

CASE HISTORY NO. W104

**PROJECT:** SITE REMEDIATION PROJECT AT FORMER SHELL CANADA SITE  
TORONTO, ONTARIO

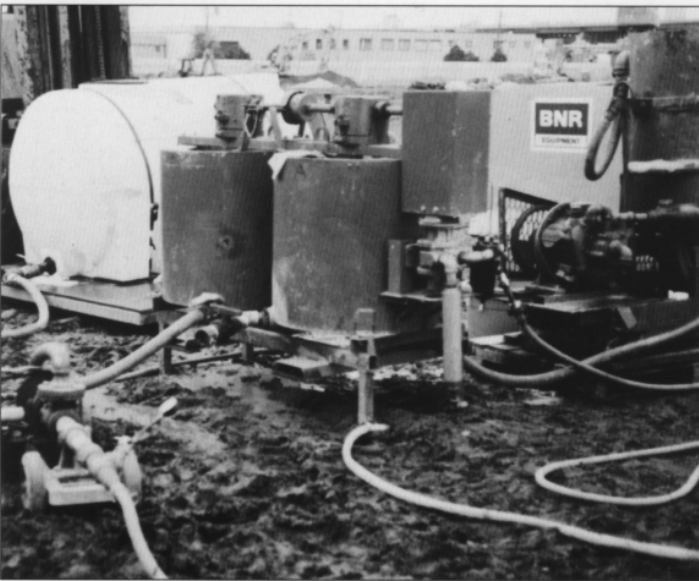
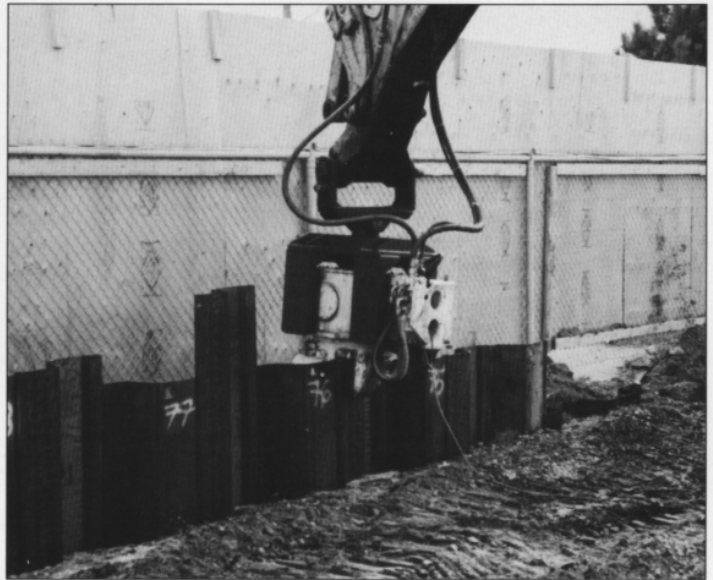
LAND OWNER: TORONTO ECONOMIC DEVELOPMENT CORP.

OCCUPANT: SHELL CANADA LTD.

CONSULTING ENGINEER: CH2M HILL LTD., WATERLOO, ONTARIO  
GLEN ADAMS, P. ENG., PROJECT ENGINEER

GENERAL CONTRACTOR: CANNINGTON EXCAVATING (1989) LTD., GORMLEY, ONT.  
DAVE McCROSSAN, PROJECT MANAGER

LICENCED WATERLOO CONTRACTOR: C<sup>3</sup> ENVIRONMENTAL, BRESLAU, ONT.  
BART KANTERS, PROJECT MANAGER



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### **DESCRIPTION OF WORK:**

In 1994 Shell Canada Ltd. decommissioned a 12 acre distribution facility in the east end of Toronto's port industrial area. This operation had been in use for nearly sixty years and during that time, the site had become contaminated with various hydrocarbons and metals.

Clearing and cleaning the above-ground area was a normal undertaking; however, the sub-surface environment was an entirely different matter. Absorbed phase hydrocarbons and heavy metals were present throughout the site in various concentrations up to 6' depth.

The consulting firm, CH2M Hill, were engaged to do a site characterization and design a site remediation plan. The plan called for the removal of approximately 55,000 tons of contaminated soil. About 25,000 tons of hydrocarbon impacted soils would receive low temperature thermal desorption processing and then be returned to the site. The balance containing various metals would be taken away to a landfill site and replaced by acceptable clean backfill material.

Supplementary to the excavation activities was the installation of a permanent low permeability cut-off wall at the downgradient perimeter of the property. The purpose of the barrier was to prevent the migration of contaminated groundwater and assist in dewatering and excavating activities. Waterloo Barrier® WZ75 sealable sheet piling manufactured by CMRM, was chosen for the cut-off wall. Reasons for the choice included ease of installation, low hydraulic conductivity characteristics, minimum site disturbance, reliable quality assurance, and ability to excavate adjacent to the wall. 1200 Wall feet (18000 ft.<sup>2</sup>) in lengths of 15' and 17'-9" were specified to create a continuous perimeter wall running inside the west and south property lines and meeting at the south west corner.

### **PERFORMANCE OF WORK:**

Installation of the piles was performed by the General Contractor, Cannington Excavating, under the supervision of the licenced Waterloo installer, C<sup>3</sup> Environmental who recorded extensive driving data for each pile. Prior to installation, each pile was fitted with a welded-on foot plate to help prevent the soil from entering the cavity during the driving operation. The entire wall was installed one pile at a time during a three week period using a small Dawson EVM 300 excavator mounted vibrator. Other major installation equipment included a hydraulic excavator and a truck-mounted crane for the threading operation. A three man crew plus an operator and a welder provide the required labour.

When the driving was half completed, the grouting operation commenced. C<sup>3</sup> Environmental performed the work using a colloidal grout plant. The sealant used was a silica fume modified thixotropic cementitious grout. Prior to grouting, the crew performed a water jetting procedure to flush out any debris still remaining in the cavity. Approximately 100 wall feet at a time were prepared for the ensuing sealing operation. The grouting went extremely well and all joints were successfully completed, as per the required quality assurance procedures.

Regular monitoring of soil and groundwater conditions inside the barrier wall will be undertaken.



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