

WETLAND DELINEATION REPORT

DIAMOND STATE PORT CORPORATION
4600 HAY ROAD
WILMINGTON, DELAWARE

October 23, 2019

Prepared for:

Diamond State Port Corporation
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Project No. 11139.LH

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“Existing Conditions Plan, North Port/ Edgemoor Site” (Sheet 1 of 1); dated October 2019; prepared by Duffield Associates, Inc.

1.0 INTRODUCTION

Duffield Associates, Inc. (Duffield) has field delineated existing and functional wetlands and other “waters of the United States” on New Castle County Tax Parcel 0615300006; hereafter referred to as the project site. The project site is located at 4600 Hay Road in Wilmington, Delaware 19809. Refer to the plan titled “Existing Conditions Plan, Port of Wilmington Edgemoor Expansion” (Sheet 1 of 1); dated October 2019; prepared by Duffield Associates, Inc. for the location of the project site. This report has been prepared in support of Permit Application CENAP-OP-R-2019-278 to the United States Army Corps of Engineers (USACE) for a Clean Water Act Section 404 permit, and a Rivers and Harbors Act Section 10 permit for dredging related to the construction of a primary harbor access channel and ship berth development (hereinafter referred to as the “proposed project”) at the applicant’s Edgemoor property.

2.0 WETLAND EVALUATION RESULTS

The wetland evaluation involved a desktop review of available maps and a field reconnaissance of the project site.

2.1 DESK-TOP REVIEW

The boundaries of the project site were approximated on the U.S. Geologic Survey (USGS) Topographic On-line map ⁽¹⁾, the U.S. Department of the Interior Fish and Wildlife Service National Wetlands Inventory (NWI) ⁽²⁾, and the U.S. Natural Resource Conservation Service On-line Soil Survey ⁽³⁾. Aerial images indicate that the project site has been historically used for industrial purposes.

According to the USGS Map (see Figure 1) the project site is located south of Lighthouse Road and Hay Road in Edgemoor, Delaware. The project site is bordered by Fox Point State Park to the north and Ludwig Access Road to the southwest. The Delaware River defines the entire eastern boundary of the project site. The adjoining properties to the west and south appear to be used for commercial and industrial purposes.

Online NWI Mapping (see Figure 2) lists the Delaware River as an Estuarine Subtidal, Unconsolidated Bottom, Subtidal wetland (E1UB1). The channel that flows into the Delaware River in the northern portion of the project site is a Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded wetland (R2UBH). A Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated wetland (PUBHx) is located in the northeast corner of the project site.

The Web Soil Survey (see Figure 3) shows three (3) soil-mapping units that underlie the project site. The Urban land (Up) unit is mapped across the majority of the project site. The Up soil unit is not defined as a hydric soil on the project site. The depth to the water table is not specified for this soil unit. Udorthents, wet

substratum (UwA) soils are mapped in small areas in the eastern and southeastern portions of the project site. The UwA soil map unit is common to flats and has a depth to water table of about 20 to 40 inches. The soil unit is moderately well drained and is not listed as a hydric soil. The Mattapex Soil Series (MtaB) is mapped in a small area in the western corner of the project site. The MtaB soil map unit is common to flats and has a depth to water table of about 20 to 40 inches. The Mattapex Soil Series is not listed as a hydric soil. The Delaware River is underlain by the map unit Water (W), which denotes open water.

2.2 FIELD RECONNAISSANCE

Duffield's personnel completed the field reconnaissance of the project site on May 11, 2018 and on June 29, 2018 during low tide events. At the time of field reconnaissance, a majority of the structures associated with a former manufacturing facility had been razed, though a majority of the site was still covered with impervious surfaces. No wetlands were identified on the project site. The Mean Low Water (MLW), Mean High Tide (MHW), and the High Tideline (HTL) were identified along the Delaware River. Multiple lagoons were observed on the project site, but were not considered jurisdictional because these lagoons had been constructed in uplands as part of the infrastructure of the former manufacturing facility. The lagoons were connected to the Delaware River via pipes to manmade channels. The MLW, MHW, and HTL lines were established along these channels. The accompanying plan titled "Existing Conditions Plan, Port of Wilmington Edgemoor Expansion" (Sheet 1 of 1) illustrates the approximate elevation of the MLW, MHW, HTL based on field observations and the project topographic survey.

The identification and delineation of wetlands was based upon the methods outlined in U.S. Army Corps of Engineers' Wetlands Delineation Manual (1987) ⁽⁴⁾ as modified by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (2010) ⁽⁵⁾. Evidence of the Mean High Tide and the Ordinary High Water Line were used to delineate the boundaries around the "water of the United States" when no wetlands were found.

Vegetation, soil and hydrologic data were collected from two sample points at representative locations on the project site. Photographs of the project site are provided in Appendix A. The field data form for the sample point is provided in Appendix B.

2.2.1 Vegetation

Two plant communities were identified and characterized on the project site. Duffield adapted the U.S. Fish and Wildlife Service classification system presented on the NWI Map to identify the plant communities. The identified plant communities were a forested upland and an upland scrub-shrub community. The location of sample points are provided in the

plan titled “Existing Conditions Plan, North Port / Edgemoor Site” (Sheet 1 of 1); dated June 26, 2018.

Forested Upland

The tree stratum included tulip poplar (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), silver maple (*Acer saccharinum*), white ash (*Fraxinus americana*), black locust (*Robinia pseudoacacia*), and Persian silk tree (*Albizia julibrissin*). Other tree species that were noted in the near vicinity of Data Point 1 included tree-of-heaven (*Ailanthus altissima*), black willow (*Salix nigra*), and eastern juniper (*Juniperus virginiana*). The shrub and sapling stratum included bush honeysuckle (*Lonicera sp.*), false indigo (*Amorpha sp.*), staghorn sumac (*Rhus typhina*), Persian silk tree, and silver maple. Other shrub or sapling species that were located in the near vicinity of Data Point 1 included box elder (*Acer negundo*). The woody vine stratum included bush honeysuckle, northern dewberry (*Rubus flagellaria*), and Virginia creeper (*Parthenocissus quinquefolia*). The herbaceous stratum included Japanese knotweed (*Reynoutria japonica*) and northern dewberry. Other herbaceous species noted in the near vicinity of Data Point 1 included velvetleaf (*Abutilon theophrasti*), milkweed (*Asclepias sp.*), English ivy (*Hedera helix*) and sticky willy (*Galium aparine*). The vegetation in this forested upland community was dominated by facultative, facultative upland, and upland species.

Refer to the data form in Appendix B for Data Point 1 that was completed in the Forested Upland community for additional information. The sample point was collected approximately 6 feet above the watercourse, during a low-tide event.

Scrub-shrub Upland

No species were present in the tree stratum. The shrub and sapling stratum included false indigo, bush honeysuckle, American sycamore (*Platanus occidentalis*), sweet gum, silver maple, and butterfly bush (*Buddleja davidii*). Other shrub and sapling species that were located in the vicinity of Data Point 2 included American holly (*Ilex opaca*), box elder, black willow, red oak (*Quercus rubra*), and red maple (*Acer rubrum*). The woody vine stratum included false indigo and bush honeysuckle. Other woody vine species that occurred in the nearby vicinity to Data Point 2 included Virginia creeper. No species were present in the herbaceous stratum. Other herbaceous species that were noted in the near vicinity of Data Point 2 were docks (*Rumex sp.*), purple crownvetch (*Securigera varia*), Japanese knotweed, and great mullin (*Verbascum thapsus*).

Refer to the data form in Appendix B for Data Point 2 that was completed in the Scrub-shrub Upland community for additional information. The sample

point was collected approximately 6 feet above the watercourse, during a low-tide event.

2.2.2 Soils

There were no hydric soil indicators in the upland communities at the time of the site reconnaissance. Refer to data forms in Appendix B for additional information.

2.2.3 Hydrology

The primary hydrologic feature on the project site is the Delaware River, which is a tidal river that flows into the Delaware Bay. At the location of the project site, the Delaware River experiences approximately a 5-foot fluctuation in tidal influence. Tidal information provided by the NAVD88 suggested that the elevation of the MHW was located along the interface of the Delaware River and shore defense structures on the project site. Hydrological indicators, such as watermarks, drift deposits, saturation, and negligible vegetation observed along this interface were used to identify the HTL. No wetland hydrologic indicators were observed higher than the HTL.

3.0 CONCLUSIONS

Duffield delineated wetlands and other “waters of the United States” on the project site. No wetlands were identified on the project site. The MLW, MHW, and HTL were used to establish the jurisdictional boundaries along the Delaware River and associated channels. Wetlands were identified using the 2010 U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0) ⁽⁵⁾. The hydrology of the encountered wetlands appears to be directly connected to other “waters of the United States”.

The U.S. Army Corps of Engineers requires permits for the filling of federally regulated wetlands and watercourses. The U.S. Army Corps of Engineers has two types of permits, Nationwide and Individual. Nationwide Permits authorize pre-approved activities that comply with the conditions stated therein. Alterations to the wetlands resulting from the construction would be viewed as a secondary impact resulting from the primary impact (construction). Activities that do not comply with the conditions for a Nationwide Permit require Individual Permits. The Delaware Department of Natural Resources and Environmental Control would regulate the watercourses on the project as “Subaqueous Lands”. A permit would be required for impacts to Subaqueous Lands. The New Castle County Department of Land Use require Riparian Buffers of 50-ft. from wetlands and floodplains and 100-ft. from watercourses, whichever is greater.

4.0 REFERENCES

1. United States Geologic Survey, Available online at <http://www.fws.gov/wetlands/Data/Mapper.html>, accessed 05/29/2018.
2. United States Department of the Interior, Fish and Wildlife Service, National Wetlands Inventory Map, Available online at <http://www.fws.gov/wetlands/Data/Mapper.html>, accessed 05/29/2018.
3. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>, accessed 05/29/2018.
4. Environmental Laboratory, 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y 87 1, United States Army Engineer Waterways Experiment Station, Vicksburg, MS.
5. U.S. Army Corps of Engineers, 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0 U.S. Army Engineer Research and Development Center. ERDC/EL TR-10-20.
6. Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron* 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X

11139LH.1019-EDGEMOOR-WETLAND DELINEATION.RPT

FIGURES



FIGURE 1: USGS TOPO MAP



May 31, 2018

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



FIGURE 2: NWI MAP



May 31, 2018

Wetlands

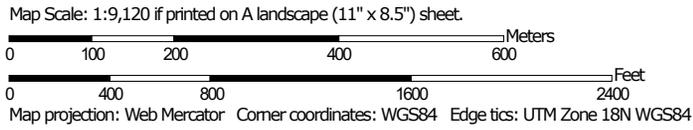
-  Estuarine and Marine Deepwater
-  Estuarine and Marine Wetland
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond
-  Lake
-  Other
-  Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Soil Map—New Castle County, Delaware
(FIGURE 3 : SOIL MAP)



Soil Map may not be valid at this scale.



Soil Map—New Castle County, Delaware
(FIGURE 3 : SOIL MAP)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: New Castle County, Delaware

Survey Area Data: Version 12, Oct 2, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 19, 2011—Sep 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MtaB	Mattapex silt loam, 2 to 5 percent slopes, Northern Coastal Plain	0.1	0.1%
Up	Urban land	95.8	97.3%
UwA	Udorthents, wet substratum, 0 to 2 percent slopes	2.3	2.3%
VoB	Urban land-Othello complex, 0 to 5 percent slopes	0.0	0.0%
W	Water	0.2	0.2%
Totals for Area of Interest		98.4	100.0%

APPENDIX A

SITE PHOTOGRAPHS



Photograph 1 -View of southern portion of the Delaware Riverbank on the project site.



Photograph 2 - View of central portion of the Delaware Riverbank on the project site.



Photograph 3 – View of seawall along the Delaware River, looking south. Drift deposits along the seawall depict the approximate location of the Mean High Waterline.



Photograph 4 – Trash and driftwood along the Delaware Riverbank depicting the approximate location of the Mean High Waterline.



Photograph 5 – View of bridge and infrastructure debris in the center of the project site, looking east towards the Delaware River.



Photograph 6 – View of existing lagoon.



Photograph 7 – View of channel located on the project site, looking west. The channel drains from and offsite location into the Delaware River.



Photograph 8 – View of channel flowing into the Delaware River, looking east.



Photograph 9 – View of pipe that carries flow from an offsite location into the channel.



Photograph 10 – View of riprap along the channel, looking north.



Photograph 11 – Location of Sample Point 1.



Photograph 12 – Location of Sample Point 2.

APPENDIX B

FIELD DATA FORMS

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Chemors Edgemoor Plant City/County: Wilmington/New Castle Sampling Date: 6/29/2018
 Applicant/Owner: Diamond State Port Corporation State: DE Sampling Point: 1
 Investigator(s): Ralph B. Downard, Kate Bullock Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): MLRA Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Urban Land (Up) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: Sample point located on western bank of Delaware River in the southern portion of the project site. The sample point was taken in the rip-rap along the bank, approximately 6 feet above the watercourse.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: No wetland hydrological indicators.	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: 1

	Absolute % Cover	Dominant Species?	Indicator Status																													
Tree Stratum (Plot size: _____)																																
1. <u>Liriodendron tulipifera</u>	15	Y	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0 %</u> (A/B)																												
2. <u>Liquidambar styraciflua</u>	10	Y	FAC																													
3. <u>Acer saccharinum</u>	5	N	FAC																													
4. <u>Fraxinus americana</u>	5	N	FACU																													
5. <u>Robinia pseudoacacia</u>	5	N	UPL																													
6. <u>Albizia julibrissin</u>	5	N	UPL																													
7. _____																																
8. _____																																
_____ = Total Cover 50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>				Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="text-align:right">Total % Cover of:</td> <td style="text-align:center">_____</td> <td style="text-align:right">Multiply by:</td> <td style="text-align:center">_____</td> </tr> <tr> <td>OBL species</td> <td style="text-align:center"><u>0</u></td> <td>x 1 =</td> <td style="text-align:center"><u>0</u></td> </tr> <tr> <td>FACW species</td> <td style="text-align:center"><u>0</u></td> <td>x 2 =</td> <td style="text-align:center"><u>0</u></td> </tr> <tr> <td>FAC species</td> <td style="text-align:center"><u>20</u></td> <td>x 3 =</td> <td style="text-align:center"><u>60</u></td> </tr> <tr> <td>FACU species</td> <td style="text-align:center"><u>25</u></td> <td>x 4 =</td> <td style="text-align:center"><u>100</u></td> </tr> <tr> <td>UPL species</td> <td style="text-align:center"><u>45</u></td> <td>x 5 =</td> <td style="text-align:center"><u>225</u></td> </tr> <tr> <td>Column Totals:</td> <td style="text-align:center"><u>90</u> (A)</td> <td></td> <td style="text-align:center"><u>385</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>4.28</u>	Total % Cover of:	_____	Multiply by:	_____	OBL species	<u>0</u>	x 1 =	<u>0</u>	FACW species	<u>0</u>	x 2 =	<u>0</u>	FAC species	<u>20</u>	x 3 =	<u>60</u>	FACU species	<u>25</u>	x 4 =	<u>100</u>	UPL species	<u>45</u>	x 5 =	<u>225</u>	Column Totals:	<u>90</u> (A)		<u>385</u> (B)
Total % Cover of:	_____	Multiply by:	_____																													
OBL species	<u>0</u>	x 1 =	<u>0</u>																													
FACW species	<u>0</u>	x 2 =	<u>0</u>																													
FAC species	<u>20</u>	x 3 =	<u>60</u>																													
FACU species	<u>25</u>	x 4 =	<u>100</u>																													
UPL species	<u>45</u>	x 5 =	<u>225</u>																													
Column Totals:	<u>90</u> (A)		<u>385</u> (B)																													
Sapling/Shrub Stratum (Plot size: _____)																																
1. <u>Lonicera sp.</u>	15	Y	---		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																											
2. <u>Amorpha sp.</u>	15	Y	---																													
3. <u>Rhus typhina</u>	5	N	UPL																													
4. <u>Albizia julibrissin</u>	5	N	UPL																													
5. <u>Acer saccharinum</u>	5	N	FAC																													
6. _____																																
7. _____																																
8. _____																																
_____ = Total Cover 50% of total cover: <u>22.5</u> 20% of total cover: <u>9</u>																																
Herb Stratum (Plot size: _____)																																
1. <u>Reynoutria japonica</u>	10	Y	UPL	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.																												
2. <u>Rubus flagellaria</u>	10	Y	UPL																													
3. _____																																
4. _____																																
5. _____																																
6. _____																																
7. _____																																
8. _____																																
9. _____																																
10. _____																																
11. _____																																
12. _____																																
_____ = Total Cover 50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																																
Woody Vine Stratum (Plot size: _____)																																
1. <u>Lonicera sp.</u>	15	Y	---	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>																												
2. <u>Rubus flagellaria</u>	10	Y	UPL																													
3. <u>Parthenocissus quinquefolia</u>	5	N	FACU																													
4. _____																																
5. _____																																
_____ = Total Cover 50% of total cover: <u>15</u> 20% of total cover: <u>6</u>																																

Remarks: (If observed, list morphological adaptations below).

Other species located nearby included *Salix nigra*, *Ailanthus altissima*, *Juniperus virginiana*, *Acer negundo*, *Asclepias sp.*, *Hedera helix*, and *Abutilon theophrasti*.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

- | | | |
|--|---|---|
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) | | Indicators for Problematic Hydric Soils³: |
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U) | <input type="checkbox"/> 1 cm Muck (A9) (LRR O) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U) | <input type="checkbox"/> 2 cm Muck (A10) (LRR S) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O) | <input type="checkbox"/> Reduced Vertic (F18) (outside MLRA 150A,B) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (LRR P, S, T) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) |
| <input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U) | <input type="checkbox"/> Redox Dark Surface (F6) | (MLRA 153B) |
| <input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Muck Presence (A8) (LRR U) | <input type="checkbox"/> Redox Depressions (F8) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> 1 cm Muck (A9) (LRR P, T) | <input type="checkbox"/> Marl (F10) (LRR U) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Ochric (F11) (MLRA 151) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T) | |
| <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A) | <input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O, S) | <input type="checkbox"/> Delta Ochric (F17) (MLRA 151) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B) | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A) | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) | |
| <input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U) | | |

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Area has been filled and no soil observation was possible. Absence of hydric soils was determined based past industrial land use and the elevation above the river.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Chemours Edgemoor Plant City/County: Wilmington/New Castle Sampling Date: 6/29/2018
 Applicant/Owner: Diamond state Port Corporation State: DE Sampling Point: 2
 Investigator(s): Ralph B. Downard, Kate Bullock Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-2
 Subregion (LRR or MLRA): MLRA Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Urban land (Up) NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks: Sample point located on the western bank of the Delaware River in the northern portion of the project site. The sample point was taken in the rip-rap along the bank, approximately 6 feet above the watercourse.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> Surface Water (A1)</td> <td style="width:50%; border: none;"><input type="checkbox"/> Aquatic Fauna (B13)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> High Water Table (A2)</td> <td style="border: none;"><input type="checkbox"/> Marl Deposits (B15) (LRR U)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Saturation (A3)</td> <td style="border: none;"><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water Marks (B1)</td> <td style="border: none;"><input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Sediment Deposits (B2)</td> <td style="border: none;"><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Drift Deposits (B3)</td> <td style="border: none;"><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td style="border: none;"><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Iron Deposits (B5)</td> <td style="border: none;"><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> </table>	<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)																				
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)																				
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)																				
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)																				
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<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)																				
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)																				
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)																					
<input type="checkbox"/> Water-Stained Leaves (B9)																					
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <u>X</u>																				
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:																					
Remarks: No wetland hydrological indicators.																					

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: 2

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling/Shrub Stratum (Plot size: _____)				
1. <i>Amorpha</i> sp.	10	Y	---	
2. <i>Platanus occidentalis</i>	10	Y	FACW	
3. <i>Lonicera</i> sp.	10	Y	---	
4. <i>Liquidambar styraciflua</i>	5	N	FAC	
5. <i>Acer saccharinum</i>	5	N	FAC	
6. <i>Buddleja davidii</i>	5	N	FACU	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
45 = Total Cover				
50% of total cover: 22.5 20% of total cover: 9				
Herb Stratum (Plot size: _____)				
1. <i>Reynoutria japonica</i>	15	Y	UPL	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Woody Vine Stratum (Plot size: _____)				
1. <i>Amorpha</i> sp.	15	Y	---	
2. <i>Lonicera</i> sp.	15	Y	---	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: 15 20% of total cover: 6				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 17% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	<u>0</u>	x 1 =	<u>0</u>	
FACW species	<u>10</u>	x 2 =	<u>20</u>	
FAC species	<u>10</u>	x 3 =	<u>30</u>	
FACU species	<u>5</u>	x 4 =	<u>20</u>	
UPL species	<u>15</u>	x 5 =	<u>75</u>	
Column Totals:	<u>40</u>	(A)	<u>145</u>	(B)

Prevalence Index = B/A = 3.625

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (If observed, list morphological adaptations below).

Other vegetation noted in close proximity to data point include *Ilex opaca*, *Acer negundo*, *Quercus rubra*, *Salix nigra*, *Securigera varia*, *Verbascum thapsus*, and *Rumex* sp.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

- Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**
- Histosol (A1)
 - Histic Epipedon (A2)
 - Black Histic (A3)
 - Hydrogen Sulfide (A4)
 - Stratified Layers (A5)
 - Organic Bodies (A6) (LRR P, T, U)
 - 5 cm Mucky Mineral (A7) (LRR P, T, U)
 - Muck Presence (A8) (LRR U)
 - 1 cm Muck (A9) (LRR P, T)
 - Depleted Below Dark Surface (A11)
 - Thick Dark Surface (A12)
 - Coast Prairie Redox (A16) (MLRA 150A)
 - Sandy Mucky Mineral (S1) (LRR O, S)
 - Sandy Gleyed Matrix (S4)
 - Sandy Redox (S5)
 - Stripped Matrix (S6)
 - Dark Surface (S7) (LRR P, S, T, U)
 - Polyvalue Below Surface (S8) (LRR S, T, U)
 - Thin Dark Surface (S9) (LRR S, T, U)
 - Loamy Mucky Mineral (F1) (LRR O)
 - Loamy Gleyed Matrix (F2)
 - Depleted Matrix (F3)
 - Redox Dark Surface (F6)
 - Depleted Dark Surface (F7)
 - Redox Depressions (F8)
 - Marl (F10) (LRR U)
 - Depleted Ochric (F11) (MLRA 151)
 - Iron-Manganese Masses (F12) (LRR O, P, T)
 - Umbric Surface (F13) (LRR P, T, U)
 - Delta Ochric (F17) (MLRA 151)
 - Reduced Vertic (F18) (MLRA 150A, 150B)
 - Piedmont Floodplain Soils (F19) (MLRA 149A)
 - Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)
- Indicators for Problematic Hydric Soils³:**
- 1 cm Muck (A9) (LRR O)
 - 2 cm Muck (A10) (LRR S)
 - Reduced Vertic (F18) (outside MLRA 150A,B)
 - Piedmont Floodplain Soils (F19) (LRR P, S, T)
 - Anomalous Bright Loamy Soils (F20) (MLRA 153B)
 - Red Parent Material (TF2)
 - Very Shallow Dark Surface (TF12)
 - Other (Explain in Remarks)
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Area has been filled and no soil observation was possible. Absence of hydric soils was determined based past industrial land use and the elevation above the river.

PLAN

