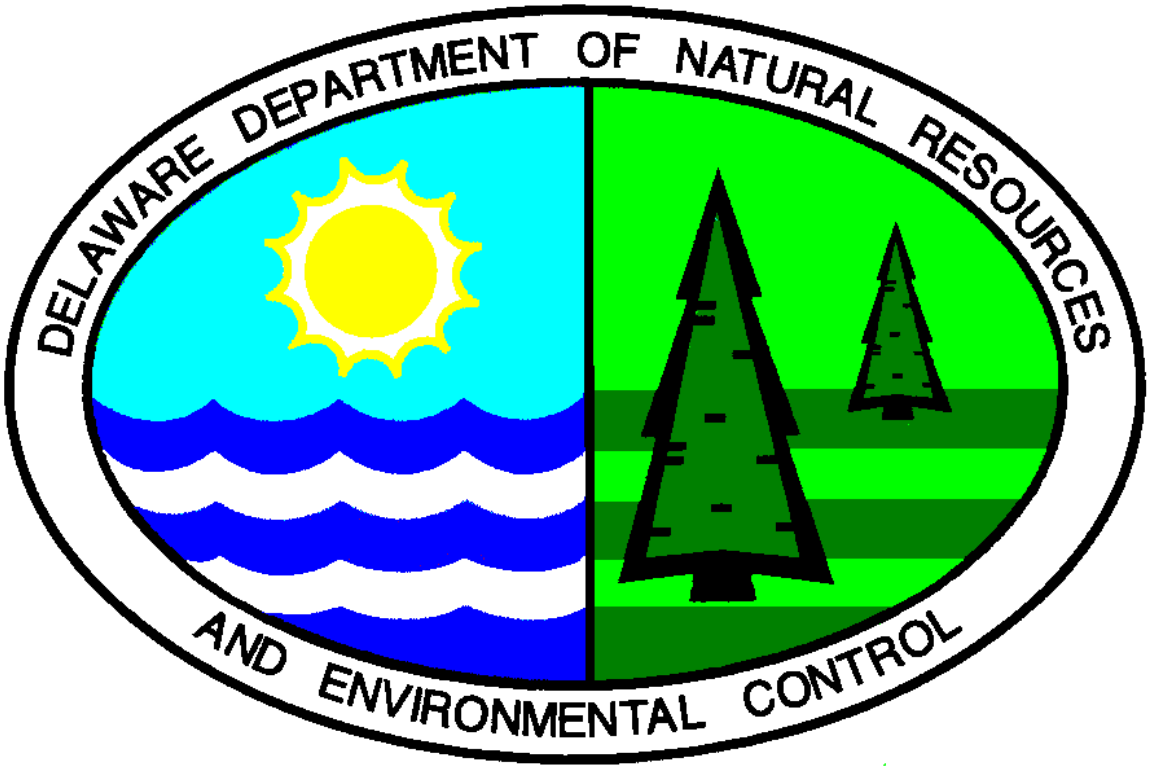
Proposed May B. Leasure Site
DE1088

Proposed Plan of Remedial Action



May 1998

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

Table of Contents

List of Figures

Proposed May B. Leasure Site
Proposed Plan of Remedial Action

I. Introduction

The Delaware Department of Natural Resources and Environmental Control ("DNREC") performed a Remedial Investigation and Feasibility Study (RI/FS) of the Proposed May B. Leasure Site ("Site") under the Delaware Hazardous Substance Cleanup Act ("HSCA") 7 Del. C. Chapter 91. Based on the comprehensive environmental investigations and interim actions performed for the Site, DNREC concluded that the Site, in its present condition, does not present a risk to public health, welfare or the environment.

II. Organization and Contents of the Proposed Plan

DNREC issues this proposed plan under the provisions of HSCA and the Regulations Governing Hazardous Substance Cleanup, ("Regulations"). The proposed plan presents DNREC's assessment of the health and environmental risks posed by the Site and plans for further action.

In accordance with the Regulations, DNREC will provide 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, DNREC will review and consider all of the comments received and then DNREC will issue a final plan of remedial action. The final plan of remedial action shall designate 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 will constitute the remedial decision record.

The Regulations discuss the contents of the proposed plan of remedial action in Section 8 of the Regulations. The proposed plan contains a description of 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.

III. Site Description

The Site is located on Church Road, south of Pulaski Highway in Bear, New Castle County, Delaware. The Site is approximately 15 acres which was subdivided from a larger farm parcel for the development of the Proposed May B. Leasure Elementary School, by the Christina School District, see Figure 1. DNREC, Christina School

District, and New Castle County Department of Planning and Public Works reviewed site development plans.

The site is bounded to the west by U.S. Route 40 and a densely vegetated hedge row, to the north by farm land, to the east by farm land, and to the south by Church Road.

The site is located within the Atlantic Coastal Plain Physiographic Province, which consists of a wedge of unconsolidated sediments overlying the crystalline rock basement. Site elevations range from approximately 71 feet on the northern edge to approximately 81 feet on the southern edge of the Site. Geological mapping by the Delaware Geological Survey shows the depth to weathered crystalline rocks in excess of 300 feet. Overlying the basement complex, from the oldest to the youngest, are found the sediments of the Potomac Formation, the Columbia Formation, and the pedogenic soil profile.

The Site soils are a combination of poorly drained soils and well-drained soils, which have been farmed since at least 1937. The majority of the Site is located within an area mapped by the United States Geological Survey as having Poor (silt/clay) sediments for recharge. The Site is relatively flat with a gently rolling topography. Surface runoff from the property generally appears to drain towards the north and then would eventually work its way to the southeast and Red Lion Creek approximately a half-mile away.

Population data were not collected since the land use is rapidly changing in the Site vicinity; formerly largely agricultural the area now contains numerous subdivisions and commercial development limited to the immediate Route 40 corridor.

IV. Site History

To determine site history aerial photography was reviewed from 1937 through 1989. The aerial photography indicates that the only use of the site was agricultural starting with the 1937 photography and going through to the 1989 photography.

The Site was evaluated through a series of investigations: December 1995, January 1996, September 1996, and March 1997 and an interim action was conducted during the summer of 1997.

V. Remedial Investigation Procedures

DNREC conducted an extensive review of past investigations prepared for the Site. After review of the work conducted, DNREC worked with the consultant (Duffield and Associates, {Duffield}) for the Christina School District (School District) to develop a strategy for collecting additional information to develop a Feasibility Study for the Site.

- Determine the volume of soil containing metals of concern,
- Determine the concentration of the metals in soils, and
- Develop remedial technologies for the metals in soils.

The Work Plan called for the following tasks:

- Sampling the area and identify the boundaries of the metal contamination in soils,
- Collect soil samples to determine treatability options for metal in soils, and
- Determine the volume of material involved.

VI. Remedial Investigation and Feasibility Study 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 information, no pesticides were detected and beryllium was found at natural background concentrations. However, the property contains soils that are contaminated with metals (arsenic, antimony and lead), probably from hunting derived lead shot deposition since lead shot pellets and shot gun cartridges were found in the soils in this portion of the Site.

The elevated levels of metals appear to be localized in an area measuring approximately 500 feet by 200 feet along the northern property line. This is an estimated quantity of approximately 4,000 to 5,000 cubic yards of material or approximately 6,000 to 7,500 tons of material assuming a soil density of 1.5 tons per cubic yard.

Since the Site is within the property to be developed as the Propose May B. Leasure School by the present owner (Rockwood V. L. Corporation, {"Rockwood}) for the School District, the School District requested and Rockwood agreed that the contaminant concentrations would be remediated to residential levels.

B. Extent of Metals Contamination

Elevated concentrations of the lead shot pellet metals (Pellet Metals) were detected in the shallow subsurface (surface to one foot below the surface) with lower concentration of the Pellet Metals being found below one foot from the surface. Almost no Pellet Metal concentrations were found at depths greater than two feet from the surface. This indicates that the transport of the pellets into the subsurface would have been through plowing during the farm growing season.

The Site's concentration of antimony is reflective of the lead pellet manufacturing process. The manufacturer added antimony to the molten lead and the antimony acted as a hardening agent to prevent the cooled pellet from falling apart during flight. In addition, to preventing the pellet from falling apparent in flight, the hardening by antimony also results in the lead pellet being less leachable and therefore limits the ability of groundwater or rain water from leaching lead into water. Finally, by utilizing solidification/stabilation mechanism to prevent the migration of lead, that same mechanism prevents the migration of antimony.

Beryllium was found in Site soils at or below the State's background concentration.

C. Treatability Study

Cement stabilization of soils is a demonstrated technology to reduce the mobility of metals. Various cement to soil addition ratios were evaluated: 0%, 3%, 5%, and 7%. Samples were submitted to an approved HSCA Laboratory for analysis for total metals, moisture and Toxicity Characteristic Leaching Procedure ("TCLP") analysis. From the treatability study it was found that the appropriate mix of cement to soil was the 5% to 7% portland cement by weight. Samples treated with the 5% to 7% ratio did not report TCLP concentrations in excess of the TCLP reporting requirements of 5 mg/l.

D. Feasibility Study

Duffield evaluated four alternatives that are all protective of human health, welfare and the environment for handling the Pellet Metal contamination. The first alternative, leaving the material in place with a soil cap and a deed restriction would cost approximately $24,000.00. The second alternative, excavation, removal and off-site disposal would cost approximately $1,200,000.00 to $1,500,000.00. The third alternative, stabilization with vaulting under a roadbed would cost approximately $390,000.00 to $487,500.00. The fourth alternative, separation by concentration of the lead and antimony and stabilizing with vaulting of one portion and straight vaulting of the remaining portion under a roadbed would cost approximately $214,500.00 to $268,125.00.

E. Interim Action

If during the course of the HSCA investigation a means becomes apparent to reduce contamination or prevent its spread, appropriate action would be taken. Solidification/stabilization is classified by the United States Environmental Protection Agency (EPA) as a presumptive remedy for soils containing lead and antimony. The EPA has found that certain categories of sites exhibit similar characteristics, such as type of contaminants and effects of contamination on environmental media. Based on this experience, the PEA has developed presumptive remedies to accelerate cleanup. Solidification/stabilization physically restricts the contaminant from contracting a mobile phase such as air or groundwater. The solidification binder forms a solid resistant matrix that can occlude waste particles, bind contaminants and reduce the permeability of the waste binder mass. Therefore the following remedial interim actions have occurred:

- Excavate soils and segregate by concentration of lead and antimony,
- Vault the soils with the low concentrations of lead and antimony under a deed restricted road bed with vaulting noted on the road's as-builts, and
- Stabilize/Solidify soils with elevated levels of lead and antimony and vault with low concentration soils under a deed restricted road bed with vaulting noted on the road's as builts.

F. Environmental Inventory

No known critical areas were identified within a three-mile radius of the Site.

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, welfare and the environment. The following objectives are determined to be appropriate for the Site:

- Prevent exposure to impacted media, and
- Continue the use of public water for all purposes in the surrounding community, and
- Use of the property as public building with road access.

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

Duffield 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 Site in its present condition does not present a risk to human health, welfare or the environment.

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

IX. Proposed Remedial Action Plan

As a result of the RI, the sucessful completion of the interm action, and the confirmatory sampling, DNREC finds that the risks associated with the Site does not present a risk if the unconfined aquifer is resticted from drinking water use. The proposed remedy includes:

- Restrict drinking water access and create a groundwater management zone for the site and sample an old farm well located near the Site;

X. Public Participation

DNREC actively solicits public comments or suggestions on the Proposed Plan and welcomes opportunities to answer questions. Please direct written comments to:

Department of Natural Resources and Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, Delaware 19720-2774

Attn: Jane Biggs Sanger

or call (302)395-2600. The public comment period for this Proposed Plan closes at 4:30 p.m. on 11 June 1998. If so requested, a public hearing will be held on the Proposed Plan. The time and place for the hearing will be announced if said hearing is requested.

JFBS/jfbs/JFB98055.DOC
DE1088 II B8

Figure 1 - Site Location

JFBS/jfbs/JFB98055.DOC
DE11088 II B8