

# CASE STUDY | Automotive Fueling Service Station



## PROJECT FACTS

**PROJECT DATES:** 2009 - 2012

**SITE:** Former automotive fueling and service station located on an acre of land at the intersection of two primary transportation arteries.

**CONTAMINANTS OF CONCERN:** Petroleum impacts: benzene, toluene, ethylbenzene and xylenes (BTEX), TPH-GRO, and methyl tert-butyl ether (MTBE).

**PROBLEM:** Residual petroleum impacts were present in soil and groundwater at concentrations above applicable criteria specified by the Indiana Department of Environmental Management (IDEM).

**SITUATION:** This project required resolution within an unusually brief time frame and specific budget parameters. The client used their own assets to pay for remediation efforts, and before they could start the project, they needed a guaranteed maximum cost for completion within a specific time frame to allow results for site redevelopment.

**ACUITYES DIFFERENCE:** Developed a *customized* reagent that delivered successful remediation results despite logistical challenges.

**ACUITYES SOLUTION:** Provided three alternative remedies to successfully reduce contaminant concentrations. Limited source area removal was performed at the site. Groundwater monitoring followed the source area removal to demonstrate stability.

- Removed 2,977 tons of soil.
- Disposed TPH impacted soil at an approved landfill.
- Applied a slow-release chemical oxidizer that also contained essential nutrients to the base of the excavation to enhance microbial degradation in the capillary fringe and groundwater.
- Completed two years of post-remediation groundwater monitoring.



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## RESULTS:

Residual impacts of petroleum hydrocarbons in soil exceeded the IDEM's Remediation Closure Guide (RCG) Migration to Groundwater Screening Levels (MTGSLs) in two small areas proximal to a fiber-optic line and high-pressure gas distribution line. The clay-rich soil beneath the Site served to limit the vertical and horizontal migration of CoCs.

Nine quarters of groundwater monitoring and analysis indicated the spatially-limited distribution of benzene above its IDEM RCG Vapor Exposure Screening Level in one remaining monitoring well. After soil remediation, benzene was not detected in the other monitoring wells at the Site.

## PROJECT DETAIL

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### SITE BACKGROUND:

The Site is located on an acre of undeveloped land, which was previously used as an automotive fueling and service station; and subsequently used for automotive maintenance (muffler shop). The Site building was demolished by others in 2009. AcuityES completed source area removal by excavating soil, fuel distribution piping, concrete debris and conduit, and disposed of the waste materials off-Site.

The Site is currently covered with crushed stone, an asphalt drive and small landscaped areas (primarily grass along road frontages). A future restaurant and possible retail space are planned for the Site.

### CONTAMINANT DETAILS:

Based on past operational history of the Site and analysis of the soil and groundwater analytical data, benzene, toluene, ethylbenzene and total xylenes (BTEX), TPH-GRO, and methyl tee-butyl ether (MTBE) were initially identified as Site-derived constituents of concern (CoCs) originating from the former Leading Underground Storage Tank (LUST) system.

Based on a series of subsurface investigations, petroleum impacts were detected at the Site in the soil and groundwater at concentrations above the Risk Integrated System of Closure (RISC), Industrial Default Closure Levels (IDCLs) for benzene and total petroleum hydrocarbons within the gasoline range organics (TPH-GRO).

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**RESTORATION DETAILS:** Soil screening was conducted to differentiate between contaminated soil for off-Site disposal, and non-impacted soil that could be used to backfill the excavation. Less than 10% of the screened-soil was suitable for use as backfill.

Upon completion of the soil removal, the Site was backfilled using approximately 2,975 tons of mixed gravel and sand. This approach, along with compaction, allowed for minor cresting of the lot to minimize ponding and facilitate overland storm water drainage without erosion.

**THE PROCESS: DURING REMEDIATION:** Excavation was initiated along a utility trench (background of the photo) that contained a high-pressure natural gas line and a fiber-optic cable. The excavation was staged to remove as much of the source area as practical without damaging the buried utilities.



**AFTER REMEDIATION:** Groundwater monitoring over nine quarters produced sufficient documentation to support Site closure under the Indiana Voluntary Remediation Program (VRP).

The closure report was submitted to the regulatory agency and a Certificate of Completion and Covenant Not to Sue were issued.

A restaurant or other commercial uses are now planned for future Site development.

