

Multi-Site Environmental Engineering Services

Conservation and Planning

Pro2Serve is currently in the 7th year of a \$26.6 million Multi-Site Miscellaneous Engineering Services contract. The scope of this contract includes a diverse array of environmental and engineering services (including all environmental program, Title I and Title II areas required in the 4PAE08 SOW) supporting the Environmental Management program at the Oak Ridge National Laboratory, East Tennessee Technology Park, and the Y-12 National Security Complex in Oak Ridge; the Portsmouth Gaseous Diffusion Facility (PORTS) in Ohio; and the Paducah Gaseous Diffusion Facility in Kentucky. To date, Pro2Serve has completed over 300 task orders among these five sites. Examples of conservation and planning tasks include:

- a time-critical Environmental Assessment (EA) for Winterization Activities in Preparation for Cold Standby at PORTS;
- an EA for Quadrant II Corrective Measures Implementation at PORTS; and
- an In-Situ Bioremediation and Phytoremediation Treatment System to address a trichloroethylene (TCE) groundwater plume at PORTS.

For the **Winterization EA**, a Finding of No Significant Impact (FONSI) was generated in a period of six weeks. Our client discovered the need for the expedited EA to allow installation of critical heating systems prior to the onset of winter. Pro2Serve organized documentation and devised a process to meet the aggressive schedule requirements for completion of the EA including:

- development of environmental synopses and critiques for equipment purchase and installation of a natural gas pipeline;
- Identification of consulting agencies and assistance in developing letters of consultation for transmittal to the State Historic Preservation Office, Ohio Department of Natural Resources, and the US Fish and Wildlife Service;
- acquisition of a certified archeological subcontractor to complete surveys for archeological and historic resources;

- development of a Draft EA for public review and comment;
- participation in the development of materials for presentation at a public meeting;
- coordination and development of responses to all comments received from the public, DOE, and Bechtel Jacobs reviewers;
- completion of document modifications and development of the Final EA for consideration by the NEPA Compliance Office; and
- development of a FONSI for review and approval by the NEPA Compliance Office.

Site knowledge, combined with the ability to foster a teaming relationship between the M&O contractor and project stakeholders, and the ability to utilize existing information accurately and efficiently, allowed this project to be completed at a fraction of the cost generally associated with completion of an EA.

Pro2Serve also completed the **Quadrant II EA**. Pro2Serve proposed corrective measures at the two areas of concern, the X-701B Holding Pond and Retention Basins Area and the X-701B Contaminated Groundwater Area, included a wide range of technologies and methods that were evaluated as part of the Quadrant II Corrective Action Study/Corrective Measures Study (also prepared by Pro2Serve). These ranged from institutional controls to removal of all contaminated soil, subsurface piping systems installation, and installation of an engineered cap for the holding pond and retention basins. For the X-701B Groundwater Plume Area, the potential corrective measures ranged from institutional controls to various combinations of ex-situ and in-situ treatment including bio- and phytoremediation and steam stripping/electrical resistance heating with vapor extraction.

Pro2Serve analyzed the impacts of the proposed action and alternatives. All components of the proposed action were reviewed, and appropriate consultations with agencies concerned with



protection of wildlife, threatened and endangered species, and cultural and historic resources were notified of the proposed action. Based on the analyses in the EA, a FONSI was issued for the site.

In 2002, Pro2Serve designed a pilot study for installation of an **In-Situ Treatment Bioremediation and Phytoremediation System** to address a TCE-contaminated groundwater plume at the PORTS site. The study concept was based on an emerging technology that uses hybrid poplar trees to facilitate aerobic biodegradation of chlorinated hydrocarbons. The study was initiated to address technical and cost issues associated with conventional groundwater treatment technologies. Use of this passive system resulted in significant capital and long-term monitoring cost savings over traditional groundwater remediation technologies. Project features include:

- 11 contaminated groundwater collection trenches (2 ft wide, 11 ft deep, total length 2400 ft) backfilled with a layer of sand and a soil mixture designed to promote tree growth;
- Sand pipes – 8 in. sand-filled boreholes installed to bedrock to transmit contaminated groundwater from semi-confined aquifer into the collection trenches (spacing based on short-term pump test); and
- 765 hybrid poplar trees, varieties selected for their ability to grow in saturated soil, and high evapotranspiration and treatment properties planted in the trenches to allow aerobic biodegradation of TCE in the root zone and between the trenches to reduce surface infiltration and lower the water table to enhance diversion of the contaminated groundwater into the treatment trenches.

Project team members, including engineers, geologist and plant scientists, took advantage of the characteristics of hybrid poplars, specific geological characteristics of the site, and the enhanced ability of non-toxic co-metabolites to facilitate aerobic degradation of chlorinated hydrocarbons to develop this approach. After two years of tree growth, groundwater assessments indicated that the water table had been impacted. Subsequent monitoring results indicated that remediation goals were achieved at 66% of the monitoring stations within five years. Based on the success of the pilot project, there was no need to expand the treatment area, and no additional actions other than monitoring were required by regulators.

