LEAK DETECTION SOLUTION OF THE YEAR

A32

•

GALLONS PER



541

electrosc



Electric Current Measures Size of Hole



electro scan

LISTENING FOR LEAKS



MEASURING **SIZE OF HOLES**

It's Time for a Change

100 Years Ago

Six Months Ago









The #1 Enemy of Acoustics





What Suppliers Hate to 'Hear' About Acoustic Data Loggers

Common Reasons Acoustic Sensors Miss Leaks

- 1. Ambient noise interferes with readings.
- 2. Lower pressures contribute to missed leaks.
- 3. Requires third-party data interpretation.
- 4. Unable to accurately assess HDPE, PE, PVC pipes.
- 5. Customer water usage 'sounds' the same as a leak.
- 6. May report ZERO LEAKS, where WATER LEAKS found.
- 7. Lack of repeatability by crew, by equipment.
- 8. Leak size difficult to determine No GPM or LPS.
- 9. Numerous FALSE-POSITIVES make results unreliable.
- 10. Defects at repair clamps often missed.
- 11. Can't certify Cured-In-Place Pipe (CIPP) liners as watertight.

Count Water Leak

- 12. Loose or worn components cause poor readings.
- 13. Different backfill materials affect results.
- 14. Special training required for crews.
- 15. Lengthy reporting times.
- 16. Unable to differentiate leaks at Customer Tap, Joint, or Pipe Wall.
- 17. Untethered balls banging on pipe wall = FALSE-POSITIVE.
- 18. Misses silent / undetected leaks = FALSE-NEGATIVE.
- 19. Air pockets cause false readings.
- 20. Different results routinely occur with different pipe diameters.
- 21. Variable water tables affect acoustic results.
- 22. Poor assessments lead to bad repair decisions.
- 23. Can't certify new pipe installations or repairs as watertight or leak-free.
- 24. Total cost per leak rarely factors in cost of unsuccessful leak detection. and
- 25. Everybody knows that water surrounding the outside of a pipe creates a natural insulation that makes it almost impossible to 'hear' a leak.

Machine-Intelligent Leak Detection is Here Page 1 of 2 Untethered Acoustic Ball Misses Leaks And, Catastrophic Failures Follow.

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Robbinsdale, MN

N 42nd Ave

Rupture#1-After Accustle Ball Found No Leaks



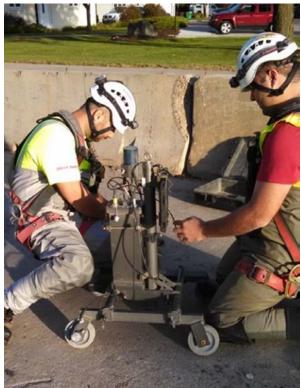


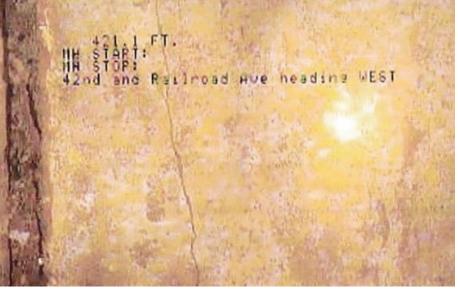
BUDIUR#2-15-Months Mier 1st BuDIUR

Page 2 of 2



Both Ruptures Cost Over \$2 Million, Each





CCTV of dewatered pipe showed major radial cracks that were not identified as 'LEAKS' using Untethered Acoustic Ball.

Electro Scan automatically identifies & quantifies leaks from cracks, without dependence on pipe pressure or noise.

Untethered Acoustic Ball Missed in Sewer Force Main Causing Over \$200,000 Damage to Pump Station

Welcowe to

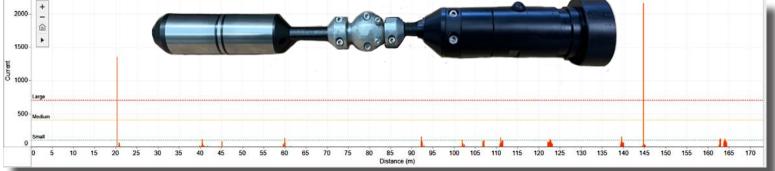
crossro<mark>ads of</mark> America

Acoustic Ball Missed Being Caught By Supplier's Crews Causing Major Damage.

Socal Water Utility Tests Over 200-Miles Using Acoustic Ball Finding ZERO LEAKS.



LISTENING FOR LEAKS MEASURING SIZE OF HOLES Machine-Intelligent Leak Detection is Here



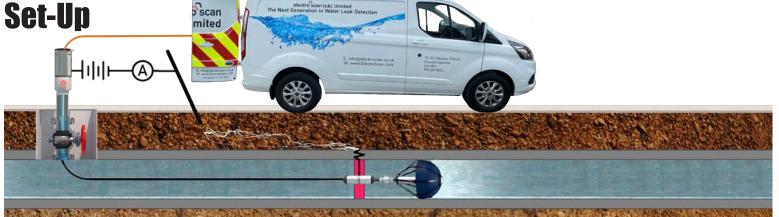
Mainline LPS	Total LPS	% of LPS	LPD
0.2290	0.229	100%	19,787

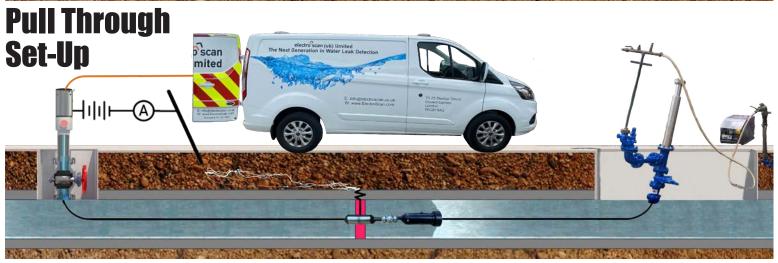
DEFECT BY LOCATION

Defect Start	Defect End	Total LPS	% of LPS	LPD
1. 20,308	20,308	0.004	1.94%	
2. 35,389	35,414	0.015	6.37%	
3. 40,405	40,453	0.021	9.42%	1,853
4. 59,906	59,906	0.001	GS DU	55
5. 78,682	78,683	0.001	P. 570	1 9 55
6. 92,231	92,281	0 005		2,998
7. 101,872	101,872		TEETT	55
8. 110,951	110,951		1.28%	55
9. 122,652	122,725		14.96%	2,944
10.139,548	1971 ULL		9.97%	1,962
11. 144,722			16.34%	3,216
12. 162,423	195162 25 1000	A	2.77%	545
13		0.004	1.94%	382
1	NJZ,980	0.045	19.67%	3,870
15. 163,938	163,942	0.002	0.83%	164



How Does Electro Scan Do It?





- No Lost Balls or Sphere. We're Tethered.
- No False-Positives from Hitting Pipe Wall. Ohms Law,
- No False-Negatives. We find them all
- No Guessing Which Leak is Larger?' Rech has a HPM.
- No High Pressure Needed. We're Pressure-Independent.
- No Long Wait for Reports. Data Available in Minutes.
- No Night-Time Work. We Aren't Acoustic.
- No False Reads from Customer Use. We Measure Holes.
- No Wide Variations. 3/8th (tem) Locational Accuracy.



O Electro Scan Multi-Sensor DELTA Probe



IJ

Condition	Performance	
Features	Low Voltage Conductivity FELL, CCTV, Acoustic Hydrophone, Pressure Sensor	APPRO
Pipe Diameters	3-60 inches, 76-1500 mm	
Pressure	Range from ZERO to 12 bar (174 psi)	
Temperatures	41-86° F, 5-30° C	
Common Launch Points	Air Release Valves, Blow Off Valves, Gate Valves, Hot Taps, Hydrants, and Meters	DWI Reg 31
Flow Rate	Min. Flow Rate for Hydrochute Propulsion is .3m/sec. Push rods able to handle NO FLOW conditions.	APPROVED
Pricing	Per Day or Per Meter Based on Total Project Size, Difficult Access, Openings, Diameter, and Traffic Control.	TED
Pipe Lengths Per Survey	1km Recommended for CCTV Up to 2km with specialised equipment.	
Average Production	1-2 Pipe Sections per Day	

SAFETY SCHEMES IN PROCUREMENT

SafeContracto

SSP

Multi-Sensor DELTA Probe case stu Ī

Pipe	Description
Length	170m (560ft)
Diameter	600mm (24in)
Material	Cement Mortar Lined Ductile Iron
Pressure	130.5 psi (9 bar)
Test Date	17 September 2020
Prior Leak Testing	Hydrostatic Pressure Test (FAILED) Tethered Acoustic (NO LEAKS) Un-Tethered Sphere (NO LEAKS) Surface Data Logger (NO LEAKS) Listening Stick (NO LEAKS)

Support



HANSEN Hansen Analytics, LLC

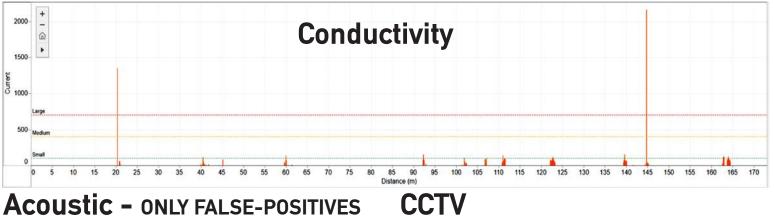
Scans

Export

criticalh20

DEFECTS	DEFECT	FLOW	Defects	Length	Total LPS	% of LPS	LPD =
Large	Severe	1.5817	15	341	2.401	100%	207,410
Large	Moderate	0.6820	Largest D	efects Ra	nked Bv L	PS	
Medium	Minor	0.1369	Defect Start	Defect End	Total LPS	% of LPS F	LPD
	Total LPS	2.401	162,883	162,980	0.471	19.61%	40,664
Small	3 LPD		144,722	144,723	0.389	16.19%	33,578
	LPD	207,403	92,231	92,281	0.364	15.16%	31,452
Pinhole	Severe %	65.89%	122,652	122,725	0.358	14.93%	30,962
	Moderate %	28.41%	Top Fou	r Leaks	1.582	66%	136,656
All Defects	5 Minor %	5.70%		LEGKS	1.302	0070	130,030

Log Out



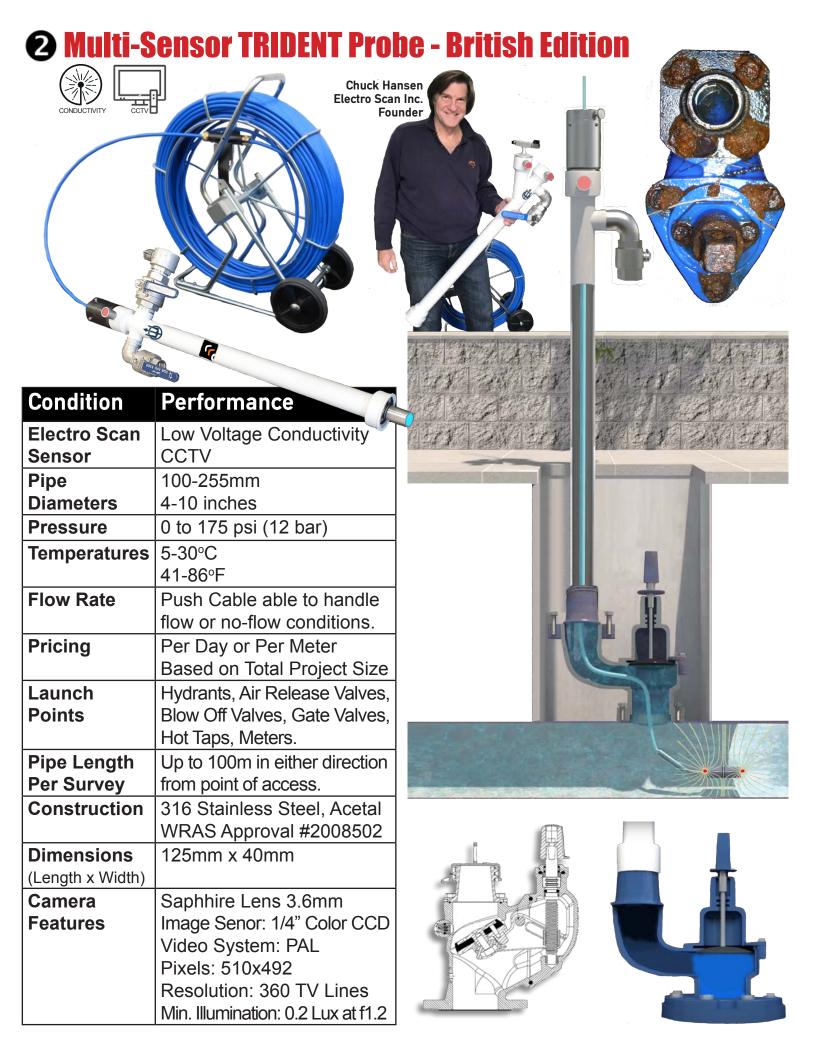
Acoustic - ONLY FALSE-POSITIVES

()) **Data Partner T4S**

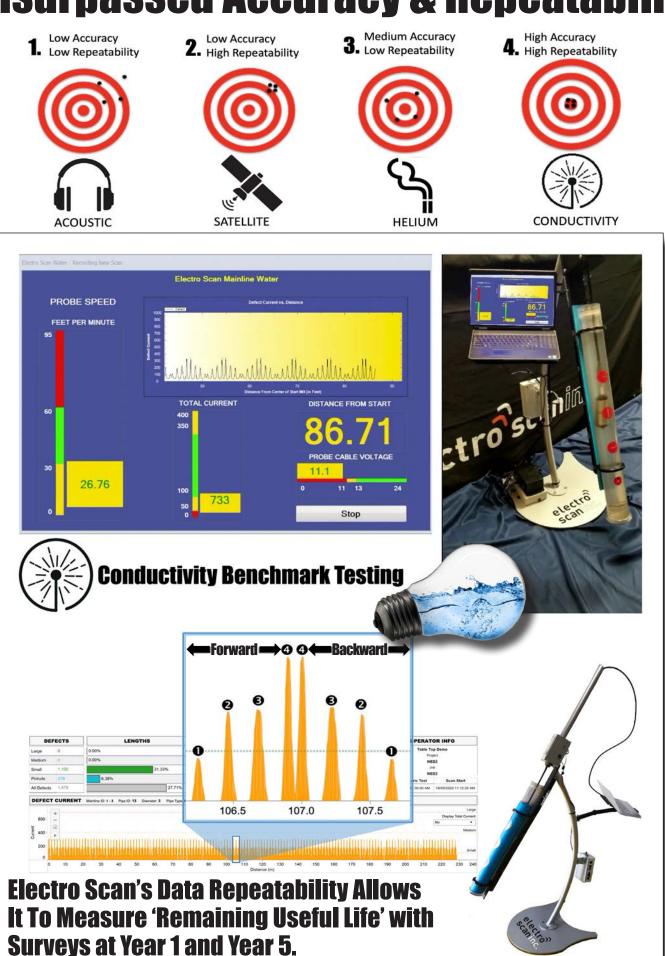
https://www.t4s.com **Smart Wireless Solution**

10.2m



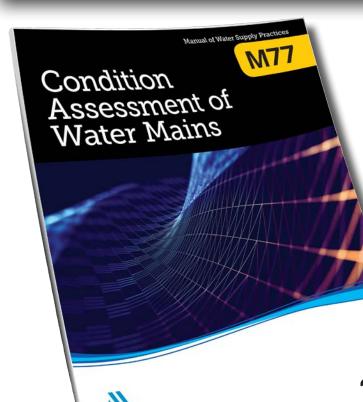


Unsurpassed Accuracy & Repeatability



Key Feature Comparison

Company	electro scaninc.	Aquam	Xylem or WRc Formerly Pure Technologies		Aganova	Utilis
Features / Product	Delta	JD7	Sahara	SmartBall®	Nautilus	Satellite
Technology	Acoustic, CCTV, Conductivity	Acoustic , CCTV	Acoustic, CCTV	Acoustic Only	Acoustic Only	Synthetic Aperture Radar
In-Pipe Connection	Tethered	Tethered	Tethered	Free Flowing	Free Flowing	\bigcirc
Device		*		(- And
Angular Misalignment Joint Coupling	•	0	0	0	0	0
Joint Coupling Spacing		0	0	0	0	0
Longitudinal Deformation		0	0	0	0	0
Leakages	ALL PIPES MATERIALS 1cm Accuracy Liters Per Second	Metallic, Not PVC 3m-10m Accuracy S, M, L (No LPS)	Metallic, Not PVC 3m-10m Accuracy S, M, L (No LPS)	Metallic, Not PVC 3m-10m Accuracy S, M, L (No LPS)	Metallic, Not PVC 3m-10m Accuracy S, M, L (No LPS)	NA
Pipe Location (X,Y,Z)	۲	0	0	0	0	Pipe
Pipe Ovality	۲	0	0	0	0	0
Visual Inspection			۲	0	0	0
AC Pipe Leaching Detection		0	0	0	0	0
Wall Thickness (AC, Metallic, Lined)		0	0	0	0	0
Full Condition Assessment Remailing Useful Life (RUL)	۲	0	\bigcirc	0	0	0
Condition Assessmen	anual of Water Supply Practices		ress A Ci	pipeline pp polic	abilitation pany guide y lega	shoo ine state in process



WWA M77 2019 **Features Electro Scan Inc.**

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ection regulation leak pole industry protection in ship d mant motion

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NCE team

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American Water Works ssociation

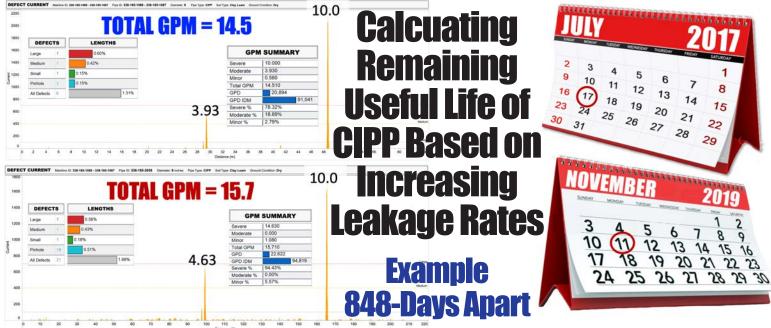
Electro Scan Is The Only M77 Technology Able to Test CIPP











Electro Scan–By Pipe Material

PĒ

PFP

PP

PVC

RCP

RTR

SPR

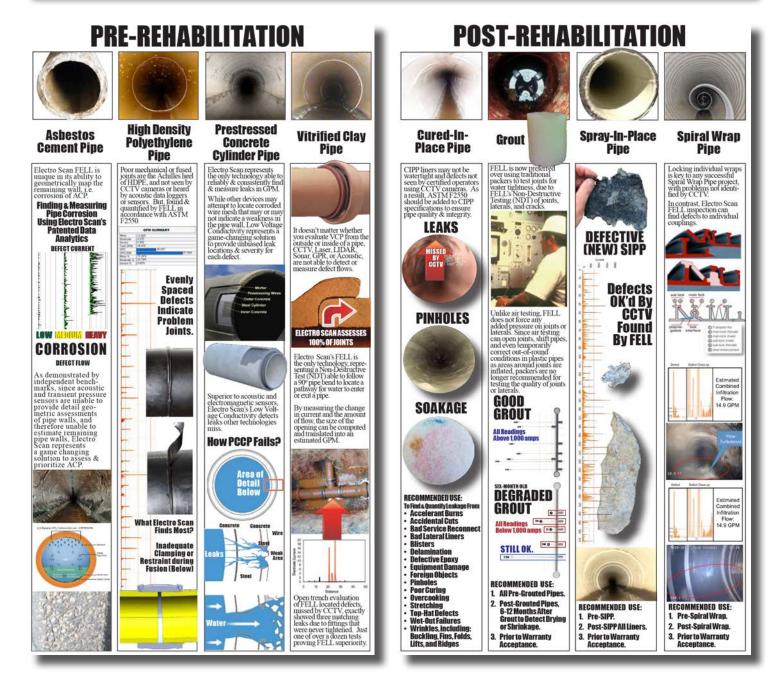
VCP

TC

ACP Asbes BRK Brick CMLSP Cemer CON Concre CIPP Cured- DIP Ductile FRP Fiberg FRPM Fiberg GRP Glass HDPE High D	In-Place Pipe Iron (w/Protector 401) ass Reinforced Pipe ass Reinforced Polymer Reinforced Pipe ensity Polyethylene eburg Pipe
--	--

PCCP Prestressed Concrete Cylinder Pipe Polyethylene Pitch Fiber Pipe Plastic Pipe Polyvinyl Chloride Reinforced Concrete Pipe RPM Reinforced Plastic Mortar **Reinforced Thermosetting Resin** SIPP Sprav-in-Place Pipe Spiral Wound Pipe Terracotta or Clay Pipe Vitrified Clay Pipe





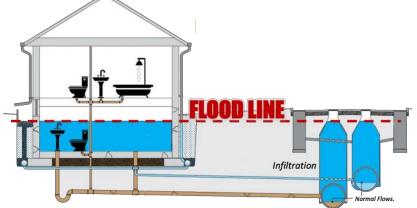
Investigation of Satellite & Drone Areas of Interest & Points of Interest



New Standard for Targeting High Risk Flood Locations Top 3 Causes of Flooding



- 1. Wet-Weather Infiltration into Sewers LEAKS
- 2. Pipe Blockages
- 3. Equipment Failure



Seamless GIS Intergration





LARGE DIAMETER PIPE ASSESSMENT - Pre- and Post-Rehabilitation Leak Location

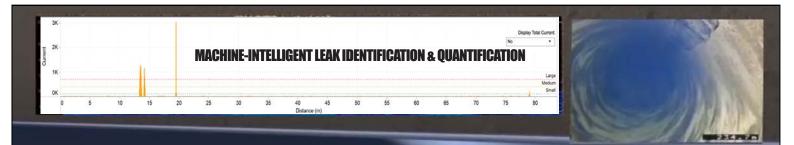


COVID-19 Coronavirus **Electro Scan Inc. Global Health & Safety Measures**

FIELD OPERTIONS: COVID-19 SAFETY UPDATES

All field operations are performed independently by Certified Electro Scan Technicians with no direct interaction with third-party personnel or customers required. The Electro Scan Operator efficiently and effectively manages all equipment, including insertion, navigation, and retrieval. The highest priority of Electro Scan staff – during all aspects of the sewer or water survey – is to safe-guard and protect the environment, deliver value-for-money to utility customers, avoid vehicle hazards, and protect pedestrians.

Electro Scan technology represents a machine-intelligent, non-destructive, leak detection solution. All data is collected without delay and instantly filtered through multiple security firewalls utilizing multiple redundant data storage backups with all data transport messaged using strict data protection algorithms, standards, and stored procedures. Once a sewer or water scan is completed, data is uploaded via onboard WiFi communication via data encrypted pathways delivered to either the Company's CriticalSewers® or CriticalH₂O cloud application where data can be instantly processed and available for review or decision support.



ELECTRO SCAN INC'S PATENTED & PATENT PENDING MACHINE-INTELLIGENT 4-IN-1 DELTA PROBE, HYDROCHUTE, CCTV. AND ACOUSTIC SENSOR

electroscan

OUR ROUTINE SAFETY STANDARDS ALREADY PROTECT OPERATORS FROM COVID-19

- Due to job specialization, only one (1) employee touches or uses any equipment as per their job function for that day. At the end of each day, all equipment is cleaned and disinfected.
- Required Personal Protective Equipment (PPE): steel-toed boots, hi vis and reflective apparel, gloves (chemical resistant, 9 mil thick), & hard hat.
- Additional PPE includes eye protection, disposable masks (N95), extra clothing, etc., as recommended by CDC, NIH, & OSHA.
- All PPE kits are personally assigned to an Operator, and kits have dedicated place to keep personal PPE from others. Extra PPE kits and equipment are available on all vehicles.
- Hand sanitizer is in the front door wells and also on rear of every truck.
- Hand washing stations are on every truck.
- All Trucks are fully stocked with spray and wipe disinfectants for use after each day's work.
- Each day all trash and used equipment (gloves, wipes, rags, etc.) is bagged and removed from the trucks to insure each day begins clean.

ADDITIONAL PRECAUTIONS IN RESPONSE TO COVID-19

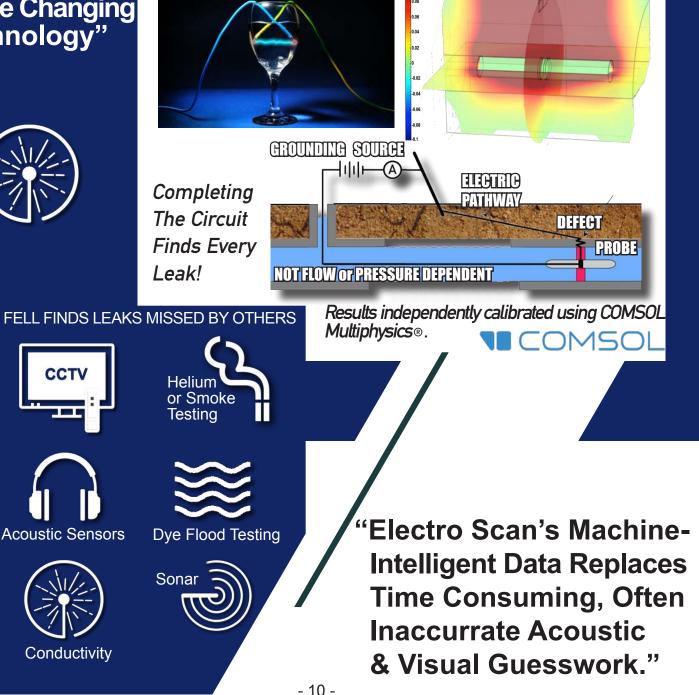
- Each Field Operator has vehicle assigned for each day, and its disinfected at the end of each day.
- Before each day begins a tail gate safety meeting takes place, with appropriate social distancing of at least 6-feet, to go over the job and reiterate the safety protocols in place and to be followed.
- Each employee has reviewed and signed off on the current guidance from the CDC, NIH on appropriate disinfection requirements, techniques, and PPE requirements for working in sewers and to protect themselves from COVID-19.

Technology

"Electro Scan's Focused **Electrode Leak** Location, is a **Game Changing** Technology"

How Do We Find & Measure Leaks?

If a pipe leaks electricity, it leaks water. And can be measured in gallons per minute or litres per second.



Team





Chuck Hansen, Founder & CEO.

International pioneer in water & wastewater asset management & condition assessment. Multi-patent holder in pipe leak detection, with nearly 40 years of experience in water & sewer industry. Founded Enterprise Asset Management (EAM) company in 1983 and sold for \$100 million in 2007. Founded Electro Scan in 2011 and Electro Scan (UK) Limited in 2014. Former Chair, ASTM F36.20, Inspection & Renewal Water & Wastewater Infrastructure.





Carissa Boudwin, VP, Chief Revenue Officer. In charge of corporate wide Technology as a Service (TaaS) and Software as a Service (SaaS) licensing. B.S. George Mason University. Over 5 years with the Company managing data reporting, sales quotes & proposals, technology licensing, and revenue recognition.



Michael Condran, PE, VP, Chief Engineering Officer. Responsible for engineered quality assurance, quality control, decision support, and reporting, with 25-years of experience with major global engineering firms. Licensed PE in Colorado, Florida, North Carolina, and Washington.



Mike App, VP, Chief Implementation Officer. Responsible for all Project Implementations & Deliverables, worldwide, with over 10-years of experience in Cured-In-Place Pipe (CIPP) and trenchless rehabilitation industry.



Paul Pasko, PE, VP, Intl. Business Development. Responsible for International Partnerships and Projects, Pasko brings over 30 years of experience condition assessment & Trenchless rehabilitation projects. In 2019, Pasko was was recognized by the American Public Works Association (APWA) as the Professional Manager of the Year Award – Engineering and Technology. Licensed PE in Illinois and Minnesota.





Brad Weston, Director, Electro Scan (UK) Limited. Responsible for UK and EU Water & Sewer Leak Detection Projects, with Master Certificate in Advanced Low Voltage Conductivity. Prior to working with Electro Scan, Weston worked for WRc doing over 1,000 water insertions.

Accurate, Fast, Repeatable

North America

Field Data 5-Minutes or Less.

LICENSING

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EU & UK

amazon webservices

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Asia Pacific

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BES

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