



## Nuclear

### Client

Ontario Power Generation

### Location

Toronto, Ontario

*The Tile Hole Removal Project was the first nuclear waste project for which OPG turned over responsibility for radiation protection to a contractor. The CH2M HILL team effectively managed project-specific environmental protection, health and safety, quality assurance, and radiation control programs, and completed the project over two months ahead of schedule with no change orders.*

## Ontario Power Generation Tile Hole Removal

### Project Description

CH2M HILL was contracted by Ontario Power Generation (OPG) to help solve waste storage problems at Radioactive Waste Operations Site 1 (RWOS1). RWOS1 contains four types of radioactive waste repositories: trenches, monoliths, lined holes and tile holes. Environmental monitoring at the site had detected tritium groundwater contamination with tile holes as the likely source of contamination.

The tile holes were 23 in-ground intermediate-level waste storage facilities, primarily used to store ion-exchange columns and filters from the Douglas Point and Pickering nuclear power plants. They are concrete pipe structures 24 inches in diameter and 12 feet long, buried in the ground and resting on concrete pad footings.

To eliminate the source of contamination, CH2M HILL was selected by OPG to remove the tile holes in a project jointly funded by the OPG and the Atomic Energy Commission of Canada. The design-build project involved the encapsulation and removal of 23 tile holes.

The tile holes were removed using a nested casing approach to encapsulate the holes in steel and concrete for removal, eliminating the need for large-scale excavation and minimizing worker dose and the potential for spread of contamination. The original project plan called for encasing the concrete pad footing along with each tile hole. However, the concrete bases were cast securely on bedrock, so the decision was made to pull the tile hole off the base after encapsulation. After extensive testing to ensure the tile hole contents were secure, the encapsulated tile hole was successfully lifted off its base and inserted into the base cap and prepared for transport to RWOS2.

Due to the proximity of each tile hole to the others, and in order to minimize disturbance of the soil, CH2M HILL used a hydraulic casing oscillator to insert the outer casing. This method, commonly used for drilling piers and bridge abutments in Asia and parts of Europe, was used to insert a 1.5 meter diameter steel casing around each tile hole.

This was the first nuclear waste project for Ontario Power Generation for which the responsibility for radiation safety was turned over to a contractor. Through the implementation of ALARA principles and the innovative project approach, radiation exposure was minimized. Techniques used to minimize exposure included a down-hole video camera to monitor the work, and a vacuum system to excavate soil from around the hole. CH2M HILL also managed the environmental, safety, health, and quality programs for the project. The project was completed two months ahead of schedule with no change orders. CH2M HILL and our subcontractors delivered over 9,000 hours with no reportable safety incidents.