

PCB Mass Loading
Amtrak West Yards
SIRB ID: DE-0159
Wilmington, Delaware



BrightFields, Inc.

Appendix 5

AMTRAK WEST YARDS NEW CASTLE COUNTY, DELAWARE

SIRB ID: DE-0159



GENERAL SITE INFORMATION

Site Name: Amtrak West Yards

SIRB ID Number: DE-0159

Site Location and Description: The site is located just outside of the Wilmington City limits, in New Castle County, Delaware. The property is located southwest of Beech Street, east of Alban Park Apartments, the Boxwood Industrial Park and the Browntown neighborhood, and west of interstate 95. The southern end of the property is roughly bordered by Mill Creek.

The site is currently a railroad staging and equipment yard, and is the site of the National Railroad Passenger Corporation's High Speed Center.

Previous Site Uses: The property has historically been maintained for railroading and related industry work. Historical maps of Wilmington indicate that the area was utilized as a railroad yard as early as 1884.

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.

Preliminary Assessment (PA) of the Wilmington Train Yard – In August 1987 DNREC – SIRB completed a site investigation of the Wilmington Train Yard. During the initial investigation, drums containing petroleum products were observed being staged on site. The petroleum products were from small maintenance jobs around the facility. A “no further action” was issued for this PA because a more “in depth” investigation was planned to take place on the site by DNREC – SIRB. No records in the file indicate that this follow up investigation took place.

Hydrogeologic Investigation for Transformer Oil Tank Abandonments – Amtrak Substation West Yard, Delaware – In January 1992 OHM collected six soil samples to assess contamination near former transformer oil tanks. One sample (B-1) contained a concentration of 810 mg/kg of total PCBs. In order to further assess the area, OHM completed a hydrogeologic investigation, which included sampling the groundwater and assessing the vertical and horizontal extent of the PCB contamination. OHM implemented a 10-foot square grid system over the area of concern. A secondary grid was then formed to further define the contamination using 5-foot squares. Soil samples were assessed in the field using field immunoassay kits to determine sampling points. Vertical delineation consisted of sample collection at six inch increments until screening results



indicated “clean” soil. The soil screening tests indicated the PCB contamination was confined to an approximate 450 square foot area around sampling location 2-2. Most of the contamination was confined to the surface soil (0 to 6 inches), but was reported as deep as 3 feet in some areas. In August 1998, the UST investigation was closed and the PCB contaminated soil issue was referred to DNREC-SIRB.

High Speed Training Center Investigation - In 1998, Advanced GeoServices Corp. conducted an investigation at the location of the future High Speed Training Center. Eight soil samples were collected from 0 to 2 feet in depth, and analyzed for PCBs and diesel range organics (DRO). PCBs were detected in all samples, ranging from 0.22 mg/kg to 13.0 mg/kg. C19-C36 aliphatics were detected in all samples ranging from 33 mg/kg to 440 mg/kg and C11-C22 aromatics were detected from 76 mg/kg to 1,400 mg/kg. BrightFields was unable to obtain a copy of this report (the results are summarized in the Brownfield Preliminary Assessment conducted in 2001), so the samples associated with this report are not included in any of the calculations performed during this assessment.

Brownfield Preliminary Assessment II (BPA) of Amtrak Wilmington Train Yard (West Yard)

– As part of this BPA, DNREC excavated 12 test pits and collected 13 shallow and 13 deep soil samples in November 2001. In addition, 15 shallow samples were collected from areas throughout the property ranging from non-detect to 170 mg/kg (SS-1). Twelve sediment samples were collected from wetland areas along the eastern side of the Site, as well as from Mill Creek. Three monitoring wells were installed to evaluate the groundwater beneath the site. As a result of this investigation, DNREC determined that a more extensive investigation should be completed on the property to evaluate the extent of contamination and that a remedial action may be required to prevent the inadvertent exposure of people to the soil.

Current Regulatory Status:

The BPA conducted in 2001 concluded that a more extensive investigation should be conducted. As of December 2008, no further assessment of the property has been conducted and the property appears to be in the same condition.

SUMMARY OF SITE PCB INFORMATION

Site Investigation PCB Findings:

PCBs were detected at the Amtrak West Yards ranging from non-detect to 810 mg/kg. The majority of surface soil that was sampled contained some concentration of total PCBs.

Due to the hydrologic system observed at the Amtrak West Yards individual areas of concern were not broken out, instead the site surface soil was assessed as one large area. The site has several drainage ditches directing surface water runoff to Little Mill Creek. Mill Creek flows along the southern end of the site and drains into the Christina. In addition there is a wet land area south of the site that appears to be connected to the hydrologic system as well. BrightFields considered the soil that has the potential to be eroded would all enter the wetland areas that eventually enter into tributaries of Little Mill Creek, which enters into the Christina River just southwest of the site.

BrightFields calculated a 95% upper confidence level (UCL) of the mean of the concentration of total PCBs observed in the surface soil for overland flow calculations as 282 mg/kg.

No concentrations of PCBs were reported in the subsurface saturated soil or in the groundwater.

Concentrations of PCBs on Site			
Sample Matrix	Corresponding Figure	Analytical Methods	Range of Total PCBs
Surface Soil	Figure 2	Method 8082 and Immunoassay	Not detected to 810 mg/kg
Subsurface Soil (unsaturated)	Figure 3	Method 8082 and Immunoassay	Not detected to 810 mg/kg
Subsurface Soil (saturated)	Figure 4	Method 8082 and Immunoassay	Not detected
Ground Water	Figure 5	Method 8082	Not detected

A summary of all samples collected for PCBs are presented in the attached Tables 1 through 3.

Acreage where PCBs detected:



Total area associated with surface soils impacted by PCBs is 14.5 acres. Total area of subsurface non-saturated soils impacted by PCBs is 13.5 acres. There were no reported concentrations of PCBs in subsurface soils that are in contact with groundwater or in the groundwater.

PCB Remediation Status:

There have been no remedial actions completed on the Amtrak West Yards site.



PCB MASS LOADING SUMMARY

The PCB mass loading rate to surface water via overland flow transport was estimated for the Amtrak West Yards site. There were no reported concentrations of PCBs in the subsurface saturated zone or in the groundwater; therefore, groundwater transport is not considered a mechanism of transport for PCBs at this site. 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 was estimated on this site 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 November 11, 2008 to estimate the current site ground cover and canopy. The majority of the site is composed slag, cinder, sand, and gravel; however, prior to any sediment entering into the hydrologic system (i.e. surface waters or wetlands) there appears to be a distinct buffer zone that borders the site. The cover/management factor (C) assigned to the site and associated flow path is 0.08, which corresponds to areas of bare ground to areas that currently have a vegetative cover consisting of 60% groundcover of tall weeds or short brush. Photographs of the site ground cover and canopy are attached

Site Sediment and Erosion Control Practices:

There are currently no sediment and erosion control practices being utilized on the Amtrak West Yards site.

Input Factors and Results:

Amtrak West Yards

RUSLE Factors	Values Provided	Explanation of Selection
E = rainfall/erodibility index (10 ² m-tonne-cm/ha-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)	0.280	The soil erodibility factor was chosen based on the information provided by the boring logs presented in the Brownfield Preliminary Investigation II for the Amtrak West Yards (DNREC 2001).
ls = topographic factor (dimensionless)	0.270	The slope length was estimated to 147 feet, which is the distance between the site and the closest storm water discharge location along the overland flow path. The assumed slope (1.97 ft/ft) and slope length were used to calculate a topographic factor of 0.270 from the USGS windows based application.
C = cover/management factor (dimensionless)	0.08	The cover/management factor C assigned to the site by the USGS windows based application was 0.08, which corresponds to areas of bare ground to areas that currently have a vegetative cover consisting of 60% groundcover of tall weeds or short brush.
P = support practice factor (dimensionless)	0.09	There are currently no support practice factors being implemented on the Amtrak West Yards Property.

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 is 3,600 grams per year. Please see attached table for specific variables.

Overland Flow Uncertainty Evaluation:

Specific Areas and Degree of Uncertainty for the Amtrak West Yards

	Samples Per Acre (site)	Chemical Data Quality*	Topography	Soil Type	Site Coverage	Map Quality	Distance to Discharge Points
Site Specific Information	1.03	Immunoassay Kits	Estimated based on visual inspection	Detailed logs that are located on-site.	Based on a thorough site assessment	Scaled Map	147 feet
Degree of Uncertainty	Moderate to High	High	High	Moderate	Low	Moderate	Low to Moderate

* Primary analysis used in the historical samples

Source of uncertainty for the Amtrak West Yards include the following: topography has not been well documented in the area. The slope associated with the overland flow path was estimated based on the site inspection. Groundwater depths were not available for all sample locations.



One of the major sources of uncertainty is that the investigation report of the High Speed Training facility was not present in DNREC's files and could not be reviewed. This report is discussed in the BPA II of the Amtrak West Yards by DNREC and that summary is used here. In the discussion it indicates that all surface soil samples (eight) collected from this investigation were reported to contain PCBs. These detected values were not used in our assessment of overland flow because the report could not be located.

In addition, BrightFields evaluated the overland flow from the most conservative approach. The discharge location from the site was determined to be just southwest of the site into one of the tributaries of Little Mill Creek. The loading from this site is to this hydrologic system and not actually into the Christina River. The loading to the Christina River will have to be further evaluated to have a better understanding of how much loading is actually contributed to the Christina River.

Based on these evaluations the overall level of uncertainty associated with PCB mass loading from the Amtrak West Yards is **moderate**.



Site References:

Advanced GeoServices Corp (1998), High Speed Training Center Investigation, 1998.

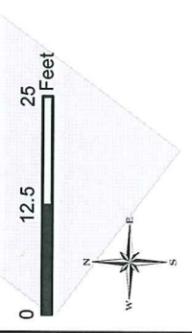
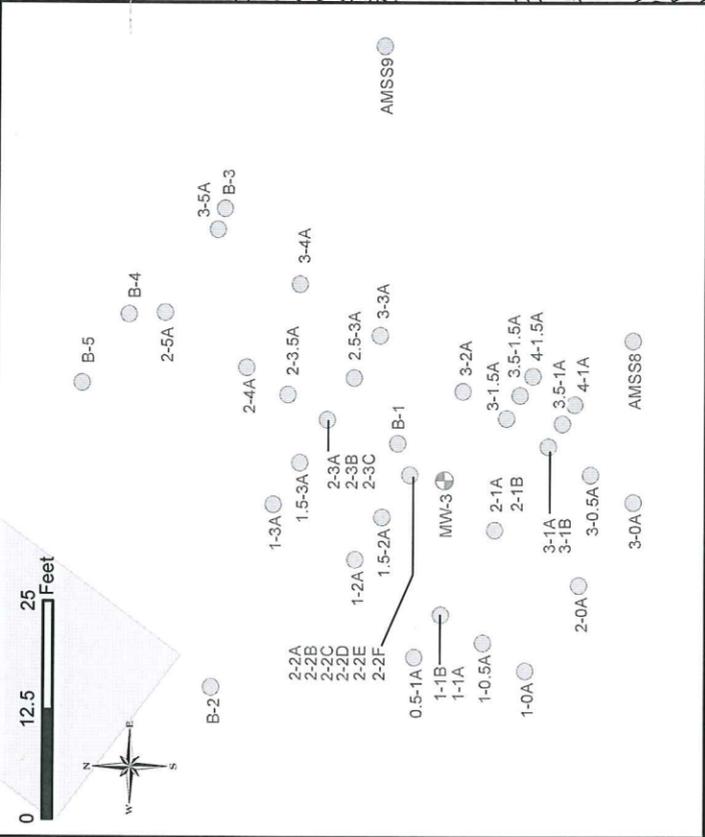
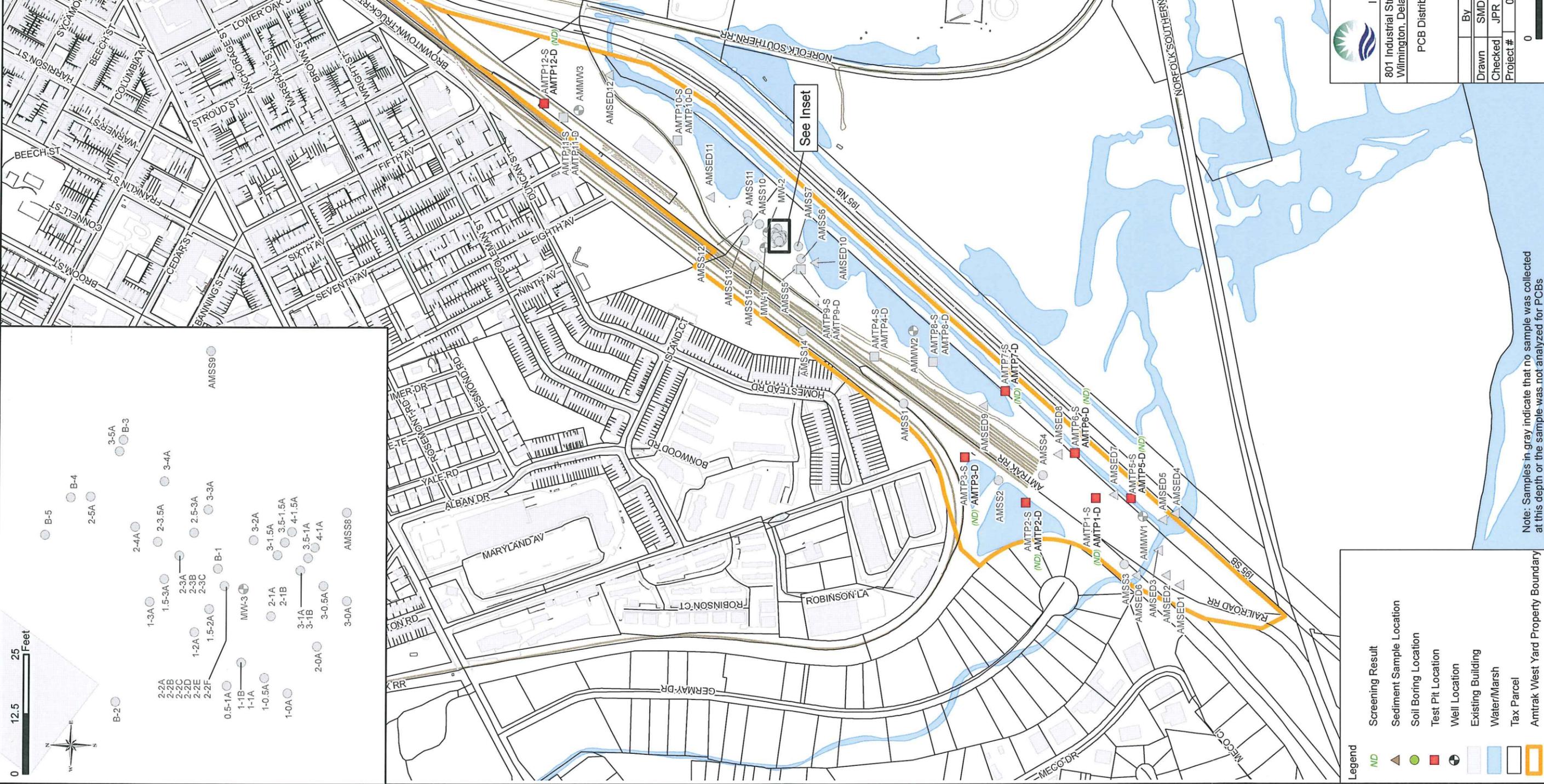
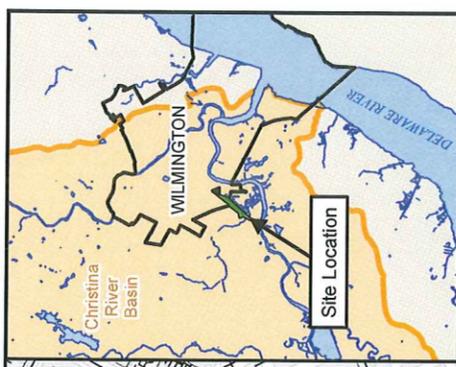
Department of Natural Resources and Environmental Control (DNREC) (2001), Brownfields Preliminary Assessment II (BPA) of Amtrak Wilmington Train Yard (West Yard), October 2001.

DNREC (1987), Preliminary Assessment (PA) of the Wilmington Train Yard. August 1987.

OHM Corporation (1993), Hydrogeologic Investigation for Transformer Oil Tank Abandonments – Amtrak Substation West Yard, Delaware, January 1993.



Figures



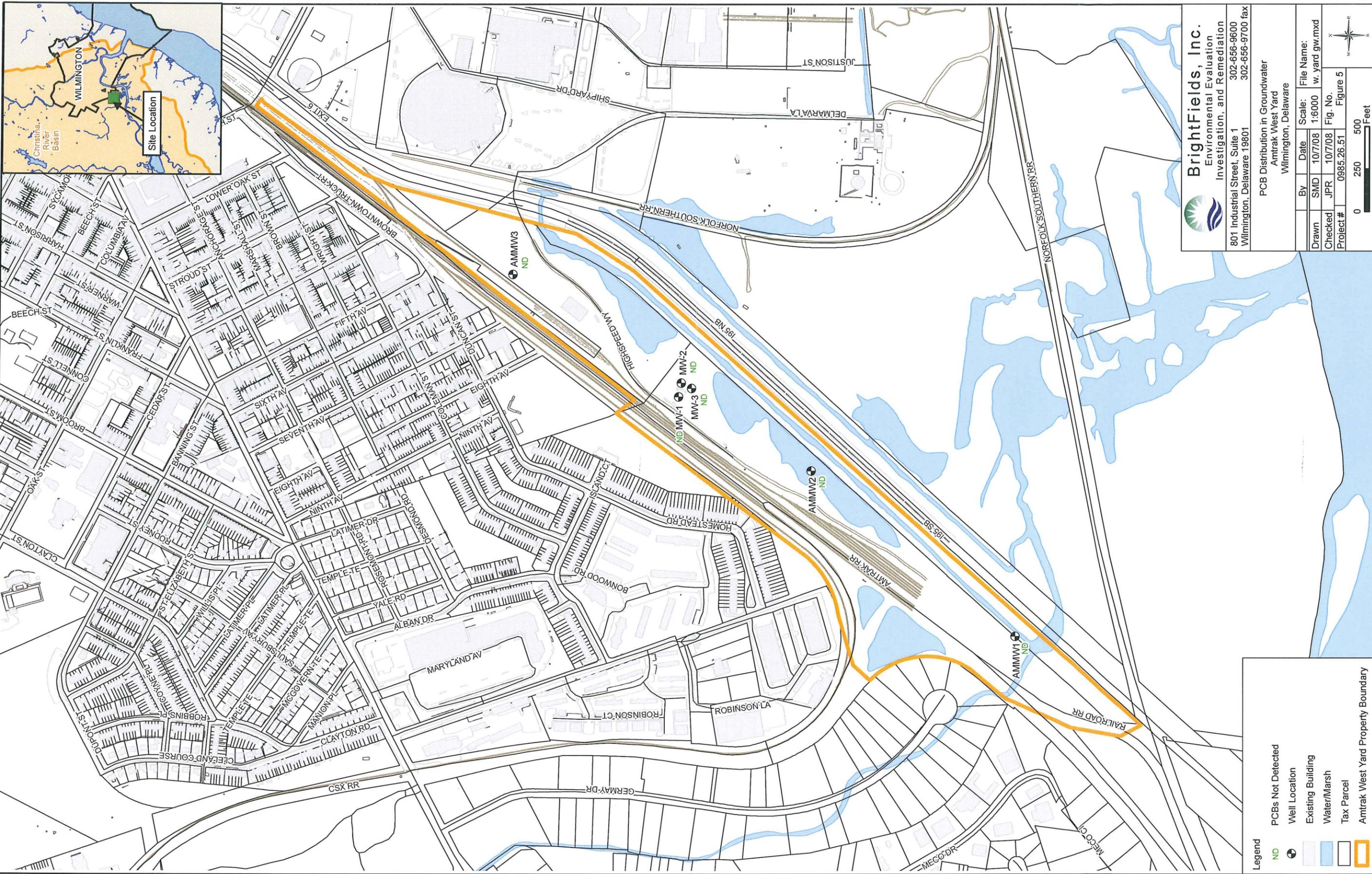
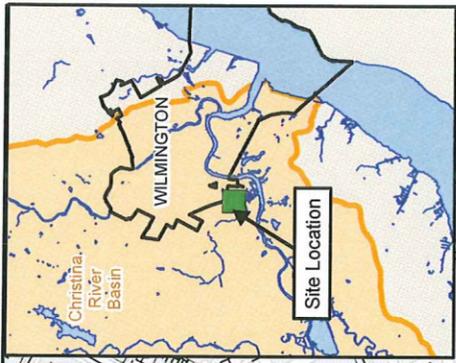
BrightFields, Inc.
 Environmental Evaluation
 Investigation, and Remediation
 801 Industrial Street, Suite 1
 Wilmington, Delaware 19801
 302-656-9600
 302-656-9700 fax

PCB Distribution in Subsurface Saturated Soil
 Amtrak West Yard
 Wilmington, Delaware

By	Date	Scale:	File Name:
Drawn	SMD 10/3/08	1:6000	w. yard unsat.mxd
Checked	JPR 10/3/08		Fig. No.
Project #	0985.26.51		Figure 4

0 250 500 Feet

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



BrightFields, Inc.
 Environmental Evaluation
 Investigation, and Remediation
 801 Industrial Street, Suite 1
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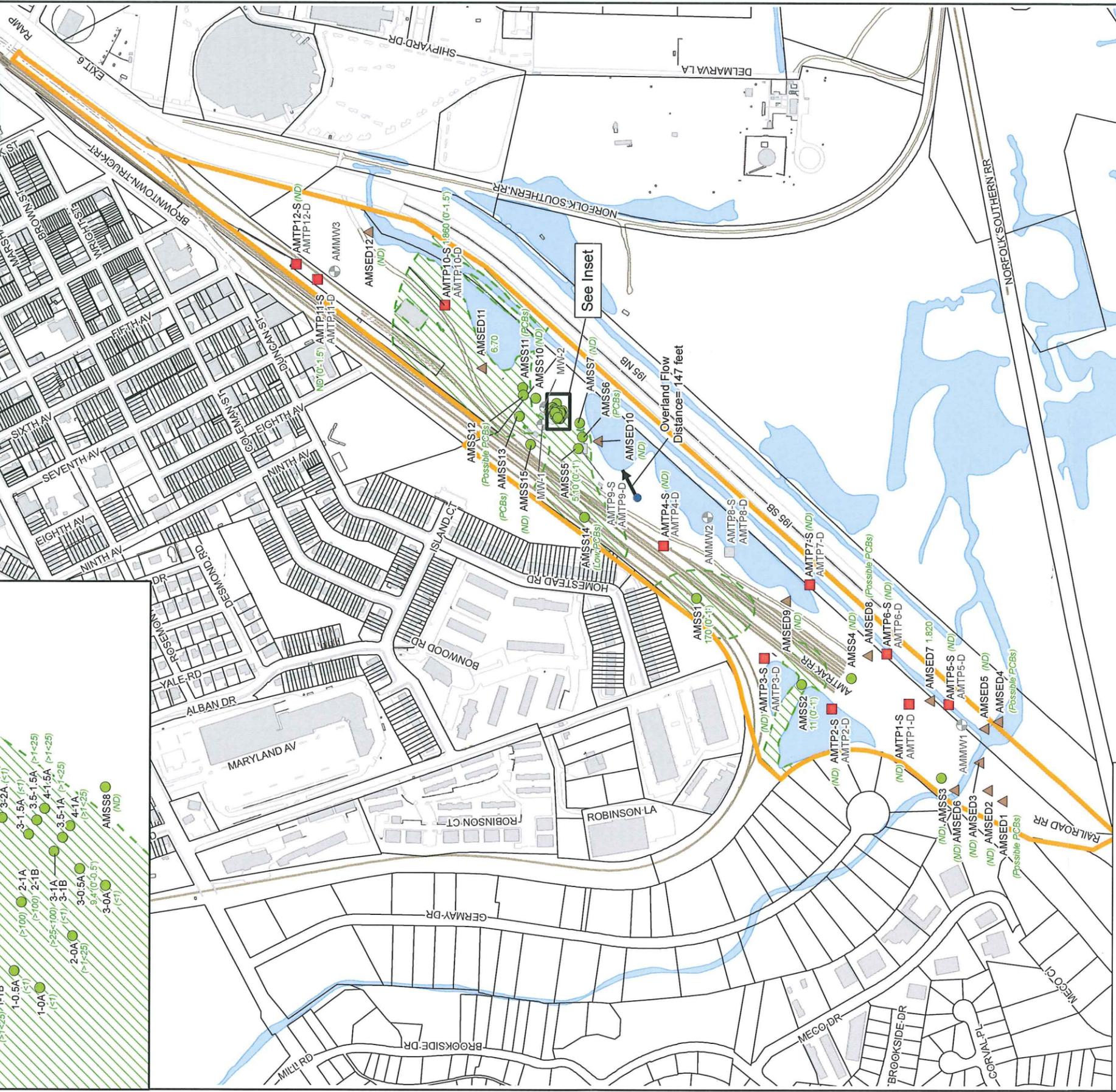
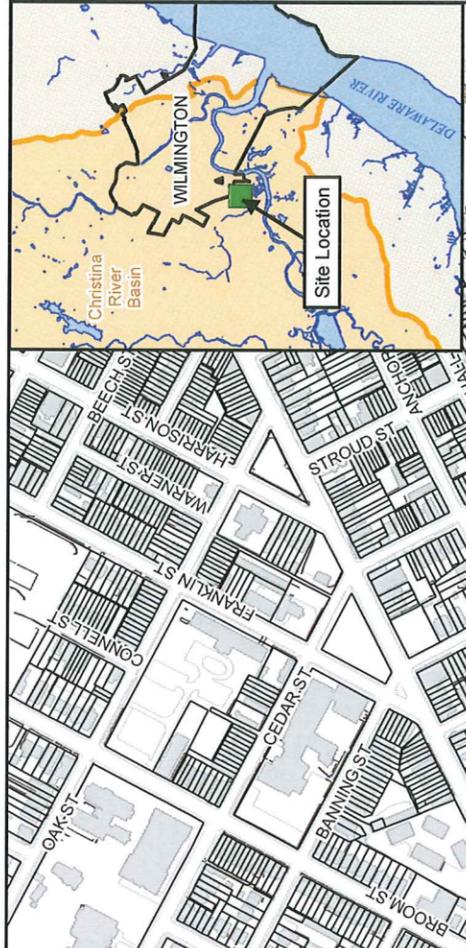
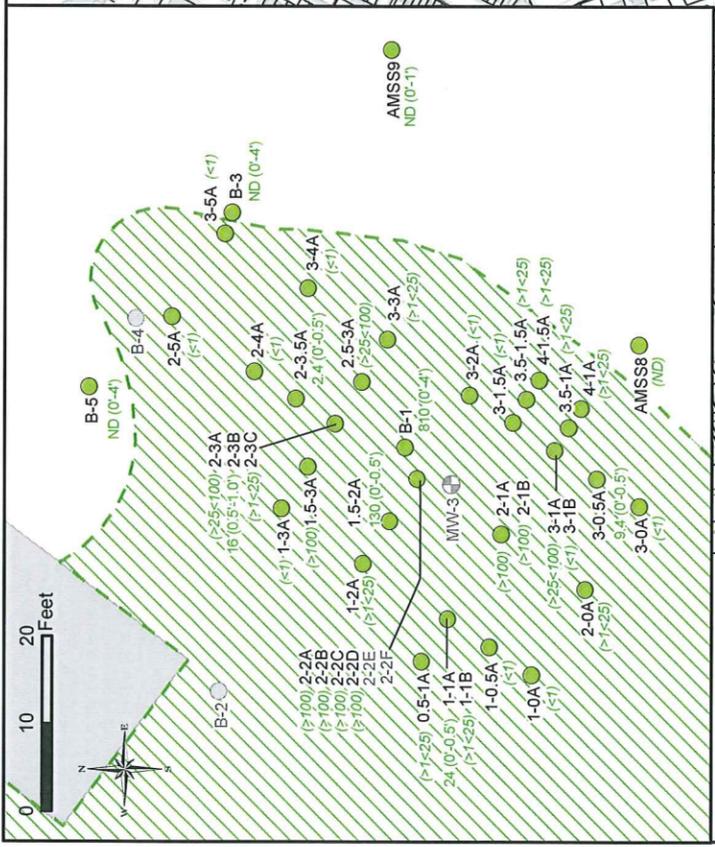
PCB Distribution in Groundwater
 Amtrak West Yard
 Wilmington, Delaware

By	Date	Scale	File Name:
Drawn SMD	10/7/08	1:6000	w. yard gw.mxd
Checked JPR	10/7/08		Fig. No.
Project #	0985.26.51		Figure 5

0 250 500 Feet

Legend

- ND PCBs Not Detected
- Well Location
- Existing Building
- Water/Marsh
- Tax Parcel
- Amtrak West Yard Property Boundary



Legend

- █ Total PCB Concentration (mg/Kg) and Sample Depth (feet)
- █ ($(>1$)
- █ (<math>(<1</math>)
- Centroid of PCB Distribution
- Sediment Sample Location
- Soil Boring Location
- Test Pit Location
- Well Location
- ↑ Overland Flow Direction
- █ Estimated PCB Contribution via Overland Flow
- █ Existing Building
- █ Water/Marsh
- █ Tax Parcel
- █ Amtrak West Yard Property Boundary

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
 Amtrak West Yard
 Wilmington, Delaware

By	Date	Scale:	File Name:
Drawn SMD	5/13/09	1:6000	w. yard topo.mxd
Checked JPR	5/13/09		Figure 6
Project #	0985.26.51		Figure 6

0 250 500 Feet

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

PCB Mass Loading
Amtrak West Yards
SIRB ID: DE-0159
Wilmington, Delaware



BrightFields, Inc.

Tables

Table 1
 PCB Laboratory Analytical Results For Soil
 Amtrak West Yards
 Wilmington, DE
 SIRB ID: DE-0159

Sample ID Sampling Depth (feet bgs) Sampling Date Units	DNREC URS for Protection of Human Health Non-critical Water Resource Area mg/Kg		AMSS1 0'-1' 7/16/2001 mg/Kg DNREC (2001)	AMSS2 0'-1' 7/16/2001 mg/Kg DNREC (2001)	AMSS5 0'-1' 7/16/2001 mg/Kg DNREC (2001)	AMSS9 0'-1' 7/16/2001 mg/Kg DNREC (2001)	AMTP10-S 0'-1.5' 7/16/2001 mg/Kg DNREC (2001)	AMTP11-S 0'-1.5' 7/16/2001 mg/Kg DNREC (2001)
	Unrestricted Use	Restricted Use						
PCBs								
Aroclor-1016	5	82	8.8 U	0.78 U	0.15 U	0.074 U	0.08 U	0.085 U
Aroclor-1221	0.3	3	8.8 U	0.78 U	0.15 U	0.074 U	0.08 U	0.085 U
Aroclor-1232	0.3	3	8.8 U	0.78 U	0.15 U	0.074 U	0.08 U	0.085 U
Aroclor-1242	0.3	3	8.8 U	0.78 U	0.15 U	0.074 U	0.08 U	0.085 U
Aroclor-1248	0.3	3	8.8 U	0.78 U	0.15 U	0.074 U	0.08 U	0.085 U
Aroclor-1254	0.3	3	8.8 U	0.78 U	2.3	0.074 U	0.91	0.085 U
Aroclor-1260	0.3	3	170	11	2.8	0.074 U	0.095	0.085 U
Aroclor-1262	nca	nca	8.8 U	0.78 U	0.15 U	0.074 U	0.08 U	0.085 U
Aroclor-1268	nca	nca	8.8 U	0.78 U	0.15 U	0.074 U	0.08 U	0.085 U
Total PCBs	1	1	170	11	5.1	ND	1.05	ND

DNREC - Brownfield Preliminary Assessment II for Amtrak West Yards (November 2001)
 OHM - Hydro Investigation (1993)

Qualifiers

U - The compound was not detected above the indicated laboratory detection limit
 NR - Not analyzed
 nca - no criteria available
 bold - concentration is above DNREC URS unrestricted use criteria
 shaded - concentration is above DNREC URS restricted use criteria

Table 1
 PCB Laboratory Analytical Results For Soil
 Amtrak West Yards
 Wilmington, DE
 SIRB ID: DE-0159

Sample ID Sampling Depth (feet bgs) Sampling Date Units Report Issued	DNREC URS for Protection of Human Health Non-critical Water Resource Area mg/Kg		B-2 4'-6' 7/1/1992 mg/Kg OHM (1993)	B-1 0'-4' 7/1/1992 mg/Kg OHM (1993)	B-5 0'-4' 7/1/1992 mg/Kg OHM (1993)	B-4 4'-6' 7/1/1992 mg/Kg OHM (1993)	B-3 0'-4' 7/1/1992 mg/Kg OHM (1993)	2-3-5A 0'-0.5' 2/8/1993 mg/Kg OHM (1993)
	Unrestricted Use	Restricted Use						
PCBs								
Aroclor-1016	5	82	nca	nca	nca	nca	nca	0.65 U
Aroclor-1221	0.3	3	nca	nca	nca	nca	nca	0.65 U
Aroclor-1232	0.3	3	nca	nca	nca	nca	nca	0.65 U
Aroclor-1242	0.3	3	nca	nca	nca	nca	nca	0.65 U
Aroclor-1248	0.3	3	nca	nca	nca	nca	nca	0.65 U
Aroclor-1254	0.3	3	nca	nca	nca	nca	nca	0.65 U
Aroclor-1260	0.3	3	nca	nca	nca	nca	nca	2.4
Aroclor-1262	nca	nca	nca	nca	nca	nca	nca	0.65 U
Aroclor-1268	nca	nca	nca	nca	nca	nca	nca	0.65 U
Total PCBs	1	1	ND	810	ND	ND	ND	2.4

DNREC - Brownfield Preliminary Assessment II for Amtrak West Yards (November 2001)
 OHM - Hydro Investigation (1993)

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Table 1
 PCB Laboratory Analytical Results For Soil
 Amtrak West Yards
 Wilmington, DE
 SIRB ID: DE-0159

Sample ID Sampling Depth (feet bgs) Sampling Date Units Report Issued	DNREC URS for Protection of Human Health Non-critical Water Resource Area mg/Kg		1.5-2A 0'-0.5' 2/8/1993 mg/Kg OHM (1993)	3-0.5A 0'-0.5' 2/8/1993 mg/Kg OHM (1993)	1-1A 0'-0.5' 2/8/1993 mg/Kg OHM (1993)	2-2F 2.5'-3.0' 2/8/1993 mg/Kg OHM (1993)	2-3B 0.5'-1.0' 2/8/1993 mg/Kg OHM (1993)	1-1A 0'-0.5' 2/8/1993 mg/Kg OHM (1993)
	Unrestricted Use	Restricted Use						
PCBs								
Atroclor-1016	5	82	65 U	3.3 U	6.5 U	3.3 U	6.5 U	6.5 U
Atroclor-1221	0.3	3	65 U	3.3 U	6.5 U	3.3 U	6.5 U	6.5 U
Atroclor-1232	0.3	3	65 U	3.3 U	6.5 U	3.3 U	6.5 U	6.5 U
Atroclor-1242	0.3	3	65 U	3.3 U	6.5 U	3.3 U	6.5 U	6.5 U
Atroclor-1248	0.3	3	65 U	3.3 U	6.5 U	3.3 U	6.5 U	6.5 U
Atroclor-1254	0.3	3	130	3.3 U	24	9.4	16	24
Atroclor-1260	0.3	3	65 U	9.4	6.5 U	3.3 U	6.5 U	6.5 U
Atroclor-1262	nca	nca	65 U	3.3 U	6.5 U	3.3 U	6.5 U	6.5 U
Atroclor-1268	nca	nca	65 U	3.3 U	6.5 U	3.3 U	6.5 U	6.5 U
Total PCBs	1	1	130	9.4	24	9.4	16	24

DNREC - Brownfield Preliminary Assessment II for Amtrak West Yards (November 2001)
 OHM - Hydro Investigation (1993)

Qualifiers
 U - The compound was not detected above the indicated laboratory detection limit
 NR - Not analyzed
 nca - no criteria available
 bold - concentration is above DNREC URS unrestricted use criteria
 shaded - concentration is above DNREC URS restricted use criteria

Table 2
 DNREC PCB Screening Data
 Amtrak West Yards
 Wilmington, DE
 SIRB ID: DE-0159

Sample ID	Sample Depth	Investigation Report	Sample Date	DNREC URS for Protection of human health (Non-critical Water Resource Area) Unrestricted Use (mg/kg)	Total PCBs (mg/kg)
AMTP5-S	0.5-1.0'	DNREC	7/16/01	1	ND
AMTP6-S	0.5-1.0'	DNREC	7/16/01	1	ND
AMTP7-S	0.5-1.0'	DNREC	7/16/01	1	ND
AMSS10	0'-1'	DNREC	7/16/01	1	ND
AMSS11	0'-1'	DNREC	7/16/01	1	PCBs
AMSS12	0'-1'	DNREC	7/16/01	1	Possible PCBs
AMSS14	0'-1'	DNREC	7/16/01	1	Low PCBs
AMSS15	0'-1'	DNREC	7/16/01	1	ND
AMSS3	0'-1'	DNREC	7/16/01	1	ND
AMSS4	0'-1'	DNREC	7/16/01	1	ND
AMSS6	0'-1'	DNREC	7/16/01	1	PCBs
AMSS7	0'-1'	DNREC	7/16/01	1	ND
AMSS8	0'-1'	DNREC	7/16/01	1	ND
AMTP12-S	0-1.2'	DNREC	7/16/01	1	ND
AMSS13	0'-1.5'	DNREC	7/16/01	1	PCBs
AMTP2-S	0'-1.5'	DNREC	7/16/01	1	ND
AMTP3-S	0'-1.5'	DNREC	7/16/01	1	ND
AMTP4-S	1.0-1.5'	DNREC	7/16/01	1	ND
AMTP1-S	1.5'-2.0'	DNREC	7/16/01	1	ND
AMTP11-D	3.0'	DNREC	7/16/01	1	PCBs
AMTP5-D	4.0-5.0'	DNREC	7/16/01	1	ND
AMTP6-D	4.0-5.0'	DNREC	7/16/01	1	ND
AMTP3-D	5.5-6.0'	DNREC	7/16/01	1	ND
AMTP4-D	5.5-6.0'	DNREC	7/16/01	1	ND
AMTP1-D	6.0'-7.0'	DNREC	7/16/01	1	ND
AMTP2-D	6.0'-7.0'	DNREC	7/16/01	1	ND
AMTP7-D	6.0'-7.0'	DNREC	7/16/01	1	ND
AMTP10-D	8.0'-9.0'	DNREC	7/16/01	1	ND
AMTP12-D	8'-9'	DNREC	7/16/01	1	ND
2-5A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
3-5A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
3-4A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
2-4A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
1-3A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
2-3A	0'-0.5'	OHM Corporation	2/8/1993	1	>25<100
1.5-3A	0'-0.5'	OHM Corporation	2/8/1993	1	>100
2.5-3A	0'-0.5'	OHM Corporation	2/8/1993	1	>25<100
3-3A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25
3-2A	0-0.5'	OHM Corporation	2/8/1993	1	<1
2-2A	0'-0.5'	OHM Corporation	2/8/1993	1	>100
1-2A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25
1-0A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
2-0A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25
3-0A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
4-1A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25

DNREC - Brownfield Preliminary Assessment II for Amtrak West Yards (November 2001)

OHM - Hydro Investigation (1993)

Qualifiers:

ND - compound was not detected

Bold - concentration exceeds URS

nca - no criteria available

Table 2
 DNREC PCB Screening Data
 Amtrak West Yards
 Wilmington, DE
 SIRB ID: DE-0159

Sample ID	Sample Depth	Investigation Report	Sample Date	DNREC URS (Non-critical Water Resource Unrestricted Use (mg/kg))	Total PCBs (mg/kg)
1-0.5A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
0.5-1A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25
2-1A	0'-0.5'	OHM Corporation	2/8/1993	1	>100
3-1A	0'-0.5'	OHM Corporation	2/8/1993	1	>25<100
3.5-1A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25
3-1.5A	0'-0.5'	OHM Corporation	2/8/1993	1	<1
3.5-1.5A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25
4-1.5A	0'-0.5'	OHM Corporation	2/8/1993	1	>1<25
1-1B	0.5'-1.0'	OHM Corporation	2/8/1993	1	>1<25
2-1B	0.5'-1.0'	OHM Corporation	2/8/1993	1	>100
3-1B	0.5'-1.0'	OHM Corporation	2/8/1993	1	<1
2-2B	0.5'-1.0'	OHM Corporation	2/8/1993	1	>100
2-2C	1.0'-1.5'	OHM Corporation	2/8/1993	1	>100
2-2D	1.5'-2.0'	OHM Corporation	2/8/1993	1	>100
2-2E	2.0'-2.5'	OHM Corporation	2/8/1993	1	>25<100
2-3C	1.0'-1.5'	OHM Corporation	2/8/1993	1	>1<25

DNREC - Brownfield Preliminary Assessment II for Amtrak West Yards (November 2001)

OHM - Hydro Investigation (1993)

Qualifiers:

ND - compound was not detected

Bold - concentration exceeds URS

nca - no criteria available

Table 3
 PCB Laboratory Analytical Results For Groundwater
 Amtrak West Yards
 Wilmington, DE
 SIRB ID: DE-0159

Sample ID Sampling Date Units Report Issued	DNREC URS for Protection of Human Health ug/L	AMMW1 7/29/2001 ug/L DNREC	AMMW2 7/29/2001 ug/L DNREC	AMMW3 7/29/2001 ug/L DNREC	MW-1 2/4/1993 ug/L OHM Corporation	MW-3 2/4/1993 ug/L OHM Corporation	MW-2 2/4/1993 ug/L OHM Corporation
PCBs							
Aroclor-1016	0.1	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U
Aroclor-1221	0.03	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U
Aroclor-1232	0.03	0.3 U	0.3 U	0.3 U	1 U	1 U	1 U
Aroclor-1242	0.03	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U
Aroclor-1248	0.03	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U
Aroclor-1254	0.03	0.4 U	0.4 U	0.4 U	1 U	1 U	1 U
Aroclor-1260	0.03	0.5 U	0.5 U	0.5 U	1 U	1 U	1 U
Aroclor-1262	nca	0.2 U	0.2 U	0.2 U	NR	NR	NR
Aroclor-1268	nca	0.2 U	0.2 U	0.2 U	NR	NR	NR

DNREC - Brownfield Preliminary Assessment II for Amtrak West Yards
 (November 2001)

OHM - Hydro Investigation (1993)

Qualifiers

U - The compound was not detected above the indicated laboratory detection limit

NR - Not analyzed

nca - no criteria available

bold - concentration is above DNREC URS unrestricted use criteria

shaded - concentration is above DNREC URS restricted use criteria

PCB Mass Loading
Amtrak West Yards
SIRB ID: DE-0159
Wilmington, Delaware



BrightFields, Inc.

Site Photographs

**PCB Mass Loading Evaluation
Amtrak West Yards**

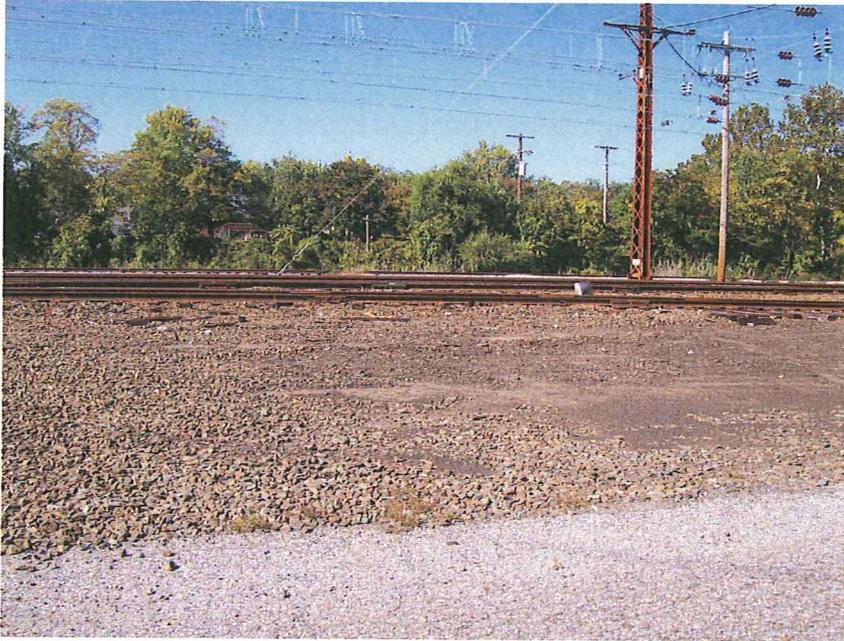


Transformer area where OHM completed their grid sampling.



Vegetative buffer zone prior to any sediments entering surface waters.

**PCB Mass Loading Evaluation
Amtrak West Yards**



Cinder ash, sand, and gravel surface cover located adjacent to the tracks.



View of surface cover at the Amtrak West Yards facility.

PCB Mass Loading Evaluation Amtrak West Yards



Ponding water located just west of property, part of marsh area. Distinct elevation change in the vegetative boundary of the site.



Newly constructed High Speed Training Facility and its associated storm water management controls.

PCB Mass Loading
Amtrak West Yards
SIRB ID: DE-0159
Wilmington, Delaware



BrightFields, Inc.

Overland Flow Calculations

**PCB Loading Calculations from the Revised Universal Soil Loss Equation
Amtrak West Yards
Wilmington, DE
DE-0159**

Surface PCB Concentration 282 mg/kg

Symbol	Factor	Value	Units
R	Rainfall/Runoff Erosivity Index	170	10 ² ft-tonf in/acre hr
K	Soil Erodibility	0.28	0.01 tonf acre hr/ac ft-ton in
	Estimated Slope Length	147	Feet
	Estimated Elevation Difference	2.9	Feet
	Slope	1.97	Percent
	Erodeable Area	14.5	Acres
LS	Topographic Factor	0.260	Dimensionless
C	Cover and Management Factor	0.08	Dimensionless
P	Support Practice Factor	1	Dimensionless
	Average Annual Soil Loss	0.98	ton/ac/yr

**PCB Loading via Overland
Flow** 3,640 **grams/year - PCBs**

Amtrak West Yards

Location: USA/Delaware/New Castle County

Net C factor	0.080
Net LS factor	0.26
Net K factor	0.28
Net contour factor	1.0
Net ridge factor	1.0
Net ponding factor	1.0

Rock cover, % 0 open

Adjust rock cover Set by user

General yield level Surf. cover

Surf. res. cov. values Normal res. burial

Adjust res. burial level

Soil conditioning index open

Energy use for entire simulation, BTU/ac:

Energy use for entire simulation, gal/ac:

Fuel cost for entire simulation, US\$/ac:

Manage Soil Topo

Avg. slope steepness, %: Slope length (horiz), ft: Crit. slope length, ft:

Detachment on slope, t/ac/yr: Soil loss erod. portion, t/ac/yr: Soil loss for cons. plan, t/ac/yr: T value, t/ac/yr:

Sediment delivery, t/ac/yr:

Fuel type for entire run:

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 year | 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 segment by day | Soil output by day | Yield values | Visuals | Info

Soil | MISC_CALCULATIONS1 | Topography | Management | Strips / Barriers | Irrigation / Subsurface drainage | Diversion/terrace, sediment basin

Slope Soils

Segment	Soil	Seg length (horiz), ft	Soil loss, t/ac/yr	Sed. del., t/ac/yr	Consolidation time, yr
+	Generic Soils\sandy loam (Fm DM, slo perm)	150	0.98	0.98	7

PCB Mass Loading
Amtrak West Yards
SIRB ID: DE-0159
Wilmington, Delaware



BrightFields, Inc.

Groundwater Transport Calculations

(Not Applicable)