

ELECTRO SCAN SWORDFISH



WINNER 'Best of Sensors' Cleantech/Sustainability



BEST OF
Sensors
AWARDS 2023

WINNER

**CLEANTECH/
SUSTAINABILITY**

Electro Scan Inc
SWORDFISH

June 21, 2023



Utility-Side, Customer-Side

- Lead, Lead
- Lead, Non-lead
- Lead, No information
- Non-lead, Lead
- Non-lead, Non-lead
- Non-lead, No information
- No information, Lead
- No information, Non-lead
- No information, No information



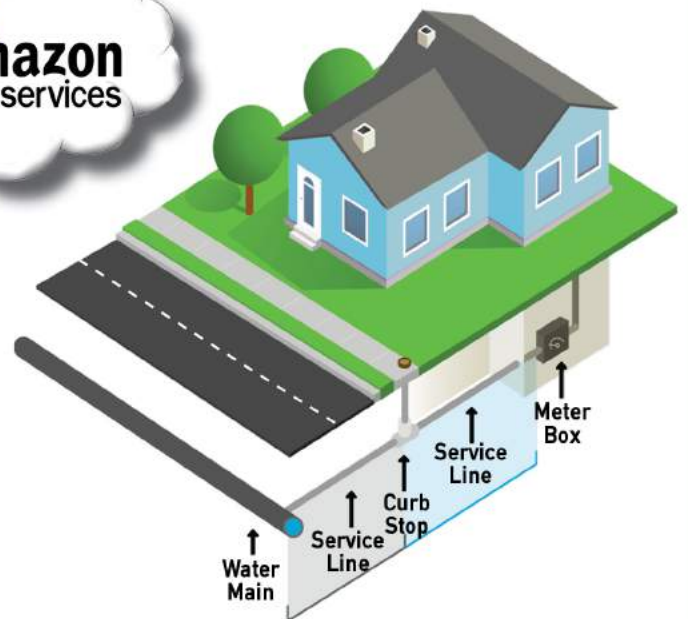
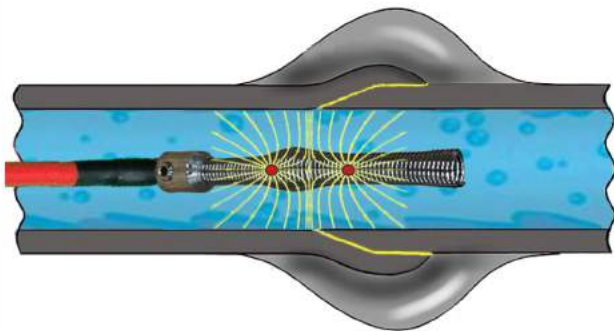
electro^{scan}



Buried Lead Pipe Detection



- **SWORDFISH** is the world's first hand-held buried lead pipe detection tool using an 18V battery with automatic system for cable feed in pipe diameters from ½ to 3 inches (12mm - 76mm)
- **SWORDFISH** is based on Electro Scan's patented machine-intelligent technology, developed in accordance with the American Water Works Association, Manual M77, Water Main Condition Assessment, to measure electric resistance using low-voltage conductivity to locate buried lead pipes.
- **SWORDFISH's** design enables users to grip the device with one hand and have the other hand free to guide the Electro Scan probe and cable in and out of the companion service line pipe insertion device.
- **SWORDFISH's** cable feed system maintains a selected feed speed with its rotating action allowing users to navigate multiple 90° pipe bends.
- **SWORDFISH's** fully enclosed drum eliminates free spinning parts, providing users with more protection to work in and around basement meters, bends and other obstructions.
- **SWORDFISH** readings are captured in real-time with data transmitted and processed in Electro Scan's Critical H₂O cloud application, with results independently verified using a 3M Lead Test Kit for 100% verification of lead pipe.



Field operation requires full compliance with EPA guidelines for drinking water pipe entry.

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U.S. Patents and Patents Pending: 9143740, 9304055, 9933329, 10451515, 10557772, 10816431

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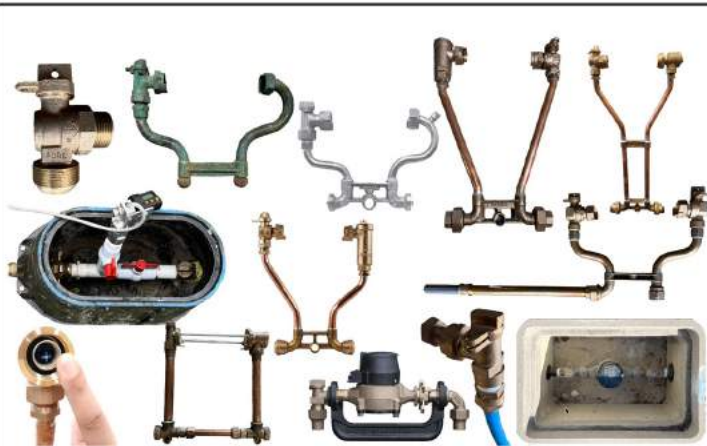


- **SWORDFISH SE** is the world's first hand-held buried lead pipe detection tool. It uses an 20V battery with automatic system for cable feed and retraction in pipe diameters from ½ to 3 inches (12mm - 76mm) to handle difficult to entry meters, valves, and fittings.
- **SWORDFISH SE** is based on Electro Scan's patented machine-intelligent technology, developed in accordance with the American Water Works Association, Manual M77, Water Main Condition Assessment, to measure electric resistance using low-voltage conductivity to locate buried lead pipes.
- **SWORDFISH SE's** design enables users to grip the device with one hand and have the other hand free to guide the Electro Scan probe and cable in and out of the companion service line pipe insertion device.
- **SWORDFISH SE's** cable feed system maintains a selected feed speed and allows users to navigate multiple 90° pipe bends, .
- **SWORDFISH SE** readings are captured in real-time with data transmitted to and processed in Electro Scan's Critical H₂O cloud application, with results independently verified using a 3M Lead Test Kit for 100% verification of lead pipe.

Electro Scan's SWORDFISH SE Designed for Difficult Pipe Entries.

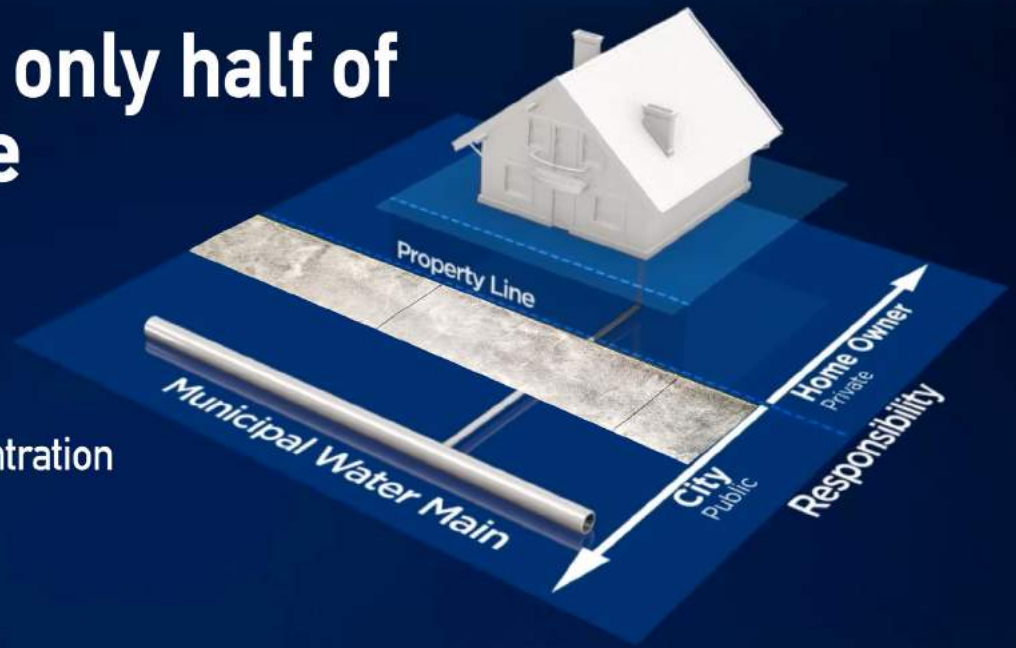
Curb Box Entries

Basement Entries

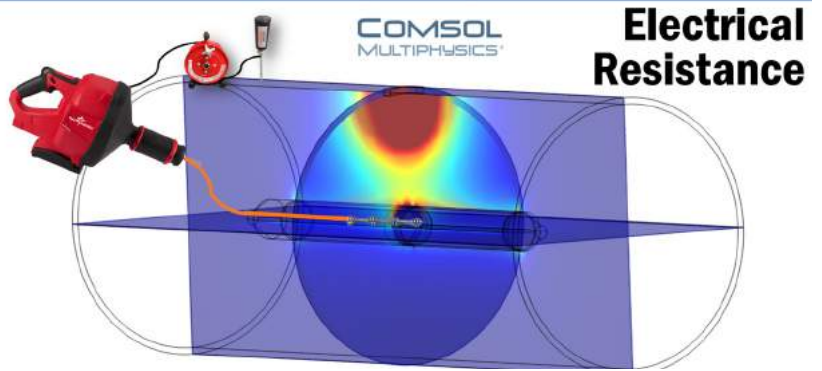


Removing only half of a lead pipe




3x the lead concentration



100% Accuracy to Identify Lead Buried Pipe



Electro Scan SWORDFISH Comparison

Feature Comparison			
Product	SWORDFISH	SWORDFISH SE Special Edition	SWORDFISH FX Flow Express
Target Service Line Entry	For utilities with meter setting entries with limited 90-degree bends and straight entries.	For utilities that have valves with extreme internal geometry, change in pipe diameter, and multiple 90-degree bends.	Designed for multiple bends in non-pressurized (gravity) pipes, primarily for meter-to-house customer service lines.
Cable Length	80 ft	100 ft	500 ft
Cable Diameter	1/4"	3/16"	3/16"
Pipe Diameter	1/2" - 3"	1/2" - 3"	1/2" - 3"
Probe	Spring/Beveled	Purpose Built	Meter-to-House Only
Real-Time Display	✓	✓	✓
Bluetooth Enabled	✓	✓	✓
Insertion Tube	✓	✓	✓
Pressurized Entry	✓	✓	✗
Non-Pressurized Entry	✓	✓	✓
Power Forward	✗	✓	✓
Power Retraction	✗	✓	Powered by Hydraulic Pump
Power Rotation	✓	✗	✗
MSRP	\$70,000	\$74,500	\$65,000

U.S. Patents and Patent-Pending.

Hear What Other Water Utilities Are Doing To Inventory Their Lead Service Lines.

28-City U.S. Roadshow



60' LONG 1/2" +/- WATER SERVICE PIPE

ACTUAL LENGTH OF PIPE SEGMENT MAY BE 65' +/- BECAUSE THE ALIGNMENT OF THE LEAD AND COPPER SEGMENTS 'WANDERS' VERTICALLY AND HORIZONTALLY BASED ON HOW THESE MATERIALS 'UNSPOLED' DURING INSTALLATION

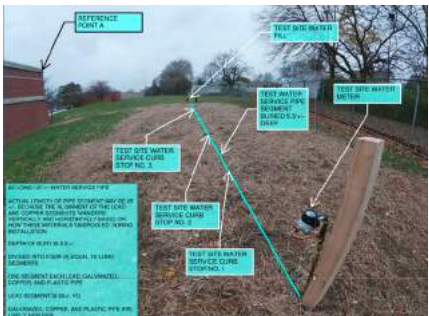
DEPTH OF BURY IS 5.5' +/-

DIVIDED INTO FOUR (4) EQUAL 15' LONG SEGMENTS

ONE SEGMENT EACH LEAD, GALVANIZED, COPPER, AND PLASTIC PIPE

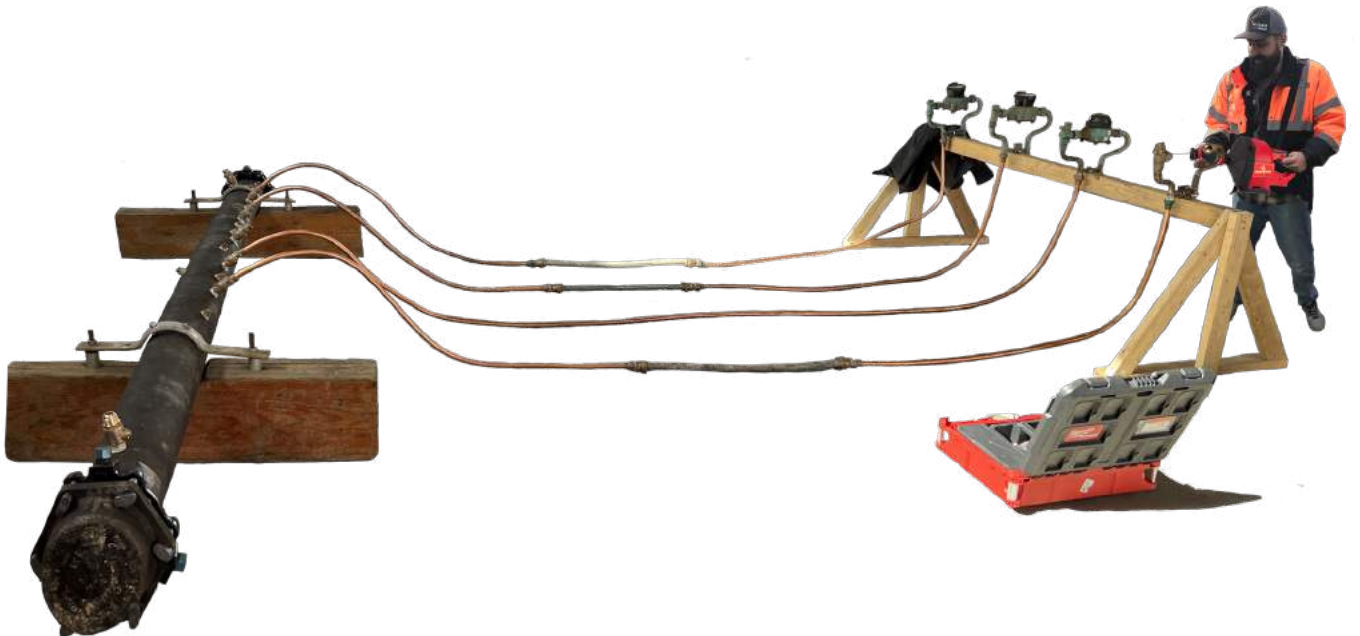
LEAD SEGMENT IS 90+/- YO

GALVANIZED, COPPER, AND PLASTIC PIPE ARE LIKELY NEW PIPE



electro^oscaninc.

SWORDFISH FINDS LEAD PIPES NOT FOUND USING DESKTOP ANALYTICS



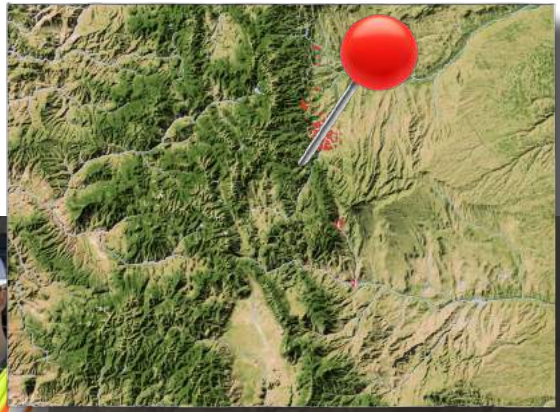
WITHOUT DIGGING.

Miami, FL

SWORDFISH TESTING



Denver, CO



LEAD



NO LEAD



Bowling Green, KY



Bowling Green, KY, Tuesday, November 7, 2022



Brunswick, GA

Buried Lead Detection Without Digging



Norwood, MA

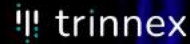


Allentown, PA



Washington, DC

Thursday, May 26, 2022 | 11:20am-12:10pm US Eastern



Meena Sankaran
Moderator



Eric Schwartz

Michelle Cock.

Rajan Ray

Chuck Hansen

'Who Led the Lead Out?'

SWAN 12th Annual Conference, Washington DC

May 26, 2022



**Rajan Ray, VP Strategy
& Marketing, Trinnex**

**Chuck Hansen, CEO,
Electro Scan Inc.**



Reporting in Minutes

SWORD FISH




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Swordfish deployed by sean@electroscan.com at 200 Union Street, Brunswick on Thu Dec 01 2022 09:56:58 GMT-0600 (Central Standard Time) with results indicating:

Agency
Brunswick-Glynn Joint Water & Sewer Commission
1703 Gloucester Street
Brunswick GA 31520
Derrick Simons


Worksite
200 Union Street
Brunswick GA 31520

Contractor
sean@electroscan.com



Lead Test
Result:
Test Used: 3M Lead Check
Performed: Thu Dec 01 2022 09:56:58 GMT-0600 (Central Standard Time)
Pipe Type: Not Known (XXX)
Pipe Diameter: 0.5
Max Load: 94
Pipe Entry Method: Meter - Inside Home
Operator Notes:

Swordfish



©Copyright Electro Scan Inc.

powered
by

aws








LET ELECTRO SCAN SHOW YOUR WATER UTILITY HOW TO...

Finding Non-Revenue Water While Locating Lead Service Lines (LSLs)

electro scan

Condition Assessment and Leak Detection Module



 Meter Box Lid	 Meter Box	 Meter	 Valve from Meter to Main	 Valve from Meter to Home
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Condition Assessment & Leak Detection Module

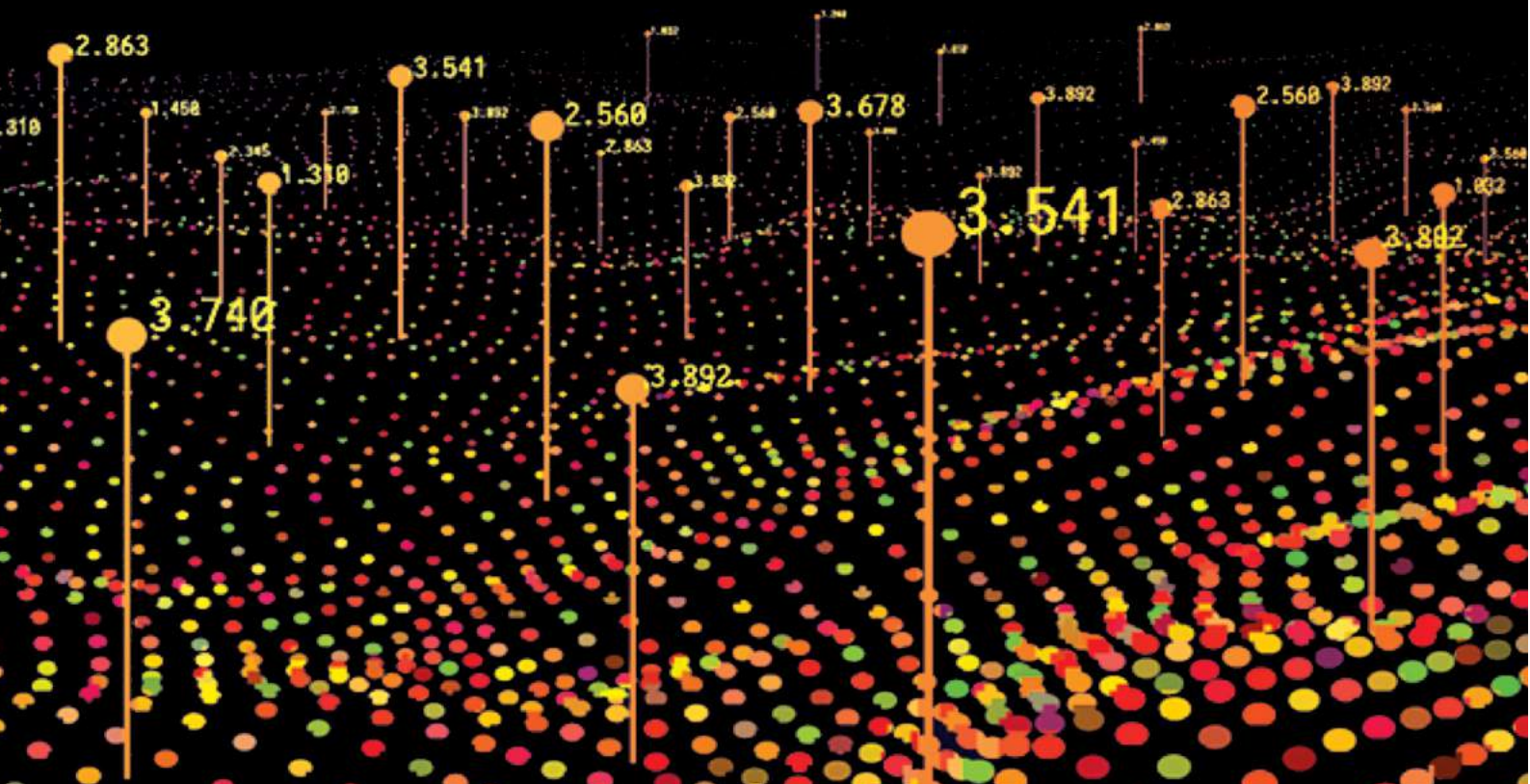
- Inventory Water Fixtures & Plumbing Components.
- Rate the Condition and Recommend Repairs or Replacements.
- Identify Existing Leaks to Solve Non-Revenue Water Equation.
- Automatically Generate Order Entry and Extended Invoice.
- Schedule Parts Delivery Associated with Specific Property Address.
- Upgrade Plumbing Fixtures to Increase Asset Life.

Available as an Optional Module to the Electro SWORDFISH Field Application. Integrated to Amazon Web Service Critical H2O Application. powered by 



Requires SWORDFISH Field Application and Critical H2O Cloud Application Licensing, including Microsoft® Surface® Tablet.





Never Miss Another Lead Pipe.

BASE UNIT 	PROBES 	SURFACE LAPTOP 	INSERTION TUBE Plus, Chlorination Chamber 	GROUNDING STAKE
LITHIUM BATTERY 	WI-FI 	LEAD TEST 	CRITICAL H₂O CLOUD REPORTING 	

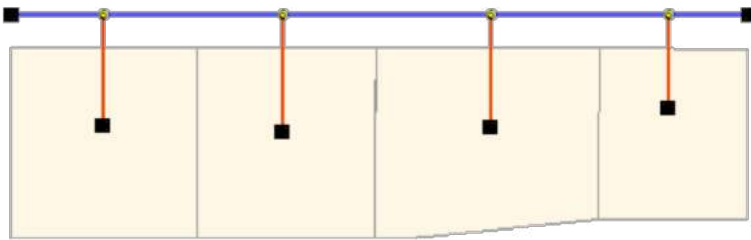
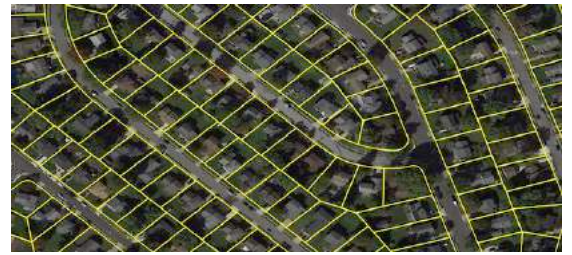
Electro Scan SWORDFISH

Why Your GIS Can't Provide a Detailed Inventory?

GIS CORRECTED BY SWORDFISH

Connecting a Parcel to a Water Main with a line may look good on paper, but it is not a substitute to correctly portray real-world Water Service Lines.

Time to fix your GIS.



Lead Inventory Requires Two Sides of the Meter. Utility & Customer- Owned Services.



Guidance for Developing and Maintaining a Service Line Inventory

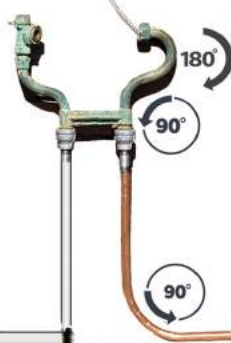
Prepare an inventory that includes the system- and customer-owned portions of all service lines in the system's distribution system.

Office of Water (4606M)
EPA 816-B-22-001
August 2022



Meter-to-Main

Meter-to-House






Why Predictive Models & GIS Fail to Identify Lead Pipes?



Given \$1 trillion of service line pipe replacements during the last 50 years, notice how random lead vs. non-lead service lines are currently found in this City.

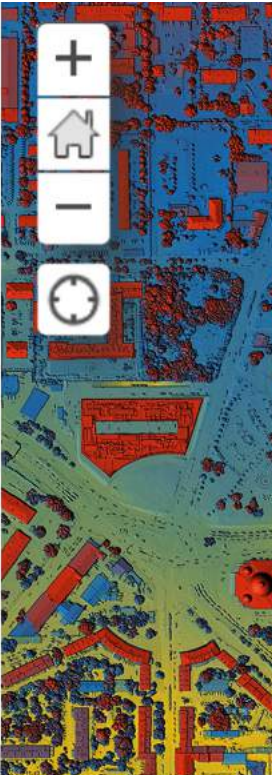


LEGEND

-  Lead Service
-  Possible Lead Service
-  Not a Lead Service

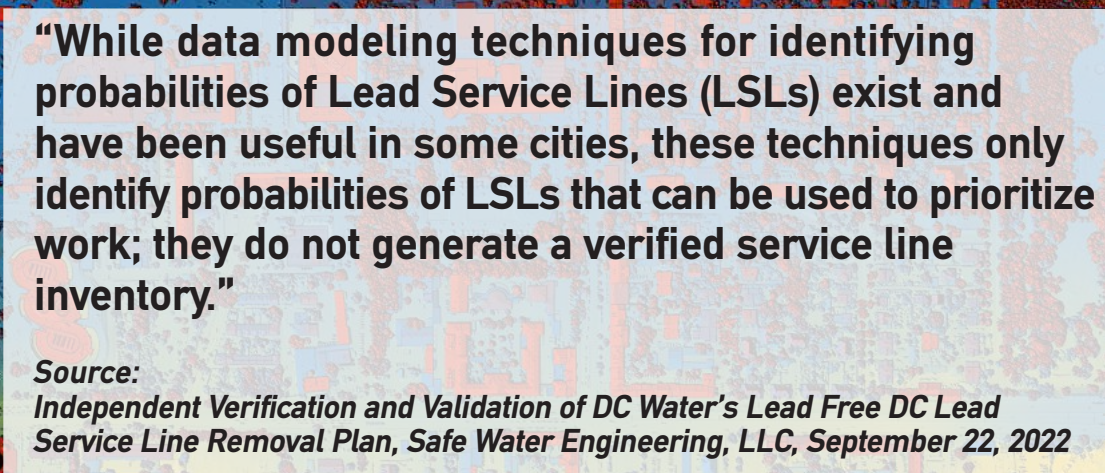


GIS Is Not Accurate & Doesn't Often Represent As-Built Conditions



“While data modeling techniques for identifying probabilities of Lead Service Lines (LSLs) exist and have been useful in some cities, these techniques only identify probabilities of LSLs that can be used to prioritize work; they do not generate a verified service line inventory.”

*Source:
Independent Verification and Validation of DC Water's Lead Free DC Lead Service Line Removal Plan, Safe Water Engineering, LLC, September 22, 2022*



OLD WAY

Aboveground Lead Test: **Exposed Pipe**



Disruptive. Expensive. Inaccurate. Messy.



Magnetic Test

Sticks →



steel pipe

Doesn't Stick

Scratch Test

Color of a Penny →



copper pipe

No Shine →



plastic pipe

Silver Streaks →



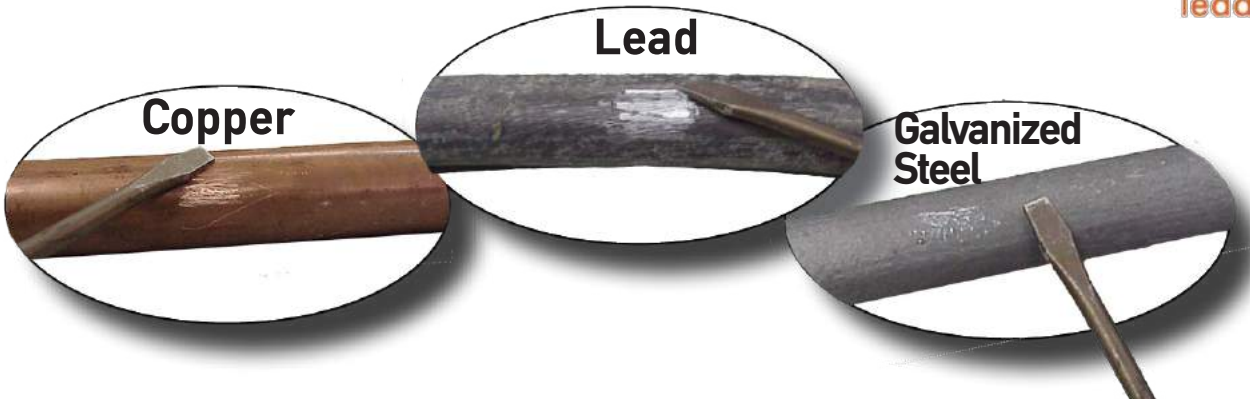
lead pipe



Lead

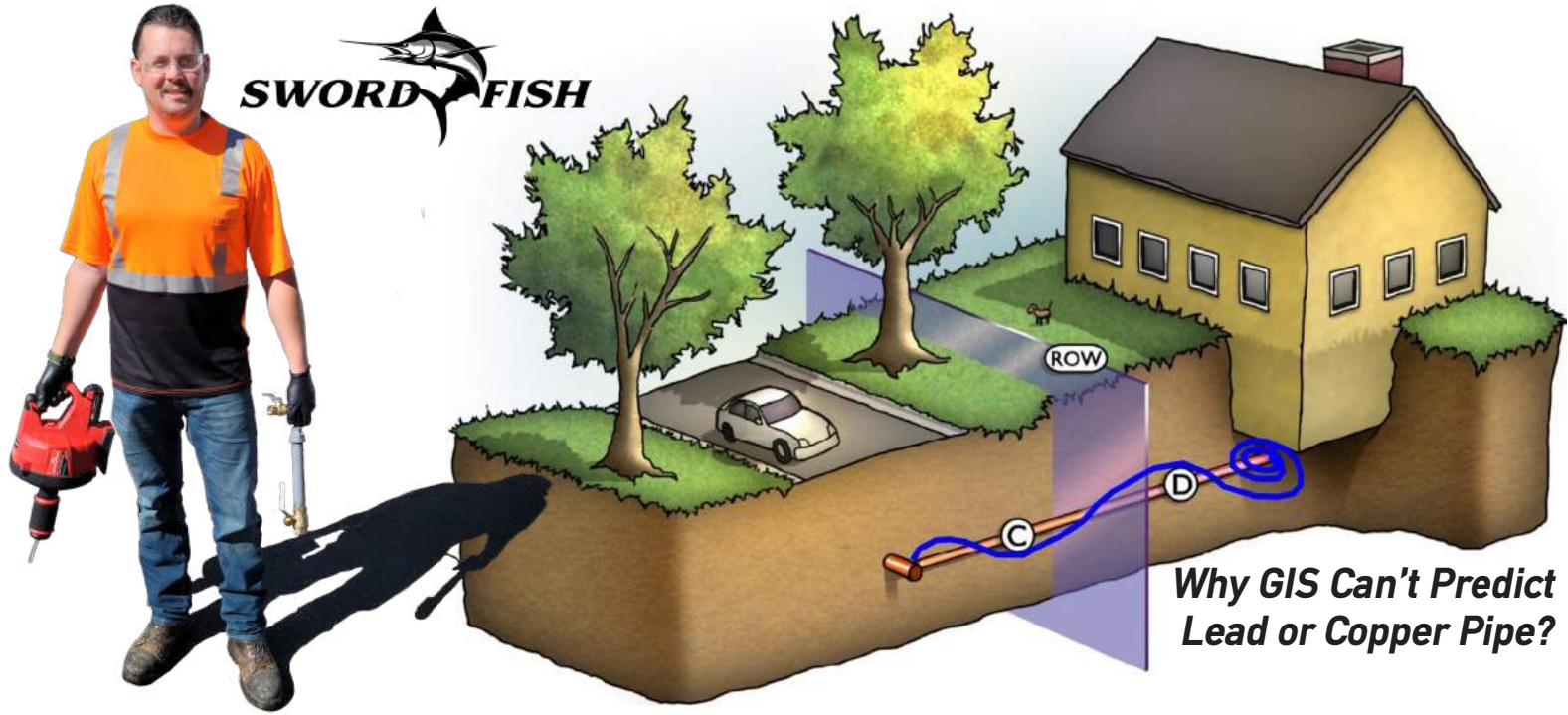
Copper

Galvanized Steel

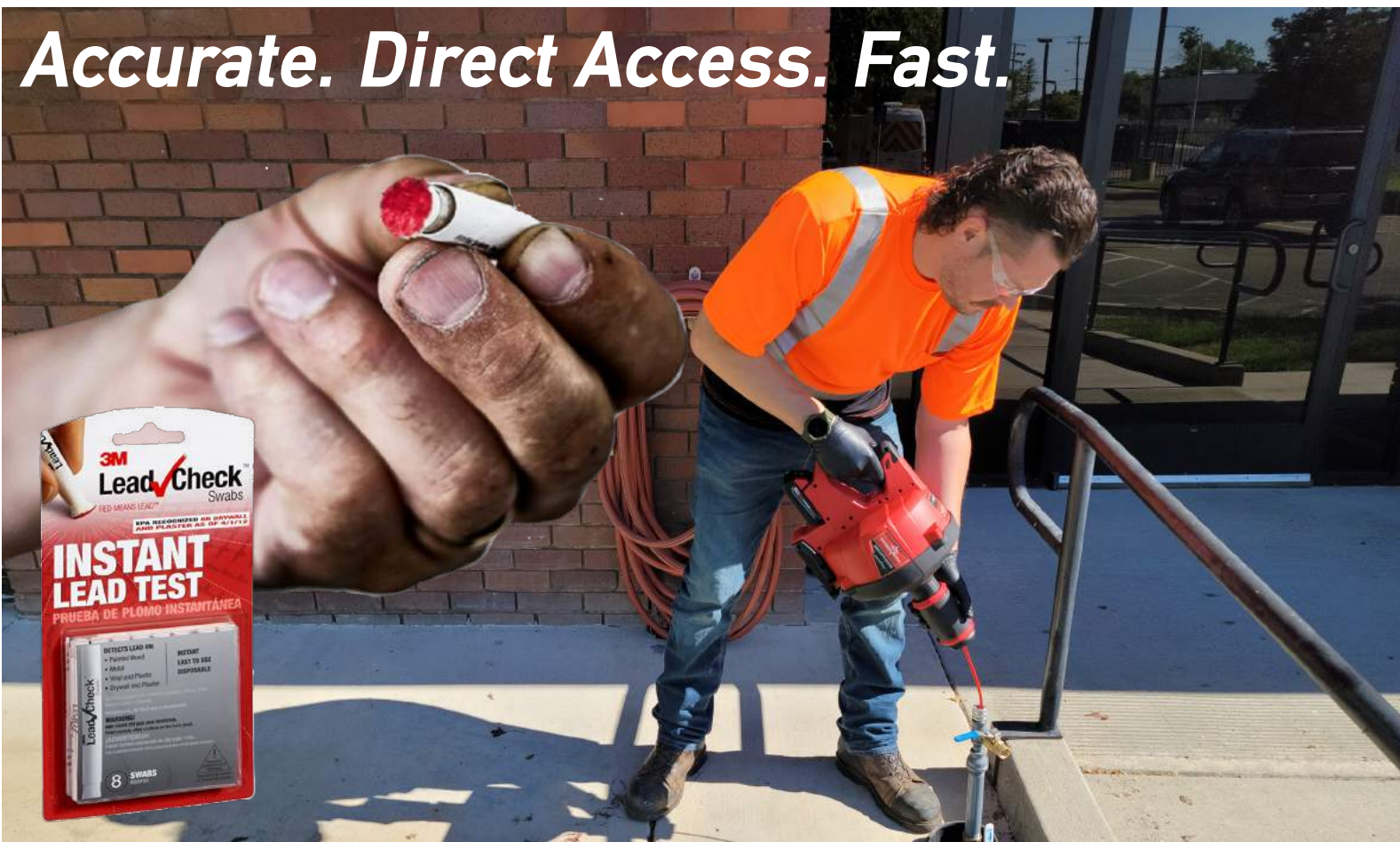


NEW WAY

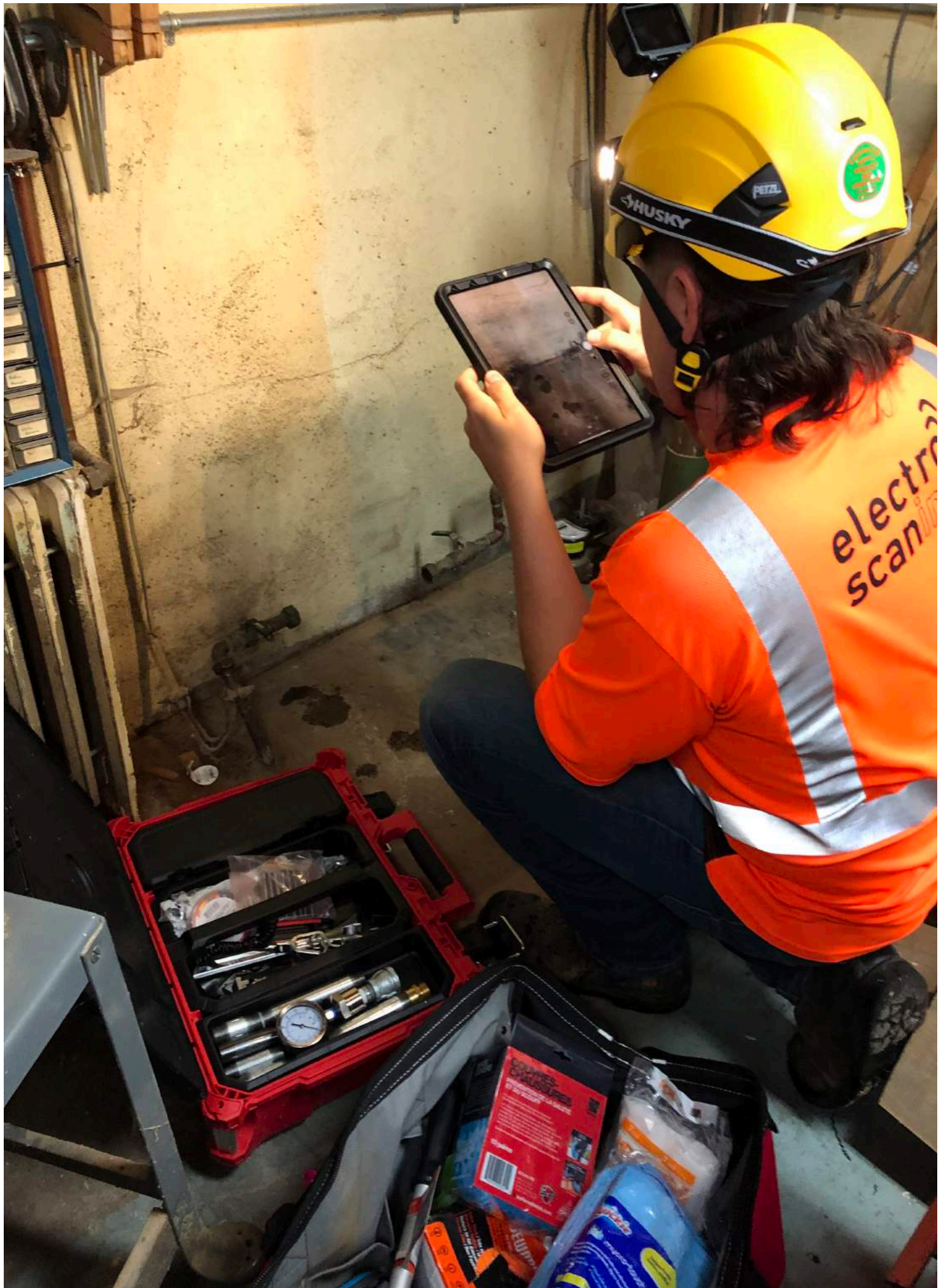
Below Ground Lead Test: **Buried Pipe**



Why GIS Can't Predict Lead or Copper Pipe?



Accurate. Direct Access. Fast.



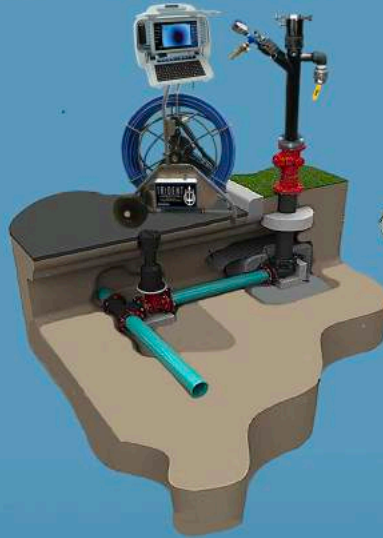


NO Acoustics
NO Visual
NO Smelling

DELTA



TRIDENT



SWORDFISH



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 Since September 2011