

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



## **Appendix 6**

# **CHICAGO BRIDGE & IRON SITE**

**NEW CASTLE, DELAWARE**

**SIRS IDs: DE-0038, DE-1038**

## **GENERAL SITE INFORMATION**

**Site Name: Chicago Bridge & Iron Site**

**SIRS ID Numbers: DE-0038, DE-1038**

**Site Location and Description:**

The Chicago Bridge & Iron Site is located at Wilmington Road (U.S. Route 9) and Anchor Mill Road on 801 East Sixth Street in New Castle, Delaware. The site is approximately 105 acres in size and is comprised of ten tax parcels (#2100500051, #2100700236, #2100700252, #2100700255, #2100700256, #2100700257, #2100800002, #2100800003, #2100800004, and #2100800005) (Figure 1). The majority of the site has been developed by Chicago Bridge & Iron (CBI). The site is bordered to the northwest by a railroad spur and residential areas, to the west by a City of New Castle electrical substation and a 1 million gallon elevated water tank for the City, to the south by the Carpenter Warehouse complex, to the southeast by the Delaware River, and to the east by a stream which discharges to the Delaware River and Buttonwood Ditch.

Surface water on the Site is expected to flow southeast towards the Delaware River or into the two retentions ponds onsite.

The site is currently owned by Chicago Bridge and Iron Company. In the developed area there is an office building, warehouse, former fabrication shop, parking areas, and designated outdoor storage areas. The whole developed area is surrounded by a fence. The undeveloped area of the site has building foundations remaining from at least six Baldt Steel company buildings as well as a former house and well, both abandoned.

**Previous Site Uses:**

The Chicago Bridge & Iron Site was used for steel manufacturing. From 1899 to 1929, the Baldt Steel Company, a steel pipe manufacturer, operated on the eastern portion of the site. The site was inactive from 1929 until 1956, when CBI purchased the property. CBI constructed a fabrication shop along the southwestern border of the property and manufactured steel plates and steel plate structures from 1957 until 1980. The steel manufacturing process generated neutralized acid wastes which were disposed of in an unlined pit beginning in 1958. In 1959 the city of New Castle discovered problems with low pH and high iron and manganese

concentrations in a shallow well gallery system 2,000 feet west of the site. In the early 1960s, the Delaware Water Pollution Commission requested that CBI begin discharging the waste into a different pit located on the property. CBI also conducted painting operations at the property. The painting operations included the use of “red lead” primer, vinyl and epoxy primers, and limited amounts of zinc and chromium based primers. Excess primer would accumulate on the ground surface by overspray or by dripping off of the steel surfaces during the painting operations. According to the 1981 Preliminary Assessment, when the fabrication facility stopped operating in 1980 the wastes on-site were disposed of and waste acid storage tanks were cleaned. In 1981 the CBI property was added to the Delaware DNREC uncontrolled hazardous waste site list. The print shop stopped operating in 1984 so ammonia and solvents were no longer produced, only x-ray film fixer and waste oil continued to be produced, both of which were recycled throughout operations at the site.

### **Site Regulatory Status:**

This section briefly summarizes previous investigations performed on the site through the SIRS program. A current SIRS regulatory status is also included.

#### **Site Closure Plan (1980)**

After the fabrication shop ceased operations in 1980, CBI developed and submitted a closure plan for proper disposal of all accumulated wastes to DNREC. It was approved, implemented, and completed by April 1980. This did not include the Drum Storage Area which was still active.

#### **Preliminary Assessment (Ecology and Environment, 1981)**

The Preliminary Assessment (PA) states that the company’s disposal practices varied over the years of operation. From 1958 through the early 1960s, an on-site pit was used to dispose of neutralized sulfuric and phosphoric acid wastewater. After this time period, four old foundation pits on the northeast edge of the property were used until 1976. Later, the acid wastewater was stored in fiberglass tanks and then disposed of offsite. Testing near the foundation pits revealed contaminant concentrations below maximum allowable RCRA levels. At the time of the PA, waste acids were no longer being produced and the tanks were emptied and cleaned. Ecology and Environment recommended No Further Action. However, the report was modified in January 1982 to recommend sampling and analysis.

**Site Inspection (DNREC, 1982)**

DNREC collected eight soil samples and analyzed them for EP toxicity, TCE, PCE, beta-chloropropyl phosphate (PCF-TRIS), PCBs, sulfate, and total phosphorus. All organics were below laboratory detection limits and the EP toxicity analysis did not reveal any contaminants above allowable levels. Sulfate concentrations ranged from 6 to 980 mg/l and total phosphorus ranged from 0.36 to 3.3.7 mg/l.

**Preliminary Assessment (DNREC, 1984)**

DNREC performed the PA and suggested a very low priority site inspection to determine if contamination had resulted from the old disposal areas since closure in 1976. Additionally, the PA recommended soil sampling for sulfates, total phosphorus, and metals in the old disposal area.

**Site Inspection (NUS Corporation, 1988)**

The Site Inspection (SI) was performed on a 65 acre parcel of land within the site off of Sixth Street. It was focused on the former disposal area. Some of the observations included several dead trees in and around the disposal area and orange-yellow soil (indicating the presence of the solid component of acid waste) at least 2.5 feet below the ground surface for two auger sampling locations. A total of 20 soil and seven water samples were collected, including blanks and duplicates. Aroclor 1254 was detected in soil sample S-1 and a background soil sample at concentrations of 27 ppm and 21 ppm, respectively. PCBs were not detected in samples from the neutralized acid disposal area. At the time, the EPA clean-up level for PCBs in soil was 25 ppm in restricted access areas and 10 ppm in residential areas. Low concentrations were also detected in samples S-8 and S-9.

**Preliminary Assessment (Duffield Associates, 1993)**

Duffield Associates, Inc. (Duffield) performed a PA of a 50 foot by 1,000 foot area on the property to be leased by Mr. Ivan Stern. The area began at the Delaware River and extended 1,000 feet inland parallel to the New Castle Warehouse/CBI property line. During the walking visual reconnaissance, Duffield Associates noticed remains from three buildings from the 1930s and solid waste piles including wood, concrete, metal, and empty 5-gallon cans for roof coating. In December 1992 five soil samples were collected and analyzed for Total Petroleum Hydrocarbons (TPH) and RCRA Metals. No concentrations of petroleum hydrocarbons or

metals exceeded New Jersey Department of Environmental Protection and Energy (NJDEPE) non-residential criteria in the samples.

**Interim Response Documentation Report (AWARE Environmental Inc., 1995)**

In 1993 CBI Services, Inc. entered into a Consent Order with DNREC and agreed to design and implement a Remedial Investigation (RI) and conduct an Interim Remedial (IR) response for the former fabrication shop. The Interim Response Documentation Report for Interim-2 Area was submitted in March 1995.

As a part of the Interim Response, Phase I excavations began in August 1994 throughout the 1.5 acre Interim-2 Area. Seven areas were excavated to the depth of a clayey silt layer to remove soil visibly impacted with lead. Two composite confirmatory samples, ES-A and ES-B, were collected and analyzed. All constituents of concern (including PCBs) were below the established clean-up levels. As a part of Phase II excavations, CBI remediated four areas in December 1994 to remove lead impacted soil. The four areas were excavated to the depth of a clayey silt layer, removing a total of 341 cubic yards of soil. Phase II confirmatory samples, collected after remedial activities, indicated contaminant concentrations (including PCBs) below clean-up goals. All of the excavated areas from Phase I and Phase II were backfilled and compacted. The excavated soil was disposed of offsite as non-hazardous waste.

**Remedial Investigation Report (AWARE Environmental Inc., 1996)**

AWARE Environmental Inc. performed an RI of the property to examine potential impacts from previous operations. The areas of focus for the RI were the warehouse area, the acid disposal area/old Baldt Steel foundations, the NUS S-1 sample location, the drainage ditches, and the landfill area. AWARE Environmental collected soil, sediment, surface water, and groundwater samples across the site. PCBs were only detected in soil and sediment samples collected from the drainage ditches.

**Current Regulatory Status:**

In 1996 DNREC stated that no further action was required for the areas remediated through interim response activities, and for all areas sampled except for groundwater. A groundwater monitoring plan was established and monitoring began in November 1996 and continued quarterly until it was changed to semi-annual in May 1997, then to annual in November 2001.

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



According to a memo addressed to CBI from Aware Environmental Inc., in 2008 permanent monitoring wells MW-2A and MW-3A on the DE-1038 property were properly abandoned.

## SUMMARY OF SITE PCB INFORMATION

### Site Investigation PCB Findings:

For purposes of the PCB loading estimates, surface soil is defined as 0 to 2 feet below ground surface (bgs). Samples collected from soil depths spanning 2 feet bgs were included in both the surface and subsurface data sets.

PCBs were detected in 23 surface soil samples with concentrations ranging from 0.036 mg/kg to 27 mg/kg. PCBs were not detected in unsaturated subsurface soil samples. No saturated soil samples were analyzed for PCBs.

Due to the fact that there were only three detections in the surface soil collected from areas that are not currently paved or covered by a building, the maximum detected value (0.20 mg/kg) was used in the calculations instead of calculating the 95% upper confidence limit (UCL) of the mean of the concentration of total PCBs observed in the surface soil (for overland flow calculations).

There were no PCBs detected in groundwater.

Concentrations of PCBs on Site			
Sample Matrix	Corresponding Figure	Analytical Methods	Range of Total PCBs
Surface Soil	Figure 2	Method 8082	Not detected to 27 mg/kg
Subsurface Soil (unsaturated)	Figure 3	Method 8082	Not Detected
Subsurface Soil (saturated)	Figure 4	Not Analyzed	Not Analyzed
Groundwater	Figure 5	Method 8082	Not Detected

A summary of all samples collected for PCB analyses are presented in Tables 1 and 2.

### Acreage where PCBs detected:

The estimated surface soil impacted by PCBs is 24.5 acres (Figure 2). Based on the data available and reviewed by BrightFields, the subsurface soil and groundwater are not impacted by PCBs.

### PCB Remediation Status:

PCB remediation is not presently required for the Chicago Bridge & Iron Site.

## **PCB MASS LOADING SUMMARY**

The PCB mass loading rate to surface water via overland flow was estimated for the Chicago Bridge & Iron site. No samples from the subsurface saturated zone were analyzed for PCBs and there were no reported concentrations of PCBs in the groundwater; therefore, groundwater transport cannot be evaluated as a mechanism of transport for PCBs at the Property. 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:**

The surface cover and flow paths were assessed through aerial photography and available contour mapping (Delaware Data Mil, 2007). The cover/management factor C assigned to the site was 0.003, which corresponds to a grass like vegetative cover with greater than 95% coverage.

### **Site Sediment and Erosion Control Practices:**

Based on the aerial photography evaluation and review of site documents it appears that there are two retention ponds located on the northeast portion of the Site. In an effort to be as conservative as possible, a support practice factor of 1, indicating no engineering controls, was utilized in the calculations to predict the maximum PCB mass loading that may leave the Site.

### **Input Factors and Results:**

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

**Chicago Bridge & Iron Site**

<b>RUSLE Factors</b>	<b>Values Provided</b>	<b>Explanation of choice</b>
R = rainfall-runoff erosivity index (10 <sup>2</sup> ft-tonf-in/ac-hr-yr)	175	An appropriate value for R for the Site was determined using the Isoerodent Map of the Eastern U.S. from the Stormwater Phase II Final Rule Construction Rainfall Erosivity Waiver (USEPA, 2012).
K = soil erodibility (0.01 ton-ac-hr/ac-ft-tonf-in)	0.18	The soil erodibility factors were selected from the National Resource Conservation Soil Survey Geographic Database (SSURGO) and a raster was generated using the values 0.02, 0.2, 0.28, 0.43, and 0.49, with a weighted average of 0.18.
ls = topographic factor (dimensionless)	0.080	The topographic factor was derived based on the slope and flow accumulation grids created in ArcGIS. An output LS grid was created and the average value for the grid is provided.
C = cover/management factor (dimensionless)	0.003	The cover/management factor C assigned to the erodible area was 0.003, which corresponds to a grass like vegetative cover with greater than 95% coverage.
P = support practice factor (dimensionless)	1	There are two retention ponds located on the Site, but a support practice factor of 1 was utilized to be conservative.
A = average annual soil loss estimate (ton/ac-yr)	0.0083	The average soil loss estimate was generated by ArcGIS using the input factors listed above.
Erodible Area (acres)	3.6	The erodible area was calculated based on the pervious surfaces within the area of concern polygon for surface soil (Figure 6).

For factors that were not consistent across the site, rasters were used to characterize the variations. Due to the methodology utilized to derive the soil loss estimate, the numbers listed above cannot simply be multiplied.

The total estimated PCB loading via overland flow for the Chicago Bridge & Iron Site would be **0.005 grams per year** if no engineering controls were in place; however, the actual load attributed to overland runoff from the Site is expected to be significantly lower due to the retention ponds onsite. Please see attached table for specific variables.

**Uncertainty Analysis Associated with Overland Flow:**

**Specific Areas and Degree of Uncertainty for the Chicago Bridge & Iron Site**

	<b>Samples Per Acre (site)</b>	<b>Chemical Data Quality*</b>	<b>Soil Type</b>	<b>Site Coverage</b>	<b>Map Quality</b>	<b>Average Distance to Discharge Points</b>
<b>Site Specific Information</b>	0.67	Aroclor Data	Soil Database	Based on a site assessment	Scaled and Unscaled Maps	Approximately 2,050 feet
<b>Degree of Uncertainty</b>	High	Moderate	Low	Low to Moderate	Moderate	Moderate

\* Primary analysis used in the historical samples

Sources of uncertainty for the Chicago Bridge & Iron Site include: All of the data utilized was analytical Aroclor data. Although some of the sample locations came from unscaled or poorly scaled maps, the majority of the locations came from scaled maps. If the retention ponds onsite are 100 percent effective at retaining sediment from overland flow, then less sediment would be expected to reach the Delaware River. Based on this evaluation the level of uncertainty associated with overland flow PCB mass loading from the Chicago Bridge & Iron Site is **Moderate**.

**Groundwater Discharge Analysis:**

No groundwater discharge analysis was performed for this site.

**Site References:**

Aware Environmental Inc. to DNREC, Interim Remediation at NUS Background Area, November 1994.

Aware Environmental Inc., 1995, Remedial Investigation Workplan for CBI Service, Inc., March 1995.

Aware Environmental Inc., 1995, Interim Response Documentation Report, Interim-2 Area, March 1995.

Aware Environmental Inc., 1995, Interim Response #3- Former Paint Dip and Drum Storage Areas, CBI Services, Inc., April 1995.

Aware Environmental Inc. and Wetland Research Associates, 1996, Remedial Investigation Report for CBI Services, Inc., January 1996.

Aware Environmental Inc., 2008, New Castle Monitoring Well Abandonment, January 2008.

Delaware Department of Natural Resources and Environmental Control (DNREC), 1984, A Preliminary Assessment of Chicago Bridge and Iron, July 1984.

DNREC, 1996, CBI Site Final Plan of Remedial Action for Operable Unit #2, August 1996.

Delaware Geological Survey, 2013, Delaware Data Mil, <<http://datamil.delaware.gov/geonetwork/srv/en/main.home>>, May 2013.

Duffield Associates, Inc., 1993, Fifty by One Thousand Foot Portion of the Chicago Bridge and Iron Company Property, New Castle, Delaware, Preliminary Environmental Assessment, January 1993, Revised June 1993.

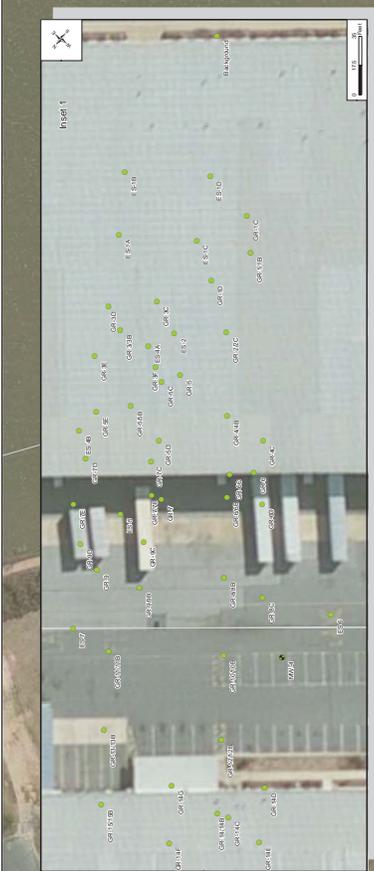
Ecology and Environment, Inc., 1981, A Preliminary Assessment of Chicago Bridge and Iron Company, September 1981.

NUS Corporation, 1988, Site Inspection of Chicago Bridge and Iron, September 1988.

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



# Figures



Delaware River



**BrighFields, Inc.**  
Investigation and Remediation  
10000 W. Main Street  
Wilmington, Delaware 19801 | 302-406-9000 FAX

**Historic Sample Locations**  
Chicago Bridge & Iron Site  
New Castle, Delaware

By	Issue	Scale	Revision
Checked	DATE	FIG. NO.	DESCRIPTION
Project #	0082-0031	Fig. No.	10000
		Sheet #	1 of 1

- Soil Sample
- Groundwater Sample
- ▲ Surface Water Sample
- Chicago Bridge & Iron Site Boundary (100-17 acres)
- The Pools

DATE PLOTTED: 01/11/2017 10:58 AM



**BrighFields, Inc.**  
 Environmental Remediation  
 1000 North Dearborn Street  
 Wheeling, Illinois 60091  
 312.456.8000  
 Fax: 312.456.8001

**PCB Distribution in Surface Soil (P - 2 pg)**  
 Chicago Bridge & Iron Site  
 Near Coast, Indiana

By:	Notes:	Revision:
Drawn:	Scale:	Sheet No.:
Checked:	Project No.:	Project Name:
Project #:	0082-00-01	Figure 2

- Soil Sample, No PCB data available
- Soil Sample
- Estimated PCB Distribution
- Chicago Bridge & Iron Site Boundary
- Buildings
- Tax Parcels
- Surface Water

Notes:  
 1. "N" indicates No Data available for this sample and sample depth.  
 2. "D" indicates Data available for this sample and sample depth.  
 3. "P" indicates PCBs detected in this sample and sample depth.



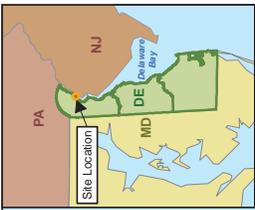
**BrighFields, Inc.**  
 Environmental Investigation and Remediation  
 1000 North Dearborn Street  
 Westmont, Indiana 46381  
 330.456.8000 fax  
 330.456.8001

PCB Distribution at Surface Unsatrated Soil  
 Chicago Bridge & Iron Site  
 Westmont, Indiana

By	Soil	Revised
Date	03/02/2014	03/02/2014
Checked	JTR	03/02/2014
Project #	0082-05-01	Figure 3

- Soil Sample
- ▭ Chicago Bridge & Iron Site Boundary
- ▭ Tax Parcels
- ▭ Buildings
- ▭ Surface Water

Scale: 1" = 100'  
 North Arrow

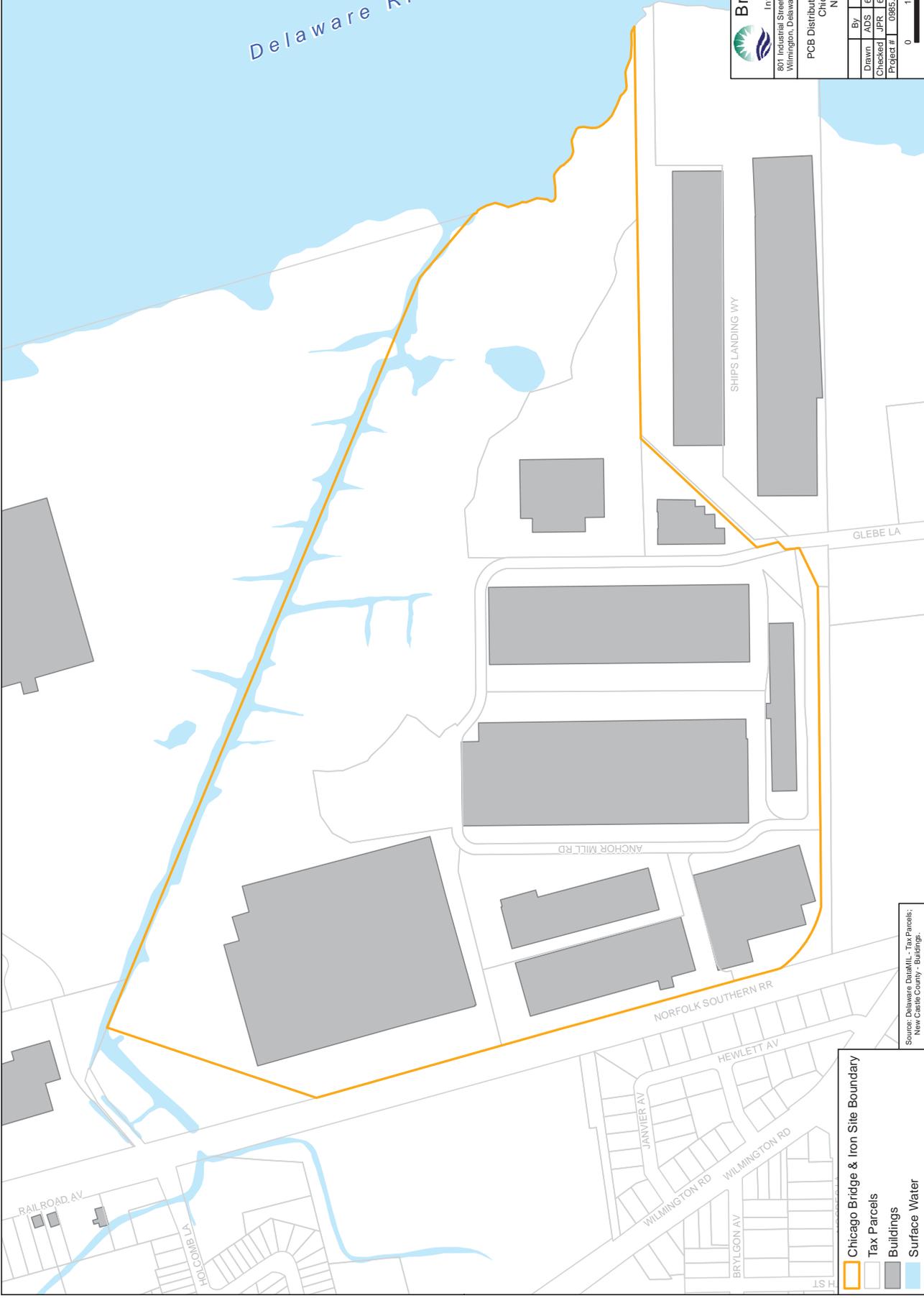
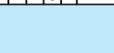


Delaware River

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

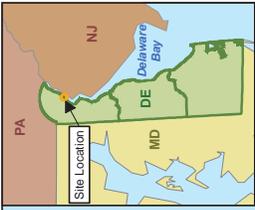
PCB Distribution in Subsurface Saturated Soil  
 Chicago Bridge & Iron Site  
 New Castle, Delaware

By	Date	Scale	File Name
Drawn	ADS 6/19/2014	1:3,000	Fig4SS_Sat.mxd
Checked	JPR 6/19/2014		Figure 4
Project #	0985.69.51		
	0	150	300
			Feet



Source: Delaware Datalink - Tax Parcels;  
 New Castle County - Buildings;

- Chicago Bridge & Iron Site Boundary
- Tax Parcels
- Buildings
- Surface Water



Delaware River

**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 Groundwater  
 Chicago Bridge & Iron Site  
 New Castle, Delaware

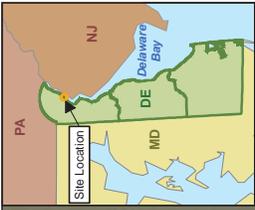
By	Date	Scale	File Name
Drawn	ADS 6/19/2014	1:3,000	Fig5GW.mxd
Checked	JPR 6/19/2014	Fig. No.	Figure 5
Project #	0985.69.51	Figure 5	0 150 300 Feet



Note:  
 ND - Not Detected.  
 Delaware DataMILL - Tax Parcels;  
 New Castle County - Buildings.

- Groundwater Samples
- Chicago Bridge & Iron Site Boundary
- Tax Parcels
- Buildings
- Surface Water

FIG. 5 - PCB DISTRIBUTION IN GROUNDWATER, CHICAGO BRIDGE & IRON SITE, NEW CASTLE COUNTY, DELAWARE. DATE: 6/19/2014. PROJECT: 0985.69.51. FIG. NO.: 5. SCALE: 1:3,000. DRAWN: ADS. CHECKED: JPR.



Delaware River

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

Soil Loss Estimates  
 Chicago Bridge & Iron Site  
 New Castle, Delaware

By	Date	Scale	File Name
Drawn ADS	6/19/2014	1:3,000	Fig#SoilLoss.mxd
Checked KEP	6/19/2014	Fig. No.	Figure 6
Project #	0985.69.51	0	150
		0	300
			Feet



Source: Delaware Databall - April 2012, Tax Parcels

↑ Overland Flow  
 □ Chicago Bridge & Iron Site Boundary  
 □ Tax Parcels  
 Tons/Year/Acre of Soil Loss Estimated  
 High : 0.91  
 Low : 0

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



# Tables

Table 1  
PCB Analytical Results For Soil  
Chicago Bridge and Iron Site (DE-0038, DE-1038)  
Wilmington, DE

Sample Identification	Sample Depth (feet bgs)	Sampling Company	Report Name	Report Date	ArcoIor-1016 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.39	ArcoIor-1221 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14	ArcoIor-1232 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14	ArcoIor-1242 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	ArcoIor-1248 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	ArcoIor-1254 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.11	ArcoIor-1260 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	
A1	NA	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
A2	NA	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
A3	NA	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
A4	NA	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
Background	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
BKG	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.042	U	0.042	U	0.042	U	0.042	U
DD-1	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.044	U	0.044	U	0.044	U	0.044	U
DD-2	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.038	U	0.038	U	0.038	U	0.038	U
DD-3	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.041	U	0.041	U	0.041	U	0.041	U
ES-1A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.033	U	0.033	U	0.033	U	0.033	U
ES-1B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.033	U	0.033	U	0.033	U	0.033	U
ES-1C	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.033	U	0.033	U	0.033	U	0.033	U
ES-1D	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.033	U	0.033	U	0.033	U	0.033	U
ES-2	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
ES-4A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
ES-4B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
ES-5	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
ES-6	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
ES-7	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
F-1	5-6.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.041	U	0.041	U	0.041	U	0.041	U
F-2	5-6.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.039	U	0.039	U	0.039	U	0.039	U
F-3	4.0'-5.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.055	U	0.055	U	0.055	U	0.055	U
F-4	8.0'-10.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.057	U	0.057	U	0.057	U	0.057	U
F-5	5-5.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.053	U	0.053	U	0.053	U	0.053	U
F-6	4.0'-5.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.041	U	0.041	U	0.041	U	0.041	U
LF-1	1.5'-2.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
LF-2	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.18	U	0.18	U	0.18	U	0.18	U
LF-2	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
LF-2	2.0'-3.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.038	U	0.038	U	0.038	U	0.038	U
NADA-A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.06	U	0.06	U	0.06	U	0.06	U
NADA-A2	2.0'-4.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
NADA-B	2.0'-2.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.052	U	0.052	U	0.052	U	0.052	U
NADA-B	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.045	U	0.045	U	0.045	U	0.045	U
NADA-C	2.0'-2.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.035	U	0.035	U	0.035	U	0.035	U
NADA-C	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.036	U
NUS (S-1)A	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.042	U	0.042	U	0.042	U	0.042	U
S1	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.08	U	0.08	U	0.08	U	0.08	U
S10	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
S2	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
S3	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
S4	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
S5	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
S7	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
S8	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
S9	0.0'-0.5'	NUS Corporation	Site Inspection of Chicago Bridge and Iron	Sep-88	0.008	U	0.008	U	0.008	U	0.016	U
TR-1	0.0'-0.5'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.037	U
WH-1A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.04	U	0.04	U	0.04	U	0.04	U
WH-1B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.04	U	0.04	U	0.04	U	0.04	U

Table 1  
PCB Analytical Results For Soil  
Chicago Bridge and Iron Site (DE-0038, DE-1038)  
Wilmington, DE

Sample Identification	Sample Depth (feet bgs)	Sampling Company	Report Name	Report Date	Aroclor-1016 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.39	Aroclor-1221 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14	Aroclor-1232 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.14	Aroclor-1242 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	Aroclor-1248 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22	Aroclor-1254 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.11	Aroclor-1260 DNREC-SIRS Screening Level (January 2014) (mg/kg) 0.22
WH-1C	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.04	U	0.04	U	0.04	U	0.042
WH-1D	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.04	U	0.04	U	0.04	U	0.042
WH-2A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.039	U	0.039	U	0.039	U	0.062
WH-2B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.039	U	0.039	U	0.039	U	0.062
WH-2C	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.039	U	0.039	U	0.039	U	0.062
WH-2D	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.039	U	0.039	U	0.039	U	0.062
WH-3A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.063
WH-3B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.063
WH-3C	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.063
WH-3D	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.037	U	0.037	U	0.037	U	0.063
WH-4A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.035	U	0.035	U	0.035	U	0.035
WH-4B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.035	U	0.035	U	0.035	U	0.035
WH-4C	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.035	U	0.035	U	0.035	U	0.035
WH-4D	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.035	U	0.035	U	0.035	U	0.035
WH-5A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.036
WH-5B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.036
WH-5D	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.036
WH-5C	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.036
WH-6A	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.097
WH-6B	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.097
WH-6C	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.097
WH-6D	0.0'-2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	0.036	U	0.036	U	0.036	U	0.097

Note: All results reported in mg/kg.

Qualifiers:

bgs - Below ground surface

NA - Not analyzed

U - Sample not detected above the laboratory method detection limit

J - Estimated value

P - % difference between primary and secondary columns outside quality control limits

Bold and shaded - Exceeds DNREC-SIRS January 2014 Screening Levels

Table 2  
 PCB Analytical Results For Groundwater  
 Chicago Bridge and Iron Site (DE-0038, DE-1038)  
 Wilmington, DE

Sample Identification	Screen Depth (feet bgs)	Sampling Company	Report Name	Report Date	Aroclor-1016 DNREC-SIRS Screening Level (January 2014) (ug/L) 0.11	Aroclor-1221 DNREC-SIRS Screening Level (January 2014) (ug/L) 0.004*	Aroclor-1232 DNREC-SIRS Screening Level (January 2014) (ug/L) 0.004*	Aroclor-1242 DNREC-SIRS Screening Level (January 2014) (ug/L) 0.034*	Aroclor-1248 DNREC-SIRS Screening Level (January 2014) (ug/L) 0.034*	Aroclor-1254 DNREC-SIRS Screening Level (January 2014) (ug/L) 0.031*	Aroclor-1260 DNREC-SIRS Screening Level (January 2014) (ug/L) 0.034*
MW-1	>2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	1	2	1	1	1	1	1
MW-2	>2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	1	2	1	1	1	1	1
MW-3	>2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	1	2	1	1	1	1	1
MW-4	>2.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	1	2	1	1	1	1	1
MW-5	8.0'-20.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	1	2	1	1	1	1	1
MW-6	5.0'-17.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	1	2	1	1	1	1	1
MW-8	8.0'-20.0'	AWARE Environmental, Inc.	Site Inspection of Chicago Bridge and Iron	Sep-88	1	2	1	1	1	1	1

Note: All results reported in ug/L.

Qualifiers:

bgs - Below ground surface

NA - Not analyzed

\* - Screening level likely below the routine method detection limit

U - Sample not detected above the laboratory method detection limit

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



# Site Photographs



The site from across Route 9 looking onto the western corner of the site. The site looks fairly flat with large trees along the border.



Looking towards the middle of the site from the south where the paved area looks flat but slopes downwards in the distance. There are some trees and landscaped areas in the middle around the buildings as well.



In the middle of the site where there are parking lots and landscaped areas between the large warehouse buildings.



A gently sloped area between two buildings in the northern portion of the site.

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



The edge of the site in the northern portion which is bordered by thick trees. The land is gently sloped up towards the boundary.

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



# Overland Flow Calculations

**PCB Loading Calculations from the Revised Universal Soil Loss Equation (RUSLE)  
Chicago Bridge and Iron Site (DE-0038 and DE-1038)  
Wilmington, DE**

Surface PCB Concentration 0.20 mg/kg

<b>Symbol</b>	<b>Factor</b>	<b>Value</b>	<b>Units</b>
R	Rainfall/Runoff Erosivity Index	175	10 <sup>2</sup> ft-tonf-in/ac-hr-yr
K	Soil Erodibility	0.18	0.01 ton-ac-hr/ ac-ft-tonf-in
	Erodible Area	3.6	Acres
LS	Topographic Factor	0.080	Dimensionless
C	Cover and Management Factor	0.003	Dimensionless
P	Support Practice Factor	1	Dimensionless
A	Average Annual Soil Loss	0.0083	ton/ac-yr

**PCB Loading via Overland  
Flow** 0.005 **grams/year - PCBs**

PCB Mass Loading Phase II  
Chicago Bridge & Iron Site  
SIRS IDs: DE-0038, DE-1038  
New Castle, Delaware



# **Groundwater Transport Calculations (Not Applicable)**