

**CLIENT:**

Johnny's Tire & Battery  
680 Mast Road  
Goffstown, New Hampshire  
Mr. William Sarette

**HIGHLIGHTS OF SITE AREA INVESTIGATION AND REMEDIATION:**

- Combined several rapid site investigation procedures and field tests to prepare for immediate response actions.
- Used Modflow a 3-D groundwater flow model with particle tracking to optimize the hydraulic containment and LNAPL removal.
- Quickly reduced groundwater VOC concentrations and removed site LNAPL.
- Lab tested oxidants for potential ISCO work along with injection well radius of influence estimates.
- Work with NHDES and the Town of Goffstown to obtain roadway access during the road and utility reconstruction work.
- ISCO injection consisted of 1,575 pounds of sodium persulfate and calcium peroxide mixture in 8 boreholes within a 5 foot thick zone from about 19 feet to 24 feet below the ground surface.
- Site monitoring well groundwater samples met NHDES standards and some VOC concentrations reduced 99%.



**PROBLEM NATURE & EXTENT:**

Site investigation data and information indicated a petroleum release from the new double wall UST and line containment system and possible residual contamination from a past release. Aries observed elevated VOC concentrations in soil, soil gas and groundwater on-site and downgradient from the site on a nearby elementary school property.

**SOLUTION:**

**Initial Site Investigation and Immediate Response Actions:**

Aries conducted a rapid site investigation in coordination with the New Hampshire Department of Environmental Services (NHDES) that revealed the contaminant source zones including light non-aqueous phase liquid (LNAPL) and delineated the contaminant plume on and off-site.

The rapid site investigation included soil gas analysis, vent tests, short duration pump tests, and a 3-D Modflow groundwater flow model to optimize extraction well locations and LNAPL containment and removal. Site UST system was replaced and Aries installed and operated a short term hydraulic containment and soil vapor extraction system successfully reducing VOC concentrations in the on-site soil, soil gas, and groundwater. However, residual petroleum contamination had smeared over an approximate 5 foot thick zone 20 feet beneath the roadway extending onto the elementary school property. Aries provided analysis to NHDES supporting a cost effective remedial option compared to long term monitoring alternative. Aries addressed petroleum contamination under the roadway and on school property using in-situ chemical oxidation (ISCO) injections when access was provided.

Approximately two days of ISCO injection was successful in reducing the remaining groundwater VOC concentrations being monitored in site and off-site monitoring wells to levels less than NHDES ambient groundwater quality standards. The petroleum related contaminants were oxidized using a combination of sodium persulfate and calcium peroxide.