

**STATE OF DELAWARE**  
**DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL**  
**SITE INVESTIGATION AND RESTORATION BRANCH**  
**FINAL PLAN OF REMEDIAL ACTION**



**Former Dover Ice Plant Site**  
**Dover, DE**

**DNREC Project No. DE-1110**

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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 the Former Dover Ice Plant (site) in Dover, 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 March 29, 2004 through April 19, 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.

The final plan summarizes the March 1998 Phase I Environmental Assessment, the October 2000 Remedial Investigation (RI) report, the May 2001 Focused Feasibility Study and the administrative record file upon which this final plan is based. All investigations of 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 comprised of approximately 2.6 acres of land located at 645 West North Street in the City of Dover, Kent County, Delaware (Kent County tax parcel number ED-05-076-12.04-0.800-000). The site is bounded to the north by vacant land and a City of Dover municipal service yard, to the south by West North Street and farmland, to the east by Conrail railroad tracks, and to the west by single and multi-family dwellings (Figure 1). The site has been used for

commercial and industrial purposes since the early 1900s and was purchased by the current owner, J. Fran Dell, Inc., in 1998. The site was vacant for about 10 years prior to the purchase and is currently vacant. J. Fran Dell Inc., 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, the site owner agreed to investigate the potential risks posed to the public health, welfare, and the environment at the site by performing a Remedial Investigation (RI) and contracted Tetra Tech, Inc. to perform the RI.

## SITE DESCRIPTION AND HISTORY

The site has been used for commercial and industrial purposes since the early 1900s. Past uses include a whiskey distillery, an apple butter and fruit juice manufacturing plant, a cold storage warehouse/ice plant, and a municipal electric generator plant. The site was vacant for approximately 10 years prior to being purchased by J. Fran Dell, Inc. in 1998. Land use in the vicinity of the site is both residential and commercial/industrial.

## INVESTIGATION RESULTS

Based on a review of all the environmental investigations conducted at the site, the analytical results indicated that several semivolatile organic compounds (SVOCs) and metals were detected in the surface and subsurface soil above their respective unrestricted or restricted use Uniform Risk-based Standard (URS) values as indicated in the following tables:

### SURFACE SOIL

benzo(a)anthracene	6.15	0.9	8	
benzo(a)pyrene	4.95	0.09	0.8	
benzo(b)fluoranthene	6.61	0.9	8	
benzo(k)fluoranthene	2.71	9	78	
indeno(1,2,3 cd)pyrene	3.74	0.9	8	
dibenz(a,h)anthracene	1.4	0.09	0.8	
Arsenic	3.6	0.4	4	11
Iron	11,807	2,300	61,000	3,000-22,000
Manganese	171	160	4,100	60-350

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

### SUBSURFACE SOIL

benzo(a)anthracene	2.1	0.9	8	
benzo(a)pyrene	2.4	0.09	0.8	

benzo(b)fluoranthene	3.2	0.9	8	
indeno(1,2,3 cd)pyrene	2.9	0.9	8	
Arsenic	2.4	0.4	4	11
Iron	8,760	2,300	61,000	3,000-22,000

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

These SVOCs and metal contaminants detected in soil were retained as the contaminants of concern (COC) for the subsequent risk assessment. Arsenic was detected in both surface and subsurface soils at concentrations that were within the range of typical background concentrations for Delaware soil. In addition Diesel Range Organics (DRO) were detected in subsurface soil in the area of previous aboveground heating oil (Area C- see Figure 2) at a concentration of 6,800 mg/kg, which is above DNREC’s action level of 1,000 mg/kg.

In groundwater, three volatile organic compounds (VOCs) (acetone, toluene, and xylene) were detected well below their respective URS for groundwater. Trace concentrations of four SVOCs (diethylphthalate, di-n-butylphthalate, butylbenzylphthalate, and bis(2-ethylhexyl)phthalate) were detected well below URS values for groundwater.

### SITE RISK EVALUATION

Risk associated with exposure to soil at the site was assessed using DNREC’s Site-Specific Standard Calculator for Multiple Analytes. Risk calculations for surface soil contaminated with certain metals and SVOCs showed a carcinogenic risk of 9.18E-05 and a non-carcinogenic risk or Hazard Index (H.I) of 0.52 based on unrestricted land use. The carcinogenic risk is above DNREC’s cleanup standard of 1.0E-05.

Risk calculations for subsurface soil also contaminated with certain metals and SVOCs showed a carcinogenic risk of 3.68E-05 and a non-carcinogenic risk or Hazard Index (H.I) of 0.50 based on unrestricted land use. The carcinogenic risk is above DNREC’s cleanup standard of 1.0 E-05. Subsurface soil in Area C exceeded the DNREC’s action level for DRO. The result of the risk evaluation indicates that remedial actions will be necessary for soils at the site.

In groundwater, certain VOCs and SVOCs were detected at concentrations well below DNREC’s URS and do not pose a risk to human health and the environment. In addition, groundwater beneath the site and the vicinity is not presently being used as a drinking water source. There is no complete pathway for exposure to groundwater or surface water relating to any potential ecological receptor.

### REMEDIAL ACTION OBJECTIVES

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

- Prevent human exposure to contaminated soil.

This objective is consistent with the future proposed use of the site as a school and for commercial purpose, Kent 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 SVOCs and metals that would result in a carcinogenic risk above 1.0E-05 assuming an unrestricted future land use.

## **FINAL PLAN OF REMEDIAL ACTION**

Based on DNREC's evaluation of the site information, which includes current and past environmental investigations, historical information and the above remedial action objectives, three alternatives were evaluated: no action; capping the entire site with selective excavation in hot spot areas; and removal of all contaminated soil. It was determined, based on the contamination present at the site, that capping and selective soil removal in hot spot areas is the preferred remedy with the following requirements:

- A cap shall be installed to prevent exposure to contaminated surface soil at the site as proposed in conceptual site development plan submitted with the feasibility study (FS) dated May 2001 and depicted in the attached Figure 2. The development plan proposed an asphalt parking area of 3,445 square yards and the existing and proposed buildings as the cap. A detailed development plan along with any modifications must meet the remedial objective of capping the site and should be submitted within sixty (60) days following DNREC's adoption of the final plan for DNREC's review and written approval prior to implementation.
- Contaminated soil located in the former aboveground waste oil tank area depicted in the attached Figure 2 as Area C shall be excavated and disposed at a disposal/treatment facility. The contaminated soil is estimated to be 45 cubic yard with the estimated dimensions of 32' x 12' x 3'. The actual volume may vary and a work plan for the excavation should be submitted for DNREC's review and written approval within sixty (60) days following DNREC's adoption of the final plan.
- A deed restriction shall be placed within sixty (60) days following DNREC's adoption of the final plan for the site prohibiting any land-disturbing activities at the site without prior written approval of DNREC.
- An Operation and Maintenance (O&M) Plan shall be established and implemented, detailing the procedures and practices including regular inspections to minimize the potential for disturbing the cap and to promote the long-term integrity of the cap, thirty (30) days following the completion of the remedial action including capping and excavation.

## **PUBLIC PARTICIPATION**

The Department actively solicited written public comments and suggestions on the proposed plan of remedial action. The comment period began on March 29, 2004, and ended on April 19, 2004. No comments were received. If you have any questions or concerns regarding the Former Dover Ice Plant 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 Former Dover Ice Plant site is protective of human health, welfare and the environment, and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

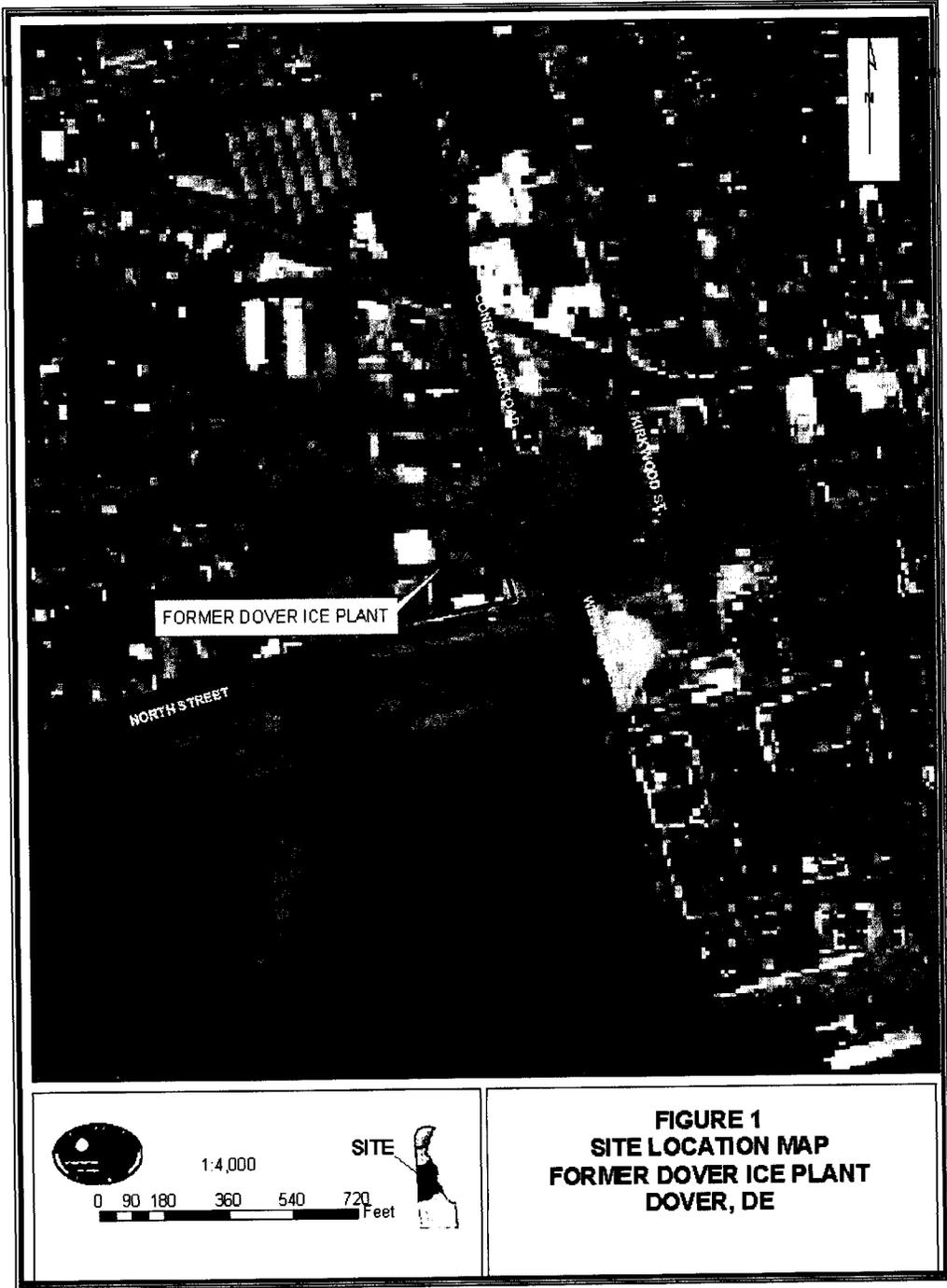


John Blevins  
Director, Division of Air and Waste

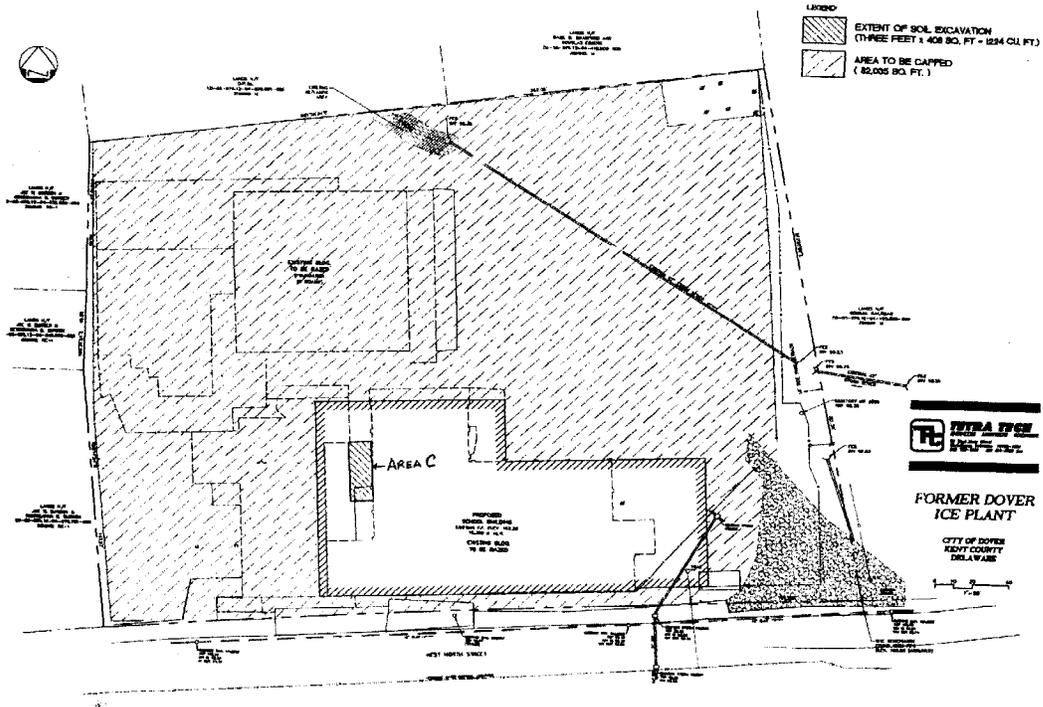
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**FIGURE 1**  
**SITE LOCATION MAP**  
**FORMER DOVER ICE PLANT**  
**DOVER, DE**



**Figure 2**  
**Proposed Area of Capping and Soil Excavation**  
**Former Dover Ice Plant, Dover, Delaware**