

# Using Ultraviolet-Induced Fluorescence to Enhance LNAPL Conceptual Site Model for Remedial Design

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**Background/Objectives.** The Site is an active gas station/truck stop in northeast Missouri. Following two known releases of gasoline, traditional characterization activities were performed at the Site which included the collection of soil COC concentrations, groundwater COC concentrations, soil vapor COC concentrations, geotechnical parameters, groundwater hydraulic trends, and free product thickness trends. Due to sustained free product in multiple monitoring wells across the Site, additional investigation activities were completed to refine the vertical and horizontal extent of mobile LNAPL, evaluate LNAPL recoverability, and evaluate remedial alternatives.

**Approach/Activities.** To accomplish the study objectives, LNAPL transmissivity testing and a laser induced fluorescence (LIF) survey were completed at the Site. LNAPL transmissivity testing was performed at five wells with GEI's H<sub>2</sub>AWK precision flow meter, which included removing LNAPL and groundwater on a continuous basis and at a sustained fluid drawdown, until removal rates were within 25 percent of one another. The LIF survey included advancing 51 borings across the Site over a period of four days.

**Results/Lessons Learned.** The LIF data were modeled to provide a horizontal and vertical illustration of LNAPL distribution throughout the Site. The data documented that the vertical distribution of LNAPL was generally less than eight feet below land surface, within more coarse-grained areas including silts, sand lenses within the clay and silts, or within a sand layer below clay/silt.

The LNAPL transmissivity data were utilized to document recoverability potential for the five wells that were tested.

The LIF and transmissivity data were utilized to refine the LCSM and evaluate remedial alternatives to address free product to the extent practicable. Based on the data and LCSM, vacuum enhanced recovery was selected for two areas with elevated transmissivity rates. Pilot tests performed in the two areas, resulted in the state accepting that free product had been recovered to the extent practicable in one area. A longer, full-scale recovery effort will be performed in the last remaining area, where extent practicable will be met upon meeting the established recoverability objectives.