



Appendix 18

KREIGER FINGER PROPERTY AND ADJACENT SITES WILMINGTON, DELAWARE

SIRB ID: DE-1067

DE-0156

DE-1291

DE-1336

DE-1337

GENERAL SITE INFORMATION

Site Name: Kreiger Finger Property and Adjacent Sites

SIRB ID Number: DE-1067, DE-0156, DE-1291, DE-1336, and DE-1337

Site Location and Description: The site is located in the northern part of the Christina Bend Area, immediately southeast of the intersection of South Walnut Street and “A” Street in the City of Wilmington. The site extent is somewhat unclear due to the numerous tax parcels in the area and the transfer of properties. BrightFields has reviewed existing data for a total of approximately 24 acres, which consists of portions of the following tax parcels: #26-050.00-048 (5.26 acres identified as 322 A Street), #26-050.00-050 (0.75 acres identified as 310 A Street), #26-050.00-056 (2.08 acres identified as Kreiger Landfill), #26-050.00-058 (14.1 acres identified as Kreiger Finger Property), #26-050.00-074 (0.72 acres identified as 0 South Walnut Street), #26-050.00-075 (0.22 acres), #26-050.00-079 (0.10 acres identified as Kreiger Subdivision), #26-050.00-080 (0.53 acres identified as 0 Walnut Street), and #26-050.00-081 (0.53 acres). Some of these properties have been sold and redeveloped but were once part of the Kreiger Finger properties. The PCB-impacted area is confined to approximately 15 acres and this area, shown on Figure 1, is the area that was targeted in this evaluation. The focus area is generally bound to the north by A Street, to the west by Walnut Street, to the east by Lombard Street, and to the south by the Delaware Broadcasting property.

When evaluating the PCB data for this site, BrightFields identified areas within parcels that contained historical PCB data. In order to better spatially evaluate the actual concentrations of PCBs observed on the site, portions of some of the above mentioned parcels were removed from the evaluation. The parcel that was most reduced in size was 2605000058. The irregular shaped property boundary displayed in Figure 1 was considered to be the area of extent for this assessment.

The northern portion of the site consists of an elevated area of historic fill approximately 2 acres in size. The fill area is bordered to the west and south by a low lying marsh area. A former railroad line cut across the southern portion of the property, but is no longer active and abandoned. The site is bounded to the west and southwest by a system of drainage ditches.

Previous Site Uses: The site is located in an old industrial area of Wilmington. In 1876, most of the area was meadowland. The George Stone Oil Factory was located on the northeast corner of French and C Streets. Tracks were located along C Street. In 1901, no buildings were

recorded and the land belonged to Diamond State Steel Co., except the oil factory land. Buildings started to be built in this area of Wilmington by 1937.

A major portion of the property was used as a scrap metal business for about 20 years, and then continued as an auto salvage operation for an additional 30 years. Some of the byproducts of these operations include petroleum hydrocarbons, heavy metals (especially lead) and PCBs. This has been well documented in the Wilmington area at three local sites. Diamond State Salvage, located along the Brandywine River, underwent an EPA Emergency removal action because of lead and PCB contamination as a result of scrap operations. This site operated as a scrap metal business. Closer by the former PennDel Metal Recycling on Howard Street, and Delaware Compressed Steel on Market Street, have also been impacted by lead and PCBs as a result of scrap operations.

As describe above, the fill area is bordered to the south by a low lying marsh area that includes a system of drainage ditches. This system also includes a drainage ditch that extends northward from the western boundary of the Delaware Broadcasting property. Flow through the system of ditches is to the north, traveling under A Street and discharging to the Christina River at a point approximately 500 feet to the north of the 322 A Street property. The drainage ditches and lowland areas receive surface water flow from A Street via Lombard Street and Spruce Street and the intervening properties located northeast of the 322 A Street property including a welding supplier and an automobile reclamation facility. Stormwater from higher elevations (including several industrial properties such as the former PennDel Metal Recycling site) also discharges to the drainage ditches bounding the site to the west through a storm sewer that runs under Market Street. Concentrations of PCBs in surface soil at PennDel were previously greater than 100 mg/kg at many locations. In 2007 and 2008 the site was remediated prior to redevelopment and PCBs are no longer present in the site surface soil. The majority of the site is capped with buildings and/or paved areas. According to previous environmental investigations, drainage from the former PennDel site discharges across Walnut Street to the ditch system that borders the Finger/Gordon property to the west. The ditches have historically received direct and indirect discharges from upstream industrial sources and accumulations of various debris/refuse.

In addition this area of Wilmington was extensively used for disposal of incinerator ash. There is evidence on the aerial photographs of a path extending from the vicinity of the nearby former Wilmington Municipal Incinerator to the Finger/Gordon property. There are levels of arsenic

and lead consistent with incinerator ash in some of the 1995 test pit samples from the Finger/Gordon Property.

Site Regulatory Status: This section briefly summarizes previous investigations performed on the site through the SIRB program. A current SIRB regulatory status is also included.

A number of investigations have been conducted at the Kreiger/Finger Property since 1985. The table below lists a chronology of investigations, reports, remedial actions, and regulatory actions.

Chronology of Investigations and Regulatory Actions

Investigation or Regulatory Action	Dates	Description
Wetlands Study	1985-1986	Surveys on the property were conducted by Mr. Finger to determine if the site was suitable for fill material. The U.S. Army Corps of Engineers (USACE), determined that protected wetlands were indeed on the property and in correspondence dated April 15, 1986, stated that filling of the wetlands would require USACE approval (Shaw 2003).
Soil Sampling by DNREC	January 1987	On January 14, 1987, DNREC, in coordination with U.S. Environmental Protection Agency (USEPA), collected three soil samples from the site. No maps or drawings indicating the location of these samples could be located. The samples were analyzed for PCBs. The results indicated that PCB concentrations ranged from 12.7 to 63.4 mg/kg (DNREC 1987).
Soil Sampling USEPA	March 1987	On March 5, 1987, the USEPA collected an additional three soil samples. No distinct locations of these samples could be acquired, but the report sited that the samples were collected from a location adjacent to the former Murowany Electric Company property. These samples did not indicate the presence of PCBs above the laboratory detection limits (Shaw 2003).
Soil Sampling NTH/Russell	March 1987	On March 19, 1987, NTH/Russell Associates collected four composite soil sample along west side of the former rail line. The exact locations of these samples could not be located. These samples were collected to represent the background concentration of PCBs in the area. Only one the samples had a reportable concentration of PCBs, which was 1.58 mg/kg. This sample was collected at the service station property (NTH/Russell 1987).
Investigation or Regulatory Action	Dates	Description
Soil Sampling by RMC	Dec. 1987 and March	Soil sampling was conducted by RMC in conjunction with Duffield Associates and USEPA in December 1987 and March of 1988. The sampling in December included nine

	1988	grab soil samples at background locations B1-B9 and two composite samples. In addition to this sampling event 16 composite samples were collected and analyzed for PCBs. The results for these sampling events are included in the figures presented in this assessment (RMC 1988).
Environmental Assessment of the South Wilmington (East) Quadrants 1 and 2 Study Area	1996	This study was conducted as part of a global preliminary assessment by DNREC of 200 acres along the Christina River in south Wilmington. Part of this report included exploratory test pits on the Kreiger/Finger Property (TP-8 and TP-9/28). Analytical results from these borings indicated PCB concentrations of 0.63 and 31 mg/kg (DNREC 1996).
Shaw Remedial Investigation Report Kreiger/Finger Property	June 2003	Exploratory test pit excavations and soil sampling were conducted at 20 soil pile and grid based sampling locations. Surface soil sampling was conducted at more than 60 locations and borings were advanced in 18 grid based locations. PCBs were detected in approximately 50% of all samples collected above their respective URS criteria. The greatest number of exceedances were reported in the upland fill area toward the northern portion of the property (Shaw 2003).
EA Engineering RI/FS of 320 A Street	Nov. 2003	EA Engineering (EA) collected a total of 44 soil samples from 23 borings (SB1-SB23). None of these samples indicated the presence of PCBs above their URS criteria.

Current Regulatory Status:

A Proposed Plan of Remedial Action (PPRA) was advertised in October 2008 for the PCB hot spot removal and capping of Kreiger Finger Property and Adjacent Sites. As of April 2009, public comments on the PPRA are currently being addressed, and the Final Plan of Remedial Action will be issued after the comments are satisfied.

The majority of the approximately 24 acres of the Kreiger Finger/Gordon properties have not had any major redevelopment activities other than the 322 A Street commercial property, a gas station at the intersection of A Street and Walnut Street (310 A Street), and the stormwater conveyance constructed by the City of Wilmington in 2008.



SUMMARY OF SITE PCB INFORMATION

Site Investigation PCB Findings:

PCBs were detected in the majority of samples collected from the Kreiger Finger Property and Adjacent Sites, particularly in the historic fill area. During the Shaw Remedial Investigation of the Kreiger Finger Property and Adjacent Sites, Shaw conducted a grid based sampling approach in the area of the historic fill. Approximately 50% of all samples collected contained concentrations of total PCBs. There did not appear to be any distinct pattern to the distribution of PCB concentrations observed in this area.

BrightFields calculated a 95% UCL of the mean of the concentration of total PCBs observed in the surface soils for overland flow calculations of 21.0 mg/kg.

The concentrations of PCBs in subsurface saturated soils ranged from non-detect to 140 mg/kg. The subsurface saturated soils were evaluated as three distinct areas. Within these areas, average concentrations of PCBs were determined. These average concentrations were used in the groundwater partitioning equation to estimate pore water concentration.

Concentrations of PCBs on Site			
Sample Matrix	Corresponding Figure	Analytical Methods	Range of Total PCBs
Surface Soil	Figure 2	Method 8082	Not detected to 256 mg/kg
Subsurface Soil (unsaturated)	Figure 3	Method 8082	Not detected to 31 mg/kg
Subsurface Soil (saturated)	Figure 4	Method 8082	Not detected to 140 mg/kg
Groundwater	Figure 5	Method 8082	Not detected

Please find the historical documents for specific concentrations

Acreage where PCBs detected:

The estimated surface soil area impacted by PCBs is 5.5 acres (Figure 2); however the area that may still be contributing to overland flow is 4.7 acres (Figure 6). The estimated subsurface unsaturated soil that is impacted by PCBs is 2.5 acres (Figure 3). The estimated subsurface saturated soil impacted by PCBs is 2.5 acres.

PCB Remediation Status:

There have been no remedial activities completed on the Kreiger Finger Property and Adjacent Sites as of December 2008. A new storm water culvert system was installed in 2008 to handle all of the surface runoff from across Walnut St., on a portion of the Kreiger Finger Property and Adjacent Sites. The concentrations associated with the samples from this area are still considered to be on site because the majority of the soil was left on site.

PCB MASS LOADING SUMMARY

The PCB mass loading rate to surface water via overland flow and via groundwater transport were estimated for the Kreiger Finger Property and Adjacent Sites. A summary of the results is included below and the details of the calculations are included as attachments to this Appendix.

OVERLAND FLOW:

Overland flow has been determined on this site by using the Revised Universal Soil Loss Equation (RUSLE). The RUSLE predicts the long term average annual rate of erosion on an area based on rainfall patterns, soil type, topography, cover/canopy factors and support management practices. These specific factors are site specific and rely on local information of the site. A breakdown of the individual factors is presented below with a brief explanation of their choice.

Ground Cover and Canopy:

A site inspection was performed on July 30, 2008 to estimate the current site ground cover and canopy. The cover/management factor (C) assigned to the site and associated flow path is 0.11, which corresponds to areas that have a vegetative cover consisting of 75% groundcover of tall weeds or short brush, with the cover at the surface being grass, grass-like plants, decaying compacted duff, or litter at least 2 inches deep. Photographs of the site ground cover and canopy are attached.

Site Sediment and Erosion Control Practices:

There are currently no erosion and sediment controls in place at the Kreiger Finger Property and Adjacent Sites.

Input Factors and Results:

A breakdown of the individual factors is presented below with a brief explanation of their choice.

Kreiger Finger Property and Adjacent Sites

RUSLE Factors	Values Provided	Explanation of Selection
R = rainfall-runoff erosivity index (10 ² ft-tonf-in/ac-hr)	170	An appropriate value for R for the site was determined from plots of Rainfall patterns for the Eastern U.S. (Wischmeier and Smith, 1978).



RUSLE Factors	Values Provided	Explanation of Selection
K = soil erodibility (0.01 tonf acre hr/acre ft-ton in)	0.420	The soil erodibility factor was chosen based on the information provided by the boring logs presented in the Remedial Investigation Report for the Kreiger/Finger Property (Shaw 2003).
ls = topographic factor (dimensionless)	0.280	The slope length was estimated to 98.5 feet, which is the distance between the centroid of the area of concern and the closest surface water discharge area. The assumed slope (2.2 %) and slope length were used to calculate a topographic factor of 0.280 from the USGS windows based application.
C = cover/management factor (dimensionless)	0.11	The cover/management factor C assigned to the site by the USGS windows based application was 0.11, which corresponds to approximately a 50% cover, with the cover at the surface consisting mostly broadleaf herbaceous plants or undecayed residues or both.
P = support practice factor (dimensionless)	1.0	There are currently no sediment and erosion controls being implemented at the Kreiger Finger Property and Adjacent Sites.

The average annual erosion rate is based on the windows based RUSLE2 program (RUSLE2 License, version 2006-Jul-24).

The total PCB loading via overland flow for the Kreiger Finger Property and Adjacent Sites is 200 grams per year. Please see attached table for specific variables.

Uncertainty Evaluation Associated with Overland Flow

Specific Areas and Degree of Uncertainty for the Kreiger Finger Property and Adjacent Sites

	Samples Per Acre (site)	Chemical Data Quality*	Topography	Soil Type	Site Cover	Map Quality	Distance to Discharge Points
Site Specific Information	7.8	Method 8082	Estimated using topography	Detailed logs that are located within the area of concern	Based on a limited site assessment and aerial photography	Scaled Map	98.5 feet
Degree of Uncertainty	Low	Low to Moderate	Moderate	Low	Moderate to High	Moderate	Low to Moderate

* Primary analysis used in the historical samples



Sources of uncertainty for the Kreiger Finger Property and Adjacent Sites include the following: the site boundaries in previous reports were not well defined. Groundwater depths were not found for all sample locations. In these instances BrightFields inferred groundwater depths from sample locations in the vicinity of missing data or determination of subsurface saturated vs. subsurface non-saturated was based on sample description (wet, saturated, etc.). In earlier reports multiple samples were collected from the same locations by different consultants. In these instances BrightFields choose one consultant's samples to be representative of the soil at that point in time. The area surrounding the Kreiger Finger Property and Adjacent Sites is defined as a wetland and in the Environmental Assessment of the South Wilmington (East) Quadrants 1 and 2 Study Area the surface samples collected were considered sediment samples, but for this assessment BrightFields defined these samples as surface samples because of their potential of movement into the drainage ditch on the southwest portion of the property. Based on these evaluations the overall level of uncertainty associated with PCB mass loading via overland flow from the Kreiger Finger Property and Adjacent Sites is **moderate**.

GROUNDWATER DISCHARGE ANALYSIS

Groundwater discharge is based on the hydraulic conductivity of the soil, the groundwater gradient, and the cross-sectional area of the aquifer. A breakdown of the individual factors used in the Darcy equation is presented below.

Because PCBs were detected in saturated soil, but not in groundwater, the calculated concentration of PCBs in pore water, based on partitioning, was used to calculate the mass loading. The calculated PCB concentration in the pore water ranges from 18 to 90 µg/L for Area A, 0.32 to 1.6 µg/L for Area B, 0.037 to 0.19 µg/L for Area C, and 0.072 to 0.36 µg/L for Area D. The calculations are presented in Table B in the groundwater transport calculations attachment.

Input Factors:

A breakdown of the individual factors is presented below with a brief explanation of their choice.

Area A: Vicinity of samples 1325 and 1329

Groundwater Transport Factors	Value Used		Justification/Derivation of Value Used
	min	max	
K = Hydraulic Conductivity (ft/day)	29.5	166	Slug tests were conducted at the Kreiger-Finger site. Results from the shallow water bearing zone indicate that the measured hydraulic conductivity ranged from 1.04 x 10 ⁻² to 5.85 x 10 ⁻² cm/sec.



Groundwater Transport Factors	Value Used		Justification/Derivation of Value Used
	min	max	
I = Horizontal Groundwater Gradient	0.0022	0.003	Groundwater elevations were measured from the wells at the Kreiger-Finger. Calculations of the horizontal gradient from these measurements showed that the gradient of groundwater flowing toward the drainage ditch ranged from approximately 0.0022 to 0.003 ft/ft.
Saturated Thickness (ft)	3	5	Based on the borings logs, the saturated zone above the marsh deposits is between 3 to 5 feet thick.
Lateral Discharge Distance (ft)	105	105	The lateral discharge distance was estimated to be equal to the length of the PCB impacted area measured perpendicular to the groundwater flow.
A= Cross-Sectional Area (ft ²)	315	525	Calculated from the saturated thickness and lateral discharge distance.
Groundwater PCB Concentration (µg/L)	18	90	The average concentration observed in the saturated subsurface soil in this area (82 mg/kg) was used to determine the estimated concentration in groundwater.
Distance to Discharge point (ft)	175 to 364		Approximate distance from property boundary to closest surface water location.

The PCB loading via groundwater discharge for Area A is between 19.3 to 245 grams per year. Please see attached tables for specific variables.

Area B: Vicinity of samples 1301, 1351, 1308, and 1463

Groundwater Transport Factors	Value Used		Justification/Derivation of Value Used
	min	max	
K = Hydraulic Conductivity (ft/day)	29.5	166	Slug tests were conducted at the Kreiger-Finger site. Results from the shallow water bearing zone indicate that the measured hydraulic conductivity ranged from 1.04×10^{-2} to 5.85×10^{-2} cm/sec.
I = Horizontal Groundwater Gradient	0.0022	0.003	Groundwater elevations were measured from the wells at Kreiger-Finger. Calculations of the horizontal gradient from these measurements showed that the groundwater gradient toward the drainage ditch ranged from approximately 0.0022 to 0.003 ft/ft.
Saturated Thickness (ft)	3	5	Based on the borings logs, the saturated zone above the marsh deposits is between 3 to 5 feet thick.
Lateral Discharge Distance (ft)	210	210	The lateral discharge distance was estimated to be equal to the length of the PCB impacted area measured perpendicular to the groundwater flow.
A= Cross-Sectional Area (ft ²)	630	1,050	Calculated from the saturated thickness and lateral discharge distance.
Groundwater PCB Concentration (µg/L)	0.32	1.6	The average concentration observed in the saturated subsurface soil in this area (1.48 mg/kg) was used to determine the estimated concentration in groundwater.
Distance to Discharge point (ft)	175 to 364		Approximate distance from property boundary to closest surface water location.

The PCB loading via groundwater discharge for Area B is between 0.69 to 9.2 grams per year. Please see attached tables for specific variables.

Area C: Vicinity of samples 1347, 1349, and 1353

Groundwater Transport Factors	Value Used		Justification/Derivation of Value Used
	min	max	
K = Hydraulic Conductivity (ft/day)	4.2	38	Slug tests were conducted at the Kreiger-Finger site. Results from the shallow water bearing zone indicate that the measured hydraulic conductivity ranged from 1.04×10^{-2} to 5.85×10^{-2} cm/sec.
I = Horizontal Groundwater Gradient	0.0022	0.003	Groundwater elevations were measured from the wells at Kreiger-Finger. Calculations of the horizontal gradient from these measurements showed that the gradient of groundwater flowing toward the drainage ditch ranged from approximately 0.0022 to 0.003 ft/ft.
Saturated Thickness (ft)	3	5	Based on the borings logs, the saturated zone above the marsh deposits is between 3 to 5 feet thick.
Lateral Discharge Distance (ft)	200	200	The lateral discharge distance was estimated to be equal to the length of the PCB impacted area measured perpendicular to the groundwater flow.
A= Cross-Sectional Area (ft ²)	600	1,000	Calculated from the saturated thickness and lateral discharge distance.
Groundwater PCB Concentration (ug/L)	0.037	0.19	The average concentration observed in the saturated subsurface soil in this area (0.170 mg/kg) was used to determine the estimated concentration in groundwater.
Distance to Discharge point (ft)	175 to 364		Approximate distance from property boundary to closest surface water location.

The PCB loading via groundwater discharge for Area C is between 0.08 to 1.0 grams per year. Please see attached tables for specific variables.

Area D: Vicinity of samples COW-5 and COW-6

Groundwater Transport Factors	Value Used		Justification/Derivation of Value Used
	min	max	
K = Hydraulic Conductivity (ft/day)	4.2	38	Slug tests were conducted at the Kreiger-Finger site. Results from the shallow water bearing zone indicate that the measured hydraulic conductivity ranged from 1.04×10^{-2} to 5.85×10^{-2} cm/sec.
I = Horizontal Groundwater Gradient	0.0022	0.003	Groundwater elevations were measured from the wells at the Kreiger-Finger. Calculations of the horizontal gradient from these measurements showed that the gradient of groundwater flowing toward the drainage ditch ranged from approximately 0.0022 to 0.003 ft/ft.
Saturated Thickness (ft)	3	5	Based on the borings logs, the saturated zone above the marsh deposits is between 3 to 5 feet thick.
Lateral Discharge Distance (ft)	155	155	The lateral discharge distance was estimated to be equal to the length of the PCB impacted area measured perpendicular to the groundwater flow.
A= Cross-Sectional Area (ft ²)	470	780	Calculated from the saturated thickness and lateral discharge distance.



Groundwater Transport Factors	Value Used		Justification/Derivation of Value Used
	min	max	
Groundwater PCB Concentration (ug/L)	0.082	0.36	The average concentration observed in the saturated subsurface soil in this area (0.330 mg/kg) was used to determine the estimated concentration in groundwater.
Distance to Discharge point (ft)	175 to 364		Approximate distance from property boundary to closest surface water location.

The PCB loading via groundwater discharge for Area D is between 0.11 to 1.5 grams per year. Please see attached tables for specific variables.

Mass Loading Via Groundwater Transport Result:

The groundwater discharge is 3,800 to 48,000 L/day (attached Table A). The estimated minimum and maximum contaminant mass loading contributions are shown in the Table C in the groundwater transport calculations attachment. As previously described, these calculations are highly conservative (protective), and they overestimate the actual mass loading because they assume that there are no contaminant losses due to degradation, dispersion, sorption, volatilization, etc.

The total PCB loading via groundwater discharge is between 20 and 300 grams per year (attached Table C).

Uncertainty Analysis Associated with Groundwater Transport:

Specific Areas and Degree of Uncertainty for the Kreiger Property and Adjacent Sites

	Groundwater PCB Concentration	Hydraulic Conductivity	Horizontal Groundwater Gradient	Saturated Thickness	Lateral Discharge Distance	Distance to Discharge point
Site Specific Information	Partitioning based on average concentration observed in saturated soil	Based on slug tests completed on on-site wells	Few points with limited number of groundwater measurements	Good quality logs	Good groundwater gradient defined and a moderate number of samples collected on-site	175 to 364 feet
Degree of Uncertainty	Moderate to High	Low	Moderate	Low to Moderate	Moderate	High

Based on this evaluation the overall uncertainty associated with the Kreiger Property and Adjacent Sites is **moderate**.

Site References:

Department of Natural Resources and Environmental Control (DNREC), Site Investigation Research Branch (SIRB), 2008, Proposed Plan of Remedial Action for the Kreiger Finger Property, October 2008.

DNREC-SIRB, 1996, Environmental Assessment of the South Wilmington (East) Quadrants 1 and 2 Study Area, 1996.

DNREC-SIRB, 1987, Soil Sampling at the Kreiger Landfill Property, January 1987.

EA Engineering, 2003, Remedial Investigation and Feasibility Study of 320 A Street, November 2003.

NTH/Russell Associates, 1987, Soil Sampling Investigation, March 1987.

RMC Consulting, 1987, Additional Soil Sampling, December 1987.

Shaw Environmental & Infrastructure, Inc. (Shaw), 2003, Revised Remedial Investigation Report Kreiger /Finger Property, June 2003.

United States Army Corps of Engineers (USACE), 1985, Wetlands Study, April 1986.

United States Environmental Protection Agency (USEPA), 1987, Soil Sampling, March 1987.

PCB Mass Loading
Kreiger Finger Property and Adjacent Sites
SIRB ID: DE-1067, DE-0156, DE-1291, DE-1336, and DE-1337
Wilmington, Delaware



BrightFields, Inc.

Figures

PCB Mass Loading
Kreiger Finger Property and Adjacent Sites
SIRB ID: DE-1067, DE-0156, DE-1291, DE-1336, and DE-1337
Wilmington, Delaware



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Historical Data



Legend

- ▲ Sediment Sample Location
- Sediment/Surface Water Sample Location
- Soil Boring Location
- + Soil Boring/Groundwater Sample Location
- Surface Water Sample Location
- Test Pit Location
- Well Location
- Tax Parcel
- Kreiger-Finger Project Boundary

Total Site Area= 15.47 acres

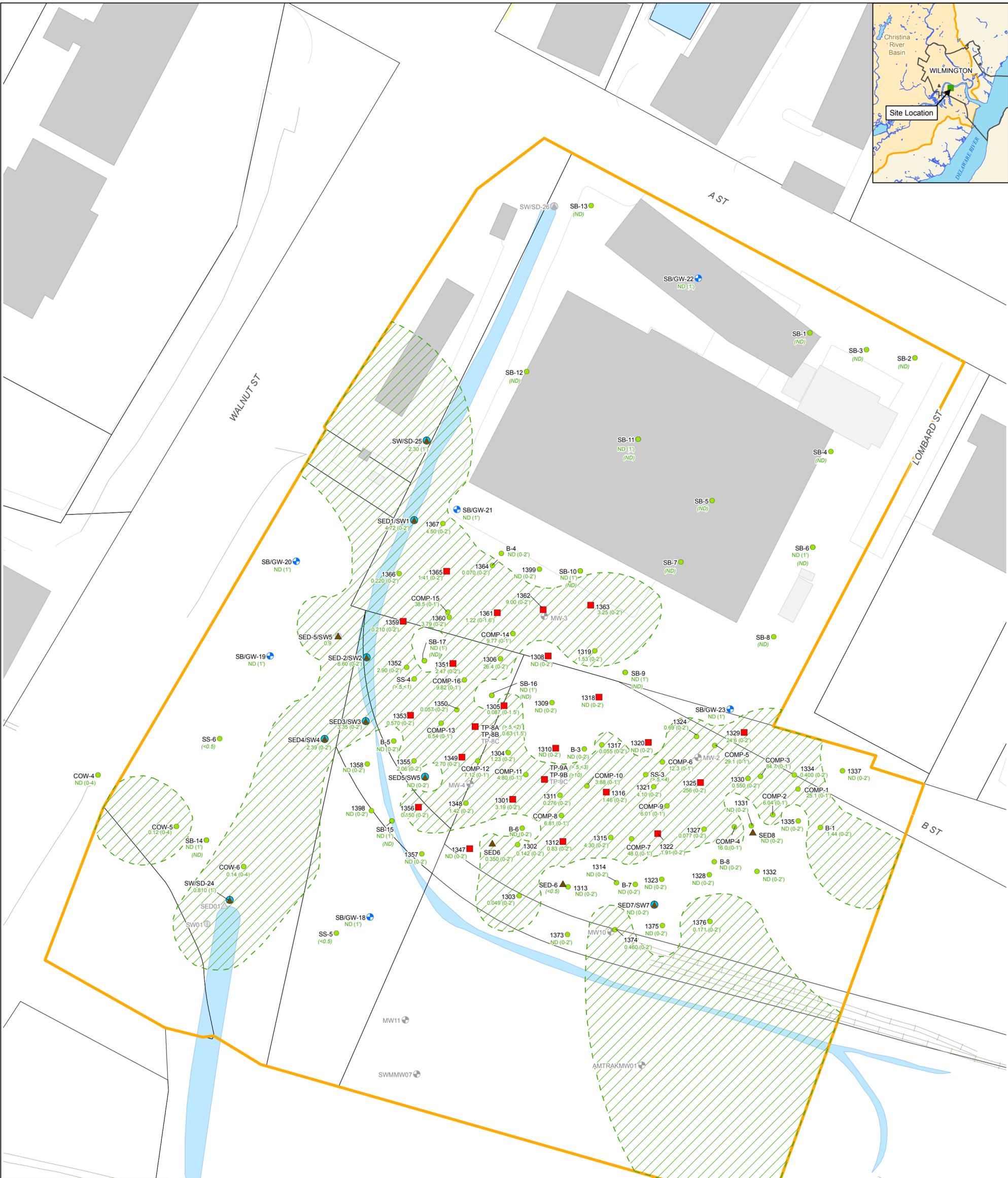
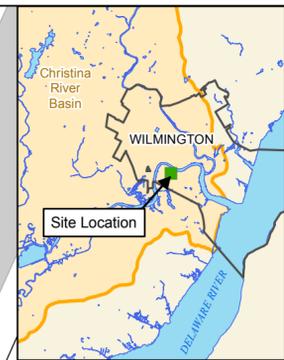
BrightFields, Inc.
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 Wilmington, Delaware 19801 302-656-9700 fax

Historic Sample Locations and Aerial Photograph (2007)
 Kreiger-Finger Property and Adjacent Sites
 Wilmington, Delaware

	By	Date	Scale:	File Name:
Drawn	SMD	5/11/09	1:840	kreiger aerial.mxd
Checked	JPR	5/11/09	Fig. No.	
Project #	0985.26.51		Figure 1	

0 35 70
 Feet



Legend

- 1.22 Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
- (>10) Screening Result
- ▲ Sediment Sample Location
- Sediment/Surface Water Sample Location
- Soil Boring Location
- Soil Boring/Groundwater Sample Location
- Surface Water Sample Location
- Test Pit Location
- Well Location
- ▨ Estimated PCB Distribution
- Existing Building
- Historic Building
- Water
- Tax Parcel
- Kreiger-Finger Project Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs

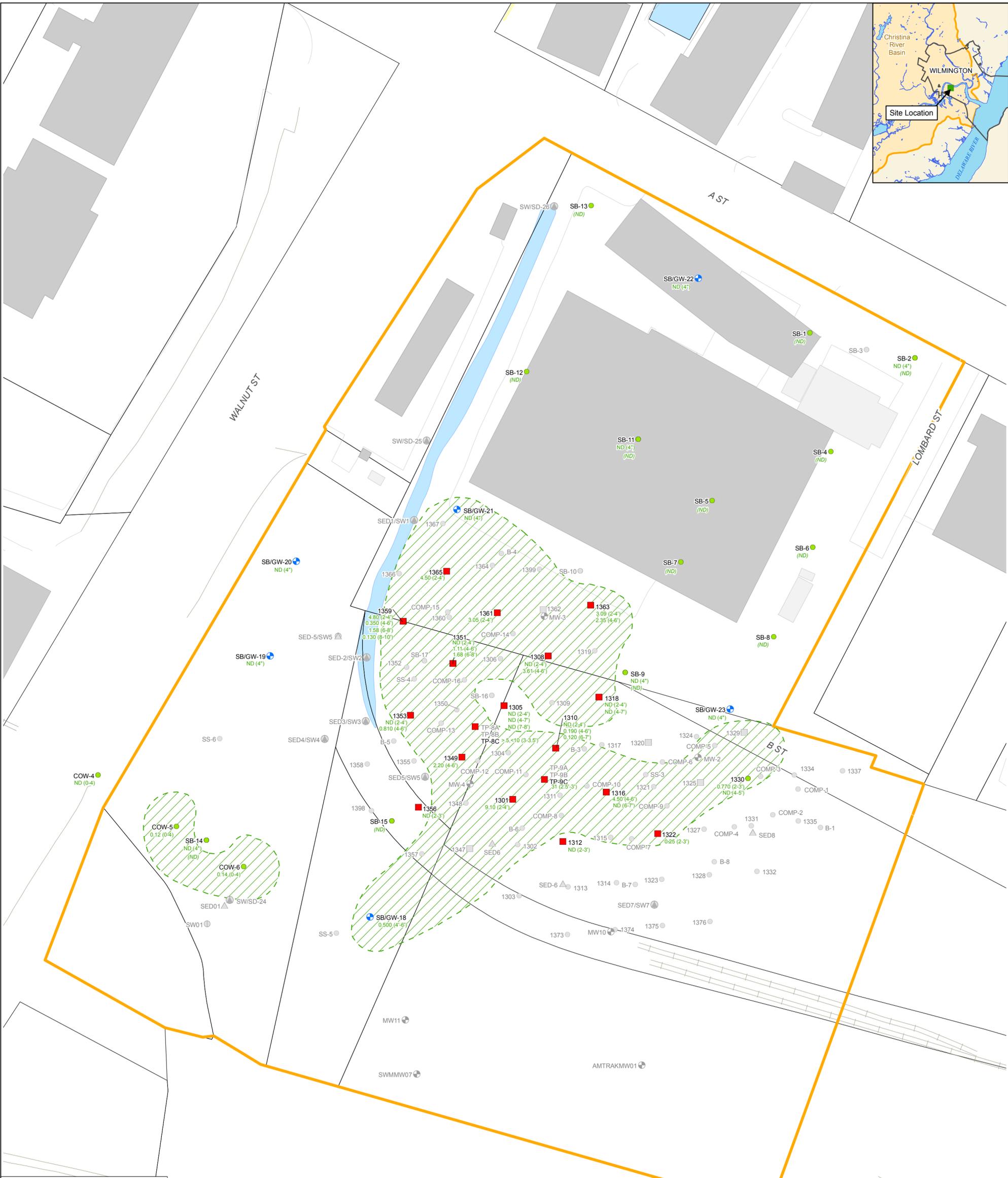
BrightFields, Inc.
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 Investigation, and Remediation

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 Wilmington, Delaware 19801 302-656-9700 fax

PCB Distribution in Surface Soil (0'-2' bgs)
 Kreiger-Finger Property and Adjacent Sites
 Wilmington, Delaware

	By	Date	Scale:	File Name:
Drawn	SMD	5/11/09	1:840	kreiger 0-2.mxd
Checked	JPR	5/11/09	Fig. No.	
Project #	0985.26.51		Figure 2	

0 35 70 Feet



Legend

- 1.11 Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
- (ND) Screening Data
- ▲ Sediment Sample Location
- Sediment/Surface Water Sample Location
- Soil Boring Location
- Soil Boring/Groundwater Sample Location
- Surface Water Sample Location
- Test Pit Location
- Well Location
- ▨ Estimated PCB Distribution
- Existing Building
- Historic Building
- Tax Parcel
- Water
- ▭ Kreiger-Finger Project Boundary

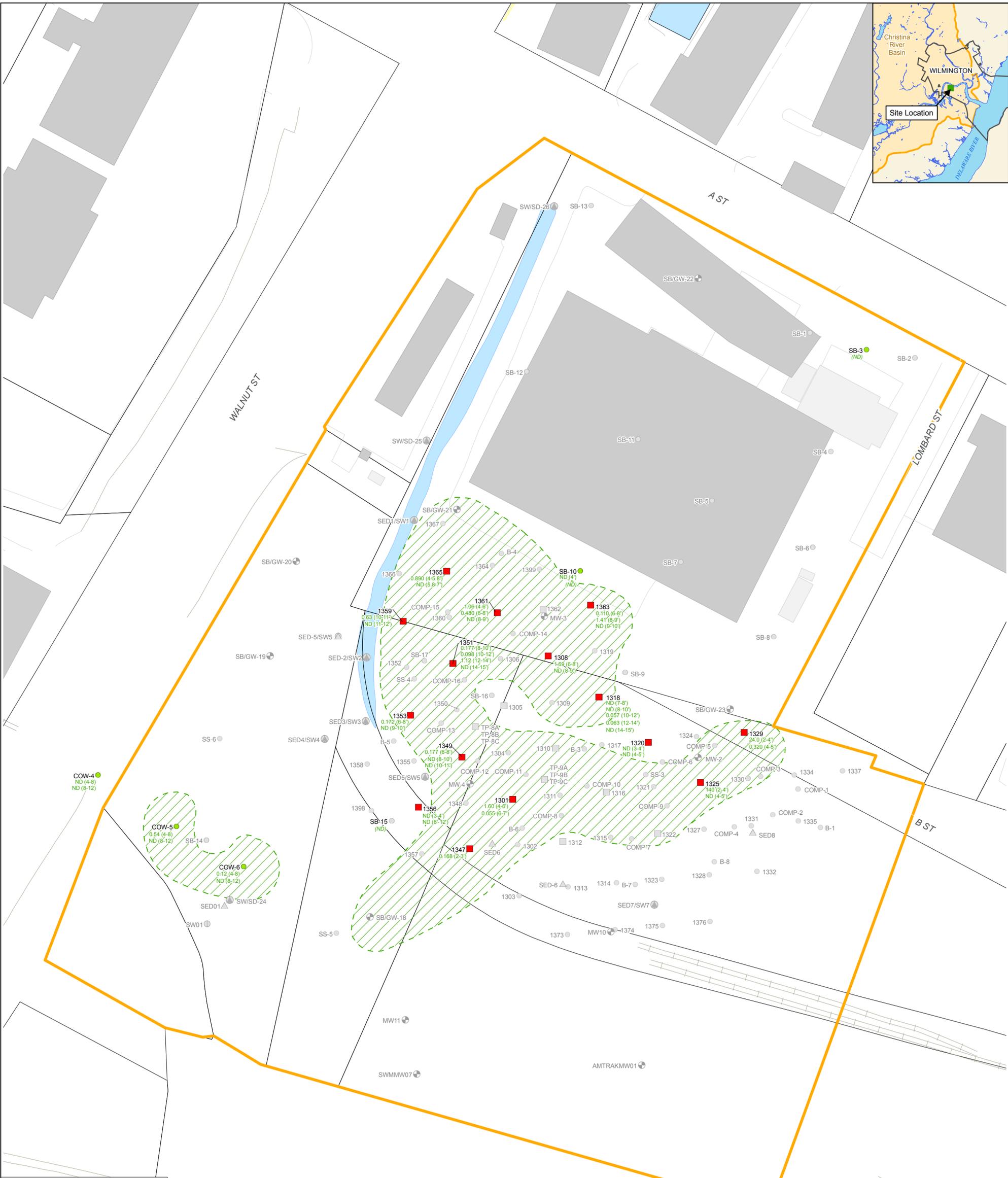
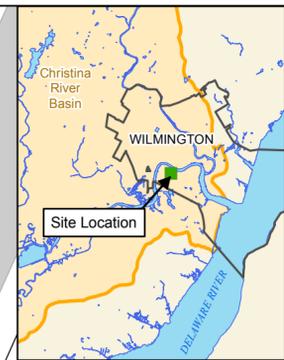
Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs. PCB polygon was created based on the assessment from the South Wilmington Wetlands Assessment, 2009.

BrightFields, Inc.
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 Investigation, and Remediation
 801 Industrial Street, Suite 1 302-656-9600
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PCB Distribution in Subsurface Unsaturated Soil
 Kreiger-Finger Property and Adjacent Sites
 Wilmington, Delaware

By	Date	Scale:	File Name:
Drawn	SMD 5/11/09	1:840	kreiger_unsat.mxd
Checked	Date	Fig. No.	
JPR	5/11/09	Figure 3	
Project #	0985.26.51		

0 35 70 Feet



Legend

- 1.12 Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
- (ND) Screening Data
- ▲ Sediment Sample Location
- Sediment/Surface Water Sample Location
- Soil Boring Location
- Soil Boring/Groundwater Sample Location
- Surface Water Sample Location
- Test Pit Location
- Well Location
- ▭ Kreiger-Finger Project Boundary
- ▨ Estimated PCB Distribution
- ▭ Existing Building
- ▭ Historic Building
- ▭ Tax Parcel
- ▭ Water

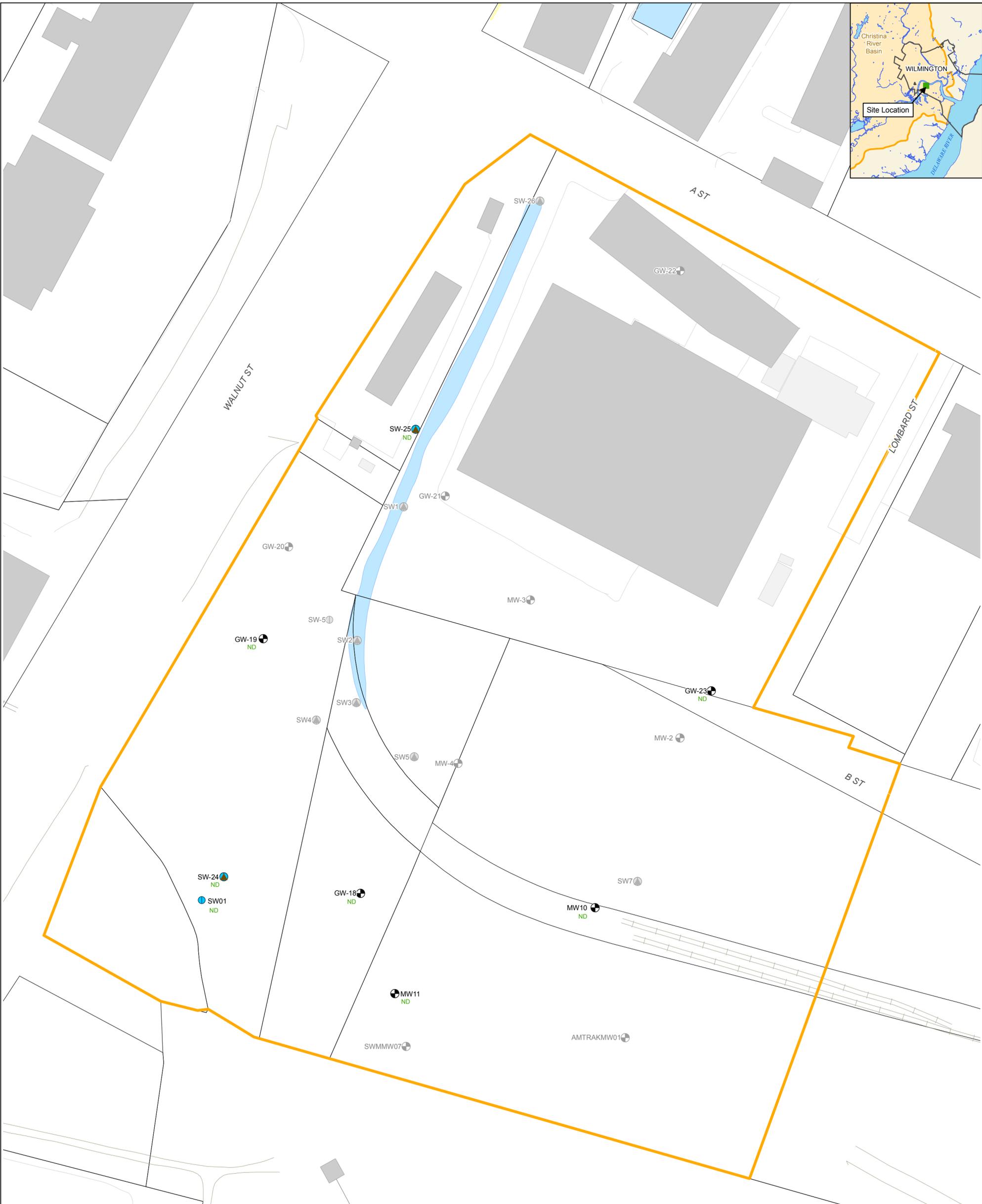
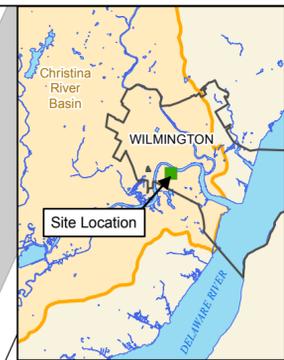
Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs. PCB polygon was created based on the assessment from the South Wilmington Wetlands Assessment, 2009.

BrightFields, Inc.
 Environmental Evaluation
 Investigation, and Remediation
 801 Industrial Street, Suite 1 302-656-9600
 Wilmington, Delaware 19801 302-656-9700 fax

PCB Distribution in Subsurface Saturated Soil
 Kreiger-Finger Property and Adjacent Sites
 Wilmington, Delaware

By	Date	Scale:	File Name:
Drawn	SMD 5/11/09	1:840	kreiger sat.mxd
Checked	JPR 5/11/09	Fig. No.	
Project #	0985.26.51	Figure 4	

0 35 70 Feet



- Legend**
- ND PCBs Not Detected
 - Sediment/Surface Water Sample Location
 - Soil Boring/Groundwater Sample Location
 - Surface Water Sample Location
 - Well Location
 - Existing Building
 - Historic Building
 - Water
 - Tax Parcel
 - Kreiger-Finger Project Boundary

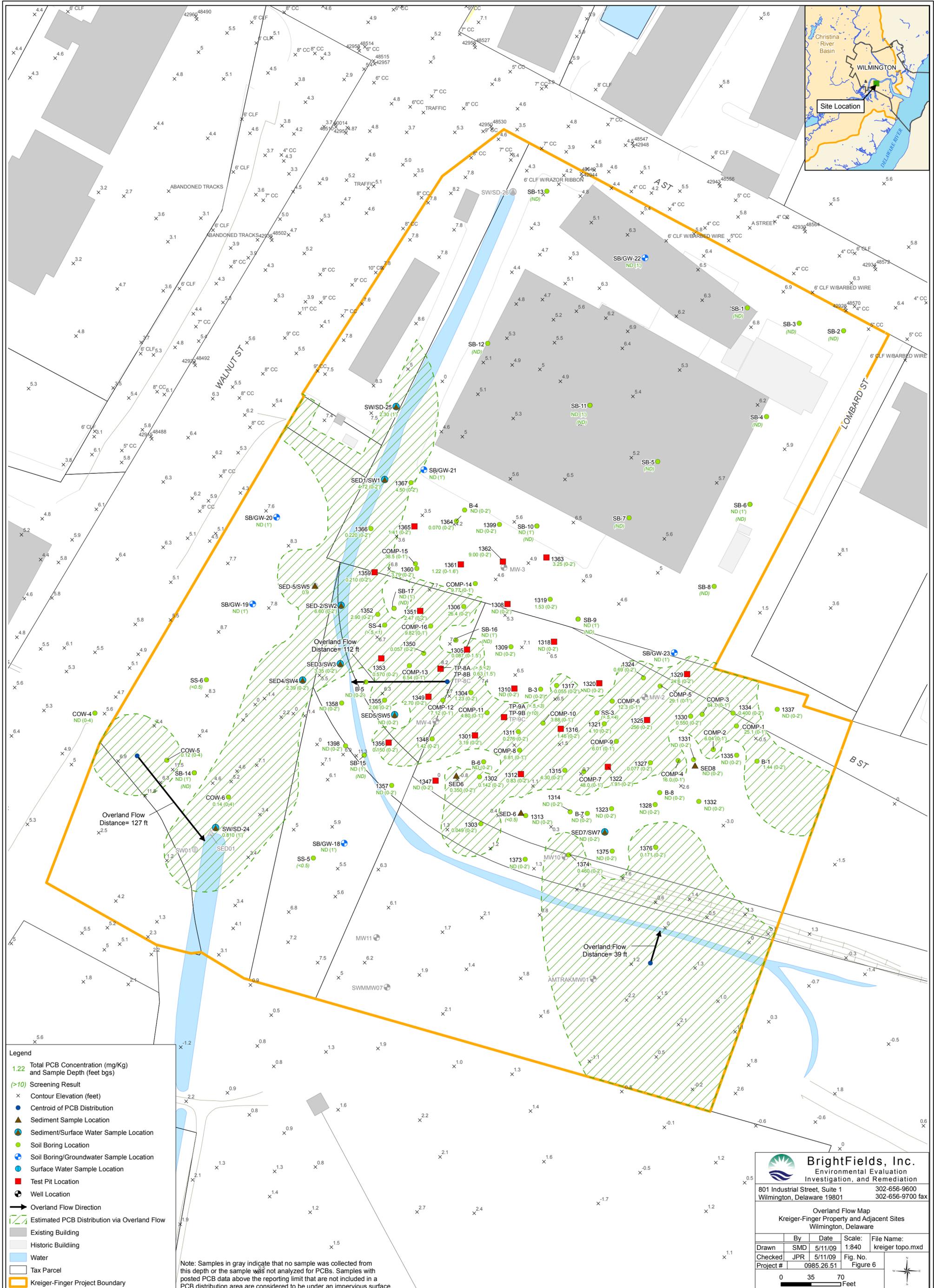
Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs

BrightFields, Inc.
 Environmental Evaluation
 Investigation, and Remediation
 801 Industrial Street, Suite 1 | 302-656-9600
 Wilmington, Delaware 19801 | 302-656-9700 fax

PCB Distribution in Groundwater
 Kreiger-Finger Property and Adjacent Sites
 Wilmington, Delaware

	By	Date	Scale:	File Name:
Drawn	SMD	11/10/08	1:840	kreiger gw.mxd
Checked	JPR	11/10/08	Fig. No.	
Project #	0985.26.51		Figure 5	

0 35 70 Feet



- Legend**
- 1.22 Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
 - (>10) Screening Result
 - x Contour Elevation (feet)
 - Centroid of PCB Distribution
 - ▲ Sediment Sample Location
 - ▲ Sediment/Surface Water Sample Location
 - Soil Boring Location
 - Soil Boring/Groundwater Sample Location
 - Surface Water Sample Location
 - Test Pit Location
 - Well Location
 - Overland Flow Direction
 - ▨ Estimated PCB Distribution via Overland Flow
 - ▨ Existing Building
 - ▨ Historic Building
 - ▨ Water
 - ▨ Tax Parcel
 - ▨ Kreiger-Finger Project Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs. Samples with posted PCB data above the reporting limit that are not included in a PCB distribution area are considered to be under an impervious surface.

BrightFields, Inc.
 Environmental Evaluation
 Investigation, and Remediation

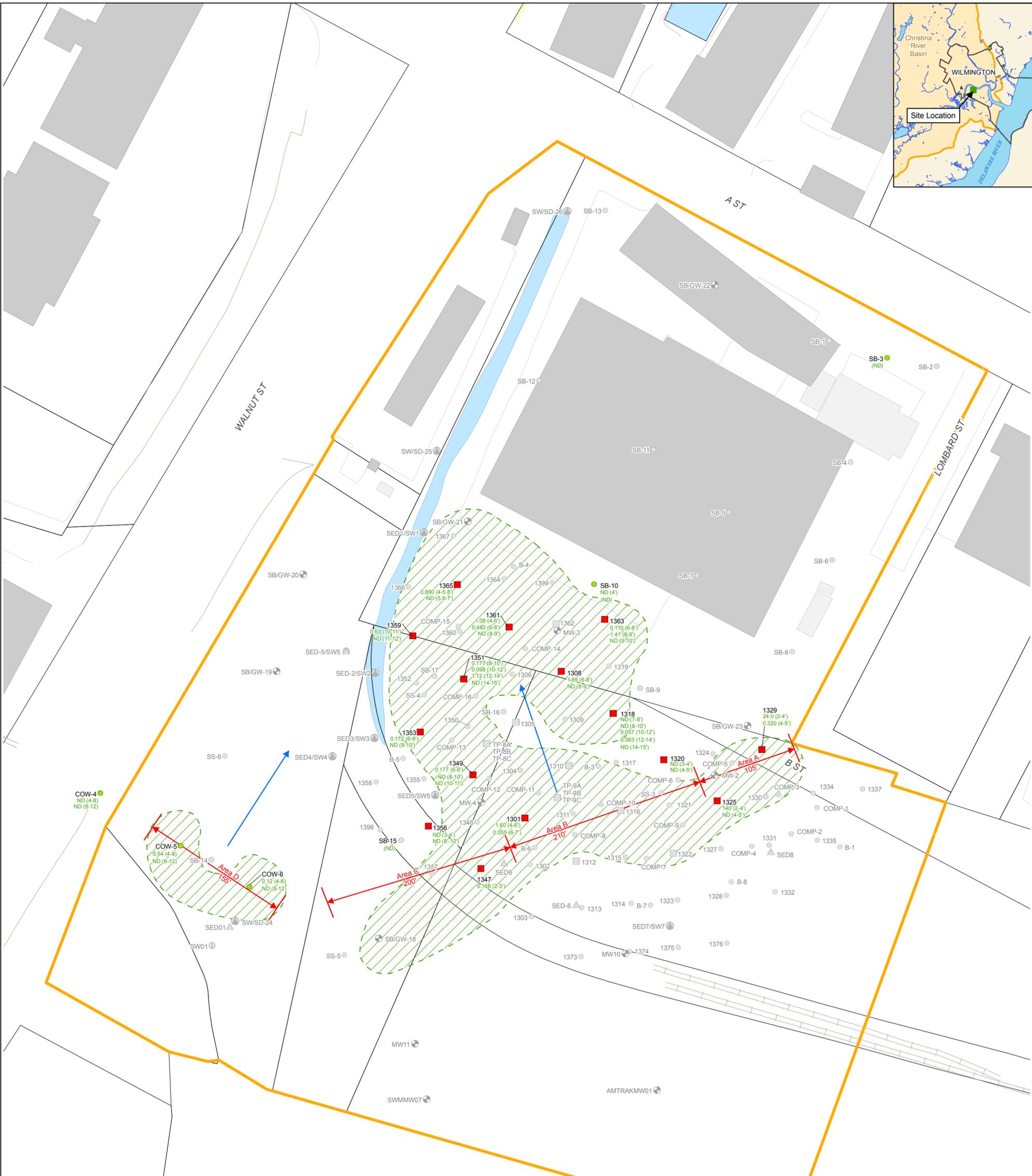
801 Industrial Street, Suite 1
 Wilmington, Delaware 19801

302-656-9600
 302-656-9700 fax

Overland Flow Map
 Kreiger-Finger Property and Adjacent Sites
 Wilmington, Delaware

By	Date	Scale	File Name
Drawn	SMD 5/11/09	1:840	kreiger topo.mxd
Checked	JPR 5/11/09	Fig. No.	
Project #	0985.26.51	Figure 6	

0 35 70 Feet



Legend

- 1.12 Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
- (ND) Screening Data
- Groundwater Flow Direction
- ↔ Groundwater Discharge Distance (feet)
- ▲ Sediment Sample Location
- Sediment/Surface Water Sample Location
- Soil Boring Location
- Soil Boring/Groundwater Sample Location
- Surface Water Sample Location
- Test Pit Location
- Well Location
- ▭ Estimated PCB Distribution
- Existing Building
- Historic Building
- Water
- Tax Parcel
- Kreiger-Finger Project Boundary

Note: Samples in gray indicate that no sample was collected from this depth or the sample was not analyzed for PCBs. PCB polygon was created based on the assessment from the South Wilmington Wetlands Assessment, 2009.

BrightFields, Inc.
 Environmental Evaluation
 Investigation, and Remediation
 801 Industrial Street, Suite 1
 Wilmington, Delaware 19801
 302-656-9600
 302-656-9700 fax

Groundwater Discharge Map
 Kreiger-Finger Property and Adjacent Sites
 Wilmington, Delaware

By	Date	Scale:	File Name:	
Drawn	SMD	5/19/09	1:840	kreiger gw dis.mxd
Checked	JPR	5/19/09	Fig. No.	
Project #	0985.26.51		Figure 7	

0 35 70 Feet

CERTIFICATE OF ANALYSIS

Antrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 BHC Number : 5963
 Sample Description: BACKGROUND #1 (B-1)

Report No. : 72887
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 04/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Ana-lyst
POLYCHLORINATED BIPHENYLS (SOIL)	1.44 HG/KG NET WT. AS 1260 PCB	01/05/88	HGH

<X = Detected but at a concentration less than the minimum quantifiable limit.

<X ND = Not Detected. Value reported is

Approved By:

Kyle F. Gross
 Kyle F. Gross

CERTIFICATE OF ANALYSIS

Antrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 RMC Number : 5964
 Sample Description: BACKGROUND #2 (B-2)

Report No. : 72887
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 04/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Analyst
POLYCHLORINATED BIPHENYLS (SOIL)	<1.0 MG/KG NET WT. AS 1016 PCB	01/05/88	BGH

<I = Detected but at a concentration less than the minimum quantifiable limit.

<X ND = Not Detected. Value reported is

Approved By:

 Kyle F. Gross

CERTIFICATE OF ANALYSIS

Antrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 RMC Number : 5965
 Sample Description: BACKGROUND #3 (B-3)

Report No. : 72887
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 01/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Analyst
POLYCHLORINATED BIPHENYLS (SOIL)	<1.0 MG/KG WET WT. AS 1016 PCB	01/05/88	RGH

<X = Detected but at a concentration less than the minimum quantifiable limit.

<X ND = Not Detected. Value reported to

Approved By:

 R. J. ...

CERTIFICATE OF ANALYSIS

Antrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 RMC Number : 5966
 Sample Description: BACKGROUND 14 (B-4)

Report No. : 72887
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 04/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Ana- lyst
POLYCHLORINATED BIPHENYLS (SOIL)	<1.0 MG/KG NET WT. AS 1016 PCB	01/05/88	HGH

(X) = Detected but at a concentration less
 than the minimum quantifiable limit.

(X) ND = Not Detected. Value reported is

Approved By:


 Kyle F. Gross

CERTIFICATE OF ANALYSIS

Antrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 EHC Number : 5960
 Sample Description: BACKGROUND #6

Report No. : 72887
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 04/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Ana- lyst
POLYCHLORINATED BIPENYLS (SOIL)	<1.0 MG/KG WET WT. AS 1016 PCB	01/05/88	HGH

<X = Detected but at a concentration less
 than the minimum quantifiable limit.

<X ND = Not Detected. Value reported is

Approved By:


 Kyle F. Gross



ENVIRONMENTAL SERVICES

Tri-County Business Campus, 88 Robinson Street, Pottstown, PA 19464, (215) 327-4850

CERTIFICATE OF ANALYSIS

Antrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 RMC Number : 5969
 Sample Description: BACKGROUND #7 (B-7)

Report No. : 72807
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 04/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Analyst
POLYCHLORINATED BIPHENYLS (SOIL)	<1.0 MG/KG NET WT. AS 1016 PCB	01/05/88	HGH

<X = Detected but at a concentration less than the minimum quantifiable limit.

<X ND = Not Detected. Value reported is

Approved By:

[Signature]
 Kyle F. Gross

CERTIFICATE OF ANALYSIS

Amtrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 RMC Number : 5970
 Sample Description: BACKGROUND #8 (B-8)

Report No. : 72887
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 04/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Analyst
POLYCHLORINATED BIPHENYLS (SOIL)	<1.0 MG/KG WET WT. AS 1016 PCB	01/05/88	HGE

<X = Detected but at a concentration less than the minimum quantifiable limit.

<X ND = Not Detected. Value reported is

Approved By:

[Signature]
 Title: F. Gross

CERTIFICATE OF ANALYSIS

Antrak
 National Railroad Passenger Corp.
 North Capitol Street
 Washington, DC 20001
 RMC Number : 5971
 Sample Description: BACKGROUND 89 (B-9)

Report No. : 72887
 Sample Date: 12/29/87
 Sampled By : DDP
 Received : 12/30/87
 Reported : 04/15/88
 P.O. Number: N/A

Parameter	Result	Date Anal Completed	Analyst
POLYCHLORINATED BIPHENYLS (SOIL)	<1.0 HG/EG NET WT. AS 1016 PCB	01/05/88	HGH

<X = Detected but at a concentration less than the minimum quantifiable limit.

<X ND = Not Detected. Value reported is

Approved By:

[Signature]
 Rita E. Cooper

TABLE 2

Krieger Landfill PCB Sampling

DATA SUMMARY: Polychlorinated Biphenyls (PCB's) (1) (3)

Area 1			
<u>Composite Number</u>	<u>Sample Points(2)</u>	<u>PCB's mg/kg(1) (dry weight)</u>	<u>EPA "Clean" Level for Composite Grouping(4)</u>
1	1, 2, 3, 4, 5	25.1	10.0
2	8, 9, 10, 13	6.04	12.5
3	6, 7, 11, 12	56.7	12.5
4	14, 15, 16, 17	2.15	12.5
Area 2			
<u>Composite Number</u>	<u>Sample Points(2)</u>	<u>PCB's mg/kg(1) (dry weight)</u>	<u>EPA "Clean" Level for Composite Grouping(4)</u>
5	18, 19, 20, 21, 25, 26, 27, 28, 64	26.4	5.56
6	33, 34, 35, 36, 37, 41, 42, 47	11.3	6.25
7	31, 32, 40, 45, 46, 50, 51	25.6	7.14
8	54, 55, 58, 59, 62, 63	6.81	8.33
9	22, 23, 29, 30, 38, 39, 43, 44	6.01	6.25
10	48, 49, 52, 53, 56, 57, 60, 61	3.88	6.25

Area 3

<u>Composite Number</u>	<u>Sample Points(2)</u>	<u>PCB's mg/kg(1)</u> <u>(dry weight)</u>	<u>EPA</u> <u>"Clean" Level</u> <u>for Composite</u> <u>Grouping(4)</u>
11	65, 66, 67, 68, 69, 70, 71, 72	3.82	6.25
12	73, 74, 75, 76, 77, 78, 80, 81, 82	7.12	5.56
12 Duplicate	73, 74, 75, 76, 77, 78, 80, 81, 82	8.43	5.56
13	79, 84, 85, 86, 87, 88, 89, 90, 92	6.54	5.56
14	100, 101, 105, 106, 110, 111, 112, 115, 116	9.77	5.56
15	102, 103, 104, 107, 108, 109 113, 114, 117	38.5	5.56
16	83, 91, 93, 94, 95, 96, 97, 98, 99	6.11	5.56
Field blank		<20	

- (1) Abbreviations: mg/kg = milligrams/kilogram (parts per million = ppm)
< = less than, i.e. below indicated level of detection.
- (2) Most samples were taken approximately one foot (12 inches) below existing grade at time of sampling.
- (3) See attached Lancaster Laboratories, Inc. Analysis Reports for complete analysis.
- (4) EPA "Clean" Level =
$$\frac{50 \text{ mg/kg (ppm)}}{\# \text{ sampling points in a composite grouping}}$$
- (5) The field blank was generated by RMC's sampling team by rinsing, with Hexane, all equipment which came into contact with the sample, and collecting the rinsate into a clean sampling jar (December 29, 1987).

TABLE 14
DATA SUMMARY FORM: PESTICIDES AND PCB's

TEST PIT SOIL SAMPLES
(SHALLOW - 'S' and DEEP 'D')
(ug/Kg)

Sample Location	TP-18-D	TP-21-S	TP-21-D	TP-22-S	TP-23-S	TP-48-S	RBC [*] Industrial Soil ug/Kg 10/4/95	RBC [*] Residential Soil ug/Kg 10/4/95
alpha-BHC				23	J		3200	350
4,4'-DDE	81**	J	400**	J	24	K	17,000	1900
Endosulfan II					200**	J	12,000,000	470,000
4,4'-DDD	94**	J	870**		100+	J	24000	2700
Endosulfan sulfate				120+	J		12,000,000	470,000
4,4'-DDT	46	J			25	J	17,000	1900
Endrin ketone	14	J					610,000	23,000
alpha-Chlordane					17	J	4400	490
gamma-Chlordane						J	4400	490
Aroclor-1242						J	740	83
Aroclor-1248			18000**	J	15000**	J	740	83
Aroclor-1254			9600*	J	62000**	J	41,000	1600
Aroclor-1260	140*	J					740	83

* = EPA Region III Risk-Based Concentrations, R.L. Smith.

** = Result from diluted analysis.

n = Non-carcinogenic effects.

c = Carcinogenic effects.

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

+ = Compound not detected in diluted analysis.

TABLE 15
DATA SUMMARY FORM: PESTICIDES AND PCBs

SURFACE SOIL SAMPLES
(ug/kg)

Sample Location	SS-15	SS-17	SS-20	SS-23	SS-25	SS-27	SS-28	SS-100	RBC ^c Industrial Soil ug/kg 10/4/95	RBC ^c Residential Soil ug/kg 10/4/95
Heptachlor			5.3 J						1300 C	140 C
Heptachlor epoxide			70+ J						630 C	70 C
4,4'-DDE		3.0 J	21 J						17,000 C	1900 C
Endrin		13 J							610,000 H	25,000 H
Endosulfan II				56 J					12,000,000 H	470,000 H
4,4'-DDE			13 J	87+ J					2400 C	2700 C
Endosulfan sulfate					29	73 J			12,000,000 H	470,000 H
4,4'-DDT		46 J							17,000 C	1900 C
alpha-Chlordane	4.6 J		460** J						4400 C	490 C
gamma-Chlordane	4.4 J		230* J	13 J					4400 C	490 C
Aroclor-1016				5124 J					140,000 H	5500 C
Aroclor-1248				7731 J	20000** J	28000** J			740 C	83 C
Aroclor-1254		59		22000** J	26000** J	25000** J	1000*** J		41000 H	1600 H
Aroclor-1260	100 J	150	110 J		11000** J	40000** J	750*** J		740 C	83 C

* = EPA Region III Risk-Based Concentrations, R.L. Smith.

** = Result from diluted analysis.

*** = Result taken from reanalyzed diluted sample (SS28REDE).

H = Non-carcinogenic effects.

C = Carcinogenic effects.

J = Analyte present. Reported value may not be accurate or precise.

+ = Compound not detected in diluted sample.

**DNREC
SOIL SAMPLES SCREENING DATA
VOC, SVOC and Pesticides/PCB**

Sample Location/Depth	VOC Analysis	SVOC Analysis	Pest/PCB Analysis
SB-1-1	ND	ND	ND
SB-1-4	ND	ND	ND
SB-2-1	ND	ND	ND
SB-2-4	ND*	ND*	ND*
SB-3-1	ND	PAH*	ND
SB-3-4	ND	PAH	ND
SB-4-1	ND	PAH*	ND
SB-4-4	ND	very low PAH*	ND
SB-5-1	ND	TPH, PAH	ND
SB-5-4	ND	PAH	ND
SB-6-1	ND*	TPH, PAH*	ND*
SB-6-4	ND	PAH	ND
SB-7-1	ND	TPH, PAH*	ND
SB-7-4	ND	very low PAH*	ND
SB-8-1	ND	PAH	ND
SB-8-4	ND	high PAH*	ND
SB-9-1	ND	ND	ND
SB-9-4	ND	low TPH*	ND
SB-10-1	ND*	PAH*	ND*
SB-10-4	ND*	ND*	ND*
SB-11-1	ND*	TPH, PAH*	ND*
SB-11-4	ND*	TPH, PAH*	ND*
SB-12-1	ND	ND	ND
SB-12-4	ND	ND	ND
SB-13-1	ND	ND	ND
SB-13-4	ND	low PAH	ND
SB-14-1	ND	PAH*	ND
SB-14-4	ND	TPH, PAH*	ND
SB-15-1	ND	PAH*	ND
SB-15-8	ND	low PAH*	ND
SB-16-1	ND	PAH	ND
SB-17-1	ND	TPH, high PAH*	ND

NOTES:

TPH - Total Petroleum Hydrocarbons

PAH - Polycyclic Aromatic Hydrocarbons

* - Sample submitted to LLab for confirmatory analysis

SOIL ANALYTICAL DATA

Pesticides and PCBs	Sample Number Lab Number Data Collected	mg/kg	SB-2-4 4059165 6/4/03	SB-6-1 4059168 07/03	SB-10-1 4059169 6/4/03	SB-10-4 4059170 5/7/03	SB-11-1 4059171 6/4/03	SB-11-4 4059172 6/11/03	SB-18-1 4059173 6/5/03	SB-DUP (SB-18-1) 4059168 6/5/03	SB-18-4 4059180 6/5/03	SB-19-1 4059183 6/5/03	SB-19-4 4059184 6/5/03	SB-20-1 4059181 6/5/03	SB-20-4 4059182 6/5/03	SS-21-1 4059175 6/5/03	SB-21-4 4059176 6/5/03	SB-22-1 4059173 6/5/03	SB-22-4 4059174 6/5/03	SB-23-1 4059177 6/5/03	SB-23-4 4059178 6/5/03
Gamma BHC-Lindane	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	1	ND	0.0037 R	ND	ND	ND	ND	ND	ND	0.0057 J	ND										
Aldrin	0.3	ND	0.011 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
D-DT	17	ND	ND	0.051	ND	ND	0.07 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.130
Dieldrin	61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	1000	ND	0.011 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methoxychlor	1000	ND	0.067 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alpha BHC	3	ND	0.0037 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beta BHC	NC	ND	0.0037 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Delta BHC	NC	ND	0.0037 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	17	ND	0.0072 R	0.015 J	ND	0.019 J	ND	0.049 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0075 J
D-DDE	24	ND	0.013 R	ND	ND	0.038 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toxaphene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
**Endosulfan I	1200	ND	0.0096 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
**Endosulfan II	1200	ND	0.0096 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	NC	ND	0.0072 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin Aldobdye	NC	ND	0.022 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1016	82	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1221	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1232	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1242	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1240	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1254	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCB-1260	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin Isoteno	NC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
**Alpha Chlordane	16	ND	0.0095 R	ND	ND	ND	ND	ND	ND	ND	ND	0.0069 J	ND								
**Gamma Chlordane	16	ND	0.0095 R	ND	ND	ND	0.0071 J	ND	ND	0.0012	ND	ND	ND	ND	ND	ND	0.041 J	ND	ND	ND	ND

* Uniform Risk-Based Remediation Standards for Protection of Human Health, Non-Critical Water Resource Area, Restricted Use, Surface and Subsurface Soil
 ** Endosulfan
 *** Chlordane
 NC - No Criteria
 ND - Not Detected
 J - Analyte present. Reported value may not be accurate or precise (estimated value)
 R - Unusable results. Analyte may or may not be present in the sample.

Groundwater Analytical Summary

Pesticides/PCBs	Sample Number Lab Number	Date Collected	GW-18	GW-19	GW-19RE	GW-DUP	GW-DUP	GW-DUP	GW-20	GW-21	GW-21RE	GW-22	GW-22RE	GW-23	GW-23RE
			4070633 6/20/03	4069402 6/19/03	4069402 6/19/03	4069406 (GW-19)	4069406 (GW-19)	4069406 (GW-19)	4069400 6/19/03						
	URS		ug/L												
Endrin Ketone	NC		ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	0.016 J	ND	0.0060 J
**Alpha Chlordane	2		ND	0.0094 J	0.0060 J	0.0070 J	0.0076 J	NA	NA	0.0074 J	ND	0.013 J	ND	0.015 J	0.012 J
**Gamma Chlordane	2		0.0067 J	0.029 J	0.029 J	0.011 J	0.027 J	NA	NA	ND	0.026 J	0.065 J	0.022 J	0.073 J	0.10 J
Alpha BHC	0.01		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Beta BHC	0.04		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Gamma BHC-Lindane	0.2		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Delta BHC	NC		ND	0.0076 J	ND	ND	ND	NA	NA	0.0051 J	0.0034 J	ND	ND	ND	ND
Heptachlor	0.4		ND	ND	ND	ND	ND	NA	NA	ND	ND	0.0047 J	ND	0.0050 J	0.0022 J
Aldrin	0.004		ND	0.0035 J	0.0027 J	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	0.2		ND	0.0049 J	0.0040 J	0.0065 J	ND	NA	NA	ND	ND	0.11 J	ND	0.12 J	0.12 J
p,p-DDE	0.2		ND	0.0056 J	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
p,p-DDD	0.3		ND	ND	0.0059 J	ND	0.0043 J	NA	NA	ND	ND	ND	ND	ND	0.0085 J
p,p-DDT	0.2		ND	0.0056 J	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Dieldrin	0.004		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Endrin	2		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Toxaphene	3		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
***Endosulfan II	22		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
***Endosulfan I	22		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	NC		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Endrin Aldehyde	NC		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
Methoxychlor	40		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
PCB-1016	0.10		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
PCB-1221	0.03		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
PCB-1232	0.03		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
PCB-1242	0.03		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
PCB-1248	0.03		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
PCB-1254	0.03		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND
PCB-1260	0.03		ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND

*URS - Uniform Risk-Based Remediation Standards for Protection of Human Health for Groundwater

** - Chlordane

*** - Endosulfan

NA - Not analyzed because not enough water was produced during sampling

NC - No Criteria

ND - Not Detected

J - Analyte present. Reported value may not be accurate or precise (estimated value)

RE - Samples were reanalyzed

A Street and South Walnut Street Properties

Remedial Investigation/Feasibility Study

Table 4-5
 PCBs In Soil Piles
 Remedial Investigation
 Krieger/Finger Property
 Wilmington, DE
 1 of 1

Sample Number	SOIL PILE #1		SOIL PILE #2		SOIL PILE #3		URS for Protection of Human Health							
	9909605		9909782		9909608		Non-Critical Water Resource Area			Restricted Use				
	Laboratory ID Number	Sample Depth (ft)	Sample Matrix	Sample Method	Sample Date	Sample Date	Sample Date	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil	
	Composite	Composite	Composite	Composite	Composite	Composite	Fill	Fill	Fill	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil	
	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	ug/kg	ug/kg	ug/kg	ug/kg	
	9/15/99	9/15/99	9/29/99	9/29/99	9/29/99	9/29/99	9/15/99	9/29/99	9/15/99	ug/kg	ug/kg	ug/kg	ug/kg	
	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aroclor 1242	ug/kg	48 U	960 U	37 U	180 U	130	130	300	300	3000	3000	3000	3000	
Aroclor 1248	ug/kg	3300 U	5200 U	37 U	180 U	38 U	38 U	300	300	3000	3000	3000	3000	
Aroclor 1254	ug/kg	2000 U	19000 U	610 U	890 U	38 U	38 U	300	300	3000	3000	3000	3000	
Aroclor 1260	ug/kg	4100 U	4000 U	1600 U	1300 U	38 U	38 U	300	300	3000	3000	3000	3000	

Footnotes appear at end of tables

Table 4-6
PCBs in Soil
Remedial Investigation
Krieger/Finger Property
Wilmington, DE
1 of 13

Sample Number	Laboratory ID Number	Sample Depth (ft)	Sample Matrix	Sample Date	1301 (0-2)		1301 (0-2)DL		1301 (2-4)		1301 (2-4)DL		1301 (4-6)		1301 (4-6)DL		1301 (NATIVE)		1302 (0-2)		1303 (0-2)		1304		1304DL			
					Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arcolor 1242	9809143	0-2'	Fill	8/26/99	35	U	180	U	18	U	19	U	19	U	190	U	55	U	68	U	43	U	41	U	240	P	81	U
Arcolor 1254	9809144	0-2'	Fill	8/26/99	220	U	2600	EP	4600	EP	4500	EP	4500	EP	4500	EP	55	U	68	U	43	U	41	U	240	P	250	P
Arcolor 1260	9809159	0-2'	Hand Auger	8/26/99	2000	EP	2600	EP	4500	EP	4500	EP	4500	EP	4500	EP	55	U	74	U	49	U	49	U	240	P	250	P

Sample Number	Laboratory ID Number	Sample Depth (ft)	Sample Matrix	Sample Date	1305		1305 (2-4)		1305 (4-7)		1305 (Native)		1306		1306DL		1308 (0-2)		1308 (0-2)		1308 (0-2)		1308 (0-2)		1308 (0-2)		1308 (0-2)			
					Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arcolor 1242	9809158	0-1.5'	Fill	8/26/99	41	U	38	U	38	U	46	U	38	U	1900	U	200	U	300	U	300	U	3000	U	3000	U	3000	U	3000	U
Arcolor 1254	9809159	0-1.5'	Fill	8/26/99	41	U	38	U	38	U	46	U	38	U	1900	U	200	U	300	U	300	U	3000	U	3000	U	3000	U	3000	U
Arcolor 1260	9809159	0-1.5'	Fill	8/26/99	87	U	38	U	38	U	46	U	38	U	1900	U	200	U	300	U	300	U	3000	U	3000	U	3000	U	3000	U

Table 4-6
PCBs in Soil
Remedial Investigation
Kleger/Finger Property
Wilmington, DE
2 of 13

Sample Number	1308 (2-4)		1308 (4-6)		1308 (4-8)DL		1308 (6-8)		1308 (6-8) DL		1309 (Native)		1310 (0-2)		1310 (2-4)				
	Laboratory ID Number	Sample Depth (ft)	Sample Matrix	Sample Method	Sample Date	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual		
Arceclor 1242	9910095	2-4'	Fill	Backhoe Bucket	9/13/99	18 U		Fill	Backhoe Bucket	9/13/99	37 U		Hand Auger	210 U	39 U		Backhoe Bucket	9/14/99	39 U
Arceclor 1254	9910095	4-6'	Fill	Backhoe Bucket	9/13/99	38 U		Fill	Backhoe Bucket	9/13/99	37 U		Hand Auger	210 U	39 U		Backhoe Bucket	9/14/99	39 U
Arceclor 1260	9910095	4-6'	Fill	Backhoe Bucket	9/13/99	38 U		Fill	Backhoe Bucket	9/13/99	37 U		Hand Auger	210 U	39 U		Backhoe Bucket	9/14/99	39 U

Sample Number	1310 (4-6)		1310 (6-7)		1311 (0-2)		1312 (0-2)		1402 (0-2)		URS for Protection of Human Health - Non-Critical Water Resource Area			
	Laboratory ID Number	Sample Depth (ft)	Sample Matrix	Sample Method	Sample Date	Result	Qual	Result	Qual	Result	Qual	Unrestricted Use	Restricted Use	
Arceclor 1242	9909594	4-6'	Fill	Backhoe Bucket	9/14/99	41 U		Fill	Backhoe Bucket	9/14/99	200 U		Surface	3000
Arceclor 1254	9909594	6-7'	Fill	Backhoe Bucket	9/14/99	41 U		Hand Auger	8/27/99	190 U		Subsurface	3000	
Arceclor 1260	9909594	6-7'	Fill	Backhoe Bucket	9/14/99	41 U		Hand Auger	8/27/99	190 U		Soil	3000	

Table 4-5
 PCBs in Soil
 Remedial Investigation
 Kiteger/Finger Property
 Wilmington, DE
 3 of 13

Sample Number	1312 (NATIVE)	1422 (NATIVE)	1313 (0-2)	1314 (0-2)	1315 (0-2)	1315 (0-2) DL	1316 (0-2)	1400 (0-2)	1316 (0-2) DL
Laboratory ID Number	9910053	9910054	9909131	9909134	9909135	9909135	9909136	9909137	9909165DL
Sample Depth (ft)	2'-3"		0-2'	0-2'	0-2'	0-2'	0-1'		0-1'
Sample Matrix	Native	Duplicate of 1312 (NATIVE)	Fill	Native	Fill	Fill	Fill	Duplicate of 1316 (0-2)	Fill
Sample Method	Backhoe Bucket		Hand Auger	Hand Auger	Hand Auger	Hand Auger	Hand Auger		Hand Auger
Sample Date	9/15/99	9/15/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99
	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result
Arceclor 1242 ug/kg	51 U	52 U	55 U	58 U	38 U	380 U	38 U	39 U	76 U
Arceclor 1254 ug/kg	51 U	52 U	55 U	58 U	38 U	380 U	38 U	39 U	76 U
Arceclor 1260 ug/kg	51 U	52 U	55 U	58 U	38 U	380 U	38 U	39 U	76 U

Sample Number	1400 (0-2) DL	1316 (2-4)	1316 (2-4) DL	1316 (4-6)		1316 (4-6) DL		URS for Protection of Human Health	
				1316 (4-6)	1316 (4-6) DL	Unrestricted Use	Restricted Use		
Laboratory ID Number	9909137DL	9909592	9909592DL	9910063	9910063DL	9910063DL	9910063DL	Non-Critical Water Resource Area	
Sample Depth (ft)	Duplicate of 1316 (0-2) DL	2'-4"	2'-4"	4'-6"	4'-6"	4'-6"	4'-6"	Non-Critical Water Resource Area	
Sample Matrix	2) DL	Fill	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Non-Critical Water Resource Area	
Sample Method	8/26/99	9/15/99	9/15/99	9/15/99	9/15/99	9/15/99	9/15/99	Non-Critical Water Resource Area	
Sample Date		Result	Qual	Result	Qual	Result	Qual	Non-Critical Water Resource Area	
Arceclor 1242 ug/kg	78 U	39 U	390 U	43 U	430 U	430 U	430 U	Non-Critical Water Resource Area	
Arceclor 1254 ug/kg	78 U	39 U	390 U	43 U	430 U	430 U	430 U	Non-Critical Water Resource Area	
Arceclor 1260 ug/kg	78 U	39 U	390 U	43 U	430 U	430 U	430 U	Non-Critical Water Resource Area	
	Result	Qual	Result	Qual	Result	Qual	Result	Non-Critical Water Resource Area	
								Surface	Subsurface
								Soil	Soil
								ug/kg	ug/kg
								3000	3000
								300	3000
								300	3000

Table 4-6
 PCBs in Soil
 Remedial Investigation
 Krueger/Finger Property
 Wilmington, DE
 7 of 13

Sample Number	1335 (0-2)	1337 (0-2)	1346 (0-2)	1347 (0-2)	1347 (NATIVE)	1348 (0-2)	1348 (0-2) DL	1349 (0-2)	1349 (4-6)
Laboratory ID Number	9909103	9909103	9909129	9908753	9910055	9909145	9909145DL	9908756	9910112
Sample Depth (ft)	0-2'	0-2'	0-2'	0-2'	2'-3'	0-2'	0-2'	0-2'	4'-6'
Sample Matrix	Native	Native	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Method	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Backhoe Bucket	Hand Auger	Hand Auger	Hand Auger	Backhoe Bucket
Sample Date	8/30/99	8/30/99	8/26/99	8/27/99	9/15/99	8/26/99	8/26/99	8/27/99	9/14/99
	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result
Anchor 1242	64 U	62 U	44 U	300 U	56 U	38 U	77 U	190 U	41 U
Anchor 1254	64 U	62 U	44 U	300 U	56 U	200 P	1100	1300	970
Anchor 1260	64 U	62 U	44 U	300 U	56 U	200 P	1100	1300	1000

Sample Number	1349 (4-6) DL	1349 (6-8)	1349 (8-10)	1349 (NATIVE)	1350 (0-2)
Laboratory ID Number	991012DL	9909590	9910113	9910040	9909095
Sample Depth (ft)	4'-6'	6'-8'	8'-10'	10'-11'	0-2'
Sample Matrix	Fill	Fill	Fill	Native	Fill
Sample Method	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Hand Auger
Sample Date	9/14/99	9/14/99	9/14/99	9/14/99	8/30/99
	Result	Qual	Result	Qual	Result
Anchor 1242	85 U	43 U	46 U	35 U	39 U
Anchor 1254	1100	89 P	46 U	35 U	39 U
Anchor 1260	1100	89 P	46 U	35 U	57

URS for Protection of Human Health
 Non-Critical Water Resource Area

Unrestricted Use
 Restricted Use

Surface
 Soil
 ug/kg

Surface
 Soil
 ug/kg

Surface
 Soil
 ug/kg

T100-45
 PCBs in Soil
 Remedial Investigation
 Krueger/Finger Property
 Wilmington, DE
 9 of 13

Sample Number	1351 (2-4)	1351 (4-4)	1351 (6-8)	1351 (8-9)	1351 (NATIVE)	1351 (0-2)	1356 (0-2)	1356 (2-3)
Laboratory ID Number	9910420	9910421	9910422	9910423	9910424	9909146	9909146	9909146
Sample Depth (ft)	2'-4"	4'-6"	6'-8"	8'-9"	9'-10"	0-2'	0-2'	0-2'
Sample Matrix	Fill	Fill	Fill	Fill	Native	Hand Auger	Hand Auger	Native
Sample Method	Backhoe Bucket	Hand Auger	Hand Auger	Hand Auger				
Sample Date	9/29/99	9/29/99	9/29/99	9/29/99	9/29/99	8/26/99	8/26/99	8/10/99
	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Arceclor 1242 ug/kg	40 U	43 U	41 U	44 U	57 U	39 U	200 U	56 U
Arceclor 1254 ug/kg	40 U	180 P	120	200 P	52 U	1300	460	95 P
Arceclor 1260 ug/kg	40 U	180 P	52 P	200 P	32 U	1300	460	65

Sample Number	1356 (NATIVE)	1357 (0-2)	1358 (0-2)	1359 (2-4)	URS for Protection of Human Health Non-Critical Water Resource Area			
Laboratory ID Number	9910039	9909128	9909092	9909149	9910076			
Sample Depth (ft)	3'-4"	0-2'	0-2'	0-2'	2'-4"			
Sample Matrix	Native	Fill	Fill	Fill	Fill			
Sample Method	Backhoe Bucket	Hand Auger	Hand Auger	Hand Auger	Backhoe Bucket			
Sample Date	9/13/99	8/28/99	8/20/99	8/26/99	9/13/99			
	Result	Qual	Result	Qual	Result			
Arceclor 1242 ug/kg	46 U	43 U	37 U	37 U	37 U	300	300	3000
Arceclor 1254 ug/kg	46 U	43 U	37 U	150	2300	300	3000	3000
Arceclor 1260 ug/kg	46 U	43 U	37 U	150	2500	300	3000	3000

Table 6-6
 PCBs in Soil
 Remedial Investigation
 Krieger/Finger Property
 Wilmington, DE
 10 of 13

Sample Number	1359 (2-4) DL		1359 (4-6)		1359 (6-8)		1359 (8-10)		1359 (10-11)		1359 (NATIVE)		1360	
	Laboratory ID Number	9910076DL	9910077	9910078	9910079	9910080	9910081	9910082	9910083	9910084	9910085	9910086	9910087	9910088
Sample Depth (ft)	2'-4"	4'-6"	6'-8"	8'-10"	10'-11"	11'-12"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"
Sample Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Sample Method	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Backhoe Bucket	Hand Auger	Hand Auger	Hand Auger
Sample Date	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	8/26/99	8/26/99	8/26/99
Result	370 U	40 U	13 U	170 U	40 U	43 U	54 U	38 U	54 U	54 U	38 U	190 U	190 U	190 U
Qualifier	U	P	EP	P	P	P	P	P	P	P	P	U	U	U
Detector	1242	1254	1260	1242	1254	1260	1242	1254	1260	1242	1254	1260	1242	1254
ug/kg	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
ug/kg	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

Sample Number	1361 (2-4) DL		1361 (4-6)		1361 (6-8)		1361 (8-10)		1361 (10-11)		1361 (NATIVE)		1360	
	Laboratory ID Number	9909155	9910082	9910083	9910084	9910085	9910086	9910087	9910088	9910089	9910090	9910091	9910092	9910093
Sample Depth (ft)	0-1.6'	2'-4"	4'-6"	6'-8"	8'-10"	10'-11"	11'-12"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	0'-2"	
Sample Matrix	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	
Sample Method	Hand Auger	Backhoe Bucket	Hand Auger	Hand Auger										
Sample Date	8/26/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	9/14/99	8/26/99	8/26/99	
Result	260	350 P	440 P	38 U	43 U	43 U	46 P	46 P	46 P					
Qualifier		P	P	U	U	U	P	P	P	P	P	U	U	
Detector	1242	1254	1260	1242	1254	1260	1242	1254	1260	1242	1254	1260	1242	
ug/kg	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	
ug/kg	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	

Table 4.6
 PCBs in Soil
 Remedial Investigation
 Kleiner/Finger Property
 Wilmington, DE
 12 of 13

Sample Number	1420 (2-4)	1365 (2-4) DL	1420 (2-4) DL	1365 (4-510")	1365 (NATIVE)	1366 (0-2)	1367	1401 (0-2)	1367 DL
Laboratory ID Number	9909602	9909601DL	9909602DL	9910094	9910095	9909150	9909151	9909152	9909151DL
Sample Depth (ft)	2'-4"	2'-4"	2'-4"	4'-5'10"	5'10"-7'	0-2'	0-2'	0-2'	0-2'
Sample Matrix	Duplicate of 1365 (2-4)	Fill	Duplicate of 1365 (2-4) DL	Fill	Native	Fill	Fill	Duplicate of 1367	Hand Auger
Sample Method	4)	Backhoe Bucket	4) DL	Backhoe Bucket	Backhoe Bucket	Hand Auger	Hand Auger	8/26/99	8/26/99
Sample Date	9/13/99	9/13/99	9/13/99	9/13/99	9/13/99	8/26/99	8/26/99	8/26/99	8/26/99
	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result
Atorclor 1242	ug/kg	38 U	410 U	42 U	51 U	46 U	40 U	39 U	200 U
Atorclor 1254	ug/kg	1099 E	1310 E	39 E	51 U	46 U	760 E	200 E	1100 E
Atorclor 1260	ug/kg	2600 E	3200 E	60 E	51 U	220	2900 E	2700 E	3400 E

Sample Number	1401 (0-2) DL	1373 (0-2)	1374 (0-2)	1375 (0-2)	1376 (0-2)	1376 (0-2)	1376 (0-2)	1376 (0-2)	1376 (0-2)
Laboratory ID Number	9909152DL	9909132	9909133	9909110	9909109	9909110	9909109	9909109	9909109
Sample Depth (ft)	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'	0-2'
Sample Matrix	Duplicate of 1367 (0-2) DL	Fill	Hand Auger	Native	Native	Native	Native	Native	Native
Sample Method	2) DL	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99
Sample Date	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99	8/26/99
	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result
Atorclor 1242	ug/kg	190 U	39 U	54 U	57 U	300	300	300	3000
Atorclor 1254	ug/kg	1100 E	39 U	54 U	57 U	300	300	3000	3000
Atorclor 1260	ug/kg	3500 E	460 E	54 U	57 U	300	300	3000	3000

Footnotes appear at end of tables

Table 4-6
 PCBs In Soil
 Remedial Investigation
 Krueger/Finger Property
 Wilmington, DE
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Sample Number	1998 (0-2)		1999 (0-2)		URS for Protection of Human Health					
	Laboratory ID Number	9909093	Laboratory ID Number	990744	Non-Critical Water Resource Area			Restricted Use		
Sample Depth (ft)	0-2	0-2	0-2	0-2	Unrestricted Use			Restricted Use		
Sample Matrix	Fill	Fill	Fill	Fill	Unrestricted Use			Restricted Use		
Sample Method	Hand Auger	Hand Auger	Hand Auger	Hand Auger	Unrestricted Use			Restricted Use		
Sample Date	8/10/99	8/10/99	8/27/99	8/27/99	Unrestricted Use			Restricted Use		
	Result	Qual	Result	Qual	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil	Surface Soil	Subsurface Soil
	ug/kg		ug/kg		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Arceclor 1242	37 U		210 U		300	300	3000	3000	3000	3000
Arceclor 1254	37 U		210 U		300	300	3000	3000	3000	3000
Arceclor 1260	37 U		210 U		300	300	3000	3000	3000	3000

Sample Number	Laboratory ID Number	Sample Depth (ft)	Sample Matrix	Sample Method	Sample Date
Arceclor 1242					
Arceclor 1254					
Arceclor 1260					

PCB Mass Loading
Kreiger Finger Property and Adjacent Sites
SIRB ID: DE-1067, DE-0156, DE-1291, DE-1336, and DE-1337
Wilmington, Delaware



BrightFields, Inc.

Site Photographs



PCB Mass Loading Evaluation Kreiger-Finger Property and Adjacent Sites



Site cover and canopy associated with Kreiger Finger/Landfill.



Vast amount of vegetation associated with northeast portion of the site.

PCB Mass Loading
Kreiger Finger Property and Adjacent Sites
SIRB ID: DE-1067, DE-0156, DE-1291, DE-1336, and DE-1337
Wilmington, Delaware



BrightFields, Inc.

Overland Flow Calculations

**PCB Loading Calculations from the Universal Soil Loss Equation
Krieger Finger-Finger Property and Adjacent Sites
Wilmington, DE**

Surface PCB Concentration 21 mg/kg

Symbol	Factor	Value	Units
R	Rainfall/Runoff Erosivity Index	170	10 ² ft-tonf in/acre hr
K	Soil Erodibility	0.42	0.01 tonf acre hr/ac ft-ton in
	Estimated Slope Length	98.5	Feet
	Estimated Elevation Difference	2.2	Feet
	Slope	2.23	Percent
	Erodeable Area	4.7	Acres
LS	Topographic Factor	0.280	Dimensionless
C	Cover and Management Factor	0.11	Dimensionless
P	Support Practice Factor	1	Dimensionless
	Average Annual Soil Loss	2.30	ton/ac/yr

PCB Loading via Overland Flow 206 **grams/year - PCBs**

Kreiger-Finger Property and Adjacent Sites Overland Flow

Location:

Manage Soil Topo

Net C factor	0.11
Net LS factor	0.28
Net K factor	0.42
Net contour factor	1.0
Net ridge factor	1.0
Net ponding factor	1.00

Rock cover, %

Adjust rock cover

General yield level

Surf. res. cov. values

Adjust res. burial level

Soil conditioning index

Avg. slope steepness, %

Slope length (horiz), ft

Crit. slope length, ft

Detachment on slope, V/ac/yr

Soil loss erod. portion, V/ac/yr

Soil loss for cons. plan, V/ac/yr

Sediment delivery, V/ac/yr

T value, V/ac/yr

Fuel type for entire run

Equiv. diesel use for entire simulation, gal/ac

Fuel cost for entire simulation, US\$/ac

Energy use for entire simulation, BTU/ac

Align of oper on segments | General composite segment info | Biomass by layer | Biomass summary | C subfactor by day | C subfactor by period | C subfactor by operation
 Ridges, contour by day | Erosion by day | Erosion by period | Erosion by operation | Extra C, L, crit. length values | Hydrology | Management output by day
 Management output by period | Residue values | Roughness | STRIPS_AND_BARRIERS | MANAGEMENT_STRIP_BUILDER | Runoff / Sediment overall results
 Runoff / Sediment results by day | Sediment results by flow path | Sediment by segment | Sediment by day | Soil output by day | Yield values | Visuals | Info
Soil | MISC_CALCULATIONS1 | Topography | Management | Strips / Barriers | Irrigation / Subsurface drainage | Diversion/terrace, sediment basin

Segment	Soil	Seg length (horiz), ft	Soil loss, V/ac/yr	Sed. del., V/ac/yr	Consolidation time, yr
1	Generic Soils\slil_loam (1-m OM, v. slo perm)	98	2.3	2.3	7

PCB Mass Loading
Kreiger Finger Property and Adjacent Sites
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Groundwater Transport Calculations

**PCB Loading Calculations - Groundwater Discharge to Surface Water
Krieger-Finger Property and Adjacent Sites
Wilmington, DE
DE-1067
TABLE A
Groundwater Discharge Calculations**

Location	Hydraulic Conductivity (K) (ft/day)	Horizontal Gradient (i) (ft/ft)	Cross-sectional Area (A) (ft ²)	Groundwater Discharge*	
				Liters/day	Gallons/day
Area A (1325, 1329 area)					
Minimum	29.5	0.0022	320	590	160
Maximum	166	0.003	530	7,500	1,970
Area B (1301, 1351, 1308, 1463 area)					
Minimum	29.5	0.0022	630	1,200	310
Maximum	166	0.003	1,100	15,500	4,100
Area C (1347, 1349, 1353 area)					
Minimum	29.5	0.0022	600	1,100	290
Maximum	166	0.003	1,000	14,000	3,700
Area D (COW-5, COW-6 area)					
Minimum	29.5	0.0022	470	860	230
Maximum	166	0.003	780	11,000	2,900
TOTAL					
Minimum	29.5	0.0022	2,000	3,800	990
Maximum	166	0.003	3,400	48,000	13,000

* - Groundwater Discharge (Q) = KiA

**TABLE B
Potential Groundwater PCB Concentration Calculation**

Location	Average Soil PCB concentration (µg/kg)	f _{oc} (fraction of organic carbon)		Pore Water PCB (µg/L)	
				Minimum	Maximum
Area A	82,000	0.01	0.05	18	90
Area B	1,480	0.01	0.05	0.32	1.6
Area C	170	0.01	0.05	0.037	0.19
Area D	330	0.01	0.05	0.072	0.36

**TABLE C
Estimated Mass Loadings of PCBs in Groundwater to Surface Water**

LOCATION	Average Detected Subsurface Soil Concentration/ Converted to Pore Water Concentration (µg/L)	Estimated PCB Mass Loading (g/yr)	
		Minimum	Maximum
Area A	90	19.3	245
Area B	1.6	0.69	9.2
Area C	0.19	0.08	1.0
Area D	0.36	0.11	1.5
TOTAL		20.1	255