APPENDIX E
THREATENED & ENDANGERED SPECIES HABITAT IMPACT ASSESSMENT REPORT

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HABITAT IMPACT ASSESSMENT REPORT

DRP GIBBSTOWN LOGISTICS CENTER

GIBBSTOWN, NEW JERSEY

RAMBOLL ENVIRON

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ACRONYMS AND ABBREVIATIONS

CZM:	Coastal Zone Management
DRP:	Delaware River Partners, LLC
FHA:	Flood Hazard Area
FHACA:	Flood Hazard Area Control Act
FWPA:	Freshwater Wetlands Protection Act
GIS:	Geographic Information System
NJDEP:	New Jersey Department of Environmental Protection
NJDFW:	New Jersey Division of Fish and Wildlife
NMFS:	National Marine Fisheries Service
USFWS:	United States Fish and Wildlife Service
USACE:	United States Army Corps of Engineers

1. EXECUTIVE SUMMARY

Ramboll Environ US Corporation (Ramboll), on behalf of Delaware River Partners LLC (DRP), has prepared this Threatened or Endangered Wildlife Species Impact Assessment in accordance with the applicable provisions of the NJDEP Coastal Zone Management Rules; the NJDEP Freshwater Wetland Protection Act Rules; and the NJDEP Flood Hazard Area Control Act Rules. The proposed Project involves the development of a multi-use, deep-water seaport and industrial logistics center. Potential impacts to five species and their habitat are assessed: bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), northern long-eared bat (*Myotis septentrionalis*), shortnose sturgeon (*Acipenser brevirostrum*), and Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*).

Through avoidance, minimization, and mitigation measures, no adverse impacts to threatened and endangered species or their habitat are expected as result of the Project.

- Bald eagles and osprey nests within or near the Project Site will be protected or relocated and mitigation for potential disturbance will include building nesting platforms, burying high voltage powerlines, and developing a management plan to protect bald eagle and osprey nests.
- Northern long-ear bats are unlikely to be present, but tree removal in areas of potential roosting habitat will be avoided during pup season from June 1 through July 31.
- Atlantic and shortnose sturgeon may forage or migrate through areas of the Delaware River disturbed by in-water work. Impacts to sturgeon will be avoided by conducting work within the recommend construction window and implementing mitigation measures and dredging best management practices.

Further, the loss of threatened or endangered species habitat mapped within the Project Site is not expected to adversely impact species due to the low quality of the habitat and the availability of ample high quality habitat adjacent to the Project Site.

2. INTRODUCTION

Ramboll Environ US Corporation (Ramboll), on behalf of Delaware River Partners LLC (DRP), has prepared this Threatened or Endangered Wildlife Species Impact Assessment (T&E Assessment) in accordance with the applicable provisions of the NJDEP Coastal Zone Management Rules (CZM Rules), N.J.A.C. 7:7-11; the NJDEP Freshwater Wetland Protection Act Rules (FWPA Rules), N.J.A.C. 7:7A; and the NJDEP Flood Hazard Area Control Act Rules (FHA Rules), N.J.A.C. 7:13.

3. SITE DESCRIPTION

3.1 Site Location

The Project Site is located on 200 North Repauno Avenue in Gibbstown, Greenwich Township, Gloucester County, New Jersey. The Project Site occupies approximately 381 acres within Block 8, Lots 1, 2, 3, 4, 4.01 and 4.02[1]. The Project Site is a portion of the property formerly known as the Dupont Repauno Property and is bordered by the Delaware River to the north, undeveloped land to the east and west, and an industrial facility to the south. A USGS quad map showing the Project Site location is provided as Figure 1.

3.2 Site History

The Dupont Repauno Property was first operated as a dairy before DuPont purchased the land in 1880. The Property has been used for industrial purposes, including the manufacture of chemicals and explosives, for more than 100 years. Atlantic City Electric operated a power plant in the northwestern part of the Project Site from 1951 to 1986. Chemours Co. FC LLC ("Chemours") became the owner of record of the Repauno site in April 2015. The Property was sold to DRP LLC on June 30, 2016.

A network of waste treatment ditches and settling basins were constructed in uplands to carry process water and storm water from the Dupont Repauno Property to the Sand Ditch west of the Project Site and to the E.L. Sluice Ditch to the east of the Project Site. Both of these conveyances discharge to the Delaware River. The network of constructed ditches is part of a permitted waste treatment system that discharges through permitted outfall 001A and historically through permitted outfall 007A[2].

Remedial activities and associated regulatory involvement began at the site in the early 1980s related to groundwater contamination identified at that time. In part related to those impacts, the NJDEP under authority from USEPA established an ACO in 1989 with DuPont to address various Solid Waste Management Units (SWMUs) and areas of concern (AOCs) under the Resource Conservation and Recovery Act (RCRA). Other AOCs at the site are currently being evaluated and remediated under New Jersey's Industrial Site Recovery Act (ISRA) process related to the pending transaction. Most recently in accordance with the Site Remediation Reform Act (SRRA), Chemours has retained a New Jersey Licensed Site Remediation Professional (LSRP) to design, oversee and approve the remedial investigations and remedial actions completed for both the ISRA and RCRA proceedings, with the ultimate goal of achieving a remedial action outcome (RAO) for the site. Chemours continues to monitor and recover contaminated groundwater as outlined in the Administrative Consent Order, including operation of the interceptor well systems for control of groundwater migration. For areas for which additional remedial investigation or remedial action is needed, Chemours has submitted certain documents for NJDEP review and approval. These remedial activities are ongoing.

[1] New lots will be created for the Project Site as part of a future subdivision.

[2] Outfall 007A may have been designated 010A after 2006.

4. SITE CHARACTERISTICS

The Project Site consists of the majority of the former industrial operations area of the Dupont Repauno Property. It is accessed by Repauno Avenue and bordered generally by C-Line Road (an extension of Repauno Avenue) to the east, the Delaware River to the North, and A-Line Road to the west. The Project Site is relatively flat with elevation ranging from -4 to 12 feet NAVD88. The area is mapped within the 100-year floodplain of the Delaware River.

4.1 Geology and Hydrogeology

The Project Site is located in the lowland subprovince of the Atlantic Coastal Plain physiographic region and is underlain by the bedrock from the Magothy formation. The Magothy formation is composed of fine to coarse grained sand and quartz interbedded with thin-bedded clay or clay silt (Owens et al. 1999). Bedrock at the Project Site is overlain by unconsolidated gravel, sand, silt and clay from the Cape May Formation (unit 2) and, in southern and western portions of the Project Site, Salt Marsh and Estuarine Formation deposits containing organic material.

The Project Site is also located within the Magothy-Potomac Aquifer (MRPA) system, which supplies potable water to much of the surrounding area (DuPont 2003). Chemours has and will continue to operate a groundwater treatment system at the Project Site for the foreseeable future.

4.2 Soils

The USDA Natural Resource Conservation Service (NRCS) has mapped three soil types covering the entire Project Site: Mannington-Nanticoke-Udorthents complex, 0 to 1 percent slopes, very frequently flooded (MamuAv); Udorthents, dredged coarse material, 0 to 8 percent slopes (UddcB); Udorthents, dredged materials-Urban land complex, 0 to 8 percent slopes (UddrB). Soils were generally observed to be sand, sandy silts or fill material.

4.3 Surface Waters

According to the NJDEP's GeoWeb online mapping tool, the Project Site is located within the Cedar Swap/ Repaupo Creek/ Clonmell Creek hydrologic unit code (HUC) 11 watershed. The Project Site may be further subdivided into two subwatersheds: Repaupo Creek (below Tomlin Station Road) / Cedar Swamp hydrologic unit code and Nehonsey Brook/Clonmell Creek.

A levee and tide gates located along the Delaware River cause the Project Site hydrology to be disconnected from the tidal influence of the River. A permitted waste treatment system drains most of the Project Site to outfall 001A located at Sand Ditch (see Figure 4). The ditches in the north part of the Project Site drain south beneath Broadway to the Process Ditch. Just south of Broadway in AOC D, the Nitrobenzene Ditch drains west to the Process Ditch. From its confluence with the Nitrobenzene Ditch, the Process Ditch continues south before turning to the west where it extends approximately 1500 feet before converging with the PMDA Ditch east of A-Line Road. An internal[3] permitted outfall 007B discharges water

[3] The 007B outfall is referred to as an "internal outfall" because it discharges internally to the waste treatment system, upstream of the 001A outfall.

from a groundwater treatment system to the Process Ditch east of A-Line Road near the convergence of the Process Ditch and the PMDA Ditch. The Process Ditch water is treated at a facility west of A-Line road and then flows via the Sand Ditch to outfall 001A where it discharges to Aunt Debs ditch and eventually the Delaware River.

Several small ditches in the western part of the Project Site and the area west of A-Line Road drain south or west to a wetland complex that eventually drains to the Sand Ditch and Delaware River. Ditches and drainage features east of C-Line Road generally drain east and north via E.L. Sluice Ditch which discharges to the Delaware River. Historically, this discharge outfall was permitted as outfall 007A.

4.4 Vegetation Communities

The Project Site consists of a mix of developed and undeveloped areas. Developed areas are concentrated in the northern portion of the Project Site and include former industrial and manufacturing areas, which generally correspond to the proposed Multi-Purpose Berth and Marine Terminal areas. These areas are characterized by limited vegetation; historic development has left large areas of impervious surface. The vegetation that is present is largely dominated by invasive species, or species that thrive in a highly disturbed environment such as common reed *(Phragmites australis)*, and common mugwort (*Artemisia vulgaris*). Trees that are present are typically found in small patches and relatively small in size. The 2012 New Jersey Land Use/ Land Cover mapping for the Project Site is provided on Figure 4.

The vegetative community in the Central Forested Area, which is generally avoided by the proposed development, is a sweetgum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*) dominated forest, and is predominantly wetlands. In the more upland areas there is a notable presence of American holly (*Ilex opaca*), white pine *(Pinus strobus*), sassafras (*Sassafras albidum*), black cherry (Prunus serotina), and hay-scented fern. Trees are generally mature and form a contiguous canopy. Low lying areas are characterized by emergent herbaceous wetlands primarily consisting of common reed and other invasive species including mile-a-minute (*Polygonum perfoliatum*) and stinging nettle (*Urtica dioica*).

The Warehousing Area was moved south of the otherwise consolidated sections of the Marine Terminal in order to avoid disturbance in the Central Forest Area. A majority of the Warehousing Area is representative of a sweetgum and red maple dominated forest. Unlike the Central Forest Area, the Warehousing Area is predominantly upland and is fragmented by former development that occurred historically along the southern and western sections.

5. PROJECT DESCRIPTION

5.1 Overview

The proposed Project involves the development of a multi-use, deep-water seaport and industrial logistics center.

The development of the Project includes:

- Multi-Purpose Berth and Mooring Dolphins
  - Demolition of dilapidated marine structures
  - Dredging of approximately 457,000 cy of material within a 29-acre area adjacent to the existing wharf
  - Construction of multi-purpose open berth with breasting and mooring dolphins
- Auto Terminal
  - Clearing, fill, and grading of approximately 99 acres
  - Construction of vehicle processing buildings totaling 107,870 SF
- General Cargo Area
  - Clearing, fill, and, grading of approximately 13.6 acres
  - Construction of two storage warehouses totaling 150,000 SF
- Bulk Liquids Storage Area
  - Clearing, fill, and grading of approximately 67.2 acres
  - Installation of storage tanks with targeted storage volume of 2M barrels of bulk liquid products
  - Railyard refurbishment and construction
  - Construction of a small operations buildings
- Logistics and Warehouse Area
  - Clearing, fill, and grading of approximately 37 acres
  - Construction of two warehouses totaling approximately 522,500 SF

In addition to the activities described above, repairs and enhancements to existing site roadways and rail infrastructure are also proposed, including refurbishment of existing rail lines and widening of A-Line and C-Line Roadways to a maximum width of 36 feet.

The Project, as proposed, requires fill within freshwater wetlands, coastal wetlands, and limited State Open Waters, as well as within waste treatment system ditches not regulated by the FWPA Rules.

5.2 Multi-Purpose Berth and Mooring Dolphins

A new multi-purpose berth is proposed that is capable of handling a range of ships transporting automobile, break-bulk cargo, and bulk liquid products. This berth will replace the existing dock and marine structures constructed by DuPont in the early 1960s, thereby taking advantage of land area that was previously disturbed and waters that have previously been dredged.

Demolition Activities

Little to no maintenance has been performed on the existing marine structures since the DuPont plant closed in 1995. An April 2016 site inspection determined that existing wharf structures are in critically poor condition, several components having collapsed or remaining in severe disrepair. Due to the instability of the existing barge berth, existing structures are proposed to be demolished to improve safety conditions and remove the potential floating debris. Demolition activities will include removal of all existing timber piles and extraction of sheet pile and concrete ice breaker structures.

Berth Construction

The proposed multi-purpose berth will be designed to accommodate vessels up to 870 feet in length. The berth will be constructed utilizing one breasting dolphin and two mooring dolphins extending from the bow end of the wharf, which reduces the required berth length to 750 feet. The structural footprint over the water is approximately 107,445 SF, a 33% reduction compared to alternative designs that were considered.

The wharf construction will require approximately 369 steel piles that are 24 inch in dimeter. Piles will be driven with an impact hammer operated from a barge.

5.2.1 Dredging

Dredging is proposed within an approximately 29 acre area of the former berth and access channel within the Delaware River. Current water depth in the area is approximately -37 ft. NAVD88. The target dredging depth is -40 feet Mean Lower Low Water (MLLW). Sediments within the dredge area consists of silts and sands, with grain size typically increasing toward the main channel of the Delaware River.

Accounting for one foot of overdredge, the total dredging volume is approximately 457,000 cubic yards of material. The proposed dredging will be performed using a closed clamshell environmental bucket, and other best management practices. The dredged material will be beneficially reused at the Project Site or property disposed off-site.

5.3 Auto Terminal

The Auto Terminal consists of the storage and maintenance facilities for wheeled cargo transported from roll-on/roll-off ("RoRo") vessels. The terminal is located south of the proposed multi-purpose berth and encompasses approximately 100 acres

5.4 General Cargo Area

A General Cargo Area is proposed west of the Auto Terminal and includes a 100,000 SF cold storage building and a 50,000 SF dry storage building, and will provide storage for a variety

of refrigerated and non-refrigerated cargo. The total area required for buildings, staging and circulation is approximately 13.6 acres.

5.5 Bulk Liquids Area

A bulk liquids storage facility is proposed in the western portion of the Project Site. The facility is approximately 67 acres. Additional space is proposed to be allocated for the construction of a railyard capable of handling 5000 to 6000 feet of rail cars and a 5-bay truck rack. The current site design incorporates existing infrastructure (substation, rail infrastructure, pump station) into the selected layout.

5.6 Warehousing Area

A logistics and warehousing area is proposed on approximately 37 acres in the southern portion of the Project Site. This area includes two warehouses totaling 522,500 SF.

5.7 Transportation Improvements

In addition to the proposed development areas described above, the Project involves site-wide transportation improvements, including enhancements and repairs to existing roadways and rail infrastructure. These upgrades are necessary to enable transport of goods and material from port off-loading areas to other warehouses and open storage areas on-site. Proposed improvements to rail and roadway infrastructure as described below.

1. *Rail Access* - The Site currently has active rail service utilized by the existing dry-ice manufacturing tenant in the southern portion of the property. DRP intends to refurbish and expand the existing network of rail spurs throughout the Site in order to provide rail service to the proposed on-site facilities.
2. *Road Widening* – Portions of A-Line and C-Line Road must be widened in order to accommodate truck and trailer traffic. Portions of C-Line and A-Line road are proposed to be widened to a width of 34 feet. Current road widths are approximately 20-22 feet. As needed to safely facilitate traffic, intersection improvements are also proposed along existing C-Line and A-Line Roads.

6. THREATENED AND ENDANGERED SPECIES HABITAT IMPACT ASSESSMENT

6.1 Regulatory Framework

The CZM Rules state, "Development of endangered or threatened wildlife or plant species habitat is prohibited unless it can be demonstrated, through an endangered or threatened wildlife or plant species impact assessment as described at N.J.A.C. 7:7-11, that endangered or threatened wildlife or plant species habitat would not directly or through secondary impacts on the relevant site or in the surrounding area be adversely affected" (N.J.A.C. 7:7-9.36(3b)). Similarly the FHA rules state, "The Department shall issue an individual permit for a regulated activity only if the activity will not destroy, jeopardize, or adversely modify a present or documented habitat for threatened or endangered species, and shall not jeopardize the continued existence of any local population of a threatened or endangered species" (N.J.A.C. 7:13-11.6(d)). The FWW rules state that the Department will issue an individual freshwater wetlands permit if the regularity activity, "will not destroy, jeopardize or adversely modify a present or documented habitat for threatened or endangered species; and shall not jeopardize the continued existence of a local population of a threatened or endangered species" (N.J.A.C. 7:7A-7.2(b3)).

Under the CZM Rules, endangered or threatened wildlife or plant species habitat is defined as, "areas known to be inhabited on a seasonal or permanent basis or to be critical at any stage in the life cycle of any wildlife or plant identified as 'endangered' or 'threatened' species on official Federal or State lists of endangered or threatened species, or under active consideration for State or Federal listing" (N.J.A.C. 7:7-9.36). Habitat includes "areas mapped as endangered or threatened wildlife species habitat on the Department's Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife". Similarly the FHA and FWW rules define present and documented habitat for threatened or endangered wildlife using the Landscape Project method" (N.J.A.C. 7:13-11.6 and N.J.A.C. 7:7A-2.4).

The Landscape Project maps represent an approximation of the location and extent of documented endangered or threatened species habitat. The maps are based on 2007 land-use/land-cover data and subject to positional error and errors resulting from changes in land use since 2007. Although this T&E Impact Assessment does not address the accuracy of the Landscape Project mapped threatened and endangered species habitat, it must be noted that the location and extent of mapped habitat is subject to error.

Several federal regulation provide protection for species including the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The ESA protects species listed as threatened or endangered. The U.S. Fish and Wildlife Service (USFWS) has primary responsibility for administering the ESA for terrestrial and freshwater species, MBTA and BGEPA. The National Marine Fisheries Service (NMFS) is responsible for marine species under the ESA. The ESA prohibits the "take" of listed species without a permit. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. Under the section 4 of the ESA special rules can be issued to target the prohibition of take for a threatened species to specific activities, thereby allowing activities that do not harm the species to continue, while

focusing on threats to protected species. The BGEPA protects bald and golden eagles and their nest from disturbance and MBTA protects most birds and their nests from disturbance.

6.2 Threatened and Endangered Species Present

The New Jersey Natural Heritage Database search results (see Appendix E1) and NJ Landscape Project identify potential bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) habitat on the Project Site, as well as shortnose sturgeon (*Acipenser brevirostrum*) habitat in the Delaware River adjacent to the Project Site (see Figure 3). However, the Natural Heritage Database search results did not identify any Rare Plant Species and Ecological Communities on or in the immediate vicinity of the Project Site. Further, no Natural Heritage Priority Sites have been identified within the Project Site.

In addition, the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) tool identified potential habitat on the Project Site for three species: red knot (*Calidris canutus rufa*), northern long-eared bat (*Myotis septentrionalis*) and bog turtle (*Clemmys muhlenbergii*) (Appendix E1). Guidance from the National Marine Fisheries Service (NMFS) also identifies the Delaware River as habitat for Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) (Appendix E2). No critical habitat is currently identified within or adjacent to the project Site. Critical habitat for Atlantic sturgeon has been proposed for the Delaware River.[4]

Neither red knot nor bog turtle present a concern at the Project Site. Red knot is a migratory bird species that generally uses beaches and mudflats along the Atlantic Coast of New Jersey for stopover areas and is not expected be present in the area of the Project. Similarly, occurrences of bog turtle, which are mapped by the Landscape Project, have not been identified within one mile of the Project Site and, accordingly, bog turtles are not expected to be present on site. Occurrences of northern long-eared bat, however, are found statewide in New Jersey, and summer roosting habitat may be present within the Project Site.

6.3 Habitat Survey

A survey of threatened and endangered species habitat was conducted in conjunction with the delineation of wetlands within and adjacent to the Project Site. The survey was conducted by traversing Project Site and a 150-foot buffer area on foot and noting vegetation, land use and potential habitat. Site surveys were conducted in June and August of 2015 by a team of Ramboll Environ environmental scientists and ecologists. Data on potential habitat was collected including information on land use, vegetation, soil and hydrology.

6.4 Bald Eagle

Bald eagles are thriving in New Jersey with 150 active nests in 2015 (NJ Bald Eagle Project 2015). Eagle populations have dramatically recovered from a low of one nesting pair in 1970 (NJ Bald Eagle Project 2015). The current eagle population in New Jersey is well above

[4] On June 3, 2016, the NMFS submitted a proposal to designate portions of the Delaware River as critical habitat for the New York Bight Distinct Population Segment (DPS) of Atlantic Sturgeon (81 F.R. 35701). An official determination on the proposed designation has not been made.

historic estimates of 20 nests in the 1940s (NJ Bald Eagle Project 2015). In Gloucester County alone, 13 active nest were identified in 2015 (NJ Bald Eagle Project 2015).

6.4.1 Habitat Criteria

When selecting a nest site, bald eagles prefer nesting habitat which typically consists of large discontinuous mature forest stands within approximately one mile of a large water body or wetland system (> 20 acres) (Evans 1982; Andrew and Mosher 1982) to afford access to fish, their primary prey item (Retfalvi 1970; Dunstan and Harper 1975; DeGraaf et al. 1980; Todd et al. 1982). Bald eagles prefer to nest in large trees with a diameter greater than 12 in. and heights of 75 ft. (Andrew and Mosher 1982). Bald eagles prefer foraging habitat with large contiguous mature forest in the vicinity of large water bodies (> 20 acres), such as rivers, lakes, and estuaries. Smaller streams and ponds are not frequently used by bald eagles (Leighton et al 1979). For wintering bald eagle populations, fish is still the primary food source and preferred wintering habitat typically consists of large mature forested areas which are frequently adjacent to open, unfrozen water bodies (Evans 1982). Evidence shows that bald eagles are typically intolerant of human activity will select nesting locations away from human-related disturbances. (Anthony et al. 1995).

In New Jersey, bald eagle prefer to nest in trees that are taller than the surrounding forest habitat and typical species include sycamore (*Platanus occidentalis*), hickory (*Carya ovata*) and loblolly pine (*Pinus taeda*) (Niles et al. 1991). The Landscape Project identifies the following criteria for bald eagle nesting, foraging and wintering habitat:

- Nesting Habitat: vegetated habitat within 1 kilometer (km) radius of a nest.
- Foraging habitat: all open water bodies greater than 8 ha with 90 m buffer applied to the identified waters to protect perching sites. All suitable habitat patches (i.e., forest and forested wetlands) that intersect with the foraging habitat and 90 m buffer.
- Wintering habitat: were identified using specific Eagle Midwinter Survey data and biologist interpretation of essential habitat, as well as recorded sightings of eagles during the winter period of November 1-January 31. Patches of suitable habitat (forest, forested wetlands, and open waters) within 500 meters of each.

6.4.2 Affected Habitat

There are currently two (2) active bald eagle nests located within 1km of the Project Site: one located on Mond's Island and a second located east of the Project Site near Clonmell Creek. The Mond's island pair of bald eagles historically nested in a patch of trees on the eastern side of the island but that nest is no longer present and the current nest is located in a patch of trees in the center of Mond's Island. The Mond's Island and Clonmell creek nests are in large, mature trees located in areas with no recent history of development or human disturbance. However, the nests are within the flight path of the Philadelphia International Airport and are exposed to regular noise disturbance from passing aircraft. The Delaware River likely provides the primary foraging habitat for eagles within the vicinity of the Project Site. The Landscape Project has mapped nesting, foraging and wintering habitat within the Project Site.

Due to the fact that the Project Site is located centrally between two active bald eagle nests, it is unlikely that a new pair of eagles would establish a nest within the Project Site in such

close proximity to existing nesting eagles. Bald eagles will vigorously defend their territories from other eagles and it is unlikely that nests would be located less than one mile apart. Nesting habitat is mapped along the edges of the northern portion of the Project Site, the majority of the central portion of the Project Site and all but the southwest quadrant of the southern portion of the Project Site (see Figure 5). The highest quality nesting habitat is within the central area, due the presence of large mature trees and the separation from developed areas. Lower quality nesting habitat is located within the southern portion of the Project Site; large mature trees are present but are generally not of the size or species preferred by eagles. The southern section is also somewhat fragmented by roads and rail track. The LOI issued for the Project Site recognized that serval of the wetlands in southern area should not be classified as exceptional resource value wetlands despite being areas mapped as bald eagle habitat. Nesting habitat is poor or absent in the northern portion of the Project Site. Areas mapped as habitat include iron oxide waste piles and the phragmites dominated wetlands in the western arm of the project area which both lack large trees that could support an eagle nest. Given the limited quality nesting habitat and presence of two other nearby nests, it is not likely that bald eagles will establish a nest on the Project Site.

The mapped foraging habitat for bald eagles on site is of low quality and lacks key habitat features such as open water. Foraging habitat is mapped in the northwestern portion of the Project Site, as well as two patches along the southern and eastern edges. In the central portion of the Project Site, foraging habitat is mapped in the northeast quadrant. These mapped foraging areas are not large bodies of open water and generally represent poor quality foraging habitat. Areas closer to Delaware River may provide perches for foraging eagles but are dominated by herbaceous invasive vegetation and provide poor quality perches for foraging eagles. Accordingly, bald eagles are unlikely to rely on the Project Site as foraging habitat. Similarly, the on-site area mapped as wintering habitat in the northwestern portion of the Project Site is heavily disturbed and dominated by herbaceous vegetation. This area represents poor quality wintering habitat and bald eagles are not likely to utilize the Project Site for overwintering.

6.4.3 Potential Impacts and Proposed Mitigation

While dredging and berth construction activities may temporarily displace fish in small portions of the Delaware River within the Project Site, any temporary reduction in foraging area will be insignificant relative to available foraging habitat along the Delaware River to the north and south. Moreover, eagles foraging near the Project Site are accustomed to marine traffic and other disturbances, including high levels of noise disturbance from low flying jets given the proximity of the Project Site to the Philadelphia International Airport. Any noise generated during construction and operations of the Project is not expected to adversely impact eagles.

Construction of the terrestrial portion of the Project will result in removal of vegetation and the development such that areas within the Project Site are not expected to provide habitat for bald eagles. Area of temporary disturbance will be restored in place with no long term impact of habitat. Areas of mapped eagle habitat within the Project Site are shown in Table 1. No construction activities or habitat disturbance will take place within 1000 feet[5] of an active bald eagle nest. Development associated with the Bulk Liquids Storage area,

[5] Avoidance distance based on NJDEP Guidelines.

including clearing, grading, and installation of three sphere storage tanks, may occur within 1000 feet of a historic bald eagle nest. However, no impacts to nesting eagles is expected since the nest is no longer present and the Mond's Island eagles are utilizing a nest farther to the west.

Impacts to mapped habitat will be further minimized by avoiding development in high quality habitat areas within the central portion of the Project Site. The area of impacted eagle habitat within the Project Site is relatively small compared to undeveloped areas to east and west of the Project Site. Eagle habitat utilization and home range may shift to areas east and west of the Project Site, but available habitat is more than sufficient to support eagles already nesting adjacent to the Project Site. To further mitigate any potential impacts to eagles from collisions, high voltage powerlines will be buried within the Project Site to the extent practicable and a Protected Species Monitoring and Management plan will be implemented to protect nesting eagles on adjacent parcels controlled by DRP (See Appendix E4). Specifically, the plan addresses the protection and monitoring of the bald eagle nest site located east of the Project Site on land owned by DRP.

6.5 Osprey

Osprey populations in New Jersey have recovered from a low of 50 nests in 1974 to more than 475 nesting pairs today (Ligouri 2003). The health of osprey populations is demonstrated by the presence of several nests identified within the Project Site (see Figure 6).

6.5.1 Habitat Criteria

Ospreys nest along the Delaware River in Cumberland, Salem, and Gloucester counties. Ospreys in New Jersey generally winter in the southern U.S. or Central and South America. Their primary prey is fish and they prefer to forage in water bodies with an abundance of fish, free of dense emergent or submerged vegetation, free of overhanging vegetation, and with low turbidity or high clarity (Vana-Miller 1987; Poole 1989). Ospreys cannot dive more than three (3) feet below the water surface and prefer to forage in shallow waters (Cornell Lab of Ornithology 2016). Ospreys prefer nest locations close to water on tall trees or telephone poles with a clear view of the surrounding area (Postupalsky and Stackpole 1974; Swenson 1975; Grover 1983). Man-made osprey nesting platform account for more than 75% of nest location in New Jersey and are largely responsible for the recovery of ospreys in the state (Ligouri 2003). Ospreys generally tolerate and will nest in proximity to people and human activity (Reese 1970; Poole and Spitzer 1983).

The Landscape Project identifies the following habitat criteria:

- Nesting habitat: wetland habitats within 300 meters of a nest
- Foraging habitat: open waters within 2 km of nests

6.5.2 Affected Habitat

Field observations have confirmed that four osprey nests were established on the Project Site (see Figure 6) on man-made structures including utility poles and a loading arm located at the wharf. According to monitoring data provided by AECOM, Nests #1, #2 and #3 are active in early June and nest #4 was inactive. Nest #3 failed by the second week of June

due to mortality of an adult from electrocution at nearby, pre-exiting power pole unrelated to the Project and subsequent predation of the nestlings. Nests #1 and #2 remain active with chicks observed until Early July, despite ongoing demolition and remediation actives that are separate from the current proposed development. As reported by AECOM, Nests #1 and #2 failed during the first week of July presumably due to predation.

The Delaware River, Aunt Debs Ditch and Sand Ditch are likely the primary foraging habitat for ospreys nesting in the Project Site. The ospreys nesting within the Project Site are accustomed to frequent disturbances from flights landing and taking off from Philadelphia Airport and the regular marine traffic along the Delaware River.

Landscape Project-mapped nesting habit on site is of low quality, especially in the southern portion of the Project Site due the lack of open areas or proximity to open water. Nesting habitat is also mapped in the northwestern and south central portions of the Project Site (see Figure 6). Areas mapped within the central portion of the Project Site that are adjacent to open water and open areas of emergent herbaceous wetlands represent the highest quality mapped nesting habitat with the Project Site. However, none of the active nests are within 900 feet of mapped nesting habitat, highlighting the unreliability of the Landscape Project maps.

The Project Site does not offer good foraging habitat for osprey. No foraging habitat is mapped in the southern portion of the Project Site (see Figure 6). The areas which are mapped as foraging habitat in the northcentral portion of the Project Site are the subject of ongoing remediation, including the nitrobenzene ditch, a retention basin and the iron oxide waste pile (see Figure 6). These areas are poor quality foraging habitat with limited open water that lack fish due to poor aquatic habitat and historic contamination. The small areas of mapped foraging habitat within the central portion of the Project Site are of relatively low value due to the lack of open water. While the Delaware River is mapped as foraging habitat (including areas within the Project Site) , the area in which construction and operations are proposed to take place is predominantly deeper than five (5) feet as result of historic dredging and, accordingly, is poor quality foraging habitat for osprey.

6.5.3 Potential Impacts and Proposed Mitigation

No adverse impacts to nesting osprey or osprey habitat are expected. In order to avoid potential impacts to osprey, existing nests will be relocated during the non-nesting season from September 1 through March 31. Nest relocation will be conducted in consultation with NJDEP's Division of Fish and Wildlife (NJDFW) to locations where ospreys will not be disturbed by Project construction or operations. To mitigate any potential impacts to osprey, a new nesting platform will be constructed and installed for each relocated nest. The location of platforms would be determined in consultation with NJDFW, and would generally be located in waterfront or over-water areas in high-quality habitat areas and away from forested areas and known bald eagle nests.

Ospreys foraging near the project area are accustomed to disturbance and marine traffic and are unlikely to be disturbed by the Project. While dredging and berth construction activities may temporarily displace fish and reduce the availability of prey within the Multi-Purpose Berth area, any temporary reduction in foraging area will be insignificant relative to available foraging habitat along the Delaware River. Additionally, Project construction will remove

vegetation and develop the Project Site such that mapped habitat areas within the Project Site are not expected to provide habitat for osprey. Temporary disturbance areas will be restored in place and no long-term impact to habitat is expected (see Table 1). Impacts to mapped habitat have been minimized by avoiding development within the Central Forested Area. The mapped foraging and nesting habitat impacted by the Project is generally poor quality. Ospreys are expected to utilize relocated nest locations, which will likely be located in the large areas of available habitat to the east and west of the Project Site.

Several measures will be implemented to prevent disturbances to ospreys and osprey habitat. First, to minimize potential mortality or injury of ospreys, high voltage powerlines within the Project Site will be buried to the extent practicable. In addition, attractive structures for nesting such as tall equipment will be moved during early nesting season when feasible in order to avoid potential colonization by ospreys. Lastly, a management and maintenance plan has been developed for osprey platforms and to protect nesting ospreys (see Appendix E4). In summary, any loss of poor quality habitat from Project development will be mitigated and no adverse impacts to osprey habitat is expected.

6.6 Northern Long-eared Bat

6.6.1 Habitat Criteria

The northern long-eared bat's range stretches across much of the eastern and north-central United States, and they have been observed overwintering, foraging, roosting, and reproducing in New Jersey (USFWS, 2015). Most of New Jersey is utilized as summer roosting and foraging habitat, while overwintering and reproduction occurs primarily within the northern portion of the state.

Northern long-eared bat typically overwinters in hibernacula such as caves or mines (USFWS, 2015). Wintering habitat is selected for traits such as constant temperatures, high humidity, and the absence of air currents (USFWS, 2015). During hibernation the species will seek out small crevices or cracks to roost in throughout the winter (USFWS, 2015).

Summer foraging habitat for northern long-eared typically consists of large wooded areas that provide roosting and foraging opportunities. These habitats will typically have emergent wetlands interspersed throughout and can often be found adjacent to agricultural fields, old fields, and pastures (USFWS, 2015). Roosting trees or snags will typically have a diameter at breast height of at least three inches and will have exfoliating bark, cracks, crevices, and/or cavities present (USFWS, 2015). Linear features such as fencerows, riparian forests, and other wooded corridors can also be utilized by northern long-eared bat, especially if the trees are larger and have features such as those listed prior (USFWS, 2015). Individual trees are considered suitable habitat if they are within 1,000 feet of a forest that qualifies as habitat for the species (USFWS, 2015). Human-made structures such as buildings, barns, bridges, and bat houses can also provide roosting habitat. Summer habitat is typically occupied from mid-May through mid-August (USFWS, 2015). Breeding begins in late summer or early fall (USFWS, 2015). After reproduction the female will store the sperm over winter and will fertilize the eggs after hibernation (USFWS, 2015). After hibernation, pregnant females will migrate to summer habitats, where they can roost in small colonies and give birth to a single pup (USFWS, 2015).

6.6.2 Affected Habitat

The lack of documented northern long-eared bat habitat in or near the project area makes their presence within the Project area unlikely. The New Jersey field office of the U.S. Fish and Wildlife Service (USFWS) maintains a list of municipalities with documented northern long-eared bat roost tree or known hibernaculum within 0.25 miles. No municipalities within Gloucester County are listed (USFWS, 2015). No caves or mines are present within or adjacent to the project area that could be used as hibernacula. If bats are present in the Project area at all, the forested areas in the central and southern portions of the Project Site may provide roosting habitat. Notably, the tree species present (red maples and sweetgum) generally lack exfoliating bark but crevices or cavities in dead trees may provide roosting habitat. The patches of trees in the northern portion of the Project Site are not likely roosting habitat due to their small size and the dominance of invasive species that generally lack exfoliating bark. Accordingly, it is possible, but unlikely, that northern long-eared bats may find roost habitat on the Project Site.

6.6.3 Potential Impacts and Proposed Mitigation

No adverse impacts to northern long-eared bats or bat habitat are expected. A large forested area in the central portion of the Project Site which may provide roosting habitat will be avoided to prevent disturbance to rooting bats. USFWS regulations prohibit incidental take of northern long-eared bat by means of tree removal that occurs within 0.25 miles of a known hibernaculum or within a 150 foot radius of a maternity roost tree during pup season, from June 1 through July 31[6]. In order to avoid the possibility of a prohibited take, tree removal in the southern and central portions of the Project Site will not take place during pup season. If tree removal needs to occur during that time, a habitat assessment will be conducted to identify and avoid potential maternity roost trees and tress within 150 feet. The Project's compliance with the USFWS regulations will prevent any adverse impacts to northern long-eared bat resulting from on-site tree removal.

6.7 Sturgeon

6.7.1 Shortnose Sturgeon Habitat Criteria

Shortnose sturgeon occur in the Delaware River from the lower bay upstream to at least Lambertville, New Jersey (river kilometer (rkm) 238) (Brundage 1986). The most heavily used portion of the river seems to be between rkm 190 below Burlington Island and rkm 220 at the Trenton Rapids. Shortnose sturgeon are typically concentrated in areas with salinity levels of less than 3 parts per thousand (ppt) (Dadswell et al. 1984) and are most likely to occur upstream of rkm 70, where salinity is typically less than 5 ppt. Shortnose sturgeon were found to use the area on the west side of the shipping channel between Deep Water Point, New Jersey (rkm 112) and the Delaware-Pennsylvania line (rkm 127). The most frequently utilized areas within this section were off the northern and southern ends of Cherry Island Flats (rkm 112-118) in the vicinity of the Marcus Hook Bar. A Brundage study in 2004 indicates that between April and October, most adult shortnose sturgeon use the Torresdale (rkm 150) to New Castle (rkm 93) area as a short-term migratory route rather

[6] Under the Final 4(d) rule some forms of incidental take of NLEN are prohibited if they occur in a county impacted by white-nose syndrome (WNS) which includes all counties in New Jersey. Incidental take is prohibited in WNS counties if it occurs within a hibernaculum or is a result of tree removal activities that occur within 0.25 miles of a known hibernaculum or cuts or destroys a known occupied roost tree or other trees with 150 foot radius from a maternity roost tree during pup season.

than a long-term concentration or foraging area (ERC 2004). The portions of the Delaware River south of Philadelphia, including the portion of the River abutting the Project Site, have not been identified as a concentration area for adult shortnose sturgeon.

In the Delaware River, movement to spawning grounds occurs in early spring, typically in late March, with spawning occurring through the end of April. During the spawning period, males remain on the spawning grounds for approximately a week while females only stay for a few days (O'Herron and Hastings 1985). After spawning shortnose sturgeon move rapidly downstream to the Philadelphia area. Shortnose sturgeon are expected to be at the overwintering grounds between early November and mid-April.

Shortnose sturgeon spawning habitat in the Delaware River likely extends from approximately Lambertville (rkm 238) to the Trenton Rapids (rkm 220) (ERC 2009, Brundage 1986, O' Herron et al. 1993). Yearlings are likely concentrated in the upper Delaware River above Philadelphia (rkm 161).

Adult sturgeon overwinter in dense sedentary aggregations in the upper tidal reaches of the Delaware between river kilometer 190 and 211. The areas around Duck Island and Newbold Island seem to be regions of intense overwintering concentrations but a limited number of shortnose sturgeon occur in other downstream areas, including Marcus Hook (rkm 130), during the winter months. Shortnose sturgeon in the Delaware do not appear to remain stationary during overwintering periods but typical overwintering movements are fairly localized and sturgeon appear to remain within two river kilometers of the aggregation site (O'Herron and Able 1985). The overwintering location of juvenile shortnose sturgeon is believed to be on the freshwater side of the oligohaline/fresh water interface (O'Herron and Able 1990). In the Delaware River, the oligohaline/freshwater interface occurs in the area between Wilmington, Delaware (rkm 110) and Marcus Hook, Pennsylvania (rkm 123-129) (Brundage & O'Herron 2009; O'Herron and Able 1990). Juveniles may be anywhere from Philadelphia (rkm 161) to below Artificial Island (rkm 87) for overwintering.

Shortnose sturgeon appear to be strictly benthic feeders (Dadswell 1984). While shortnose sturgeon forage on a variety of organisms, sturgeon in the Delaware River primarily feed on the Asiatic river clam (Corbicula manilensis). Corbicula is widely distributed at all depths in the upper tidal Delaware River, but it is considerably more numerous in the shallows on both sides of the river than in the navigation channels. Foraging is heaviest immediately after spawning in the spring and during the summer and fall, and lighter in the winter. Juvenile sturgeon primarily feed in 10 to 20 meter deep river channels, over sand-mud or gravel-mud bottoms (Pottle and Dadswell 1979).

6.7.2 Atlantic Sturgeon Habitat Criteria

In the Delaware River and Estuary, Atlantic sturgeon occur from the mouth of the Delaware Bay to at least the fall line near Trenton, NJ (Simpson and Fox 2006). The earliest detection of an adult entering the river for spawning from marine waters was mid-April and the latest departure occurred in mid-June (Fox and Breece 2010); supporting the assumption that adults are only present in the river during spawning. Tracked adults spent seven to 70 days upriver of the salt-front, in April-July. Adult sturgeon spend generally about four weeks in river. Young of the year (YOY) are present from rkm 105 to rkm 199 from late fall to early spring including the Marcus Hook area (rkm 127). Juveniles may be present year round but

are restricted, due to low tolerance to salinity, to waters above the salt line which varies seasonally. During the summer months, concentrations of Atlantic sturgeon have been located in the Marcus Hook (rkm 123-129) and Cherry Island Flats (rkm 112-118) regions of the river.

Young of the year use several areas from Deepwater (rkm 105) to Roebling (rkm 199) during late fall to early spring to overwinter. Some remain in the Marcus Hook area while others move upstream, exhibiting migrations in and out of the area during winter months (Calvo et al. 2010; Fisher 2011). For non YOY fish, most detections occurred in the lower tidal Delaware River from the middle Liston Range (rkm 70) to Tinicum Island (rkm 141). A trawl survey along rkm 127-139 from January 25-March 7, 2014 collected 36 Atlantic sturgeon (7 juveniles, 29 YOY).

Likely spawning locations occur at rkm 120-150 and rkm 170-190 from Tinicum Island (rkm 136) to the fall line in Trenton, NJ (rkm 211). Hard bottom habitat (gravel/coarse grain depositional material and cobble/boulder habitat) and areas with mixed gravel and mud substrate are preferred habitat for spawning (Breece et al., 2013). Atlantic sturgeon spawning is believed to occur in flowing water between the salt front and fall line of large rivers, where optimal flows are 46-76 cm/s and depths of 11-27 meters (Borodin 1925, Leland 1968, Scott and Crossman 1973, Crance 1987, Bain et al. 2000). Sturgeon eggs are highly adhesive and are deposited on the bottom substrate, usually on hard surfaces (e.g., cobble) (Gilbert 1989, Smith and Clugston 1997).

6.7.3 Affected Habitat

Based on the location of the Project Site (rkm139), it is unlikely that the Project will adversely impact sturgeon or sturgeon habitat. The result of a preliminary submerged aquatic vegetation (SAV) survey indicates limited potential for vegetation within the Multi-Purpose Berth area. Sampling within the area indicates the substrate is fine grained sediments that are contaminated with polycyclic aromatic hydrocarbons (PAHs), metals and PCBs, exceeding certain ecological screening levels. The proposed Multi-Purpose Berth area is poor benthic habitat due to historic disturbance, lack of hard bottom substrate or documented SAV, and thus provides poor foraging habitat for sturgeon.

The Landscape Project has mapped the proposed Multi-Purpose Berth Area as part of a migration corridor for shortnose sturgeon (see Figure 7). However, the Project Site is not located near spawning habitat for shortnose sturgeon and most adults have been observed concentrating further upstream. Adults may pass through the Project Site from March to April during seasonal migrations, but, while some juveniles could be present from November to April, it is unlikely that the adult shortnose sturgeon overwinter within the Project Site.

Juveniles and YOY Atlantic sturgeon may be present within the Project Area from late fall to early spring and adult Atlantic sturgeon may pass through the Project Site from April to June for spawning, but the Project Site lacks hard bottom substrate that sturgeon use for spawning.

6.7.4 Potential Impacts and Proposed Mitigation

Dredging activities could impact sturgeon by capturing individuals in the dredge bucket or from disturbance of sediment. Construction vessels could strike sturgeon resulting in injury. Noise from installation of support piles or dolphins could disturb sturgeon or cause them to avoid the Project Site. Sediment disturbance and noise could result in sturgeon avoiding the Project Site and potentially impacting the Zone of Passage[7] and migration to spawning areas. Dredging and berth construction could impact benthic resources directly or from shading, reducing potential foraging habitat. Through the use of mitigation measures established by NMFS and dredging best management practices (BMPs) described below, the project is not expected adversely impact the sturgeon population or sturgeon habitat.

Mitigation Measures

- Time of year restrictions from March 1 – July 15
- Cushion block will be used to attenuate impact hammer under water noise levels
- Use "soft start" procedure for pile driving
- Limit pile driving to no more than 12 hours per day
- Shallow draft vessels that maximize the navigational clearance between the vessel and the river bottom will be used where practicable
- Vessels within the Project Site will operate at speeds of less than 10 knots

Dredging BMPs

- Use of an environmental clamshell with complete closure of the bucket before it is lifted from the river bottom
- Control of the pace of dredging to minimize disturbance of sediments (e.g., 1 fps lowering speed)
- Controlling the "bite" of the bucket to: (a) minimize the total number of passes needed to dredge the required sediment volume; and (b) minimize the loss of sediment due to extrusion through the bucket's vents openings or hinge area
- Slowly withdrawing the clamshell through the water column
- Placing material deliberately in the barge to prevent spillage of material overboard
- Not dragging the dredge bucket along the sediment surface

The mitigation measures identified above are based on the USACE Philadelphia District Section 7 NMFS guidance (September 2015). Time of year restrictions will limit dredging work to times when adult sturgeon are least likely to be present within the Project Site. The amount of dredging required for the Project is less than what would be required for a new marine terminal since the Multi- Purpose Berth area was historically dredged. The limited number of sturgeon that may be present are expected to avoid the slow moving dredge bucket and no injury from mechanical dredging is expected.

[7] Zone of passage referrers to the ability of a species to bypass the impacted area and depends on the width of the water body and the size of the affected area.

The turbidity table provided by USACE Philadelphia District Section 7 NMFS guidance represent a conservative estimate of suspended solids (TSS) for mechanical dredging (USACE 2015). Dredging BMPs will likely reduce TSS below USACE estimates but the analysis is described here to illustrate the lack of impact on sturgeon from TSS. The USACE estimated that mechanical dredging concentration will typically range from 31-210 mg/L (USACE 2015) above background levels and be present within the bottom 6.6 feet of the water column for a distance of up to 4,921 feet from the dredge site (Burton 1993). Elevated suspended sediment levels up to 210 mg/l may be present within a 4,921-foot radius from the location of the mechanical dredge. The TSS levels expected for dredging are below those shown to adversely affect fish (580.0 mg/L for the most sensitive species, with 1,000.0 mg/L more typical; Burton 1993) and benthic communities (390.0 mg/L (EPA 1986)). Any increase in turbidity/suspended sediment will be minor and temporary such that there is no impairment of movement of sturgeon and there is only a minor and temporary reduction in available prey. Sturgeon are not expected to be adversely impacted from dredging.

Construction of the Multi-Purpose Berth will reconfigure the existing wharf resulting in no reduction of open water area (see Table 1). Construction of the wharf and shading from the decking is not expected to have a significant impact on benthic resources due to lack of existing benthic habitat. An increase in impervious surface as result of the project is not expected to impact water quality since stormwater will be appropriately treated before being discharge to the Delaware River. Fill associated with outfall constructed along the northern shoreline will be minimal and will not impact sturgeon foraging habitat.

Construction vessels will have the minimal draft practicable and operate at speeds less than 10 knots. Any sturgeon present are expected to avoid collisions with vessels. Noise from pile driving and construction could potentially exceed 206 dB (Peak) injury threshold. A cushion block will be used to attenuate noise levels from impact hammer and reduce them below injury thresholds. Noise levels may exceed the 187 dB cumulative injury threshold for sturgeon and the 150 dB (RMS) behavioral threshold.[8] The cumulative/behavioral threshold level may be exceeded for an area of less than 100 meters from the impact hammer. A "soft start" procedure will be used when the driving is started and impact hammer use will be limited to 12 hours per day. Sturgeon will likely temporally avoid the relatively small areas of sound disturbance and not cumulative impacts from noise are expected. Avoidance of the Project Site would not be a barrier to movement within Delaware River or constitute a significant change in available foraging habitat for sturgeon. No significant adverse impacts to sturgeon are expected as result of the construction activities.

[8] NMFS Greater Atlantic Regional Fisheries Office acoustic analysis spread sheet.

7. SUMMARY OF FINDINGS & CONCLUSIONS

Through avoidance, minimization and mitigation measures, the proposed project is not expected to adversely impact threatened and endangered species and habitat on and near the Project Site.

Bald eagles and osprey nests within or near the Project area will be protected or relocated to avoid impacts. Mitigation for potential disturbance of osprey and bald eagle will include building nesting platforms, burying high voltage powerlines, and developing a management plan to protect bald eagle and osprey nests. No vegetation within 1000 feet of identified active bald eagle nests will be disturbed.

Northern long-ear bats are unlikely to be present within the Project area, but tree removal in areas of potential roosting habitat will be avoided during pup season from June 1 through July 31. If tree removal needs to occur during that time, a habitat assessment will be conducted to identify and avoid potential roost trees.

Atlantic and shortnose sturgeon may forage or migrate through areas of the Delaware River disturbed by in-water work. Impacts to sturgeon will be avoided by conducting work within the recommend construction window and implementing dredging best management practices.

Further, the loss of threatened and endangered species habitat mapped by the landscape project is not expected to adversely impact species due to the low quality of the habitat and the availability of ample high quality habitat adjacent to the Project Site.

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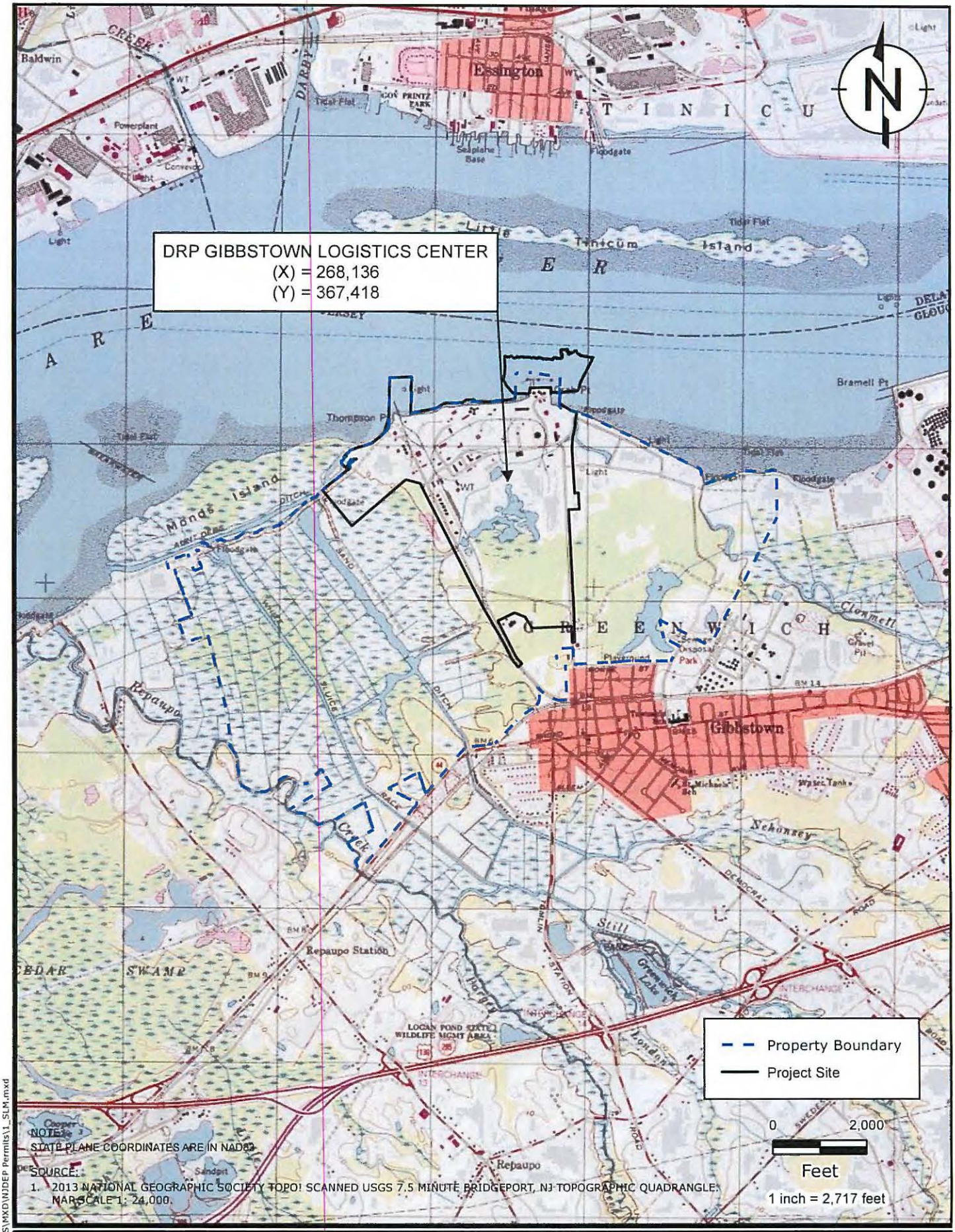
Table

Table 1: Landscape Project Threatened and Endangered Species Habitat Mapped Within the Project Site

Habitat Type	Total Mapped Habitat (acres)	Permanent Disturbance (acres)	Temporary Disturbance (acres)	Not Impacted (acres)
Bald Eagle[1]	160.8	57.2	1.2	102.4
Osprey[1]	75.3	27.5	0.6	47.2
Shortnosed Sturgeon[2]	41.8	0	29	13.3

Note:
[1] Acreages do not include dredging limits.
[2] Acreages include wharf and dredging limits.



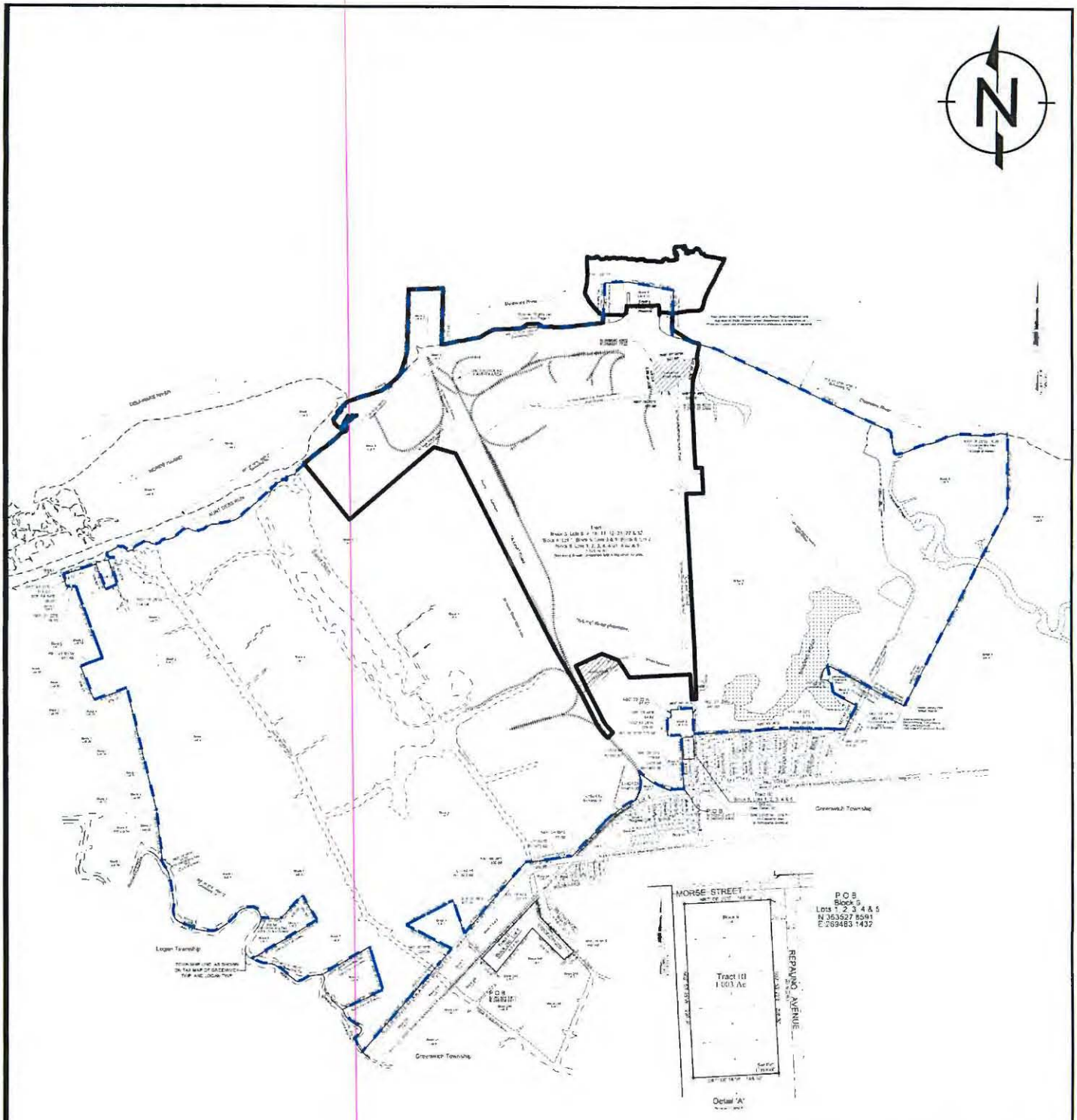
RAMBOLL ENVIRON

USGS QUAD MAP
DRP GIBBSTOWN LOGISTICS CENTER
GIBBSTOWN, NEW JERSEY

FIGURE
1

DRAFTED BY: HW | DATE: 7/26/2016 | 02-35702A

P:_Projects\Repauno\GIS\MXD\NJDEP Permits\1_SLM.mxd



SOURCE:

1. TALTA/ACSM BOUNDARY SURVEY FOR GLOUCESTER COUNTY IMPROVEMENT AUTHORITY & E.I. DU PONT DE NEMOURS AND COMPANY, 2015.

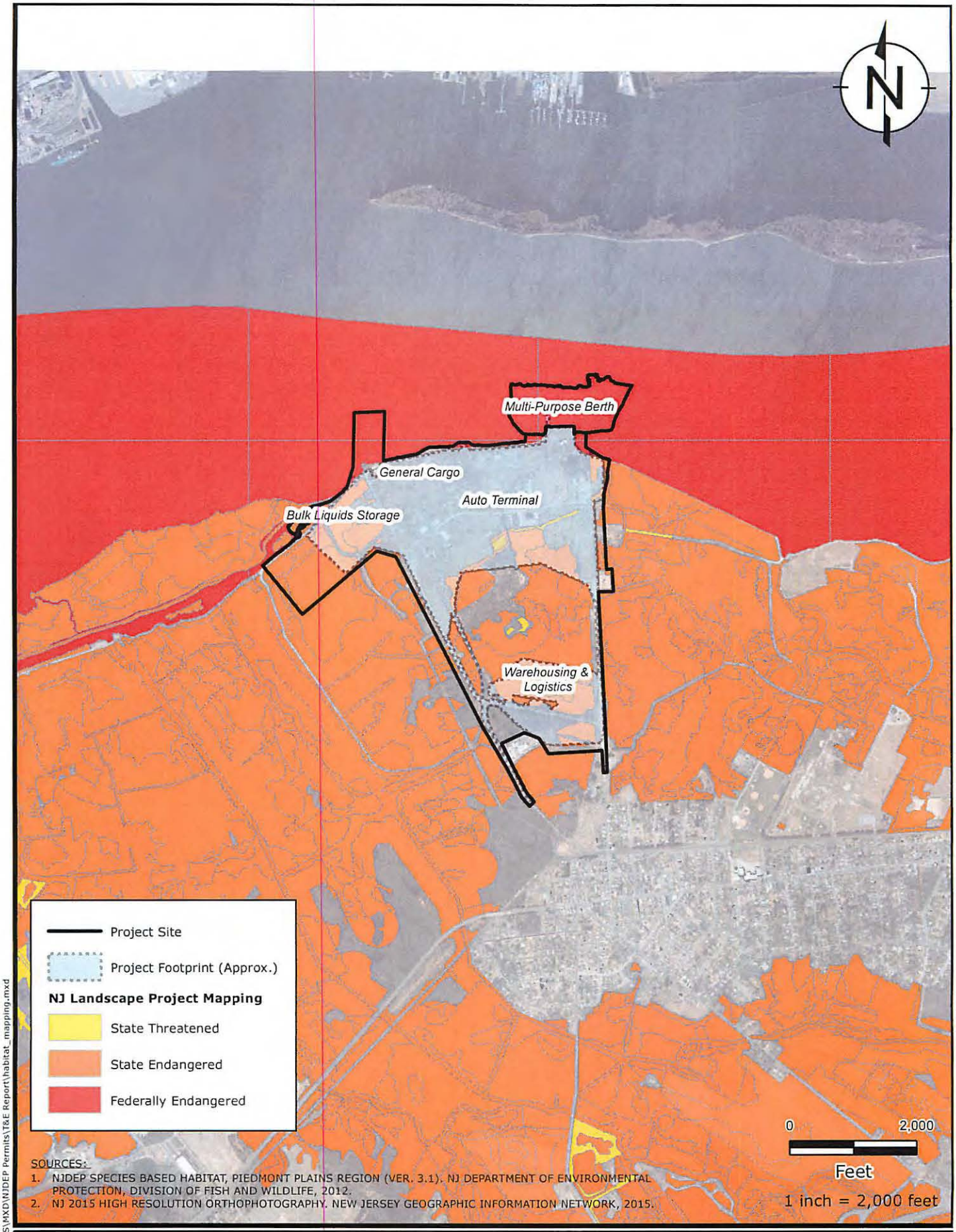
RAMBOLL ENVIRON

TAX PARCELS MAP
DRP GIBBSTOWN LOGISTICS CENTER
GIBBSTOWN, NEW JERSEY

FIGURE
2

DRAFTED BY: HW | DATE: 7/27/2016 | 02-35702A

P:_Projects\Repauno\GIS\MXD\NJDEP Permits\3_TaxMap.mxd



SOURCES:

1. NJDEP SPECIES BASED HABITAT, PIEDMONT PLAINS REGION (VER. 3.1). NJ DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF FISH AND WILDLIFE, 2012.
2. NJ 2015 HIGH RESOLUTION ORTHOPHOTOGRAPHY. NEW JERSEY GEOGRAPHIC INFORMATION NETWORK, 2015.

P:_Projects\Repauno\GIS\MXD\NJDEP Permits\T&E Report\habitat_mapping.mxd

RAMBOLL ENVIRON

DRAFTED BY: HWC | DATE: 7/27/2016

LANDSCAPE PROJECT HABITAT MAP
DRP GIBBSTOWN LOGISTICS CENTER
GIBBSTOWN, NEW JERSEY

FIGURE
3

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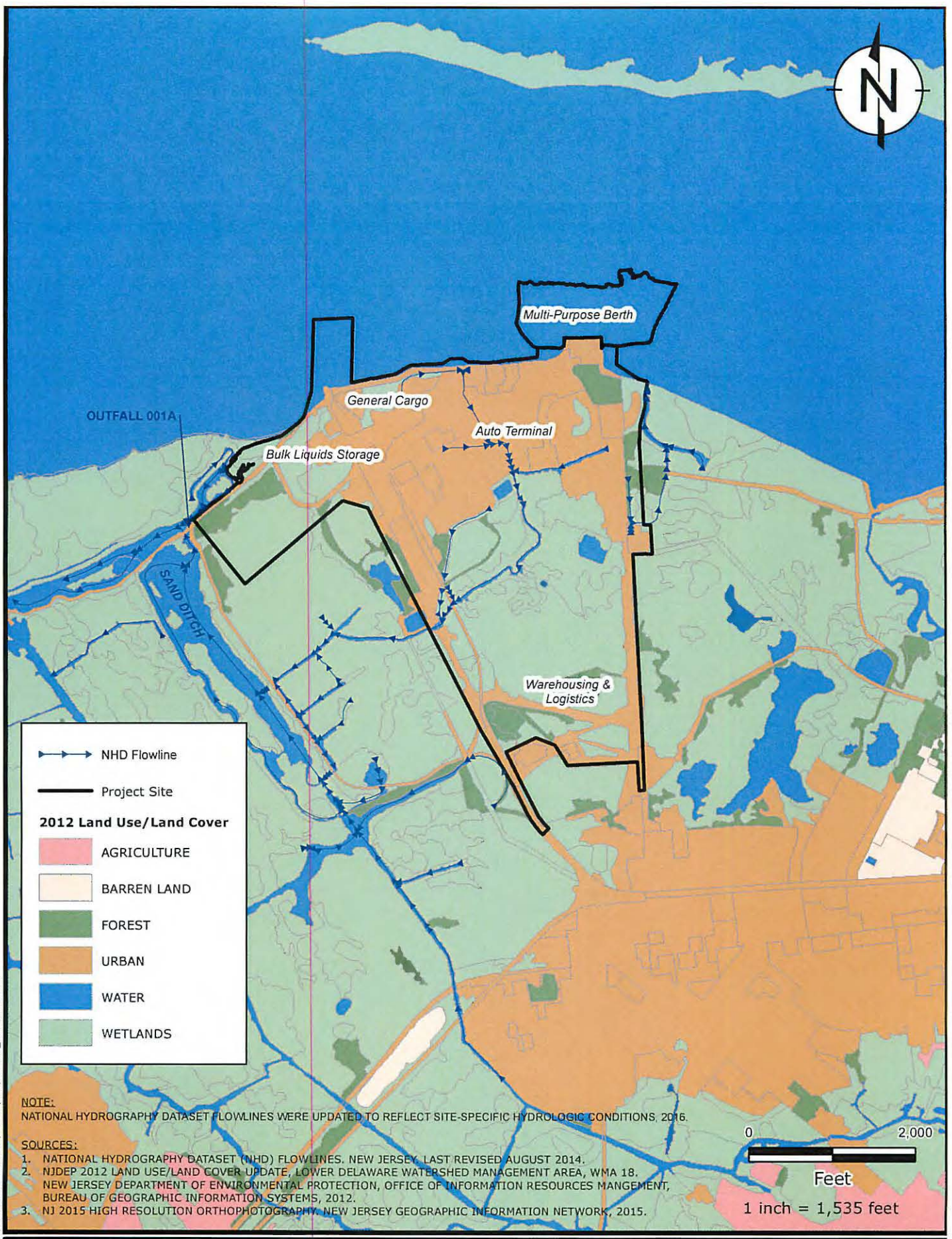

NOTE:
NATIONAL HYDROGRAPHY DATASET FLOWLINES WERE UPDATED TO REFLECT SITE-SPECIFIC HYDROLOGIC CONDITIONS, 2016.

SOURCES:
1. NATIONAL HYDROGRAPHY DATASET (NHD) FLOWLINES. NEW JERSEY. LAST REVISED AUGUST 2014.
2. NJDEP 2012 LAND USE/LAND COVER UPDATE, LOWER DELAWARE WATERSHED MANAGEMENT AREA, WMA 18. NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF INFORMATION RESOURCES MANGEMENT, BUREAU OF GEOGRAPHIC INFORMATION SYSTEMS, 2012.
3. NJ 2015 HIGH RESOLUTION ORTHOPHOTOGRAPHY. NEW JERSEY GEOGRAPHIC INFORMATION NETWORK, 2015.

0 2,000
Feet
1 inch = 1,535 feet

RAMBOLL ENVIRON

LAND USE / LAND COVER
DRP GIBBSTOWN LOGISTICS CENTER
GIBBSTOWN, NEW JERSEY

FIGURE
4

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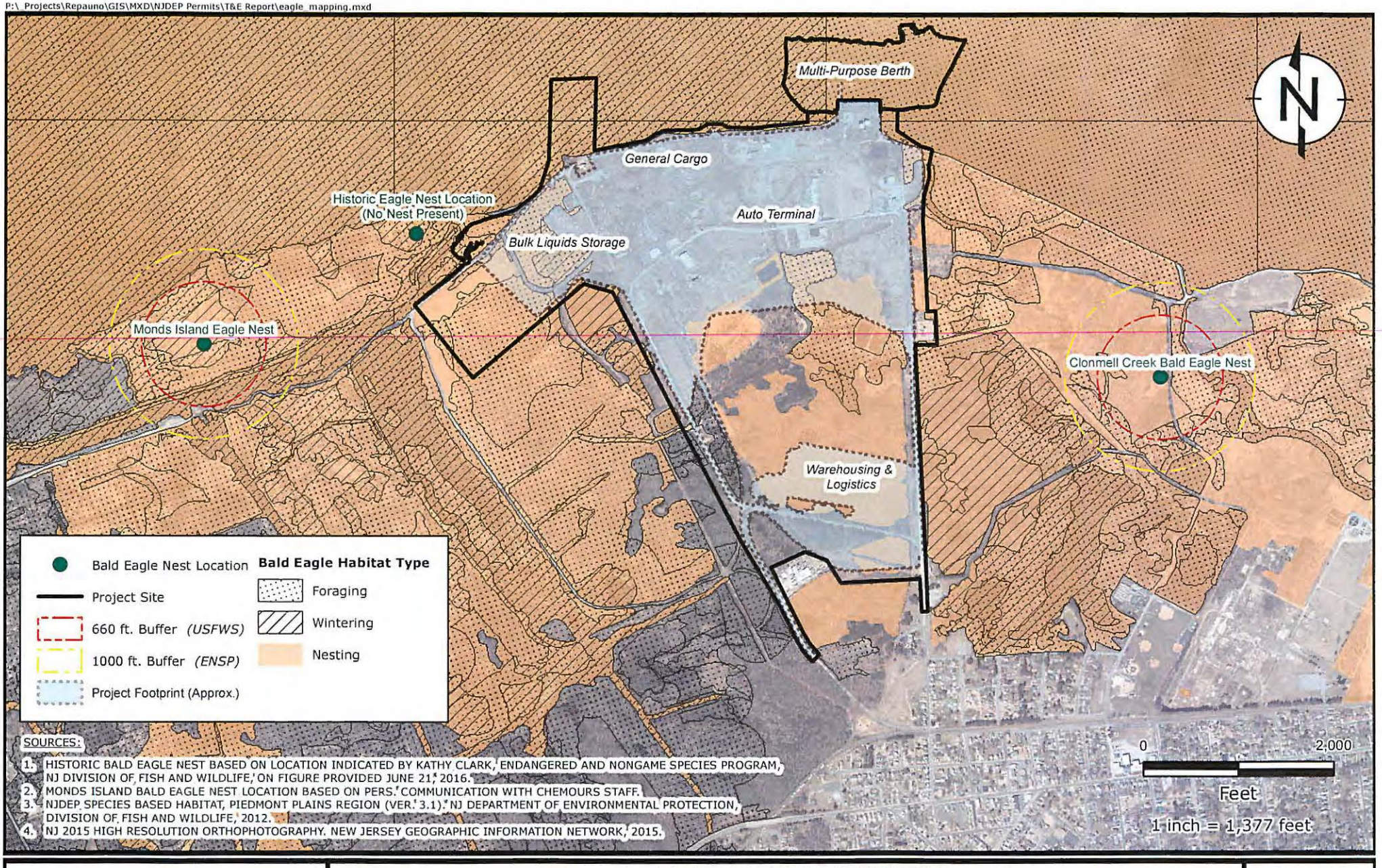
P:_Projects\Repauno\GIS\MXD\NJDEP Permits\T&E Report\eagle_mapping.mxd



SOURCES:

1. HISTORIC BALD EAGLE NEST BASED ON LOCATION INDICATED BY KATHY CLARK, ENDANGERED AND NONGAME SPECIES PROGRAM, NJ DIVISION OF FISH AND WILDLIFE, ON FIGURE PROVIDED JUNE 21, 2016.
2. MONDS ISLAND BALD EAGLE NEST LOCATION BASED ON PERS. COMMUNICATION WITH CHEMOURS STAFF.
3. NJDEP SPECIES BASED HABITAT, PIEDMONT PLAINS REGION (VER. 3.1). NJ DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF FISH AND WILDLIFE, 2012.
4. NJ 2015 HIGH RESOLUTION ORTHOPHOTOGRAPHY. NEW JERSEY GEOGRAPHIC INFORMATION NETWORK, 2015.

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BALD EAGLE HABITAT MAP
DRP GIBBSTOWN LOGISTICS CENTER
GIBBSTOWN, NEW JERSEY

FIGURE
5

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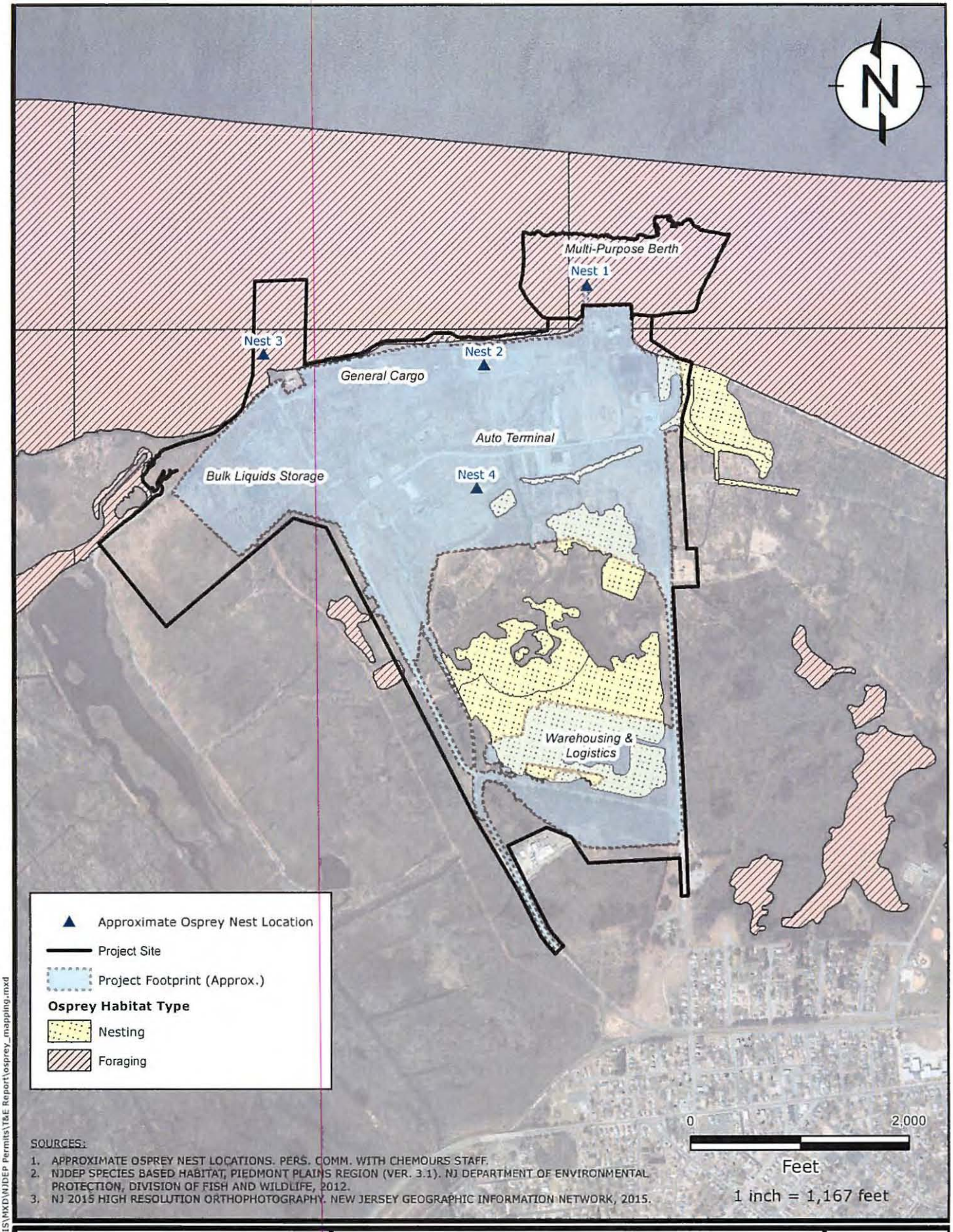

SOURCES:

1. APPROXIMATE OSPREY NEST LOCATIONS. PERS. COMM. WITH CHEMOURS STAFF.
2. NJDEP SPECIES BASED HABITAT, PIEDMONT PLAINS REGION (VER. 3.1). NJ DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF FISH AND WILDLIFE, 2012.
3. NJ 2015 HIGH RESOLUTION ORTHOPHOTOGRAPHY. NEW JERSEY GEOGRAPHIC INFORMATION NETWORK, 2015.

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OSPREY HABITAT MAP
DRP GIBBSTOWN LOGISTICS CENTER
GIBBSTOWN, NEW JERSEY

FIGURE 6

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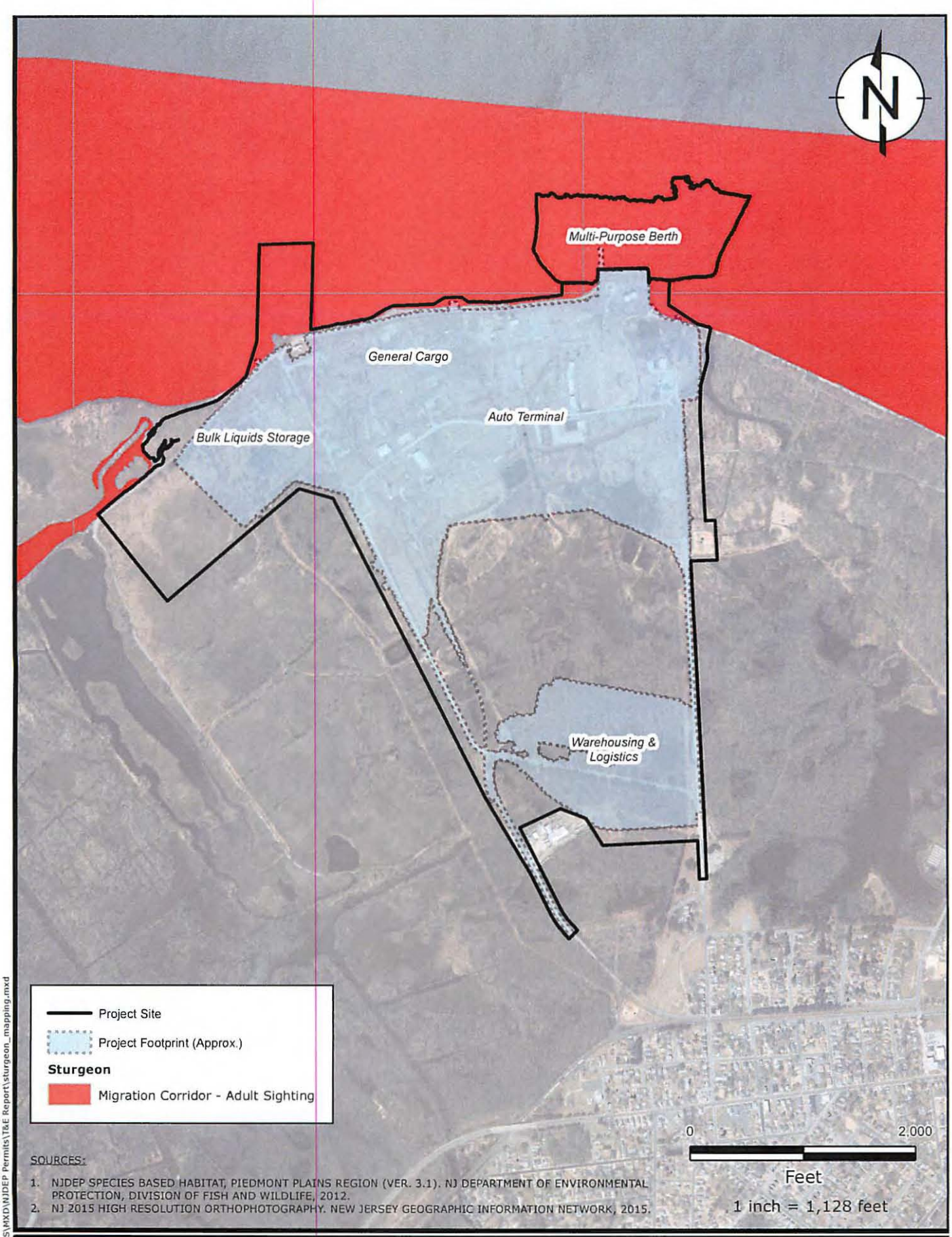

SOURCES:

1. NJDEP SPECIES BASED HABITAT, PIEDMONT PLAINS REGION (VER. 3.1). NJ DEPARTMENT OF ENVIRONMENTAL PROTECTION, DIVISION OF FISH AND WILDLIFE, 2012.
2. NJ 2015 HIGH RESOLUTION ORTHOPHOTOGRAPHY. NEW JERSEY GEOGRAPHIC INFORMATION NETWORK, 2015.

P:_Projects\Repauno\GIS\MXD\NJDEP Permits\T&E Report\sturgeon_mapping.mxd

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STURGEON HABITAT MAP
DRP GIBBSTOWN LOGISTICS CENTER
GIBBSTOWN, NEW JERSEY

FIGURE
7

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