JUNE 10, 2024

BREAKING NEWS

6:00am ET

Baltimore Selects SWORDFISH for Major Inspection Project

City of Baltimore Awards $7.6 Million Contract to Electro Scan for Scanning of Water Services for Lead

Total Number of Housing Units	272,839	100%
Built in 1939 or Earlier	**113,626**	**42%**
Built between 1940 and 1949	32,547	12%
Built between 1950 and 1959	44,821	16%
Built between 1960 and 1969	24,058	9%
Built between 1970 and 1979	15,618	6%
Built between 1980 and 1989	11,962	4%
Built between 1990 and 1999	10,697	4%
Built between 2000 and 2009	10,106	4%
Built between 2010 and 2019	9,286	3%
Built in 2020 or Later	118	0.04%

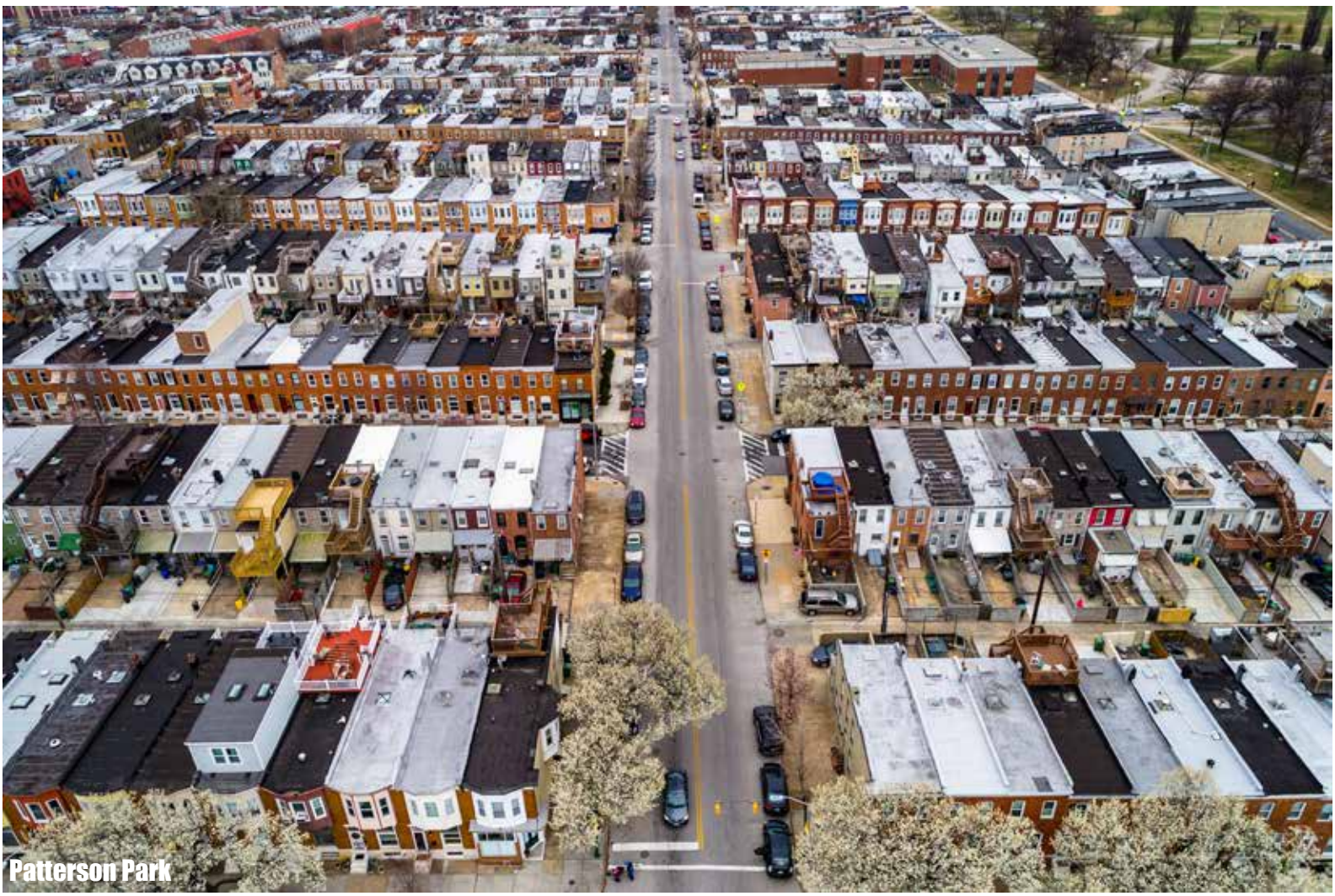
Selected Neighborhoods of Baltimore


Greektown

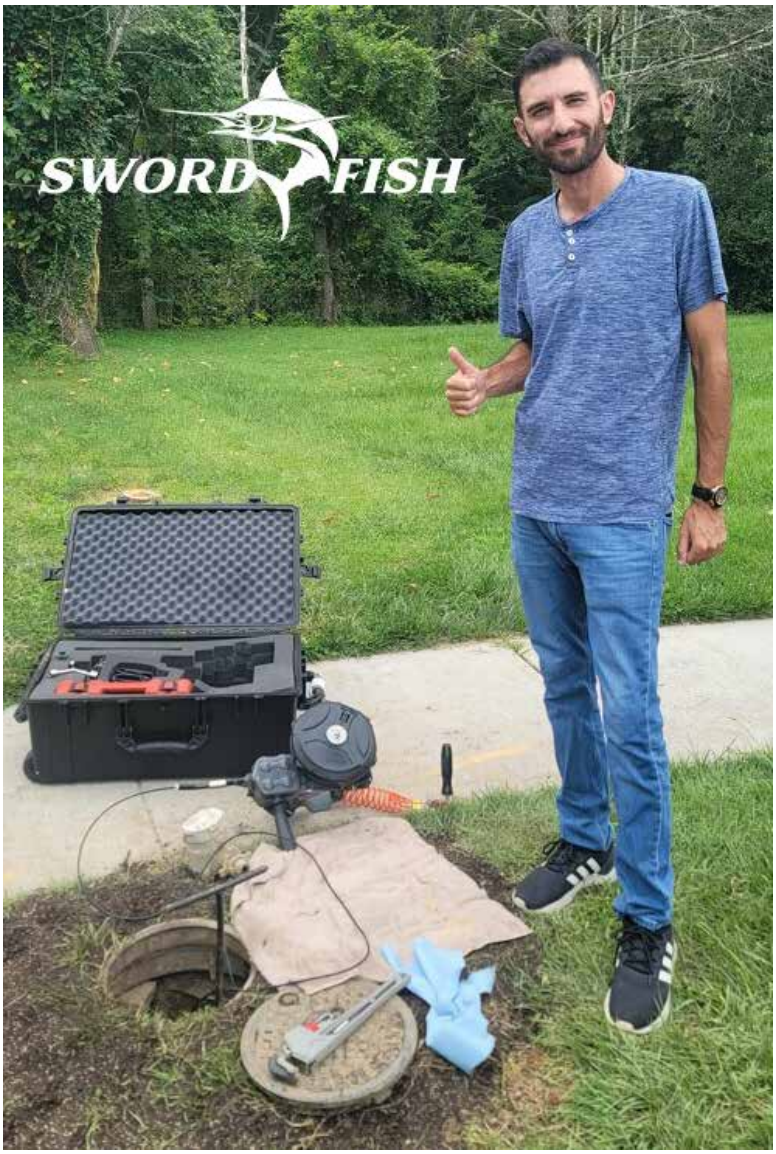

Federal Hill


Little Italy


Penn Station


Patterson Park

Mike App Meets the City and County



SWORDFISH

electroscaninc.

Swordfish deployed by matt@electroscan.com at 1002 Southwick Court Pump Station, Towson on Tue Jul 25 2023 10:47:09 GMT-0500 (Central Daylight Time) with results indicating: Lead Detected

Agency

Baltimore County
404 Washington Office Building
Towson MD 21204

Worksite

1002 Southwick Court Pump Station
Towson MD 21208

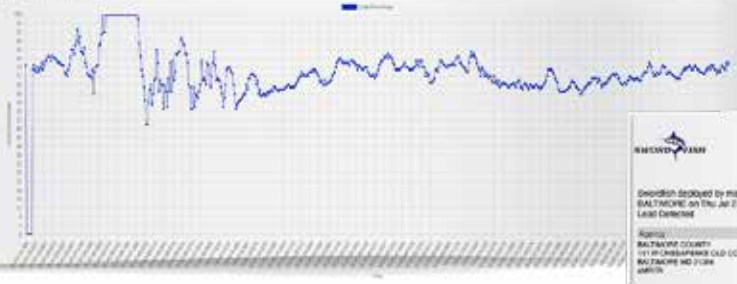
Contractor

matt@electroscan.com

Lead Test

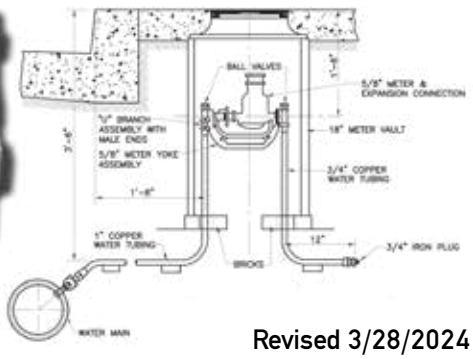
Result: Lead Detected
Test Used: 3M Lead Check
Performed: Tue Jul 25 2023 10:47:09 GMT-0500 (Central Daylight Time)
Pipe Type: Not Known (XXX)
Pipe Diameter: 0.5
Max Load: 100
Pipe Entry Method: Meter - Inside Home
Operator Notes:

Swordfish



City of Baltimore's Meter Adapter

Standard No. BC 838.01
5/8" Water Supply Services
Issued 3/2008



Revised 3/28/2024

Homes Built Before 1939 is a Risk Indicator

Baltimore, MD

Median Year Built **1954**

Total Number of Housing Units	272,839	100%
Built in 1939 or Earlier	**113,626**	**42%**
Built between 1940 and 1949	32,547	12%
Built between 1950 and 1959	44,821	16%
Built between 1960 and 1969	24,058	9%
Built between 1970 and 1979	15,618	6%
Built between 1980 and 1989	11,962	4%
Built between 1990 and 1999	10,697	4%
Built between 2000 and 2009	10,106	4%
Built between 2010 and 2019	9,286	3%
Built in 2020 or Later	118	0.04%

Washington DC

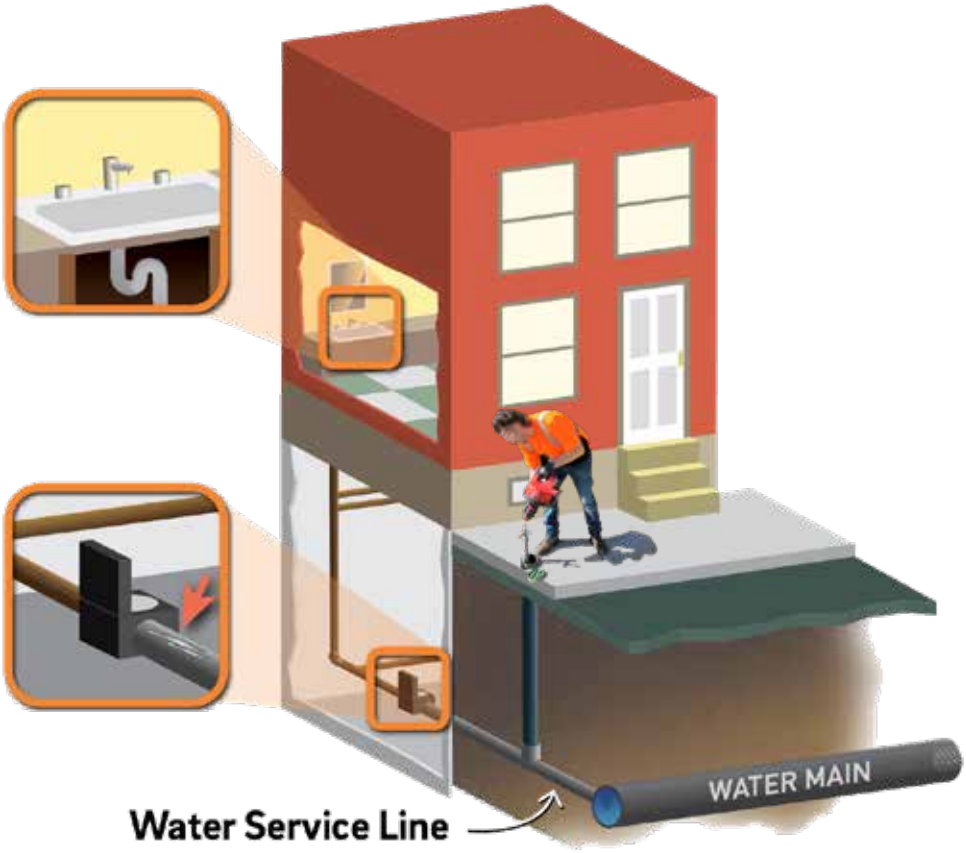
Median Year Built **1955**

Total Number of Housing Units	344,306	100%
Built in 1939 or Earlier	**113,235**	**33%**
Built between 1940 and 1949	37,350	11%
Built between 1950 and 1959	41,643	12%
Built between 1960 and 1969	38,349	11%
Built between 1970 and 1979	23,368	7%
Built between 1980 and 1989	16,104	5%
Built between 1990 and 1999	10,832	3%
Built between 2000 and 2009	27,352	8%
Built between 2010 and 2019	35,399	10%
Built in 2020 or Later	674	0.2%

Philadelphia, PA

Median Year Built **1948**

Total Number of Housing Units	720,688	100%
Built in 1939 or Earlier	**293,652**	**41%**
Built between 1940 and 1949	80,477	11%
Built between 1950 and 1959	113,385	16%
Built between 1960 and 1969	80,327	11%
Built between 1970 and 1979	53,115	7%
Built between 1980 and 1989	28,583	4%
Built between 1990 and 1999	23,062	3%
Built between 2000 and 2009	21,548	3%
Built between 2010 and 2019	25,847	4%
Built in 2020 or Later	692	0.10%



Water Service Line

May be made of lead, copper, galvanized steel or plastic.

Public Side, Homeowner Side

Water Service Information

- 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

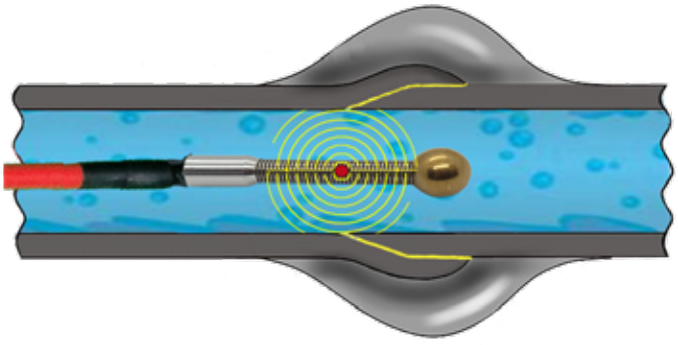
Buried Lead Pipe Detection

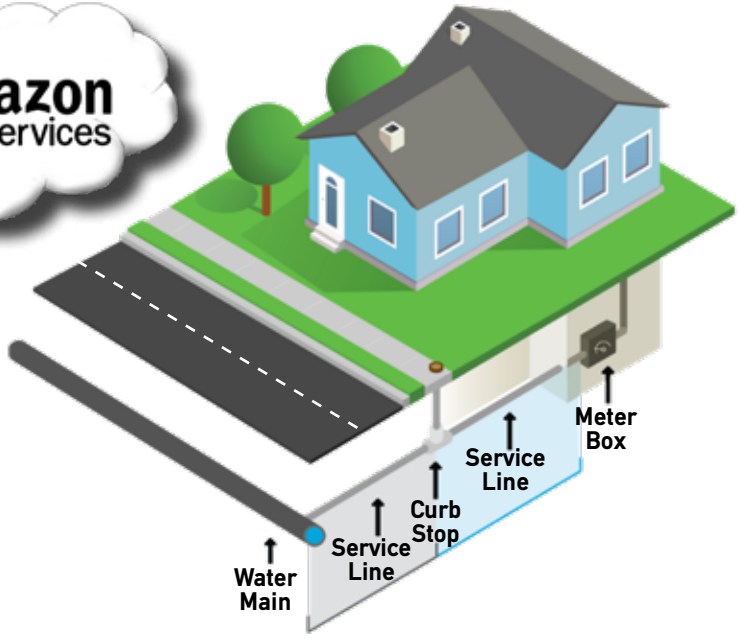
electro scan

SWORDFISH

- **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 diamters 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 H_2O cloud application, with results independently verified using a commercially available lead test kit for 100% verification of lead pipe.

amazon web services





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

1745 Markston Road | Sacramento, California USA 95825 | Tel: +1 916.779.0660 | Email: info@electroscan.com | Web: www.ElectroScan.com

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

electro scan SWORDFISH

Buried Lead Pipe Detection

KEY FEATURES

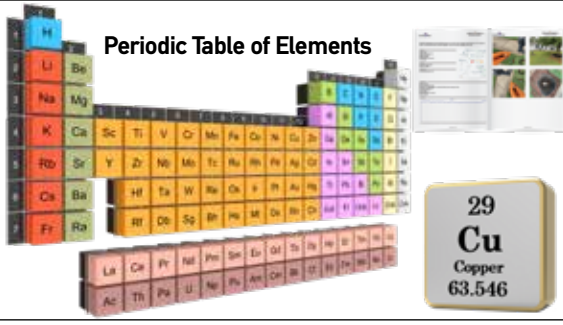
1. Probe entry.
2. Cable feed and retraction.
3. Gripping surface.
4. Light beam.
5. Guard test.
6. Grounding reel and stake.
7. Electro Scan readings.
8. Fully enclosed drum.
9. On-Off switches
10. Rechargeable batteries.

Electro Scan probes confirms lead pipe with an approved independent Lead Test Kits. Testing of probe is required after each survey.

Images shown are representation only. Electro Scan adapted M18 FDCPF8 , Milwaukee Electric Tool Corporation ("Milwaukee Tool").

A Breakthrough in Buried Lead Pipe Detection

Electro Scan's SWORDFISH is a breakthrough in accurately & consistently locating buried lead pipes. Using its patented machine-intelligent low-voltage (i.e. non-acoustic, non-electro magnetic) technology, Electro Scan first discovered its ability to locate lead pipes when it was used to assess Asbestos Cement (AC) pipes; finding lead soldered joints used to seal pipe joints. Aided by the major difference in resistivity of pipe materials, Electro Scan developed SWORDFISH to enter pressurized pipes with ½-inch diameters with multiple 90° bends.



TECHNOLOGIES	Locate Buried Lead Pipes
Acoustic Monitors	NO
Fiber Optics	NO
Acoustic Sensors	NO
CCTV Inspection	NO

SWORDFISH: The Complete Solution

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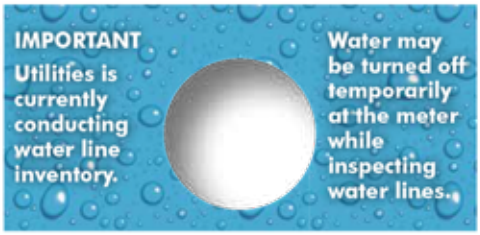
Equipment Sales & Professional Services*

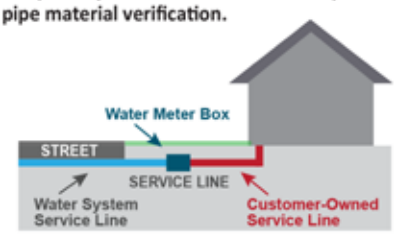


IMPORTANT INFORMATION

The US EPA revised lead and copper rule for drinking water systems requires completion of two key milestones by October 16, 2024. See details about the rule and the status of your Utility's plan.

1 Your Water Utility is currently conducting required system inventory. We will identify pipe materials for both the public (utility-owned) and private (customer-owned) portions of water lines in the system.

City Utilities will use a tool that measures electrical conductivity of the pipe at the water meter box to identify pipe material type on both the public and private sides of the meter. This work will require water be turned off temporarily at the meter while crews perform pipe material verification.



2 Once water lines have been identified, your Utility will develop and submit a plan to replace any lines as required by the EPA's revised rule. For more information, please visit:

www.electroscan.com/pipeinventory
epa.gov/dwreginfo/lead-and-copper-rule
Email questions: info@electroscan.com

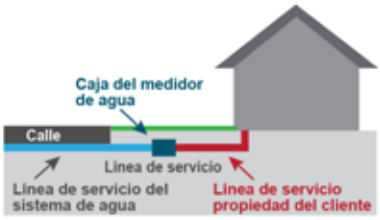
electro scaninc.

INFORMACIÓN IMPORTANTE

La EPA de EE. UU. regla revisada de plomo y cobre para los sistemas de agua potable requiere que la cuidad completa dos hitos importantes antes del 16 de octubre de 2024. Puede revisar los detalles sobre la regla y el estado del plan de servicios públicos de la ciudad.

1 Los servicios de agua de la ciudad actualmente están llevando a cabo el inventario del sistema requerido. Identificaremos los materiales de las tuberías tanto para la parte pública (propiedad de la ciudad) como para la parte privada (propiedad del cliente) de las líneas de agua del sistema.

El departamento de agua de la ciudad podría usar una herramienta que mida la conductividad eléctrica de la tubería en la caja del medidor de agua para identificar el tipo de material de la tubería tanto en el lado público como en el privado del medidor. Este trabajo requerirá que el agua se cierre temporalmente en el medidor mientras el equipo realiza la verificación del material.



2 Una vez que hayan identificado las líneas de agua, el departamento de agua de la ciudad desarrollará y publicará un plan para reemplazar cualquier línea según lo requiera la regla revisada de la EPA. Para obtener más información, visite:

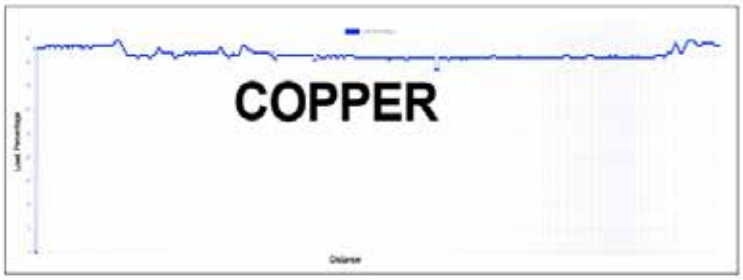
www.electroscan.com/pipeinventory
epa.gov/dwreginfo/lead-and-copper-rule
Preguntas: info@electroscan.com

electro scaninc.

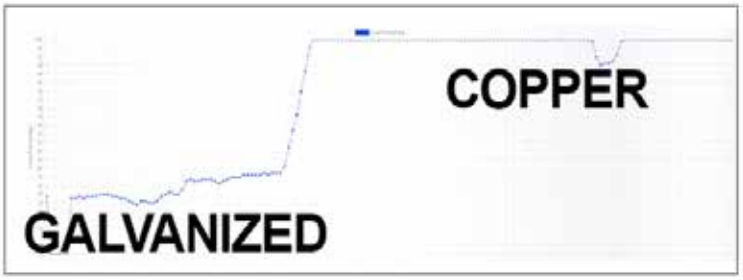
*** Professional Services Available from SWORDFISH Authorized Service Providers.**

SWORDFISH

Single Pipe Materials



Multiple Pipe Materials



SWORDFISH Training Manual 134-Pages

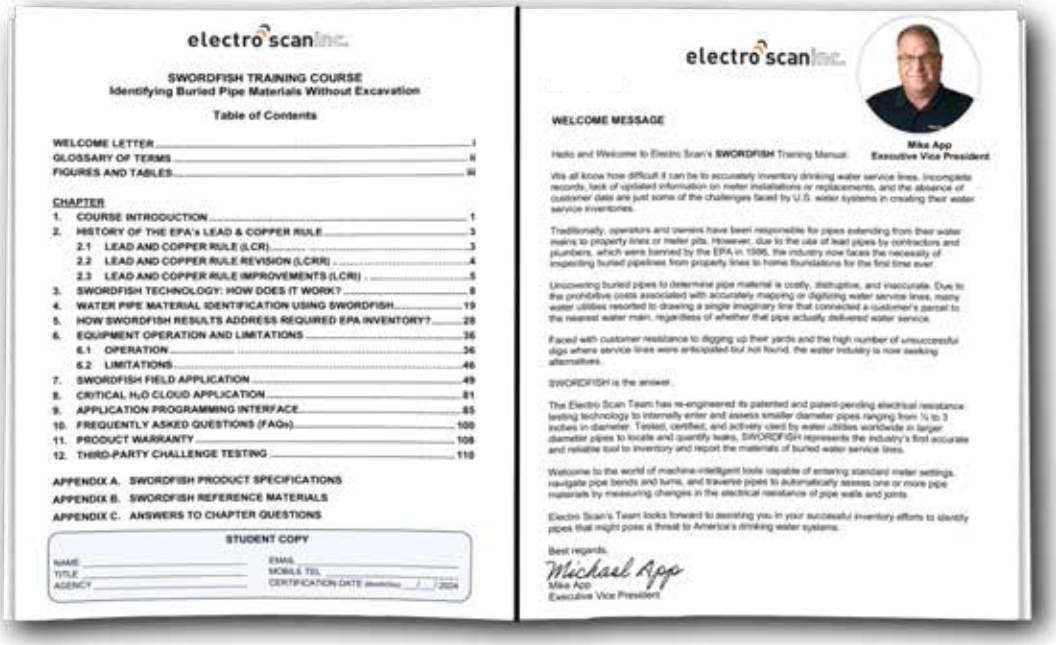
How to Create, Verify and Validate Your Water Service Line Inventory.

Release 1.5

What's Inside?

- Expanded Content
- LCR, LCRR, LCRI
- Example Scans
- Single v. Multiple Pipe Materials.
- New Chapter on API
- New Chapter on FAQs
- Chapter Tests

Learn from Water Industry Insiders How to Report!



electro scan inc.

SWORDFISH TRAINING COURSE
Identifying Buried Pipe Materials Without Excavation

Table of Contents

STUDENT COPY

NAME _____ EMAIL _____
TITLE _____ MOBILE TEL _____
AGENCY _____ CERTIFICATION DATE (mm/dd/yy) ___/___/2024

electro scan inc.

WELCOME MESSAGE

Mike App
Executive Vice President

Hello and Welcome to Electro Scan's **SWORDFISH** Training Manual.

We all know how difficult it can be to accurately inventory drinking water service lines. Incomplete records, lack of updated information on meter installations or replacements, and the absence of customer data are just some of the challenges faced by U.S. water systems in creating their water service inventories.

Traditionally, operators and owners have been responsible for pipes extending from their water mains to property lines or meter pits. However, due to the use of lead pipes by contractors and plumbers, which were banned by the EPA in 1986, the industry now faces the necessity of inspecting buried pipelines from property lines to home foundations for the first time ever.

Uncovering buried pipes to determine pipe material is costly, disruptive, and inaccurate. Due to the prohibitive costs associated with accurately mapping or digitizing water service lines, many water utilities resorted to drawing a single imaginary line that connected a customer's parcel to the nearest water main, regardless of whether that pipe actually delivered water service.

Faced with customer resistance to digging up their yards and the high number of unsuccessful digs where service lines were anticipated but not found, the water industry is now seeking alternatives.

SWORDFISH is the answer.

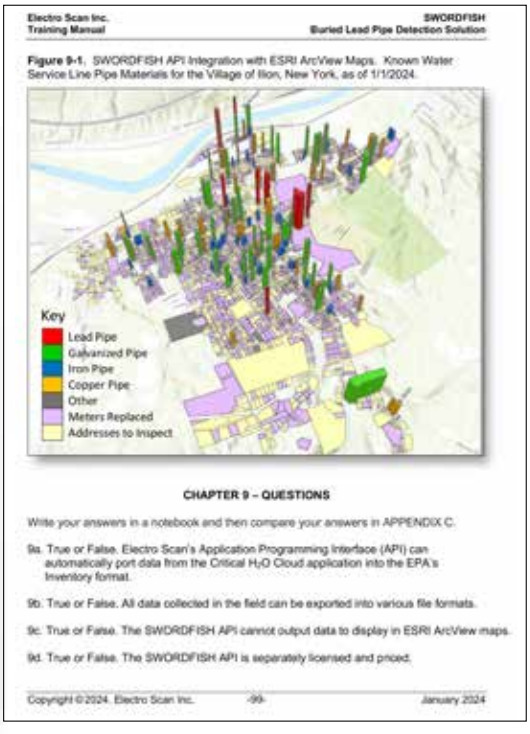
The Electro Scan Team has re-engineered its patented and patent-pending electrical resistance testing technology to internally enter and assess smaller diameter pipes ranging from ½ to 3 inches in diameter. Tested, certified, and actively used by water utilities worldwide in larger diameter pipes to locate and quantify leaks, SWORDFISH represents the industry's first accurate and reliable tool to inventory and report the materials of buried water service lines.

Welcome to the world of machine-intelligent tools capable of entering standard meter settings, navigate pipe bends and turns, and traverse pipes to automatically assess one or more pipe materials by measuring changes in the electrical resistance of pipe walls and joints.

Electro Scan's Team looks forward to assisting you in your successful inventory efforts to identify pipes that might pose a threat to America's drinking water systems.

Best regards,

Michael App
Mike App
Executive Vice President



Electro Scan Inc.
Training Manual

SWORDFISH
Buried Lead Pipe Detection Solution

Figure 9-1. SWORDFISH API Integration with ESRI ArcView Maps. Known Water Service Line Pipe Materials for the Village of Ilion, New York, as of 1/1/2024.

CHAPTER 9 – QUESTIONS

Write your answers in a notebook and then compare your answers in APPENDIX C.

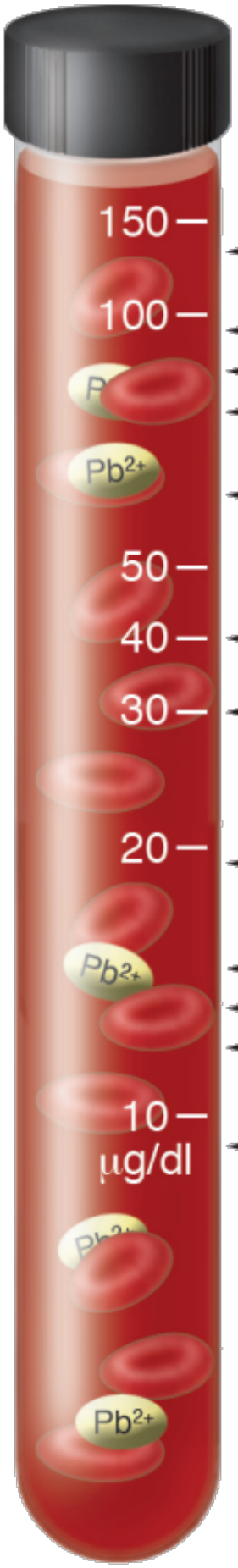
9a. True or False. Electro Scan's Application Programming Interface (API) can automatically port data from the Critical H_2O Cloud application into the EPA's Inventory format.

9b. True or False. All data collected in the field can be exported into various file formats.

9c. True or False. The SWORDFISH API cannot output data to display in ESRI ArcView maps.

9d. True or False. The SWORDFISH API is separately licensed and priced.

Levels of Lead in Drinking Water



ENVIRONMENT AMERICA
RESEARCH & POLICY CENTER

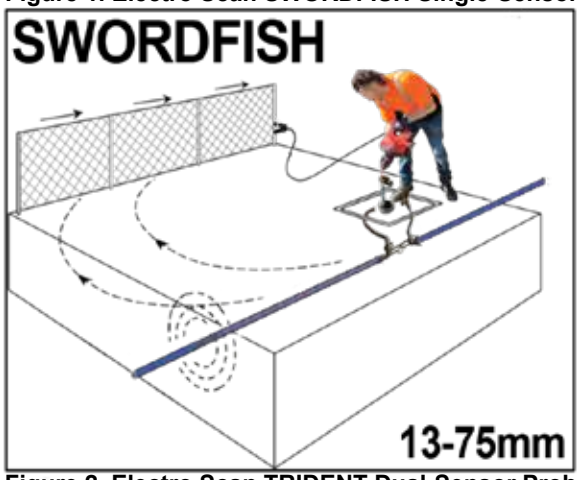
U.S. PIRG
Education Fund

- 150 — Death
- 100 — Encephalopathy
- Nephropathy
- Frank anemia
- Colic
- 50 —
- 40 — Decreased hemoglobin synthesis
- 30 — Increased vitamin D metabolism
  Increased risk of hypertension in adulthood
- 20 — Increased nerve conduction velocity
- Increased level of erythrocyte protoporphyrin
- Decreased vitamin D metabolism
- Decreased calcium homeostasis
- 10 µg/dl — Developmental toxicity
  - Decreased IQ level
  - Decreased hearing
  - Decreased growth
  - Impaired peripheral nerve function
  - Transplacental transfer

AS FEATURED IN AWWA M77

SWORDFISH Uses The Same Patented Technology That Finds Leaks Missed by Acoustic Sensors & CCTV

Figure 1. Electro Scan SWORDFISH Single-Sensor Probe



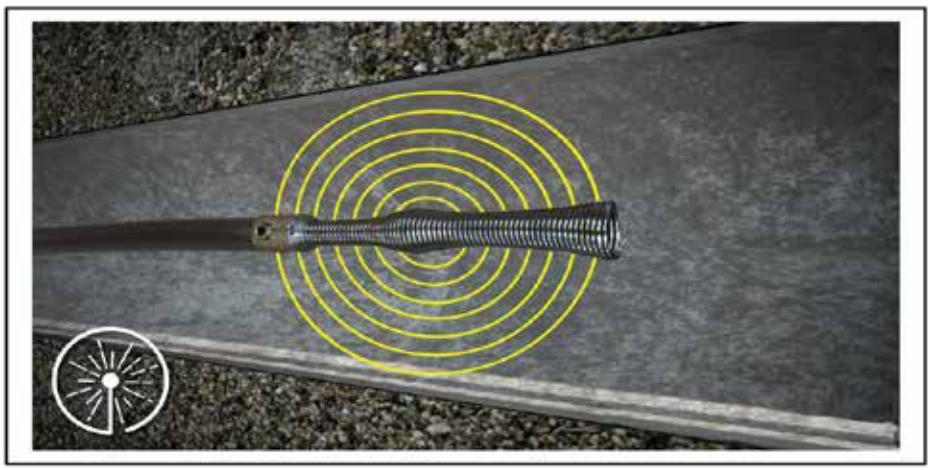
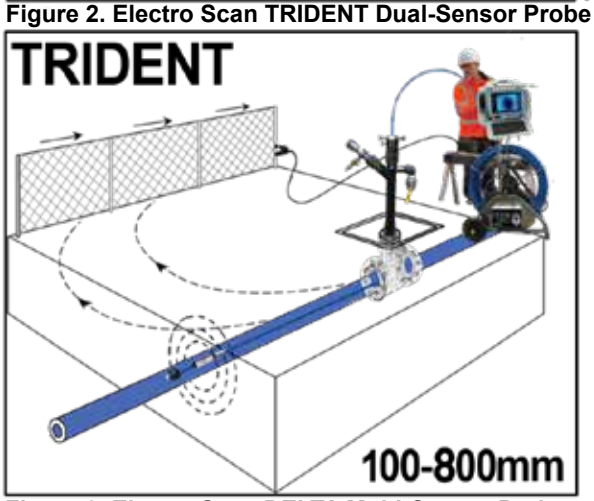


Figure 2. Electro Scan TRIDENT Dual-Sensor Probe



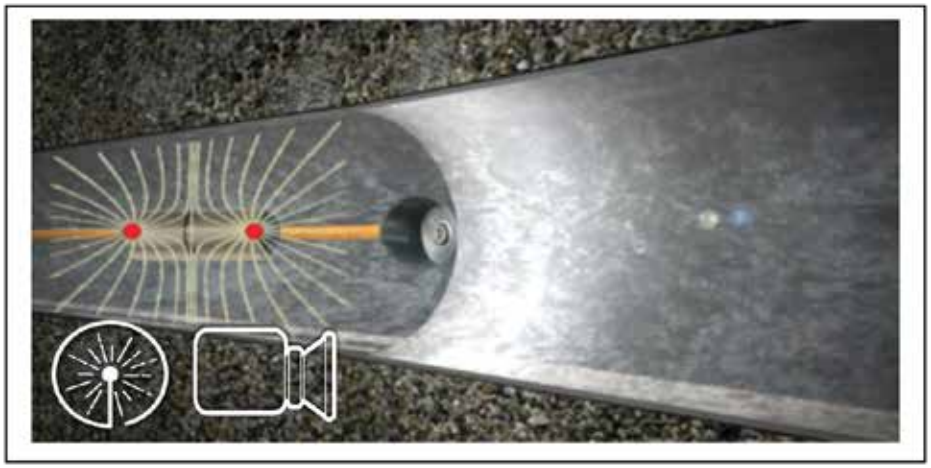
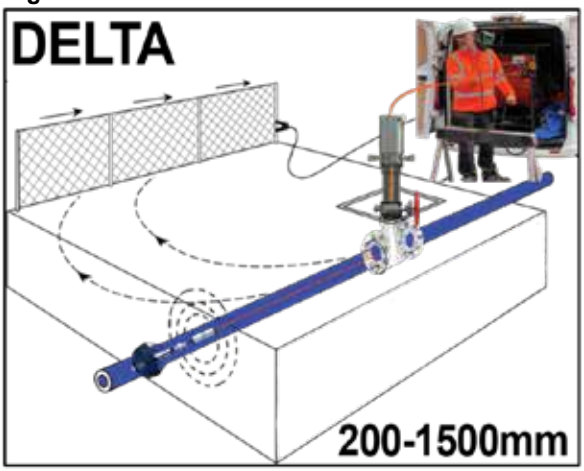
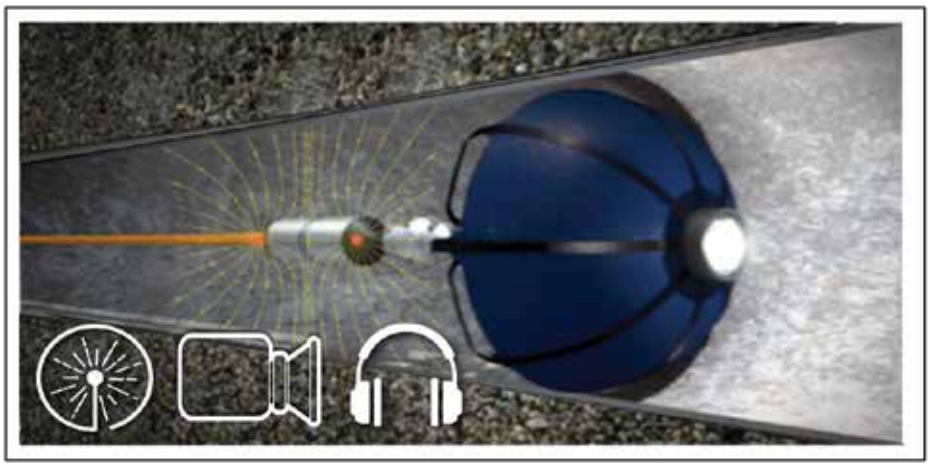


Figure 3. Electro Scan DELTA Multi-Sensor Probe



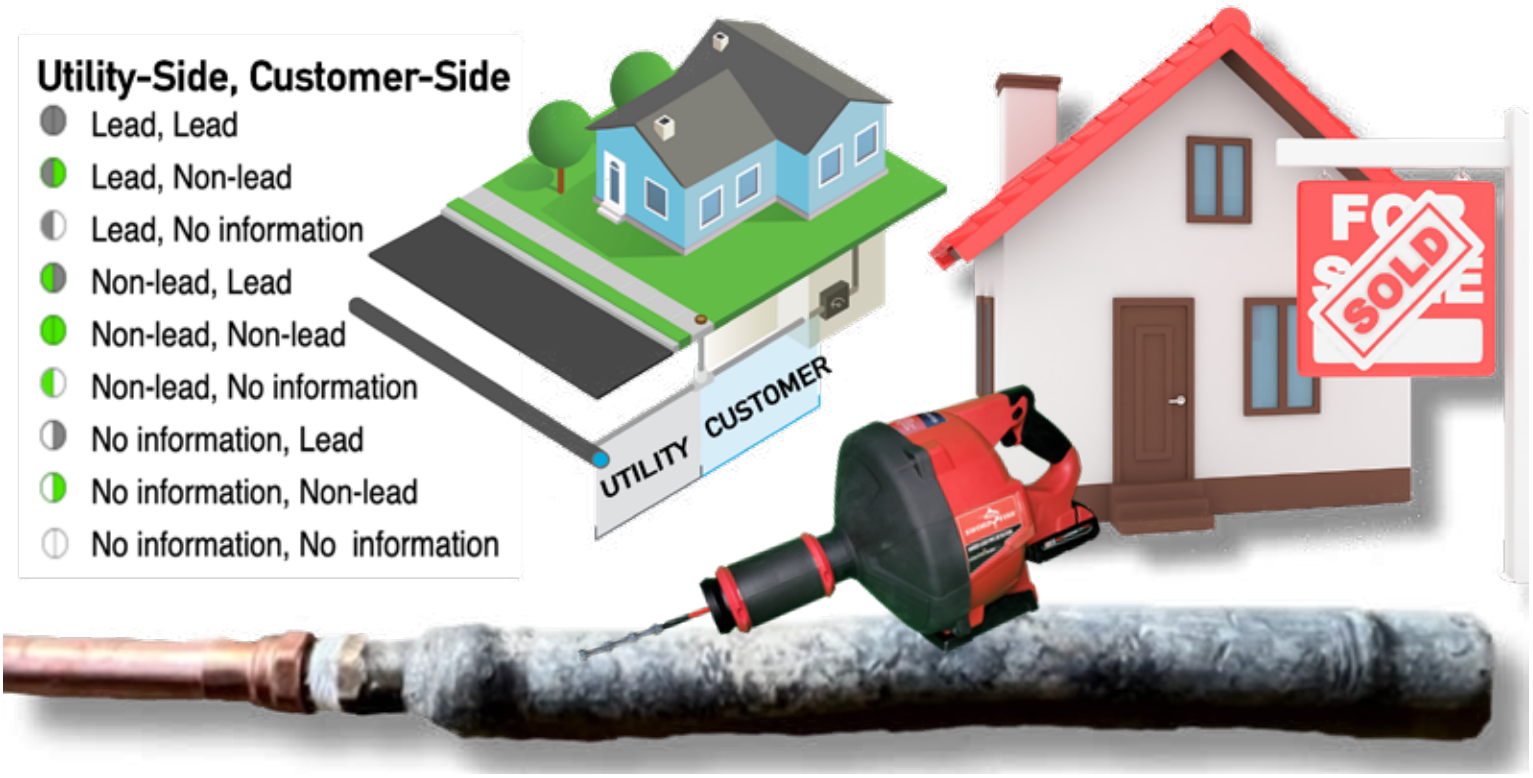


LEGEND

Electro Scan

CCTV

Acoustic


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
UTILITY
CUSTOMER
SOLD


LEAD

OLD WAY

Aboveground Lead Test: Exposed Pipe

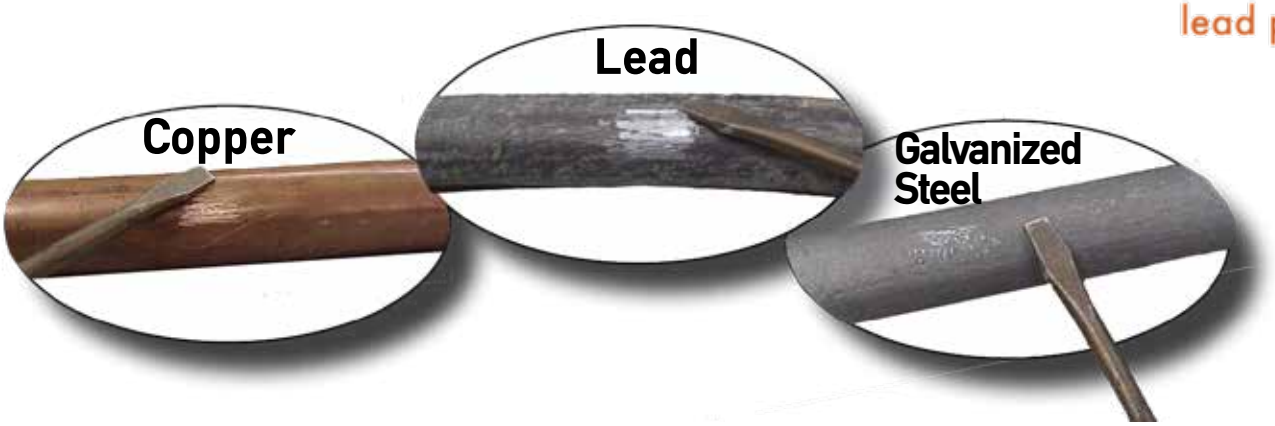
Disruptive. Expensive. Inaccurate. Messy.

Magnetic Test —Sticks→ steel pipe

Doesn't Stick ↓

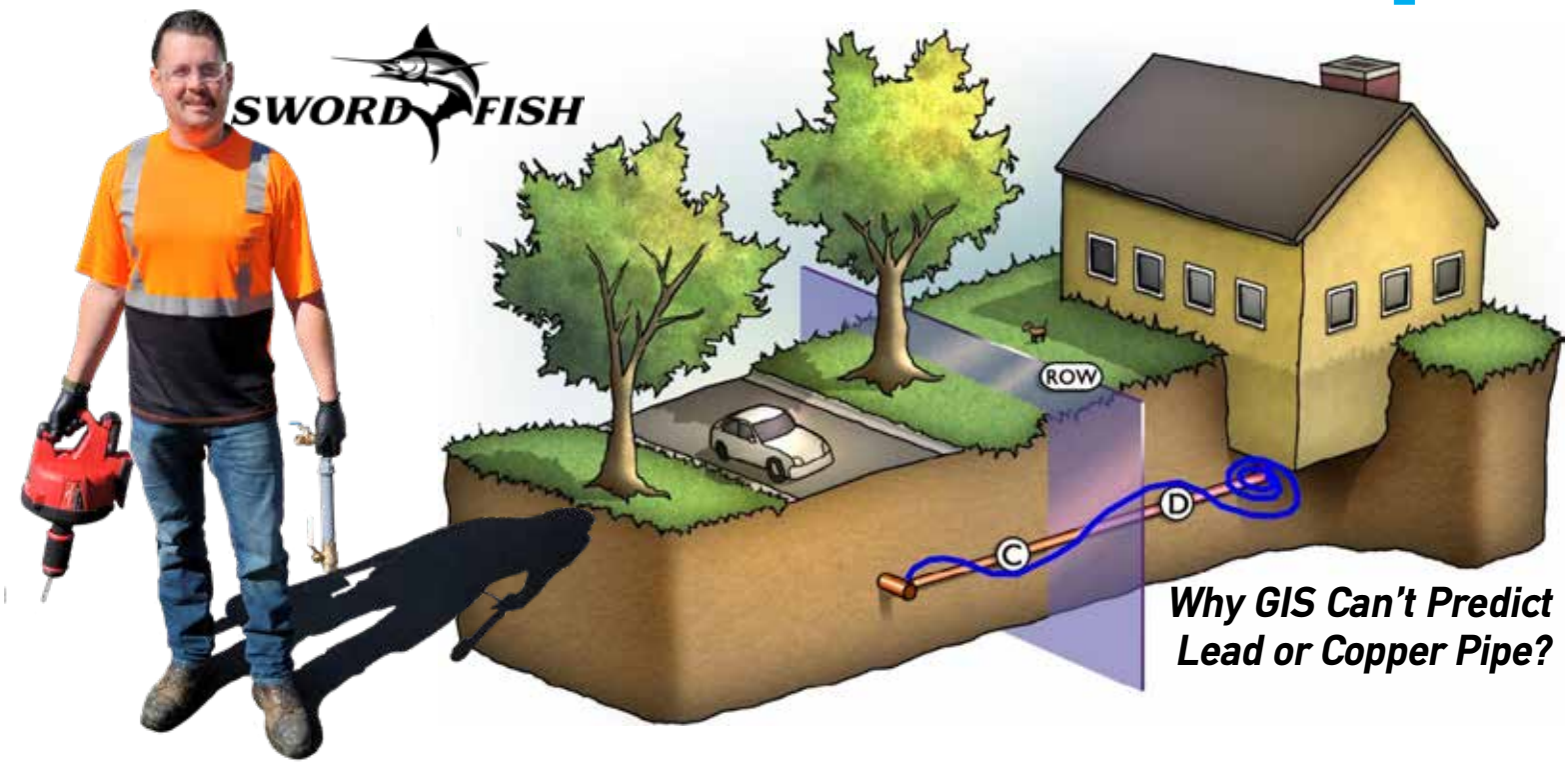
Scratch Test

- Color of a Penny → copper pipe
- No Shine → plastic pipe
- Silver Streaks → lead pipe



NEW WAY

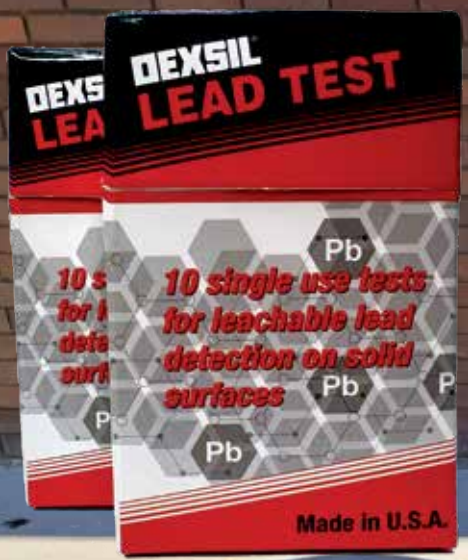
Below Ground Lead Test: Buried Pipe



Why GIS Can't Predict Lead or Copper Pipe?

Accurate. Direct Access. Fast.

Including a Swab Test to Confirm Results from Electrical Resistance Testing When Lead is Found.



CONTACTS

Chuck Hansen

Title	President & CEO
Mobile	916 275 2921
Email	chuck@electroscan.com
Linkedin	linkedin.com/in/chuckhansen1
Since	October 2011

Mike App

Title	Executive Vice President
Mobile	917 817 0090
Email	mike@electroscan.com
LinkedIn	linkedin.com/in/mikeapp1021
Since	April 2018

Matt Campos

Title	Vice President, Pressurized Pipelines
Mobile	916 879 0685
Email	matt@electroscan.com
LinkedIn	linkedin.com/in/matthew-campos-89812924
Since	August 2014

Janine Mullinix

Title	Vice President, Administration
Mobile	916 873 5714
Email	janine@electroscan.com
LinkedIn	linkedin.com/in/janine-mullinix-05317667
Since	September 2011

GRAVITY & UNPRESSURIZED PIPELINES

ES-38

ES-400

ES-620

GRAVITY & PRESSURIZED PIPELINES

DELTA

TRIDENT

SWORDFISH

1745 Markston Road, Sacramento, California 95825, Tel: +1 916 779 0660
EMAIL: info@electroscan.com, WEBSITE: www.electroscan.com