

Coakley Landfill Site

North Hampton

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The Coakley Landfill Superfund site is located in the towns of North Hampton and Greenland and abuts the town of Rye to the east. Situated on the southernmost portion of a 92-acre parcel, the landfill itself is approximately 27 acres and received municipal and industrial wastes from 1972 to 1982. From 1982 to 1985, when land-filling activities terminated, the site received incinerator residue from the Portsmouth Refuse-to-Energy Facility at Pease Air Force Base.

In 1983, the State received a complaint from residents, living near the southeastern corner of the landfill, about the quality of water coming from their water supply wells. Water samples were taken and the results of the chemical analyses reported the presence of volatile organic compounds (VOCs) in several residential wells. Water lines from three local utility companies were promptly extended into the area and, by the end of 1983, most of the homes and businesses east of the site were connected to public water supplies.

The site was listed on the National Priorities List in December of 1983, identifying the following contaminants of concern: benzene, tetrachloroethene, arsenic, 2-butanone, phenol, diethyl phthalate, chlorobenzene, dichloroethene, chromium and nickel. The subsequent remedial investigation and feasibility study (RI/FS) was completed in 1989. The findings of the RI/FS identified the landfill as the source of contamination in local surface waters, groundwater and, to an unknown extent, in wetlands to the west.

The first Record of Decision (ROD) for the site, signed in June of 1990, required constructing a landfill cap and treating contaminated groundwater. It separated response actions to be taken in the immediate vicinity of the landfill (i.e., source control) from those taken to address contamination outside the landfill footprint (i.e., management of migration).

Operable Unit 1 (OU-1) is a source control action intended to minimize further degradation of the environment by isolating the contaminant sources. The ROD for OU-1 includes consolidating sediments on the landfill, consolidating refuse material within the landfill footprint, constructing a multi-layered landfill cap over the landfill, treating groundwater and landfill gases, and long-term monitoring. Pre-design studies began in the summer of 1992. Construction of the landfill cap began in the fall of 1996 and was completed in August 1998.

Due to limited information concerning off-site contamination of wetlands, a second operable unit (OU-2) required further evaluation of site conditions in order to determine the most appropriate response action. A second ROD for the site to address management of migration was issued in September 1994. The ROD for OU-2 calls for groundwater monitoring over the next thirty years while contamination naturally attenuates and the elimination of potential threats posed by the future ingestion of contaminated groundwater by implementing institutional controls restricting the use of the groundwater.

Following completion of the landfill cap, the limited plume of VOC-contaminated groundwater stabilized and began attenuating. Consequently, EPA issued an Explanation of Significant

Differences on September 29, 1999, that removed the requirement to remove and treat groundwater directly beneath the landfill. However, in recent years, two newly identified contaminants of concern, 1,4-dioxane and perfluoroalkyl substances (PFCs), were identified to be present at the landfill and predominantly migrating to the north and west.

The Second Five-Year Review was finalized in September 2006 by EPA. A site-wide protectiveness determination could not be made in this review due to sporadic violations of off-site methane gas levels. Follow-up actions included continued quarterly monitoring of compliance boundary gas probes and installation of gas alarm systems in adjacent buildings/homes that may be at risk. Since 2006, methane levels have decreased significantly with no exceedance of regulatory standards in compliance boundary probes since 2011. In December 2015, the Potentially Responsible Parties (PRPs) submitted a proposal for reduced landfill gas monitoring. The Department approved a decrease in sampling frequency from quarterly to annually.

The September 2011 Five-Year Review concluded that the remedy remained protective of human health and the environment in the short-term. Long-term protectiveness has also been achieved at OU-1 based on continued maintenance of the landfill cap, long-term monitoring, and use restrictions being in-place. Long-term protectiveness will also be achieved at OU-2 when interim groundwater cleanup levels for all contaminants of concern are met and restrictions on the use of groundwater within OU-2 can be removed. Monitoring of the site will continue until cleanup levels for the contaminants of concern are met. The next Five Year-Review is scheduled for September 2021.

On August 4, 2015, EPA released an Explanation of Significant Differences that formally incorporates 1,4-dioxane as a site contaminant of concern, requires the implementation of institutional controls over a defined area to prohibit or restrict the installation of new wells or the increased use of existing wells, and several minor changes (e.g., change in terminology regarding groundwater cleanup levels and clarification on approach to determine when groundwater cleanup levels have been attained).

The September 2016 Five-Year Review concluded that the OU-1 remedy remained protective. However, a protectiveness statement for OU-2 was deferred until the following actions are taken: (1) sampling existing or installing and sampling new monitoring wells in the southern area of the GMZ for all COCs and PFCs; (2) sampling private drinking water wells that may exist within the southern area of the GMZ for all COCs and PFCs; and (3) submitting validated data to the agencies from the aforementioned sampling efforts. Sampling of well cluster FPC-3 in the southern GMZ has been completed and reported to support compliance in this area, however, further evaluation of the compliance boundary is warranted. Access to sample an existing drinking water supply well within the southern GMZ area has not been secured; therefore, alternative investigations may be required to fully delineate southern GMZ plume boundaries.

Sampling and detection of perfluoroalkyl substances (PFCs) in Site monitoring wells during summer 2016 prompted NHDES to offer sampling and analysis to area private property owners that utilized wells for potable water. Samples collected were analyzed for PFCs, VOCs and 1,4-dioxane in an effort to ensure that area groundwater is safe for potable use. A total of seventy

nine (79) private wells were sampled and results reported to property owners. In January 2017 the Coakley Landfill Group (CLG) also sampled nineteen private wells in the area north of the Landfill that had been previously tested by NHDES. In no case has there been a result that exceeded the 70 parts-per-trillion (ppt) Public Health Advisory or equivalent NHDES ambient groundwater quality criteria for PFCs. Private well sampling/testing will be repeated on a subset of the 79 wells previously sampled and will be performed by the CLG in August 2017 and February and August 2018.

Exceedances of drinking water standards for several contaminants of concern (i.e., arsenic, manganese, 1,4-dioxane and perfluoroalkyl substances) in site monitoring wells near the northwest corner of the existing groundwater management zone prompted the agencies to expand the groundwater management zone (GMZ) to include additional properties to the north/northwest of the site. Given the absence of public water to the north of the site and a proposed 10-lot subdivision on Breakfast Hill Road in the Town of Greenland, the agencies supported the PRP's efforts to provide public water to this proposed subdivision. Negotiations between the PRPs and the subdivision developer on an agreement to supply public water to the proposed development were finalized in late 2016.

The installation, technical evaluation of, and sampling of four new GMZ compliance wells (two well couplets: overburden and bedrock) within the northern area of the GMZ will provide groundwater data at the Site compliance boundary in this area. This is the area of primary concern given the understanding that the bulk of impacted groundwater from the Site moves in a northerly direction along the Berrys Brook drainage feature. In addition, the agencies are reviewing area private well sampling data, private well and site monitoring well construction details, surface water and groundwater interactions and site and regional hydrogeological information to evaluate the need for further investigative activities related to the off-site migration of site contaminants.

In December 2016, NHDES sampled surface water for PFCs and 1,4-dioxane at various locations along Berrys Brook. Elevated levels of PFCs were detected in several samples, prompting EPA to develop a Site-specific screening level for recreational receptors that could be exposed to perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS) and perfluorobutane sulfonate (PFBS) in surface water and sediment associated with the Site. Surface water results to date do not exceed SLs outside the Site GMZ. It is important to note that an exceedance of a SL does not necessarily mean that there is an unacceptable risk at the Site. It does indicate that further sampling and evaluation are required. Given these results and in order to ensure maximum protection, EPA and NHDES will require further sampling of surface water and sediments. In addition, in April 2017, EPA began gathering information in support of the development of a Site-specific fish consumption screening level for the aforementioned PFCs. A Site-specific fish consumption screening level will provide a basis to assess the potential risk to human health resulting from the consumption of fish that have accumulated Site contaminants over time. Upon development of this screening level, fish sampling for the presence of certain PFCs will be necessary to determine if further actions are needed to protect public health (e.g., development of a fish consumption advisory).