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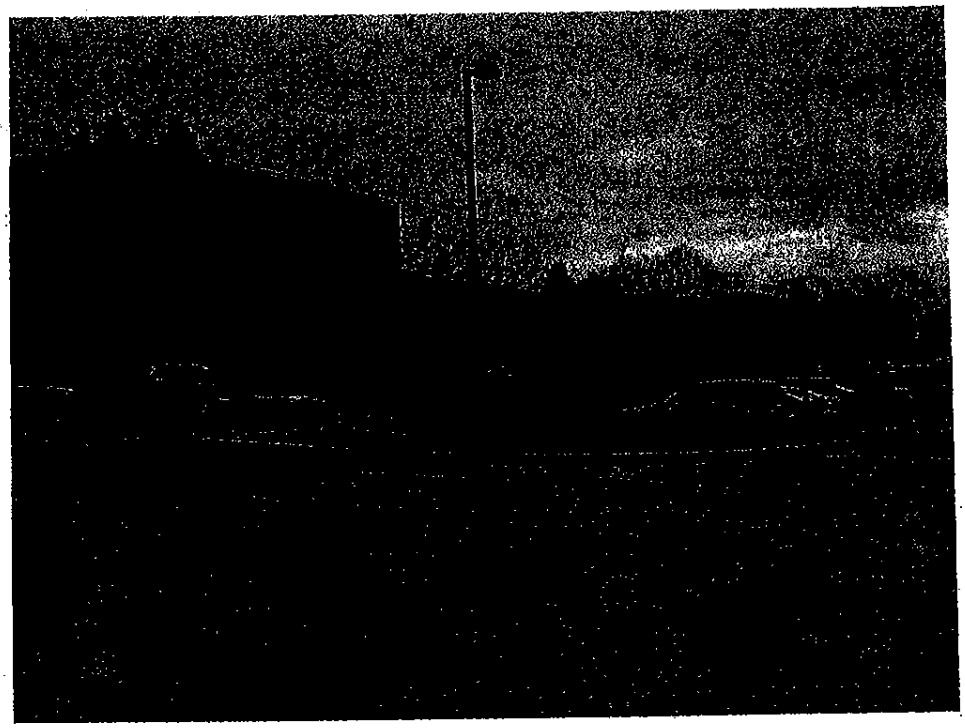
Barley Mill Plaza
Wetland Investigation Report



Barley Mill Plaza

Wetland Investigation Report

Prepared at the Request of:

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Newport, Delaware 19804

Prepared for Review by:

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New Castle County
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State of Delaware
Division of Water Resources
Wetlands Section
89 Kings Highway
Dover, Delaware 19901

Prepared:
March 2008

TABLE OF CONTENTS

Appendices
  Data Sheets
  Wetland Plan

Summary

This document presents the findings from the wetland field investigation completed for Barley Mill Plaza (property) located east of Centre Avenue and north of Lancaster Pike in New Castle County, Delaware. The property is further identified as Tax Parcels 07032200003, 49, 50, 51, 52, 53, 54, 55, and 57, 0703330072 and 0702940097. This report is suitable for a submittal to local agencies. The wetland delineation must be verified by the U.S. Army Corps of Engineers (USACE) through a jurisdictional determination (JD) before it can be deemed official. All information contained within this report has been field collected and summarized by James C. McCulley IV, Environmental Consultants, Inc. (JCM Environmental). Formal surveyed field delineations were performed within the property boundaries of the subject parcel as identified by Apex Engineering, Inc. both in the field and on provided site drawings titled Wetlands Plan – Barley Mill Plaza dated March 13, 2008.

The field delineation was performed within the approximate boundaries of the subject property as shown on Figures 1 and 2. The property consisted of a commercial complex with commercial buildings surrounded by paved parking and landscaped areas. Forested areas were observed in the northern, north-central, southern, and eastern portions of the property.

The investigation concluded that Chestnut Run and two tributaries within the property were relatively permanent waters (RPW). Chestnut Run flows off-site to the south, into Little Mill Creek, a tributary to the Christina River. Delineated wetlands in the south-central and southeastern portions abutted these RPW's. The USACE asserts jurisdiction over RPWs and wetlands that abut RPWs.

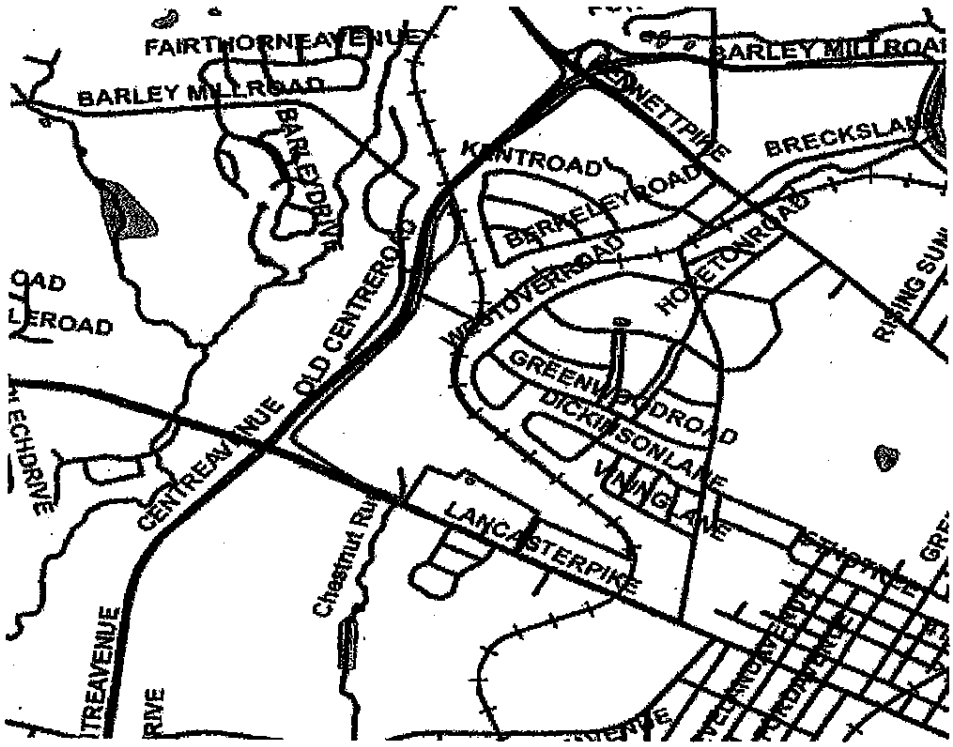


Figure 1. Site Location Map (not to scale, for reference only)

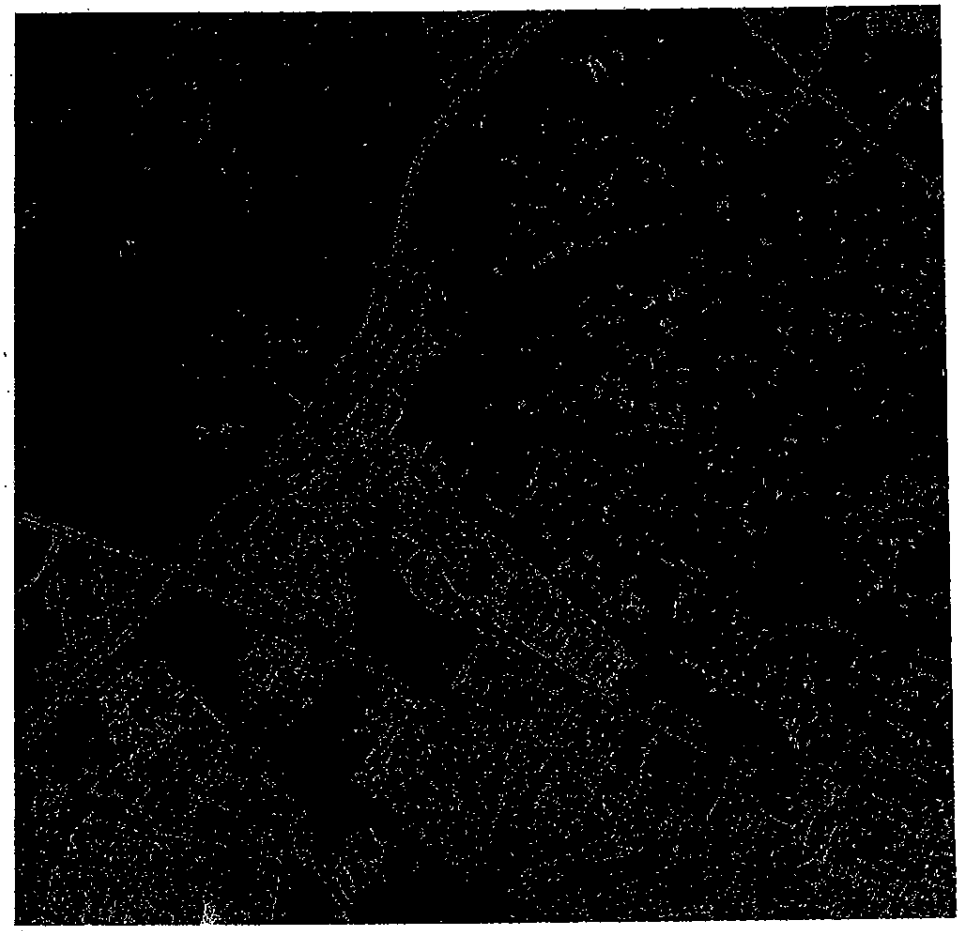


Figure 2. 2006 Aerial Photograph
(not to scale, for reference only)

Wetland Delineation History

The wetland field delineation and data collection was performed by this firm in February 2008 to accurately define the limits of wetlands for jurisdictional and permitting purposes within the parcel. The field delineations have been completed, and the wetland lines have been surveyed and plotted for final verification.

Methods

This investigation used the techniques for Routine Determinations described in the 1987 USACE Wetland Delineation Manual (Y-87-1). The field interpretations follow the definitions listed in the Public Notices from the Army Corp of Engineers, dates September 26, 1990, October 4, 1990, and September 4, 1991.

Delineation Criteria

The following criteria were used to delineate the natural resources described in this report. For the purpose of Section 404 of the Clean Water Act regulation, the term "waters of the United States"

includes open water and wetlands (see Glossary for complete definitions). For the purpose of this report and common usage, "waters of the U.S." refers to regulated open water areas and wetlands refers to vegetated areas that meet the wetland criteria as defined below.

Waters of the United States

In order for an area to be classified as waters of the U.S., a discreet conveyance of water plus bed and banks must typically be present. In non-tidal, freshwater systems, in the absence of adjacent vegetated wetlands, the limits of Federal jurisdiction extend to the ordinary high water mark (OHWM). In the absence of physical evidence depicting the location and elevation of the OHWM, a routing of the 2.3 year storm event through the channel will be accepted as the mean high water elevation. See Jurisdictional section for further explanation of regulated waters.

Non-tidal and Tidal Vegetated Wetlands

In order for an area to be classified as wetlands under USACE methods, it must display: 1. Hydric Soils, 2. Hydrophytic Vegetation and 3. Indicators of Wetland Hydrology. The methodology for determining the dominant vegetation on the site was a hybridization of the methods described in the 1987 Manual and the 1989 Federal Manual for the Identification and Delineation of Jurisdictional Wetlands, as described below.

The diagnostic environmental characteristics of wetlands in accordance Part II, Number 26 b.(1), (2) and (3); and Number 26 c. are listed below:

1. Vegetation: The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions (as described below). Hydrophytic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.

Vegetation has been classified by the U.S. Fish and Wildlife Service according to the following categories:

Obligate Wetland Plants (OBL): Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions.

Facultative Wetland Plants (FACW): Plants that occur usually (estimated probability >67% to 99%) in wetlands.

Facultative Plants (FAC): Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and uplands (non wetlands).

Facultative Upland Plants (FACU): Plants that occur sometimes (estimated probability 1% to <33%) in wetlands.

Not Listed (NL or UPL): Plants that occur rarely (estimated probability <1%) in wetlands.

The categories are also subdivided by the addition of (+) for plants at the wetter end of the category and (-) for plants at the drier end of the criteria. In order for an area to meet the

technical criteria for hydrophytic vegetation, more than 50% of the dominant species must be classified as FAC, FACW, and/or OBL.

2. Soil: Soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions. Common hydric soil indicators include:

Organic Soil: A soil that is more than 50% organic material (peats and mucks).

Sulfidic Material: A soil that emits the odor of rotten eggs produced by sulfides formed in a reducing environment of saturated soils.

Aquic or Peraquic Moisture Regime: A soil that is permanently flooded and/or saturated close to the surface and is devoid of oxygen.

Soil Colors: Gleyed (Gray) soils and/or soils with low matrix chroma and bright mottles in the top 10-12 inches. A chroma of #2 in mottled soils or #1 in unmottled soils is considered hydric. (Colors are as defined in Munsell Color Book 1975).

Soil on Hydric Soils List: A soil that matches the profile description for a soil type defined as hydric by the National Technical Committee on Hydric Soils (NTCHS).

Iron and/or Manganese Concretions: Segregated oxides of iron or manganese are found close to the surface (within 7.5 cm).

3. Hydrology: The area is inundated either permanently or periodically at mean water depths of less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation.

Wetland hydrology may be indicated by drift lines, sediment deposition, watermarks, recorded well or stream gage data, visual observations, blackened leaves, or oxidized root channels with living roots.

The general guidance utilized at this time is that water must be within one foot of the surface consecutively greater than 5% of the growing season or more than 12 consecutive days during the growing season.

Except in certain situations, evidence of a minimum of one positive wetland indicator from each parameter (vegetation, soils and hydrology) must be found in order to make a positive wetland determination.

Data Collection

Wetland parameters observed throughout the site were recorded in standard field note books. Representative wetland and upland borings were recorded at or near the wetland boundary as well as any representative areas of disagreement between this delineation and the United States Fish and Wildlife Service, National Wetlands Inventory (NWI) map or where deemed appropriate.

The soils exposed at each sample station were observed using a hand soil auger. Borings were made to a depth of 18 inches when possible. Soil texture information follows the United States Department

of Agriculture (USDA) classification system and specific soil nomenclature follows the New Castle County Soil Survey (1971).

The plants recorded at each sample station follow the nomenclature of Fernald (1950) and Kartesz and Kartesz (1981) and the PLANTS Database (USDA 2007). Hydrological indicators follow the descriptions of the 1987 Wetland Delineation Manual. Wetland hydrology indicator nomenclature uses the system developed by Cowardin, et al. (1981) and the U.S. Fish and Wildlife Service National Wetland Inventory mapping program.

Data Sheets

The wetland analysis provided ample opportunity to express the typical conditions found in the field which determined where to place the wetland flags as well as to document any conditions found in areas of disagreement between the delineation and the NWI or SWMP designations. Conditions along the lines were characterized by representative wetland and upland samples which recorded the vegetation, apparent hydrology and existing soil conditions. These samples were documented on the Routine Wetland Delineation Data Forms from the 1987 USACE Wetlands Delineation Manual, which are attached in the Appendix. Sample locations were estimated on the plans based on their relative location to physical features and surveyed wetland flags.

Boring locations were estimated on the plans based on their relative location to physical features and surveyed wetland flags.

Jurisdiction

USACE and EPA

Section 10 Waters (Navigable Waters)

Section 10 of the Rivers and Harbors Act (RHA) of 1899 gives the Environmental Protection Agency (EPA) and USACE (the agencies) jurisdiction over traditional navigable waters (TNW). These waterways include tidal and certain non-tidal waters and are typically defined by the high tide line or the ordinary high water mark (OHWM). Mudflats and marshes below these water lines are regulated under this section (see Glossary). The USACE maintains a list of navigable waters.

Waters of the U.S. including Non-Tidal Vegetated Wetlands

Waters of the United States (see Glossary) and non-tidal vegetated wetlands are regulated by the USACE under Section 404 of the Clean Water Act. Waters of the United States typically are discreet conveyances of water with bed and banks. Limits of Federal jurisdiction extend to the OHWM. Non-tidal wetlands must display three criteria (hydric soils, hydrophytic vegetation, and wetland hydrology) in order to be jurisdictional.

The agencies will assert jurisdiction over the following waters and wetlands:

- Wetlands adjacent to TNWs
- Non-navigable tributaries of TNWs that are relatively permanent (relative permanent waters - RPW) where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g. typically three months.)

- Wetlands that directly abut such tributaries

The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus (see Glossary) with a TNW:

- Non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary
- In addition, an USACE policy decision has been made to collect information relevant to a significant nexus evaluation for all "intermittent" non-navigable tributaries and their adjacent wetlands (i.e., even if the tributary's flow may be relatively permanent, but is not perennial).

The agencies generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow)
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water

The agencies will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNWs.
- Significant nexus includes consideration of hydrologic and ecologic factors (see Glossary)

Geographically isolated wetlands which do not have a significant nexus connection to interstate commerce are not jurisdictional. The USACE District office evaluates if these wetlands are isolated under the CWA. USACE headquarters must concur with an isolated wetlands evaluation for a non-jurisdictional determination.

Tidal Wetlands

Tidal wetlands regulated by the USACE under Section 10 of the Rivers and Harbors Act of 1899 are limited to the areas below the high tide line. All other wetlands are regulated under Section 404 of the Clean Water Act. Tidal wetland areas consist of hydrophytic vegetation on hydric soils that are subjected to regular or periodic tidal action and include most marshes and coastal lowland areas.

State of Delaware

State Subaqueous Lands

The State of Delaware regulates all perennial and intermittent watercourses as State Subaqueous Lands. Subaqueous Lands are water conveyances with defined banks and channels permanently or seasonally supported by groundwater, spring seeps, or surface waters in addition to precipitation and surface water runoff from storm events. Ephemeral streams are not typically considered Subaqueous Lands as they rely only on surface water runoff from storm events and are otherwise dry. A determination of the limits of regulated Subaqueous Lands is usually done on a case-by-case basis

by the Delaware Department of Natural Resources and Environmental Control (DNREC). If Subaqueous Lands are determined to be present on the property, they will most likely be found to coincide with waters of the United States.

Tidal Wetlands

The State of Delaware regulates those tidal wetlands indicated on the Delaware Tidal Wetland maps in accordance with the Delaware Wetlands Title 7, Part VII, Chapter 66. These areas include tidal waters and adjacent areas "whose surface is at or below an elevation of 2 feet above local mean high water, and upon which may grow or is capable of growing" typical tidal water hydrophytes.

New Castle County

Perennial and Intermittent Streams

The Unified Development Code (UDC) for New Castle County, Delaware requires a 100-foot riparian buffer on either side of all perennial and intermittent streams, plus land adjacent to identifiable stream channels that drain greater than 10 acres. If a wetland is classified as a Piedmont stream valley wetland, the entire wetland area plus an additional 50 feet of adjacent land is required as a riparian buffer.

Non-Tidal Vegetated Wetlands

The UDC for New Castle County, Delaware provides protection for 100% of federally regulated and non-federally regulated wetlands, and requires the addition of a 50-foot buffer around all non-tidal wetlands greater than 20,000 ft^2 in area. A USACE permit or a variance from New Castle County allows for the waiver of this protection.

Tidal Wetlands

The UDC for New Castle County, Delaware requires a 100-foot buffer on all tidal wetlands within the County.

Results

General Site Description

A background review was performed in the office prior to the commencement of site work. The results of this background review are described below.

Location

The field delineation was performed within the boundaries of the subject property located at Latitude 39°-45'-33' North and Longitude 75°-35'-57' West. The property was bordered by Old Centre Road to the north; railroad tracks and Westover Hills to the east; commercial properties, Mount Olive Cemetery, and Lancaster Pike to the south; and Old Centre Road to the west (see Figures 1 and 2).

Soils

The New Castle County Soil Survey document indicated the site is underlain with Aldino silt loam (AdA and AdB2), Aldino-Keyport-Mattapex-Urban land complex (Am), Neshaminy-Talleyville Urban land complex (NtB and NtD), Glenville silt loam (GnB2), Glenelg and Manor loam (GmB2 and GmC2), Hatboro silt loam (Ha), and Chester loam (ChA and ChB2). The Aldino series consists of moderately well-drained soils that occur on uplands. The Aldino-Keyport-Mattapex-Urban land complex consists of Aldino, Keyport, and Mattapex soils that have been used for community purposes. The soils series can be recognized, but the soils have been disturbed so much that it is impractical to separate them on a soil map. The Neshaminy-Talleyville-Urban land complex consists of well-drained Neshaminy and Talleyville soils that are used for residential and community development. The Glenville series consists of moderately well-drained to somewhat poorly drained soils that have a fragipan. These soils occur in depressions around the heads of drains, in the northern part of the county. The Glenelg and Manor series consists mainly of Glenelg loam, but a smaller acreage is made up of Manor loam. Any given area may be occupied by the Glenelg soil, the Manor soil, or both soils in any proportion. Each soil has the profile described as typical for its respective series. The Hatboro series consists of deep, wet soils that occur on the Piedmont Plateau. The Chester series consists of deep, nearly level to fairly steep, well-drained soils. Of these mapped soils, the Hatboro series is considered hydric by the USDA Natural Resources Conservation Service (Figure 3). An unclassified drainage is depicted in the southeastern corner of the property.

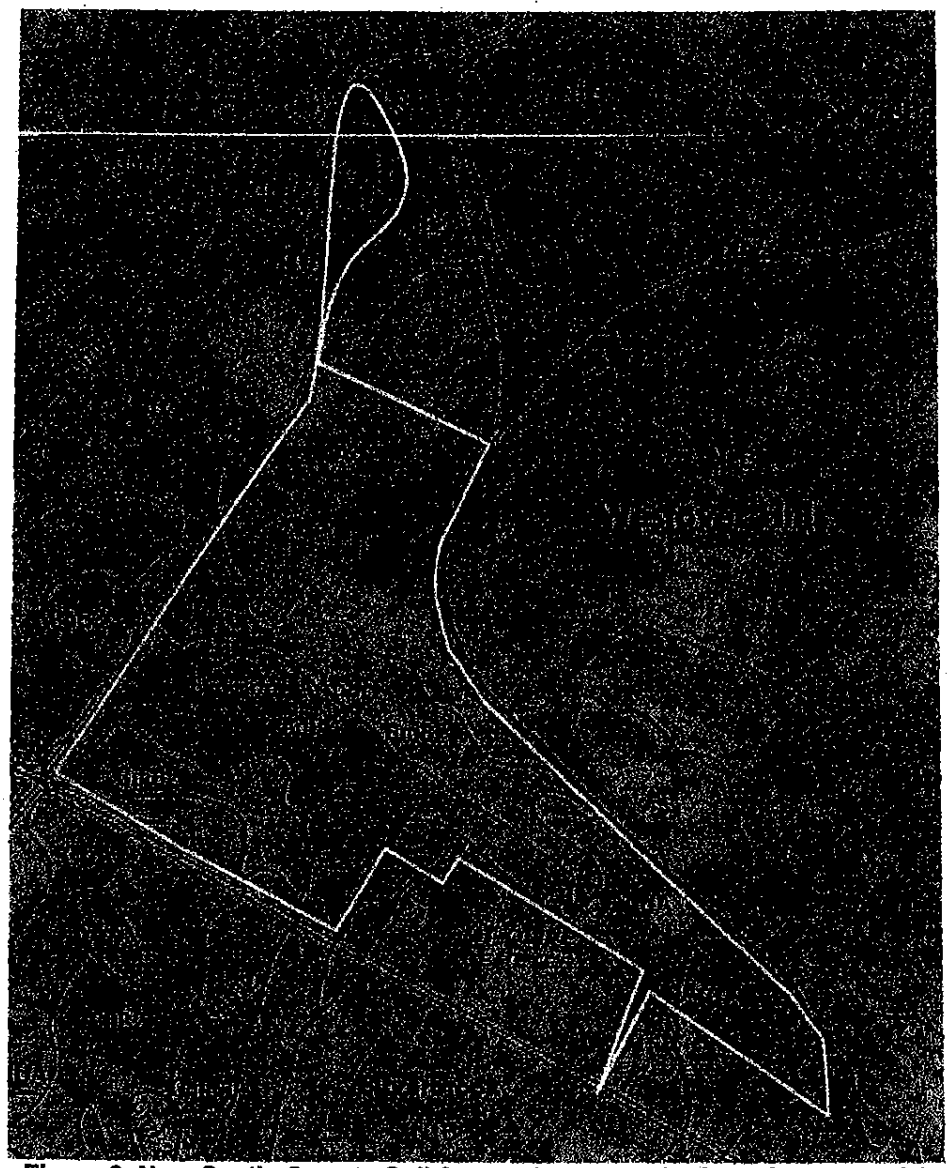


Figure 3. New Castle County Soil Survey (not to scale, for reference only)

Mapped Hydrology and Topography

The subject property drains generally to the south into Chestnut Run located in the southern portion of the property. Chestnut Run flows off-site into Mill Creek, a tributary of the Christina River. The Christina River flows into the Delaware River. Site hydrology appears to be influenced mainly by sheet flow runoff from paved and developed areas within the property. Municipal stormwater drains were observed thoughout parking lots within the property. Site elevations range from 130 feet above sea level (asl) in the southern portion to 230 feet asl in the northern portion of the property according to the Wilmington North 7.5 Minute USGS Quadrangle (Figure 4). Chestnut Run, a "blueline stream", is depicted in the south-central portion of the property.

Figure 4. Wilmington North 7.5 Minute USGS Topographic Map (not to scale, for reference only)

Mapped Wetlands

National Wetland Inventory Mapping

The U.S. Fish and Wildlife Service National Wetland Inventory (NWI) map indicated Chestnut Run along the south-central portion of the property (Figure 5). In addition, a riverine system (R30WH) is identified in the eastern portion of the property. Two man-made ponds (POWKFx) are shown in the western portion of the property.

Figure 5. National Wetlands Inventory Map
(not to scale, for reference only)

Statewide Wetland Mapping Program

The Statewide Wetland Mapping Program (SWMP) map (Figure 6) indicated Chestnut Run as a riverine system (R5UBH) in the southern portion of the property. A second drainage is depicted in the southeastern portion of the property.

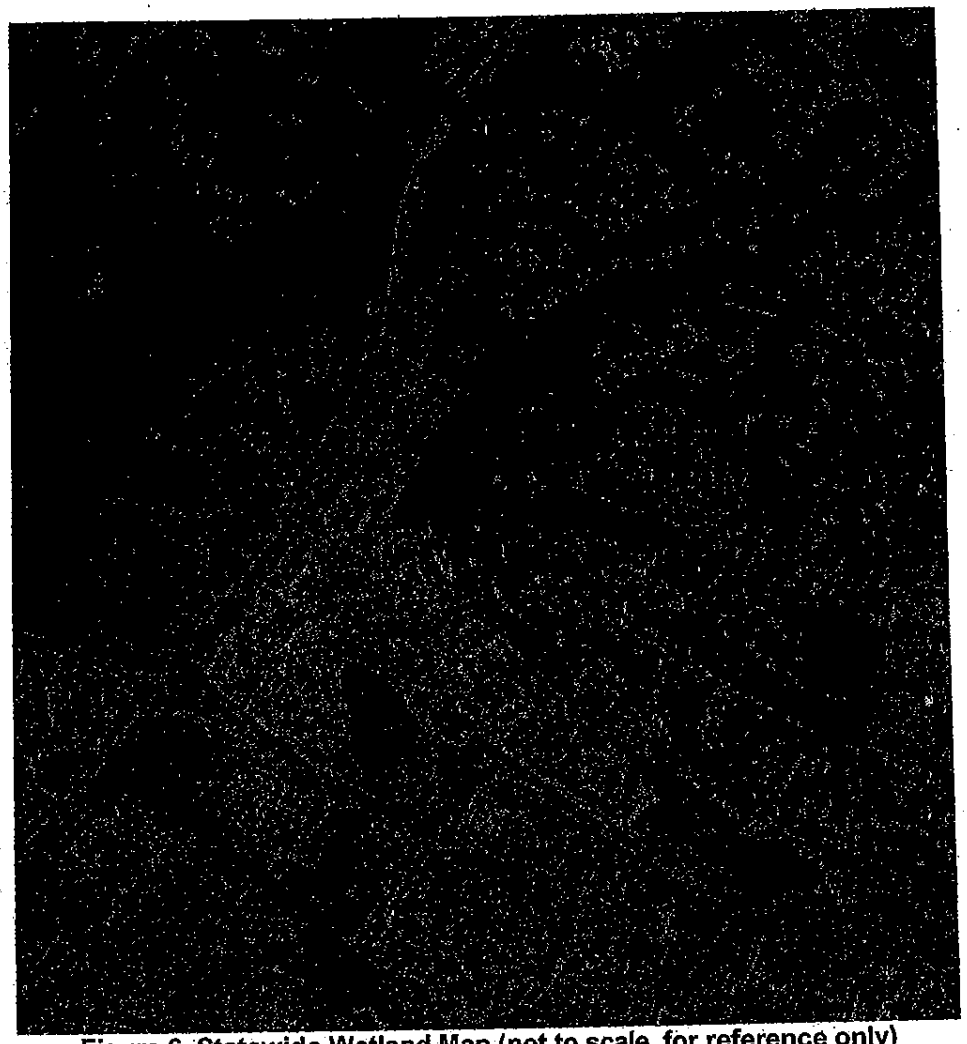
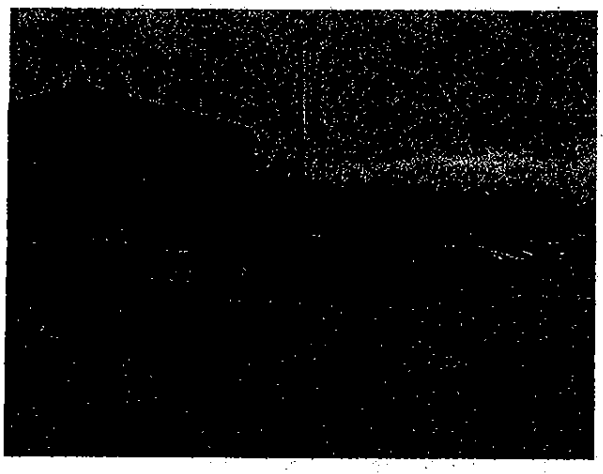


Figure 6. Statewide Wetland Map (not to scale, for reference only)

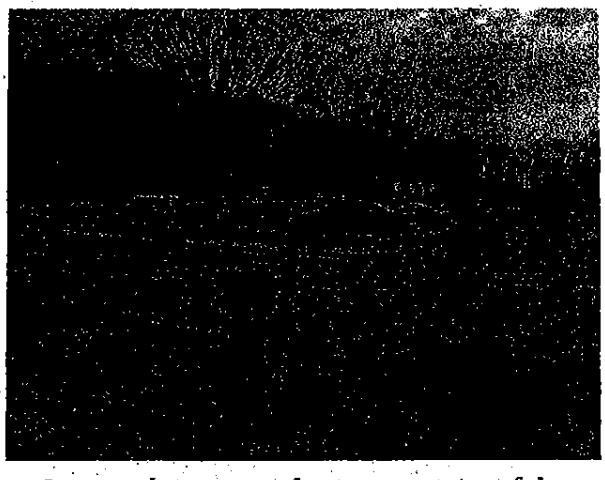
Field Delineation Specifics

Upland Land Use and Land Cover Types

- Commercial – The majority of the property was developed commercially. An office building complex with paved parking areas and landscape areas were observed at the property. Vegetation observed in the landscaped areas located throughout the property included maintained lawn grasses, Red Maple, White Pine, Bradford Pear, White Oak, Norway Spruce, Bayberry, and Zelkova.



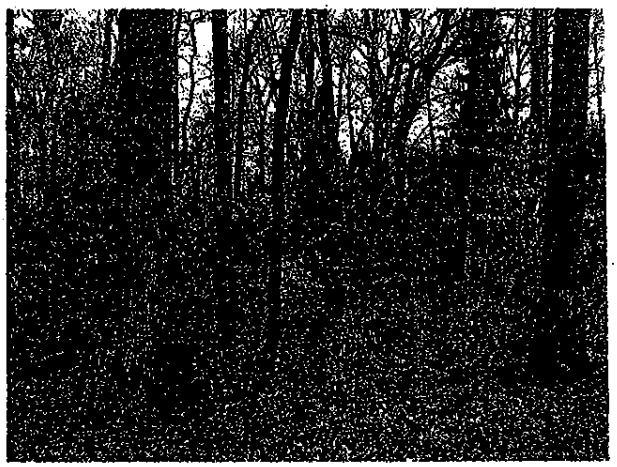
Existing commercial building in the central portion of the property.



Large parking area in the eastern portion of the property.

- Deciduous Forest and Scrub-shrub areas – Several forested areas were observed in the northern, north-central, southern and eastern portions of the property. Dominant vegetation observed in these areas included Tulip Poplar, White Oak, American Beech, Black Oak, Black Gum, Arrow-wood, Apple, Multiflora Rose, Japanese Honeysuckle, Asters, and European Privet.

Forest cover in the northeastern portion of the property.



Upland forest in the northern portion of the property.

Scrub-shrub vegetation in the northwestern portion of the property.

Typical forest cover in the south-central portion.

Wetland Line Specifications

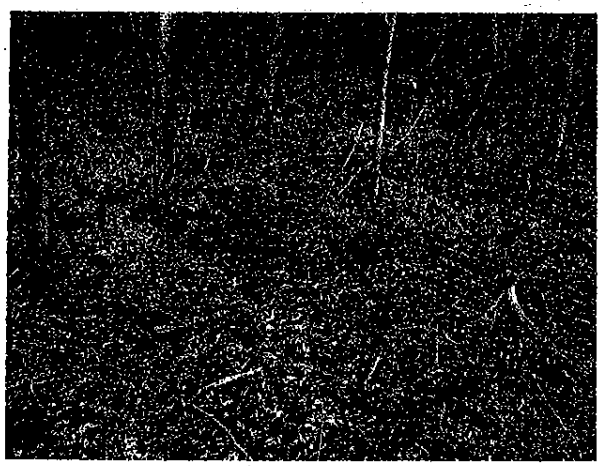
The wetland lines were placed within the property boundaries as estimated during fieldwork based on physical features. All wetland features found within this area were flagged with vinyl, pink ribbon with black "WETLAND DELINEATION" letters. Eleven lines were marked with alpha numeric designators with letters representing the lines and numbers representing the positions along each line. These lines were subsequently surveyed and plotted by Apex Engineering, Inc. Common vegetation observed within the wetlands is described below within the appropriate wetland classification section.

Line A began at a culvert along Lancaster Pike and delineated the western boundary of waters of the U.S. and associated wetlands in the southern portion of the property. Line A ended at a large box culvert and consisted of 64 flags.

Chestnut Run delineated by Line A in the south-central portion of the property.

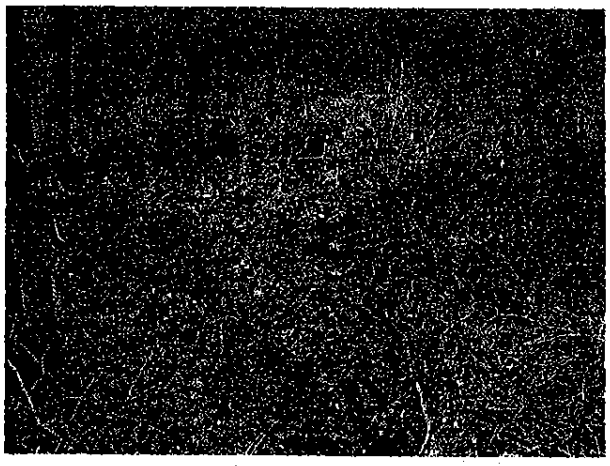
Line B began at a culvert (opposite of A1) along Lancaster Pike delineating wetlands and extended off-site to the east. Line B consisted of 4 flags.

Line C delineated forested wetlands in the south-central portion of the property and extends off-site to the east. Line C consisted of 9 flags.



Forested Wetland delineated by Line C.

Line D began off-site and delineated the eastern boundary of waters of the U.S. and associated forested wetlands in the southern portion of the property. Line D ended at the large box culvert opposite of flag A64. Line D consisted of 30 flags.



Forested wetland in the southern portion of the property.

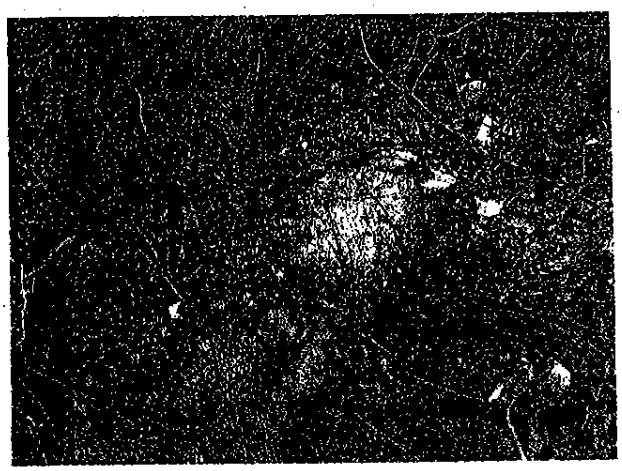
Water-stained leaves within wetland area D.

Lines E and F began at a culvert located in the southern portion of the property and delineated Chestnut Rum between two culverts upstream of Lines A and C. Flag E38 connected to Flag F48. Line E consisted of 38 flags and Line F consisted of 48 flags.

View looking south along Chestnut Run.

View looking north along Chestnut Run.

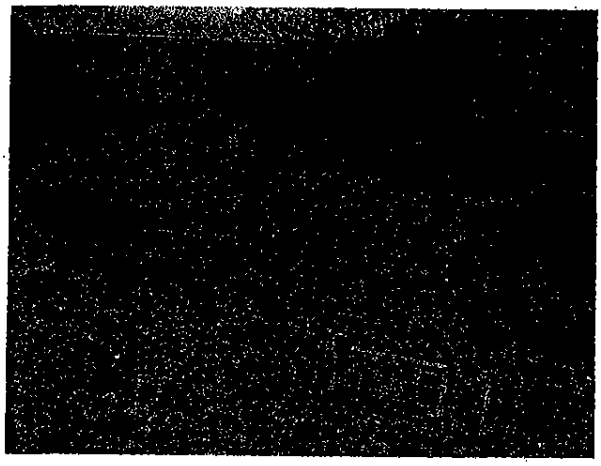
Line G began off-site and delineated a drainage along the eastern property boundary. Line G consisted of 9 flags.



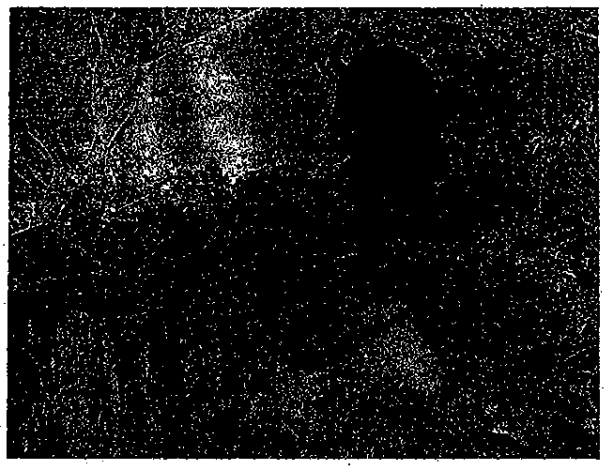
View looking north along G line in the eastern portion of the property.

View looking east along G line.

Lines H and J began at a culvert located in the eastern portion of the property and delineated a unnamed stream tributary to Chestnut Run and associated wetlands. Both lines extended north and ended at a culvert. Line H consisted of 32 flags and Line J consisted of 22 flags. Portions below the culvert were surveyed and are shown on the attached plan.

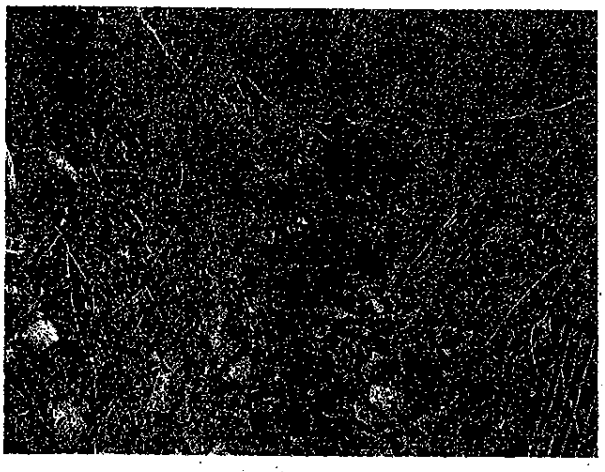


View looking west at drainage delineated by lines H and J.

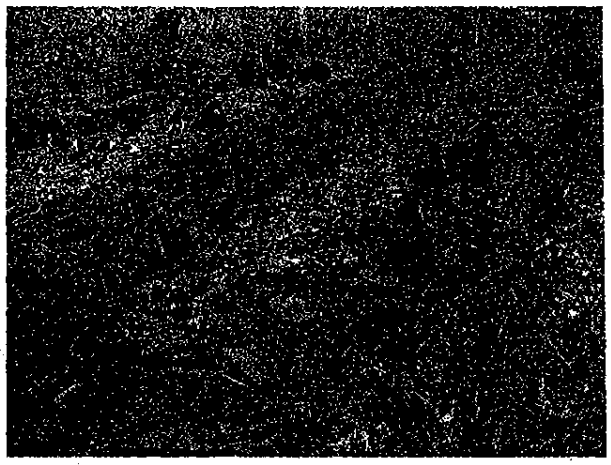


View looking north at stream located in the northeastern portion of the property at the railroad line.

Lines K and L delineated a drainage and associated wetlands in the north-central portion of the property. Both lines began and ended at culverts. Line K consisted of 64 flags and Line L consisted of 56 flags. It is assumed that this area connects to the waters delineated by Lines E and F through underground pipes.



View looking north along Chestnut Run in the northern portion of the property.



View looking north along Chestnut Run delineated by Lines K and L.

Waters of the United States (open water)

Chestnut Run located in the central portion of the property and the unnamed tributaries in the eastern portion would be classified as RPWs and therefore falls under the jurisdiction of the USACE.

State Subaqueous Lands

Chestnut Run and the tributaries in the eastern portion of the subject property would also be considered State Subaqueous Lands. The State determines the boundaries of their jurisdiction on a case-by-case basis.

Non-tidal Vegetated Wetlands

Non-tidal vegetated forested, scrub/shrub, and emergent wetlands were delineated. These wetlands abut the RPW tributaries and therefore fall under the jurisdiction of the USACE. Dominant vegetation observed within these wetlands included Red Maple, Green Ash, Arrow-wood, Sedges, and Skunk Cabbage. The data is summarized in the attached data sheets.

Section 10 Waters

No navigable waters applicable to Section 10 regulation were located within the subject property boundaries.

Tidal Wetlands

No tidal wetlands were encountered within the subject property boundaries.

Comparison to Mapped Wetlands

Lines A, B, C, D, E, and F correspond with Chestnut Run, which is depicted on the NWI, SWMP, and USGS maps. The remaining delineated wetlands and waters were not depicted on the NWI, SWMP, or USGS maps.

Conclusions

The wetlands delineated within the property boundaries were flagged in February 2008. Eleven lines were used to demarcate the delineated wetland boundaries for review by the USACE and eight data samples were collected to support the delineation.

Field investigations and data collections conducted during this delineation concluded that Chestnut Run and delineated tributaries are RPW tributaries of a TNW and are therefore jurisdictional waters of the U.S. The delineated palustrine forested and scrub/shrub wetlands abut Chestnut Run and its tributaries and therefore are also jurisdictional waters of the U.S.

Chestnut Run would be considered Subaqueous Lands regulated by the State of Delaware. The State determines the boundaries of their jurisdiction on a case-by-case basis.

No tidal wetlands were present on the subject property.

The sole purpose of this delineation is to identify the limits of waters of the United States including wetlands, Tidal Waters, Navigable Waters, and Subaqueous Lands and to document the site conditions. This report contains the information necessary to accompany the JD information sheets when submitting to the USACE with a jurisdictional determination request.

Notes

The USACE regulates the placement of structures in Section 10 Waters and the placement of fill and/or dredge material into waters of the United States including wetlands. No work of this nature should be performed without a permit from the USACE.

The State of Delaware regulates activities in Subaqueous Lands as well as State mapped tidal wetlands. No work in those areas should be performed without a permit from the State.

New Castle County regulates the disturbance of wetlands, including non-jurisdictional, isolated wetlands and associated buffers. No work should be performed in these areas without approval from the County.

This study has been performed utilizing best professional judgment based on the conditions at the time of the investigation. The investigator is not responsible for changed conditions, either man made or natural, which change the wetland boundaries.

Wetland delineations must be verified by the USACE and Subaqueous Lands must be verified by DNREC in order to be considered "jurisdictional".