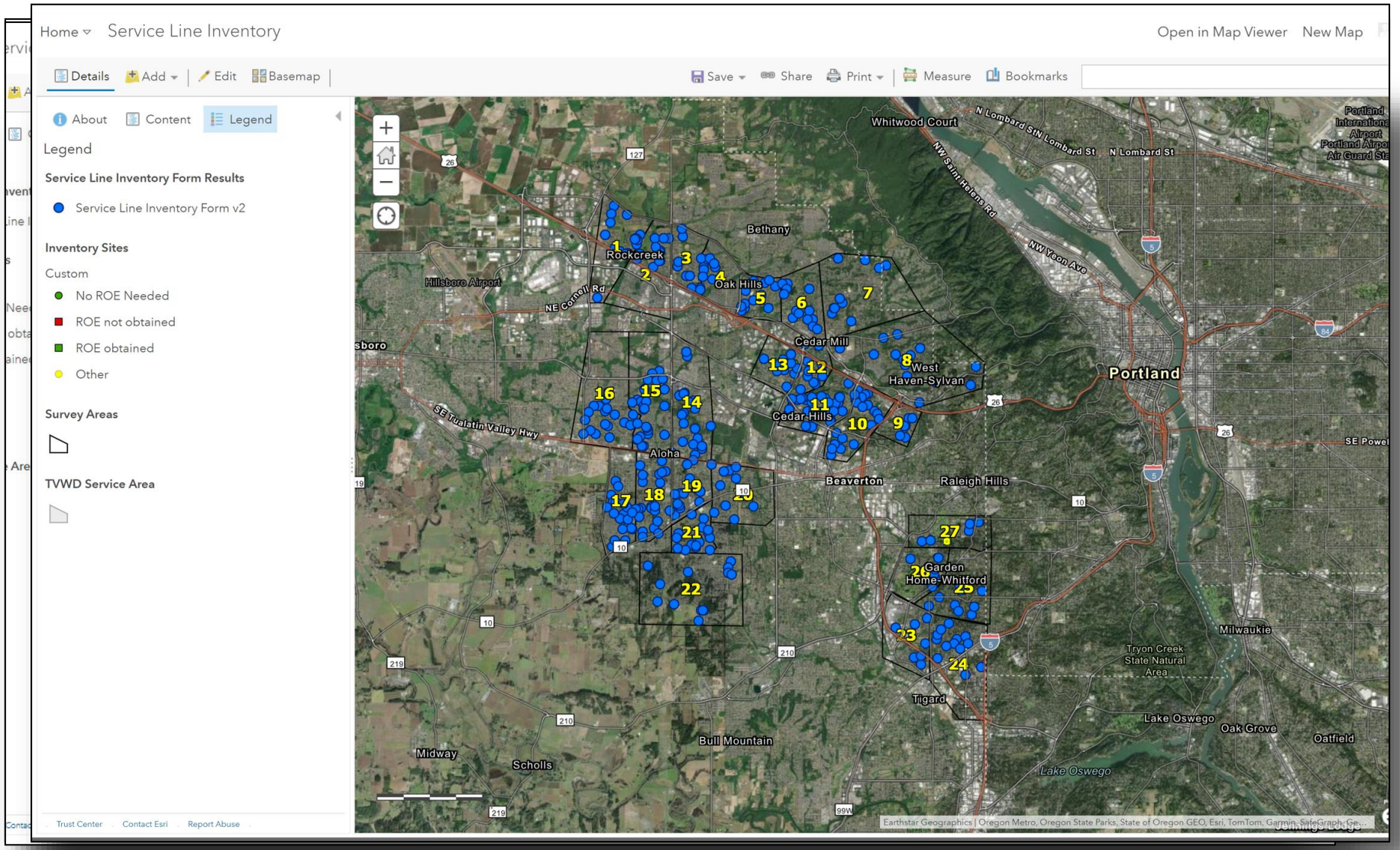
Collaboration with contractor led to dividing project into 27 “zones”

- Workload leveling for TVWD and contractor
- Expedited review of data/photos
- Better ability to perform advanced outreach as work progressed
- Customer follow-up more effective (e.g., “what was my material?”)

TUALATIN VALLEY WATER DISTRICT

PROGRESS TRACKING

- Able to track progress in real time
- Initial project duration was two months
- Final project duration was four weeks



Time-lapse of project duration, January 29 – February 19, 2024

TUALATIN VALLEY WATER DISTRICT

INVENTORY: COMMUNICATIONS TOOLKIT DEPLOYMENT

Nov 2023

- Digital media already deployed
- Initial outreach to all 378 sites
- Specific messaging for ROE sites

Dec 2023

- Provided print materials to contractor
- Began follow-up with ROE sites

Jan 2024

- Contractor began (delayed due to freeze event)
- “Zone” tracking used for advance outreach

Feb-Mar 2024

- Final email and phone calls to ROE sites
- Completed inventory (378 + 12 extra sites)

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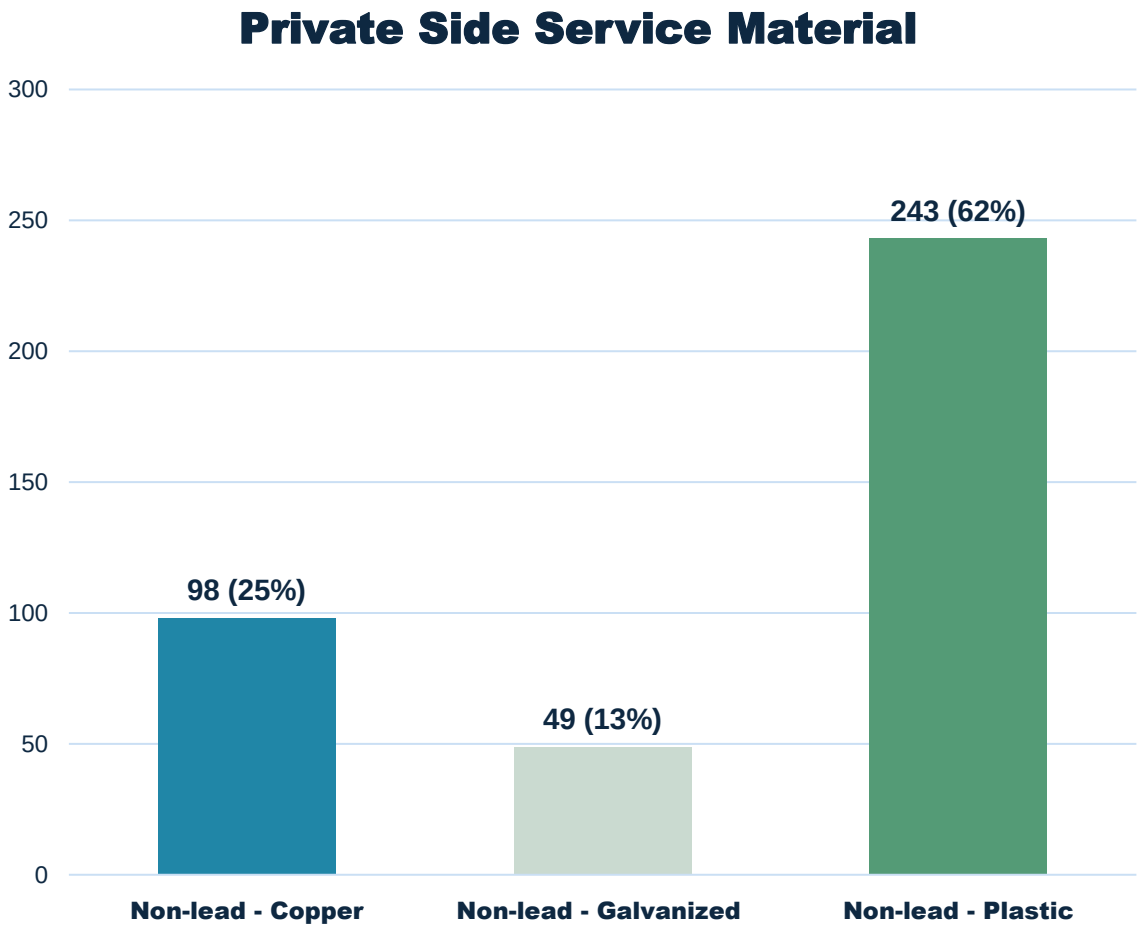
INVENTORY RESULTS



390 total inspections – No lead, public or private side

- Added sites to align with proposed LCRI statistical method bins
- Majority were plastic based (e.g., PVC, PEX)
- 49 classified as “Galvanized Requiring Replacement” under OHA required inventory template

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INVENTORY PROCESS SUMMARY

Challenges

- ROE sites – 35% non-respondent
  - Remaining sites replaced with randomly selected non-ROE sites (34 sites)
- Initial contracting slowed progress
- More training and coordination with contractor vs. internal staff
- Some initial site inspections weren't adequate (e.g., not enough material exposure, poor photos)

Successes

- ROE sites – 65% were responsive
- Little to no customer complaints
- Feedback loop w/ contractor – use of real time data collection (i.e., Survey123)
- Inspection timeline halved
- Under budget
- Data collection process minimized errors

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Key Takeaways

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WHAT LESSONS DID WE LEARN

- Well prepared communications meant minimal customer issues, higher approval rate for ROE
- Input from a large cross section of TVWD led to higher quality and buy-in for the outreach toolkit
- Early technology vetting led to a near seamless use of contract services
- Contractor efficiency led to being under budget
- Early regulatory planning is beneficial

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Brown AND Caldwell

THANK YOU! Q&A TIME

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