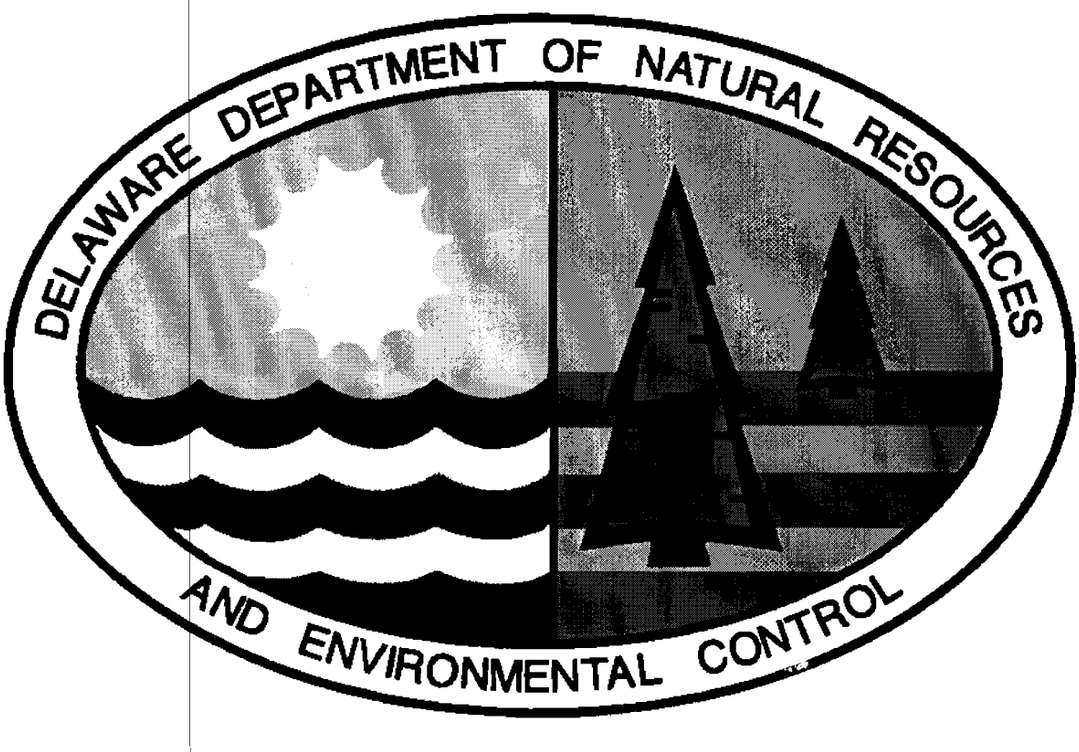
Final Plan of Remedial Action

103, 105 & 121 N. Poplar Street
Wilmington, DE



December 1996

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

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Final Plan of Remedial Action

103, 105 & 121 N. Poplar Street

1. INTRODUCTION

The Department of Natural Resources and Environmental Control ("DNREC" or "Department") issues this Final Plan of Remedial Action under the authority granted by the Hazardous Substance Cleanup Act (7 Del. C., Ch. 91) and the Delaware Regulations Governing Hazardous Substance Cleanup ("Regulations"). The Final Plan presents the Department's final selection of remedial activities to occur at 103, 105 & 121 N. Poplar Street, Wilmington, Delaware. (Figures 1 and 2).

2. BACKGROUND

The Department reached an agreement with SBM Housing, Inc., the prospective purchaser of 121 N. Poplar Street, in August of 1996, to review a Phase I Environmental Site Assessment, a Phase II Investigation, and to give technical advice regarding future sampling at the site. In October of 1996, a portion of the adjacent community garden was found to be part of the 121 N. Poplar street property. In November of 1996, the owners of the adjacent two properties (also included within the community garden), represented by Poplar Street Associates, requested to be included under the Department's agreement with SBM Housing, Inc.

The site consists of an irregular shaped .93± acre parcel of land located in Wilmington, Delaware (Figure 1). The site is bound by Second Street to the north, Walnut Street to the west, Poplar Street to the east and Front Street to the south (see Figure 2). Improvements to the site include a three-story apartment building, paved parking areas, and a community garden. The 24 unit apartment building is currently vacant. Surrounding land use is generally residential. The site is currently zoned as residential (R-5B; Apartment House Medium Density).

3. INVESTIGATION RESULTS

In August 1996, WIK conducted a Phase II investigation at the 121 N. Poplar Street site. During that investigation, WIK installed five (5) hand auger borings and collected two (2) surficial soil samples and one (1) subsurface soil sample. Hand auger sample locations are included on Figure 2. Analytical results and chemicals analyzed are summarized in Table 1.

As shown in Table 1, the surficial soil samples contained several polycyclic aromatic hydrocarbons (PAHs), including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene, which exceeded DNREC Reporting Levels for residential soils. Lead was also detected in the surficial soils at levels which exceed DNREC Reporting Levels for residential soils. Analytical results of subsurface soil samples also indicated that arsenic and barium exceeded DNREC Reporting Levels.

The results of the Phase II Investigation indicated that additional sampling was warranted. A Limited Site Investigation Work Plan was submitted and approved by DNREC. The purpose of

this investigation was to delineate the extent of arsenic impacted soil discovered during the Phase II investigation.

On September 5, 1996, WIK Associates, Inc. supervised the installation of eight (8) geoprobe borings at 121 North Poplar Street (Figure 2). Borings were installed to delineate the extent of arsenic impacted soils discovered during the Phase II investigation. Based on observed site conditions, eight soil samples were collected and analyzed for arsenic. Samples were collected in accordance with the DNREC approved work plan. No groundwater samples were collected as groundwater was not encountered in the borings. As shown in Table 1, five (5) of the eight (8) samples contained arsenic concentrations above the DNREC subsurface soil reporting level.

On October 2, 1996, it was determined that approximately 3000 square feet of an adjacent community garden is part of the 121 North Poplar property. DNREC requested that samples be collected from the garden to determine if this portion of the property needed to be considered for remediation (Figure 2). Two (2) soil samples were collected and analyzed for arsenic, one (1) sample was collected and analyzed for lead and arsenic, and one (1) sample was collected and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. As shown in Table 1, lead concentrations in samples SS02G and SS04G are above the DNREC residential surface soil reporting level. No other metal was detected above DNREC residential surface soil reporting levels.

On November 5, 1996, the remaining portion of the community garden, contained within the 103 and 105 N. Poplar Street properties, was sampled by WIK Associates, Inc. (Figure 2). WIK collected nine shallow soil samples under DNREC oversight. Three soil samples, one from each property, were analyzed for TCL semivolatiles and 8 RCRA metals. The remaining 6 samples, two from each property, were analyzed for arsenic and lead only. All three of the semivolatile samples exceeded DNREC's reporting levels for benzo(a)pyrene (Table 2). A total of seven samples exceeded DNREC's residential reporting levels for lead (Table 3).

4. REMEDIAL ACTION OBJECTIVES

According to HSCA Regulations, the Department will set remedial action objectives for land use, resource use, and cleanup levels that are protective of human health and the environment. The following objectives were determined to be appropriate for the site:

- Prevent contact with soils containing arsenic in exceedence of HSCA reporting requirements (greater than 23 mg/Kg);
- Prevent contact with soils containing lead in exceedence of HSCA reporting requirements (greater than 400 mg/Kg); and
- Prevent contact with soils containing PAHs in exceedence of HSCA reporting requirements (greater than 0.088 mg/Kg).

These objectives are consistent with the current and future use of the site, the surrounding land use, the City of Wilmington zoning policies, state and federal regulation, and community safety.

5. PROPOSED PLAN AND PUBLIC PARTICIPATION

The Department provided public notice of its Proposed Plan of Remedial Action for the 103, 105, & 121 N. Poplar Street site in The News Journal and Delaware State News on December 4, 1996. The Department preferred remedy conveyed in the Proposed Plan is:

- Excavation, removal and disposal at a DNREC approved facility of PAH, Lead and Arsenic contaminated soils which are in exceedence of qualitative remedial action objectives;
- Placement of clean fill on the site to replace the area excavated of contaminated soil; and
- Isolated capping of parking lot and section of land between the sidewalk and street as shown in Figure 3.

During the comment period, the Department received no comments on the Proposed Plan.

6. FURTHER ACTION

Based upon the information and results of the investigations performed at the 103, 105 & 121 N. Poplar Street site, Wilmington, the Department has determined that the most preferred remedy conveyed in the proposed plan should be implemented.

7. DECLARATION

This Final Plan of Remedial Action for the 103, 105 & 121 N. Poplar Street site is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

Nicholas A. Di Pasquale 1/6/97

Nicholas A. Di Pasquale, Director
Division of Air and Waste Management

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FIGURE 1

Site Location/Topographic Map

Wilmington South Quadrangle: 7.5 minute series

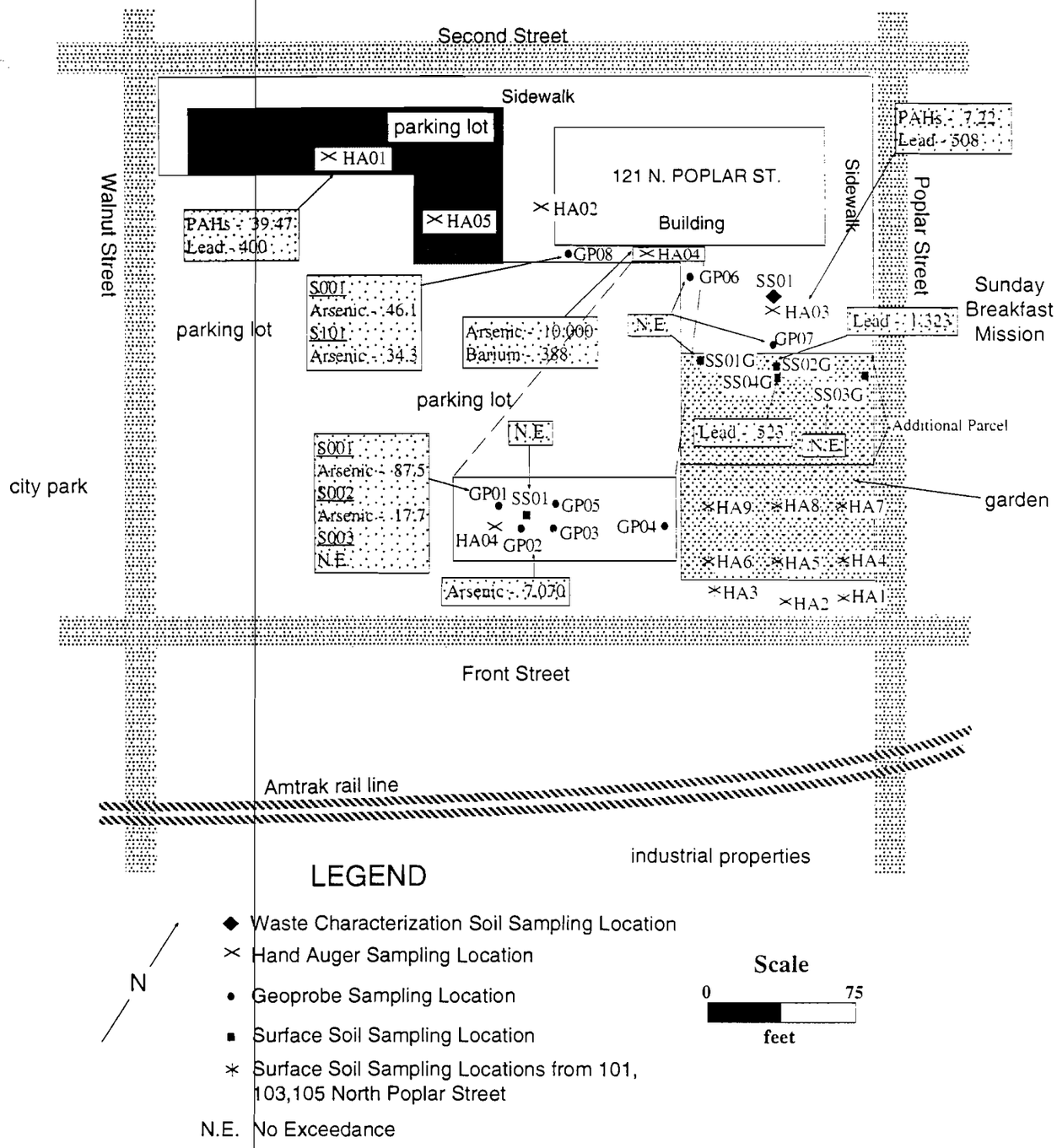
Map Date: 1993

121 North Poplar Street

Wilmington, Delaware

File: 976.04.21

FIGURE 2
Focused Remedial Investigation
&
Feasibility Study
Wilmington Housing Authority Property
121 North Poplar Street
Sample Locations



LEGEND

- ◆ Waste Characterization Soil Sampling Location
- ✕ Hand Auger Sampling Location
- • Geoprobe Sampling Location
- ▪ Surface Soil Sampling Location
- ∗ Surface Soil Sampling Locations from 101, 103,105 North Poplar Street
- N.E. No Exceedance

N

Scale

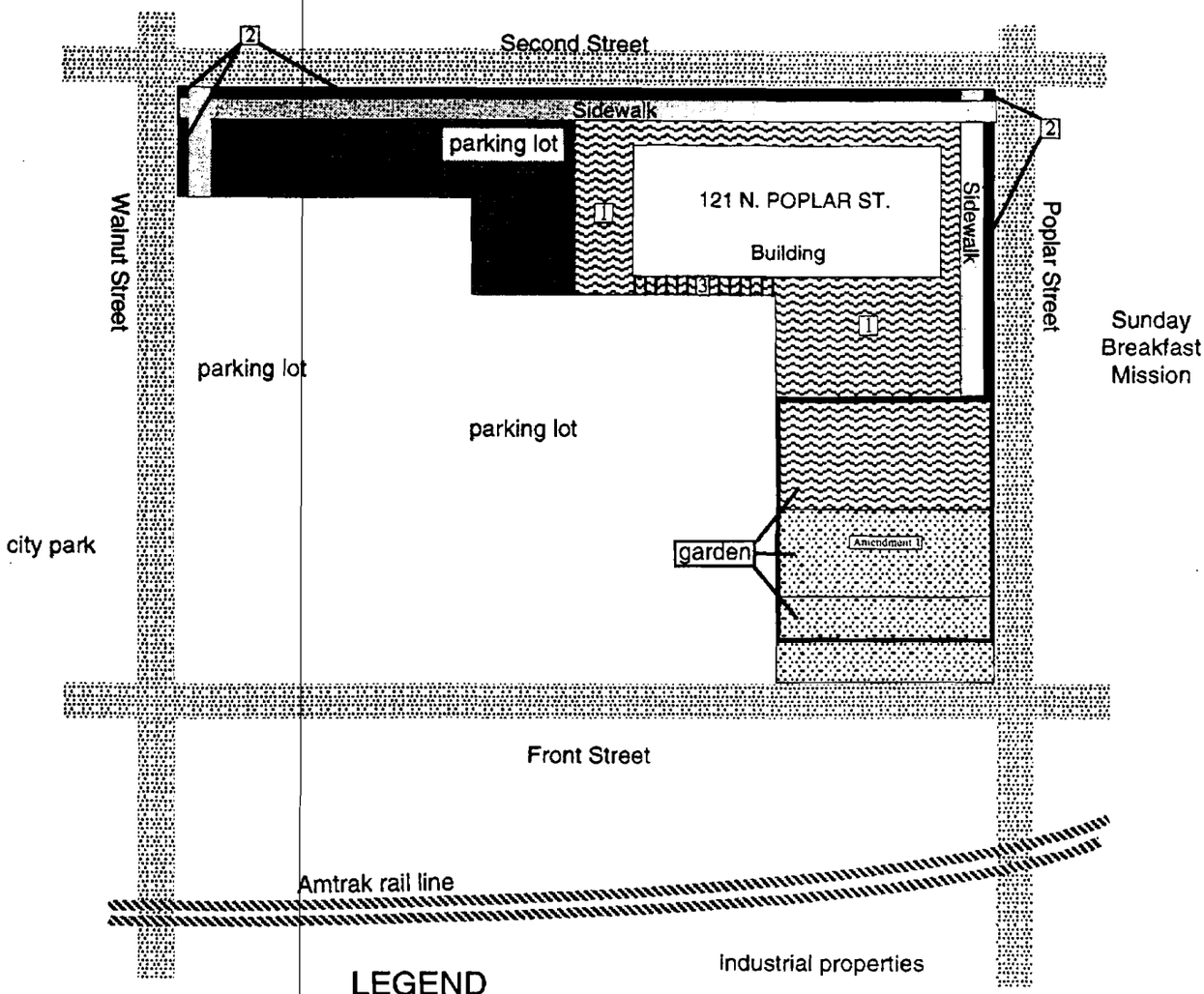
0 75

feet

FIGURE 3
Remedial Action

121 North Poplar Street
Wilmington, Delaware

Proposed Areas of Excavation



LEGEND

- Scope of work item #1 — Area = 14,144 ft^2 Volume = 1,047 yd^3
- Scope of work item #2 — Area = 2,525 ft^2 Volume = 93 yd^3
- Scope of work item #3 — Volume = 1 yd^3
- Amendment 1 — Scope of work Amendment #1 — Area = 7,487 ft^2 Volume = 555 yd^3
- Garden — Scope of work Garden — Area = 10,212 ft^2 Volume = 757 yd^3

N

Scale
0 75
feet

Area 1: Excavation of Upper 2 Feet of Soil
Area 2: Excavation of Upper 1 Foot of Soil
Garden : Excavation of Upper 2 Feet of Soil

TABLE 1

Focused Remedial Investigation
Feasibility Study
Wilmington Housing Authority Property
121 North Poplar Street
Wilmington, Delaware

Summary Soil Analytical Results (mg/kg)

	DNREC Surface Soil Reporting Levels (03/96)	DNREC Subsurface Soil Reporting Levels (03/96)	HA01-S001	HA03-S001	HA04-S001	SS01G	SS02G	SS03G
Sample Depths			1.0' - 2.0'	1.0' - 1.5'	3.0' - 5.0'	1.0' - 2.0'	1.0' - 2.0'	1.0' - 2.0'
Semivolatile Organics								
2-Methylnaphthalene	nca	nca	0.500 J	ND (1.60)	ND (3.50)	NA	NA	NA
Acenaphthylene	nca	nca	1.80 J	0.360 J	ND (3.50)	NA	NA	NA
Anthracene	10,000	4,300	2.00 J	0.330 J	ND (3.50)	NA	NA	NA
Benzo (a) Anthracene	0.88	0.7	**10.0 J**	**2.70 J**	ND (3.50)	NA	NA	NA
Benzo (a) Pyrene	0.088	4	**5.60 J**	**1.60 J**	0.490 J	NA	NA	NA
Benzo (b) Fluoranthene	0.88	4	**9.60 J**	**2.90 J**	ND (3.50)	NA	NA	NA
Benzo (k) Fluoranthene	8.8	4	**11.0 J**	3.40 J	ND (3.50)	NA	NA	NA
Benzo(g,h,i)perylene	nca	nca	ND (3.70)	ND (1.60)	ND (3.40)	NA	NA	NA
Carbazole	32	0.2	1.20 J	0.260 J	ND (3.50)	NA	NA	NA
Chrysene	88	1	11.0 J	3.10 J	ND (3.50)	NA	NA	NA
Dibenzo (a,h) Anthracene	0.088	11	**1.20 J**	ND (1.60)	ND (3.50)	NA	NA	NA
Dibenzofuran	310	120	1.20 J	ND (1.60)	ND (3.50)	NA	NA	NA
Fluoranthene	3,100	980	21.0 J	4.70 J	0.390 J	NA	NA	NA
Fluorene	3,100	160	0.490 J	ND (1.60)	ND (3.50)	NA	NA	NA
Indeno (1,2,3-cd) Pyrene	0.88	35	**2.00 J**	0.830 J	ND (3.50)	NA	NA	NA
Naphthalene	30	30	0.680 J	0.170 J	ND (3.50)	NA	NA	NA
Phenanthrene	nca	nca	16.0 J	2.60 J	ND (3.50)	NA	NA	NA
Phenol	10,000	49	ND (3.70)	0.265 J	ND (3.50)	NA	NA	NA
Pyrene	2,300	1,400	15.0 J	7.10 J	1.50 J	NA	NA	NA
Volatile Organics								
Acetone	8	8	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.25	0.25	NA	NA	NA	NA	NA	NA
Tetrachloroethene	0.25	0.25	NA	NA	NA	NA	NA	NA
Xylene, Total	74	NA	NA	NA	NA	NA	NA	NA
METALS								
Arsenic	23	15	2.2 UJ	2.3 UJ	**10000 J**	2.4	6.1	<2.2
Barium	5,500	32	345 J	102 J	**388 J**	NA	NA	NA
Cadmium	39	6	2.22 J	ND (1.2) UJ	2.9 J	NA	NA	NA
Chromium	390	19	18.2	6.95	ND (3.8)	NA	NA	NA
Lead	400	400	**400**	**508**	91.9	NA	**1,323**	NA
Mercury	23	3	1.14	0.54	0.22	NA	NA	NA
Selenium	390	3	0.22 UJ	0.23 UJ	0.84 UJ	NA	NA	NA

* - Risk-based concentration
B -Indicates that the concentration falls between the IDL & the CRDL.
B* - Indicates compound present in the blank.
Bold - indicates value is above regulatory criteria
J- Indicates value is below the detection limit and is an estimated value.
NA- Not Analyzed
nca - No criteria available
ND - Not Detected

TABLE 1

Focused Remedial Investigation
Feasibility Study
Wilmington Housing Authority Property
121 North Poplar Street
Wilmington, Delaware

Summary Soil Analytical Results (mg/kg)

	DNREC Surface Soil Reporting Levels (03/96)	DNREC Subsurface Soil Reporting Levels (03/96)	SS04G	GP01-S001	GP01-S002	GP01 - S003	GP02-S001	GP06-S001
Sample Depths			1.0' - 2.0'	3.0' - 4.0'	6.5' -7.0'	8.0' - 9.0'	3.0' - 4.0'	4.0 - 5.0'
Semivolatile Organics								
2-Methylnaphthalene	nca	nca	ND (0.720)	NA	NA	NA	NA	NA
Acenaphthylene	nca	nca	0.180 J	NA	NA	NA	NA	NA
Anthracene	10,000	4,300	0.170 J	NA	NA	NA	NA	NA
Benzo (a) Anthracene	0.88	0.7	1.00 J	NA	NA	NA	NA	NA
Benzo (a) Pyrene	0.088	4	1.00 J	NA	NA	NA	NA	NA
Benzo (b) Fluoranthene	0.88	4	0.970 J	NA	NA	NA	NA	NA
Benzo (k) Fluoranthene	8.8	4	0.940 J	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	nca	nca	0.410 J	NA	NA	NA	NA	NA
Carbazole	32	0.2	0.092 J	NA	NA	NA	NA	NA
Chrysene	88	1	1.20 J	NA	NA	NA	NA	NA
Dibenzo (a,h) Anthracene	0.088	11	ND (0.720)	NA	NA	NA	NA	NA
Dibenzofuran	310	120	ND (0.720)	NA	NA	NA	NA	NA
Fluoranthene	3,100	980	2.00 J	NA	NA	NA	NA	NA
Fluorene	3,100	160	ND (0.720)	NA	NA	NA	NA	NA
Indeno (1,2,3-cd) Pyrene	0.88	35	0.430 J	NA	NA	NA	NA	NA
Naphthalene	30	30	ND (0.720)	NA	NA	NA	NA	NA
Phenanthrene	nca	nca	0.910 J	NA	NA	NA	NA	NA
Phenol	10,000	49	ND (0.720)	NA	NA	NA	NA	NA
Pyrene	2,300	1,400	1.90 J	NA	NA	NA	NA	NA
Volatile Organics								
Acetone	8	8	NA	NA	NA	NA	NA	NA
Methylene Chloride	0.25	0.25	0.109	NA	NA	NA	NA	NA
Tetrachloroethene	0.25	0.25	NA	NA	NA	NA	NA	NA
Xylene, Total	74	NA	0.197	NA	NA	NA	NA	NA
METALS								
Arsenic	23	15	8.7 J	**87.5 J**	**17.7 J**	9.9 J	**7070 J**	14.7 J
Barium	5,500	32	276	NA	NA	NA	NA	NA
Cadmium	39	6	NA	NA	NA	NA	NA	NA
Chromium	390	19	23.1	NA	NA	NA	NA	NA
Lead	400	400	**523**	NA	NA	NA	NA	NA
Mercury	23	3	1.5	NA	NA	NA	NA	NA
Selenium	390	3	NA	NA	NA	NA	NA	NA

* - Risk-based concentration
B -Indicates that the concentration falls between the IDL & the CRDL.
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TABLE 1

Focused Remedial Investigation
Feasibility Study
Wilmington Housing Authority Property
121 North Poplar Street
Wilmington, Delaware

Summary Soil Analytical Results (mg/kg)

	DNREC Surface Soil Reporting Levels (03/96)	DNREC Subsurface Soil Reporting Levels (03/96)	GP07-S001	GP08-S001	GP08-S101	SS01
Sample Depths			2.0' - 3.0'	3.0' - 4.0'	3.0' - 4.0'	1.0' - 1.5'
Semivolatile Organics						
2-Methylnaphthalene	nca	nca	NA	NA	NA	NA
Acenaphthylene	nca	nca	NA	NA	NA	NA
Anthracene	10,000	4,300	NA	NA	NA	NA
Benzo (a) Anthracene	0.88	0.7	NA	NA	NA	NA
Benzo (a) Pyrene	0.088	4	NA	NA	NA	NA
Benzo (b) Fluoranthene	0.88	4	NA	NA	NA	NA
Benzo (k) Fluoranthene	8.8	4	NA	NA	NA	NA
Benzo(g,h,i)perylene	nca	nca	NA	NA	NA	NA
Carbazole	32	0.2	NA	NA	NA	NA
Chrysene	88	1	NA	NA	NA	NA
Dibenzo (a,h) Anthracene	0.088	11	NA	NA	NA	NA
Dibenzofuran	310	120	NA	NA	NA	NA
Fluoranthene	3,100	980	NA	NA	NA	NA
Fluorene	3,100	160	NA	NA	NA	NA
Indeno (1,2,3-cd) Pyrene	0.88	35	NA	NA	NA	NA
Naphthalene	30	30	NA	NA	NA	NA
Phenanthrene	nca	nca	NA	NA	NA	NA
Phenol	10,000	49	NA	NA	NA	NA
Pyrene	2,300	1,400	NA	NA	NA	NA
Volatile Organics						
Acetone	8	8	NA	NA	NA	0.152B*
Methylene Chloride	0.25	0.25	NA	NA	NA	0.0281 JB*
Tetrachloroethene	0.25	0.25	NA	NA	NA	0.06
Xylene, Total	74	NA	NA	NA	NA	NA
METALS						
Arsenic	23	15	7.6 J	**46.1 J**	**34.3 J**	NA
Barium	5,500	32	NA	NA	NA	NA
Cadmium	39	6	NA	NA	NA	NA
Chromium	390	19	NA	NA	NA	NA
Lead	400	400	NA	NA	NA	NA
Mercury	23	3	NA	NA	NA	NA
Selenium	390	3	NA	NA	NA	NA

* - Risk-based concentration
B -Indicates that the concentration falls between the IDL & the CRDL.
B* - Indicates compound present in the blank.
Bold - indicates value is above regulatory criteria
J- Indicates value is below the detection limit and is an estimated value.
NA- Not Analyzed
nca - No criteria available
ND - Not Detected

TABLE 2

Site Investigation
101-105 Poplar Street
Wilmington, DE
Soil Analytical Results - TCL SVOCS (mg/kg)

Date Sampled	DNREC HSCA Residential Surface Soil Reporting Levels (10/95)	EPA Region 3 Risk Based Concentrations Residential Surface Soil (4/96)	HA2 11/4/96	HA5 11/4/96	HA8 11/4/96
Semivolatile Organics					
Acenaphthylene	nca	nca	0.45 J	0.21 J	ND
Anthracene	10000	23000	0.36 J	0.21 J	ND
Benzo (a) Pyrene	0.088	0.088	***1.6***	***1.2 J***	***0.39 J***
Benzo (b) Fluoranthene	0.88	0.88	***1.6***	***1.2 J***	0.38 J
Benzo (g, h, i) Perylene	nca	nca	0.4 J	0.35 J	0.15 J
Benzo (k) Fluoranthene	8.8	8.8	1.8	1.5 J	0.41 J
Benzo (a) Anthracene	0.88	0.88	***1.5 J***	***1.3 J***	0.37 J
bis(2-Ethylhexyl)Phthalate	46	46	0.62 J	1.0 J	ND
Carbazole	32	32	0.33 J	ND	ND
Chrysene	88	88	1.8	1.3 J	0.43 J
Di-n-Butylphthalate	100	nca	ND	0.23 J	ND
Dibenzofuran	nca	310	0.18 J	ND	ND
Fluoranthene	3100	3100	3.6	2.2	0.76 J
Fluorene	3100	3100	0.21 J	ND	ND
Indeno (1, 2, 3-cd) pyrene	0.88	0.88	0.40 J	0.35 J	ND
Naphthalene	30	3100	0.16 J	ND	ND
Phenanthrene	nca	nca	2.9	1.1 J	0.41 J
Pyrene	2300	2300	4	2.3	0.79 J

J - Result is below the detection limit and is an estimated value

ND - Not Detected

nca - No criteria available

Italics - indicates value is above Residential Surface Soil regulatory criteria

Note: Soil samples are identified on the Chain of Custody as HA01-S001, HA02-S001, etc.

TABLE 3

Site Investigation
101-105 Poplar Street
Wilmington, DE
Soil Analytical Results - Metals(mg/kg)

Date Sampled	DNREC HSCA Residential Surface Soil Reporting Levels (4/96)	EPA Region 3 RBCs for Residential Surface Soils (4/96)	HA1 11/4/96	HA2 11/4/96	HA3 11/4/96	HA4 11/4/96	HA5 11/4/96	HA6 11/4/96	HA7 11/4/96	HA8 11/4/96	HA9 11/4/96
Metals											
Arsenic	23	23	2	2.3	9.5	1.3	4.3	11.9	6.8	1.4	0.86
Barium	5,500	5,500		324			415			147	
Cadmium	39	39		1.4			2.33			<1	
Chromium(III)	nca	78,000		9.46			34.7			20.8	
Lead	400	nca	***2050***	***970.2***	***609***	***741***	***1332***	***1650***	***892***	388.7	100
Mercury	23	23		0.16			0.58			<0.12	
Selenium	390	390		<0.46			0.44			<0.45	
Silver	390	390		<2.3			<2.3			<2.1	
	1,600	1600									

ND - Not Detected
nca - No criteria available
above Residential Surface Soil regulatory criteria
*-EPA action level for Drinking Water

Note : Soil samples are identified on the Chain of Custody as HA01-S001, HA02-S001, etc.