

EXECUTIVE SUMMARY

The steam injection treatability study will be conducted under the Comprehensive Environmental Response, Compensation, and Liability Act. This study will provide data to assess the feasibility of deploying steam injection with multiphase extraction as a part of the interim remedial action at the C-400 Cleaning Building at the Paducah Gaseous Diffusion Plant. In April 2013, the U.S. Department of Energy, U.S. Environmental Protection Agency (EPA), and the Kentucky Department for Environmental Protection agreed to scope a treatability study for steam injection. The steam injection treatability study is consistent with the guidance set forth in the EPA's *Guidance for Conducting Treatability Studies under CERCLA* (EPA 1992).¹

The planned treatability study will include the design, installation, and operation of one steam injection location, with intermediate and deep screened intervals in the Regional Gravel Aquifer (RGA), together with a temperature monitoring array. The steam injection well will be installed to the base of the RGA (~ 100 ft depth). Determination of whether a single extraction well outside the temperature monitoring array will be considered necessary for hydraulic control of contaminant migration will be made at the design stage of the treatability study. The single extraction well would require using the existing water treatment system. Steam injection into the subsurface is controlled by hydrostratigraphic and thermal properties of the target formation. Subsurface temperatures increase in response to steam migration, and groundwater and contaminants are volatilized.

The objective of the treatability study is to gather information on steam mobility in the RGA to inform the regulatory decision process for determining the appropriate technology for Phase IIb. The treatability study is designed to observe the movement and distribution of steam and provide data to refine the estimates of permeability, anisotropy/heterogeneity, and local groundwater velocity. The resulting information will be used to model steam injection and multiphase extraction (well spacing, locations, steam injection rates, and timing) to assess the technical implementability and cost-effectiveness of steam injection. Metrics to assess steam injection as a viable technology will be developed during the treatability study design. Concurrence among the Federal Facility Agreement parties on key performance metrics will be established prior to initiation of treatability study construction.

The treatability study report will document the treatability study set up and operation, field data collection and results, steam injection modeling, and technology evaluation including technical implementability and cost-effectiveness.

¹ This work plan does not follow the suggested outline for a treatability study work plan included in *Guidance for Conducting Treatability Studies under CERCLA* (EPA 1992), but does include the information in the outline.