Explanation of Significant Differences

# MACKENZIE CHEMICAL WORKS SUPERFUND SITE

Central Islip, Suffolk County, New York

EPA Region 2 August 2020

## INTRODUCTION

The purpose of this Explanation of Significant Differences (ESD) is to explain changes made by the U.S. Environmental Protection Agency (EPA) to the remedy selected for the MacKenzie Chemical Works (MCW) Superfund site, located in Central Islip, Suffolk County, New York.

Under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. Section 9617(c) (CERCLA) and Section 300.435(c)(2)(i) of the National Oil and Hazardous Substances Contingency Plan (NCP), EPA is required to issue an ESD when, after issuance of a Record of Decision (ROD),[1] a significant, but not fundamental, change is made in either scope, performance, or cost of a selected remedy.

This ESD provides a brief history of the site, describes the remedy selected for the site, and describes a significant change to the selected remedy.

The remedy that was selected in a 2003 ROD (and modified by a 2011 ESD) includes, among other things, treatment of volatile organic compound (VOC)-contaminated soils using soil vapor extraction (SVE) and excavation and off-site disposal of semivolatile organic compound (SVOC)-contaminated soils. The ROD also calls for a contingent remedy of soil excavation and off-site disposal if it is determined that the selected remedy (or portions thereof) is ineffective in achieving the remediation goals.

While the SVE system was highly effective in removing VOCs from the sandy soils that are located from 3 to 5 feet (ft) below ground surface (bgs) to the water table (approximately 50 ft), it was not as effective in treating the tighter soils located from the surface to 3 to 5 ft bgs. The residual VOC-contaminated soils that were not addressed by the SVE system were excavated and disposed off-site.

## SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

The MCW site is located in a residential/light commercial area and includes an approximately 1.4-acre property that had been operated for nearly 40 years by MCW. The property originally contained numerous buildings and structures, including three one-story block buildings (a former manufacturing building and two warehouses) and a two-story block building (a former laboratory/warehouse), all of which were removed by EPA as a part of its response actions at the site. The property is bounded to the north by the Long Island Rail Road and commercial properties, to the east by a residential property and an abandoned parking lot, to the south by Railroad Avenue and residential properties, and to the west by Cordello Avenue and vacant land.

The property was used by MCW from approximately 1948 to 1987 for the manufacture of various chemical products by MCW, including fuel additives and metal acetylacetonates. Over the years of operation, the Suffolk County Department of Health Services (SCDHS) and the Suffolk County Fire Department documented poor housekeeping and operational procedures. According to SCDHS, MCW stored 1,2,3-trichloropropane (1,2,3-TCP) in three 10,000-gallon tanks on the property. Other potential historical waste sources include other storage tanks, leaking drums, two concrete-lined waste lagoons, a cesspool, and storm-water drywells. Spills, explosions, and fires occurred at the facility, including a methyl ethyl ketone (MEK) spill in 1977, a nitrous oxide release in 1978, and an MEK fire in 1979. Releases resulting from MCW's operations contaminated the soil and groundwater at the site. In response to contamination at the property, SCDHS ordered MCW to perform a general property cleanup, including the excavation and drumming of stained surface soils. This effort was completed in 1979.

Based on a 1983 assessment conducted by EPA, MCW arranged for the disposal of thirty-three drums of stained surface soils (from the 1979 cleanup effort) and twenty-two

[1] A ROD documents EPA's remedial cleanup decision.

drums of liquid wastes. MCW operations at the property ceased in 1987. In 1993, SCDHS installed nine downgradient temporary well points to assess the horizontal and vertical extent of groundwater contamination. The results of the SCDHS effort indicated the presence of elevated levels of 1,2,3-TCP, tetrachloroethylene (PCE), and trichloroethylene (TCE) in downgradient groundwater. In 1993, the New York State Department of Environmental Conservation (NYSDEC) completed an investigation of the property. The results of this effort indicated the presence of elevated levels of 1,2,3-TCP, PCE, and TCE in on-site soils and groundwater. SVOCs were detected in on-site soils.

In 1998, NYSDEC commenced a remedial investigation and feasibility study (RI/FS) to determine the nature and extent of contamination at and emanating from the property and to identify and evaluate remedial alternatives. During this investigation, NYSDEC emptied the waste lagoons of all soil and sludge materials and backfilled them with clean soil. The excavated material was disposed of at an appropriate waste-receiving facility. In 1999, based on the preliminary findings of the RI, NYSDEC requested that EPA take a response action at the property. In response to NYSDEC's request, EPA collected groundwater samples from off-property monitoring wells, two municipal supply wells, and one private well. Based upon the results of this investigation, EPA concluded that immediate actions were not required, but that remedial actions should be considered to address potential long-term threats. NYSDEC completed the RI/FS in 2000.

The site was listed on the National Priorities List in 2001. Based upon the results of NYSDEC's RI/FS, in March 2003, EPA signed a ROD, selecting a remedy for the site. The key components of the selected remedy include treatment of the VOC-contaminated soils using thermally-enhanced SVE;[2] excavation and off-site disposal of SVOC-contaminated soils; building demolition, decontamination, as necessary, and off-site disposal of the laboratory building; treatment of the contaminated groundwater using *in-situ* chemical oxidation (*e.g.*, air sparging with ozone injection); long-term groundwater monitoring; institutional controls restricting the installation and use of groundwater wells at and downgradient of the property until groundwater quality has been restored; and engineering controls, such as fencing and signs, to protect the integrity of the remedy and to limit facility access until cleanup levels have been attained. The ROD also identified a contingency remedy for the soil (excavation and off-site treatment/disposal of the contaminated soils) and a contingency remedy for the groundwater (treatment using a permeable reactive barrier) should treatability studies show that the selected remedies would not be effective.

A treatability study performed from 2003 to 2004 determined that thermal enhancement of the SVE system was not necessary to achieve the established cleanup goals. In addition, based on the results of an air sparging and ozone injection field study performed in 2006, it was concluded that this particular oxidation technology was insufficient to effectively remediate the groundwater. Laboratory and field testing of an alternative-oxidation technology was performed, resulting in the successful deployment of *in-situ* chemical oxidation using persulfate for the treatment of the groundwater. The soil and groundwater remedies were changed accordingly. The decisions were documented in a July 2011 ESD.

Following the completion of the treatability study, full-scale operation of the SVE system commenced. The buildings were demolished in 2004 and 2006. The SVOC-contaminated soils were excavated and disposed of off-site in 2006. Full-scale deployment of *in-situ* chemical oxidation occurred in 2006.

## BASIS AND DESCRIPTION OF SIGNIFICANT DIFFERENCES

EPA operated the SVE system for over 10 years. While the SVE system was highly effective in removing VOCs from the sandy soils that are located from 3 to 5 ft bgs to the water table (approximately 50 ft), it was not as effective in treating the tighter soils located from the surface to 3 to 5 ft bgs. These soils, which were less permeable than the soils at depth, were likely fill material. The VOC-contaminated soils that were not addressed by the SVE system were excavated and disposed off-site in August and September of 2020.

The estimated present-worth cost of the complete soil remedy is $2.4 million. The estimated present-worth cost of treating the contaminated groundwater is $2.1 million.

This ESD serves to document EPA's decision to excavate and dispose off-site the residual VOC-contaminated soils that were not addressed by the SVE system, consistent with the contingent remedy.

## SUPPORT AGENCY COMMENTS

NYSDEC, after careful consideration of the modified remedy, supports this ESD, as the modified remedy significantly changes, but does not fundamentally alter the remedy selected in the ROD.

[2] The ROD concluded that the chemical and physical properties of 1,2,3-TCP suggested that thermal enhancement might be necessary for SVE to be effective in the contaminant's removal (*i.e.,* heating would make 1,2,3-TCP more volatile).

## FIVE-YEAR REVIEW

The remedy will result in the reduction of hazardous substances, pollutants, or contaminants on the property to levels that will permit unlimited use of, and unrestricted exposure to, soil and groundwater. However, because it will take more than five years to attain cleanup levels, in accordance with 40 CFR 300.430 (f)(4)(ii), the remedial action for the site shall be reviewed no less often than every five years. EPA has completed two reviews thus far and will conduct another five-year review on or before January 2022.

## AFFIRMATION OF STATUTORY DETERMINATIONS

EPA is issuing this ESD after consultation with NYSDEC. NYSDEC concurs with the approach presented in this ESD. The remedy, as modified by this ESD, will continue to be protective of human health and the environment and will comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action. The modified remedy is technically feasible, cost-effective and satisfies the statutory requirements of CERCLA by providing for a remedial action that has a preference for treatment as a principal element and, therefore, permanently and significantly reduces the toxicity, mobility and volume of hazardous substances.

## PUBLIC PARTICIPATION ACTIVITIES

Pursuant to NCP §300.825(a)(2), this ESD will become part of the Administrative Record for the 2003 ROD. The Administrative Record is available for public review at:

Central Islip Public Library
33 Hawthorne Street
Central Islip, NY 11722

The Administrative Record and other site-related records are also available for public review at EPA Region 2's office at the following location:

U.S. Environmental Protection Agency
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-3263

Links to the Administrative Record and other site-related documents can be found on the EPA Site Profile Page at www.epa.gov/superfund/mackenzie. EPA is making this ESD available to the public to inform them of the changes made to the remedy. Should there be any questions regarding this ESD, please contact:

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With the publication of this ESD, the public participation requirements set out in §300.435(c)(2)(i) of the NCP have been met.