

The Methodologies and Technologies of Utility Locating

Issues, Challenges, and Equipment for the Positive Location, Mapping and Leak Surveying of Natural Gas Facilities

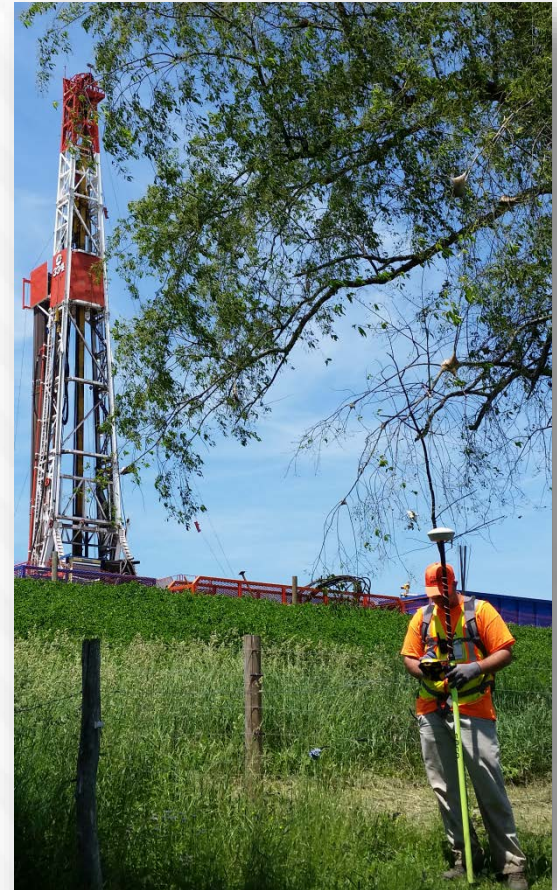
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For:



Today's Topics

- The 811 (One Call) system, its purpose and limitations as it applies to the oil and gas industry.
- Utility locating technology – its capabilities and limits
- Gas leaks – what the oil and gas industry looks for versus what researchers are interested in.
 - Case Study #1, People Natural Gas Leak Survey
- Orphan wells – challenges face when attempting to locate and map the wells.
 - Case Study #2, third party well, initial orphan well survey
- Moving forward.



Methane Gas Leak Surveys

Methane Leaks and the Marcellus

- Current data is outdated and limited
- Research is focused on new wells, transmission lines, compressor stations, process plants, etc.
- Legacy systems are largely ignored
 - Gathering systems
 - Farm taps
- PULS believes that legacy systems represent an under reported source of methane leaks.



Some Statistics

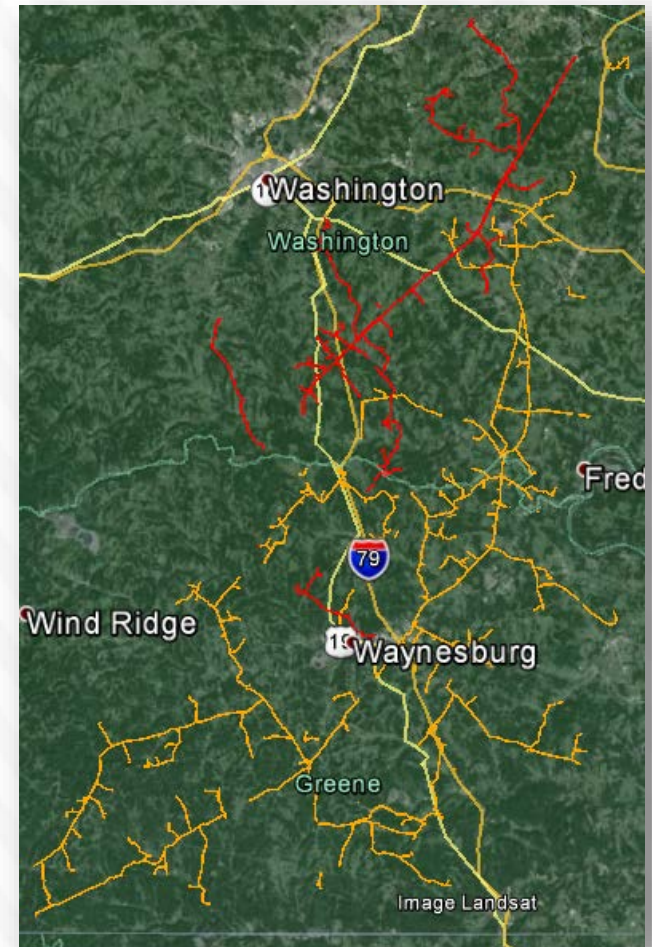
- There are an estimated 100,000 mile of gathering systems within Pennsylvania alone.
- There are an estimated 325,000 wells drilled within Pennsylvania.
- There are currently over 14,000 shale gas wells, with 120,000 wells estimated by 2020 – these will all have to be connected to gathering systems.
- An estimated 100 miles a month is added to the systems and the pace is expected to accelerate.



Case Study – Leak Survey

- Natural Gas Gathering System
- 371 miles of pipelines spread over two counties in rural Pennsylvania
- Oldest pipe dates from 1890's
- Very high lost and unaccounted for gas numbers:

	2009	2011	2012
System No. 1	46%	53%	63%
System No. 2	70%	78%	83%
<i>*No Data for 2010</i>			



The Project

Three distinct tasks:

- Locate the gathering system
- Leak survey and classify all leaks (I, II or III)
- Take GPS coordinates and map all data:
 - Pipeline locations
 - Location and photographs of all appurtenances
 - Location of all leaks

Unique aspects of the project:

- All encompassing survey of the system
- PULS worked directly with end users (GIS/Corrosion/ROW) to design data capture system

Leak Locating Challenges

- Depending on the owner and level of documentation – the exact pathway of the gathering system may not be known.
- Many of the gathering systems exist under heavy vegetation or tree canopies.
- Terrain can make leak detection difficult and expensive.



The Results

- A very detailed data map of the gathering systems:
 - Allowed for detailed analysis and costing
 - Provided leak locations and classifications
- Summary:
 - Mapped over 350 miles of pipeline
 - Recorded over 1,800 leaks
 - Mapped over 22,000 data points

Gas companies are interested in severity and location of leaks – not the volume of gas lost at the leak. We believe we can extrapolate the volume per leak based on data that is currently available.

Questions?