



## Environmental Site Contamination

### Client

Confidential

### Location

St. Louis, MI, USA

*"The contractor's technical assistance has been invaluable throughout the period regarding issues such as MDEQ's approach to OU1 RI, alternatives array, data gaps and additional site-wide sampling plan. Technical memorandums and presentations that [CH2M] Hill has prepared for EPA management and the site team have been well thought out and have demonstrated [CH2M] Hill's technical expertise and innovation with regards to the complex issues at this site.... Overall performance was rated as outstanding."*

Stephanie Ball,  
EPA Remedial Project Manager

## Pine River Superfund Site Remediation

### Project Highlights:

- CH2M HILL's performance on this 750,000 cubic yard DDT-contaminated sediment megasite has been rated as "outstanding" by the U.S. Environmental Protection Agency (EPA) twelve times
- The Community Action Group commends CH2M HILL for "best example of community-regulatory collaboration in the country"
- Value engineering, change management, investigative screening methods, design-build construction by project team of a non-aqueous phase liquid (NAPL) collection trench, and other innovative tools and smart approaches have saved over \$16 million in cost and removed 4,000 gallons of NAPL

As part of the Remedial Action Contract (RAC) 5 contract, CH2M HILL is assisting the EPA with the remediation of numerous superfund sites across the country, including the chemical site along the Pine River in St. Louis, Michigan. A chemical plant operated on the site from 1936 through 1978 and manufactured and distributed fodder feed, dichlorodiphenyltrichloroethane (DDT), and a variety of organic and inorganic chemicals including hexabromobenzene (HBB) and the fire retardant polybrominated biphenyl (PBB).

In the early 1980s, the chemical plant was demolished, contained within a slurry wall, and capped (Operable Unit [OU] 1); the river (OU 2) was left for monitored natural recovery. Rising fish tissue DDT levels prompted an emergency sediment removal action in 1998 and 1999, which transitioned into a multi-year remedial action. The 2005 construction season marks the sixth year of EPA and CH2M HILL's sediment remedial action in the 37-acre Pine River OU 2. Excavation is conducted in a dry environment, using a wall of sheet piling to split the river into manageable cells. An access road with twenty 7-foot diameter culverts was built to reach the other half of the river. Dewatering activities route the cell water to an onsite treatment plant. A drying/stabilizing agent is added to the drained sediments and they are excavated and disposed in offsite landfills. During one of the seasons, a local byproduct, sugar beet lime, was found to be a less costly, less dusty stabilizing agent than pelletized lime.

The use of the dry excavation method at this site facilitated discovery that the slurry wall around the 52-acre OU 1 former plant site was failing, and dense non-aqueous phase liquid (DNAPL) has migrated from OU 1 into sand seams within the glacial till underlying the river sediments. Change management techniques were applied to adapt to the discovery of DNAPL without losing construction time or recontaminating the cleaned areas. DNAPL was pumped from the river bottom and 1,200 linear feet of interceptor trench were installed along the river bank. Laterals to the trench extend into the cells where residual DNAPL within the till was left in place due to proximity of a deeper aquifer. A clay cap was constructed over the areas with residual DNAPL to isolate the contaminants from the river.

*"EPA never has seen a design that was this complex and had so many issues (many of the issues associated with the transition from the removal contractor) happen so fast with such high quality."*

Stephen Nathan, EPA Region 5  
Program Manager

*"I was impressed with your staff's ability to adapt to a series of variations that occurred at this site... your staff provided high quality deliverables, in many cases ahead of schedule, despite the expedited schedule. Your adaptability at resolving continual issues at this site, which could have impeded the implementation schedule on the remedial action, is very noteworthy and fully supports an outstanding rating."*

Norman R. Niedergang,  
EPA Assistant Regional  
Administrator

CH2M HILL also conducted a river bottom coring and seismic investigation, provides perimeter air monitoring, and is providing assistance to the EPA in developing a holistic approach to the site, integrating OU 1 and OU 2.

Cost savings engineered by our project team include:

- Natural drying of exposed sediments with drainage trenches and sumps, resulting in a drop in average lime use from 15 percent to 6 percent (cost saving - \$12,000,000)
- Five landfills in different geographic directions and different operating hours used to maximize production (cost saving - \$2,000,000)
- Identification and verification of clean "sediment island" (cost saving - \$1,700,000)
- Use of sugar beet lime versus pelletized lime (cost saving - \$400,000)
- Credit to client when production rates were higher than assumed (cost saving - \$150,000)
- Baffle installed to settle fines versus hydraulic dredging equalization basin (cost saving - \$200,000)
- TRIS eliminated from parameter list after season of non-detects (cost saving - \$200,000)