Wetlands and Waters Delineation Report NJNG Southern Reliability Link Pipeline Project (NJ Pinelands Section)

Plumsted Township, Jackson Township, Manchester Township
Ocean County, New Jersey

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Project No.: 20000603

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Table of Contents

Tables

Figures

Appendices

Executive Summary

On behalf of New Jersey Natural Gas (NJNG), URS Corporation (URS) conducted a delineation of wetlands and waters for the NJ Pinelands section of the proposed NJNG Southern Reliability Link Pipeline Project (NJ Pinelands Section) (Project), in Plumsted Township, Jackson Township, and Manchester Township, New Jersey. This report has been prepared to document findings and to support site investigation activities and was prepared in accordance with the Pinelands Comprehensive Management Plan (CMP) (N.J.A.C. 7:50), the New Jersey Department of Environmental Protection (NJDEP) Freshwater Wetlands Act Rules (N.J.A.C. 7:7A), and the NJDEP Flood Hazard Area Control Act Rules (N.J.A.C. 7:13).

The delineation involved a preliminary review of existing information and a field delineation of wetlands and waterways within the NJ Pinelands Section of the Project (Project Study Area). Information collected during the preliminary review was used in conjunction with the field delineation to identify regulated areas under jurisdiction of the Pinelands Commission and NJDEP.

The field delineation was conducted in October 2014 and identified twenty-one (21) wetland complexes consisting of palustrine emergent, palustrine scrub-shrub, palustrine unconsolidated bottom, and palustrine forested wetlands as well as nine (9) waterways.

1.0 Introduction

The proposed NJNG Southern Reliability Link project consists of the construction of a new approximately 28 mile, 30" natural gas transmission pipeline in Burlington, Monmouth, and Ocean Counties, New Jersey (Figure 1). The pipeline will be primarily located underground, with the exception of three proposed valve stations within the Pinelands Area (exact locations to be determined). A 10.7 mile portion of the pipeline is located within the boundary of the Pinelands Area which is the subject of this report (Project Study Area). In this section, the alignment is co-located with existing, paved roadways including County Route 539, active roadways and taxiways within the Joint Base McGuire-Dix-Lakehurst military facility (JB MDL), and crosses County Route 547 as it exits JB MDL.

The objective of the delineation was to delineate and assess regulated areas in support of proposed pipeline construction. This report was prepared to identify regulated areas pursuant to the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50) (CMP), the New Jersey Department of Environmental Protection (NJDEP) Freshwater Wetlands Act Rules (N.J.A.C. 7:7A) (FWW Rules), and the NJDEP Flood Hazard Area Control Act Rules (N.J.A.C. 7:13) (FHA Rules) and may be used in support of permit applications.

URS wetland scientists performed a preliminary data review, which was then followed by a field delineation using the *New Jersey Pinelands Commission Manual for Identifying and Delineating Pinelands Area Wetlands* (Pinelands Delineation Manual), and the 1989 *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* where appropriate. Information for each data point was collected using Pinelands specific information in accordance with the methodologies described in the Pinelands Delineation Manual. Data collected was recorded using the Wetland Determination Data Forms provided in the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* (Appendix B). The delineation was conducted in October 2014.

1.1 Project Study Area Description

The Project Study Area the Pinelands Section of the Project is 10.7 miles long and includes approximately 50 feet on both sides of the center-line of the proposed pipeline in the portion that is located within the Pinelands Area. In areas where property boundaries occur at a distance less than 50 feet from the proposed centerline, the Project Study Area limits followed the property boundary. The Project Study Area extends south along County Route 539, and east through the Joint Base McGuire-Dix-Lakehurst military facility (JB MDL) in Plumsted Township, Jackson Township, and Manchester Township, Ocean County, New Jersey (Figure 1). Additionally, a 0.2 mile portion of the proposed pipeline located within the Project Study Area has not been field delineated due to property access restrictions as of the date of the field evaluations (Block 72.01, Lot 14.03 and Block 200, Lot 2) (Appendix A, Sheet 39). In addition to these identified parcels, additional laydown areas and valve setting locations will likely be identified as engineering design progresses. These areas will be assessed and the findings will be included in addendums or appropriate report revisions.

The Project Study Area primarily follows existing paved roadways and sand/gravel access roads. Land cover types identified along the Project Study Area include forested wetlands, mixed deciduous/coniferous upland forest, maintained roadside right-of-way, freshwater wetlands, and previously disturbed urban areas such as roadways, taxiway, and areas associated with JB MDL. Existing facilities and structures associated with JB MDL occur adjacent to the Project Study Area.

2.0 Regulatory Review

The Project Study Area is located entirely within the boundary of the Pinelands Area defined by the NJ Pinelands Protection Act (N.J.S.A. 13:18-11) and within the jurisdiction of the NJ Pinelands Commission. In New Jersey, wetlands and waters may also be subject to regulation under the NJDEP FWW Rules and the FHA Rules. This report was prepared to identify features that may be subject to these regulations. The presence/absence and location of these regulated features may require coordination and confirmation with the Pinelands Commission and/or NJDEP. Certain activities within these jurisdictional areas, such as the placement of fill or excavation, may require permits. Additional Federal, State, and local regulations may also apply in these areas.

2.1 Pinelands CMP and the Freshwater Wetlands Protection Act

New Jersey protects wetlands and State open waters under the FWW Rules by regulating certain activities in freshwater wetlands, wetlands transition areas, and State open waters. Additionally, activities in wetlands located within the Pinelands Area are regulated by the Pinelands Commission, pursuant to the CMP. As a linear improvement located within the Pinelands Area, wetland buffers do not apply to the pipe alignment; however, three above ground valve settings are proposed within the Pinelands (N.J.A.C. 7:50-6.14). All valve settings will be sited at least 300 feet (ft.) from wetland boundaries to maintain the appropriate buffers.

To determine the extent of regulated features, a delineation of freshwater wetlands within the Pinelands Area is required using the methodologies identified in the Pinelands Delineation Manual and the 1989 Federal Manual. Wetland boundaries are determined by the presence of hydrophytic vegetation, hydric soils, and indicators of wetland hydrology. State open waters include surface waters, such as streams, rivers, lakes, and the ocean. Some types of man-made surface waters are not regulated as State open waters.

2.2 Flood Hazard Area Control Act

The Flood Hazard Area Control Act (N.J.S.A. 58:16B) and FHA Rules (N.J.A.C. 7:13) protect against flooding and protect water quality. Regulated areas include regulated waters, flood hazard areas, and riparian zones.

Per the regulated waters definition found in FHA Rules (N.J.A.C 7:13 -2.2), all waters are regulated under the Flood Hazard Area Control Act, except for the following:

- Manmade canals;
- Coastal wetlands regulated under the Wetlands Act of 1970; and
- Waters that have a drainage area of less than 50 acres with no discernible channel, are a lawfully existing manmade feature, or are not connected to a regulated water by a channel or pipe.

All regulated waters that have a drainage area of 50 acres or more have a flood hazard area. All regulated waters also have a riparian zone, except for the Atlantic Ocean,

manmade lagoons, stormwater management basins, oceanfront barrier islands, spits, or peninsulas.

The flood hazard area includes a flood fringe and a floodway, other than along the ocean and other non-linear tidal waters, which only have a flood fringe. NJDEP has delineated the flood hazard areas for several waters throughout New Jersey, and, when available, is the preferred method for identifying the location of the flood fringe and floodway. When a NJDEP stream delineation is not available, Federal Emergency Management Agency (FEMA) mapping can be used. When existing mapping from NJDEP or FEMA does not address the property or project area, other methods that involve approximating or calculating the flood hazard area are used.

Riparian zones are the land and vegetation within and adjacent to a regulated water. Riparian zones occur along both sides of a regulated water and are measured landward from the top of bank if there is a discernible channel and from the centerline of the feature if there is no channel. Pinelands waters have riparian zones that are 300 ft. wide along both sides of a regulated waterway.

3.0 Preliminary Data Review

A preliminary review of existing information for the Project Study Area was performed prior to conducting the field investigation. Information reviewed included the following:

- United States Geological Survey (USGS) topographic maps (Cassville, NJ Quadrangle, dated 1971, Lakehurst, NJ Quadrangle, dated 1971, Whiting, NJ, dated 1971, Keswick, NJ, dated 1971);
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database for Ocean County, New Jersey, dated 2008;
- NJDEP Freshwater Wetland Maps, dated 2007;
- U.S. Environmental Protection Agency (EPA) Priority Wetlands for the State of New Jersey, dated 1994;
- NJDEP Surface Water Quality Standards (N.J.A.C 7:9B), last amended in 2011;
- FEMA Q3 Flood Data Accessed 10/31/2014; and
- NJDEP Landscape Project (Version 3.1) – Species Based Habitat for the Pinelands Region and Piedmont, updated 2012.

3.1 Topography

The Project Study Area is located in the Cassville, Lakehurst, Whiting, and Keswick, New Jersey USGS Quadrangles (Figure 1). The elevation in the Project Study Area ranges between 50 and 150 feet above mean sea level. The Project Study Area primarily follows County Road 539 and existing roadways on the JB MDL base.

3.2 Soils

Based on the USDA NRCS soil map, 12 soil map units occur within the Project Study Area (Figure 2 and Table 1). Of these soils, Urban land (UR), is listed as non-hydric soil. Atsion (AtsA), Downer (DocB), Evesboro (EveB), Lakehurst (LakB, LakkB), Lakewood (LasB, LasC), and Psamments (PssA) are listed as containing hydric inclusions, and Berryland (BerAt), Manahawkin (MakAt), and Psammaquents (PstAt) are listed as hydric soils.

Table 1. Mapped Soils within the NJNG Southern Reliability Link Project Study Area, Ocean County, New Jersey

Mapping Unit	Soils Series	Soil Phase	Hydric Soils
AtsA	Atsion	sand, 0 to 2 percent slopes	Inclusions
BerAt	Berryland	sand, 0 to 2 percent slopes, frequently flooded	Yes
DocB	Downer	sand, 0 to 5 percent slopes	Inclusions
EveB	Evesboro	Sand, 0 to 5 percent slopes	Inclusions
LakB	Lakehurst	sand, 0 to 5 percent slopes	Inclusions
LakkB	Lakehurst	sand, clayey substratum, 0 to 5 percent slopes	Inclusions
LasB	Lakewood	sand, 0 to 5 percent slopes	Inclusions
LasC	Lakewood	sand, 5 to 10 percent slopes	Inclusions
MakAt	Manahawkin	muck, 0 to 2 percent slopes, frequently flooded	Yes
PssA	Psamments	0 to 3 percent slopes	Inclusions
PstAt	Psammaquents	sulfidic substratum, 0 to 3 percent slopes, frequently flooded	Yes
UR	Urban land		No

3.3 NJDEP Freshwater Wetlands Maps

The NJDEP Freshwater Wetland mapping identifies potential wetlands that are larger than one acre using interpretation of aerial photography. These maps provide the general boundaries of potential wetlands, however delineation is required to accurately determine the presence/absence of wetland features. The NJDEP mapping identified potential wetlands within the Project Study Area and is depicted in Figure 3.

3.4 Threatened and Endangered Species Habitat

The potential for threatened and endangered species or their habitat to occur in the Project Study Area was reviewed using Landscape Project (Version 3.1) data available through NJDEP's GeoWeb application (NJDEP, 2014). Threatened and endangered species identified as having potential habitat within the Project Study Area and the results of the Habitat Assessment conducted in October 2014 are presented in the *Threatened and Endangered Species Habitat Assessment Report: NJNG Southern Reliability Link Pipeline Project – (NJ Pinelands Area Section)* (URS, 2014).

3.5 Surface Water Quality Standards

The Project Study Area is located entirely within the boundary of the Pinelands Area. Based on New Jersey's Surface Water Quality Standards (N.J.A.C. 7:9B, last amended April 4, 2011), all waters identified within the Project Study area are listed as Pinelands waters (PL). These waterways are considered high quality and classified as Outstanding

National Resource Waters (ONRW). Based on their designation, these waters are subject to a riparian zone of 300 ft.

3.6 Floodplain Mapping

FEMA Q3 Flood Data accessed October 30, 2014 was reviewed to determine areas that may potentially be regulated pursuant to the FHA Rules. Figure 4 shows flood hazard areas based on the information available from these maps.

4.0 Field Methodology

The field delineation was conducted in October 2014. The purpose of the delineation was to provide detailed information regarding the locations and boundaries of jurisdictional wetlands and waters.

URS wetland scientists conducted field delineations using the *New Jersey Pinelands Commission Manual for Identifying and Delineating Pinelands Area Wetlands* (Pinelands Delineation Manual), and the 1989 *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. Information for each data point was collected using Pinelands specific information in accordance with the methodologies described in the Pinelands Delineation Manual. Data collected was recorded using the Wetland Determination Data Forms provided in the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)* and are contained in Appendix B.

4.1 Wetland Delineation

During delineation efforts, vegetation, soil characteristics, and hydrology were documented and evaluated for evidence of wetland conditions. Wetland and upland data points were established to confirm the wetland/upland boundaries, conditions and unique vegetative communities. Information for each data point was documented using the *United States Army Corp of Engineers Atlantic and Gulf Coastal Plain Region Wetland Determination Data Forms* (Appendix B). In accordance with the Cowardin Wetland Classification System (Cowardin, et al., 1979), wetlands were classified based on dominant plant community or mix of communities or wetland complexes ((e.g., palustrine forested (PFO), palustrine shrub/scrub (PSS), palustrine unconsolidated bottom (PUB), and palustrine emergent (PEM)). Each wetland boundary and data point was marked with sequentially numbered flags during the delineation.

4.1.1 Vegetation

The vegetation evaluation included the identification of trees, shrubs and saplings, herbaceous plants and woody vine species. Each plant was identified to the lowest taxon possible, and the dominant species represented within each vegetation layer were recorded. The wetland indicator status of these species was documented using the Pinelands Delineation Manual and 2014 National Wetland Plant List for the Atlantic and Gulf Coastal Plain Region (Lichvar et al., 2014).

4.1.2 Soils

At selected locations, the soil profile was examined from the ground surface to a minimum depth of 18 inches below ground surface (bgs) or until refusal. A sharp shooter shovel was used to excavate the soil for inspection. The color of each distinct horizon was evaluated using a Munsell Soil color chart (Munsell Color, 2009). Soil horizon depths, in inches bgs, were measured and recorded. Soil color, texture, physical characteristics, and redoximorphic features, if present, were also recorded. This information was used to evaluate the presence of hydric soil conditions.

4.1.3 Wetland Hydrology

The hydrology evaluation for wetlands was conducted by visual inspection for the presence of primary and secondary wetland hydrologic indicators, including inundation, observed saturation, oxidized rhizospheres, water marks, drift lines, sediment deposits, water-stained leaves, drainage patterns, morphological plant adaptations, and hydric soil characteristics. Depth to soil saturation and shallow groundwater were measured, if present, within the top 18 inches of soil.

4.2 Waters Delineation

Waters were assessed in the Project Study Area to determine if they were jurisdictional waters regulated under FWW and/or FHA Rules. Nine (9) jurisdictional regulated waters were identified within the Project Study Area during the field delineation. In accordance with the FWW and FHA Rules, waters were field delineated by identifying the top of bank of a waterway. Streams that were less than five feet wide were delineated based on the location of centerline of the channel.

4.3 Mapping

Subsequent to the delineation of each jurisdictional wetland and water, the boundary flags and confirmation sample point locations were mapped using a Trimble® GeoXH handheld 6000 GPS global positioning system (GPS) capable of obtaining sub-meter accuracy.

5.0 Field Delineation

URS wetland scientists identified twenty-one (21) wetlands and nine (9) waters in the Project Study Area, as shown on the *Wetlands and Waters Delineation Plan*, dated December 2014, (Appendix A):

Wetlands – Twenty-one (21) jurisdictional wetlands intersected the Project Study Area and included the following types:

- Palustrine emergent (PEM)
- Palustrine scrub-shrub (PSS)
- Palustrine forested (PFO)
- Palustrine unconsolidated bottom (PUB)

Waters – Nine (9) waters were identified within the Project Study Area:

- One unnamed channel (Stream 4)
- Four Unnamed Tributaries to Middle Ruckels Branch
- North Ruckels Branch
- Manapaqua Brook
- Two Unnamed Tributaries to Manapaqua Brook

Upland areas included maintained roadside right-of-way, developed areas associated with the JB MDL military facility, and mixed deciduous and coniferous upland forest. Dominant vegetation in the forested upland areas included pitch pine (*Pinus rigida*), post oak (*Quercus stellate*), blackjack oak (*Quercus marilandica*), and lowbush blueberry (*Vaccinium angustifolium*). Dominant vegetation within the maintained roadside right-of-way consisted of various turf grass and herbaceous species such as English plantain (*Plantago lanceolata*), red fescue (*Festuca rubra*), and white clover (*Trifolium repens*).

The routine wetland determination data sheets with photographs characterizing the identified features are provided in the Data Forms in Appendix B. Photograph locations are shown on the Wetland Delineation Map (Appendix A). The following sections include a discussion of the delineated wetlands and waters in the Project Study Area.

5.1 Wetlands

Twenty-one (21) wetlands were delineated within the Project Study Area (Table 2) and include PEM, PSS, PUB, and PFO wetlands. All field delineated wetlands mapped within the Project Study Area are EPA Priority Wetlands (EPA, 1994), because of their connection with Barnegat Bay and its tributaries.

- Wetland 1 (W-GJM-001) – A wetland complex comprised of PSS/PUB wetlands is located on the north side of South Boundary Road on the JB MDL military facility. The wetland consists of a PUB wetland in an excavated fire pond, with PSS wetlands occurring along the fringe. Wetland 1 extends beyond the Project Study Area. Dominant vegetation included highbush blueberry (*Vaccinium*

corymbosum), red maple (*Acer rubrum*), and sphagnum moss (*Sphagnum spp.*). Wetland 1 is connected to Wetland 2 via a culvert under Southern Boundary Road.

Indicators of wetland hydrology included standing water, a high water table, saturated soils, hydrogen sulfide odor, FAC-neutral Test, drainage patterns, and water stained leaves. Hydric soil indicators include Hydrogen Sulfide and Muck Presence.

- Wetland 2 (W-GJM-002) – Is a PSS wetland located on the south side of South Boundary Road on the JB MDL military facility. Dominant vegetation included smooth alder (*Alnus serrulata*), highbush blueberry, red maple, and sphagnum moss.

  Indicators of wetland hydrology included standing water, high water table, saturation, drainage patterns, water stained leaves, FAC-neutral Test, and hydrogen sulfide odor. Hydric soil indicators included Hydrogen Sulfide and Muck Presence.

- Wetland 3 (W-GJM-003) – Is a PSS wetland located on the north side of South Boundary Road on the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, and sphagnum moss. The wetland community transitions to a PFO beyond the Project Study Area. Wetland 3 is connected to Wetland 4 via a culvert under Southern Boundary Road.

  Indicators of wetland hydrology included a high water table, saturated soils, drainage patterns, water stained leaves, and moss trim lines. Hydric soil indicators included Dark Surface.

- Wetland 4 (W-GJM-004) – Is a PFO wetland located on the south side of South Boundary Road on the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, sphagnum moss, and coastal sweet pepperbush (*Clethra alnifolia*).

  Indicators of wetland hydrology included a high water table, saturated soils, drainage patterns, and water stained leaves. Hydric soil indicators included Dark Surface.

- Wetland 5 (W-GJM-005) – Is a PFO wetland located on the north side of South Boundary Road on the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, sphagnum moss, and black gum (*Nyssa sylvatica*).

  Indicators of wetland hydrology included a high water table, water stained leaves, saturation, FAC-neutral Test, and moss trim lines. Hydric soil indicators included Dark Surface.

- Wetland 6 (W-GJM-006) – Is a PFO wetland located on the south side of South Boundary Road on the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, black gum, and pitch pine.

  Indicators of wetland hydrology included a high water table, saturated soils, water stained leaves, and drainage patterns. Hydric soil indicators included Dark Surface.

- Wetland 7 (W-GJM-007) – Is a wetland complex comprised of PFO/PUB wetlands located on the south side of South Boundary Road on the JB MDL military facility. The wetland consists of a PUB wetland in an excavated fire pond, with PFO wetlands occurring along the fringe. The wetland boundary continues beyond the Project Study Area where the community transitions to an Atlantic white cedar (*Chamaecyparis thyoides*) swamp with pockets of standing water. Dominant vegetation included highbush blueberry, red maple, sphagnum moss, black gum, and pitch pine.

  Indicators of wetland hydrology included a high water table, saturated soils, water stained leaves, hydrogen sulfide odor, and FAC-neutral Test. Hydric soil indicators included Dark Surface and Hydrogen Sulfide.
- Wetland 8 (W-GJM-008) – Is a wetland complex comprised of PSS/PUB wetlands located on the north side of South Boundary Road on the JB MDL military facility. The wetland consists of a PUB wetland in an excavated fire pond, with PSS wetlands occurring along the fringe and extending beyond the Project Study Area. Dominant vegetation included highbush blueberry and red maple. Wetland 8 is connected to Wetland 9 via a culvert under South Boundary Road.

  Indicators of wetland hydrology included standing water, high water table, saturated soils, Fac-neutral Test, and drainage patterns. Hydric soil indicators included Muck Presence.
- Wetland 9 (W-GJM-009) – Is a PFO wetland located on the south side of South Boundary Road on the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, and coastal sweet pepperbush.

  Indicators of wetland hydrology included water stained leaves, geomorphic position, and FAC-neutral Test. Hydric soil indicators included Dark Surface.
- Wetland 10 (W-GJM-010) – Is a wetland complex comprised of PSS/PUB wetlands located on the north side of South Boundary Road on the JB MDL military facility. The wetland consists of a PUB wetland in an excavated fire pond, with PSS wetlands occurring along the fringe and extending beyond the Project Study Area. Dominant vegetation included highbush blueberry. Wetland 10 is connected to Wetland 11 via a culvert under South Boundary Road.

  Indicators of wetland hydrology included standing water, high water table, saturated soils, water stained leaves, and FAC-neutral Test. Hydric soil indicators included Dark Surface.
- Wetland 11 (W-GJM-011) – Is a PSS wetland located on the south side of South Boundary Road on the JB MDL military facility. Dominant vegetation included highbush blueberry, pitch pine, and common greenbrier (*Smilax rotundifolia*).

  Indicators of wetland hydrology included water stained leaves, drainage patterns, and FAC-neutral Test. Soils were disturbed in Wetland 11 due to fill material being washed into the wetland from the adjacent roadside upland and from rip-rap construction. Wetland 11 met the criterion for both hydrophytic vegetation and wetland hydrology.

- Wetland 12 (W-GJM-012) – Is a wetland complex comprised of PFO/PUB wetlands located on the north side of South Boundary Road on the JB MDL military facility. The wetland consists of a PUB wetland in an excavated fire pond, with PFO wetlands occurring along the fringe and extending to the west of the pond and beyond the Project Study Area. Dominant vegetation included highbush blueberry, red maple, and pitch pine. Wetland 12 is connected to Wetland 13 via a culvert under South Boundary Road.

  Indicators of wetland hydrology included saturated soils, water stained leaves, and FAC-neutral Test. Hydric soil indicators included Dark Surface.
- Wetland 13 (W-GJM-013) – Is a wetland complex comprised of PFO/PSS wetlands located on the south side of South Boundary Road on the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, and pitch pine.

  Indicators of wetland hydrology included saturated soils, water stained leaves, and FAC-neutral Test. Hydric soil indicators included Dark Surface.
- Wetland 14 (W-GJM-014) – Is a large wetland complex comprised of PUB/PSS/PFO wetlands located south of an aircraft runway on the JB MDL military facility. The wetland consists primarily of PUB wetlands with PFO wetlands dominated by Atlantic white cedar occurring along the edge of water, and PSS wetlands dominated by highbush blueberry and coastal sweet pepperbush occurring along the cleared, maintained right-of-way at the upland boundary.

  Indicators of wetland hydrology included standing water, high water table, saturated soils, water stained leaves, and geomorphic postion. Wetland 14 met the criterion for both hydrophytic vegetation and wetland hydrology but not for hydric soils at the wetland data point.
- Wetland 15 (W-GJM-015) – Is a PFO wetland located on the west side of Proving Ground Road on the JB MDL military facility. The wetland occurs in a topographic depression adjacent to a powerline right-of-way. Dominant vegetation included highbush blueberry, red maple, and common greenbrier.

  Indicators of wetland hydrology included a high water table, saturated soils, water stained leaves, geomorphic position, and FAC-neutral Test. Hydric soil indicators included Dark Surface.
- Wetland 16 (W-GJM-016) – Is a PFO wetland located on the east side of Proving Ground Road and north of a dirt road on the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, black gum, and coastal sweet pepperbush.

  Indicators of wetland hydrology included standing water, a high water table, saturated soils, water stained leaves, geomorphic position, and FAC-neutral Test. Hydric soil indicators included Dark Surface.
- Wetland 17 (W-GJM-017) – Is a PFO wetland located on the east side of Proving Ground Road and south of a dirt road on the JB MDL military facility. Due to site access restrictions, the wetland was visually assessed from the road and no soil data point was taken. Dominant vegetation included black gum, red maple, and coastal sweet pepperbush.

Indicators of wetland hydrology included water stained leaves, geomorphic position, and FAC-neutral Test. Soils were not assessed due to site access restrictions.

- Wetland 18 (W-GJM-018) – Is a wetland complex comprised of PFO/PSS wetlands located on the north side of a dirt road near the southern boundary of the JB MDL military facility. Dominant vegetation included highbush blueberry, red maple, an unknown sedge (*Carex sp.*), and coastal sweet pepperbush.

  Indicators of wetland hydrology included standing water, a high water table, saturated soils, geomorphic position, FAC-neutral Test, and water stained leaves. Wetland 18 met the criterion for both hydrophytic vegetation and wetland hydrology but not for hydric soils at the wetland data point.
- Wetland 19 (W-GJM-019) –Is a wetland complex comprised of PFO/PSS wetlands located on the north side of a dirt road near the southern boundary of the JB MDL military facility. PSS wetlands occur primarily along the floodplain of S-GJM-003. Dominant vegetation included Atlantic white cedar, pitch pine, and highbush blueberry. Wetland 19 is connected to Wetland 20 via stream S-GJM-003 which flows through a culvert under the dirt road.

  No indicators of hydrology were present outside of the floodplain of the stream at the soil data point. Hydric soil indicators included Dark Surface.
- Wetland 20 (W-GJM-020) – Is a PFO wetland located on the south side of a dirt road near the southern boundary of the JB MDL military facility. Due to site access restrictions, Wetland 20 was visually assessed from the road and no soil data point was taken. Dominant vegetation included red maple, Atlantic white cedar, coastal sweet pepperbush, and common greenbrier.

  Indicators of wetland hydrology included surface water, water stained leaves, geomorphic potion, and FAC-neutral Test. Soils were not assessed due to site access restrictions.
- Wetland 21 (W-GJM-021) – Is a PFO wetland located on the south side of a dirt road near the southern boundary of the JB MDL military facility. Dominant vegetation included Atlantic white cedar, highbush blueberry, common greenbrier, and sphagnum moss.

  Indicators of wetland hydrology included a high water table, saturated soils, and FAC-neutral Test. Hydric soil indicators included Dark Surface.

Table 2. Wetlands Delineated within the NJNG Southern Reliability Link Project Study Area, Ocean County, New Jersey

Wetland Name	Municipality	Wetland ID	Wetland Classification	Subwatershed[1]
Wetland 1	Jackson Township	W-GJM-001	PSS/PUB	Blacks Branch (above 74d22m05s)
Wetland 2	Jackson Township, Manchester Township	W-GJM-002	PSS	Blacks Branch (above 74d22m05s)
Wetland 3	Jackson Township	W-GJM-003	PSS	Blacks Branch (above 74d22m05s)
Wetland 4	Jackson Township, Manchester Township	W-GJM-004	PFO	Blacks Branch (above 74d22m05s)
Wetland 5	Jackson Township	W-GJM-005	PFO	Blacks Branch (above 74d22m05s)
Wetland 6	Jackson Township, Manchester Township	W-GJM-006	PFO	Blacks Branch (above 74d22m05s)
Wetland 7	Jackson Township, Manchester Township	W-GJM-007	PFO/PUB	Blacks Branch (above 74d22m05s)
Wetland 8	Jackson Township	W-GJM-008	PSS/PUB	Blacks Branch (above 74d22m05s)
Wetland 9	Jackson Township, Manchester Township	W-GJM-009	PFO	Blacks Branch (above 74d22m05s)
Wetland 10	Jackson Township	W-GJM-010	PSS/PUB	Blacks Branch (above 74d22m05s)
Wetland 11	Jackson Township, Manchester Township	W-GJM-011	PSS	Blacks Branch (above 74d22m05s)
Wetland 12	Jackson Township	W-GJM-012	PFO/PUB	Blacks Branch (above 74d22m05s)
Wetland 13	Jackson Township, Manchester Township	W-GJM-013	PFO/PSS	Blacks Branch (above 74d22m05s)
Wetland 14	Jackson Township, Manchester Township	W-GJM-014	PUB/PSS/PFO	Manapaua Brook
Wetland 15	Manchester Township	W-GJM-015	PFO	Manapaua Brook
Wetland 16	Manchester Township	W-GJM-016	PFO	Manapaua Brook

Wetland Name	Municipality	Wetland ID	Wetland Classification	Subwatershed[1]
Wetland 17	Manchester Township	W-GJM-017	PFO	Manapaua Brook
Wetland 18	Manchester Township	W-GJM-018	PFO/PSS	Manapaua Brook
Wetland 19	Manchester Township	W-GJM-019	PFO/PSS	Manapaua Brook
Wetland 20	Manchester Township	W-GJM-020	PFO	Manapaua Brook
Wetland 21	Manchester Township	W-GJM-021	PFO	Manapaua Brook

Notes:
[1] Subwatersheds based on the NJDEP HUC-14 Boundaries

5.1 Waters

Nine (9) waters were identified within the Project Study Area (Table 3).

- Waterway 1 (S-GJM-001, North Ruckels Branch) – Is a perennial stream that flows through wetland W-GJM-012 and W-GJM-013. Water is conveyed under South Boundary Road via a culvert. It is approximately fifteen feet wide and one foot deep and had a water depth of approximately 6 inches at the time of survey.
- Waterway 2 (S-GJM-002, Unnamed Tributary to Middle Ruckels Branch) – Is an intermittent stream that flows through wetland W-GJM-010 and W-GJM-011. The stream dissipates into a manmade excavated fire pond on the north side of South Boundary Road where no defined bed or bank was observed within the Project Study Area. Water is conveyed under South Boundary Road via a culvert. It is approximately three feet wide and one foot deep and no water was observed in the channel at the time of survey.
- Waterway 3 (S-GJM-003, Unnamed Tributary to Manapaquea Brook) – Is a perennial stream that flows through wetland W-GJM-019 and W-GJM-020. Water is conveyed under a dirt road via a culvert. It is approximately twenty five feet wide and five foot deep and had a water depth of approximately 1-3 feet at the time of survey.
- Waterway 4 (S-GJM-004) – Is an unnamed channel located along County Road 539. A culvert connects the channel and conveys water under the roadway. It is approximately three feet wide and one foot deep and no water was observed in the channel at the time of survey.
- Waterway 5 (Unnamed Tributary to Middle Ruckels Branch) – Is a stream located outside of the Project Study Area which dissipates into wetlands W-GJM-001 and W-GJM-002. No defined bed and bank was observed within the Project Study Area. Water is conveyed under South Boundary Road via a culvert.
- Waterway 6 (Unnamed Tributary to Middle Ruckels Branch) – Is a stream located outside of the Project Study Area which dissipates into wetlands W-GJM-005 and W-GJM-006. No defined bed and bank was observed within the Project Study Area. Water is conveyed under South Boundary Road via a culvert.
- Waterway 7 (Unnamed Tributary to Middle Ruckels Branch) – Is a stream located outside of the Project Study Area which dissipates into wetlands W-GJM-008 and W-GJM-009. No defined bed and bank was observed within the Project Study Area. Water is conveyed under South Boundary Road via a culvert.
- Waterway 8 (Manapaqua Brook) – Is a stream located outside of the Project Study Area which dissipates into wetland W-GJM-014. No defined bed and bank was observed within the Project Study Area. Water is conveyed under a remnant airplane runway via a culvert.
- Waterway 9 (Unnamed Tributary to Manapaquea Brook) – Is a stream located outside of the Project Study Area which dissipates into wetland W-GJM-014. No

defined bed and bank was observed within the Project Study Area. Water is conveyed under a remnant airplane runway via a culvert.

Table 3. Waters Identified within the NJNG Southern Reliability Link Project Study Area, Ocean County, New Jersey

Municipality	Stream ID	Stream Class	Waterway Name[1]	Associated Wetlands	Subwatershed[3]	Surface Water Quality Standards[4]	Preliminary Riparian Zone Width (feet)[5]	Comment[5]
Jackson Township, Manchester Township	Waterway 1 (S-GJM-001)	Perennial	North Ruckels Branch	W-GJM-012, W-GJM-013	Blacks Branch (above 74d22m05s)	PL	300	ONRW
Jackson Township, Manchester Township	Waterway 2 (S-GJM-002)	Intermittent	Unnamed Tributary to Middle Ruckels Branch	W-GJM-010, W-GJM-011	Blacks Branch (above 74d22m05s)	PL	300	ONRW
Manchester Township	Waterway 3[2] (S-GJM-003)	Perennial	Unnamed Tributary to Manapaqua Brook	W-GJM-019, W-GJM-020	Manapaua Brook	PL	300	ONRW
Plumsted Township	Waterway 4 (S-GJM-004)				Blacks Branch (above 74d22m05s)	PL	300	ONRW
Jackson Township, Manchester Township	Waterway 5[2]	Intermittent	Unnamed Tributary to Middle Ruckels Branch	W-GJM-001, W-GJM-002	Blacks Branch (above 74d22m05s)	PL	300	ONRW
Jackson Township, Manchester Township	Waterway 6[2]	Intermittent	Unnamed Tributary to Middle Ruckels Branch	W-GJM-005, W-GJM-006	Blacks Branch (above 74d22m05s)	PL	300	ONRW
Jackson Township, Manchester Township	Waterway 7[2]	Intermittent	Unnamed Tributary to Middle Ruckels Branch	W-GJM-008, W-GJM-009	Blacks Branch (above 74d22m05s)	PL	300	ONRW
Jackson Township, Manchester Township	Waterway 8[2]	Intermittent	Manapaqua Brook	W-GJM-014	Manapaua Brook	PL	300	ONRW
Jackson Township, Manchester Township	Waterway 9[2]	Intermittent	Unnamed Tributary to Manapaqua Brook	W-GJM-014	Manapaua Brook	PL	300	ONRW

Notes:

[1] Waterway names are based on NJDEP Surface Water Quality Standards (N.J.A.C. 7:9B)

[2] In areas where streams dissipated into wetland areas and no longer contained the characteristic of a defined bed and bank within the Project Study Area, stream centerlines were used

Municipality	Stream ID	Stream Class	Waterway Name[1]	Associated Wetlands	Subwatershed[3]	Surface Water Quality Standards[4]	Preliminary Riparian Zone Width (feet)[5]	Comment[5]

[3] Subwatersheds based on the NJDEP HUC-14 Boundaries

[4] Surface Water Quality Standards were determined in accordance with N. J. A. C. 7:9B

[5] Preliminary Riparian Zone widths are based on the the requirements for aregulated water at N.J.A.C 7:13-4.1 and are subject to confirmation with the Pinelands Commission and NJDEP.

[6]ONRW = Outstanding National Resource Water as defined in N.J.A.C. 7:9B

6.0 Summary and Conclusions

During the delineations conducted in October 2014, twenty-one (21) jurisdictional freshwater wetlands and nine (9) waters were identified within the NJNG Southern Reliability Link (NJ Pinelands Section) Project Study Area. All delineated wetlands and waters are shown on the Wetlands and Waters Delineation Plan in Appendix A.

Wetlands – Twenty-one (21) jurisdictional wetlands (Table 2) intersected the Project Study Area and included the following types:

- Palustrine emergent (PEM)
- Palustrine scrub-shrub (PSS)
- Palustrine forested (PFO)
- Palustrine unconsolidated bottom (PUB)

Waters – Nine (9) waters (Table 3) were identified within the Project Study Area:

- One unnamed channel (Stream 4)
- Four Unnamed Tributaries to Middle Ruckels Branch
- North Ruckels Branch
- Manapaqua Brook
- Two Unnamed Tributaries to Manapaqua Brook

All delineated features presented in this report are subject to review and verification by the Pinelands Commission and NJDEP. Wetlands, adjacent uplands, and waters may be regulated pursuant to the Pinelands CMP, NJDEP FWW Rules, and FHA Rules.

Other local, State, and/or Federal regulations may also be applicable. Certain activities within these areas may be regulated and may require permits. Permitting requirements will be assessed when final project design is completed.

7.0 References

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