



Keefe Environmental Services Site Epping

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The Keefe Environmental Services Site (Site) is located off Exeter Road (Old Route 101) approximately two miles southeast of the municipal center of Epping. The Site occupies approximately seven acres of land north of Exeter Road and south of the Piscassic River. It was operated as a hazardous waste bulking and treatment facility from early 1978 until January 1981, when the company filed for bankruptcy. During its operation, the Site consisted of drum storage areas and a 700,000-gallon waste lagoon.

In September 1979, the New Hampshire Department of Environmental Services (NHDES) began sampling surface water and groundwater at the Site. Volatile organic compounds (VOCs) were detected in both media. Due to threats to the environment after the Site was abandoned, the Environmental Protection Agency (EPA) began an emergency cleanup action in the spring of 1981, which included the drawdown and treatment of liquids that were overflowing from a lagoon. Additional activities included the over-packing of damaged drums, waste stabilization, and separation of the 4,100 drums according to waste category. All drums, storage tanks, and dumpsters were later removed and transported to hazardous waste treatment facilities.

In September 1983, the Site was added to the National Priorities List. In November 1983, EPA issued a [Record-of-Decision](#) (ROD) for lagoon contents removal and decommissioning. In addition to taking emergency actions to stabilize the Site, NHDES began the remedial investigation in July 1983 to define the nature and extent of contamination at the Site. EPA issued a [second ROD](#) in March 1988. The remedial action included extracting contaminated groundwater from both the overburden and bedrock aquifers; treating it on-site using air stripping to remove VOCs, filtration, and carbon adsorption; and then discharging the treated water to the groundwater table (this process is known as “pump-and-treat”).

Following the issuance of the ROD, EPA and NHDES initiated pre-remedial design activities. EPA issued an [Explanation of Significant Differences](#) in June 1990 to explain that soil remediation was no longer necessary because soil contamination levels already met the cleanup standards provided in the ROD.

Between June 1992 and February 1993, a \$1.6 million treatment facility was constructed to treat contaminated groundwater containing VOCs. Start-up of the treatment plant commenced in the summer of 1993 and the plant became fully operational in the fall of 1994.

EPA and NHDES completed the [Third Five-Year Review](#) in August 2003. This Five-Year Review determined that the remedy selected for the Site remained protective of human health and the

environment and recommended that NHDES continue to operate the groundwater treatment facility.

The Site was transitioned from Long-Term Response Action (LTRA) to Operation and Maintenance (O&M) on June 30, 2005, transferring Site remedial responsibilities to NHDES. EPA continues to have Five-Year Review responsibilities.

In 2005, an upgrade to the groundwater treatment system, including treatment technologies for the removal and destruction of an emerging contaminant known as 1,4-dioxane, was completed. The upgraded system was operated for two years and a reduction in the distribution and concentration of 1,4-dioxane was achieved.

NHDES issued a Groundwater Management Permit to the town of Epping in January 2006. The permit established a Groundwater Management Zone (GMZ) at the Site which included several properties abutting the Site. Groundwater restrictions will remain in effect on these properties until such time the groundwater is restored within the GMZ.

In response to the decrease in both VOCs and 1,4-dioxane, the upgraded treatment system was shut down after approximately two years of operation to evaluate potential “rebound effects” on the concentrations of Site contaminants at groundwater monitoring locations during non-pumping conditions.

The rebound study indicated that the VOC contamination in the groundwater had decreased through the pump-and-treat operations; however, 1,4-dioxane was detected at the GMZ boundary at elevated levels, indicating a potential need to restart the treatment unit to both reduce the source area concentrations and to provide containment of the plume within the GMZ. In the meantime, exposure pathways were being monitored both on the Site and in residential wells off-site.

As a result of the rebound of 1,4-dioxane concentrations in groundwater at the Site, pump-and-treat operations were restarted in March 2009. In January 2010, seven additional wells were installed to monitor groundwater around the perimeter of the Site. Additional pumping was employed at several monitoring wells to increase the capture of the contaminated groundwater at the Site.

The NHDES, with EPA concurrence, shut down the Site groundwater treatment operations on December 31, 2011, and initiated a second rebound evaluation period based on favorable results during the system operations conducted between 2009 and 2011. Conditions at the Site and at nearby residential properties continue to be monitored. The NHDES issued a revised Groundwater Management Permit in 2012 that included an expanded GMZ.

A [Fifth Five Year Review](#) was completed in September 2013. While concentrations continued to exceed cleanup goals at certain locations, decreasing trends had been observed in most of the Site wells. Concurrent with the Fifth Five Year Review, a natural attenuation evaluation and modeling were conducted to determine the potential viability of monitored natural attenuation (MNA) as a future remedy for the Site, in lieu of the then-current remedy of pump-and-treat. The initial results of the natural attenuation evaluation and modeling were encouraging, and a

Focused Feasibility Study (FFS) was commenced in 2015 to evaluate changing the remedy from pump-and-treat to MNA. The [FFS](#) was completed in June 2017 and resulted in the September [2017 ROD Amendment](#) converting the remedy to MNA. The NHDES issued a revised Groundwater Management Permit in early 2017 to expand the GMZ and refine existing boundaries. A renewed Groundwater Management Permit was issued on February 24, 2018. Groundwater monitoring is ongoing.

The [Seventh Five Year Review](#) was completed in September 2023. The review determined that the Site remedy remains protective in the short-term. For the remedy to be protective over the long term, groundwater cleanup levels, established in the 1988 ROD, the 2005 Explanation of Significant Differences, and the 2017 Amended ROD, need to be achieved; institutional controls will need to be reviewed and updated, as appropriate; and further evaluation of whether poly- and perfluorinated alkyl substances (PFAS) in groundwater pose a potential unacceptable risk to future users of groundwater is needed.

NHDES continues to perform groundwater and surface water monitoring on a periodic basis, including analysis for VOCs, 1,4-dioxane, and PFAS.