



### **NTH'S VALUE ADDED**

Innovative use of repair materials and procedures

Field operation completed in one week to minimize disruption to operations

Close interaction with regulatory agencies to obtain approval

## **Carleton Farms Landfill**

### **Innovative Landfill Liner Repair**

Today's landfills are designed with a sophisticated liner system that protects the groundwater from contamination. Most have gas extraction wells installed within the refuse to harvest the methane gas produced by decomposing waste. What happens when installation of a gas well accidentally punctures the liner system under 60 feet of refuse?

Waste Management, Inc. encountered this scenario at its Carleton Farms Landfill, when the liner was accidentally damaged during gas well installation. Waste Management immediately repaired the three-foot diameter hole in the geosynthetic composite liner with a bentonite plug, preventing landfill leachate from escaping into the groundwater.

The Michigan Department of Environmental Quality (MDEQ) accepted this repair, but prohibited placement of additional refuse in the area until a more permanent repair was made. With plans to place several hundred thousand yards of waste over this area, Waste Management needed to find a viable solution for making permanent liner repairs through 60 feet of refuse with explosive levels of methane.

Waste Management assembled a team of experts to find the solution. Led by NTH Consultants, Ltd., the team determined that complete excavation of the waste would be too costly, and that large diameter shaft excavations with manual operator repairs were too dangerous due to the methane environment and too difficult because of leachate over the repair area. Drawing upon their expertise, the team developed an innovative solution that called for a process using polyurea to seal the ruptured liner.

In a pilot application, the team successfully demonstrated this solution and gained the MDEQ's approval. The project proceeded, marking the first use of polyurea for this application in the country. Actual repairs were completed within one week.

With its innovative approach, this project was awarded the Honorable Conceptor from ACEC/M and MSP, and was recognized with an engineering award from the Engineering Society of Detroit in 2000.