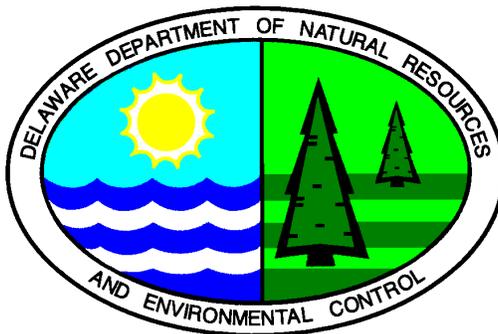


STATE OF DELAWARE

**DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL-
SITE INVESTIGATION AND RESTORATION BRANCH**

FINAL PLAN OF REMEDIAL ACTION



**Christina Lab Site
Wilmington, DE**

DNREC Project No. DE-1219

This final plan of remedial action (final plan) presents the Department of Natural Resources and Environmental Control's (DNREC's) preferred cleanup alternative for the remediation at Christina Lab (site) in Wilmington, Delaware. The final plan is issued under the provisions of the Delaware Hazardous Substances Cleanup Act, 7 Del. C Chapter 91 (HSCA) and the Regulations Governing Hazardous Substance Cleanup (Regulations). As described in Section 12 of the Regulations, DNREC provided notice to the public and an opportunity for the public to comment on the proposed plan of remedial action (proposed plan). During the comment period of April 15, 2004 through May 4, 2004, DNREC did not receive any comments on the proposed plan, therefore the proposed plan has been adopted as the final plan. The final plan designates the selected remedy for the site. All investigations of the site, the proposed plan and the final plan will constitute the Remedial Decision Record.

The final plan summarizes several reports including the July 2003 Environmental Summary and Risk Assessment, and the November 2003 revised Risk Assessment and Focused Feasibility Study, as well as the administrative record file upon which this final plan is based. All investigations performed at the site, the proposed plan, and the final plan will constitute the remedial decision record. Copies of these documents can be obtained or viewed by contacting DNREC.

INTRODUCTION

The site is located along the Christina River at 501 Christina Avenue in Wilmington, Delaware. The site covers approximately 20.4 acres of land and is located within a highly industrialized area near the Port of Wilmington (New Castle County, Tax Parcel No. 26.0058.0019). The site is bounded to the east by the Christina River; to the west by F.A. Potts Company International Inc. and the Forbes Steel & Wire plant; to the north by a railroad line and Delmarva Power; and

to the south by F.A. Potts Company International Inc. (Figure 1). DuPont purchased the property in 1961 and used the site for testing equipment and machinery until 1991. All buildings were subsequently demolished in the early 1990s. In July 2003, DuPont entered into the Voluntary Cleanup Program (VCP) under the provisions of the Delaware Hazardous Substance Cleanup Act, 7 Del. C. Chapter 91 (HSCA), as administered by the Delaware Department of Natural Resources and Environmental Control-Site Investigation and Restoration Branch (DNREC). Through a VCP Agreement, DuPont investigated the potential risks posed to the public health, welfare, and the environment at the site by evaluating previous investigations performed at the site and performing a risk assessment. A focused feasibility study (FFS) was subsequently performed to evaluate remedial alternatives for the site.

SITE DESCRIPTION AND HISTORY

The site has been used for commercial and industrial purposes since the early 1900s. This was the location of a sugar beet processing facility in the 1920s. Delaware Floor Products manufactured linoleum at this facility from the 1930s through 1961. From 1961 until 1991 DuPont used the facility as a pilot plant production in the development of new products. DuPont ceased operations in 1991 and all buildings were subsequently demolished in the early 1990s. Currently, the site is a vacant lot, and access is controlled by a locked chain-link fence that surrounds the site.

INVESTIGATION RESULTS

Based on a review of all the environmental investigations conducted at the site, the analytical results indicated that soil is the only media of concern. Several polynuclear aromatic hydrocarbons (PAHs) and metals were detected in the surface and subsurface soil above their respective unrestricted or restricted use Uniform Risk-based Standard (URS) values and are presented in the following tables:

SURFACE SOIL

<u>Contaminant</u>	<u>RME Concentration*</u> <u>(mg/kg)</u>	<u>URS for Unrestricted Use</u> <u>(mg/kg)</u>	<u>URS for Restricted Use</u> <u>(mg/kg)</u>	<u>Default Natural Background Concentration (mg/kg)</u>
Benzo(a)anthracene	7.9	0.9	8	
Benzo(a)pyrene	6.4	0.09	0.8	
Benzo(b)fluoranthene	9.1	0.9	8	
Dibenz(a,h)anthracene	7.8	0.09	0.8	
Arsenic	41	0.4	4	11

*RME – Reasonable Maximum Exposure Concentration calculated as the 95% Upper Confidence Level (UCL) of the arithmetic mean of contaminants detected at the site.

mg/kg – Milligrams per kilogram.

SUBSURFACE SOIL

<u>Contaminant</u>	<u>Maximum Concentration*</u> <u>(mg/kg)</u>	<u>URS for Unrestricted Use</u> <u>(mg/kg)</u>	<u>URS for Restricted Use</u> <u>(mg/kg)</u>	<u>Default Natural Background Concentration (mg/kg)</u>
benzo(a)anthracene	5.2	0.9	8	
benzo(a)pyrene	4.4	0.09	0.8	
Arsenic	66	0.4	4	11

*RME –Reasonable Maximum Exposure Concentration calculated as the 95% Upper Confidence Level (UCL) of the arithmetic mean of contaminants detected at the site.

The PAHs and arsenic detected in soil were retained as the contaminants of concern (COCs) for the subsequent risk assessment. Arsenic was detected in both surface and subsurface soils at concentrations that are above the range of typical background concentrations for Delaware soil.

With regards to groundwater, no contaminants were found above their primary maximum contaminant level (MCL). Iron and manganese at concentrations of 300 ug/l and 76 ug/l respectively, were the only contaminants detected in groundwater above the federal secondary maximum contaminant level (SMCL) for drinking water. SMCLs are based on aesthetic qualities of the water such as taste and odor and do not present a risk to human health or environment. Therefore, groundwater was not considered as a media of concern at the site. In addition, groundwater beneath the site and the vicinity is not presently being used as a drinking water source.

SITE RISK EVALUATION

DuPont calculated the site-specific risk associated with exposure to soil contaminated with arsenic and certain PAHs for an on-site worker under a restricted use scenario assuming the site will be used as a storage area. For surface soil a potential carcinogenic risk of 1.0E-04 and a non-carcinogenic risk or Hazard Index (HI) of 1.3 were calculated. For potential worker exposure to subsurface soil during excavation activities, a potential carcinogenic risk of 9.0E-07 and a non-carcinogenic risk or HI of 0.1 were calculated. The carcinogenic and non-carcinogenic risks for surface soil are above DNREC's cleanup standard of 1.0E-05 and HI of 1.0.

In addition, an ecological risk assessment was performed. Based on this assessment, DNREC concluded that there are no potential ecological risks for the site.

REMEDIAL ACTION OBJECTIVES

The following qualitative objectives are determined to be appropriate for the site:

- Prevent human exposure to impacted soil under future restricted land use.

This objective is consistent with the future proposed use of the site as a commercial storage area, New Castle County zoning policies, and state regulations governing water supply, and worker health and safety.

Based on the qualitative objectives, the quantitative objectives are:

- Prevent human exposure to soil contaminated with PAHs and metals that would result in a carcinogenic risk above 1.0E-05 and a non-carcinogenic risk above a HI of 1.0.

FINAL PLAN OF REMEDIAL ACTION

Based on DNREC's evaluation of the site information, which includes current and past environmental investigations, historical information, the above remedial action objectives, and

the remedial alternatives evaluated in the FFS, DNREC determined that the following remedial actions be taken at the site:

1. Installation of a cap over the entire site consisting of clean fill, stone base and asphalt cover. A remedial design providing details of the cap and the resulting storm water erosion control management plan shall be submitted within sixty (60) days following DNREC's adoption of the final plan for DNREC's review and approval prior to installation of the cover system. The capping system should be implemented in compliance with the applicable federal, state and local laws and regulations including but not limited to Delaware Sediment and Storm Water Regulations, 1991.
2. A deed restriction shall be placed on the property within sixty (60) days following DNREC's adoption of the final plan on the site prohibiting any land-disturbing activities at the site without prior written approval of DNREC.
3. An Operation and Maintenance (O&M) Plan shall be established and implemented sixty (60) days following the completion of remedial action. The O & M Plan shall detail the procedures and practices, including regular inspections, to minimize the potential for cap disturbance, and to promote the long-term integrity of the cap.

PUBLIC PARTICIPATION

The Department actively solicited written public comments and suggestions on the proposed plan of remedial action. The comment period began April 15, 2004, and ended on May 4, 2004. No comments were received. If you have any questions or concerns regarding the Christina Lab site, or if you would like to view reports or other information regarding this site, please contact the project manager, Qazi Salahuddin, at 391 Lukens Drive, New Castle, Delaware 19720, or at 302.395.2600.

DECLARATION

The final plan of remedial action for the Christina Lab site is protective of human health, welfare and the environment, and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

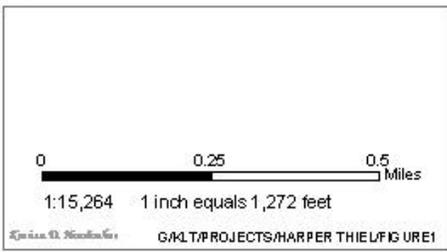
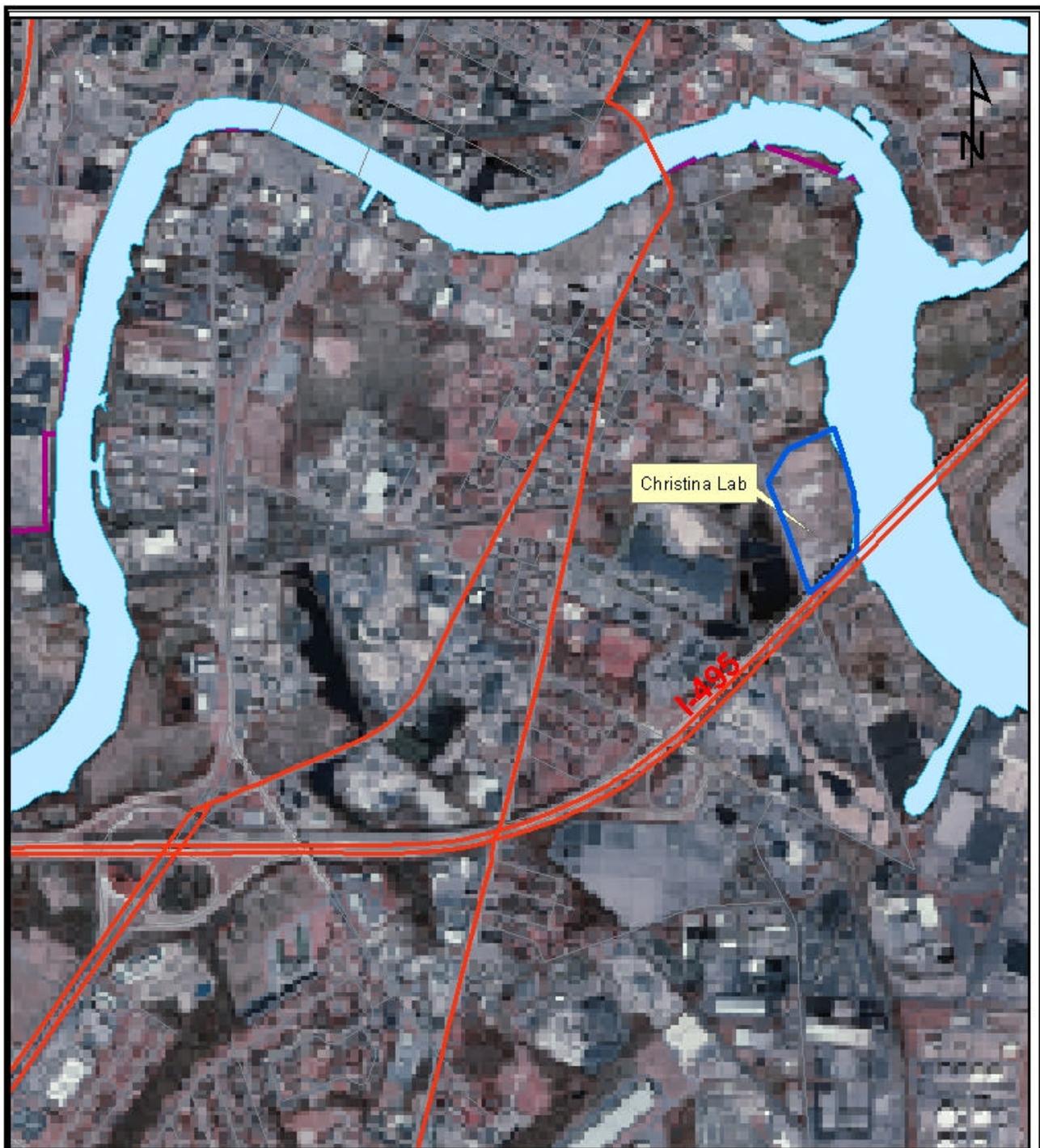


John Blevins
Director, Division of Air and Waste



Date

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**SITE INVESTIGATION &
 RESTORATION BRANCH**
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Figure 1
Location Map
Christina Lab Site
Wilmington, Delaware