APPENDIX J

Wetland Delineations

J.1 | SIGNATURE EAST

J.2 | SIGNATURE SOUTH

APPENDIX J.2

Signature South

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SECTION 3

WETLAND DELINEATION REPORT



TETERBORO AIRPORT – SIGNATURE SOUTH WETLAND DELINEATION REPORT

BOROUGH OF TETERBORO: BLOCK 203, LOT 1 (PORTION)
BOROUGH OF MOONACHIE: BLOCK 76, LOT 1.02 (PORTION)
BERGEN COUNTY, NJ

FEBRUARY 2024

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1.0 INTRODUCTION

1.1 PURPOSE OF STUDY

The objective of this effort was to delineate and describe waters of the United States, including wetlands, located within a portion of the properties designated as Block 203, Lot 1 in the Borough of Teterboro; and Block 76, Lot 1.02 in the Borough of Moonachie, Bergen County, New Jersey (**Figure 1** and **Figure 2**). Areas identified and delineated are potentially regulated pursuant to Section 404 of the Clean Water Act (CWA). Section 404 of the CWA defines wetlands as:

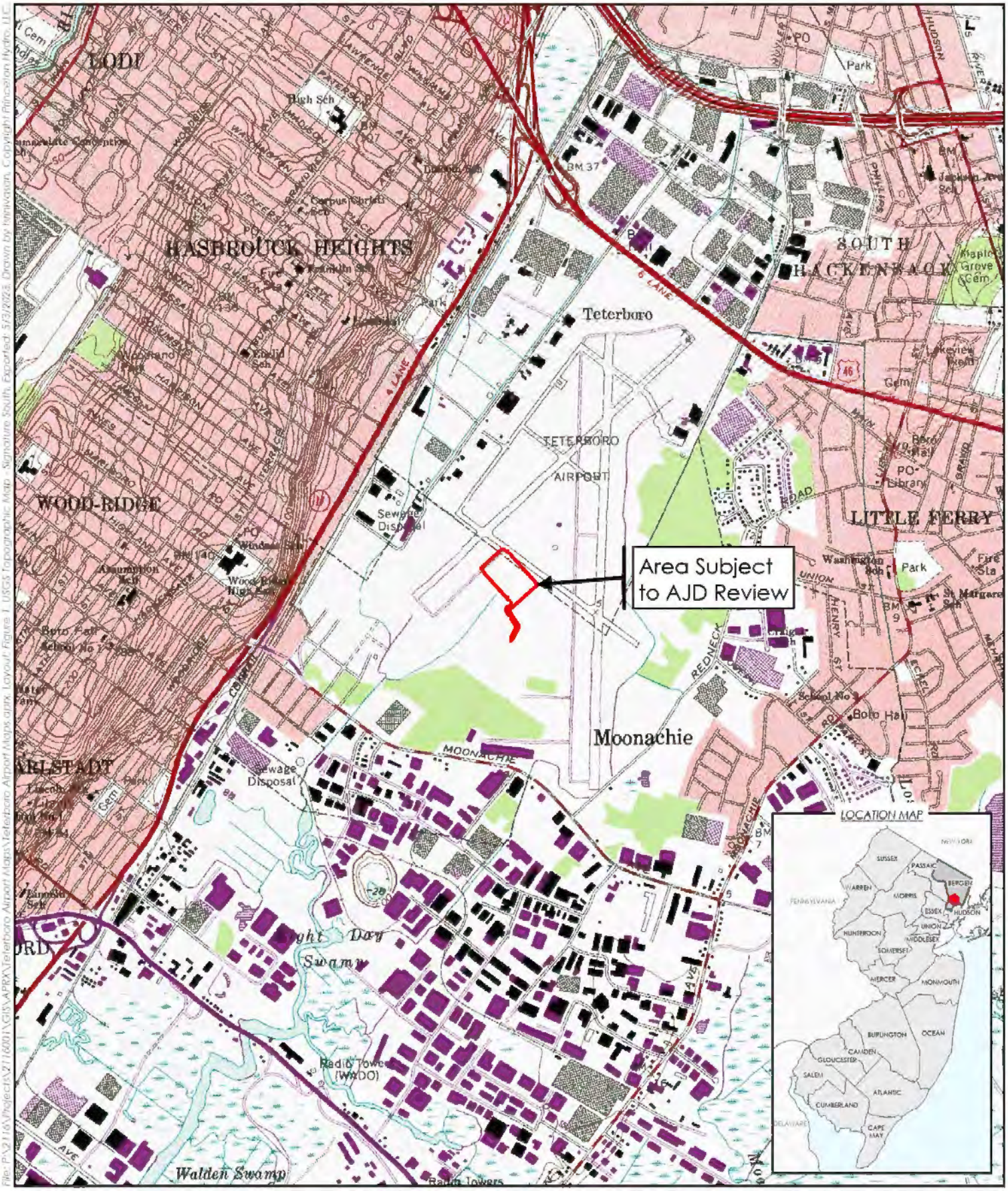
> *"Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

The delineation of waters of the United States, including wetlands, was performed by Princeton Hydro, LLC (Princeton Hydro) on February 9, 2023 in accordance with the methods and procedures set forth in the *1987 Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 (1987 Manual)* (Environmental Laboratory 1987) and the U.S. Army Corps of Engineers (USACE) *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (NCNE Regional Supplement)* (Environmental Laboratory 2012). Princeton Hydro conducted a desktop review of historical aerial imagery, soil, wetland, and topographic information prior to the field investigation to assist in describing and delineating areas potentially under Federal and/or State jurisdiction.

1.2 SITE DESCRIPTION

The area subject to the delineation effort consisted of a 16.46-acre proposed lease area located within portions of Block 203, Lot 1 in the Borough of Teterboro and Block 76, Lot 1.02 in the Borough of Moonachie, Bergen County, New Jersey (Site) (**Figure 1** and **Figure 2**). The Site is bound to the northwest and northeast by the runways and tarmacs of Teterboro Airport and associated maintained lawns, to the southwest by the Signature Flight Support Teterboro South Terminal complex, and to the southeast by freshwater wetlands.

The land associated with Teterboro Airport was acquired in 1917 by William Teter. The first flight took off from the airport in 1919, and airport operations have continued consistently to the present day. The Signature Flight Support Teterboro South Terminal complex was recently built to the southwest of the Site, providing a connection for the airport's runways to the northwest and east. The Site itself has remained largely unchanged since the opening of the airport. The Site is owned by the Port Authority of New York and New Jersey (PANYNJ) and will be leased by First Aviation Services. The Signature South Expansion Project (Project) is proposed within a 9.52-acre portion of the proposed lease area. The Project area is generally defined by the anticipated limit of disturbance for the future expansion of the existing First Aviation Services aircraft hangar facilities.



NOTES:
1. Area Subject to AJD Review provided by Signature Flight Support.
2. USGS topographic map obtained from the New Jersey Geographic Information Network, Weehawken, NJ quadrangle.

0 1,000 2,000 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 1.
USGS TOPOGRAPHIC MAP
SIGNATURE SOUTH

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File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 1_USGS Topographic Map - Signature South, Exported: 5/3/2023, Drawn by: hmkwasin, Copyright Princeton Hydro, LLC



File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps.aprx, Layout: Figure 2. Aerial Overview Map - Signature South, Exported: 5/3/2023, Drawn by Srinivasan, Copyright Princeton Hydro, LLC

NOTES:
1. Streams obtained from the United States Geological Survey's (USGS) National Hydrography Dataset (NHD).
2. Area Subject to AJD Review provided by Signature Flight Support.
3. 2020 orthoimagery and roads obtained from the New Jersey Geographic Information Network.

0 500 1,000 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 2.
AERIAL OVERVIEW MAP
SIGNATURE SOUTH

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The Site possessed nine distinct vegetative communities: maintained lawn wetland and upland, common reed dominated wetland and upland, red maple/pin oak successional forested wetland and upland, emergent wetland, degraded emergent wetland, and an upland berm (**Figure 3**).

The maintained lawn wetland and upland communities were observed along the northern edge of the Site; the common reed dominated wetland and upland communities were observed within the central and northern portions of the Site; the emergent wetland community was observed in the eastern portion of the Site; the degraded wetland community was observed in the northcentral portion of Site, and the upland berm was observed in the southern portion of the Site. The red maple/pin oak successional forested wetland was observed in two different locations. The larger of the two stands was located in the southern extent of the Site and continued off-Site. A smaller, fragmented stand was located in the central portion of the Site surrounded by common reed dominated wetland. Red maple/pin oak successional forested upland was observed in the southern portion of the Site upgradient from its wetland counterpart.

The Site is located within the Hackensack River (below and including Hirshfeld Brook) Watershed (Hydrologic Unit Code [HUC]-11: 02030103180). No waterbodies were observed or delineated within the Site; however, the wetlands on-Site abut East Riser Ditch off-Site to the southeast. East Riser Ditch is a tidal tributary of Berry's Creek. Berry's Creek is a tidal tributary of the Hackensack River, which is a navigable waterbody.

1.3 PRIOR APPROVED JURISDICTIONAL DETERMINATION

Wetlands on-Site were originally delineated by Langan Engineering and Environmental Services, Inc. (Langan) in April 2014. On December 9, 2014, the USACE-NYD issued an Approved Jurisdictional Determination (AJD) for the Site, confirming that Langan's wetland delineation accurately reflected the extent of waters of the United States present (Permit Application No. NAN-2014-01328). The jurisdictional waters of the United States identified on-Site consisted of one freshwater wetland complex. This jurisdictional wetland was determined to be 8.03 acres in size and was delineated by wetland flags A1N through A-68 (hereinafter referred to as "Wetland A"). Wetland A was determined to consist of 0.52 acres of scrub shrub and forested wetlands and 7.51 acres of emergent wetlands that abutted East Riser Ditch. East Riser Ditch was determined to be a tidal tributary of Berry's Creek. Berry's Creek is a tidal tributary of the Hackensack River, which is a navigable waterbody. As the wetlands on-Site were determined to be a part of a tributary system, they were considered to be waters of the United States under the jurisdiction of the USACE. A copy of the prior AJD for the Site is provided in **Section 5**. The prior AJD expired on December 9, 2019.

1.4 SUMMARY OF PROPOSED JURISDICTIONAL DETERMINATION

Based on the findings presented herein, it was determined that waters of the United States exist on-Site as it applies to the jurisdictional limits of the authority of the USACE under Section 404 of the CWA. There were no non-jurisdictional waters observed on-Site.

On February 9, 2023, Princeton Hydro conducted field investigations at the Site and confirmed that the extent of waters of the United States on-Site remain unchanged from those previously approved by the USACE (Permit Application No. NAN-2014-01328). **Table 1** below summarizes the waters of the

File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 3. Existing Ecological Communities - Signature South, Exported: 5/3/2023, Drawn by tsrinivasan, Copyright Princeton Hydro, LLC.



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NOTES:
1. Wetland limit and existing ecological community boundaries are approximate. Boundaries were delineated by Princeton Hydro based on on-site observations.
2. Area Subject to AJD Review and lease lines provided by Signature Flight Support.
3. Property boundaries (Bergen County 2021 Parcels), 2020 orthoimagery, and roads obtained from the NJ Geographic Information Network (NJGIN).

0 70 140 Feet

Spatial Reference: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

FIGURE 3. EXISTING ECOLOGICAL COMMUNITIES SIGNATURE SOUTH

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United States originally delineated by Langan which were approved by the USACE in 2014, and their proposed jurisdiction as it applies to the authority of the USACE under Section 404 of the CWA. The only notable difference between this AJD request and the prior AJD is the area subject to the USACE's review. Although Langan's original wetland delineation has not changed, the Site subject to this AJD request is 16.46 acres in size (versus the original AJD's 10.75 acres) and contains a total of 12.55 acres of jurisdictional wetlands (versus the original AJD's 8.03 acres) (see **Section 4**).

The jurisdiction of waters of the United States is subject to review and approval by the USACE. As such, the findings within this report are preliminary and should not be considered final until the USACE has issued an AJD.

Table 1. Summary of Proposed CWA Section 404 Jurisdiction

RESOURCE IDENTIFIER[1]	RESOURCE TYPE[2]	Vegetative Communities	PROPOSED JURIDICTION[3]	JURIDICTIONAL DETERMINATION RATIONALE[4]	SIZE OF EXISTING RESOURCE[5]
Wetlands					
Wetland A	PEM1Jd	Maintained Lawn Wetland Emergent Wetland Degraded Emergent Wetland	Jurisdictional	Wetland Adjacent to a RPW (Berry's Creek UNT)	12.55
	PEM5Jd	Common Reed Dominated Wetland			
	PFO1J	Red Maple/Pin Oak Successional Forested Wetland			
Waterbodies					
None					

Notes:
[1] Reference the Wetland Delineation Drawing provided externally as Section 4.
[2] Cowardin Classifications, Cowardin et al. 1979.
PEM1Jd = Palustrine Persistent Emergent, Intermittently Flooded, Partially Drained/Ditched
PEM5Jd = Palustrine Emergent, Phragmites Australis, Intermittently Flooded, Partially Drained/Ditched
PFO1J = Palustrine Forested, Broad-leaved Deciduous, Partial Drained/Ditched
[3] The jurisdiction of waters of the United States is subject to review and approval by the USACE. As such, the findings within this report are preliminary and should not be considered final until the USACE has issued an AJD.
[4] Source: EPA 2008 and 80 FR 3004
[5] Area in acres

2.0 FIELD INVESTIGATIONS

2.1 WETLAND DELINEATION METHODOLOGY

The delineation of waters of the United States, including wetlands, was performed in accordance with the methods and procedures set forth in the *1987 Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 (1987 Manual)* (Environmental Laboratory 1987) with supplemental information provided by the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast (Version 2.0) (NCNE Regional Supplement)* (Environmental Laboratory 2012). The methods and procedures set forth in *the 1987 Manual* were applied for both the collection and review of existing available background information on vegetation, soils, and hydrology and the on-Site delineation.

Based on the "three parameter" approach, an area is defined as a wetland if it exhibits, under normal circumstances, all of the following characteristics:

1. The land supports a dominance of hydrophytic vegetation.
2. The substrate is hydric soil.
3. The soil/substrate is at least periodically saturated or inundated during a portion of the growing season.

The delineation effort involved the establishment of representative sampling points along wetland lines and at representative locations within each plant assemblage on-Site. At each sampling point, data regarding the vegetation, soil and hydrology of the area was collected. The data collected provided the information required to determine whether the area met the definition of a wetland.

2.1.1 VEGETATION

A hydrophyte is any plant that has the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels. The United States Fish and Wildlife Service (USFWS) prepared a list of wetland plant species for the Northeast United States (Region 1) (USFWS 1988 & 1996). On June 1, 2012, the 2012 National Wetland Plant List replaced the 1988 USFWS' National list of plant species that occur in wetlands (USFWS Biological Report 88 (24)). This list was developed by the USACE, the USFWS, the United States Environmental Protection Agency (USEPA), and the NRCS. The 2012 list included changes in the names of species, the recognition of new species, changes in wetland regions, and changes in the wetland indicator statuses of species. The most recently updated 2020 National Wetland Plant List was utilized to classify the plant species identified on-Site. The wetland indicator classification assigned to each species listed is provided in **Table 2**.

Table 2. Plant Affinity for Wetland Conditions

INDICATOR CLASSIFICATION	PERCENT OCCURRENCE IN WETLANDS
Obligate (OBL)	>99
Facultative Wetland (FACW)	67-99
Facultative (FAC)	34-66
Facultative Upland (FACU)	1-33
Non-wetland (UPL)	<1

Species for which insufficient information is available for classification are listed in the USFWS list with a designation of NI (No Indicator) for regional status. This wetland indicator classification was used for plant species found at the Site. A designation of NL (Not Listed) was used if a species was not present within the list.

To accurately describe the vegetation at each sampling point, data on each horizontal strata or layer were collected. Vegetative strata for which dominants were determined included (1) tree (≥ 5.0 inches diameter at breast height (DBH) and 20 feet or taller); (2) sapling (0.4 to <5.0 inches DBH and <20 feet tall); (3) shrub (usually 3 to 20 feet tall including multi-stemmed, bushy shrubs); (4) woody vine; and (5) herb (herbaceous plants including graminoids, forbs, ferns, fern allies, herbaceous vines, and tree seedlings).

The dominant species was determined by making visual estimates of the herb, shrub, sapling, woody vine, and tree strata and assigned one of the following cover classes, with the midpoints of each cover class in parentheses: T < 1% (none); 1 = 1-5% (3.0); 2 = 6-15% (10.5); 3 = 16-25% (20.5); 4 = 26-50% (38.0); 5 = 51-75% (63.0); 6 = 76-95% (85.5); 7 = 96- 100% (98.0). The midpoints of each species were averaged at each sample point and ranked. The dominance threshold number was calculated and used to determine dominant species. Those species comprising 50 percent of the total cover were considered to be the dominants, plus any additional species representing 20 percent or more of the total cover class midpoint values for each stratum. A USFWS wetland indicator was assigned to each species recorded. The affinity of the dominant species to wetlands was used in the determination of the wetland status at each sample point.

At each wetland determination data point, vegetation was initially evaluated using the Rapid Test for Hydrophytic Vegetation. If all dominant species across all strata were OBL or FACW based on a visual assessment, vegetation was determined to be hydrophytic. If the area sampled was not dominated solely by OBL and FACW species, the standard Dominance Test was used. Using the Dominance Test, if greater than 50 percent of the dominant plant species were OBL, FACW or FAC then hydrophytic vegetation was determined to be present.

2.1.2 SOILS

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (Environmental Laboratory 1987). Typically, these soils are predominately gray and mottled immediately below the "A" horizon and have thick, dark colored surface layers. At each sampling point, a detailed soil description was obtained from an auger boring. A Munsell soil color book was used to determine soil color. Each boring was taken to a depth of at least 18 inches or until refusal was met.

2.1.3 HYDROLOGY

The identification of positive indicators of wetland hydrology includes direct observation of inundation, soil saturation, or secondary characteristics, such as stained leaf litter or buttressed tree trunks, indicating that the area is subject to inundation or saturation for a prolonged duration. For an area to be designated as a wetland, the area must have the presence of water for a week or more during the growing season (Environmental Laboratory 1987). Areas with wetland hydrology characteristics are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively.

At each sampling point, positive indicators of wetland hydrology were noted when encountered. These indicators include, but are not limited to, drainage patterns, drift lines, sediment deposition, watermarks, saturated soils, or inundation. Features that could influence the hydrology of the area, such as ditches or drainage systems, were also noted.

2.2 *WATERBODIES*

This study also evaluated the presence of waters of the United States, other than wetlands, potentially subject to the jurisdictional limits of the authority of the USACE under Section 404 of the CWA. Waterbodies within the northcentral northeast region include, but are not limited to, tidal flats and

shorelines along the Atlantic coast and estuaries; unvegetated temporary pools; ponds; lakes; mud flats; and perennial, intermittent, and ephemeral stream channels (*NCNE Regional Supplement*). The delineation of waterbodies on-Site was based on the high tide line and indicators of ordinary highwater marks (OHWM) (33 CFR 328.3c).

3.0 RESULTS AND DISCUSSION

3.1 VEGETATION

3.1.1 DESKTOP REVIEW OF VEGETATION

Prior to conducting Site investigations, Princeton Hydro conducted a desktop review of mapped freshwater wetlands utilizing the previous AJD issued for the Site, along with both NJDEP's GeoWeb (NJDEP 2023) and the USFWS's National Wetland Inventory (NWI) (USFWS 2023). As described in *Section 1.3* above, the previous AJD reported there was one jurisdictional wetland complex located on-Site. The majority of this wetland was characterized as an emergent wetland with a small portion comprised of scrub shrub wetland. Additionally, both NJDEP GeoWeb (**Figure 4**) and the NWI (**Figure 5**) indicated the presence of freshwater wetlands on-Site. NJDEP's GeoWeb indicated the presence of three vegetative wetland communities on-Site: Disturbed Wetlands (Modified), Phragmites Dominated Interior Wetlands, and Deciduous Wooded Wetlands. The NWI Wetland Map indicated the presence of two vegetative wetland communities on-Site: Freshwater Emergent Wetland and Freshwater Forested/Shrub Wetland.

3.1.2 RESULTS OF FIELD INVESTIGATIONS OF VEGETATION

Princeton Hydro observed nine distinct plant communities on-Site: maintained lawn wetland and upland, common reed dominated wetland and upland, red maple/pin oak successional forested wetland and upland, emergent wetland, degraded emergent wetland, and an upland berm (**Figure 3**). A list of all plant species identified on-Site is provided in **Appendix I**. Plant species identified at each sampling point are provided in the Wetland Delineation Data Forms included in **Appendix II**.

The red maple/pin oak successional forested wetland vegetative community is represented on the Wetland Delineation Data Forms by Bor-1 (**Appendix II**). The tree stratum of this vegetative community was dominated by red maple (*Acer rubrum*, FAC) and pin oak (*Quercus palustris*, FACW), and the sapling/shrub stratum was dominated by highbush blueberry (*Vaccinium corymbosum*, FACW) and pin oak saplings. There was no vegetation observed within the herbaceous or woody vine stratums. This vegetative community was comprised of two separate stands: one disjunct, younger, and poorer quality stand located in the middle of the Site and surrounded entirely by common reed dominated wetland; and a more mature stand at the southern end of the Site that connected to a larger deciduous forested wetland that extended off-Site (see **Figure 3**).

The degraded emergent wetland vegetative wetland community is represented on the Wetland Delineation Data Forms by Bor-2 (**Appendix II**). This community was observed in the eastern portion of the Site adjacent to maintained lawn. No trees, saplings, shrubs, or woody vines were observed within the degraded emergent wetland. The herbaceous stratum was dominated by perennial ryegrass



File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 4. NJDEP Wetlands Map - Signature South, Exported: 5/3/2023, Drawn by tsrinivasan, Copyright Princeton Hydro, LLC.

NOTES:
1. Area Subject to AJD Review provided by Signature Flight Support.
2. NJDEP Wetlands (2015 land use/land cover) obtained from NJDEP GIS website: www.state.nj.us/dep/gis/
3. 2020 orthoimagery obtained from the New Jersey Geographic Information Network.

0 100 200 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 4.
NJDEP WETLANDS MAP
SIGNATURE SOUTH

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File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 5. NWI Wetlands Map - Signature South, Exported: 5/3/2023, Drawn by Srinivasan, Copyright Princeton Hydro, LLC.

NOTES:
1. Area Subject to AJD Review provided by Signature Flight Support.
2. National Wetlands Inventory (NWI) wetlands obtained from The US Fish & Wildlife Service.
3. 2020 orthoimagery obtained from the New Jersey Geographic Information Network.

0 100 200 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 5.
NWI WETLANDS MAP
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(*Lolium perenne*, FACU) and purple loosestrife (*Lythrum salicaria*, OBL). Switchgrass (*Panicum virgatum*, FAC) and common reed (*Phragmites australis*, FACW) were also present but were not dominant. This vegetative community had poor species composition as it was comprised primarily of invasive plant species and was surrounded entirely by common reed dominated wetland and maintained lawn communities, leading to its designation as a "degraded" emergent wetland vegetative community.

The emergent wetland occurred in the eastern portion of the Site and is represented on the Wetland Delineation Data Forms by Bor-3 (**Appendix III**). There were no trees observed within this vegetative community Shrubs were uncommon but when present in the sapling/shrub stratum it was limited to either eastern baccharis (*Baccharis halimifolia*, FACW) or highbush blueberry. The herbaceous stratum was dominated by broadleaf cattail (*Typha latifolia*, OBL), common rush (*Juncus effusus*, OBL), and Pennsylvania smartweed (*Polygonum pensylvanicum*, FACW). Herbaceous species, such as blue verbena (*Verbena hastata*, FACW), purpleleaf willowherb (*Epilobium coloratum*, OBL), common marshmallow (*Althaea officinalis*, FAC), and shallow sedge (*Carex lurida*, OBL), also occurred within this wetland community but were not dominant. This community differed from the degraded emergent wetland community in that it was comprised of a wide variety of native hydrophytic plant species and possessed structural complexity.

The common reed dominated wetland occurred over a large portion of the Site. This vegetative community was generally devoid of any trees, saplings, shrubs, and woody vines. The herbaceous stratum was dominated by a dense monoculture of common reed and lacked structural heterogeneity. The common reed dominated upland vegetative community occurred in a small area just upslope of the common reed dominated wetland. The vegetation in this community consisted of a similar monoculture of common reed, however it did not possess wetland hydrology of hydric soils, and therefore was not delineated as a wetland community.

The red maple/pin oak successional forested upland is represented on the Wetland Delineation Data Forms by Bor-4 (**Appendix III**). The tree stratum was dominated by sweetgum (*Liquidambar styraciflua*, FAC), and the sapling/shrub stratum was dominated by sweet cherry (*Prunus avium*, FACU) and black cherry (*Prunus serotina*, FACU). Grey birch was present but not dominant in the tree and sapling stratums, but they were dying back and senescing as the forest community matures and they are outcompeted. The herbaceous stratum was dominated by Japanese knotweed (*Reynoutria japonica*, FACU), and the woody vine stratum was dominated by Japanese honeysuckle (*Lonicera japonica*, FACU). This vegetative community occurred in a small area directly upslope of the red maple/pin oak successional forested wetland.

The maintained lawn upland and wetland vegetative communities occurred along the edges of the Site. These communities did not possess any tree, sapling, shrub, or woody vine vegetation within them. The herbaceous stratum was dominated by routinely mowed cool season grasses which likely consisted of Kentucky bluegrass (*Poa pratensis*, FACU). Within the maintained lawn wetland community, hydrophytic plants such as common rush and shallow sedge occurred along with the cool season grasses, but were also mowed.

The upland berm community occurred in a very small area in the southern extent of the Site. This s sparsely vegetated community was associated with piles of fill material and was dominated by Japanese knotweed and cool season grasses within the herbaceous stratum.

The vegetative communities described in this AJD differ from those described in the prior AJD. This was done to outline the vegetative communities on-Site more accurately and in greater detail, but also to highlight that the proposed Project area has purposefully been sited within lower quality, degraded habitats (see **Figure 3** for project area extent). For example, the majority of the Project area is proposed within common reed dominated wetland, which was typified by a monoculture of the invasive common reed and low utility maintained lawn communities. Additionally, the lower quality, fragmented stand of red maple/pin oak successional forest and degraded emergent wetlands occur within the Project area. The Project area limits minimize impacts to the higher quality emergent wetland and red maple/pin oak successional forested wetland that are contiguous with a larger forest stand that continues off Site to the south.

3.2 *SOILS*

3.2.1 DESKTOP REVIEW OF SOILS

The NRCS' Web Soil Survey is the official source for soil survey information for Bergen County, New Jersey. The NRCS' Web Soil Survey was utilized to conduct a desktop review of soils on-Site prior to conducting the wetland delineation (USDA NRCS 2023). The NRCS' Web Soil Survey indicated the presence of three soil-mapping units on-Site (**Figure 6**). A summary of these soils is provided in **Table 3** below. An official NRCS soil description is provided in the sections below. Additionally, a soil resource report for the Site is provided in **Appendix IV**.

Table 3. NRCS Mapped Soils

MAP UNIT SYMBOL	MAP UNIT NAME
TrkAv	Westbrook, Ipswich, and Sandyhook soils, 0 to 2 percent slopes, very frequently flooded
UdwB	Udorthents, wet substratum, 0 to 8 percent slopes
UdwuB	Udorthents, wet substratum-Urban land complex

WESTBROOK SERIES

The Westbrook Series consists of very deep, very poorly drained soils formed in organic deposits over loamy mineral material. This soil series is typically found in flat coastal areas and along tidal marshes and rivers that are subject to inundation by salt water twice daily. Slopes in this series generally range from 0 to 2 percent. In a representative soil profile, the surface layer, from 0 to 40 inches, is a very dark gray (10YR 3/1) mucky peat with 45 percent organic matter, followed from 48 to 64 inches by a very dark gray (5Y 3/1) silt loam with 12 percent organic matter. The depth to the water table is typically 0 inches, and soils within this series are predominantly hydric.

IPSWICH SERIES

The Ipswich Series consists of very deep, very poorly drained soils formed in thick herbaceous organic deposits. This series is typically found level tidal marshes and coastal areas that are subject to inundation by salt water twice daily. Slopes in this series generally range from 0 to 2 percent. In a representative soil profile, the first soil horizon, from 0 to 18 inches, is a dark grayish brown (2.5Y 4/2)



File: P:\2116\Projects\2116001\GIS\APRX\Teterboro Airport Maps\Teterboro Airport Maps.aprx, Layout: Figure 6. SSURGO Soils Map - Signature South, Exported: 5/3/2023, Drawn by Istinivasan, Copyright Princeton Hydro, LLC.

NOTES:
1. Area Subject to AJD Review provided by Signature Flight Support.
2. SSURGO Soils obtained from NRCS, USDA, Soil Survey Geographic (SSURGO) Database for Bergen County, New Jersey.
3. 2020 orthoimagery obtained from the New Jersey Geographic Information Network.

0 100 200 Feet

Spatial Reference: NAD 1983 2011 StatePlane New Jersey FIPS 2900 Ft US

FIGURE 6.
SSURGO SOILS MAP
SIGNATURE SOUTH

SIGNATURE FLIGHT SUPPORT - TETERBORO AIRPORT
TETERBORO AND MOONACHIE BOROUGHS
BERGEN COUNTY, NEW JERSEY

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mucky peat (hemic material), about 80 percent fiber and a dense mat of roots, stems, and leaves. This layer is followed from 18 to 42 inches by a very dark grayish brown (2.5Y 3/2) mucky peat (hemic material) with about 70 percent fiber, underlain from 42 to 62 inches by a very dark gray (2.5Y 3/1) muck (sapric material) with about 50 percent mineral material of silt and very fine sand. The depth to the water table is typically 0 inches, and soils within this series are predominantly hydric.

SANDYHOOK SERIES

The Sandyhook Series consists of very deep, very poorly drained soils formed in thick sandy marine deposits along the Atlantic coast. Soils within this series are typically found on flats and other level areas in back-barrier beaches and tidal marshes that are subject to daily tide flooding. Slopes in this series generally range from 0 to 8 percent. In a representative soil profile, the surface layer, from 0 to 4 inches, is a dark brown (7.5YR 3/2) mucky peat, followed from 4 to 8 inches by dark grayish brown (10YR 4/2) sand with many very fine to medium roots throughout. This was followed in the upper portion of the subsoil from 8 to 11 inches by a black (7.5YR 2.5/1) mucky sand with many very fine to medium roots throughout. This was underlain from 11 to 26 inches by a very dark grayish brown (10YR 3/2) coarse sand, and from 26 to 40 inches by a very dark gray (10YR 3/1) coarse sand with few very fine and fine roots throughout. The depth to the water table is typically 0 inches, and soils within this series are predominantly hydric.

3.2.2 RESULTS OF FIELD INVESTIGATIONS OF SOILS

Soils that exhibited indicators of anaerobic and/or hydric soil conditions were observed within Wetland A. The depth, matrix color, redoximorphic features and texture of a subset of soil samples taken are provided in the Wetland Delineation Data Forms provided in **Appendix II**.

Soils within the red maple/pin oak successional forested wetland met the criteria for hydric soil indicators A11: Depleted Below Dark Surface and F3: Depleted Matrix (*NCNE Regional Supplement*). A typical soil profile observed within wetland consisted of a 0 to 3-inch layer of black (10YR 2/1) sandy loam, followed from 3 to 7-inches by very dark grey (10YR 3/1) sandy loam. This was underlain from 7 to 12-inches by a mixed matrix consisting of 60 percent gray (10YR 5/1) and 40 percent grayish brown (2.5Y 5/2) sandy loam, followed by a 12 to 16-inch layer of grayish brown (2.5Y 5/2) sandy loam with 15-percent yellowish brown (10YR 5/8) redox concentrations occurring as pore linings. This layer was underlain from 16 to 24-inches by grayish brown (2.5Y 5/2) sandy loam with 30 percent yellowish brown (10YR 5/8) redox concentrations occurring as pore linings (**Appendix II, Bor-1**).

Soils within the degraded emergent wetland, maintained lawn wetland, and common reed dominated wetland communities met the criteria for hydric soil indicator F6: Redox Dark Surface (*NCNE Regional Supplement*). A typical soil profile observed within wetland consisted of a 0 to 8-inch surface layer of very dark grayish brown (10YR 3/2) loamy clay, followed from 8 to 14-inches by black (10YR 2/1) loamy clay with 10-percent brown (10YR 5/3) distinct redox concentrations. This was underlain from 14 to 20-inches by dark grayish brown (10YR 4/2) sand, followed from 10 to 24-inches on by dark grayish brown (10YR 4/2) sand with 5-percent yellowish brown (10YR 5/6) redox concentrations (**Appendix II, Bor-2**).

Soils within the emergent wetland community met the criteria for hydric soil indicators A11: Depleted Below Dark Surface, F3: Depleted Matrix, and F6: Redox Dark Surface (*NCNE Regional Supplement*). A

typical soil profile observed within wetland consisted of a 0 to 8-inch layer consisting of very dark gray (10YR 3/1) silty clay with 10-percent yellowish brown (10YR 5/4) distinct redox concentrations, followed from 8 to 24-inches by dark gray (10YR 4/1) with 30-percent yellowish brown (10YR 5/4) distinct redox concentrations along with 10-percent manganese masses within the matrix (**Appendix II, Bor-3**).

Indicators of anaerobic soil conditions were absent in soil borings taken within the upland vegetative communities on Site (**Appendix II, Bor-4**). A typical soil profile within the upland portions of the Site was characterized by a 0 to 2-inch layer of a black (10YR 2/1) sandy loam, followed from 2 to 4-inches by a dark gray (2.5Y 4/1) loam, followed from 4 to 6-inches by a black (10YR 2/1) loam, followed from 6 to 16-inches by loam mixed matrix of 50-percent black (10YR 2/1) with 50-percent very dark grayish (10YR 3/2), and followed from 16 to 24-inches by a brown (10YR 4/3) sand. These soils did not exhibit redoximorphic features or any other indicators of anaerobic conditions and therefore did not meet the definition of a hydric soil.

3.3 HYDROLOGY

3.3.1 DESKTOP REVIEW OF HYDROLOGY

Prior to conducting Site investigations, Princeton Hydro conducted a desktop review of mapped waterbodies on-Site utilizing the previous AJD issued for the Site, along with NJDEP's GeoWeb (NJDEP 2023) and the USFWS's NWI (USFWS 2023). Neither the previous AJD, NJDEP's GeoWeb, nor the USFWS' NWI indicated the presence of waterbodies on-Site.

3.3.2 RESULTS OF FIELD INVESTIGATIONS OF HYDROLOGY

Primary and secondary wetland hydrology indicators were observed within the vegetative communities that comprised the Wetland A complex. Specifically, Saturation (A3), a primary indicator of wetland hydrology, and Geomorphic Position (D2), a secondary indicator of wetland hydrology, were observed within the degraded emergent wetland, maintained lawn wetland, and common reed dominated wetland vegetative communities (see **Appendix II, Bor-2**).

Within the emergent wetland vegetative community, primary indicators of wetland hydrology included High Water Table (A2), Saturation (A3), Algal Mat or Crust (B4), and Water-Stained Leaves (B9). Secondary indicators of wetland hydrology observed within this vegetative community included Drainage Patterns (B10), Geomorphic Position (D2), and FAC-Neutral Test (D5) (see **Appendix II, Bor-3**).

Within the fragmented red maple/pin oak successional forested wetland, two secondary indicators of wetland hydrology were observed: Geomorphic Position (D2) and FAC-Neutral Test (D5) (see **Appendix II, Bor-1**).

Primary and secondary indicators of wetland hydrology were absent within the upland portions of the Site, including the maintained lawn upland, common reed dominated upland, red maple/pin oak successional forested upland, and the upland berm (see **Appendix II, Bor-4**).

3.4 WATERBODIES

The Site is located within the Hackensack River (below and including Hirshfeld Brook) Watershed (HUC-11: 02030103180). This region receives approximately 47-inches of precipitation on average per year (US Climate Data 2023).

The previous AJD reported there were no waterbodies located on-Site, including tidal flats and shorelines along the Atlantic coast and estuaries; unvegetated temporary pools; ponds; lakes; mud flats; and perennial, intermittent, and ephemeral stream channels, as defined by the USACE under Section 404 of the CWA. The absence of waterbodies on-Site was verified by Princeton Hydro during the field investigation conducted in 2023.

Although no waterbodies were observed or delineated within the Site, the wetlands on-Site abut East Riser Ditch off-Site to the southeast. According to the prior AJD, East Riser Ditch is a tidal tributary of Berry's Creek, and Berry's Creek is a tidal tributary of the Hackensack River, which is a navigable waterbody.

4.0 CONCLUSIONS

4.1 DELINEATION SUMMARY

The delineation of waters of the United States, including wetlands, was performed by Princeton Hydro in accordance with the Routine Determination methods and procedures set forth in the *1987 Manual* (Environmental Laboratory 1987) and the *NCNE Regional Supplement* (Environmental Laboratory 2012). Wetlands on-Site were originally delineated by Langan in April 2014. On December 9, 2014, the USACE-NYD issued an AJD for the Site, confirming that Langan's wetland delineation accurately reflected the extent of waters of the United States present (Permit Application No. NAN-2014-01328). One jurisdictional wetland was determined to be present under the prior AJD: Wetland A. This jurisdictional wetland was determined to be 8.03 acres in size and was delineated by wetland flags A1N through A-68. Wetland A was determined to consist of 0.52 acres of scrub shrub and forested wetlands and 7.51 acres of emergent wetlands that abutted East Riser Ditch. East Riser Ditch was determined to be a tidal tributary of Berry's Creek. Berry's Creek is a tidal tributary of the Hackensack River, which is a navigable waterbody. As the wetlands on-Site were determined to be a part of a tributary system, they were considered to be waters of the United States under the jurisdiction of the USACE. The prior AJD expired on December 9, 2019. A copy of the prior AJD for the Site is provided in **Section 5**.

On February 9, 2023, Princeton Hydro conducted field investigations at the Site and confirmed that the extent of waters of the United States on-Site remain unchanged from those previously approved by the USACE. The only notable difference between this AJD request and the prior AJD is the area subject to the USACE's review. Although Langan's original wetland delineation has not changed, the Site subject to this AJD request is 16.46 acres in size (versus the original AJD's 10.75 acres) and contains a total of 12.55 acres of jurisdictional wetlands (versus the original AJD's 8.03 acres) (see **Section 4**). During Princeton Hydro's field investigations, it was determined that Wetland A possessed the following

vegetative communities: maintained lawn wetland, common reed dominated wetland, red maple/pin oak successional forested wetland, emergent wetland, and degraded emergent wetland.

Upgradient of Wetland A were the following upland vegetative communities: maintained lawn upland, common reed dominated upland, red maple/pin oak successional forested upland, and an upland berm. Although hydrophytic vegetation was observed in some portions of these areas, neither hydric soils nor wetland hydrology indicators were observed. As these areas did not meet all three criteria of a wetland, they were determined to be uplands.

The vegetative communities described in this AJD differ from those described in the prior AJD. This was done to outline the vegetative communities of the Site more accurately and in greater detail, and to highlight that the proposed Project area has purposefully been sited within lower quality, degraded habitats (see **Figure 3** for project area extent). For example, the majority of the Project area is comprised of common reed dominated wetland, which was typified by a monoculture of invasive common reed and low quality maintained lawn communities. Additionally, the lower quality, fragmented stand of red maple/pin oak successional forest and degraded emergent wetlands occur within the Project area. The Project area limits minimize impacts to the higher quality emergent wetland and red maple/pin oak successional forested wetland that are contiguous with a larger forest stand that continues off Site to the south.

The previous AJD reported there were no waterbodies located on-Site. The absence of waterbodies on-Site was verified by Princeton Hydro during the field investigation conducted in 2023. Although no waterbodies were observed or delineated within the Site, the wetlands on-Site abut East Riser Ditch off-Site to the southeast. According to the prior AJD, East Riser Ditch is a tidal tributary of Berry's Creek, and Berry's Creek is a tidal tributary of the Hackensack River, which is a navigable waterbody.

A list of all plants identified on-Site are provided in **Appendix I**. Data collected at each sampling point pertaining to vegetation, soils and hydrology are presented in **Appendix II**. Representative photographs of the Site and a photo location map illustrating the location and direction of each photo taken are provided in **Appendix III**. A SSURGO Soil Report and official descriptions of soils are provided in **Appendix IV**. Resumes of personnel involved in the delineation and preparation of this wetland delineation report are provided in **Appendix V**.

4.2 PROPOSED JURISDICTIONAL DETERMINATION

Based on the findings presented herein, it was determined that the wetland delineated as Wetland A met the definition of waters of the United States as it applies to the jurisdictional limits of the authority of the USACE under Section 404 of the CWA (USACE and EPA 2023). The Wetland Delineation Plan provided as **Section 4** of this AJD request depicts the extent of this wetland. **Table 1** above summarizes the extent of wetlands delineated and their proposed jurisdiction. Overall, the Site contained 12.55 acres of jurisdictional wetlands.

The location of waters of the United States on-Site is subject to review and approval by the USACE – New York District. Therefore, this determination should not be considered final until the USACE has issued an AJD with regard to the represented extent of jurisdictional areas on-Site.

5.0 REFERENCES

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