Enhancing the EPRI Generic Work Plan to Assess Dense Nonaqueous Phase Liquid Mobility in the Subsurface at Manufactured Gas Plant Sites

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Background/Objectives. Research has shown that when dense nonaqueous phase liquid (DNAPL) is present in the subsurface at a manufactured gas plant (MGP) site, a principal issue related to site closure is an assessment of its mobility and potential for migration. In the absence of a quantitative approach for differentiating between mobile and immobile DNAPL, environmental regulators are prone to the conservative assumption that all DNAPL identified in the subsurface is potentially mobile; thereby, precluding environmental closure of the Site until the subsurface DNAPL is removed or otherwise managed.

Approach/Activities. Expanding on earlier Electric Power Research Institute (EPRI)-sponsored research, the DNAPL mobility assessment approach within the *Generic Work Plan to Assess Dense Non-Aqueous Phase Liquid Mobility in the Subsurface at Manufactured Gas Plant Sites* (EPRI, 2015; EPRI Work Plan) provides a standardized and reproducible characterization protocol using a combination of conventional and high resolution site characterization (HRSC) field-based and laboratory-based methods for conducting a site-specific subsurface DNAPL mobility assessment. To further enhance the EPRI Work Plan, a new patent-pending in situ process for areas of known pooled MGP DNAPL has been developed for both unconsolidated and fractured bedrock environments. This approach is used to best understand the lithological units or fractures that are the primary focus of concern and define if these fingers of mobile MGP DNAPL are nearing a quantifiable endpoint based upon transmissivity.

Results/Lessons Learned. The use of this novel approach aids in a better understanding of areas of mobile DNAPL that may have the potential to migrate, and how to best address these zones within the subsurface; and further, as a leading, lagging, progress, and design remediation metric for DNAPL removal technologies like hydraulic recovery within both unconsolidated and fractured bedrock. The EPRI protocol uses methods that are acceptable to the regulatory community and provide responsible parties with the data necessary for informed, defensible evaluations of the potential for subsurface MGP DNAPL to migrate under anticipated site conditions. In addition to supporting site closure, the EPRI protocol may also be used to target areas of mobile MGP DNAPL at a site for active remediation. The new patent-pending approach enhances the EPRI protocol with critical design information that can be collected in both unconsolidated and fractured rock environments for hydraulic remedies, enhances conceptual site models (CSMs) with high resolution mobile DNAPL interval data, and aids in defining the endpoint metrics for remediation through quantified levels of transmissivity, a metric gaining nation-wide regulatory approval.