



Your Safety...Our Commitment

www.heathus.com

2022 TGA Transmission Roundtable

Robert Botello Jr



Heath Consultants - History



- 1933 - Founded as New England Forestry Service, Inc., providing line clearance services to the electric industry
- 1st documented vegetation leak survey in Salem, MA
- 1939 - Heath Tree Service, Inc. was formed
- 1956 - Heath Consultants Ltd. was incorporated in Canada
- 1959 - Introduced first Flame Ionization (FI) detector to gas industry
- 1971 - Heath Consultants Australia, Pty., Ltd. was formed
- 1975 - Heath Energy Services was formed to offer contract services for pole maintenance, pole testing and insulator washing

Heath Consultants - History



- 1980 - Purchased tank and line testing division of Kent Moore Corporation
- 1988 - GMI first introduction of combination instrument with sensors and pumps
- 1990 - Formed LEAK TEK to offer full service engineering technology to the water industry
- 1997 - Introduction of Optical Methane Detector (OMD™) to the market
- 1999 - Sure-Lock “family” of locators released for sale

Heath Consultants - History



- 2005 - Remote Methane Leak Detector (RMLD®) officially released to market
- 2007 - Detecto Pak-Infrared (DP-IR™) officially released
- 2008 - Reynolds Equipment asset purchase
- 2010 – Release of Staylit non-intrusive meter change-out device
- 2011 – Release of OPGAL Imaging Camera
- 2014 – Release of ODORATOR 2™ - Odorization Survey Audit System
- 2014 – August, Acquisition of Norton Corrosion Limited
- 2017 – Release of ABB MobileGuard™ Advanced Leak Detection System
- 2019 – Release of RMLD Complete Solution (RMLD-CS)

Business Units



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Products Business Unit

- Manufacturing
- Product Sales
 - Environmental, Social & Governance
 - *Methane Emissions Measurement, Monitoring & Mitigation*

Services Business Unit

- Field Services
 - Leak Survey
 - Meter Reading
 - Locating

Manufacturing Facility



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22.000

SQUARE FEET



Remote Methane Leak Detector Complete Solution



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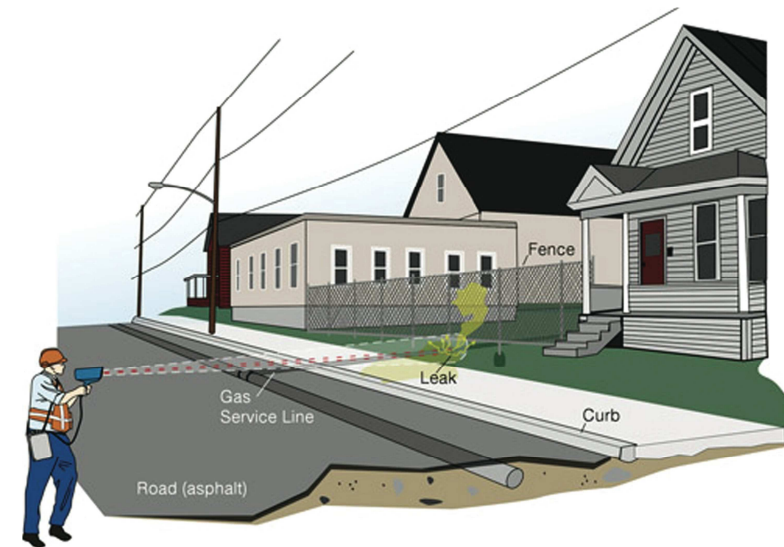


Technology - OVERVIEW



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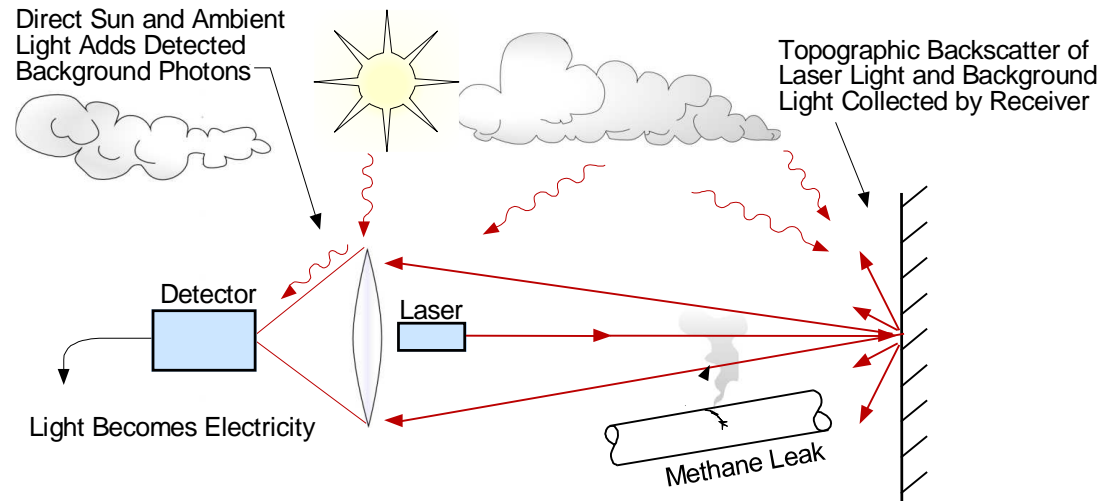
The Remote Methane Leak Detector-Complete Solution (RMLD-CS) is a highly advanced technology, capable of detecting methane leaks from a remote distance. This technology makes it possible to detect leaks without having to walk the full length of the pipeline, thus creating safer surveys in areas that may be difficult to reach such as busy roadways, yards with dogs, fenced off area and other hard to access places.



TUNABLE DIODE LASER ABSORPTION SPECTROSCOPY

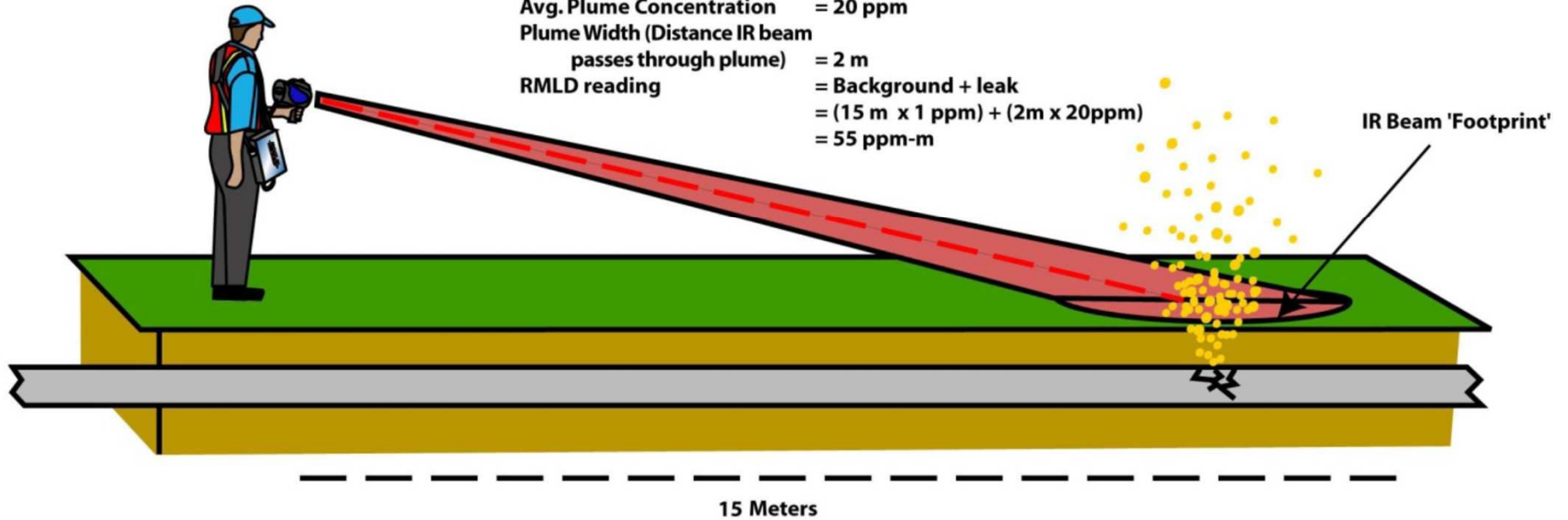
TECHNICAL APPROACH – How it Works

- Laser light beam is remotely projected on to a target (e.g., grass, wall, etc.)
- A fraction of the beam is scattered from the target surface and returned to the source
- Returned light is collected and focused onto a detector
- The presence of methane is encoded within the returned light
- Methane readings are displayed in ppm-m

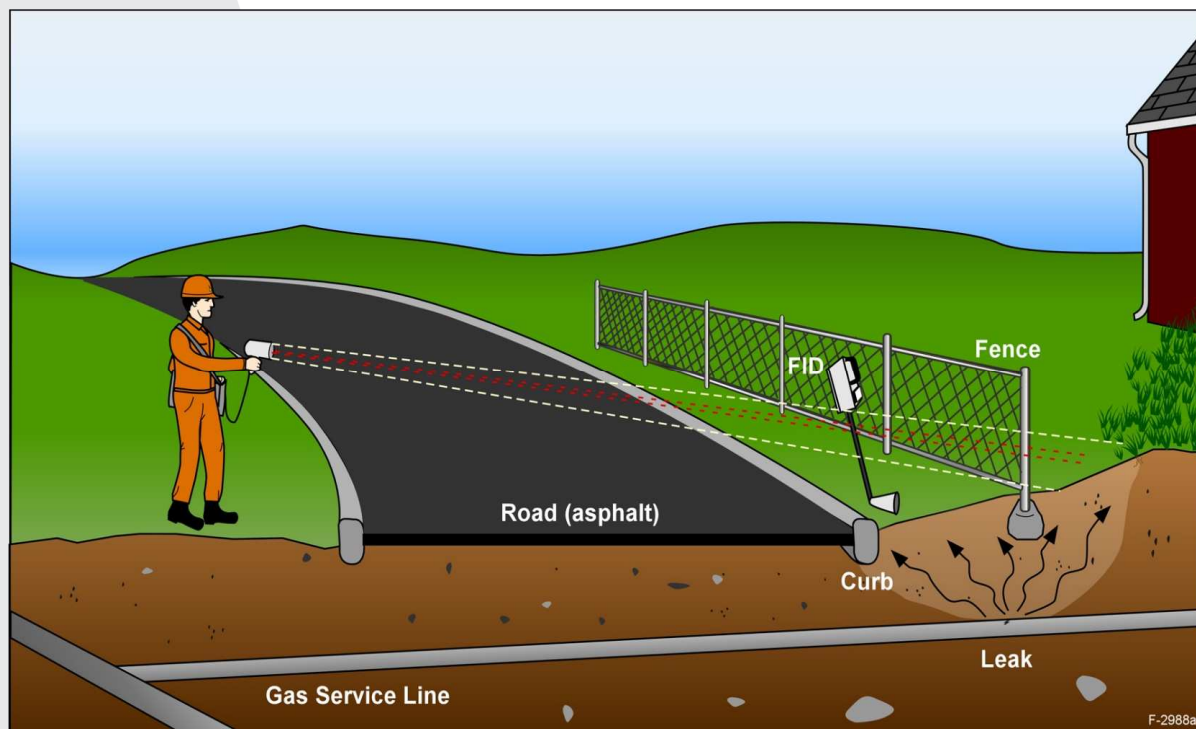


Footprint / Infrared (IR) / PPM-M

Example	
Scan Distance	= 15 m (50 ft)
IR Beam 'Footprint'	= 4.9 m (16 ft) x .3 m (11 inches) @ 15 m (50 ft)
Background Methane	= 1 ppm
Avg. Plume Concentration	= 20 ppm
Plume Width (Distance IR beam passes through plume)	= 2 m
RMLD reading	= Background + leak = (15 m x 1 ppm) + (2m x 20ppm) = 55 ppm-m



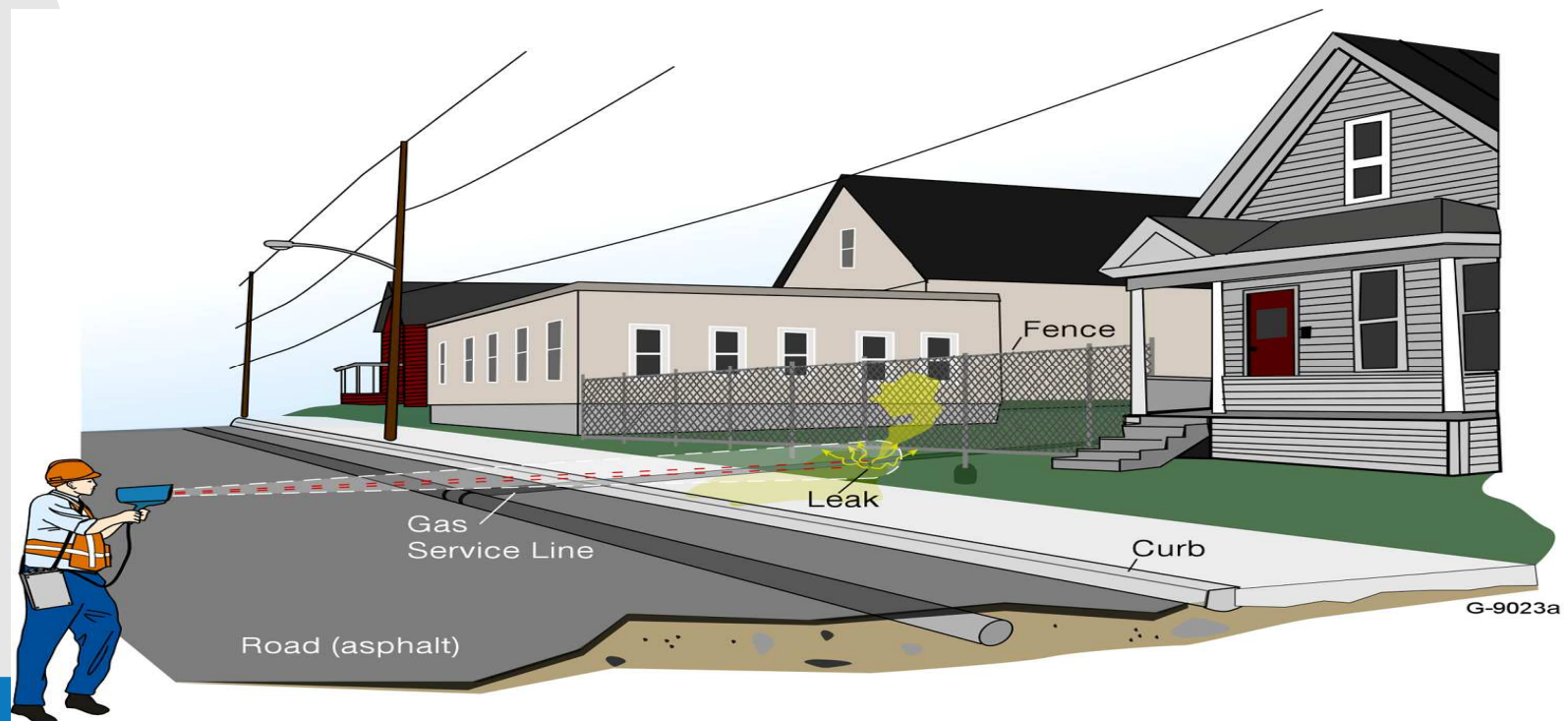
RMLD CONCEPT



Do not need to be in gas plume!

THREE CONDITIONS NEEDED TO DETECT A LEAK

- Need a sufficient plume to detect a leak
- The IR beam must pass through the plume
- Need a background target to reflect beam



Specifications



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Detection method	Tunable Diode Laser Absorption Spectroscopy (TDLAS)
Measurement Range	0 to 50,000 ppm-m
Sensitivity	5 ppm-m at distances from 0 to 100 ft (30 m)
Intrinsic Safety	Class 1, Division /Zone 2 Aex ic op is IIA T4 Gc Class 1 Div 2, Group D Intrinsically Safe
Detection Distance	100 ft (30m) maximum. Actual distance may vary due to background type.
Beam Size	Conical in shape with a 22" diameter at 100 ft (55 cm at 30 m)
Detection Alarms Modes	Digital Methane Detection(DMD): Audible tone relative to concentration when detection threshold exceeded Real Time(RT):Continuous audio chirp relative to concentration. Adjustable Detection Alarm Level 1 to 999
System Fault Warning	Unique audible pitch and indication on the display
Self Test & Calibration	Built-in Self Test and Calibration function verifies operation and adjusts laser wavelength for maximum sensitivity. Test gas cell integrated within carrying case.
Compliance	EMC (EN61000-6-2, EN6100-6-4)
Laser Eye Safety	IR Laser: Class 1; Green Spotter laser Class 2(II) <5mW @ 532nm Spot size is 7mm at 15M
Operating Temperature	0° to +122° F (-17° to 50° C)



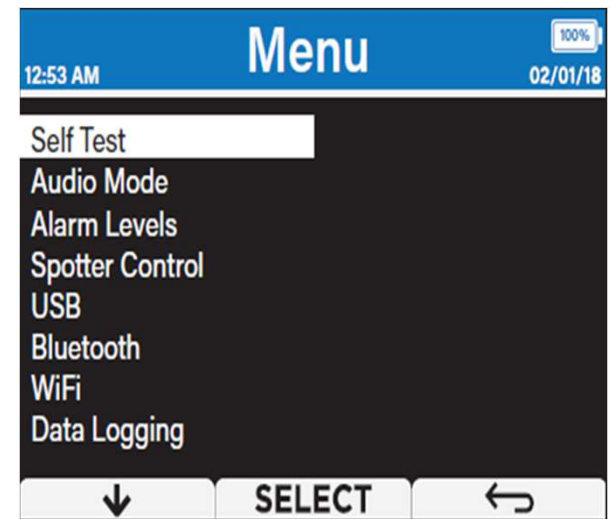
Self-Test

Instrument Self Test

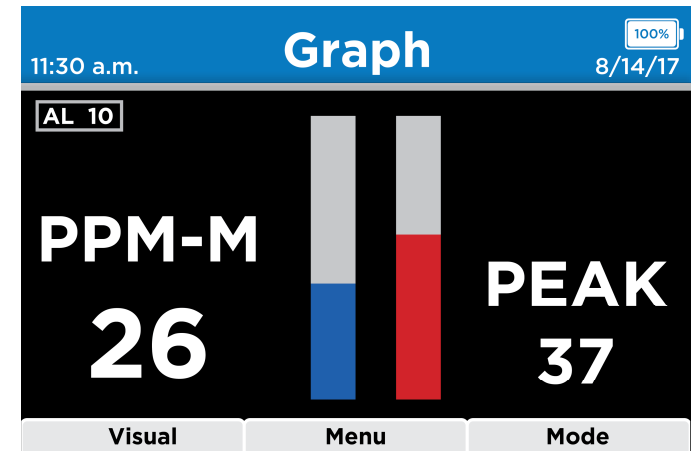
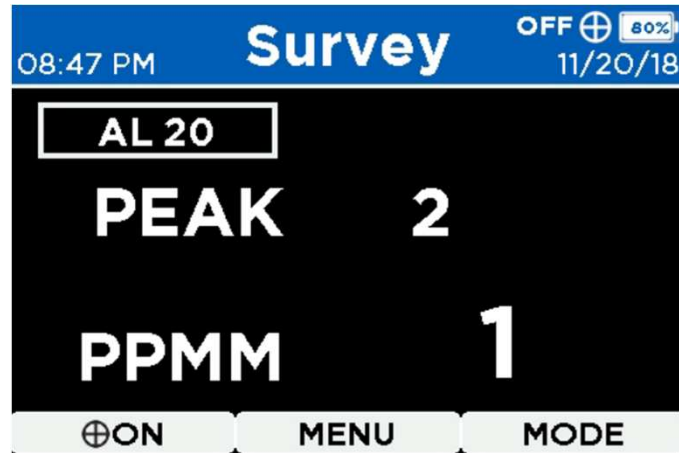
The RMLD-CS has a built-in function to perform a Self-Test of the laser wavelength. The self-test feature should be performed daily before survey to ensure that the instrument is operational. A Self-Test log file is recorded and stored on the RMLD-CS instrument.

NOTE: No yearly factory calibration required
Unless instrument fails the self-test (repeatedly)
or presents other problems.

NOTE: The self-test takes approximately one to
three minutes to perform.

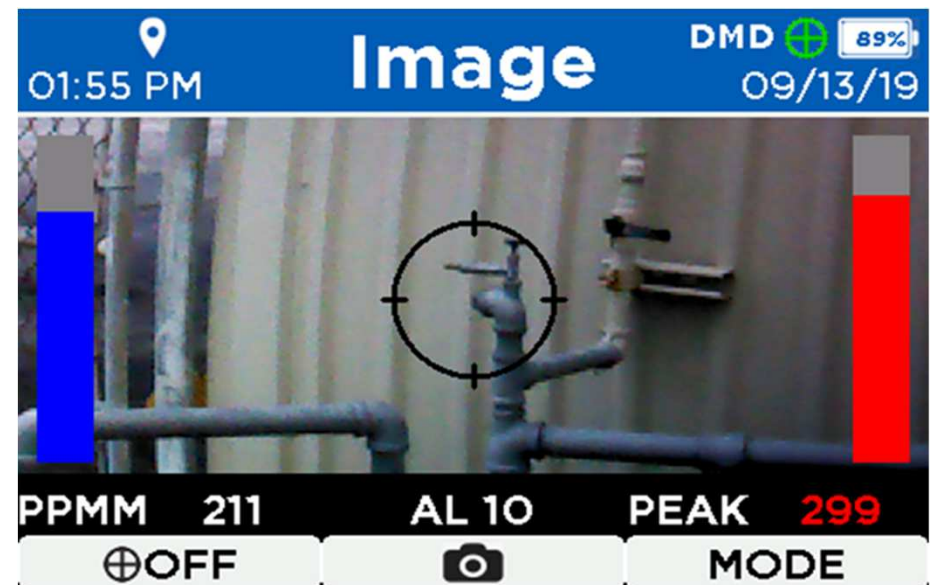


Survey – Graph / Image Modes



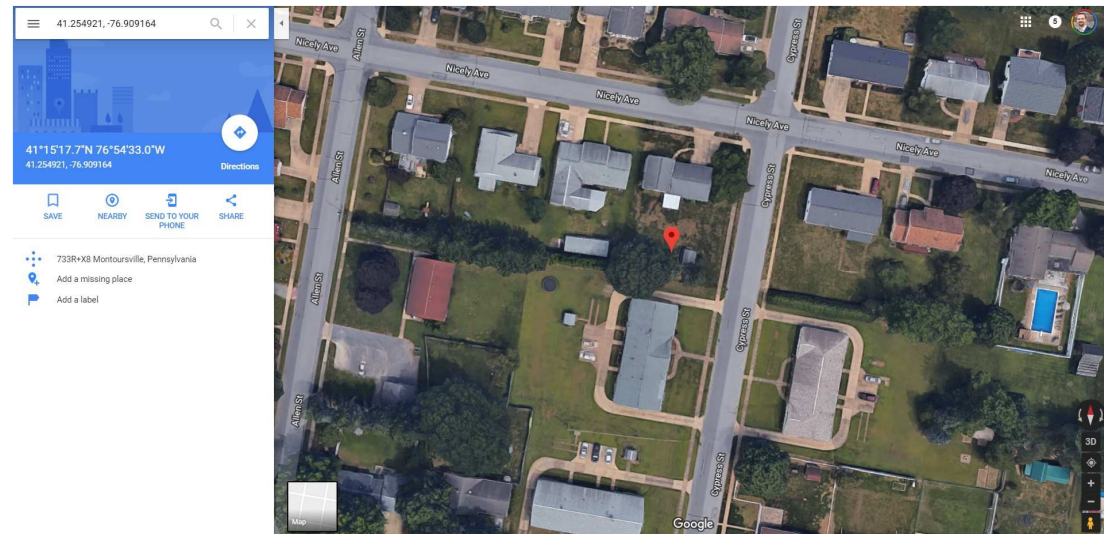
PICTURE/IMAGE CAPTURED & TEXT DATA – CS unit only not from App

- Capture
- 09/13/19-06:55:09 PM
- Serial: 8211937001
- -----Peak Read: 298.50
- Gas Concentration--210.54
- GPS Stats: 29.637661 -95.264969



Screen Capture – Data Logging

GasConcentration	F1Mag	F2Mag	BattLevel	BattVolt	Latitude	Longitude	Altitude
4049.61	24.13	50.84	94	12.33	41.254921	-76.909164	169.5



MOBILE APP – LEAK INDICATION



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- During the survey, any leaks that are detected, you can press the “log leak” on the screen and it will show up on the KML file (google maps).

RMLD APP DATA

- Available for iOS and Android devices
- Connect to RMLD
- Set GPS logging intervals
- View current readings and alarm from device
- Log location of leak
- View survey map upon completion
- Send or save kml, csv, or zip files
 - Kml contains coordinates only
 - Csv contains phone and instrument coordinates, instrument data, and time stamp

APP – KML file



- Example of RMLD-CS app indicating GPS and Leak indications
- You would need to take a picture, with the Image Mode of the CS, of the leak to correlate with the pin location. Which also provides GPS coordinates

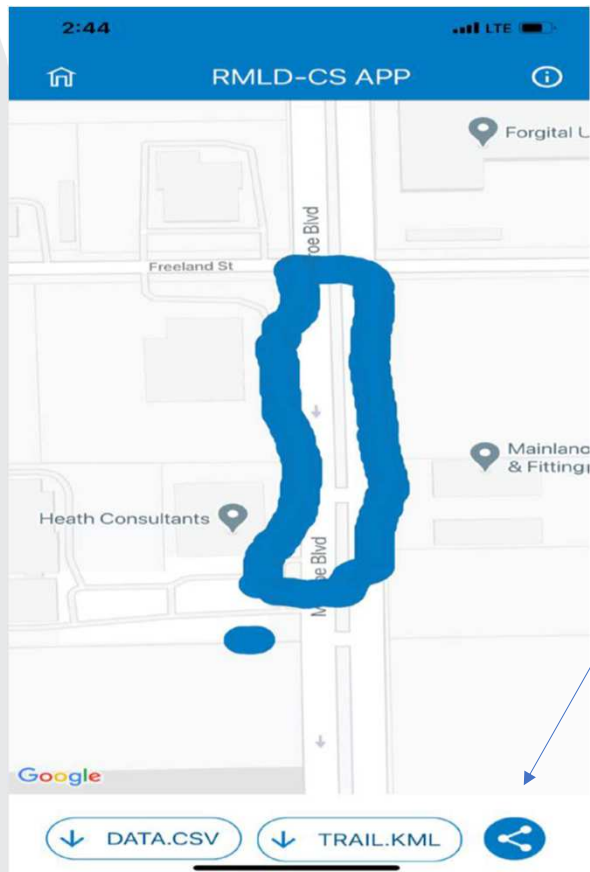
RMLD APP DATA – MOBILE GPS



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Latitude	Longitude	Date/Time
29.63746811	-95.26595719	2/10/2021 9:46
29.63746811	-95.26595719	2/10/2021 9:46
29.63722344	-95.26437743	2/10/2021 9:46
29.63750851	-95.26587332	2/10/2021 9:46
29.63740731	-95.26562423	2/10/2021 9:46
29.63746342	-95.26564116	2/10/2021 9:46
29.63746342	-95.26564116	2/10/2021 9:46
29.63746342	-95.26564116	2/10/2021 9:46
29.63751195	-95.26564887	2/10/2021 9:46

GENERATE DATA



- Ending the survey, you can then transfer the data – CSV / KML - to your email (zip file).

BENEFITS

Reduce survey challenges:

Dogs

Reduction of dog bites

Landscaping

Less intrusion on property

Uncooperative Customers

Better customer relations



BENEFITS



Reduce Survey challenges:
Backyard main/services.



Over or through fences
/ no access

Enclosed Regulator stations

BENEFITS



Perform most surveys without physically walking service lines.

Can scan both sides of the street.

Safer to inspect busy street and intersections.

BENEFITS

COMPRESSOR STATIONS:

Quicker and more efficient inspection of multiple exposed piping in a stations yard.



BENEFITS



More efficient survey
of pipelines on
bridges
and overpasses

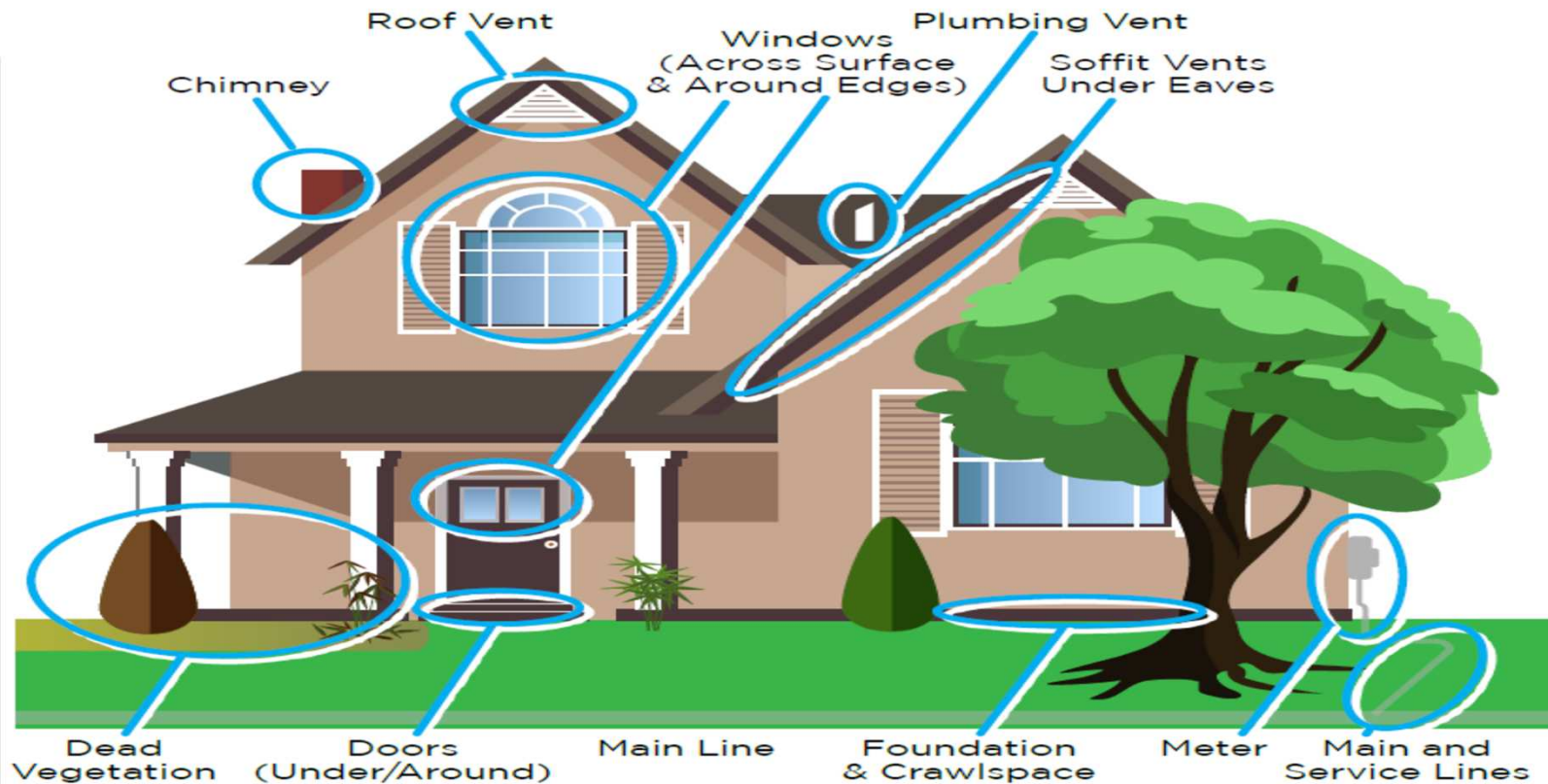


BENEFITS



- Able to remotely check inside buildings or confined spaces for presence of methane.
- Ability to inspect roof top vents
- Intrinsic Safety – Class 1 Div./Zone 2

CS ABILITY TO INSPECT FOR A LEAK





DISCOVER

Advanced Mobile Leak Detection





★ TEXAS
PMD-860
The Lone Star State

DISCOVER
Advanced Mobile Leak Detection



Gases Detected	Simultaneous Detection of Methane and Ethane
Sensor Technology	Open-Air Fixed Path Mid-IR TDLAS
Sensitivity & Resolution	Methane: < 50 PPB at 10 Hz, < 20 PPB at 1 Hz Ethane: < 10 PPB at 10 Hz, < 4 PPB at 1 Hz
Selectivity	No Cross-sensitivity to humidity, other hydrocarbons or industrial gases
Response Time	Sample frequency of 100 Hz, Data update rate of 10 Hz
Accuracy	±10% of reading for Methane/Ethane in Natural Gas, ±50% for quantification
Calibration	Field Calibration using self-test with a Natural Gas Calibration Cell
GPS	GNSS-INS system at 10 Hz, < 1 m accuracy, Inertial navigation
Battery & Display	All sensors powered with Re-chargeable batteries (8-10 hr life). Rugged Windows-10 Vehicle Mounted Tablet with HD display
Data & Connections	Robust Bluetooth 5 (BLE): No Wires!!
User Interface & Reports	Full Suite Cloud Based Leak Survey Analytics Simple intuitive and graphics rich touch screen operation Real Time Leak Detection Post-processed Leak Detection & Leak Localization Leak Survey Coverage Area Emission Quantification
Operation while Driving	Hands off voice alerts, instructions and commands





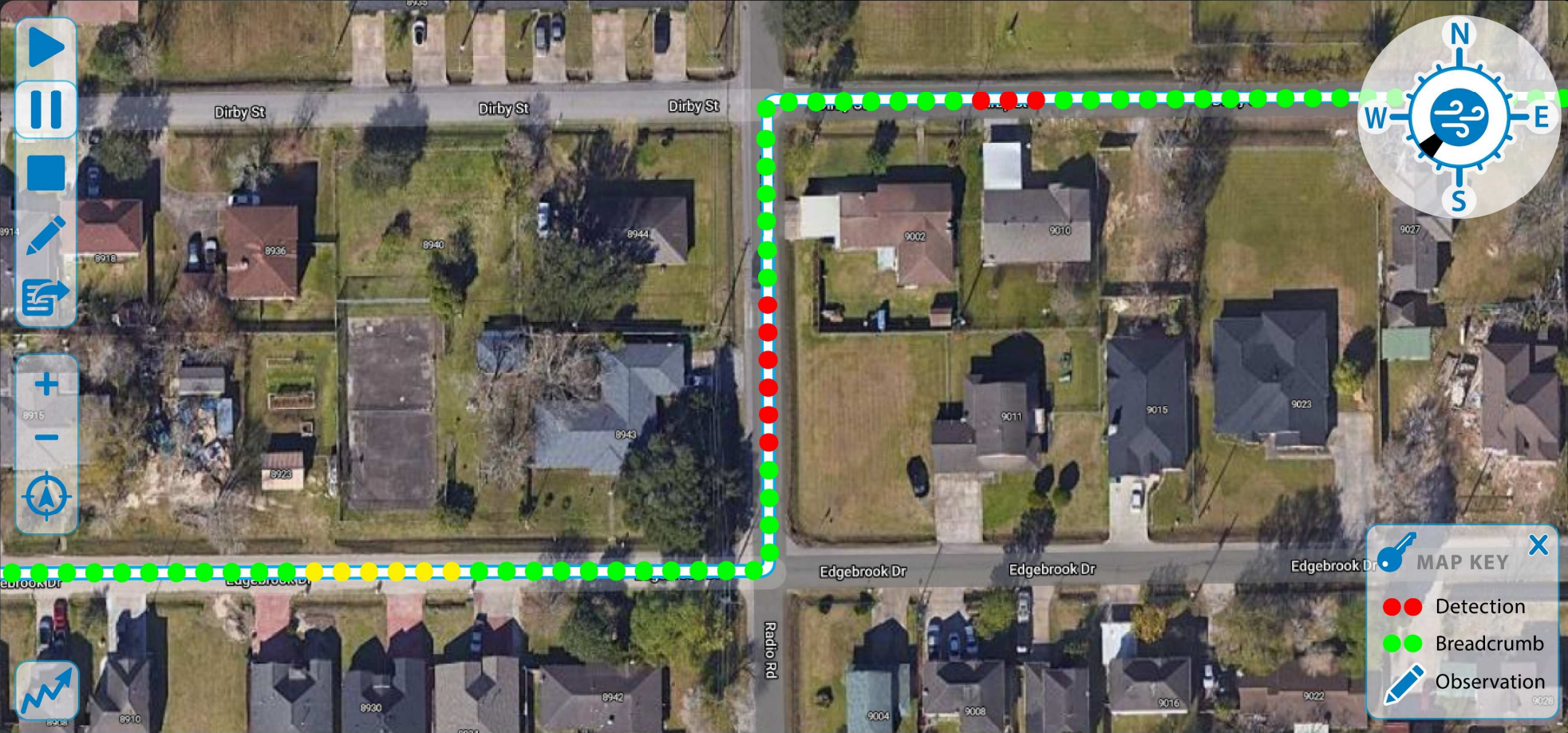
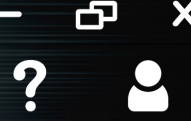
ALERT
 High Ethane Concentration
 High Methane Concentration

ETHANE
150 PPB
 MORE 95%

METHANE
2.2 PPM

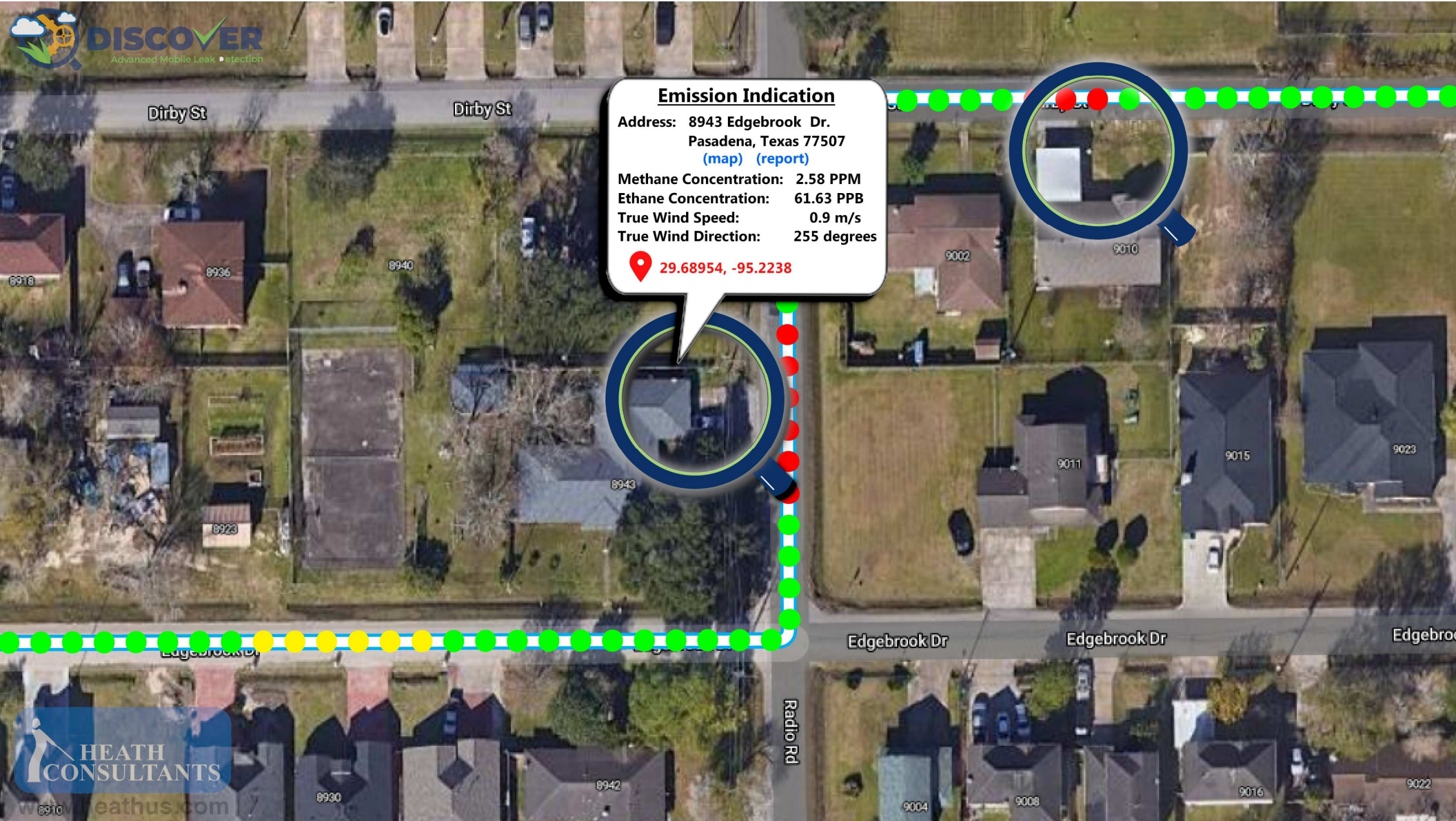
ANEMOMETER
5 SW (225)
 18%

GPS
 98% Signal Strength
 1.5 ft Accuracy



MAP KEY

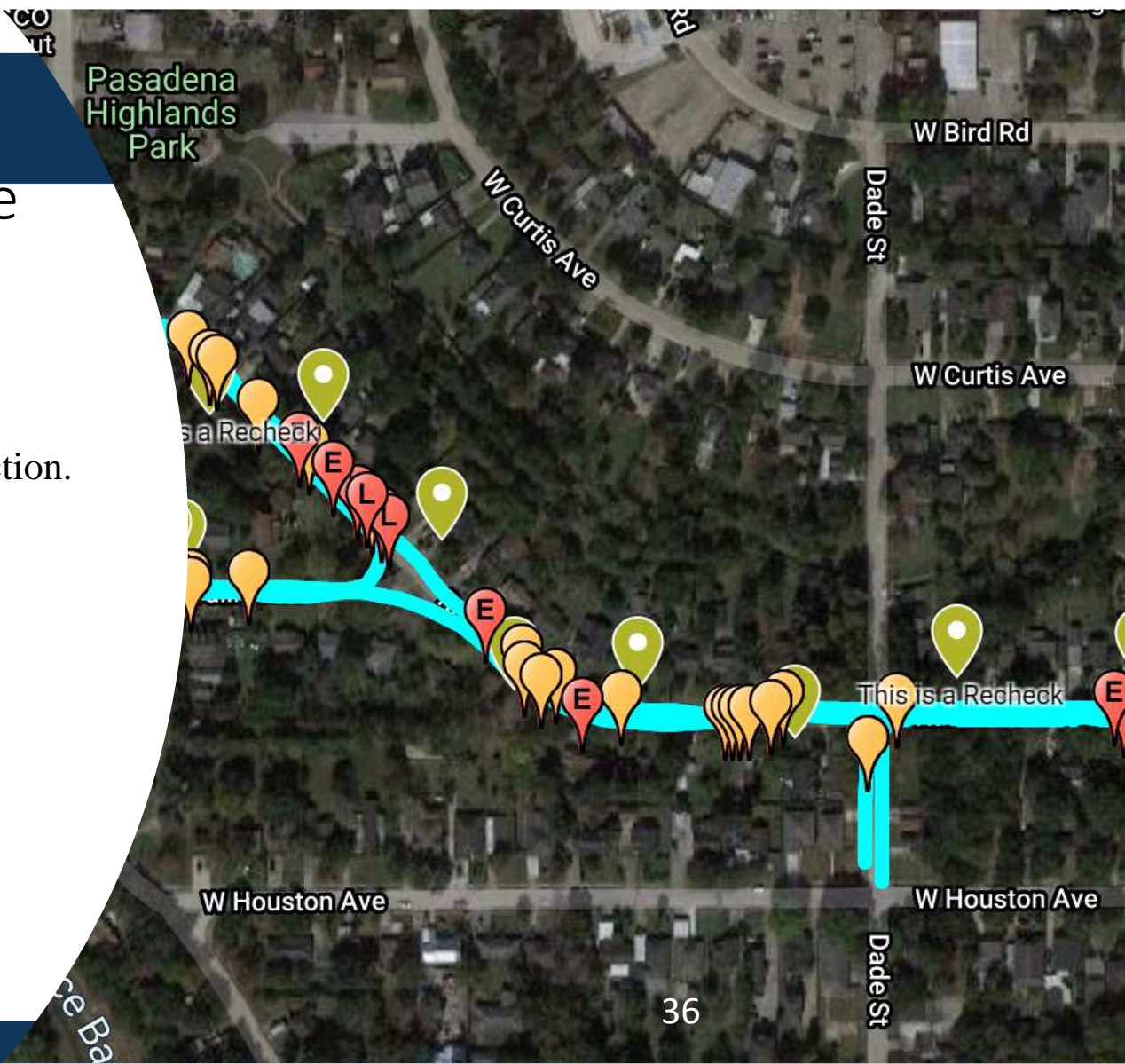
- Detection
- Breadcrumb
- ✎ Observation



Emission Indication
Address: 8943 Edgebrook Dr.
Pasadena, Texas 77507
[\(map\)](#) [\(report\)](#)
Methane Concentration: 2.58 PPM
Ethane Concentration: 61.63 PPB
True Wind Speed: 0.9 m/s
True Wind Direction: 255 degrees
 29.68954, -95.2238

The importance of sample rate

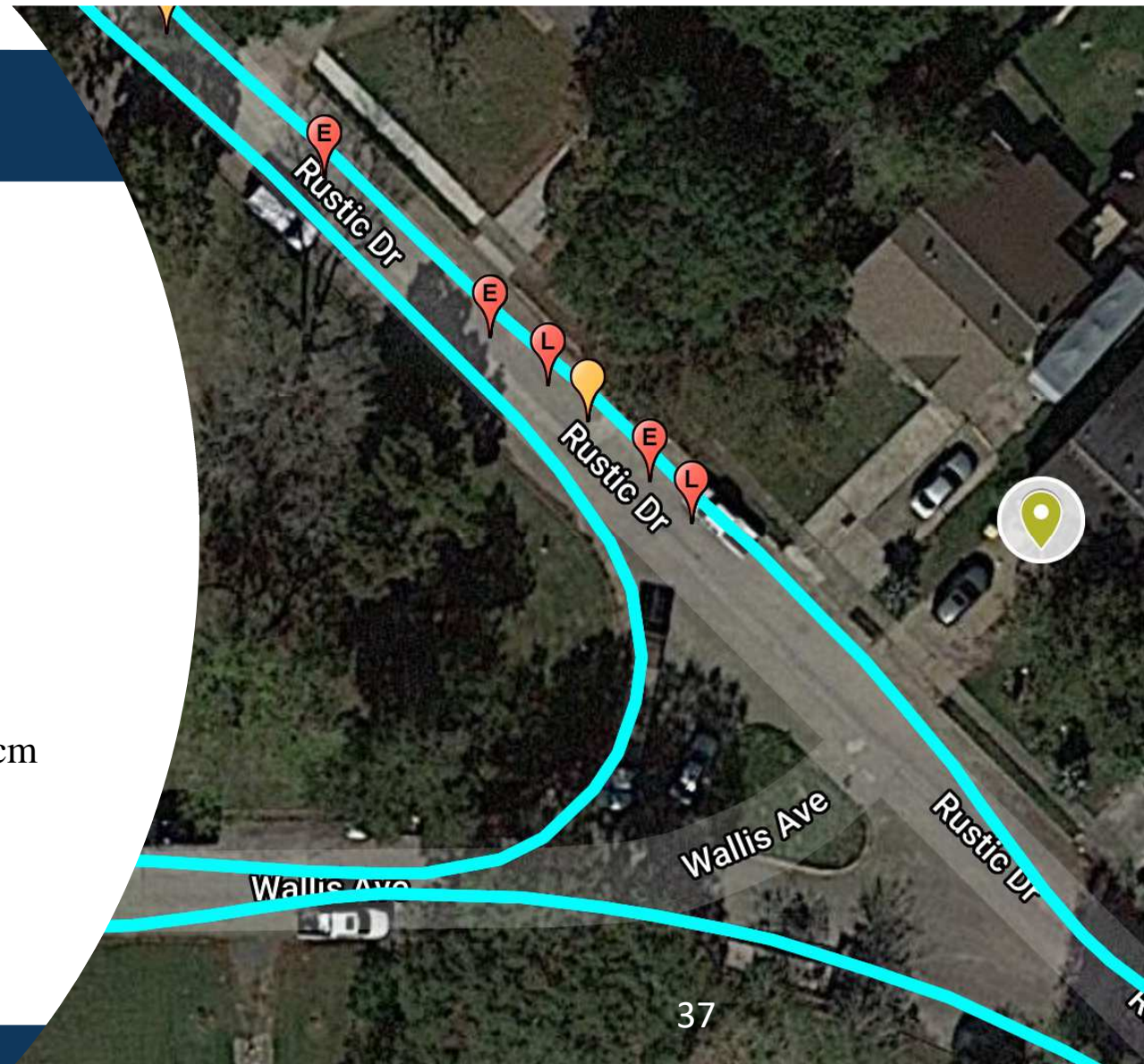
- 100Hz equals more data aggregation enabling better decisions for true leak detection.
- Higher precision localization.
- Drive routes faster



The importance of open path

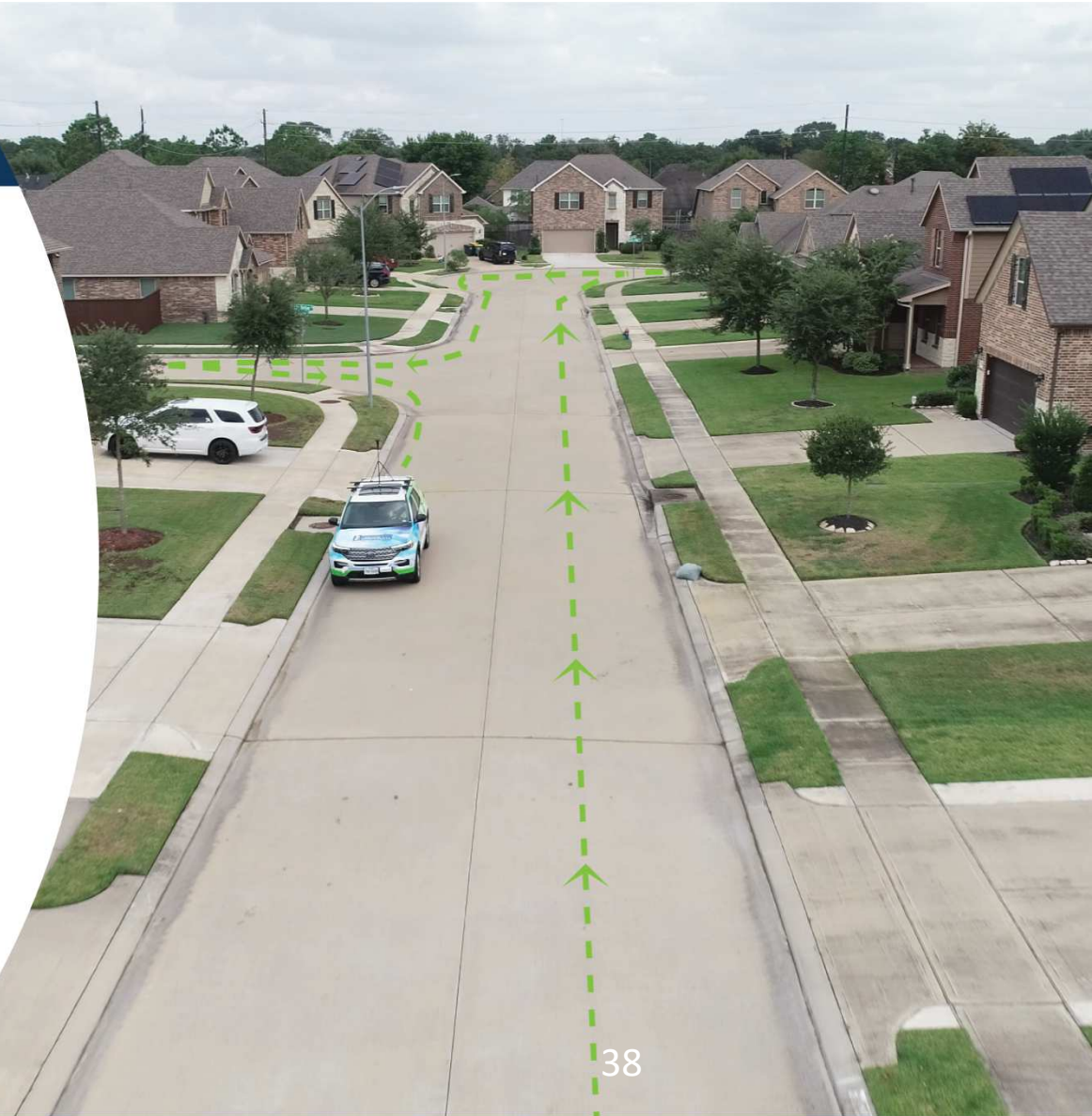
- Methane Leak Concentration: 159 ppb
- Ethane Leak Concentration: 14 ppb
- True Wind Speed: 0.2 m/s
- True Wind Direction: 78.9 deg
- Baseline Methane: 2.389 ppm

- 1 meter path length: Ability to detect 10cm wide plume at 10 m/s (22mph)
- No dilution of sample



Early blind survey testing

- **98% Find Rate for all true natural gas leaks.**
- Leak indications were verified with follow up survey.
- **Less than 28% False Positive**
- Desired goal to be less than 15%
- Continuously updating detection algorithm and LSA modules



QUESTIONS



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