STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

OFFICE OF THE DIRECTOR

PHONE: (302) 739-9949
FAX: (302) 739-7864

January 30, 2019

Mr. Peter R. Blum, P.E.
Chief, Planning Division
Philadelphia District, Corps of Engineers
Department of the Army
100 Penn Square East, 7th Floor Wanamaker Bldg
Philadelphia, PA 19107-3390

RE: Proposed new port facility at Edgemoor Delaware

Dear Mr. Blum:

We are in receipt of your December 17, 2018, letter soliciting comments regarding "…significant issues, problems, needs, or concerns…" regarding the proposed new shipping container port facility along the Delaware River in Edgemoor, New Castle County, Delaware in an effort "to gather information and assist with coordination on potential impacts in accordance with the National Environmental Policy Acts (NEPA)." Multiple programs within the Delaware Department of Natural Resources and Environmental Control (Department) received the same letter. This correspondence represents the compilation of responses from these programs. Please be aware that, while many discussions have taken place on this subject, as of the date of this letter, the pertinent programs within the Department have yet to receive any specific plans or applications for the proposed facility and, as such, have not had the ability to perform a detailed review of the project. Therefore, the comments compiled below are being provided as fairly high-level topics/concerns that we believe should be addressed by the applicant as they proceed through application development, submittal, and review stages. We would assume that there will be the opportunity to review and comment on future stages of this project as more detailed applications are submitted and/or information becomes available.

Division of Climate, Coastal, and Energy:

Because this project will require an individual permit from the US Army Corps of Engineers, the applicant will need to submit a federal consistency certification to the Delaware Coastal Management Program (DMCP) for a federal consistency review.
Contact: Delaware Coastal Management Program (302) 739-9283

Division of Waste and Hazardous Substances:

A RCRA Hazardous Waste Permit #HW-03A16 has been issued previously to the current property owner (Diamond State Port Corporation). Under the conditions of that permit a Corrective Measures Study must be completed based on the results of the RCRA Facility Investigation, which has already been completed. The Corrective Measures study will determine what, if any, remedy is necessary for the contaminated media located on the site. Should soil removal be proposed during construction activities, a contaminated media management plan will need to be in place to manage any contaminated media that might be encountered.
Contact: Solid and Hazardous Waste Management Section (302) 739-9403

Division of Water (coordination with Division of Fish & Wildlife):

The applicants representatives attended an April 19, 2018 Joint Permit Processing Meeting. Concerns discussed at that meeting were critical habitat and increased fish strikes (primarily associated with sturgeon) and the dredging of potentially contaminated sediments and their disposition. The project will require a State Subaqueous Lands Permit and a 401 Water Quality Certification, however, an application has not been received at this time. Additionally, the Wetlands and Subaqueous Lands Section (WSLS) issued a Letter of Authorization in 2016 for five (5) sediment sample borings, and another in July of 2018 for an additional nine (9) standard penetration test borings.

Contact: Wetlands and Subaqueous Lands Section (302) 739-9943

Division of Watershed Stewardship (coordination with Division of Water):

There has been significant correspondence between the port's consultant, Duffield Associates, and staff regarding the necessary characterization of proposed dredge material for several months. These discussions have been associated with the location/distribution of samples, the contaminants of concern, and the disposition of those sediments. The consultant was initially expressing their belief that the five (5) samples were sufficient to characterize what they verbally estimated to be approximately 12 acres of dredged area. The estimate of that area has increased substantially with your letter estimating it to be 85.7 acres (which has since been confirmed by Duffield Associates). The Department maintains that five (5) samples are inadequate to properly characterize the area of disturbance. The primary contaminants of concern that have been discussed are PCBs and TAL Metals. Additionally, it remains unclear as to the disposition of these sediments; where they will be placed, and if any beneficial reuse has been considered.

Contact: Division of Watershed Stewardship (302) 739-9939

As stated in the opening paragraph, the various Department program's that are anticipated to be engaged in the review and permitting of the proposed new port have yet to receive any detailed submission on the project, and therefore can only provide rather generic comments at this time. However, we anticipate being substantially more engaged in the process once the applicant begins their Delaware-Specific application/review processes. We encourage and will fully support any needed coordination efforts between our State programs and your offices as this project moves forward.

Thank you for the opportunity to provide initial comments on this important matter.

Sincerely,

Steven M. Smailer, P.G.
Environmental Program Administrator

cc: DNREC, Division Directors

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

February 25, 2019

Ms. Barbara E. Conlin
Department of the Army
U.S. Army Corps of Engineers, Philadelphia District
Environmental Resource Branch
Wanamaker Building, 100 Penn Square East
Philadelphia, PA 19107-3390

RE: Scoping for proposed new shipping container port facility along the Delaware River in Edgemoor, New Castle County, Delaware

Dear Ms. Conlin:

The U.S. Environmental Protection Agency (EPA) has received your scoping request for the proposed new shipping container port facility along the Delaware River in Edgemoor, New Castle County, Delaware. In accordance with the National Environmental Policy Act of 1969 (NEPA) and Section 309 of the Clean Air Act, EPA welcomes the opportunity to provide comments for consideration in the development of the NEPA analysis. According to the information provided, the main objective of the Project is to meet Diamond State Port Corporation's desired pattern of growth and development of the Port of Wilmington and to contribute to Delaware's economic vitality. Dredging related to the construction of a primary harbor entrance channel and ship berth development is proposed. Please find general and specific recommendations below.

- Since the range of alternatives evaluated is defined by the purpose and need for the project, the purpose and need should be clearly identified in the Environmental Assessment (EA) or Environmental Impact Statement (EIS). The purpose or objective of the proposal should be defined in relationship to the need for the action. The need for the action identifies and describes the underlying problem or deficiency and facts and analyses supporting the problem. EPA recommends that the perspective of the agency mission in relation to the need for action be stated, and the roles of the U.S. Army Corps of Engineers and the Applicant defined.
- The alternatives analysis is central to the EA and it is important to provide it in the public document. The analysis should include other alternative sites considered and eliminated and alternative site designs of the Preferred Alternative to determine the least environmentally intrusive alternative. It is through this comparison that the lead agency is able to incorporate agency and public input to make informed decisions with regard to the merits of the project and the advantages and disadvantages of each of the alternatives being studied. The CEQ regulations require that the details of each alternative, including the "no action" alternative be clearly presented in a comparative form for easy analysis by the reader.

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- EPA recommends all water quality issues including surface water, groundwater, drinking water, stormwater management, wastewater management, wetlands, and watersheds be evaluated. It is recommended that a narrative describing aquatic resources and functions be included in the NEPA document. Please provide a narrative that includes: a discussion of hydrology, including sources and direction of flow; as well as the vegetative communities in the impact area, including size of trees (dbh), and presence of invasive species; and soil type(s).
- As mentioned in the scoping notice, the project site is located adjacent to Cherry Island Flats, a locally important striped bass spawning area. Additionally, the Delaware River is critical habitat for Atlantic sturgeon and Shortnose sturgeon, both of which are Federally listed as endangered. Coordination with US Fish and Wildlife, National Marine Fisheries Service, and DNREC Fish and Wildlife throughout the drafting of the NEPA document is suggested. An Essential Fish Habitat (EFH) assessment may be needed. Please include detailed information on this topic in the NEPA document.
- Based on the plans provided in the Strategic Mater Plan, it appears that 5.3 acres of the Delaware River would be filled to build the new two berth Rubber Tired Gantry (RTG) crane-based container terminal at Edgemoor. EPA recommends the NEPA document address efforts made to reduce this quantity of river fill to the greatest extent practicable. Additionally, it is suggested that the EA or EIS detail the mitigation planned as a result of the impact including type, amount, and location.
- The NEPA document should include an analysis of any hazardous sites or materials. Please also address the status of any ongoing or past remediation efforts in the project area, including any groundwater contamination. EPA recommends in depth information be provided related to contamination present in aquatic and land-based sediments. Assessment of potential exposure to workers or adjustments to construction methods may be considered, if needed. Please include any logistical challenges related to the coordination of site redevelopment and RCRA closure in the NEPA document.
- Please include information related to Diamond State Port Corporation's intentions for maintenance dredging to be done by USACE, potential challenges associated with this agreement, and if contingency plans would be put in place if the Corps is not available to dredge.
- The scoping notification mentions that use of Corps facilities for the proposed construction and subsequent maintenance will require the applicant to provide additional placement capacity. With the exception of the proposed facility at First State Crossing Site, additional facilities currently under consideration for this purpose have not yet been identified. As the potential impact of constructing a new confined storage facility (CSF) could be sizeable, it is recommended that the sites under consideration for this purpose be identified in the NEPA document and the impacts of creating a CSF be addressed. If the proposed CSF at the First State Crossing Site is advanced, efforts to mitigate soil compaction and inadvertent discharge should be explained.
- If any dredged sediments have the potential to be suitable for beneficial reuse, EPA recommends exploring options for employing these techniques.
- To reduce runoff volume and improve water quality, EPA recommends where possible the incorporation of Low Impact Development (LID) design features. Technical guidance in implementing green infrastructure (GI) practices and LID can be found at:

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https://19january2017snapshot.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf and www.epa.gov/greeninfrastructure. We suggest LID options be considered for design of features such as parking, paving, and landscaping. Other information can be found at www.epa.gov/nps/lid; U.S. EPA's Smart Growth Website: www.epa.gov/smartgrowth; and the International Stormwater BMP Database: http://www.bmpdatabase.org

- We recommend the NEPA document include consideration of extreme weather events in particular in association with resiliency design.
- Please include an evaluation of air quality and community impacts, including noise, light and possible traffic impacts in the document. Please also include General conformity status.
- The NEPA document should address potential indirect and cumulative effects in the project areas; analysis may aid in the identification of resources that are likely to be adversely affected by multiple projects, and sensitive resources that could require additional avoidance or mitigation measures. It is suggested that a secondary and cumulative effects analysis begin with defining the geographic and temporal limits of the study; this is generally broader than the study area of the project. The cumulative impact analysis evaluates impacts to environmental resources that have the potential to be impacted by the project. Positive cumulative impacts may also be identified. Along with the analysis, EPA recommends including a list of potentially relevant projects in the area that could contribute to cumulative impacts.

Thank you for coordinating with EPA on this project. We look forward to working with you as more information becomes available. The staff contact for this project is Ms. Nora T. Hwang, she can be reached at 215-814-2727 or hwang.nora@epa.gov if you have any questions on the recommended topics above. Please provide a copy of the EA/EIS to EPA when it is available for review.

Sincerely,

Barbara Okorn
Acting NEPA Team Leader
Office of Environmental Programs

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

FEB 28 2019

Peter Blum, Chief
Planning Division
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

RE: NEPA Scoping – Edgemoor Shipping Container Port Facility along the Delaware River, New Castle County, Delaware

Dear Mr. Blum:

We have reviewed the information provided in your National Environmental Policy Act (NEPA) Scoping letter dated December 17, 2018, for the construction of Diamond State Port Corporation's (Applicant) proposed Edgemoor shipping container port facility along the Delaware River in New Castle County, Delaware (Edgemoor Site). Due to the lapse in appropriations for Fiscal Year 2019 and resulting closure of our office, we did not receive your letter until January 29, 2019. The Applicant intends to apply for a Clean Water Act Section 404 permit, and a Rivers and Harbors Act Section 10 permit for an alternative identified in the Applicant's Master Plan. The Applicant's preferred alternative includes deepening portions of the Delaware River adjacent to the federal navigation channel at the Edgemoor Site, formerly occupied by the Chemours (DuPont) Edgemoor Plant, to create a primary access channel that will serve the proposed berth construction at the site. The proposed new entrance channel and berth area would be constructed by excavating the riverbank between the existing shoreline and federal navigation channel in the Delaware River to depths between 38 and 45 feet below MLLW. A new wharf of unknown size will also be constructed along the shoreline and over the water to support large container cranes. The estimated area proposed to be dredged is 85.7 acres, while the estimated area of wetland impacts for a proposed terminal bulkhead is 5.3 acres; the area of wharf impact is currently unknown.

The U.S. Army Corps of Engineers, Philadelphia District, Planning Division (ACOE), is acting as a neutral party on this non-federal project proposal in order to gather information and assist with coordination on potential impacts in accordance with NEPA. Any alternatives analysis will be presented in the NEPA report and will use a tiered approach to evaluate: (1) physical location; (2) dredging depth; and (3) dredge material storage. This approach will be dependent on two scenarios: (a) expanding operations at the Port of Wilmington's current location, or (b) expansion and development of a new multiple-user marine terminal on the Delaware River. At present, six (6) alternatives have been outlined for the physical location, three (3) alternatives for dredged material disposal, and the Applicant is currently evaluating a range of proposed dredging depths between 38 and 45 feet below Mean Lower Low Water (MLLW).

The Applicant is requesting that you determine the federal interest for the Assumption of Maintenance of non-federal sponsor improvements for the primary harbor access channel (under Section 204(f) of the Water Resources Development Act of 1986 [WRDA]). Approval of the proposed project by the Assistant Secretary of the Army – Civil Works, in accordance with WRDA, would authorize future maintenance of the proposed entrance channel as a federal responsibility. Recurrent dredging is expected to maintain the new entrance channel and berth area for port operation.

The stated purpose of the proposed project is to modernize Delaware's international waterborne trade capabilities and meet the rising demand for modern containerized ports as a consequence of the completion of the Panama Canal Lock Expansion. According to the Applicant, the proposed project is anticipated to attract new containerized shipping commerce to the region rather than displace existing container operations, resulting in economic expansion. New Panamax vessels are approximately 1,200 feet in length, 161 feet in width, and draft approximately 50 feet. Initial plans for the proposed port facility include the capability to berth two New Panamax container ships simultaneously.

You are requesting our input on potential resource issues related to the proposed project. To assist you in the development of a NEPA document and to assess the impacts of the proposed project, we offer you the following comments pursuant to our authorities under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Fish and Wildlife Coordination Act (FWCA), and Endangered Species Act (ESA).

MAGNUSON STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT (MSA)

The main stem Delaware River has been designated essential fish habitat (EFH) for a variety of fish managed by the New England Fishery Management Council (NEFMC) and Mid-Atlantic Fishery Management Council (MAFMC) because these areas provide feeding, resting, nursery, and staging habitat for a variety of commercially, recreationally, and ecologically important species. Various life stages of species for which EFH has been designated in the area of the proposed project include, but are not limited to, Atlantic butterfish (*Peprilus triacanthus*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), and Atlantic herring (*Clupea harengus*).

The Delaware River is also important habitat for anadromous fish such as alewife *(Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and American shad (*Alosa sapidissima*), which use the Delaware River including the areas in and around the proposed project site as migratory, nursery, resting, and foraging habitat. These *Alosa* species have complex lifecycles where individuals spend most of their lives at sea then migrate great distances to return to freshwater rivers to spawn. American shad (stocks north of Cape Hatteras, N.C.), alewife, and blueback herring are believed to be repeat spawners, generally returning to their natal rivers to spawn (Collette and Klein-MacPhee 2002). These fish are important forage for several federally managed species, providing trophic linkages between inshore and offshore systems. Buckel and Conover (1997) in Fahey et al. (1999) reports that diet items of juvenile bluefish include *Alosa*

species such as these. Additionally, juvenile *Alosa* species have all been identified as prey species for windowpane and summer flounder in Steimle et al. (2000). The specific area of the proposed project exhibits high relative abundance of diadromous fish species, including alewife and blueback herring (ENTRIX, Inc. 2002). This area is also important for fisheries and their prey as it demarcates the boundary between the mesohaline and oligohaline zones of the river.

In the Mid-Atlantic, landings of alewife and blueback herring, collectively known as river herring, have declined dramatically since the mid-1960s and have remained very low in recent years (ASFMC 2007). Because landing statistics and the number of fish observed on annual spawning runs indicate a drastic decline in alewife and blueback herring populations throughout much of their range since the mid-1960s, river herring have been designated as Species of Concern by NOAA. Species of Concern are those about which we have concerns regarding their status and threats, but for which insufficient information is available to indicate a need to list the species under the ESA. We wish to draw proactive attention and conservation action to these species.

The 2012 river herring benchmark stock assessment found that of the 52 stocks of alewife and blueback herring assessed, 23 were depleted relative to historic levels, one was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short. The "depleted" determination was used instead of "overfished" to indicate factors besides fishing have contributed to the decline, including habitat loss, habitat degradation and modification, and climate change. Increases in turbidity due to the resuspension of sediments into the water column during construction can degrade water quality, lower dissolved oxygen levels, and potentially release chemical contaminants bound to the fine- grained estuarine/marine sediments. Suspended sediment can also mask pheromones used by migratory fishes to reach their spawning grounds and impede their migration and can smother immobile benthic organisms and demersal newly-settle juvenile fish (Auld and Schubel 1978; Breitburg 1988; Newcombe and MacDonald 1991; Burton 1993; Nelson and Wheeler 1997). Noise from the construction activities, such as wharf construction, may also result in adverse effects. Our concerns about noise effects come from an increased awareness that high-intensity sounds have the potential to adversely impact aquatic vertebrates (Fletcher and Busnel 1978; Kryter 1984; Popper 2003; Popper et al. 2004). Effects may include (a) lethal and non-lethal damage to body tissues, (b) physiological effects including changes in stress hormones or hearing capabilities, or (c) changes in behavior (Popper et al. 2004).

Understanding how the riverine environment and the geomorphic features (e.g., shoreline, nearshore wetlands, and flats) associated with it function to provide habitat is the product of complex interactions between biological processes and physical factors. There is potential for significant short-term and long-term physical, biological, and chemical impacts from dredging, filling, and modifying habitat in the Delaware River. Potential impacts caused by dredging and filling include physical removal of benthic faunal communities and disturbance of foraging, nursery, and migratory habitat for fish and invertebrates. Dredging and filling can also affect benthic communities by altering sediment transport characteristics, sediment texture, depth and vertical relief, and overall community structure. Systematic disturbances such as repeated dredging and high-energy propeller wash may result in cumulative and chronic changes in habitat quantity and quality.

Consultation
The MSA requires federal agencies, such as the ACOE, to consult with us on any action or proposed action authorized, funded, or undertaken, by such agency that may adversely affect EFH identified under the MSA. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in the consultation process. The level of detail in an EFH assessment should be commensurate with the complexity and magnitude of the potential adverse effects of the action.

Essential fish habitat is defined as, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." For the purpose of interpreting the definition of EFH:

- "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate;
- "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities;
- "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem;
- "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

The EFH final rule published in the Federal Register on January 17, 2002 defines an adverse effect as: "any impact which reduces the quality and/or quantity of EFH." The rule further states that:

> An adverse effect may include direct or indirect physical, chemical or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

The EFH final rule also states that the loss of prey may be an adverse effect on EFH and managed species. As a result, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH.

Our EFH regulations also allow EFH consultations, including abbreviated and expanded consultations to be combined with existing procedures required by other statutes, such as NEPA if such processes meet, or are modified to meet, certain criteria. The existing process must provide us with timely notification of actions that may adversely affect EFH. Whenever possible, we should have at least 60 days' notice prior to a final decision on an action, or at least 90 days if the action would result in substantial adverse impacts.

If an EFH assessment is contained in another document, such as a draft NEPA document, it must be clearly identified as an EFH assessment and include all of the following mandatory elements

including: (i) a description of the action, (ii) and analysis of the potential adverse effects of the action on EFH and the managed species, (iii) the federal agency's conclusions regarding the effects of the action on EFH, and (iv) proposed mitigation, if applicable. If appropriate, the assessment should also contain additional information, including: (i) the results of an on-site inspection to evaluate the habitat and the site specific effects of the project, (ii) the views of recognized experts on the habitat or species that may be affected, (iii) a review of pertinent literature and related information, (iv) an analysis of alternatives to the action. Such analysis should include alternatives that could avoid or minimize adverse effects on EFH, and (v) other relevant information.

As part of the NEPA process, a comprehensive EFH assessment should be prepared to address the direct, indirect, individual, cumulative, and synergistic effects of the proposed project on EFH, federally managed species and their prey. To fully evaluate the proposed project, information regarding the location, type, quantity, frequency, magnitude, and duration of impacts will be necessary as well as biological information characterizing the distribution, abundance, biomass, production and diversity of fish and their prey (including benthic invertebrates).

Additionally, fishery-independent surveys that include a combination of active sampling (e.g., trawling) and passive sampling (e.g., acoustic technologies) should be used to fully characterize species use of the area. Sampling should occur throughout the year to evaluate temporal differences in biological communities. Fishery-dependent surveys may also be useful for evaluating project effects. Furthermore, thorough analyses of each alternative, as well as the individual components of each alternative should be undertaken to fully evaluate the potential impacts of the proposed project. Impacts to aquatic resources should be avoided to the maximum extent practicable and compensatory mitigation should be provided to offset unavoidable adverse effects. Avoidance and minimization measures and compensatory mitigation should be clearly described in the EFH assessment.

For a listing of EFH and further information, please see our website at: http://www.greateratlantic.fisheries.noaa.gov/habitat. The website also contains information on descriptions of EFH for each species, guidance on the EFH consultation process including EFH assessments, and information relevant to our other mandates.

FISH AND WILDLIFE COORDINATION ACT (FWCA)

The Fish and Wildlife Coordination Act, as amended in 1964, requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream or body of water. It also required that they consider effects that these projects would have on fish and wildlife and must also provide for improvement of these resources. Under this authority, we work to protect, conserve and enhance species and habitats for a wide range of aquatic resources such as shellfish, diadromous species, and other commercially and recreationally important species that are not managed by the federal fishery management councils and do not have designated EFH. The Delaware River serves as important habitat for many aquatic species and their forage including striped bass (*Morone saxatilis*), blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), American eel (*Anguilla rostrata*), bay anchovy (*Anchoa*

mitchilli), hickory shad (*Alosa mediocris*), Atlantic croaker *(Micropogonias undulatus)* and other assorted baitfishes and shrimps.

The section of the Delaware River where the project is proposed is used by a wide variety of resources of concern to us. The New Jersey Department of Environmental Protection (NJDEP) has conducted fish sampling in the Delaware River, including the portion of the river near the project area since 1980. This long-term survey documents the use of this section of the river by a wide variety of species including blueback herring, alewife, American shad, American eel, Atlantic herring, Atlantic menhaden, bay anchovy, gizzard shad (*Dorosoma cepedianum*), hogchoker (*Trinectes maculatus*), striped bass, yellow perch (*Perca flavescens*), white perch (*Morone americana*), Atlantic silverside (*Menidia menidia*), and many others (NJDEP 2010). Weisberg *et al.* (1996) captured more than 25 different species near the area of the proposed project in the Delaware River including yellow perch, hickory shad, hogchoker, banded killifish (*Fundulus diaphanus*) and mummichog (*Fundulus heteroclitus*). Studies done by VERSAR, Inc. (Weisberg *et al.* 1990) determined that striped bass eggs and larvae were most abundant near Wilmington, DE.

Impingement studies done at the Eddystone power plant located on the Pennsylvania side of the Delaware River near the project site identified 53 species of fish in this section of the river including alewife, American eel, American shad, Atlantic menhaden, bay anchovy, blueback herring, gizzard shad, hogchoker, spot, striped bass and white perch (Waterfield et al. 2008). Additionally, trawl, ichthyoplankton, and impingement/entrainment studies were conducted at the specific area of the proposed project from 1999 to 2001 for the Edgemoor Power Plant operated by Conectiv (ENTRIX, Inc. 2002). ENTRIX, Inc. (2002) identified over 40 species in this section of the river, with Atlantic croaker, bay anchovy, and hogchocker dominating trawl surveys, striped bass dominating all ichthyoplankton surveys, and river herring and striped bass dominating entrainment surveys. Striped bass and river herring appear to favor the shoreline and nearshore area near the Edgemoor Site (ENTRIX, Inc. 2002).

The area of the proposed project is regionally significant for striped bass because of its importance as spawning, nursery, foraging, and resting habitat. Striped bass are not only a commercially and recreationally important species, but are strongly tied to the cultural heritage of the eastern U.S. The spawning migration of resident and coastal contingents moving upriver to the freshwater reaches of the Delaware River occurs in the spring. Late larvae and early juveniles favor shallower water with slower currents, and likely reside in nearshore areas for increased feeding opportunities and reduced predation risk. Juveniles subsequently move downstream to overwinter in the lower Delaware River and Delaware Bay. Additionally, the proposed project is adjacent to the Cherry Island Flats, a geomorphic feature where gravid females aggregate and various other life stages of striped bass use as nursery, foraging, and resting habitat; the Flats are considered a hot spot for all life stages of striped bass (personal communication with Delaware DNREC fisheries biologists).

Flats (shoal) habitat is defined by such factors as exposure, sediment texture, depth, and rugosity. Flats are also generally characterized by high fish production, high benthic faunal density, and species diversity; dense aggregations of fish are supported by local primary production. Benthic invertebrate communities can be highly diverse and productive despite natural disturbance

regimes. Infaunal species provide important trophic linkages coupling benthic-pelagic ecosystems. Potential changes to the physical, biological, or chemical elements of the Cherry Island Flats from the proposed project may result in widespread and unanticipated adverse impacts to the habitat.

Catadromous American eels spawn in the Sargasso Sea and transit the Delaware River as elvers to migrate to freshwater tributaries within Delaware River watershed. They inhabit these freshwater areas until they return to the sea as adults. According to the 2012 benchmark stock assessment, the American eel population is depleted in U.S. waters. The stock is at or near historically low levels due to a combination of historical overfishing, habitat loss, food web alterations, predation, turbine mortality, environmental changes, exposure to toxins and contaminants, and disease (ASMFC 2012). Actions being considered as part of the proposed project may impede the movements of these species between important freshwater habitats and the Atlantic Ocean in a number of ways including altering hydrologic conditions such as velocity and flow patterns, as well as changing water quality.

Submerged Aquatic Vegetation

The area of the proposed project may also include submerged aquatic vegetation (SAV) habitat. SAV habitats are among the most productive ecosystems in the world and perform a number of irreplaceable ecological functions which range from chemical cycling, physical modification of the water column, and binding sediments to providing food and shelter for commercially and recreationally important fishery species (Stephan and Bigford 1997). Several species have been observed throughout the tidal Delaware River since 1970, including: *Vallisneria americana*, *Myriophyllum spicatum*, *Elodea nuttallii*, *Najas flexillis*, *Potamogeton sp.* and others (Schuyler 1988). Since 2017, the U.S. Environmental Protection Agency (USEPA) has surveyed portions of the tidal Delaware River and found expansive SAV beds, with many of the same species documented by Schuyler (1988) [preliminary USEPA data]. Wild celery (*Vallisneria americana*) appears to be one of the most abundant SAV species in the Delaware River and its tributaries, as it is routinely encountered by researchers and the public (preliminary USEPA data and personal communication with USEPA). SAV provides valuable nursery, forage and refuge habitat for a variety of migratory and forage fish species including striped bass, American shad, alewife, and blueback herring. It is also an important food source for waterfowl. In addition, the USEPA has designated SAV as a special aquatic site under Section 404(b)(1) of the federal CWA, due to its important role in the marine ecosystem for nesting, spawning, nursery cover, and forage areas for fish and wildlife. Surveys for SAV should be conducted in and around the site of the proposed project between June 1 and October 15 of any year. Surveys should be conducted in any area proposed to be dredged, filled, or covered (with an over-water structure) and adjacent areas that may be affected by turbidity, sedimentation or other impacts extending beyond the primary project footprint.

Wetlands
While much of the wetland fill proposed may occur within a confined dredged material disposal facility (CDF), numerous acres of tidal wetlands could be filled as part of the proposed project. Tidal wetlands provide nursery and forage habitat for a variety of species including alewife, Atlantic croaker, Atlantic menhaden, spot (*Leiostomus xanthurus*), striped bass, as well as federally managed bluefish and summer flounder (Graff and Middleton undated). Important forage species such as mummichog, Atlantic silverside (*Menidia menidia*), inland silverside (*Menidia beryllina*), killifish (*Fundulus sp.*), and bay anchovy also use these areas. Mummichog, killifish, anchovies and other small fish and benthic organisms found in estuarine wetlands provide a valuable food source for many of the commercially and recreationally valuable species mentioned above including striped bass, summer flounder, weakfish, red hake (*Urophycis chuss*), scup (*Stenotomus chrysops*) and windowpane flounder (Steimle et al. 2000).

Wetlands also provide many other important ecological functions and services to society including fish and wildlife habitat, food chain support, surface water retention or detention, groundwater recharge, and nutrient transformation, sediment retention and atmospheric equilibrium. The primary production in wetlands forms the base of the food web that supports insects and forage fish that are then prey species for larger fish such as bluefish, summer flounder and other species that have been documented in the marsh creeks surrounding the project site. The water quality services provided by these wetlands retain nutrients, sediments and contaminants and improve water quality. Wetlands may also help to moderate global climate change through carbon storage within the plant communities and soil. The loss of wetlands as a result of this project can adversely affect federally managed species and other species of concern to us though the reduction in prey species and primary production, as well as water quality degradation from the reduction in sediment retention and pollution filtration.

ENDANGERED SPECIES ACT

The ESA requires federal agencies (in this case, the ACOE) to ensure, in consultation with NMFS, that any action authorized, funded, or carried out by them is not likely to jeopardize species listed under the ESA or destroy or adversely modify critical habitat. Depending on the final alternative selected and as project details become finalized, an interagency consultation, pursuant to section 7 of the ESA, may be necessary. If you determine that the proposed project is not likely to adversely affect listed species under our jurisdiction, then you need to request concurrence from us with your determination. If you determine that the proposed project is likely to adversely affect listed species under our jurisdiction, then a formal consultation will be required.

It is important to note that in the regulations implementing Section 7(a)(2) of the ESA (interagency consultation), "effects of the action" are the direct and indirect effects of the action, plus the effects of any interrelated or interdependent activities. Interrelated activities are activities that are part of the proposed action and depend on the proposed action for their justification. Interdependent activities are activities that have no independent utility apart from the action under consideration. Such activities would be those that would not occur "but for" the proposed action under consultation.

In recognition of this, a consultation needs to fully consider all effects of the action on listed species, which include effects on listed species from the construction of the terminal and the activities related to the future operation of the terminal, including associated vessel traffic. While all construction activities and future operation of the facilities such as long-term vessel use of the new facility may not be under your jurisdiction, they are effects of the action that need to be analyzed if they would not occur "but for" the action and are reasonably certain to occur.

Overall, to ensure ESA consultation is completed in a timely manner, we recommend that the lead federal action agency develop a biological assessment (BA) that includes: 1) a thorough analysis and deconstruction of the proposed project into its individual components that includes all activities related to the construction as well as long-term operation of the facility; 2) a description of the action area that encompasses direct and indirect effects from all stressors from the proposed project, including interrelated and interdependent actions; 3) a full description and status of all life stages of ESA-listed species that may be present in the action area; 4) a thorough consideration of the baseline that includes all current activities that affect ESA-listed species; and 5) an effects analysis that evaluates the impacts of all stressors, including those from interrelated and interdependent activities, on each species, their life stages, and critical habitat that are present in the action area. Further, a biological assessment should include any known, unrelated future non-federal activities (cumulative effects) reasonably certain to occur within the action area that are likely to affect ESA-listed species. Information about the ESA interagency consultation process, tools to evaluate effects, and suggested avoidance and minimization measures can be found on our GARFO website[1].

Project Activities and Action Area

During an interagency consultation under section 7(a)(2) of the Act, the lead federal agency in coordination with us will evaluate the effects of a proposed project within the action area. The action area is defined in 50 CFR § 402.02 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." It also includes the areas to be affected by interrelated and interdependent activities. Here we discuss the activities and their associated stressors that should be considered in determining the action area for the proposed project. Since the project is in the early stages of planning, the activities addressed below may not include all proposed activities. Therefore, effects to listed species from other activities than those addressed here may have to be consider when determining the action area. Based on the information provided, the construction of the terminal includes demolition of existing structures, riverbank excavation, deepening of the berth area and entrance channel, transport and deposition of dredged materials, construction of structures, and grading of upland areas. In-water construction activities are expected to include the use of a dredge to remove sediment, driving of piles, and the movement and transit of project vessels. The proposed project also includes development of facilities for the handling, storage, logistics, and landward transport of cargo. While the construction of landward components of the terminal are not under your jurisdiction, the landward components of the terminal construction should be considered for potential pathways of stressors that would affect ESA-listed species under our jurisdiction. Potential activities include, but are not limited to, excavation and grading of the terminal site, waste and stormwater discharge, the construction and subsequent presence of a cut-off wall, removal of riparian vegetation, and any loss of tidal wetlands. Effects of these activities needs to

[1]NOAA Fisheries: https://www.greateratlantic.fisheries.noaa.gov/protected/section7/index.html

be considered when determining the effects and the action area. Thus, the area that will be dredged, the extent of turbidity plumes, the distance that sound travels during pile driving, the route of project vessels to and from disposal sites, and the route of project vessels to and from their point of origin will all determine the size and shape of the action area.

In addition to construction activities, the proposed project includes port operations for containerized shipping commerce. Activities related to the operation of the facility include but may not be limited to the management and discharge of stormwater, dredging to maintain river depth at the berth and entrance channel, vessel maneuvers and movements in the entrance channel and berth, and transit of container vessels to and from the port. Effects of these activities needs to be considered in determining the action area.

The applicant states that the new terminal is expected to attract new container commerce rather than displacing existing commerce. The terminal is intended to accommodate two New Panamax container ships simultaneously. Thus, the transit and movement of the vessels in the Delaware River, Delaware Bay, and offshore may be vessel activities that would not occur but for the proposed project. Vessel traffic is known to interact with ESA-listed sturgeon, sea turtles, and whales (Barco et al. 2016, Brown and Murphy 2010, Damon-Randall et al. 2017, Singel et al. 2003). Further, vessel traffic and navigation can negatively affect habitat (Gabel et al. 2017, PIANC 2008). Therefore, a consultation will need to analyze effects of container vessel activity to ESA-listed species under our jurisdiction and to Atlantic sturgeon critical habitat. To the extent effects are reasonably certain to occur, the transit routes and movements of the vessels that are expected to call at the proposed terminal should be used in determining the action area.

We look forward to assisting you with the development of the project description and defining the action area as well as collaborating with you to determine how best to appropriately analyze effects for this action.

ESA-Listed Species Presence in the Action Area

Currently the project is in the early stage of planning and, as part of the NEPA process, you and the applicant are evaluating several alternatives. Consequently, the action area has not been defined. Below, we provide information on presence of species within an action area based on the preferred alternative.

In your request for comments on the proposed project you incorrectly stated that "the entire Delaware River has been declared critical habitat for Atlantic sturgeon and shortnose sturgeon." However, critical habitat has not been designated for shortnose sturgeon. Critical habitat was designated for Atlantic sturgeon in 2017 (82 FR 39160), including for the Atlantic sturgeon New York Bight (NYB) Distinct Population Segment (DPS), which includes Atlantic sturgeon originating from the Delaware River. While a large portion of the Delaware River was designated as critical habitat for the NYB DPS, it is not correct that the entire Delaware River is designated as critical habitat (see below). Further, your assessment failed to include several other listed species that the proposed project may affect. Please note that we have developed an online web application (ESA Section 7 Mapper) where you can access data layers that represent our best estimate of the spatial and temporal range of listed species' life stages and critical habitat

in our region. The Section 7 Mapper can be accessed from our website[2] and is a convenient tool that can be used to generate a report for the presence of species and life stages within an area.

Below we provide a list of species and their various life stages that are present in the lower Delaware River, within the Delaware Bay, and in coastal areas offshore of New Jersey and Delaware. We also provide information about presence of critical habitat for Atlantic sturgeon. Please, note that our comments are limited to the presence of species and do not include the detailed information about biology, behavior, and habitat use that may be needed to properly analyze effects on each species and their life stages.

The following protected species and critical habitat may be affected by the proposed project:

Fish

- Shortnose Sturgeon (*Acipenser brevirostrum*) (32 FR 4001; Recovery plan: NMFS 1998)
- Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) (77 FR 5880 and 77 FR 5914)

Sea Turtles

- Kemp's Ridley Turtle (*Lepidochelys kempii*) (35 FR 18319; Recovery plan: NMFS et al. 2011)
- Leatherback Turtle (*Dermochelys coriacea*) (35 FR 849; Recovery plan: NMFS & USFWS 1992)
- Loggerhead Turtle (*Caretta caretta*) (76 FR 58868; Recovery plan: NMFS & USFWS 2008)
- Green Turtle (*Chelonia mydas*) (81 FR 20057; Recovery plan: NMFS & USFWS 1991)

Whales

- North Atlantic Right Whale (*Eubalaena glacialis*) (73 FR 12024; Recovery plan: NMFS 2005)
- Fin Whale (*Balaenoptera physalus*) (35 FR 18319; Recovery plan: NMFS 2010)

Critical Habitat

- Critical habitat of Atlantic Sturgeon (82 FR 39160)

Shortnose sturgeon

The federally endangered shortnose sturgeon occurs in the Delaware River from the lower Delaware Bay upstream to at least Lambertville, New Jersey (RKM 238, RM 148). The shortnose sturgeon are benthic invertivores. Young-of-year (YOY) feed on amphipods and dipteran larvae found in drift and mud substrate. Juveniles and adults feed on benthic insects, crustaceans, mollusks, and polychaetes (SSSRT 2010). Adult shortnose sturgeon may also forage on small benthic fishes.

In the Delaware River, movement to the spawning grounds occurs in early spring, typically, in late March, with spawning occurring through early May. Larvae have been collected and spawning is believed to occur in the area between Scudders Falls and the Trenton rapids (RKM

[2] https://www.greateratlantic.fisheries.noaa.gov/protected/section7/listing/index.html

214-224; RM 133-139) (ERC 2007). Hatchlings may seek cover in the gravel at the spawning site and larvae are expected to remain in the spawning area (Kynard and Horgan 2002). Young-of-year may move downstream to areas above the salt front and can therefore occur in the lower Delaware River including the areas in and around the proposed project site.

Juveniles migrate downstream where they move back and forth in the low salinity portion of the salt wedge during summer. In the Delaware River, the oligohaline/freshwater interface can range from as far south as Artificial Island (RKM 87, RM 54) north to the Schuylkill River (RKM 142, RM 92). Juvenile shortnose sturgeon are known to occur year round at and downstream of the site of the proposed project (Brundage and O'Herron 2009, ERC 2016, 2017, 2018).

After spawning, adult shortnose sturgeon migrate rapidly downstream to the lower Delaware River. By the time water temperatures have reached 10°C, typically by mid-November, most adult sturgeon have returned to the overwintering grounds in the Roebling (RKM 200, RM 124), Bordentown (RKM 208, RM 129), or Trenton reaches (RKM 214, RM 133), but may overwinter as far downstream as Wilmington (RKM 116, RM 72) (Environmental Research and Consulting 2016, O'Herron et al. 1993).

Thus, both juvenile and adult shortnose sturgeon occur year round at the site or the proposed project and in the downstream reaches. The lower Delaware River provides important foraging and overwintering habitat. Based on spawning occurring over 100 RKM upstream of the project site and the behavior of larvae, shortnose sturgeon eggs and larvae do not occur at the site of the proposed project.

Atlantic Sturgeon

The Atlantic sturgeon originating from the New York Bight, Chesapeake Bay, South Atlantic and Carolina Distinct Population Segments (DPS) are listed as endangered, while the Gulf of Maine DPS is listed as threatened. The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida; therefore, the Atlantic sturgeon originating from any of the five DPSs may be present in the Delaware River.

The Atlantic sturgeon are omnivorous benthic feeders that draw food into a ventrally located protrusible mouth. The diet of adult and subadult Atlantic sturgeon includes benthic invertebrates such as worms (Oligo- and Polychaeta), mollusks, crustaceans (incl. amphipods, decapods and isopods), gastropods and occasionally fish (ASSRT 2007, Guilbard et al. 2007, Savoy 2007). Juveniles also feed on aquatic insects and aquatic life stages of terrestrial insects, such as chironomidae larvae (ASSRT 2007).

In the Delaware River, Atlantic sturgeon occur from the mouth of the Delaware Bay to the fall line near Trenton, NJ (ASSRT 2007, Simpson 2008). Spawning migrations are believed to occur from April and into July and spawning to occur over hard bottom substrate. Atlantic sturgeon spawning could occur where spawning habitat features are present from Marcus Hook Bar (~RKM 125) to the fall line at Trenton, NJ (~RKM 213.5) (Breece et al. 2013, Simpson 2008).

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). Hatchlings (yolk sac larvae) seek refuge among coarse bottom substrate. Once the yolk is exhausted, the post yolk sac larvae

are believed to move downstream to rearing grounds in freshwater areas upstream of the salt front (Kynard and Horgan 2002). The larvae do not tolerate saline water.

Rearing of YOY and juveniles occur upstream of the salt water front and in increasingly saline waters as they grow. In the Delaware River, juvenile rearing concentration areas exist from the New Castle Range to upstream of Philadelphia, PA (Calvo et al. 2010, ERC 2018, Fisher 2011).

Young remain within their natal river/estuary for periods of approximately one to six years before emigrating to the open ocean as subadults (ASSRT 2007, Smith 1985). After emigration from the natal river/estuary, subadults and adult Atlantic sturgeon travel within the marine environment, using coastal bays, sounds, and ocean waters and may enter estuaries and rivers other than their natal rives (Collins and Smith 1997, Dunton et al. 2010, Erickson et al. 2011, Laney et al. 2007, Murawski and Pacheco 1977).

Atlantic sturgeon are commonly found off the coast of New Jersey where they are generally found at depths of less than 40 meters with most captures at depths of 20 meters or less (Dunton et al. 2015, Dunton et al. 2010, Erickson et al. 2011). Aggregations and large presence of sturgeon from Long Island to Virginia during winter months indicates that the New York Bight is an important overwintering area (Dunton et al. 2010). Two concentration areas have been identified along the New Jersey coast; one of these is located at the Delaware Bay mouth (Breece et al. 2018, Dunton et al. 2010, Erickson et al. 2011, Stein et al. 2004).

Based on the above information, all life stages of Atlantic sturgeon are found at the project area. The project site and extending down the Delaware River to its mouth with the bay is an important area for juvenile foraging and physiological development and is used for foraging by subadults. It is also a migration corridor for adults during spawning. Adult and subadult individuals are present year round in the Delaware Bay and the Bay mouth; high concentrations are present from fall through spring just within and oceanward of the Bay mouth.

Critical Habitat for Atlantic Sturgeon

On August 17, 2017, we issued a final rule to designate critical habitat for the threatened Gulf of Maine DPS of Atlantic sturgeon, the endangered New York Bight DPS of Atlantic sturgeon, the endangered Chesapeake Bay DPS of Atlantic sturgeon, the endangered Carolina DPS of Atlantic sturgeon, and the endangered South Atlantic DPS of Atlantic sturgeon (82 FR 39160). The rule was effective on September 18, 2017.

Critical habitat in Delaware River for the New York Bight Atlantic sturgeon DPS includes the river main stem from the Trenton-Morrisville Route 1 Toll Bridge (RKM 214.6, RM 133) to where the main stem of the river discharge into Delaware Bay (RKM 77.6, RM 48). Thus, the project area overlaps with the Delaware River critical habitat unit designated for the New York Bight DPS.

As identified in the final rule, the biological and physical features (PBF) that are essential to the conservation of the species and that may require special management considerations or protection are:

1) Hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0 to 0.5 parts per thousand (ppt) range) for settlement of fertilized eggs, refuge, growth, and development of early life stages;
2) Aquatic habitat with a gradual downstream salinity gradient of 0.5 up to as high as 30 ppt and soft substrate (e.g., sand, mud) between the river mouth and spawning sites for juvenile foraging and physiological development; 3)
3) Water of appropriate depth and absent physical barriers to passage (e.g., locks, dams, thermal plumes, turbidity, sound, reservoirs, gear, etc.) between the river mouth and spawning sites necessary to support:
    i) Unimpeded movement of adults to and from spawning sites;
    ii) Seasonal and physiologically dependent movement of juvenile Atlantic sturgeon to appropriate salinity zones within the river estuary; and
    iii) Staging, resting, or holding of subadults or spawning condition adults. Water depths in main river channels must also be deep enough (e.g., at least 1.2 m) to ensure continuous flow in the main channel at all times when any sturgeon life stage would be in the river.
4) Water, between the river mouth and spawning sites, especially in the bottom meter of the water column, with the temperature, salinity, and oxygen values that, combined, support:
    i) Spawning;
    ii) Annual and interannual adult, subadult, larval, and juvenile survival; and
    iii) Larval, juvenile, and subadult growth, development, and recruitment (e.g.,13 °C to 26 °C for spawning habitat and no more than 30 °C for juvenile rearing habitat, and 6 milligrams per liter (mg/L) dissolved oxygen (DO) or greater for juvenile rearing habitat).

The Delaware River Basin Commission (DRBC) identifies RKM 107.8 (approximately RM 67) as the lower part of the median range for the salt front (defined as 0.25 ppt). It is reasonable to use the furthest downstream extent of the median range of the location of the salt front (0.25 ppt) as a proxy for the downstream border of PBF 1 in the Delaware River. This because the salinity near the salt front is dynamic and the area where there would be a difference in salinity between 0.25 and 0.5 ppt is very small. Consequently, we consider the area upstream of RKM 107.8 to have salinity levels consistent with the requirements of PBF 1. The river channel adjacent to the proposed Edgemoor site may consist of hard bottom substrate [3]. Based on the physical and biological features of the river, PBF 1,3, and 4 are present adjacent to and upstream of the project site and PBF 2, 3, and 4 in the river downstream from the project site to the mouth of the Delaware River.

Sea Turtles

There are four listed turtle species that may occur within New Jersey state coastal waterways and the Delaware Bay from late spring to mid-fall. The four listed species include the federally threatened Northwest Atlantic Ocean DPS of loggerhead, endangered Kemp's ridley, endangered leatherback, and threatened North Atlantic DPS green sea turtle.

[3] https://erma.noaa.gov/atlantic/erma.html#/layers=1+814+17307+1073+1252&x=-75.50481&y=39.74258&z=14&panel=layer

The functional ecology of sea turtles in the marine and/or estuarine ecosystem is varied. The loggerhead is primarily carnivorous and has jaws well-adapted to crushing mollusks and crustaceans, and grazing on encrusted organisms attached to reefs, pilings and wrecks. The Kemp's ridley is omnivorous and feeds on swimming crabs and crustaceans. Juvenile green sea turtles are primarily carnivorous, and more mature specimens eat marine animals, particularly, cnidarians, mollusks, crustaceans, sponges and jellyfish, along with vascular sea grass. An adult green turtle is an herbivore and grazes on marine grasses and algae, while the leatherback is a specialized feeder preying primarily upon jellyfish.

The recognized life stages for these turtles are egg, hatchling, juvenile/subadult, and adult (Hirth 1971). Reproductive adults of all species return to their natal beach to lay eggs that incubate in the sand. A female sea turtle leaves the beach to enter the coastal waters immediately after laying and covering her eggs.

Hatchlings dig their way out of the sand to emerge from the nest. They find their way across the beach and, once in the surf, swim offshore for many hours. Hatchlings may become associated with floating sargassum rafts offshore (Bjorndal 1995).

Along the U.S. Atlantic coast, known sea turtle nesting beaches occur from Virginia south through Florida. No beaches north of Virginia support regular nesting by any sea turtle species. A few green and loggerhead sea turtle nesting attempts have occurred on Delaware and New Jersey beaches, but these have been unsuccessful and are believed to have been abnormalities. Thus, hatchlings would not be present along the Delaware and New Jersey coast.

In general, listed juvenile and adult sea turtles are seasonally distributed in coastal U.S. Atlantic waters, migrating to and from habitats extending from Florida to New England, with overwintering concentrations in southern waters. As water temperatures rise in the spring, these turtles begin to migrate northward. As temperatures decline rapidly in the fall, turtles in northern waters begin their southward migration. Sea turtles are expected to be in coastal water from Massachusetts to New Jersey and in the Delaware Bay in warmer months, typically when water temperatures are at least 15°C. This generally coincides with the months of May through November, with the highest concentration of sea turtles present from June through October (Morreale et al. 2007, Shoop and Kenney 1992).

Right and Fin Whales

Federally endangered North Atlantic right whales are found in waters from New Jersey to Massachusetts. This species may be present on the continental shelf off the coast of New Jersey.

Two Seasonal Management Areas (SMA) for right whales with 10 knots maximum speed restrictions for vessels 65 feet or larger exist in New Jersey state waters (50 CFR 224.105)[4]. One SMA is located at the on the oceanward side of the entrance to Delaware Bay.

It is believed that there are approximately 450 right whales comprising the western North Atlantic population. The North Atlantic right whale remains critically endangered, the rarest of all large whale species and among the rarest of all marine mammal species. Recent analysis of

[4] https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales

sightings data suggests a decrease in population size (Pace et al. 2017). The North Atlantic right whales migrate along the New Jersey coast to calving and nursery grounds and they have been documented year round along the New Jersey coast, including at the mouth of the Delaware Bay (see NMFS: http://www.nefsc.noaa.gov/psb/surveys/).

Fin whales are listed as endangered. The species is found off the eastern United States and are centered along the 100 meter (328 foot) isobaths. However, sightings are spread out over shallower and deeper water, with their summer feeding range occurring mainly between 41°N and 51°N, from shore seaward to the 1,000-fathom (6,000 feet) contour (Hain et al. 1992, NMFS 2010).

Information concerning the individual life history, distribution and biological requirements for each of the individual species of whales can be found on the NOAA Fisheries webpage at https://www.fisheries.noaa.gov/species-directory.

Effects

The Delaware River from the New Castle Range to the Little Tinicum Island Range are important nursery reaches that supports high densities of both juvenile Atlantic sturgeon and shortnose sturgeon (ERC 2016, 2017, 2018, Hale et al. 2016). Subadult and adult Atlantic sturgeon are present from spring to fall. The adjacent Cherry Island Flats is an area that sturgeon are known to utilize (Hale et al. 2016). Its importance for sturgeon is not clear but the feature is known to provide habitat for multiple fish species and likely provides important forage and potential staging for migrating adult Atlantic sturgeon. This part of the river is also a migration corridor during spawning. Therefore, there are no time period when sturgeon exposure to stressors can be avoided. However, in developing the proposed project, you should consider avoiding in-water construction activities when Atlantic sturgeon spawning migration occurs (April through early July) and when Atlantic sturgeon larval life stages are present (May through September).

As part of the NEPA process, it is important that impacts to protected resources are not analyzed in a vacuum but rather assessed in light of the cumulative impacts from existing and planned commercial developments and navigation activities in the Delaware River and Bay. Similarly, as part of the ESA consultation process, the risk to listed species is based on the effects of proposed activities when added to the existing environmental baseline within the action area.

Below we provide information on stressors and concerns with regard to development of the proposed project. Please note that the comments below are not meant to be extensive or address all potential stressors and effects related to the proposed project. The extent and intensity of effects will also depend on the alternative.

Habitat Modification

The Shortnose Sturgeon Status Review Team (SSSRT 2010) and the Atlantic Sturgeon Status Review Team (ASSRT 2007) have identified loss of habitat as a threat to sturgeon in the Delaware River. Further, Atlantic sturgeon critical habitat PBF 1 (Hard bottom substrate in low salinity waters for settlement of fertilized eggs, refuge, growth, and development of early life stages) is present upstream of Wilmington and PBF 2 (soft substrate for juvenile foraging and physiological development) is present in the Delaware River from the project site to its mouth with the Delaware Bay.

Proposed Project Site

The riverbed adjacent to Edgemoor seems to consist of hard bottom substrate[5]. Based on current information, Atlantic sturgeon spawn upstream (i.e., RKM 125-212, RM 77.7-131.7) of the proposed Edgemoor project site. However, the hard substrate may support refuge, growth, and development of early life stages. Therefore, as part of the NEPA process, you should survey presence of hard bottom substrate and assess its type (i.e. bedrock, cobble, etc.) within the project site and in the adjacent river channel above RKM 107.8 for each of the alternatives.

Both shortnose sturgeon and Atlantic sturgeon forage on benthic invertebrates and substrate type strongly affects the composition of benthic prey. Both species are associated with the availability of prey, and, as a result, soft substrates, such as sand and mud, constitute ideal forage conditions for the sturgeon. Mollusks are also important prey for shortnose sturgeon and they may forage off the plant surface of submerged aquatic vegetation. Therefore, as part of the NEPA process, you should document the presence of soft bottom substrate and provide information characterizing baseline distribution, abundance, biomass, production, and diversity of invertebrate prey.

The construction of the berth and approach channel as well as future maintenance dredging will result in the total removal of the substrate and thereby benthic invertebrates that sturgeon forage on. Active dredging results in suspension of sediment and re-deposition, elevated turbidity, and reduced water quality that can negatively affect benthic invertebrates and Atlantic sturgeon spawning habitat. Besides the proposed deepening, the stopping-starting and maneuvering of vessels approaching and docking at the terminal are expected to continue to disturb bottom sediment and decrease available forage within the approach channel and berth. The strong swirling jet flow induced by a rotating ship propeller causes shear stress and can scour the riverbed as the vessels maneuver within the approach channel and berth (Hong et al. 2013, Hong et al. 2016, Karaki and van Hoften 1975). Because the propeller-induced bed shear stress is a main stirring force, sediment erosion, resuspension and deposition are all expected to be closely related to vessels maneuvering while docking (Karaki and van Hoften 1975, Nybakk 2015). Thus, bottom scour and shear stress from vessel operations and propellers should be calculated and quantified. In your letter you note that the new river bottom after deepening may consist of sediments that has concentration of certain substances that exceed ecological screening criteria. As such, the resuspension of sediment can contribute to transport of contaminants from a polluted area to a non-polluted area and expose sturgeon to suspended pollutants. Studies have also shown that scouring and resuspension of sediment caused by vessel traffic negatively affect submerged aquatic vegetation (Asplund and Cook 1997, PIANC 2008). Consequently, a calculation of the concentration, duration, and extent of suspended sediment should be prepared as part of the NEPA process. Further, vessel activity and propeller motion when vessels are arriving and leaving the berth are likely to disturb sturgeon that are present within or adjacent to the berth area. Based on these considerations, we believe the development of the access channel and berth will result in the permanent loss and degradation of sturgeon habitat in a reach of the Delaware River that provides important habitat for sturgeon.

[5] https://erma.noaa.gov/atlantic/erma.html#/layers=1+814+17307+1073+1252&x=-75.53756&y=39.74388&z=12&panel=layer

Based on the calculations and findings above, you should evaluate the effects that the proposed project will have on both sturgeon species and the Atlantic sturgeon critical habitat. Continuous impacts to substrate and turbidity plumes are expected to decrease the value that habitat within the berth, approach channel, and the adjacent river channel have for conservation. The extent to which habitat value will decrease depends on the value for conservation that the habitat within the proposed berth, access area, and adjacent river currently provide.

Delaware River Navigation Channel

New Panamax sized vessels will have little clearance between the hull and the river bed. The propeller of these vessels are several meter in diameter. Propeller wash from large vessels with minimal clearance and hydrodynamic forces around the hull of a moving vessel can cause shear stress on the riverbed and re-suspend sediment (Chen and Wang 2014, PIANC 2008). Starting and maneuvering of vessels such as occur at anchorages can cause large scour holes and significant suspension of sediment (Hong et al. 2013, PIANC 2008). Waves and hydraulic forces around the hull also affect the river bed and causes erosion of the riverbed and banks (Gabel et al. 2017, Gutreuter et al. 2006, Miller and Payne 1991, PIANC 2008, Wilcox 1991). These impacts can detach invertebrates or expose and displace Atlantic sturgeon early life stages seeking cover within interstitial spaces amongst coarse habitat. However, we have little information on clearance between the vessel hulls and the river bottom within the Navigation Channel or the level of shear stress that vessel traffic has on bottom substrate and its impact on sturgeon and their habitat in the Delaware River. As part of the NEPA process, you should calculate the shear stress that New Panamax sized vessels cause on the riverbed as they move through the Navigation Channel, calculate the sizes of sediment that would be impacted, calculate sediment suspension from the vessels' movements, and the quantity of hard and soft substrate that would be exposed to the vessels. This information should be used to evaluate risks to sturgeon from habitat impacts and to Atlantic sturgeon designated critical habitat.

Effects of Construction and Channel Deepening

Pile Driving

We expect that the proposed project includes driving steel piles, though, at this stage in the planning, the number and type of piles are not known. The driving and removal of piles generate sound waves that travels through the water body. Exposure to human generated sounds may potentially affect stress levels and the immune system, cause temporary or permanent loss of hearing, damage body tissues, result in mortality, and kill or damage larvae.

Besides injurious effects, pile driving may elicit behavioral modification and avoidance. Depending on the size and type of the pile as well as the type of hammer, this may temporarily limit use of important foraging areas, affect the value of critical habitat, and restrict migration and movements within the river. Avoidance may also restrict sturgeon up and downstream movements to the navigation channel and, thereby, increase the risk of interaction with vessels. Pile driving may adversely affect listed sturgeon given the importance that this reach of the river has for sturgeon, the density of sturgeon in river reaches adjacent to the project site, and the potential presence of Atlantic sturgeon early life stages with poor swimming abilities.

Dredging

You manage and maintain the Delaware River federal navigation channel (the Federal Navigation Project, FNP) and the deepening of the federal navigation channel in reach B from 40 to 45 feet. The deepening of the channel includes dredging and blasting of bedrock and rock outcrops as well as relocation trawling of sturgeon to minimize effects from blasting. These activities are currently ongoing and expected to be completed in 2019 or 2020. In addition, maintenance dredging of the navigation channel is ongoing and will continue in the foreseeable future. Entrainment in dredges, exposure to sound from blasting, and relocation trawling have injured and killed both Atlantic sturgeon and shortnose sturgeon. An interagency consultation on the deepening and maintenance of the FNP was reinitatied in 2018 and a biological opinion and incidental take statement issued on December 10, 2018.

The applicant has requested that you determine the federal interest for the Assumption of Maintenance of the approach channel under the Water Resources Development Act of 1986. It is unclear how, if approved by the Assistant Secretary of the Army, this will relate to the FNP and determine any future ESA consultation with us.

The proposed project includes the deepening of the berth area and the approach channel connecting the berth to the navigation channel. While project plans are not finalized, we assume the deepening include use of dredges. In addition, rock outcrops seem to be present within the proposed approach channel. Thus it is a possibility that blasting may be needed. In addition, maintenance of the depth at the berth and approach channel will require ongoing dredging. This lower reach of the Delaware River is an important rearing area for juveniles and the relocation trawling for the deepening project has shown that this stretch of river reach supports high densities of young of the year and juvenile sturgeon. Further, sub-adult Atlantic sturgeon are commonly found on the Cherry Island Flats reach of the river. Therefore, risk of mortality from construction and maintenance activities is a concern. Especially, the effects from constructing and maintaining the berth and approach channel needs to be assessed by how those activities affect the species when added to other existing and ongoing federal and private dredging and deepening activities.

Vessel Traffic

In your letter, you note that the proposed project "is anticipated to attract new containerized shipping commerce to the region rather than displacing existing container operations." An increase in the activity of large vessels is a major concern with regard to rebuilding the Atlantic sturgeon population in the Delaware River and has been identified as an issue for the recovery of sturgeon species (ASSRT 2007, Brown and Murphy 2010, SSSRT 2010). Vessels are known to strike sturgeon species as well as marine mammals and sea turtles.

The ACOE Waterborne Commerce Statistics Center reports a large number of vessel trips (in the tens of thousands) in the Delaware River and Bay each year[6]. However, these vessel trips include short movements by tug boats, shallow draft vessels, and non-motorized vessels while studies have identified large, deep draft vessels as the major cause of sturgeon vessel strikes

[6] ACOE Waterborne Commerce Statistics Center: https://www.iwr.usace.army.mil/About/Technical-Centers/WCSC-Waterborne-Commerce-Statistics-Center/

(Balazik et al. 2012, Brown and Murphy 2010). The number of registered large commercial vessel trips between Philadelphia, PA, and the mouth of the Delaware Bay each year is considerably lower than the total vessel trips reported. For instance, for 2016, the ACOE Waterborne Commerce Statistics Center reported 1,403 trips of tanker sized vessels.

Over a ten-year period, from 2007 to 2017, a median of 13 sturgeon mortalities per year was reported to the Delaware Department of Natural Resources and Environmental Control through their sturgeon carcass public reporting program[7]. Of these, a median of five sturgeon carcasses per year was attributed to vessel strike mortalities. The cause of death could not be determined for a median of seven carcasses and these likely included vessel mortalities. It is unlikely that these mortalities represent the total number of mortalities, as most carcasses are likely to go undetected. Vessel strike mortality of subadult and adult Atlantic sturgeon is of particular concern as the mortality of a small portion of a population's females will significantly affect population growth (ASMFC 2007, Brown and Murphy 2010) and migrating subadults and adults may be especially exposed to vessels (Fisher 2011, Hondorp et al. 2017). The geomorphic structure of the river such as narrow areas and presence of sturgeon concentration areas influence the probability of a vessel striking a sturgeon (Balazik et al. 2012). Further, Atlantic sturgeon larvae exposed to vessel traffic and entrained through a propeller will likely be injured or killed (Killgore et al. 2001).

Large whales are also injured and killed by ocean going vessels. Five North Atlantic right whale confirmed or probable vessel strike mortalities occurred during 2017 and 2018[8]. The cause of death could not be determined for another eight whales and these may have included vessel strikes. North Atlantic right whale occurs in New Jersey coastal areas and in waters off the mouth of the Delaware Bay. Thus, this species will be exposed to vessels transiting to and from the proposed terminal. A Seasonal Management Area seaward of the Delaware Bay COLREG line restricts vessels speeds to protect right whales during migration to and from calving and nursery grounds[9].

Four species of sea turtles are known to be seasonally present in the Delaware Bay and in the waters off the coast. Small and fast moving vessels are known to strike sea turtles. However, little information exists about the risk of injury and death from interaction with large oceangoing vessels. It is possible that the bow wave of large vessels pushes sea turtles away, thereby reducing the risk of blunt impact from the hull or entrainment through the vessel's propeller, though this has not been confirmed.

Supporting documentation and analysis is needed for both short-term vessel traffic associated with the project's construction, as well as long-term vessel use of the proposed Edgemoor multiuser containerized cargo port for each of the proposed alternatives. In addition to the number of vessel trips, information should clearly demonstrate whether all anticipated vessel traffic to the site is from new vessels or whether it includes vessels displaced from other ports should be considered. Any seasonal trends should also be provided. Overall the analysis needs

[7] DNREC: http://apps.dnrec.state.de.us/sturgeon

[8] NOAA Fisheries: https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2018-north-atlantic-right-whale-unusual-mortality-event

[9] NOAA Fisheries: https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales

to show the number of new vessels that will be added to the existing vessel traffic and which would not occur but for the proposed action. The analysis should include if certain vessels are expected to be diverted from visiting ports further upstream of the Delaware River and thus, now taking shorter trips over less distance. As part of the NEPA process, for each alternative, the vessel information together with best available data on vessel strikes should be used to analyze and document the risk to protected resources.

There is an expectation of expanded shipping commerce in the region. Therefore, it is important to consider the risk to listed species from the proposed vessel activities within the context of how this adds to the overall commercial vessel activity of the Delaware port complex. Several other ports are expanding and new terminals are being built. These include, but are not limited to, the construction of the Southport Terminal in Philadelphia, the Delaware River Partners' Gibbstown terminals within the Little Tinicum Island range, the expansion of the Paulsboro port in New Jersey upstream of Little Tinicum Island, and activities to increase cargo capacity at several other existing ports and terminals.

CONCLUSION

We look forward to continued coordination with your office to address the issues we have outlined in this letter as you prepare the NEPA document for this project and evaluate project alternatives. The Applicant's preferred project site is located in an area that is highly sensitive for NOAA trust resources including federally protected species under our jurisdiction such as ESA-listed sturgeon as well as aquatic resources of national importance including alewife, blueback herring, and striped bass. Construction activities and terminal operations could result in significant impacts to these resources. Regular maintenance of the approach channel in an area where trust resources, species of concern, and sturgeon are known to congregate can result in significant impacts to these species. Vessel traffic is known to kill sturgeon, including Atlantic sturgeon during spawning migrations, and we are very concerned about planned increases in vessel activity on the Delaware River and in the Delaware Bay. Impacts to sea turtles and whales are also of concern and should be considered. Therefore, the cumulative impacts of construction, maintenance, and operation of the terminal should be analyzed in context of the operation of the overall navigation infrastructure and marine commerce on the Delaware River and Bay.

If you have any questions or need additional information, please do not hesitate to contact Keith Hanson in our Annapolis, MD field office at keith.hanson@noaa.gov or (410) 573-4559 regarding EFH/MSA issues and Peter Johnsen at peter.b.johnsen@noaa.gov or (978) 282-8416 regarding ESA issues.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: ACOE – B. Conlin, D. Caprioli
PRD – M. Murray-Brown, P. Johnsen
FWS- C. Guy
EPA Region III – Mike Mansolino
MAFMC – C. Moore
NEFMC – T. Nies
ASMFC –L. Havel

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