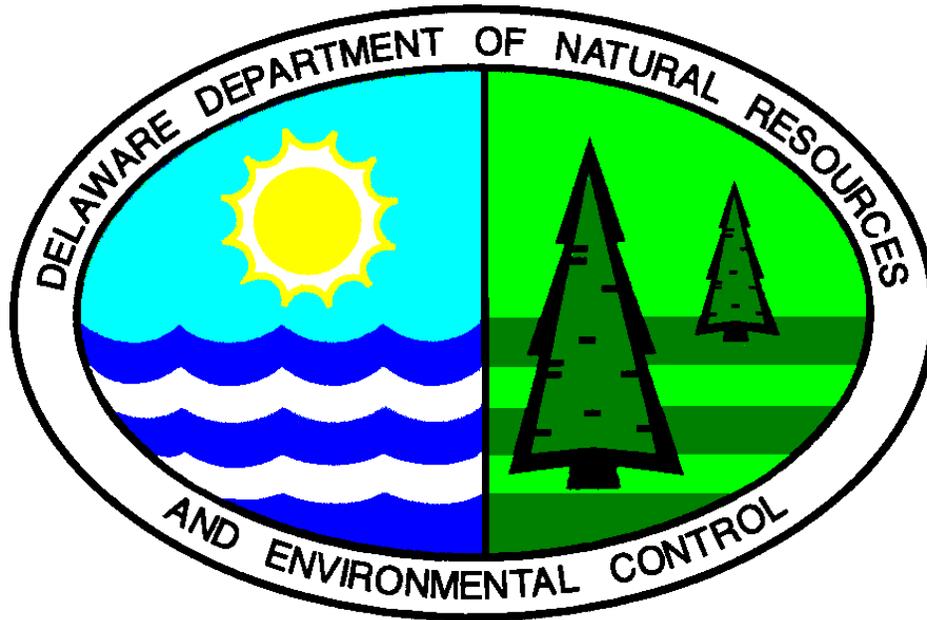


FINAL PLAN OF REMEDIAL ACTION

Riverwalk Park Site
Wilmington, DE



July 1998

Delaware Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation & Restoration Branch
715 Grantham Lane
New Castle, Delaware 19720

DNREC Project No. DE 1116

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Final Plan of Remedial Action Riverwalk Park Site

I. INTRODUCTION

The Riverfront Development Corporation (RDC) is constructing a park (Riverwalk Park) along the Christina River between French Street and King Street in Wilmington, DE. The park is being constructed within an approximate 2-acre parcel of open land that was most recently a parking lot. The Delaware Department of Transportation (DelDOT) owns the northern portion of the former parking lot and the southern portion is owned by RDC.

During utility installations in January 1998 within the DelDOT portion, petroleum odors were detected. Black soil suspected to contain coal ash was encountered throughout the site. Subsequent soil exploration lead to finding five (5) underground storage tanks on the DelDOT portion. No tanks were found on the RDC portion of the park.

Due to the petroleum contaminated soils, the RDC decided to enter into the DNREC Voluntary Cleanup Program (VCP). Through a VCP agreement, RDC agreed to further characterize the potential risks posed to the public health and environment. The RDC contracted EA Engineering, Science, and Technology, Inc. (EA) to conduct the required tasks.

The purposes of the investigative process were to: 1) understand the nature and extent of any soil and/or groundwater contamination at the site, 2) evaluate risks to the public and environment associated with identified contamination, and 3) perform a feasibility study that would identify and recommend a remedial action, if required.

This document is the Department's Final Plan of Remedial Action for the site. It is based on the results of the previous investigations performed at the site. This Final Plan is issued under the provisions of the Delaware Hazardous Substance Cleanup Act ("HSCA") and the Regulations Governing Hazardous Substance Cleanup ("the Regulations"). It presents the Department's assessment of the potential unacceptable health and environmental risk posed by the site.

Section II presents a summary of the site description, site history and previous investigations of the site. Section III provides a description of the remedial investigation results. Section IV presents a discussion of the remedial action objectives. Section V presents an analysis of remedial alternatives, including identification of and rationale for selection of alternatives and description of alternatives. Section VI discusses public participation requirements.

The Department provided public notice and opportunity to comment on the Proposed Plan in accordance with Section 12 of the Regulations. At the conclusion of the comment period, no

comments were received. Therefore, the Department issues this Final Plan of Remedial Action that designates the remedial action. The Proposed Plan, the comments received from the public, responses to the comments and the Final Plan will constitute the "Remedial Decision Record".

II. SITE DESCRIPTION AND HISTORY

Site Setting

The site is a one-block area located in Wilmington and is bordered to the north and northeast by Water Street, on the southeast by French Street, on the south and southwest by the Christina River, and on the northwest by Market Street. The King Street extension runs from northeast to northwest in the northern portion of the site.

The area surrounding the property is primarily commercial and industrial with limited residential development. The Wilmington Train Station and associated parking lot are located across French Street. The elevated rail lines border the northeast side across from Water Street.

Geology/Hydrogeology

The topography around the site is nearly flat with a surface at approximately 10 feet above sea level. The ground slopes down to the south-southwest toward the Christina River.

The site is located within the Piedmont Physiographic Province and is underlain by the Wilmington Complex crystalline rock formation composed of hypersthene-quartz-andesine gneiss.

The Christina River is the nearest surface water body to the site. According to 1974 flood insurance maps a portion of the site is located in a floodplain; however, the site is not in a Water Resource Protection Area. No surface water intakes are known to exist within one mile of the property.

The depth to the shallow water table aquifer is approximately 5 to 7 feet and is tidally influenced. During high tide the water table has been noted to be within 4 feet of the surface. The groundwater flow direction changes with the tide but is considered to be to the river.

Site and Project History

Five site assessments are known to have been conducted on the property prior to the 1998 construction activities which prompted the site's entrance into VCP. In April 1987 a preliminary geotechnical engineering assessment survey was conducted by SITE Engineers, Inc. The purpose was to assess the subsurface conditions with respect to the proposed construction activities planned for the site. Fill material was found to be present throughout the site.

In June 1987 a site inspection was conducted by Jason Cortell and Associates, Inc. Soil sampling and analysis at six locations indicated no elevated volatile organic compounds or metals.

A Phase I audit was performed by WIK Associates, Inc. in October 1993. Solid waste and drums were found on the site. An additional assessment (a Phase II audit) was recommended. The Phase II audit was conducted by WIK Associates, Inc. in August 1994. The Phase II tasks included a magnetometer survey with anomaly excavation and soil boring with subsequent soil analysis. Six magnetic anomalies were excavated and found to contain railroad ties with spikes and metal pipes. A total of 56 soil borings were attempted. Thirty-two of the attempts met refusal. Soil samples were analyzed for volatile organic compounds, semi-volatile organic compounds, total petroleum hydrocarbons, polychlorinated biphenyls, and metals. No contamination other than petroleum hydrocarbons (less than action levels) was reported.

In March 1996, EA Engineering conducted a soil vapor survey at the site. A total of 37 borings were attempted but only 21 were completed. Five soil samples indicated the presence of volatile organic compounds by screening methods. No samples were submitted to a laboratory for analysis.

In February 1998, under the VCP agreement, EA Engineering was contracted by the RDC to perform a remedial investigation that consisted of soil sampling and groundwater sampling. The soils were collected from test pits and samples were split with DNREC and field screened for volatile organic compounds, polynuclear aromatic hydrocarbon compounds, polychlorinated biphenyls, pesticides, and metals. Samples were sent to a laboratory for analytical confirmation. Petroleum compounds, particularly polynuclear aromatic hydrocarbons, were detected in the soil at levels greater than residential and industrial criteria. One sample indicated low level concentration of pesticides but was not over a regulatory level. No elevated levels of heavy metals were noted. The chemicals of concern are therefore, the polynuclear aromatic hydrocarbons.

Groundwater samples were collected through temporary monitoring wells installed at the site. The water samples were analyzed for volatile organic compounds and semi-volatile organic compounds. Of the three samples collected, one sample (GP-3) exhibited the presence of several organic compounds, but only one compound, benzene, was detected at a concentration slightly above the DNREC reporting level of 5 µg/L, which is the drinking water Maximum Contaminant Level (MCL). The GP-3 benzene concentration was 9 µg/L.

III. INVESTIGATION RESULTS

Based on the information obtained from the investigations performed at the Riverwalk Park several constituents could pose a potential risk to the public and future workers if not appropriately addressed. The potential risk pathways include:

Air Migration: Contaminant migration may be caused by volatilization and fugitive dust emissions. This route is of particular concern to workers on the site.

Direct Contact: Contact with the contaminants may occur during construction activities and afterward if bare ground exists.

Surface Water: Migration to the Christina River may occur as the groundwater flows to the river.

Ground Water: Desorption of contaminants from soils to groundwater may occur due to tidal interactions and precipitation. The water could pose an increased health risk if used for consumption.

IV. REMEDIAL ACTION OBJECTIVES

According to HSCA regulation 8.4 (1) remedial action objectives must be established. The remedial action was established utilizing the Qualitative and Quantitative Objectives and the following considerations:

- The site will be a park and therefore residential risk factors are designated as most applicable;
- The risk to the residents would increase if the groundwater is used for drinking water, and;
- The surrounding properties are industrial and commercial.

Based on the qualitative objectives, the quantitative objectives are:

1. Prevent human contact with the soils contaminated with PAH compounds over residential risk levels.
2. Prevent human contact with the soils contaminated with petroleum hydrocarbon compounds over 1,000 parts per million.
3. Prevent ingestion of groundwater with benzene concentrations over 5 parts per billion.

V. FINAL REMEDIAL ACTION PLAN

Three potential remedial actions were evaluated for their ability to accomplish the Remedial Action Objectives. These were:

1. No Further Action.
2. Cover and Contain the Affected Material with Additional Institutional Controls.
3. Removal of All Affected Material.

Alternative 1 was eliminated from consideration because it would not meet the Quantitative or Qualitative Objectives.

Alternative 2 tasks will include; the placement of a fabric liner on the existing ground surface, covering the site with 1.5 feet to 6 feet of clean fill material and, the placement of a deed restriction to prevent a residential usage and restrict intrusive construction activities, following the completion of the cover system. A Groundwater Management Zone (GMZ) shall be instituted by DNREC which prohibits the installation of public or domestic wells on the property.

Alternative 3 tasks would include the excavation of all affected material, treatment and disposal of the material, and replacement with clean fill. Additional fill for the park construction would also be required.

Both Alternatives 2 and 3 met DNREC requirements for an appropriate remedy for this type of site. Alternative 2 can be accomplished quicker, which will reduce the duration of worker exposure and is also lesser in cost by approximately \$145,000. Therefore, Alternative 2 is the selected alternative. The RDC has already begun implementation of this alternative at their own risk in order not to delay the park opening scheduled for July 4, 1998.

VI. PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the Proposed Plan and welcomed opportunities to answer questions. The comment period began Monday June 10, 1998 and ended June 30, 1998.

VII. RECOMMENDATIONS

As a result of the findings of the Remedial Investigation, the Department recommended in the Proposal Plan that the existing soil be covered by a fabric membrane and covered with 1.5 to 6 feet of clean fill. Further an institutional control in the form of a deed restriction will be placed on the property that limits construction activities following the completion of the cover system. Regarding the groundwater contamination at the site, DNREC shall institute a groundwater management zone for the parcel that will prohibit the construction of water supply wells on the parcel. The consultant for the RDC has convincingly shown that the groundwater contamination shall not adversely effect surface water quality as a function of the discharge because of the low concentrations. Therefore, no impact to environmental receptors is expected. There being no objections raised to this proposal during the public comment period, the Department has adopted the proposed alternative as the Final Plan of Remedial Action under HSCA.

VIII. DECLARATION

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

Nicholas A. Di Pasquale
Director

Date