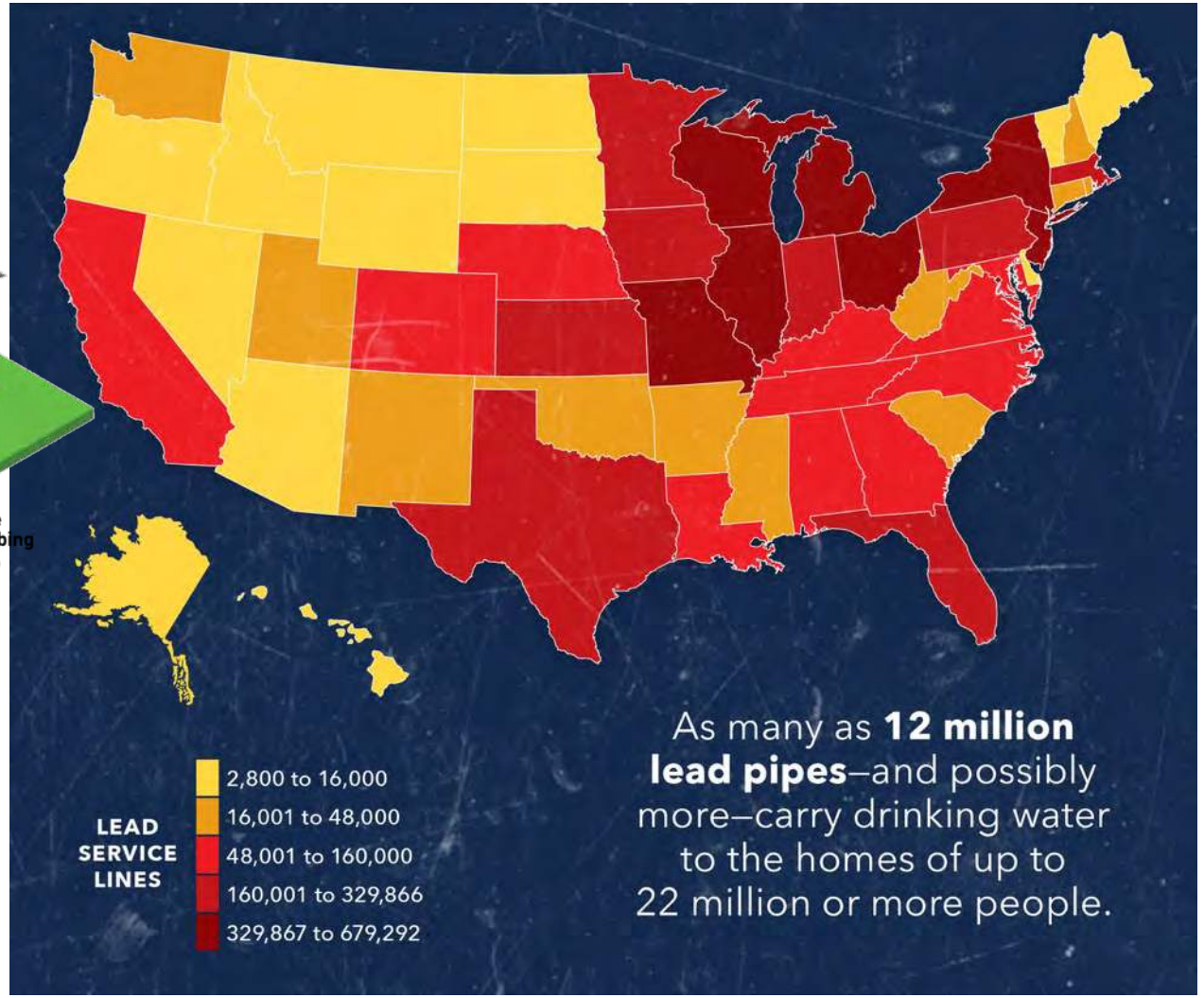

electro scan
M.E. SIMPSON Co., Inc.
82
Pb
Lead
207.2
Chuck Hansen
Chairman & CEO
Electro Scan Inc.
Mike Simpson
Chairman & CEO
M.E. Simpson, Co. Inc.

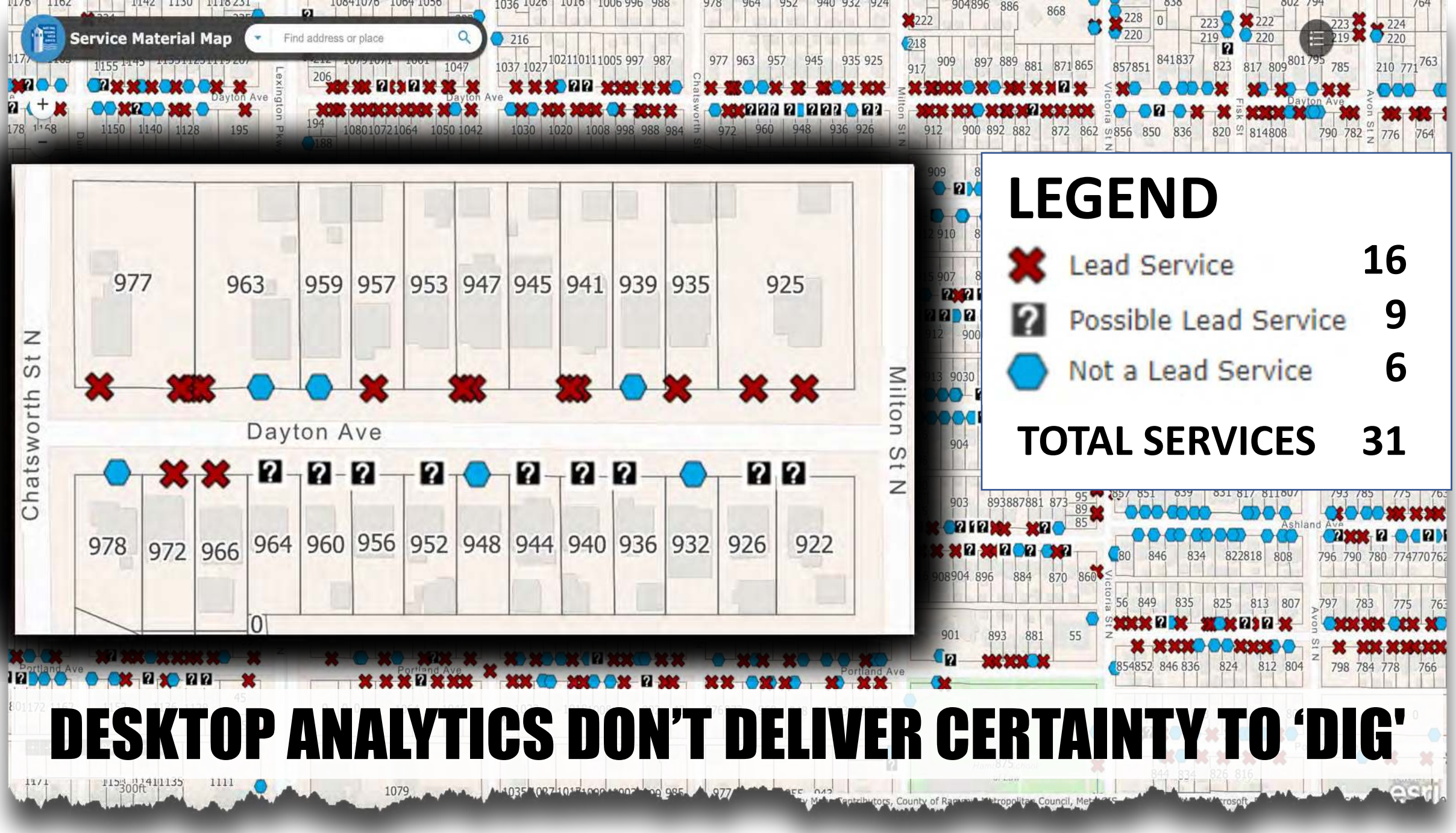

Introduction

Lead Service Lines By State

12 MILLION LEAD PIPES




How to Locate?
L
E
A
D


Service Material Map
Find address or place
Chatsworth St N
Milton St N
Dayton Ave
977 963 959 957 953 947 945 941 939 935 925
978 972 966 964 960 956 952 948 944 940 936 932 926 922
0
LEGEND
Lead Service 16
Possible Lead Service 9
Not a Lead Service 6
TOTAL SERVICES 31
DESKTOP ANALYTICS DON'T DELIVER CERTAINTY TO 'DIG'

Water Research Foundation

TECHNOLOGIES ASSESSED

1. Vacuum Excavation
2. CCTV Inspection
3. Metal Detectors
   - 3.1. Very Low Frequency (VLF) Technology
   - 3.2. Terahertz Technology
   - 3.3. Three-Dimensional Electromagnetic Induction
   - 3.4. Pulse Induction
   - 3.5 Multi-mode Electromagnetic Target Discriminators
   - 3.6. Polyharmonic Metal Detectors
4. Desktop Predictive Models
5. Magnetometers and Gradiometers
6. Ground-Penetrating Radar
7. Stress Wave Propagation
8. Acoustic
9. Electrical Conductivity Object Locators
10. Field Portable X-ray Fluorescence Spectrometry

THE Water Research FOUNDATION®

Old Way

$2,000/hr Cost to Hydro-Excavate.

ABOVE GROUND EXPOSED PIPE

MAGNET TEST

Sticks → 

steel pipe

Doesn't Stick

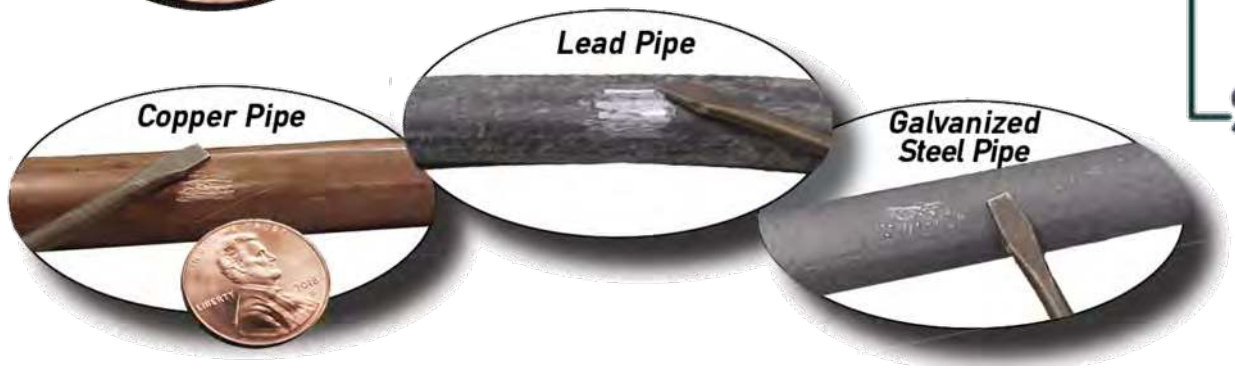
SCRATCH TEST

- Color of a Penny → 

  copper pipe
- No Shine → 

  plastic pipe
- Silver Streaks → 

  lead pipe



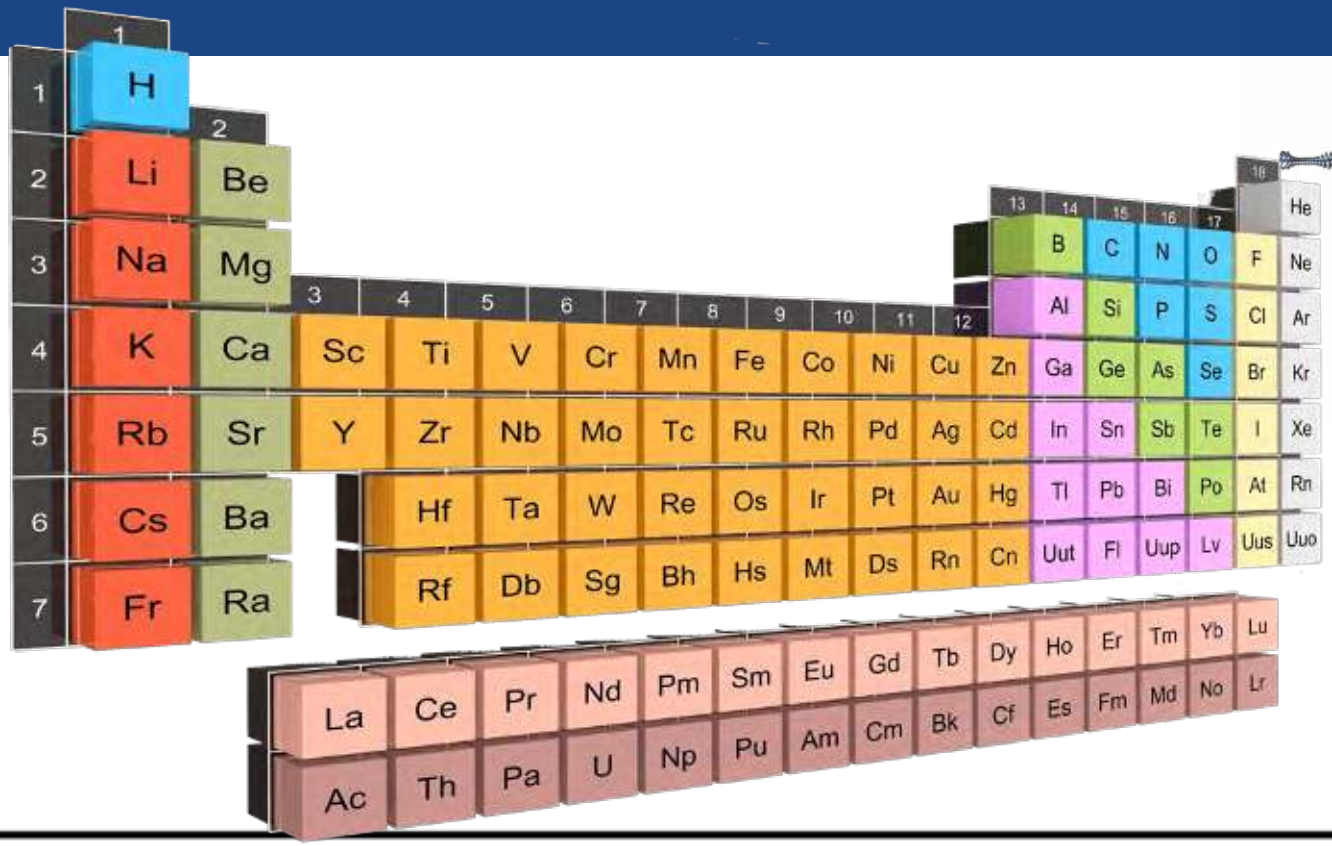
5.6 Emerging Methods

Service line material identification technology is the subject of ongoing research. A review of emerging methods is provided in Hensley et al. (2021) and Bukhari et al. (2020). A central theme of these techniques is identifying creative ways to isolate the service line material and location based on physical signatures of the pipe, largely by assessing how service line materials respond to stimuli such as electrical or wave energy and pairing that information with documented characteristics of material service lines in the evaluation area. Many of these emerging methods ap… …any ca… co… lin… kn… potentially function as a service line inventory technique by linking the… pipe with the corresponding service line material for that diameter (Deb et al., 1995; Bukhari et al., 2020). Other examples of emerging technologies include electrical resistance testing and stress wave propagation.

electrical resistance testing

Application of these emerging technologies can be limited by signal interferences, caused by the presence of other pipe materials and subsurface environments, and the development of signal processing algorithms. Hensley et al. (2021) notes that emerging methods have "technical basis but limited research or field implementation to demonstrate their effectiveness."

Lead Pipe Detection



SWORDFISH

International Annealed Copper Standard (IACS)	100%	7%
Electric Conductivity (10.E6 Siemens/m)	58,7	4,7
Electric Resistivity (10.E-8 Ohms.m)	1,7	21,3
Thermal Conductivity (W/m.K)	386	35

Challenges


Lead Pipe Removal

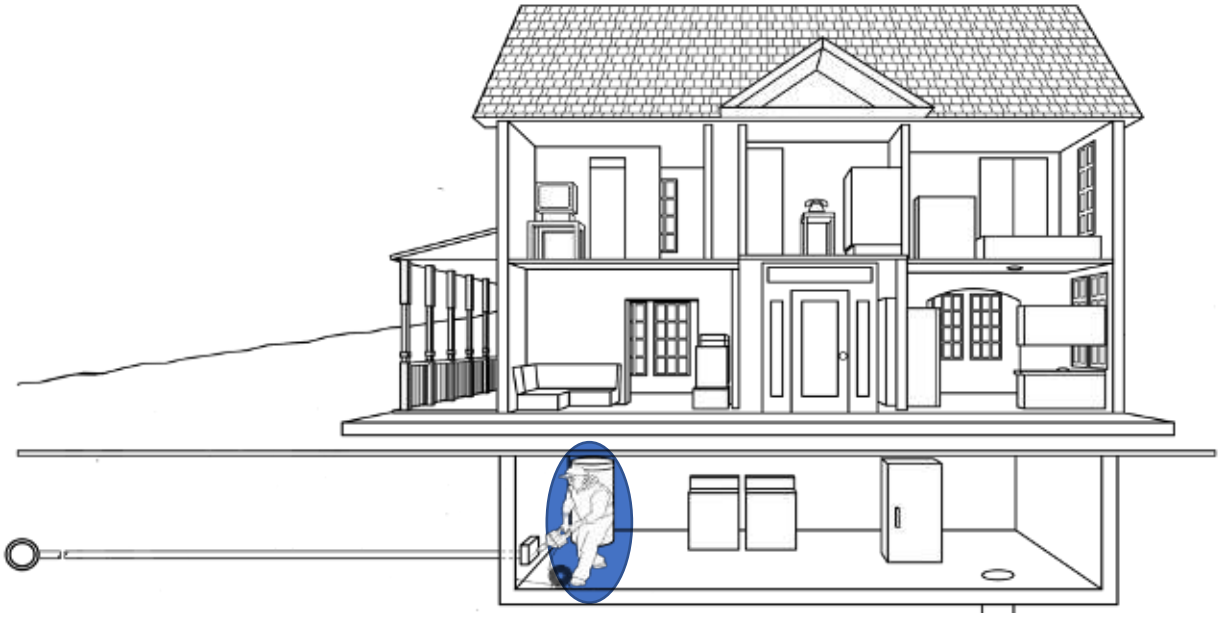

GOAL 100% Removal

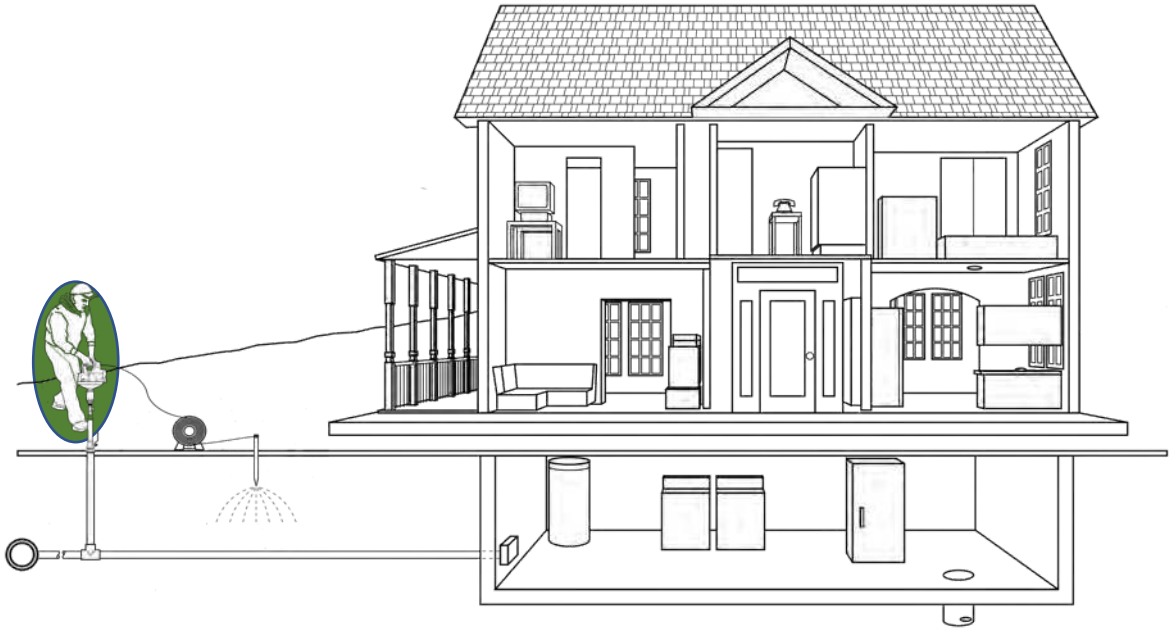

Copper Pipe Removal


GOAL 0% Removal

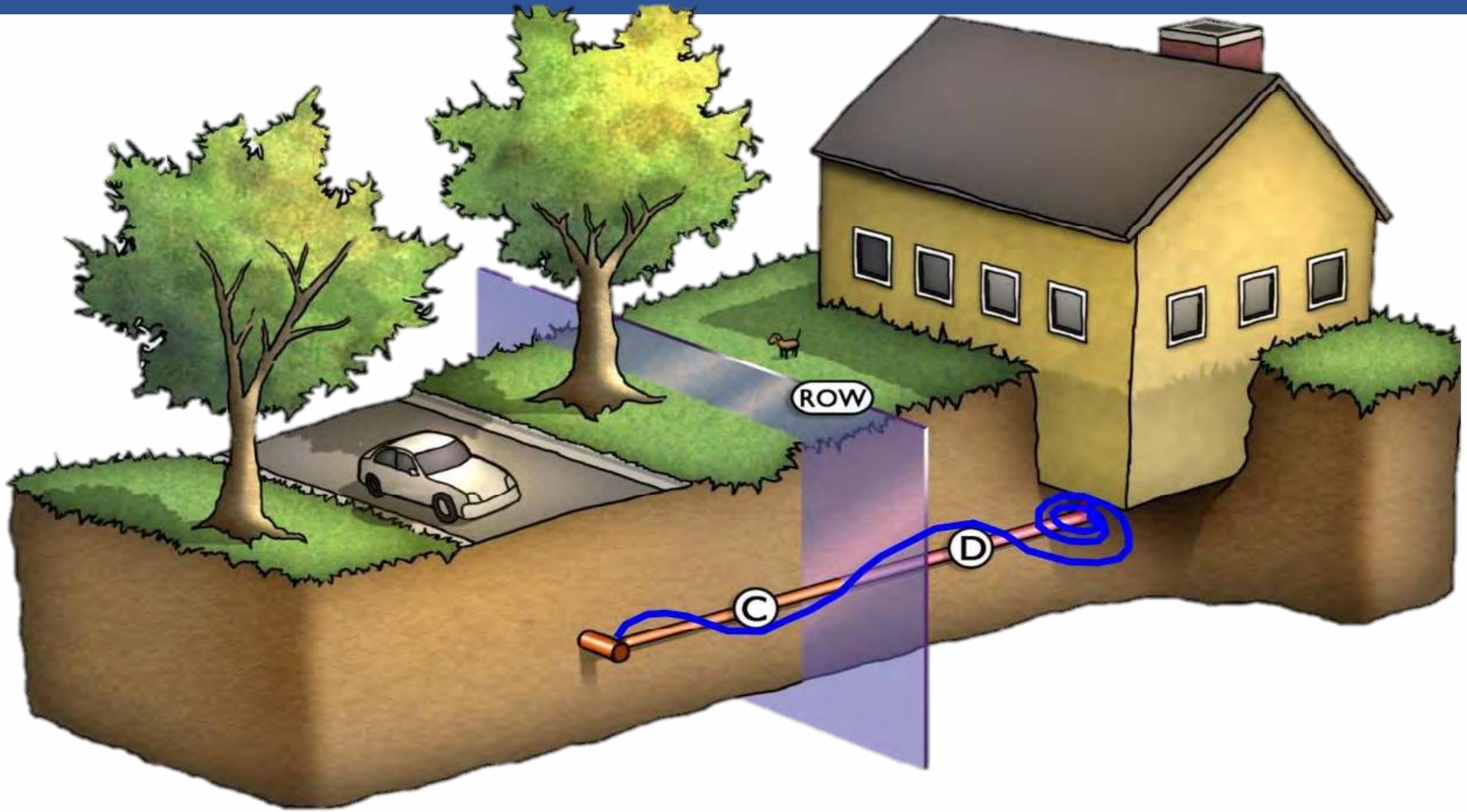

Basement Entry
electro scan
SWORD FISH


Curb Side Entry
electro scan

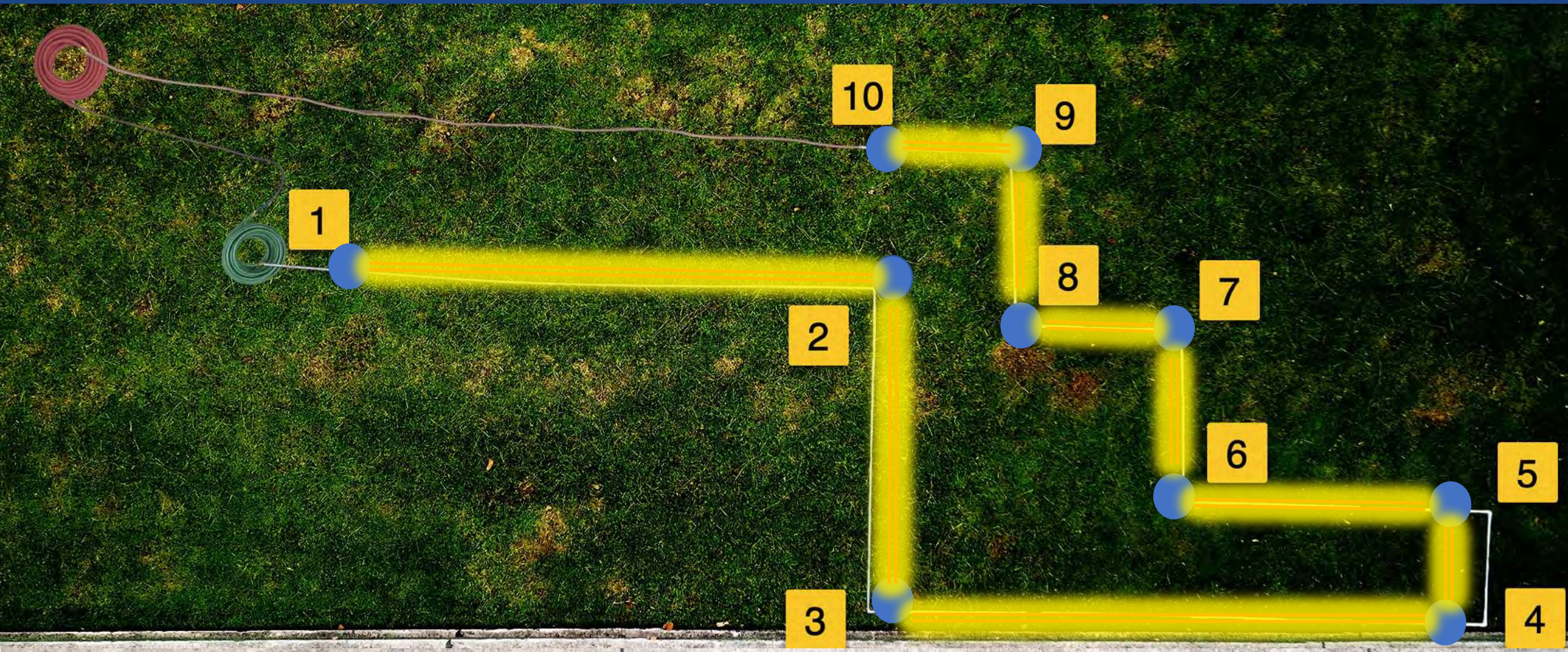




Service Lines are Not Usually Straight



90-Degree Bends



Solution


EMPATHISE
BRAND
ANALYZING
DEFINE
CUSTOMER
IDEATE
PLAN
BRAINSTORM
TEST
PROTOTYPE
DATA
DEVELOPMENT
DESIGN THINKING
STRATEGY

SEWER

FELL

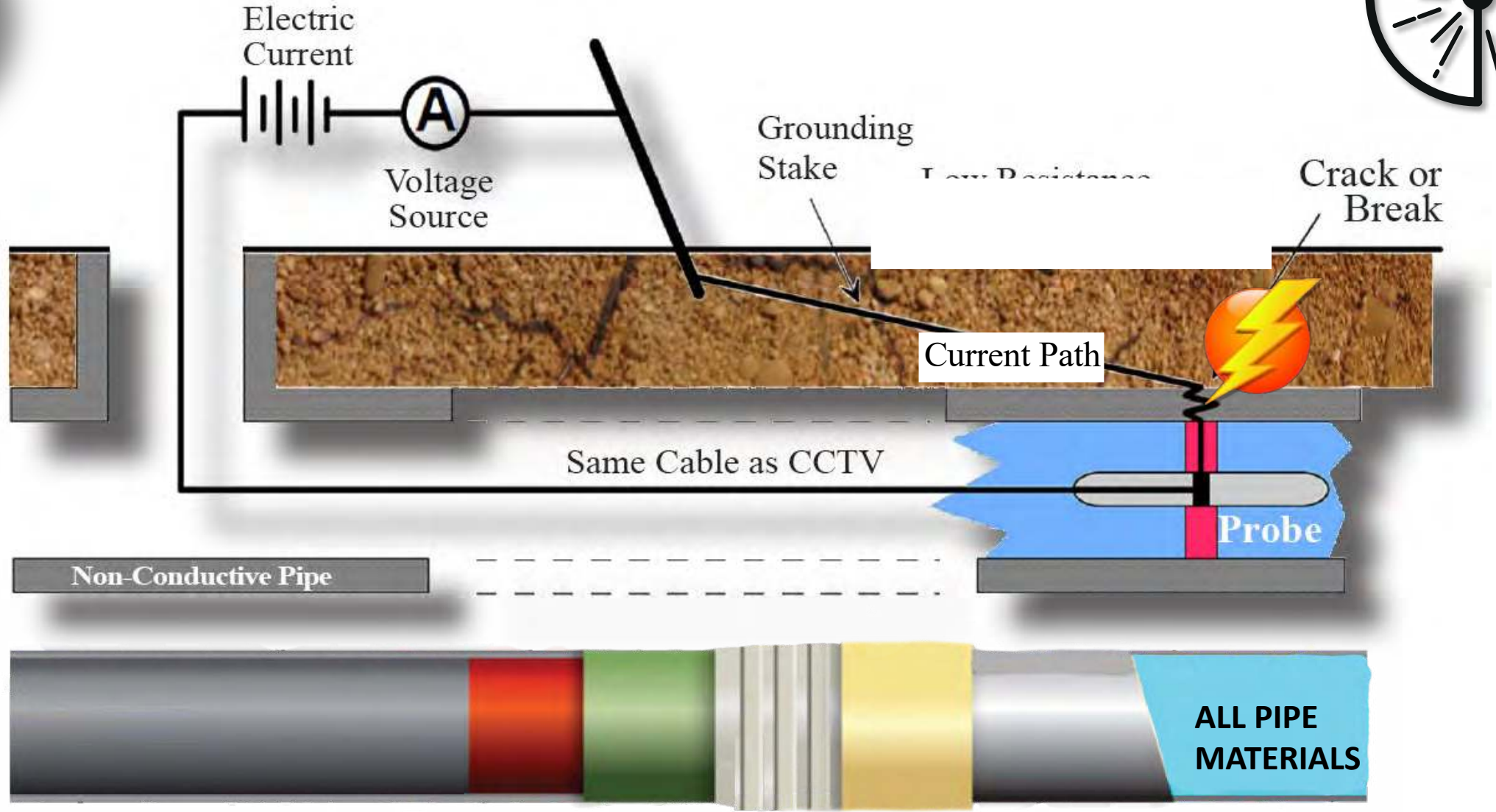
WATER

TRIDENT

DELTA

DELTA FORCE MAIN

Science of Electrical Resistance



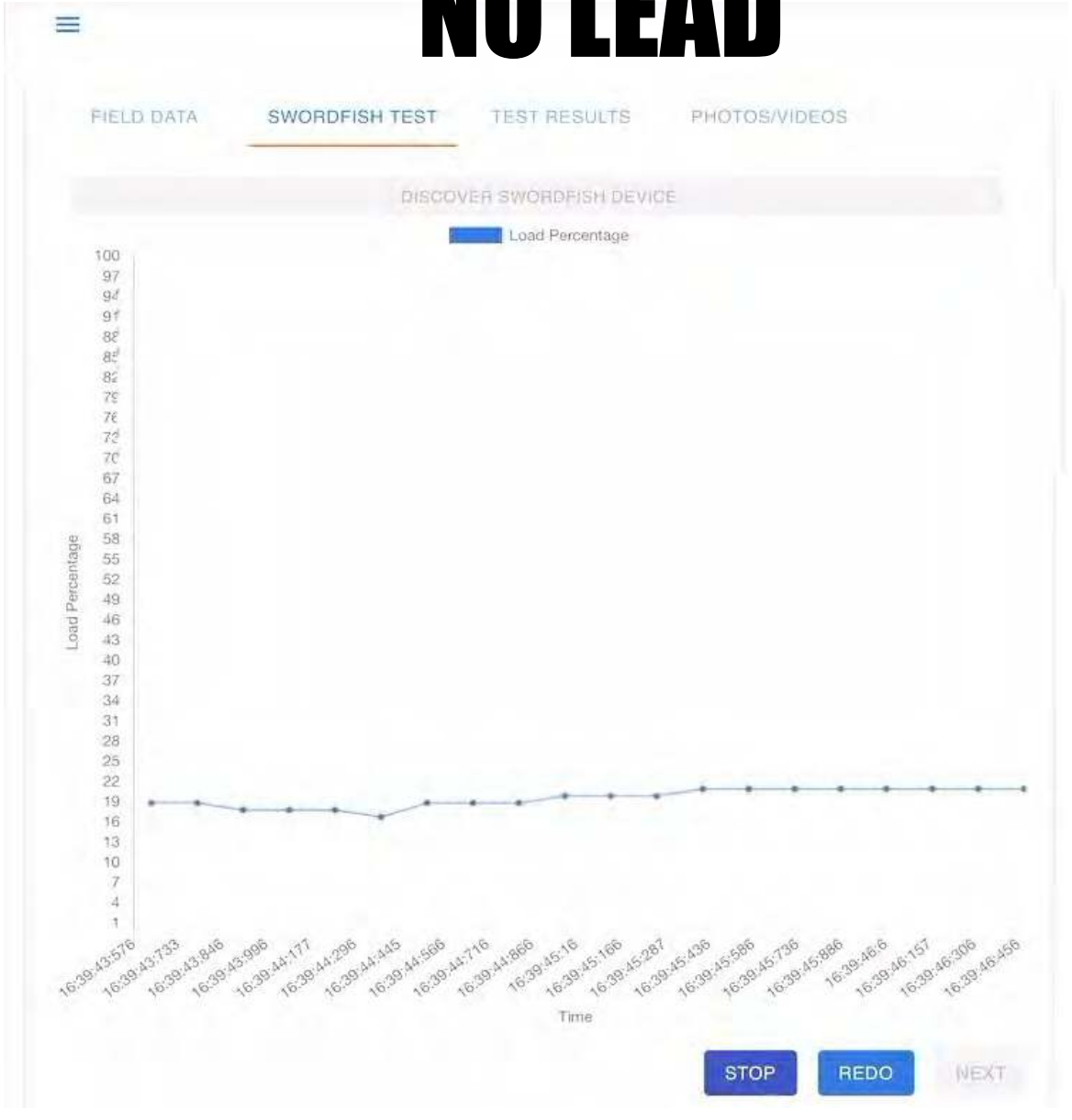

VIDEO
electro scan
SWORD FISH

Chlorination Chamber & Footage Reading

Common Readings

LEAD

NO LEAD



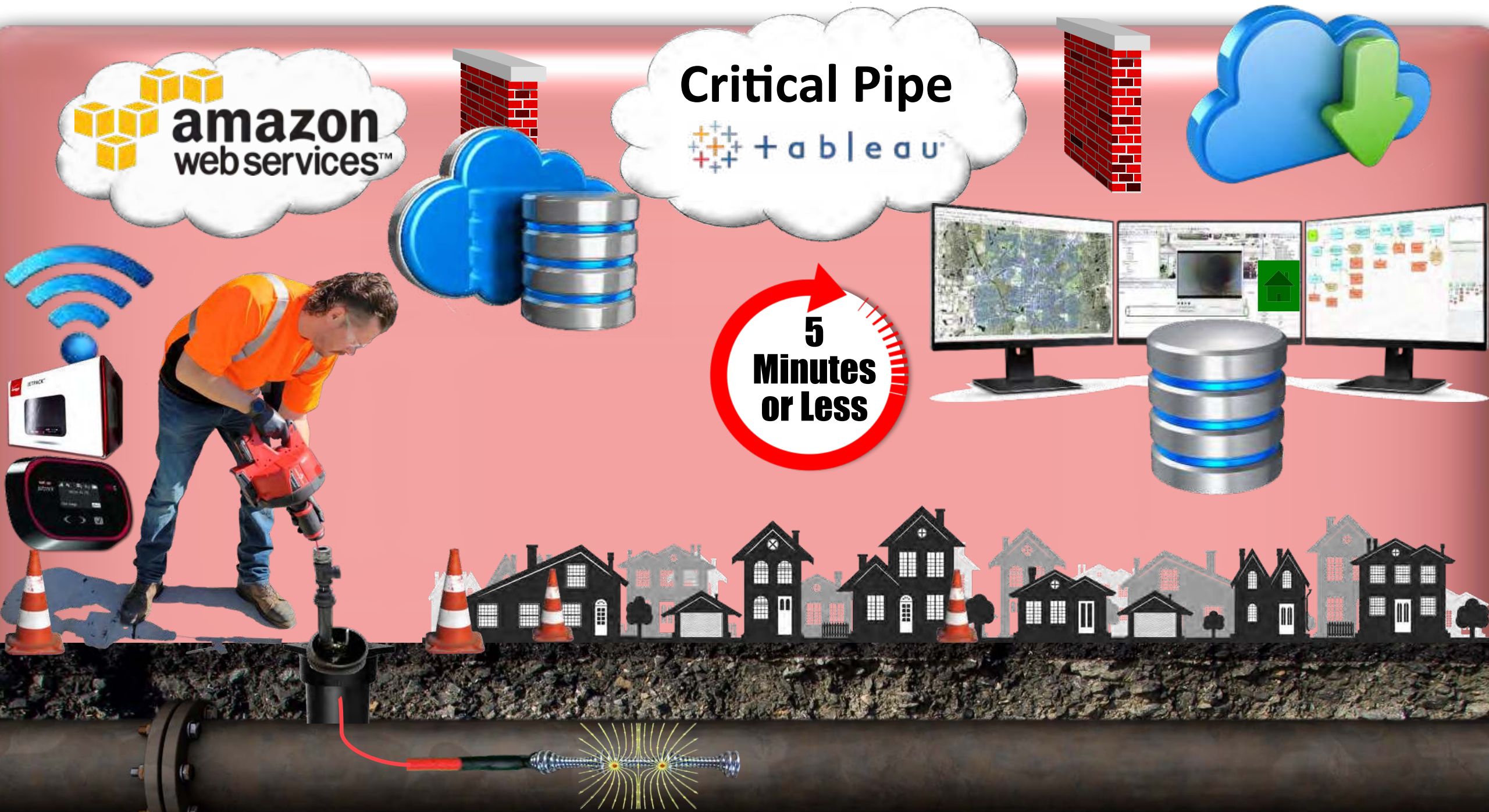
SWORDFISH

SWORDFISH


BASE UNIT
PROBES
SURFACE LAPTOP
Microsoft
INSERTION TUBE
Plus, Chlorination Chamber
GROUNDING STAKE
LITHIUM BATTERY
WI-FI
LEAD TEST
INSTANT LEAD TEST
CRITICAL H_2O CLOUD REPORTING
amazon web services


Milwaukee
M18 FUEL

Additional Lead Testing Confirmation


amazon web services™
Critical Pipe
+ableau
5 Minutes or Less

SWORDFISH

electroscaninc.

Swordfish deployed by thomas@electroscan.com at 94 South Cottage Road,Sterling on Thu Sep 08 2022 14:39:26 GMT-0500 (Central Daylight Time) with results indicating: No Lead

Agency

Loudon water
44865 Loudon water way
Ashburn Va 20147
Kathleen whitten
Kwhitten@loudonwater.org
5712917933

Worksite

94 South Cottage Road
Sterling Va 20164

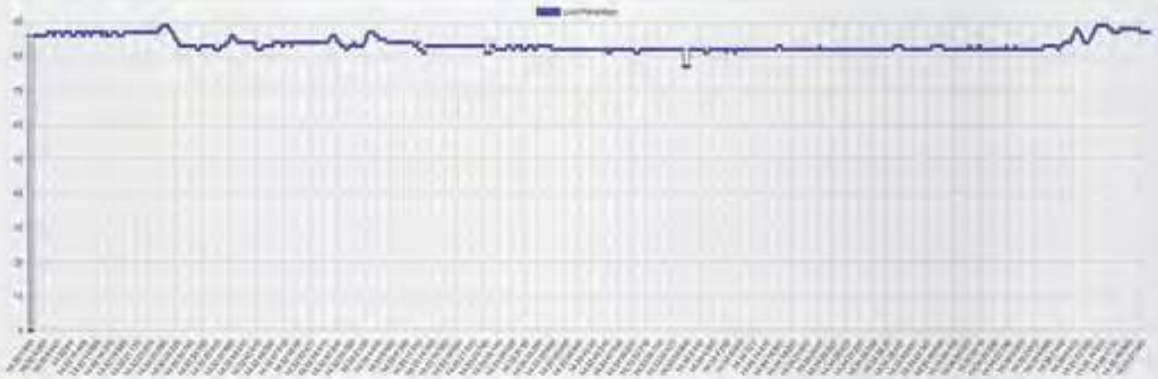
Contractor

thomas@electroscan.com

Lead Test

Result: No Lead
Test Used: 3M Lead Check
Performed: Thu Sep 08 2022 14:39:26 GMT-0500 (Central Daylight Time)
Pipe Type: Copper (COP)
Pipe Diameter: 0.75
Max Load: 89
Pipe Entry Method: Curb Box
Operator Notes:

Swordfish



SWORDFISH

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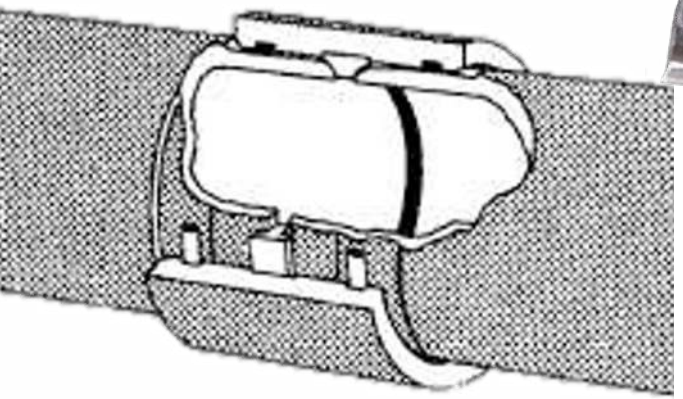
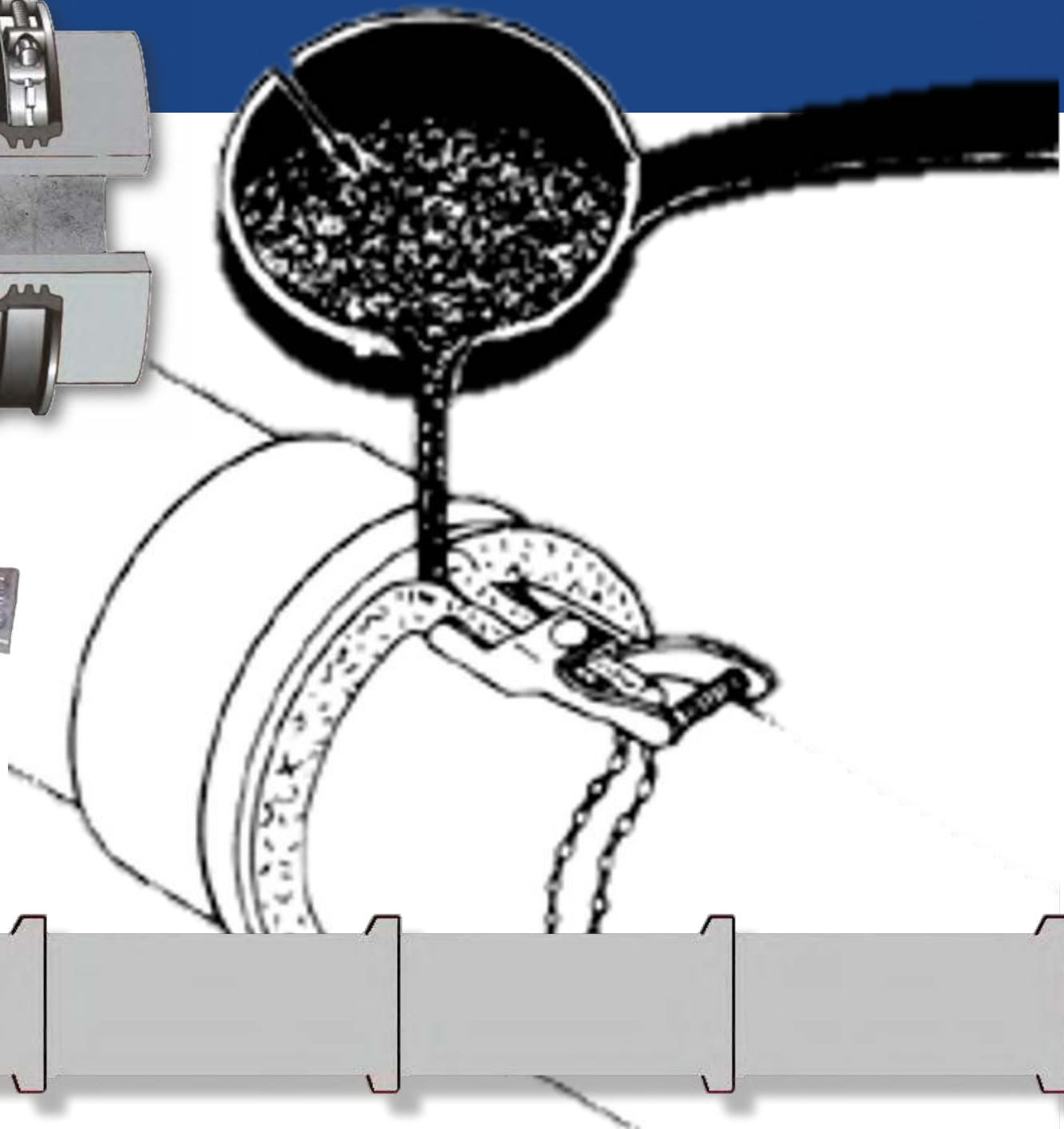
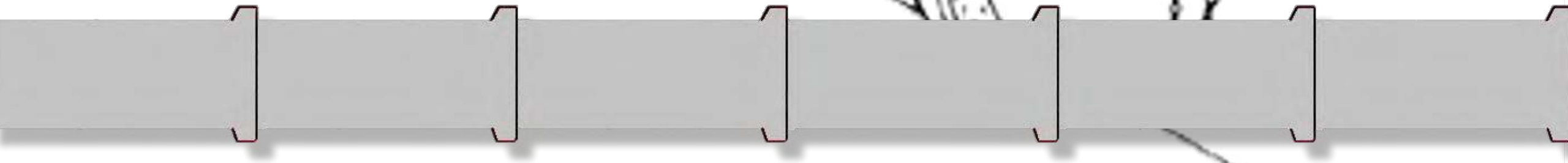
What's Happens When There Are High Lead Readings & No Lead Pipes?

Lead Soldered Joints







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