

C³ | Case Study:

A n d o v e r

Vapor Extraction and Refrigerated Condensation was used as a primary source removal technology to remediate high concentrations of recalcitrant chlorinated solvent compounds at the WDE Site in Minnesota. The use of Refrigerated Condensation has achieved high mass removal rates and will reduce the lifecycle costs and time of remediation.

ISTR Overview

Client:
MPCA

Neighborhood:
Suburb

Consultant:
DCI Environmental

Target Temp:
100 °C

Contaminant:
Petroleum Hydrocarbons
Chlorinated Compounds
Other Inorganics
Chlorinated Solvents

Geology:
Mixed fills and silts

Volume:
2,500-10,000

Specificities:
LNAPL Present
Source Zone Treatment
Classified or Hazardous Site
Private Site Requiring Discretion
DNAPL Present

History

6,600 drums of hazardous wastes were placed in a 0.2-acre asphalt-lined pit between November 1972 and January 1974. Soil and ground water beneath the pit in the upper sand aquifer was highly contaminated. Contaminants included various chlorinated solvents, benzene, and toluene. In 2007, methane power generation operations commenced, but were quickly suspended after vapors from chlorinated VOCs ingested by the system prevented reliable operations.

Pilot Test

In October 2009, the MPCA selected a soil vapor extraction (SVE) system utilizing cryogenic-cooling and compression processes (C3 Technology) for site trials, and the system was installed for pilot testing at the site. In April 2010, modifications were made to increase the treatment capacity of the SVE system from 100 scfm to 200 scfm capacity.

During pilot testing, the SVE system has recovered over 40,000 pounds of mixed chlorinated solvents in the form of non-aqueous phase liquid (NAPL). Some NAPL was collected and sent offsite for use in fuel blending (recycling), while other condensate was sent offsite for disposal.

Full Scale Remediation

Design and construction of a permanent 200 scfm condensation-based SVE system began in December 2012, and was installed in January 2013. During the month of February 2013, the system achieved 100% runtime while recovering an average condensate volume of 40 gallons per day.

Based on these pilot and full-scale results, the use of thermally-enhanced soil vapor extraction in combination with condensation off-gas treatment is being explored at additional hazardous waste sites.