

ENVIRONMENTAL SETTING

The study area is a modern urban landscape that bears little resemblance to the natural environmental conditions that existed prior to urbanization. On the western side of the study area there are a number of large industrial and commercial properties, the I-95 road corridor, a ballpark known as the Judy Johnson Field at Daniel S. Frawley Stadium, and a shopping center known as the Shipyard Shops. A walkway is proposed extending to the Russell W. Peterson Wildlife Refuge, a protected urban wetland used for environmental education programs. On the eastern side of the study area, near the waterfront, are Helmark Steel, Inc., and a number of smaller industrial and commercial properties. Market Street (U.S. Route 13) and Walnut Street are major thoroughfares with an intersection at the eastern terminus of the APE.

The Christina River is approximately 370 feet wide at the point of the proposed crossing. Surface elevation on the west bank of the river near the Shipyard Shops ranges from approximately 9 to 10 feet above mean sea level (amsl); elevations on the east bank of the river are about 5 to 6 feet amsl. Both banks are ancient (Pleistocene-age) stream terraces and have little natural topographic variation.

The study area lies in the inner portion of the Coastal Plain Physiographic Province, with the Piedmont Province beginning immediately west/northwest of I-95 generally at elevations above 25 feet amsl (Ramsey 2005; Shenck et al. 2000). Much of downtown Wilmington is in the Piedmont, over gneiss-dominated bedrock. The Coastal Plain typically consists of unconsolidated sand and gravel deposits. The boundary between the two provinces is often called the Fall Line but geologists prefer to call it a “zone” because the boundary is not abrupt or easily delimited. The Fall Zone is an ecologically rich environment where flora and fauna from the Piedmont and Coastal Plain can intermix.

Pleistocene terraces are found in the eastern and western expanses of the APE, with fill close to the Christina River and along the buried channel of Mill Creek, a now extinct tributary on the western side of the Christina River. Soils in the area include the Delaware Bay Group, undifferentiated (Qdb) (Ramsey 2005), which is present in the western extent of the APE. The Delaware Bay Group is described as transgressive deposits (alluvium) laid down along Delaware Bay estuaries during Middle to Late Pleistocene highstands of sea level (Ramsey 1997). Also present in the western portion of the APE is an area of fill (f), following the former channel of Mill Creek. Soil maps from 1970 show the west bank of the Christina River as Made Land and Urban Land (“Ma”) (United States Department of Agriculture [USDA] 1970). These soils are in areas that have been filled with various soil materials, trash, or both. In most areas of the APE, the original land surface has been covered by 5 to 7 feet of fill material, which is now capped with buildings and pavement (USDA 1970).

The east bank of the Christina River is also mapped as fill, extending inland for approximately 600 feet. Farther east, the APE is mapped as the Scotts Corners Formation (Qsc), which is a Late Pleistocene geologic unit composed of sand and gravel. The unit is thought to be a transgressive deposit of reworked swamp, marsh, estuarine channel, beach, and bay deposits (Ramsey 1997). Flanking the Christina River on the east side is a narrow strip of Tidal Marsh (Tm). Tidal Marsh

lies at low elevations and is regularly flooded by tidal waters. Also present in the eastern APE are soils classified as the Othello-Fallsington-Urban land complex (Ou). Both Othello and Fallsington soils are poorly drained soils found on upland flat landforms on the Coastal Plain. Othello soils are primarily silt, and Fallsington soils have a higher proportion of sand.

A number of soil borings have been conducted across the APE. The borings support the interpretation of widespread fill sediments in the APE above wetland soils. A boring from the western side of the APE, south of the Shipyard Shops in the APE (Boring CRB-GP02) (Brightfields, Inc. 2009:appendix G.1), is illustrative. The boring encountered layers of fill extending to 5.2 feet below ground surface (bgs) (Table 1). Older fill layers extended to 10 feet bgs. The basal sediments (below 10 feet bgs) appear to be old wetland soils.

Table 1: Soil Log, Boring CRB-GP02

DEPTH (ft)	DESCRIPTION	NOTE
0.-0.9 ¹	Gray brown silt and sand with gravel; crusher run	Fill
0.9-5.2 ²	Medium coarse orange sand, some silt and gravel	Fill
5.2-6.0	Black sand with some silt and a white lens	Fill with brick fragments
6.0-10.0	Gray silt and clay with some sand, trace of white material at 9.0-9.6 ft	Fill; possible dredge spoils
10.0-10.3	Brown coarse sand	Buried land surface
10.3-11.0	Dark gray silt and clay	Possible wetland soils

¹Ground surface is approximately 9.0 ft amsl; ²Groundwater was encountered at 5.2 ft.

Source: Brightfields, Inc. 2009

Fill sediments are generally not as thick on the eastern side of the river. A boring from the APE north of James Court near the Christina River (Boring CRB-MW02) (Brightfields, Inc. 2009:appendix G.1; Table 2) encountered layers of fill extending to 8.0 feet bgs. There may be multiple sequa of fill, with historic-era dumping at about 4.6 feet bgs. Brick fragments, glass, and other artifacts were observed in the fill. What appears to be a buried wetland was encountered at 8.0 feet bgs, with a more ancient marsh sediment at 9.9 feet bgs.

Table 2: Soil Log, Boring CRB-MW02

DEPTH (ft)	DESCRIPTION	NOTE
0.-2.1 ¹	Brown silt, some sand and gravel	Fill
2.1-2.3	Light gray and white sand, some silt	Fill
2.3-4.6	Brown silt, some clay, some brick	Fill with brick fragments
4.6-8.0 ²	Brown silt, some clay, some wood, brick, glass, and metal	Fill with artifacts
8.0-8.6	Black medium-coarse sand, some silt	Buried land surface
8.6-9.9	Brown medium-coarse sand, some silt and clay	Possible wetland soils
9.9-10.2	Dark grey silt, some vegetation	Buried marsh

¹Ground surface is approximately 6.0 ft amsl; ²Groundwater was encountered at 6.0 ft.

Source: Brightfields, Inc. 2009