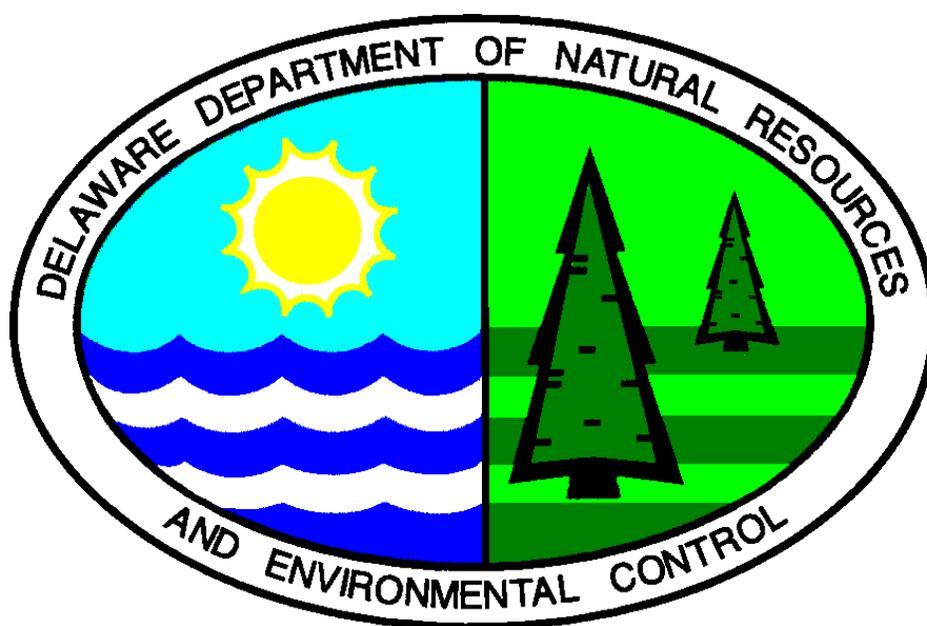


FINAL PLAN OF REMEDIAL ACTION

State Archives Building Site
Dover, Delaware



August, 1999

DNREC Project DE 1133

Prepared by:
Delaware Department of Natural Resources & Environmental Control
Division of Air and Waste Management
Site Investigation & Restoration Branch

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Duffield Figure 1. Site Location in Dover

Duffield Figure 2. Boring and Test Pit Locations

I. Introduction and Summary

In September 1999, the State of Delaware Department of Natural Resources and Environmental Control, Site Investigation and Restoration Branch (DNREC-SIRB) entered into an agreement with the Department of Administrative Services, Division of Facilities Management under the authority granted by the Hazardous Substance Cleanup Act (HSCA) (7 Del. C., Ch. 91) to conduct a Voluntary Cleanup Program document review of environmental work performed during the construction of the State Archives Building. The purpose of the agreement was to allow the DNREC-SIRB to review a work plan for the removal of contaminated soil, to provide recommendations for remedial action and to oversee field activities. The building was already under construction when the contaminated soil was discovered. The building is nearing completion as of this writing and no further intrusive activity is anticipated.

The Division of Facilities Management is managing construction of the building for the Department of State. Duffield Associates, a private environmental consulting firm, provided services to the Division of Facilities Management.

Only July 14, 1999, DNREC published notification of the Proposed Plan for this site in the “Wilmington News Journal” in accordance with Section 12 of the “Regulations Governing Hazardous Substance Cleanup”. The Proposed Plan presented the DNREC-SIRB’s evaluation of site conditions and potential risks and described the interim actions that have occurred. The twenty-day public comment period closed on August 4. Since no comments were received during the comment period, DNREC-SIRB adopts the recommendations of the Proposed Plan as the Final Plan of Remediation.

In summary, the selected remedy will consist of:

1. No further cleanup action.
2. A deed restriction placing future excavation or subsurface construction activity under the oversight of the DNREC-SIRB.
3. The development of an Operations and Maintenance Plan for the building which summarizes the environmental conditions on the property and addresses procedures for reducing the potential for inadvertent human or environmental exposures to regulated materials remaining on the site.
4. Continued oversight of the present construction project in the event that any additional work uncovers potentially contaminated soil.

II. Site Description and History

The site is located at the intersection of Loockerman Street and Legislative Avenue in Dover, Delaware as shown on Duffield Figure 1. The site is generally bounded by Loockerman Street to the north, Legislative Avenue to the west, and Duke of York Street to the south. The St. Jones River is located approximately 500 feet east of the site. Based on the United States, Department of the Interior Geological Survey topographic map of the Dover, Delaware Quadrangle (1993), the ground surface at the site is approximately 20 to 25 feet above mean sea level and appears to slope toward the east. Groundwater and surface water would likely flow east toward the St. Jones River according to Duffield Associates.

State government buildings and facilities surround the site. Legislative Hall is located south of the site, directly across Duke of York Street. The Hall of Records building is located on the southern portion of the site. A paved parking lot is located adjacent and east of the construction area.

Prior to the current development, an underground document storage facility was located north and adjacent to the existing Hall of Records. In preparation for the construction of the new facility, this underground structure was demolished. However, the concrete foundation slab of the former storage facility was left in place and was incorporated into the foundation of the new building.

The concrete slab for the new facility has been placed on the existing foundation but extends beyond it in limited areas. Auger cast piles were installed through the old slab and just outside it to support the new building. An ethylene propylene diene monomer membrane was installed between the existing and new slabs as a moisture barrier.

III. Environmental Characterization

Soil contamination in the building area was not anticipated prior to the start of construction. However, stained soils were observed during a review of auger cast pile installations near the new stairwell area of the building addition (see Duffield Figure 2). On the recommendation of Duffield Associates, a sample of this soil was taken on August 14, 1998 for laboratory analysis. The analytic results indicated the presence of coal tar related compounds in the soil. The installation of auger cast piles was suspended and Duffield Associates reported the findings to DNREC-SIRB.

Duffield Associates proceeded with further subsurface investigation of areas where additional piles were to be installed. This investigation found further evidence of past disposal of coal tar and ash related materials on the site. In some areas, glass and ceramic shards are mixed in with ash-like material and suggest that the site had been used for municipal waste disposal prior to construction of the archive storage building.

Soil contaminants discovered in the stairwell area and also in the side walls of excavation elsewhere on the site included coal tar related compounds (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(a,h) anthracene), arsenic and lead.

IV. Interim Action

In view of the potential health and safety issues affecting construction workers, a qualified environmental remediation contractor was called in to excavate and dispose of contaminated soil. Approximately 90 cubic yards of soil was removed from the stairwell area. A further 166 tons of contaminated soil was removed in October and December 1998 from a utility trench excavation under the old slab. The contaminated soils were sent to CleanEarth in New Castle and SoilSafe in Salem, New Jersey with the oversight and approval of DNREC-SIRB.

Post excavation samples in the stair well area showed that some coal tar related contaminants remained at moderately elevated levels. These soils have been covered with flowable fill material consisting of cement-amended fly ash. The interim action was effective in eliminating

the exposure of construction workers to contaminated soils. The contamination remaining in subsurface soil is not expected to have any impact on future occupants or visitors to the building. The moisture barrier over the foundation would prevent migration of coal tar compounds into the building through soil gas; however, no indoor air quality problems were reported in the old building.

V. Remedial Action Objectives

The objective of the remedial action is to accommodate the current expansion of the archive facility on this site without adverse impacts to human health and welfare or the environment. This use is consistent with current zoning and surrounding land use. A further objective is to minimize the exposure to contaminated soils by workers during any future utility installation or maintenance. The site is not in a critical water resource area or an ecologically sensitive area.

The quantitative cleanup objectives for the site reflect the *Site-Specific Standard Determination Using Pathway Elimination* method as discussed in the “Remediation Standards Guidance Under the Delaware Hazardous Substance Cleanup Act,” Section 5 (February 1998). According to this method, the existing site concentrations may be used as site-specific cleanup standards in situations where it can be determined and fully documented that there are no complete exposure pathways for a given media.

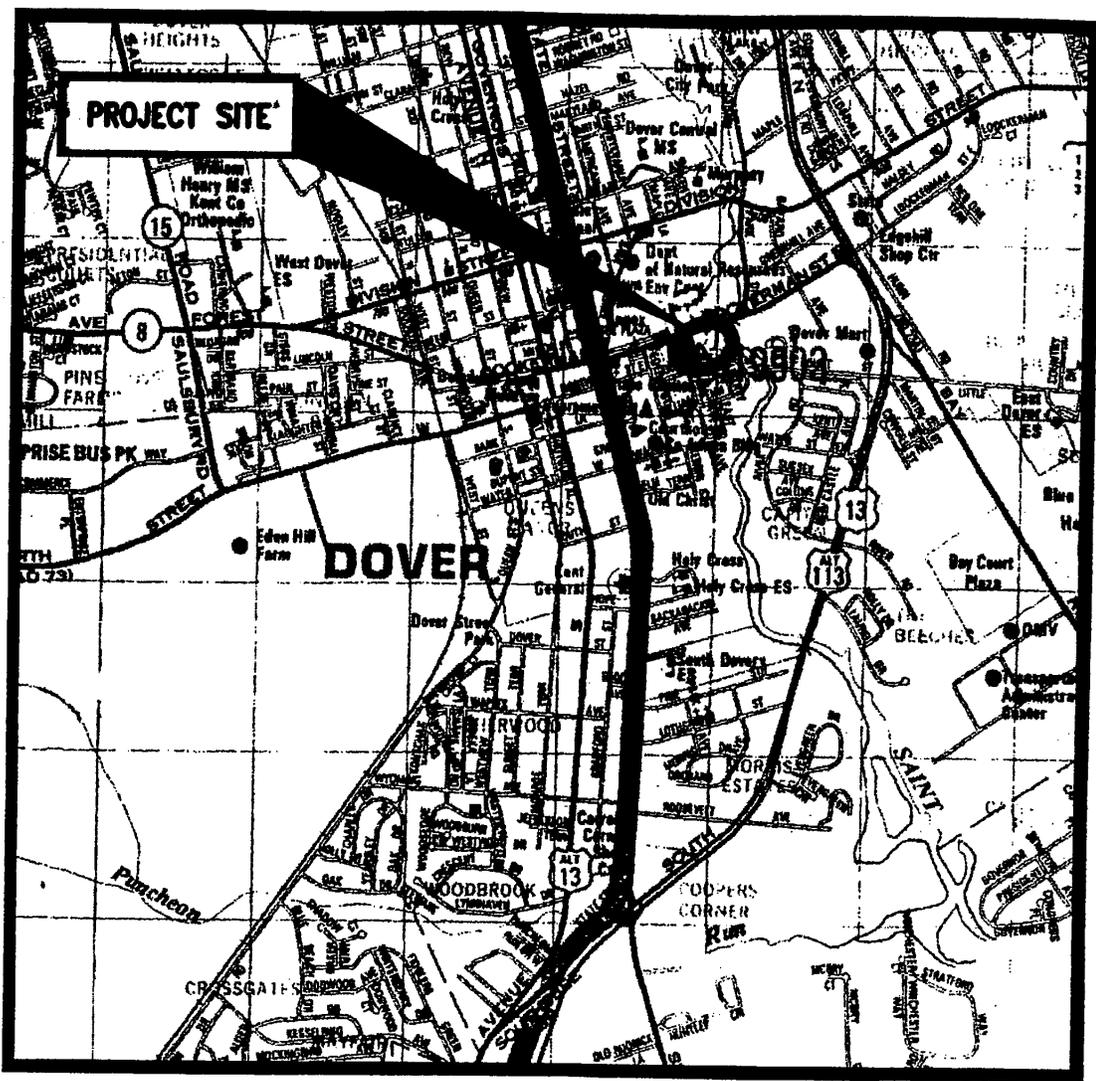
The remedial actions that have already occurred have met the remedial action objective by eliminating current exposure to contaminated soils. Additional action consisting of institutional controls will eliminate future exposure.

VI. Final Plan of Remedial Action

The DNREC has adopted the following remedy:

1. No further cleanup action.
2. A deed restriction placing future excavation or subsurface construction activity under the oversight of the DNREC-SIRB.
3. The development of an Operations and Maintenance Plan for the building which summarizes the environmental conditions on the property and addresses procedures for reducing the potential for inadvertent human or environmental exposures to regulated materials remaining on the site.
4. Continued oversight of the present construction project in the event that any additional work uncovers potentially contaminated soil.

The DNREC will proceed to complete the provisions of this Final Plan under the existing Voluntary Cleanup Agreement with the Division of Facilities Management Declaration.



NOTE:

THIS LOCATION SKETCH IS ADAPTED FROM "KENT COUNTY, DEL. STREET MAP," 6TH EDITION (1995), PUBLISHED BY ADC OF ALEXANDRIA, INC., MAP 23.

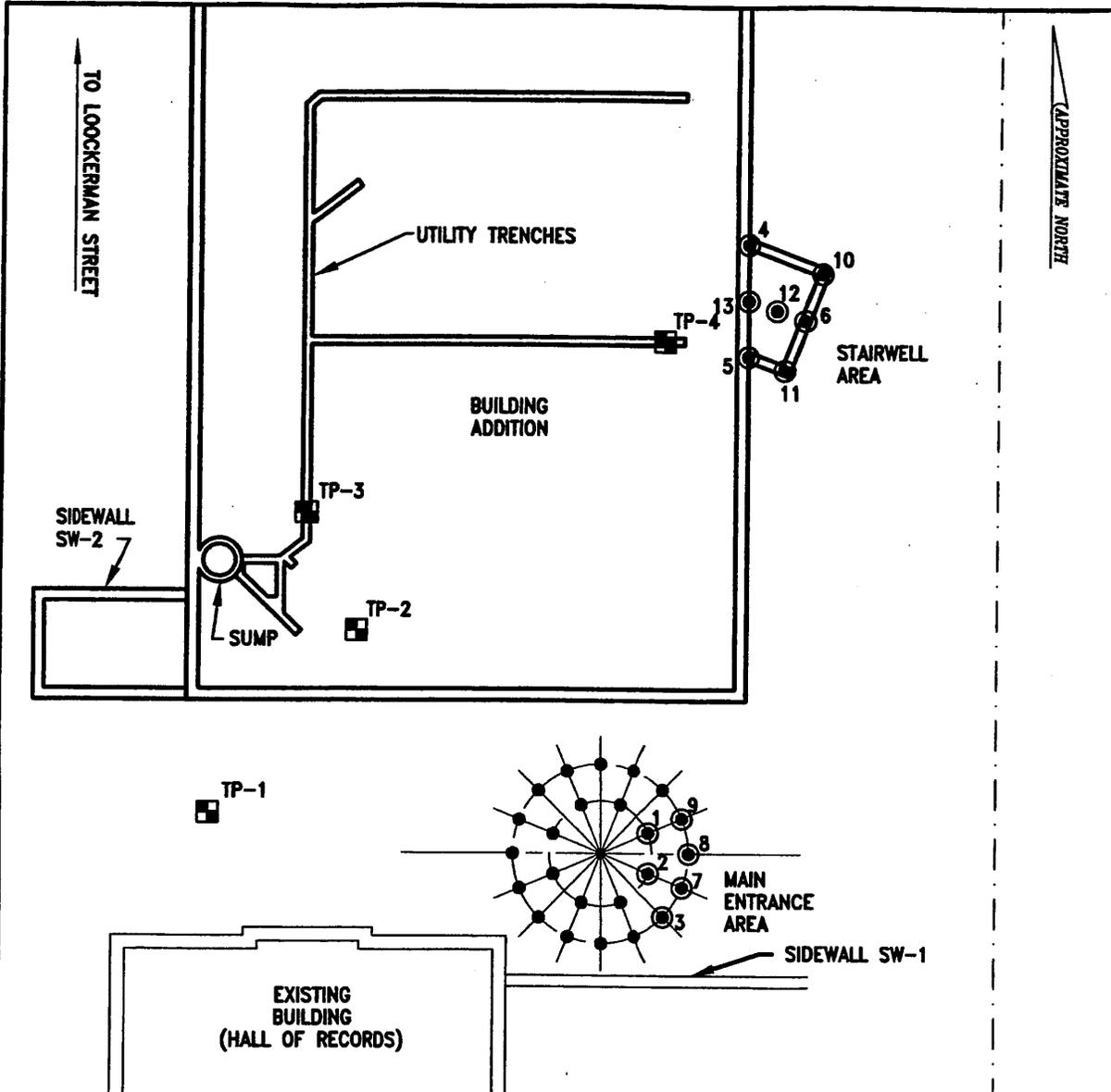
**AREA SKETCH
PUBLIC ARCHIVES BUILDING ADDITION**

DOVER
KENT COUNTY ~ DELAWARE

**DUFFIELD
ASSOCIATES**

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Drawn: DSH	Chk'd: <i>KTL</i>	Date: 3 SEPTEMBER 1998
Scale: 1" = 2000'	W.O.: 3864.EB	
Drawing No: A-3846EB-1		FIGURE 1



LEGEND:

- AUGER CAST PILE LOCATION
- ⊙ GEOPROBE BORING LOCATION
- TEST PIT LOCATION

NOTE:

THIS LOCATION SKETCH IS ADAPTED FROM AN UNTITLED, UNDATED SKETCH PROVIDED BY THE CLIENT.

**GEOPROBE BORING AND TEST PIT LOCATION SKETCH
PUBLIC ARCHIVES BUILDING ADDITION**

DOVER
KENT COUNTY ~ DELAWARE

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Drawn: JJV	Chk'd:	Date: 15 MARCH 1999
Scale: NONE		W.O.: 3846.EB
Drawing No: A-3846EB-3		FIGURE 2