



Conestoga-Rovers & Associates Project Summary

KEY PROJECT ELEMENTS

- Design-Build
- Soil-Bentonite Barrier Wall
- Cement-Bentonite Barrier Wall
- Jet Grouting
- Capping
- Utilities

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BARRIER WALL CONSTRUCTION DELAWARE CITY, DELAWARE



CLIENT: OCCIDENTAL CHEMICAL CORPORATION
DURATION: APRIL – DECEMBER 2003
COST: APPROX. \$5,500,000

This design/build project comprised the installation of two barrier walls totaling over one mile in length with an average depth of 50 feet. The main objective of the project was to isolate source areas of contamination and prevent off-site migration of contaminants.

CRA's engineering group had completed several years of consulting services at the site prior to this work. The design/build approach allowed the project to proceed at an expedited rate, which allowed the client to comply with important regulatory deadlines. Due to the close working relationship between CRA's engineering group and CRA's construction group, the design/build approach reduced the client's cost by elimination of the bidding process and by reducing the scope of detailed specifications required to successfully complete the project. Initially, several alternatives were reviewed before selecting slurry wall technology as the best technique for containment.

The main elements of the selected remedy included:

- Removal and replacement of existing asphalt and concrete along the barrier wall alignment.
- Pre-trenching the barrier wall alignment to identify numerous known/unknown underground utilities in the path of the work. The exposed utilities were either removed or encased in concrete to allow for the barrier wall installation. Several overhead utilities were also encountered along the alignment.
- Installation of approximately 118,000 sf of cement-bentonite and 98,000 sf of soil-bentonite barrier wall around the active portion of the facility to depths up to 82 feet.
- Installation of approximately 106,000 sf of a soil-bentonite barrier wall around an inactive waste lake to depths of 94 feet.
- Jet grouting a portion of the barrier wall around railroad tracks and under a low-clearance pipeline.
- Capping of the barrier wall around the inactive waste lake with an engineered cap.

This challenging project was completed in close coordination with the plant, thereby minimizing interference to the active plant daily operations. In addition, the project was completed during a period when the country was on elevated security alert. CRA provided turnkey services and completed the project with over 40,000 consecutive man-hours with no recordable incidents.

Since installation, the performance of the barrier walls has been monitored through the collection of groundwater level measurements and groundwater analytical data. These data show that the barrier walls have an effective permeability of 1.00×10^{-6} centimeters per second as designed and that they have effectively isolated the source areas.