

CASE STUDY

Wheatley, Ontario Explosion

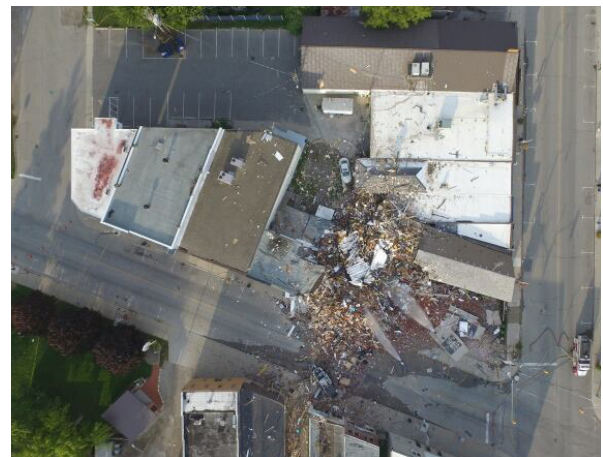
WHAT HAPPENED, THE IMPLICATIONS, AND FUTURE PREVENTION



Introduction

On August 26, 2021, a hydrogen sulfide gas (H₂S) explosion occurred in the downtown core of Wheatley, Ontario, resulting in 20 people being injured and causing extensive damage to surrounding buildings. During demolition, the gas was traced to a legacy gas well nearby which had migrated through an underground water reservoir and used an undocumented water well as a conduit to accumulate in the basement of a building that was ultimately destroyed. The force of the explosion necessitated the demolition of several surrounding structures.

Subsequent emergency response and investigation activities uncovered additional undocumented wells, highlighting the need for enhanced monitoring and response protocols to prevent similar incidents. The discovery of these wells also underscored the risks posed by aging and undocumented infrastructure in municipalities with historical oil and gas development.



What has been done?

Following the incident, several critical actions were taken to address the situation and mitigate further risks:

- A groundwater monitoring well was installed on-site to observe subsurface conditions, and the undocumented water wells were plugged to prevent additional gas migration pathways.
- An Emergency Response Plan (ERP) was developed, which included baseline testing for gas flow rates and H₂S concentrations, dispersion modeling, and an evacuation plan for Wheatley residents.
- Drone surveys were conducted to establish a baseline of methane emissions from all potential sources within Wheatley.
- An operations program was created to educate crews on safe work procedures and best practices for early gas detection.
- All above-ground buildings adjacent to the explosion site were demolished, and residual concrete foundations and basements were removed in anticipation of discovering more undocumented wells during the excavation process.
- The suspected gas well was discovered and re-entered for remediation of subsurface contamination.
- Operations were completed over a period of 60 days and the preliminary results indicate that the re-entry was successful in remediating the gas leak.



The map above illustrates the water (green) and gas (red) wells in western Chatham-Kent, and neighboring Essex County.

Moving Forward

The Wheatley incident highlighted the risks posed by undocumented legacy wells in urban areas. Our team provided critical support throughout the response, including emergency planning, regulatory coordination, and well re-entry oversight. By managing 24-hour field operations, securing project-specific insurance, and ensuring compliance with Ministry of Natural Resources and Forestry regulations, we helped mitigate further hazards and establish a safer environment for the community. This project underscores the need for municipalities to proactively assess and manage aging oil and gas infrastructure to prevent similar incidents in the future.