

**Grubb Road Site
Final Plan of Remedial Action
DE0279**



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**Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch**

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Grubb Road Site

Final Plan of Remedial Action

I. Introduction

The Delaware Department of Natural Resources and Environmental Control (“DNREC”) performed a Remedial Investigation (“RI”) of the Grubb Road Site (“Site”) under the Delaware Hazardous Substance Cleanup Act (“HSCA”). Based on the comprehensive environmental investigations performed for the Site, DNREC concluded that the Site, in its present condition, does not present an unacceptable risk to public health, welfare or the environment.

II. Organization and Contents of the Final Plan

DNREC issues this Final Plan under the provisions of HSCA and the Regulations Governing Hazardous Substance Cleanup, (“Regulations”). The Final Plan presents DNREC’s assessment of the health and environmental risks posed by the Site and plans for limited further action.

DNREC provided notice to the public and an opportunity for the public to comment on the Proposed Plan in accordance with Section 12 of the Regulations. At the comment period’s conclusion, (the public comment period for this proposed plan closed on June 11, 1998), DNREC had not received any substantive comments to the proposed plan. Therefore, DNREC issues this final plan of Remedial Action. The final plan of remedial action designates the selected remedy for the Site. The proposed plan, the comments received from the public, DNREC’s responses to those comments, and the final plan of remedial action constitute the remedial decision record.

Section 8 of the Regulations discusses the contents of the proposed and final plan of remedial action. The proposed and final plan contain the following site information:

- A summary of the procedures, analytical results, and conclusions of the remedial investigation,
- A discussion of objectives,
- A summary of the risk assessment results, and
- A plan for the site’s future.

The Regulations discuss the contents of the Final Plan of Remedial Action in Section 8 of the Regulations. The Final Plan contains a description of the Final selected remedial action for the Site.

III. Site Description

The Site is centered around a residential area located along the 2800 block of Grubb Road, in the Brandywine Area of northern New Castle County, Delaware approximately

2000 feet southeast of Naamans Road, see Figure 1. There are no specific boundaries to the site, but the primary focus of previous site activities has been on seven (7) residential properties with addresses from 2800 to 2812 Grubb Road, which comprises approximately four (4) acres, see Figure 2. The site consists primarily of single family detached dwellings that at one time had both domestic water supply and cesspools for sewage disposal, although most residents presently are connected to public water and wastewater systems.

The site is bounded to the west by farmland slated to become a public park, to the east by Kimberly Chase residential development, to the south by the residential development of Chalfont and to the north by the residential development of Country Gates and Brandon.

The Site is characterized by rolling hills and is underlain by the Wilmington Complex (a meta-igneous and meta-sedimentary crystalline “bedrock”) which is overlain by approximately 20 to 50 feet of sandy silt to silty clay material. Fracture orientation and frequency control groundwater flow in this area. Well yields are generally low, with the average residential well yielding about one gallon per minute. Groundwater is also present in the overlying silty clay material (regolith).

IV. Site History

The Site is a collection of residential properties and there are various current and historic owners. Many of the houses in the immediate Site area are over 40 years old. Prior to the area’s development for residential properties, the land-use of the Site was agricultural as part of a farm complex. The Site history is summarized in the Table 1, below.

Table 1: Summary of Past Investigations

Time Period	Description
1940’s – 1980’s	Land use gradually changed from agricultural to residential.
March 1993	Homeowner at 2819 Grubb Road contacted Delaware Division of Public Health (DPH) concerning a film that formed on a glass of water left overnight. DPH sampled the domestic well and subsequent analysis detected trichloroethene (TCE) at a concentration of 15.9 ug/l. Resampling and analysis by DNREC in May 1993 indicated TCE at a concentration of 59ug/l.
July 1993	DPH conducted additional sampling from 3 other nearby homes and detected: 130 ug/l of TCE at one residence (2808 Grubb Road), 10.1 ug/l of chloroform at another residence (2805 Grubb Road, please note this was from a municipal water supply), and no detection in the third (2814 Grubb Road).
September 1993	At the request of DNREC, DPH collected samples from an additional 3 residences and detected TCE at 8.81 ug/l at one residence (2812 Grubb Road), but no volatile organic compounds (VOCs) at the other 2 residences (2816 and 2821 Grubb Road).
February 1994	DNREC identified approximately 50 residences in the area believed to be supplied by domestic water supply wells and issued invitations to these residences for a public information meeting to discuss the TCE issue. The public meeting held on February 15, 1994 generated responses from 26 homeowners requesting to have their wells sampled.

March 1994	DNREC conducted water supply sampling at a total of 25 residences as part of the Preliminary Assessment/Site Investigation conducted for the Grubb Road TCE Site. Of the 25 residences sampled, 5 contained detectable levels of TCE, 8 contained detectable levels of 1,1,1-trichloroethane (TCA a breakdown product of TCE), 3 contained chloroform (municipal water supply source), and 1 contained tetrachloroethene (PCE a breakdown source). Samples from 10 homes contained no detectable VOCs.
November 1994	DNREC completes the PA/SI for the Site. The PA/SI indicates that there is no obvious source for the VOC contamination, and recommends additional investigation and sampling to locate the source of the TCE. The PA/SI also recommends that an alternative water supply be considered for those wells impacted by TCE.
1995	DNREC implements the connection of a public water supply systems to various residences in the area.
1996-1997	DNREC's contractor (Tetra Tech) conducts a limited RI at the Site and submits its findings to DNREC for their review and approval.

V. Remedial Investigation Procedures

DNREC conducted an extensive review of past investigations prepared for the Site. DNREC could not identify any potentially responsible parties for this Site. Therefore, this investigation and remediation were conducted using the HSCA Fund. DNREC hired Tetra Tech as a contractor to develop a Work Plan and to conduct the investigation and feasibility study to address the following:

- Determine the presence or absence of contaminants in the underlying regolith aquifer, if present, determine the contaminant fate and transport, and
- Determine the presence or absence of a source in the underlying soils, and if present to remove the source.

The Work Plan called for Tetra Tech to perform the following tasks:

- The sampling of the existing wells and analysis of the collected groundwater samples,
- The sampling of existing cesspools and analysis of the collected liquid and solid samples,
- The sampling of the soils gas to identify the extent of the chlorinated volatile organic compound contamination in the groundwater in the vicinity of the Site,
- A risk assessment, if necessary, both human health and/or ecological, and
- A FS, if the Site poses unacceptable risk to human health and the environment to correct these risks.

VI. Remedial Investigation Results

The following is a brief summary of the results of the investigations for the Site.

A. General Information

Based on a review of available well information, the domestic wells in the vicinity of the Site are believed to be screened in the regolith aquifer. The groundwater flow direction in the vicinity of the Site is to the south or southeast, based on the topography and surface water drainage. However, the local flow directions vary given the presence of fractures in the underlying bedrock.

Most residents are currently connected to public water supply and waste water systems; wells and cesspools systems previously used at these residences remain in place.

B. Well/Cesspool Investigation

Analytical results of the well and cesspool sampling identified three VOCs in two aqueous samples. No detections were reported in solid samples. The maximum VOC concentration detected was 140 ug/l of toluene in the septic tank at 2802 Grubb Road. Other VOC detections were one to two orders of magnitude lower.

C. Soil Gas Survey

Analytical results for the soil gas survey positively identified one volatile organic compound, vinyl chloride in five GORE-SORBER samples. Vinyl chloride is an intermediate breakdown product of the target compound trichloroethene. The vinyl chloride detected, 0.03 ug/l – 0.09 ug/l over a two week period, are far below the GORE-SORBER method detection limit of 1.77 ug/l. These detections were at locations within the primary investigation area.

D. Storm Water Run-off

Storm water run-off goes to the south/southeast towards two unnamed tributaries to the South Branch of Naamans Creek.

E. Environmental Inventory

The site is comprised of typical suburban landscaping with grass and deciduous trees, although a more extensive wooded area and some agricultural lands are located in areas west of the Site. There are no wetlands within 500 feet of the Site.

F. Summary

The results of the limited soil and ground-water sampling and area wide soil gas survey indicate that a localized area of low-level ground-water contamination remains in the area bounded by the properties of 2812 Grubb Road to the north and 2800 Grubb Road to the south. The soil gas survey, an indirect measure of ground-water quality, indicates that

there appears to be no major ground-water plume at the Site extending beyond the immediate 2812 to 2800 Grubb Road area. The limited soil gas VOC detections are consistent with the low-level VOC detections from the RI water samples and are generally consistent with the PA/SI findings.

There appears to be no definitive/specific source area for the TCE remaining at the Site. There are no off-site sources since no TCE or its degradation products were detected outside of the primary source area. The likely source of the TCE remains either a small one-time spill by one of the residents in the area, or the historic use of products containing TCE (degreaser) as part of the maintenance of the septic tanks/cesspools that were previously used in the area. The detection of toluene and xylene in one of the septic tanks illustrates the potential for septic tanks to be a source of contamination in the area.

VII. Facility Remedial Action Objectives

The Regulations provide that DNREC sets objectives for land use, resource use, and cleanup levels that are protective of human health and the environment. The following objectives are determined to be appropriate for the Site:

- Prevent residential exposure to impacted media, and
- Continue the use of public water for all purposes to the surrounding community, and

These objectives are consistent with the value of the Site as part the surrounding land use, New Castle County zoning policies, state regulations governing water supply, and worker health and safety.

VIII. Risk Evaluation Summary

Tetra Tech performed a health risk assessment to evaluate the possible effects on human health from the use of the Site consistent with the objectives discussed above.

The Risk Evaluation (“RE”) evaluated whether there was a possible health risk and/or environmental impacts from the release of hazardous substances from the Site given that nearly all the residents in the immediate area are connected to municipal water supply. There is no completed pathway for exposure to ground water for most of the residents in the area.

However, a domestic well is still in use at 2800 Grubb Road with a water treatment system with a pre treatment TCE concentration of 13 ug/l. The Maximum Contamination Level (MCL) for TCE is 5 ug/l. The only other domestic well remaining is located at 2803 Grubb Road, up gradient of the Site, and it is still in use and does not have TCE above the MCL. These wells will be monitored on a regular basis and appropriate action taken if conditions change.

Other residences located north of the primary study area (Jest Park Farm, 2814, 2816, 2817, and 2821 Grubb Road) and south of the primary study area (2727, 2728,

2731, 2738, and 2741 Grubb Road) continue to use domestic wells for water supply. Based on historic ground-water quality data and soil gas survey results, there is no evidence that TCE or its degradation products are migrating in the ground water from the Site toward these water supply sources. The ground-water contamination migration potential is considered to be low given the follow factors:

- Dilution and biological degradation would render the relatively low concentration of TCE in the immediate study area (5 to 7 ug/l) to levels below the MCL or detection limits before reaching any water supply well outside the study area; and
- The overall anticipated ground-water flow direction in the area is to the south/southeast, indicating that all the current water supply wells that are located north of the Site are upgradient of the contamination area.

There is no completed pathway for exposure to ground water for any potential ecological receptors in the area.

IX. Final Remedial Action Plan

Since the risks associated with the Site are acceptable if both the regolith and bedrock aquifers area restricted from drinking water use, DNREC will:

- Restrict drinking water access and create a groundwater management zone for the site,
- Continue monitoring remaining two (2) residential water supply wells for the presence of TCE and it degradation products; and take corrective action as necessary, and
- Continue to monitor Site conditions on a routine basis.

X. Declaration

This Final Plan of Remedial Action for the Grubb Road Site is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.



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