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

PROPOSED PLAN OF REMEDIAL ACTION

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Habitat for Humanity
1303 North Heald St., Wilmington, DE **DNREC Project No. DE-1372**

This Proposed Plan of Remedial Action (Proposed Plan) presents the Department of Natural Resources and Environmental Control's (DNREC's) proposed cleanup alternative for the Habitat for Humanity—North Heald Street Site in Wilmington. For site-related reports and more information, please see the public participation section of this document.

The purpose of the Proposed Plan is to provide specific information about the soil and groundwater contamination and the cleanup alternatives DNREC has considered. In addition, as described in Section 12 of the Delaware Regulations Governing Hazardous Substance Cleanup (Regulations), DNREC will provide notice to the public and an opportunity for the public to comment on the proposed plan. At the comment period's conclusion, DNREC will review and consider all of the comments received and then will issue a Final Plan of Remedial Action. The Final Plan shall designate the selected remedy for the site. All investigations of the site, the Proposed Plan, and comments received from the public, DNREC's responses to the comments, and the final plan will constitute the Remedial Decision Record.

This Proposed Plan summarizes the 2006 Site Specific Assessment and Preliminary Risk Assessment and the administrative record file upon which the Proposed Plan is based. Each of these reports is included in the administrative record file. Copies of these documents can be obtained or viewed at the DNREC offices in New Castle, Delaware.

DNREC's proposed remedy is preliminary and a final decision will not be made until all comments are considered. The final remedy selected may differ from the proposed remedy based on DNREC's responses to comments.

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INTRODUCTION

The Habitat for Humanity Site is a vacant lot that will be developed as affordable housing. It is located at 1303 North Heald Street, one block east of Northeast Blvd., in Wilmington. Construction will begin in March 2007. The new construction will consist of eight townhouse units in a single two-story structure.

Habitat for Humanity and DNREC concluded a Brownfields Development Agreement in May 2006. Since then, DNREC has partnered with Habitat to investigate the environmental conditions at the site and complete a cleanup prior to construction of the new homes.

The details of the investigation and its findings are in the Site Specific Assessment (SSA) dated October 2006. The SSA also covered the adjacent lot at 1330 Thatcher Street. DNREC then performed a Preliminary Risk Assessment (PRA) on the Heald Street parcel to determine its suitability for re-development as housing. The PRA concluded that the Heald Street parcel has soil contamination that should be corrected before the new construction begins. This Proposed Plan will summarize the findings and recommendations.

SITE DESCRIPTION

The Habitat for Humanity Site on North Heald Street (Tax Parcel Number 26-036.20 066) is approximately 160' x 80' in area. (See Figure 1.) The parcel is fenced. It is occupied by a few small trees and the remnants of concrete foundations and footers. The lot has recently been used for storage of trucks and equipment. The surface of the land is flat and it is located within the 100-year flood plain. The Brandywine River lies about 800-feet southwest of the property.

The surrounding neighborhood is a mixture of residences and businesses. The adjacent property to the west at 1330 Thatcher Street has two buildings that have been used for engine and equipment repair. The rest of the Thatcher Street property has been used to store trucks, equipment and salvage parts. Solid waste and scrap material is present there. About half of the property is paved but the pavement is in poor condition. The investigation showed that an underground storage tank is located on the Thatcher Street lot near the property line that divides it from the Habitat for Humanity Site.

The Naga Foods Site is on 14th Street immediately to the north of the Habitat for Humanity Site. It has also been investigated by DNREC as a brownfield and will be developed as a food production facility. A Proposed Plan for the Naga Foods Site has not yet been completed.

Across Heald Street to the east of the site are residences and open space. A row of houses is located to the south of the site on 13th Street.

The City of Wilmington supplies the site and surrounding properties with drinking water and sewer service There are no known private wells in the vicinity.

SITE SPECIFIC ASSESSMENT

Investigation

The SSA performed by DNREC addressed both the Heald Street parcel and the Thatcher Street parcel. The investigation included shallow and deep soil samples taken at 20 locations on the two parcels and two shallow monitoring wells, one on each parcel. Information from two additional wells on the Naga Foods Site were used for the evaluation of ground water.

Soil borings at the 20 locations were advanced to approximately 15 feet below the ground surface. Soil samples were taken near the surface and also from 8 to 10 feet below the surface. DNREC took a total of 40 soil samples for the investigation. The wells were approximately 15 feet deep and collected groundwater from the water table.

No surface water or sediment samples were collected for this investigation since the site is 800-feet distant from the nearest surface water body, the Brandywine River.

Results

Examination of the boring logs shows that the entire site is covered by approximately 8 feet of fill material. The material includes silty soil, debris such as brick fragments and timbers, and ash.

The analytical results show that the fill material contained some hazardous substances including polycyclic aromatic hydrocarbons. Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

There are also slightly elevated concentrations of inorganics (metals) in the fill material. These include arsenic, lead, barium and manganese as well as relatively non-toxic inorganics such as iron and aluminum.

Borings located near the underground storage tank on the Thatcher Street parcel contained gasoline range organic compounds as wells as PAHs suggesting that the tank leaked or that some spillage occurred in the immediate area.

The shallow ground water has been affected by the fill material and perhaps by activities on the site. Barium, calcium, iron, magnesium, manganese, potassium, and sodium are present in the groundwater. Naphthalene and 2-methylnaphthalene were detected in the sample from one of the wells but both concentrations were estimated because they were less than the method detection limits of the laboratory.

PRELIMINARY RISK ASSESSMENT

Methods

The purpose of the preliminary risk assessment is to estimate the health impacts of toxic chemicals at the site caused by the most significant and obvious exposure pathways.

The most significant and obvious exposure pathway on the site is ingestion of, or dermal contact with, contaminated soil. Current exposure to soil is limited to workers on the site and

trespassers. Future exposure to soil may occur when new houses are constructed on the site and when those houses are subsequently occupied.

To estimate the amount of contaminated soil that people could come in contact with, DNREC used default parameters in industrial, residential and construction worker exposure scenarios developed by the US EPA. These parameters include frequency of exposure, duration of exposure and amount of soil ingested.

The preliminary risk assessment reviewed all of the chemical substances present in soils that were found in the SSA. Compounds of concern (COCs) were selected based on their prevalence, concentration and toxicity. Seven COCs were identified, three PAHs and four metals. Because of the limited number of samples, surface and subsurface soils were combined for this evaluation. Table 1. lists the compounds of concern and their concentration in soil in units of milligrams per kilogram (mg/kg).

Table 1. Contaminants of Concern in Soil (mg/kg)

Contaminant of Concern	# of Samples	Minimum	Maximum	Mean	95% UCL of Mean	Exposure Concentration
Metals						
Arsenic	8	4	24.1	10.69	15	15
Barium	8	71.1	1140	317.01	716	716
Lead	8	11.9	1640	579.78	1087	1087
Manganese	8	110	427	261.13	336	336
PAHs						
Benzo(a)pyrene	7	0.031	39	6.90	67	39
Dibenz(a,h)anthracene	7	0.019	5.1	0.87	8	5
Benzo(a)anthracene	7	0.031	32	5.59	16	16

The "exposure concentration" on the table above is the value used in the calculation of both cancer and non-cancer risk. Lead is evaluated separately from the other substances.

There is no exposure to ground water on the site. The site lies within an existing Groundwater Management Zone (GMZ). Drinking water at the site is supplied by a water utility and the site is unsuitable as a location for water supply wells due to hydrogeological conditions.

The HSCA Regulations state "The cleanup levels will be determined using a risk-based approach on a site specific basis. The risk-based approach may include consideration of existing and likely future uses of the facility and related natural resources" (Subsection 9.1 (1)). Since use of the shallow groundwater at the site as drinking water is not likely, the preliminary risk assessment does not include consideration of the remote possibility of exposure to groundwater through ingestion. This proposed plan does not include cleanup of groundwater.

DNREC evaluated the potential for vapor intrusion at the Habitat for Humanity Site. The analytical results indicate that ground water is not a source of vapor that could migrate through the soil into buildings. Although semi-volatile compounds are present in one well, the concentrations are extremely low.

Findings

DNREC compared the estimated risks of exposure to contaminated soil on the site to risk levels defined by the HSCA Regulations as unacceptable, that is, an additional cancer risk of greater than 1 in 100,000 or, for non-cancer effects, a hazard index of greater than 1. A summary of risks is presented in Table 2.

Table 2. Summary of Risks from Exposure to Soil*

Exposure Scenario	Cancer Risk	Non-cancer Risk
Industrial/commercial (current exposure)	**Unacceptable**	**Acceptable**
Construction (future exposure)	**Acceptable**	**Acceptable**
Residential (future exposure)	**Unacceptable**	**Acceptable**

*For COCs other than lead

Under current industrial/commercial land use, the analysis shows an unacceptable cancer risk. Dermal contact with benzo(a)pyrene is the most significant contributor to the total cancer risk of 2.4 in 10,000. The non-cancer risk is acceptable.

For future land uses, the residential exposure scenario leads to unacceptable cancer risk due largely to the concentration of benzo(a)pyrene in soil (39 mg/kg). However, the ingestion of and contact with dibenz[a,h]anthracene and benz[a]anthracene separately present unacceptable cancer risks as well. The total cancer risk is 8.9 in 10,000 compared to an acceptable risk of 1 in 100,000. The non-cancer risk in the residential exposure scenario is acceptable.

There are no unacceptable risks to the worker in the construction exposure scenario.

Risks due to lead contaminated soil are evaluated by comparing lead concentrations in soil at the site in question to concentrations established by rule by the US EPA. The EPA rule is that the average lead concentration in bare soil in a play area should not exceed 400 mg/kg. Since it is probable that the future land use will include play areas in the backyards of the new homes, the existing condition—an average concentration of 580 mg/kg--would not be acceptable.

The important conclusion of the PRA is that the soil contamination now on the site presents an unacceptable risk to its future use as residences. However, there is not an unacceptable risk to construction personnel working on the site.

REMEDIAL ACTION OBJECTIVES

Based on the evaluation of site specific risks, there is only one remedial objective at the Habitat for Humanity site: minimize exposure of future residents to contaminated soil.

The risk can be eliminated or reduced to an acceptable level by replacing surface soil at the site with clean material from a commercial borrow source.

REMEDIAL ACTION ALTERNATIVES

The "no-action" alternative at the Site does not meet the HSCA regulatory requirements. The PRA shows that there is an unacceptable risk caused by exposure to contaminated surface soil both for the present use of the land and also its anticipated future use as housing.

Because of the relatively small area of the site, removal, off site disposal or treatment, and replacement is the most cost effective remedy. The scale of the site makes treatment remedies such as soil washing or stabilization uneconomical.

PROPOSED PLAN OF REMEDIAL ACTION

Remedial Actions

- Soil Removal and Replacement—Concrete paving for driveways and crawl spaces will occupy approximately 60% of the surface area of the site. In the rest of the site, approximately 4,320 square feet, soil will be removed to a minimum depth of two feet below the existing surface and will be replaced with clean material from a DNREC approved borrow source. The clean fill will be put in above a marker layer. The exact depth of excavation will depend on conditions found during the removal activity. However, there will be a minimum of two-feet of clean material over contaminated soil in unpaved areas. The contaminated soil will be treated and disposed of at an offsite facility.
- Contaminated Soil Management—Habitat for Humanity shall provide to DNREC a written Remedial Action Plan. It will include means for identifying a disposal facility for material leaving the site, additional sampling required by the disposal facility and procedures for managing materials on the site to avoid cross contamination.
- Institutional Control—Habitat for Humanity will place a restrictive covenant consistent with the Uniform Environmental Covenants Act (Title 7, Del. Code Chapter 79 Subtitle II). The covenant shall (a) restrict activities conducted by future residents; (b) prohibit any digging, drilling, excavating, grading, constructing, earth moving, or any other land disturbing activities at a depth greater than two feet on the property without the prior written approval of the DNREC; and (c) prohibit the installation of any water well on, or use of groundwater at, the Site without the prior written approval of DNREC, as well as noting the Site's location within a GMZ.
- Inspection and Maintenance—Habitat for Humanity will establish a written plan to inspect the site regularly for signs that the soil cover has been breached or the paving over contaminated material has been damaged. The plan will assign responsibility for repairing any problems. The plan will be subject to approval by DNREC.

Estimated Costs of Soil Removal and Replacement

Prior to construction, Habitat for Humanity will test the contaminated material to be removed from the site to determine whether it would be considered "hazardous waste" by the US EPA. Non-hazardous waste can be treated locally for $45/ton in transportation and tipping fees. Hazardous waste must go to a more distant facility for $120/ton in transportation and tipping fees.

Consequently, the estimated costs cover a considerable range. Table 3 shows estimated costs of the remedy for both types of disposal.

Table 3. Estimated Soil Removal Cost

Item	Non-hazardous waste	Hazardous waste
Additional testing	$1,000	$1,000
Soil excavation	$4,000	$4,000
Disposal and Transportation (350 tons)	$15,750	$42,000
Replacement (75% common fill, 25% topsoil)	$8,000	$8,000
Total	$28,750	$55,000

PUBLIC PARTICIPATION
The Department invites written public comments and suggestions on the Proposed Plan of Remedial Action. The comment period begins ~~November~~ December 9th __, 2006 and ends at the close of business (4:30 p.m.) on December ___, 2006
If you have any questions or concerns regarding the site, or if you would like to view reports or other information regarding this site, please contact the project manager, Stephen F. Johnson, 391 Lukens Drive, New Castle, Delaware 19720 or at 302.395.2600.

James D. Werner
Director of Air & Waste Management

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Date

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Figure 1. Habitat for Humanity—North Heald Street Site Location

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0 50 100 150 Feet

DNREC
SITE INVESTIGATION &
RESTORATION BRANCH
391 LUKENS DR
NEW CASTLE, DE 19720-2774
302.395.2600

FIGURE 1
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HABITAT FOR HUMANITY

Figure 2. Habitat for Humanity—North Heald Street Site Sample Locations (also showing locations taken on the Thatcher Street Parcel and the Naga Foods Site)

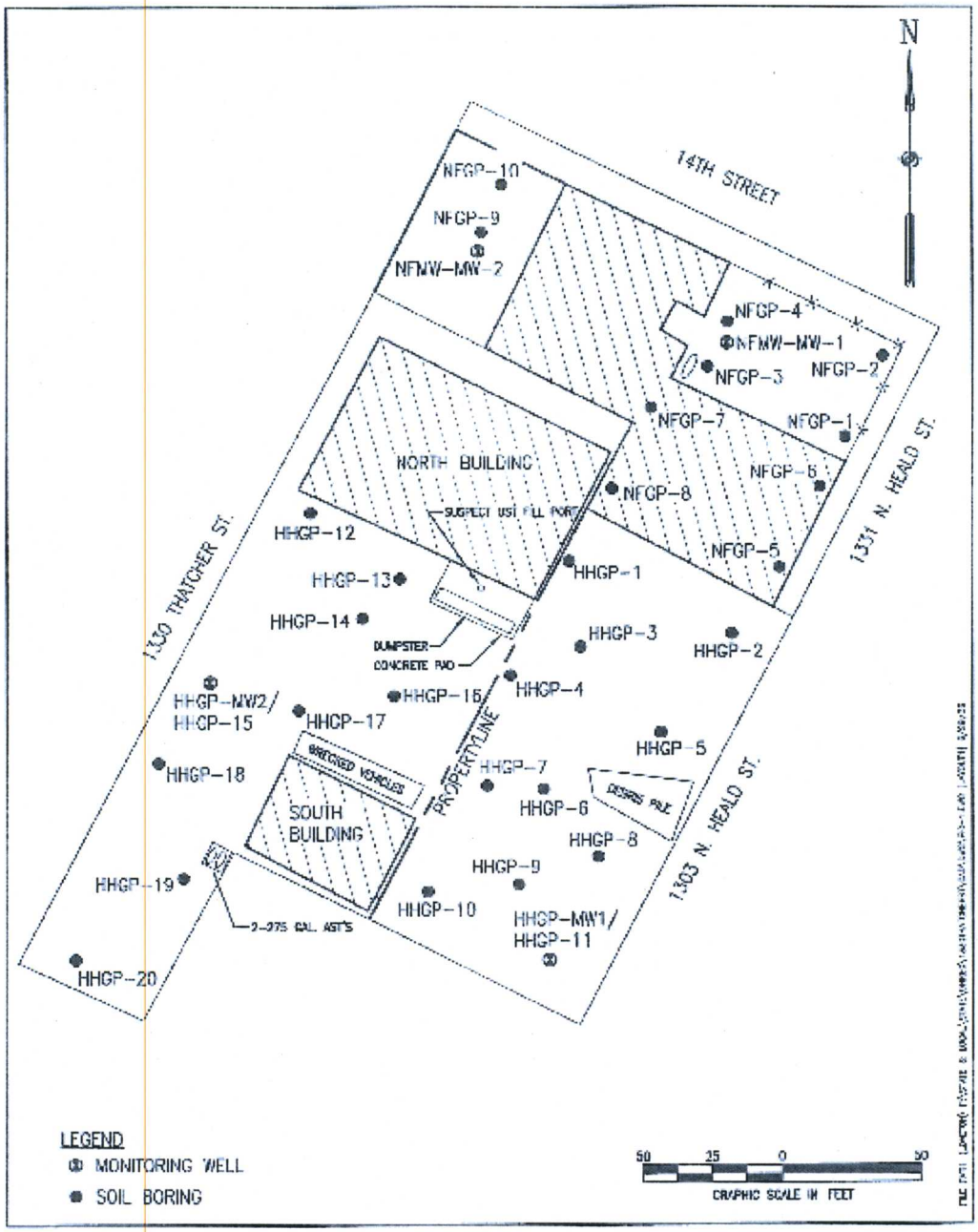

Figure 3
NAGA FOOD & 1330 THATCHER STREET COMBINED SITE DIAGRAM