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Via E-mail

DNRECHearingComments@delaware.gov

Lisa A. Vest

Hearing Officer

DNREC

89 Kings Highway

Dover, DE 19901

Re: Comments of PhilaPort to Docket #2020-MULTI-0024, Applications of Diamond State Port Corporation's Proposed Development a New Container Port on the Former Chemours Property, 4600 Hay Road, Edgemoor, DE

INTRODUCTION:

These comments are filed on behalf of the Philadelphia Regional Port Authority ("PhilaPort"), which was established pursuant to Philadelphia Regional Port Authority Act of 1989 and is an independent agency of the Commonwealth of Pennsylvania. The comments pertain to the application filings of the Diamond State Port Corporation ("DSPC" or the "Applicant") with respect to a Subaqueous Lands Permit and Water Quality Certificate, a Notice of Intent To Implement Corrective Action and Post-Closure Care, and a Notice of Federal Consistency Certification Submission (collectively, the "Applications"). The DSPC has made these filings in connection with its intended development of the Edgemoor Development Project ("EDP") located at or about 4600 Hay Road, Edgemoor, DE, and is the site of the former DuPont Edgemoor Facility (recently transferred to Chemours Corporation), and is filed with the Delaware Department of Natural Resources and Environmental Control ("DNREC") as Docket #2020-MULTI-0024.

In review of the overall application packages reviewed in connection with Docket #2020-MULTI-0024, PhilaPort was struck by the dismissive overall tone of the studies with respect to any environmental impacts to wildlife and aquatic species. Studies appear haphazardly prepared and appear often to collect samples at times experts would and should know fall outside the established timeframes for many of the most endangered species in the region. Environmental risk assessment studies do not follow known and well-established guidance from the United States Environmental Protection Agency

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(“USEPA”), sediment analyses fail to account for suspended solids and their known impacts to aquatic species, and data analyses fail to use the appropriate methodologies. For example, it is no wonder that the studies do not identify any subaqueous vegetative species: the samples were collected beyond the established time windows for such investigations. While the Applicant attempted to collect samples during the correct timeframes, that data is excluded.

One of the most disturbing aspects of the Applicant’s submissions is the misleading Navigation Study that would create the illusion of safe transport to and from the proposed port, with no demonstration of how a vessel would actually turn in the turning basin. This proposed project raises the distinct prospect that a massive Post-Panamax vessel could lose steam in the middle of a turn, blocking the entire Main Navigation Channel. That contingency is simply not addressed by the Applicant who notes that additional safety studies are necessary to demonstrate the efficacy of the proposed turning basin, one of the key elements of the proposed port. If the purpose of enclosing such a report was to demonstrate the safe use of the turning basin, it achieves no such demonstration. Such an incomplete work product cannot be used to support such a massive development project.

Another gross deficiency in the Applications concerns the lack of any demonstration that there are any Confined Disposal Facilities with sufficient capacity to house the initial project dredging or the massive annual maintenance dredging. The Applicant appears to be requesting authorization for the use of the Wilmington Harbor South CDF, which has no meaningful remaining capacity, but at other parts of the application package appears to explore other CDFs, which not surprisingly also have no room for the Applicant’s dredge. The Applicant at best clearly demonstrates that massive investment is needed to bring any of the referenced CDFs to a condition ready to accept the initial dredge. With respect to the annual maintenance dredging, there is almost no hope of sufficient CDF capacity, and thus the Applicant proposes to deploy shoaling fans on an unprecedented scale with no useful supporting data on the fate and transport of the sediment continually spewed into the water column of the Delaware River. There is no substantive study on whether these fans can create harmful noise for endangered species, how contaminated sediment may leach into the water column, the impacts of increased turbidity, or even whether the technology can work under these conditions.

Perhaps the most disturbing observations come from the government agency tasked with evaluating many of the impacts to endangered species, National Oceanic and Atmospheric Administration (“NOAA”).¹ NOAA’s comments to the USACE in connection with other necessary federal permits (CENAP-OP-R-2019-278) truly capture the inadequacy of the Applicant’s attempts to both characterize and manage environmental impacts, and the overall poor quality of the environmental studies in support of the Applications:

¹ See. Letter from Michael Pentony, Regional Administrator, NOAA to Lt. Colonel David Park, District Engineer, USACE, Re: Diamond State Port Corporation (CENAP-OP-R-2019-278), September 28, 2020. A copy is attached hereto and incorporated herein.

Based on the information provided to us ... we have significant concerns about the proposed project, its impact to aquatic resources, the adequacy of the project purpose and need documentation, and the lack of a full and complete analysis of alternatives to avoid or minimize the adverse effects and compensatory mitigation for unavoidable impacts. We are also deeply concerned that the District and DSCP seem to have discounted decades of data on the aquatic resources found within the project area collected by the State of Delaware, the State of New Jersey, and others in favor of extremely limited and inadequate survey data produced by DSCP's consultant. In addition, both the EFH assessment and the Biological Assessment provided to us are incomplete, and lack a comprehensive evaluation of direct, indirect, individual, cumulative, and synergistic effects in the assessments and application materials provided. This is especially concerning since we provided the District with extensive comments on the consultations required, aquatic resources under our purview, site-specific resources and habitat, in our February 28, 2019, response to the District's request for National Environmental Policy Act (NEPA) scoping comments.

Due to the significant impacts that will result from this project, the incomplete consultation, and the numerous inaccuracies and inadequacies in Districts' analysis of effects as discussed in the attached document, our recommendation that the DA permit for this project not be issued at this time is in accordance with Part IV, Paragraph 3(b) of the Memorandum of Agreement (MOA) between our agencies, due to the substantial and unacceptable impacts to aquatic resources of national importance. These resources include: American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass (*Morone saxatilis*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), and shortnose sturgeon (*Acipenser brevirostrum*) as well as the potential permanent impacts to Cherry Island Flats, a highly productive area for a number of commercially and recreationally important species including striped bass, and an extremely popular recreational fishing area. In addition, based upon the significant impacts resulting from the construction and operation of the proposed project, and pursuant to the National Environmental Policy Act (NEPA), we also recommend that the District reach a finding of Significant Impact and develop an Environmental Impact Statement (EIS) for the project. We have provided detailed

comments on the proposed project and our concerns in the attached document.

In short, the Applicant provides what can be at best described as a rough draft application package. Typically, DNREC holds applicants to a much more vigorous standard of substantive responses to permitting requirements. PhilaPort expects that DNREC will recognize the numerous deficiencies in the Applications and reject these Applications accordingly. Below please find PhilaPort's comments with respect to the Applications.

1. National Marine Fisheries Service ("NMFS") Scoping Letter

On February 28, 2019 the NMFS raised serious concerns about the proposed Edgemoor Development Project ("EDP"), and in particular points out that the Cherry Island Flats is adjacent to the development and represents an important area for striped bass as a resting, spawning, nursery and foraging area. There appears to be little or no follow up on this issue in Environmental Assessment ("EA") application which centers its analysis on shortnose sturgeon. Although the proposed site is a declared critical habitat for Atlantic Sturgeon and shortnose sturgeon, only the latter is analyzed, and the Applicant fails to follow through with respect to other Species of Concern, including Catadromous American Eels, the population of which appears decimating in the region. The comments of the NMFS, which appear to raise serious questions with respect to the proximity of the EDP to critical habitats stands in stark contrast to the Applicant's bold and apparently inaccurate statements that its project will not adversely impact any such populations. Therefore, the Applicant's approach to and treatment of these Species of Concerns should be carefully analyzed by both the NMFS and DNREC given what appears to be a pre-existing predilection by the Applicant to categorically minimize impacts to local species.

The NMFS Scoping Letter is curiously devoid of any reference to shoaling fans. Given the fact that these fans, if deployed, will substantially alter conditions in and around the site of the EDP, NMFS review of the proposed array and impact of these structures would be critical. Page two of the NMFS letter discusses the need for continuous maintenance dredging, which in other portions of the Applicant's submission are to be addressed by an array of 13 shoaling fans to eliminate or significantly reduce the need for annual maintenance dredging. As discussed below, the shoaling fans raise a number of technical questions with respect to the suspension of sediments in the water column and/or the movement of sediments across the riverbed. Further, even without the knowledge of the shoaling fans, the NMFS finds on page 18 of its letter:

Continuous impacts to substrate and turbidity plumes [referring to scour from ships and propellers] are expected to decrease the value [for sturgeon] that habitat within the berth, approach channel and adjacent river channel have for conservation...[NMFS] believe[s] 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.

Any potential for the increase in turbidity and/or movement of sediments must be robustly reviewed by the NMFS, especially given the Applicant's extensive documentation of contaminated sediments.

Thus, the NMFS makes clear that the scope of the Applicant's review of Species of Concern must address specifically not only the Atlantic and shortnose sturgeon species, but with respect to striped bass, eel and other local populations that appear to be adversely impacted by the proposed EDP. These impacts must be analyzed in connection with both ongoing maintenance dredging required for the EDP, and with respect to the shoaling fans which in theory are proposed to displace the need for annual maintenance dredging but may exacerbate the presence of suspended and/or blowing sediments, and result in significant changes to the substrate.

The full scale of the deficiencies suspected by the NMFS is identified by the US Department of the Interior, Fish and Wildlife Service ("FWS").² The Applicant's dismissive consideration of the local fish populations is starkly at odds with the abundant literature and studies cited by the FWS, which ultimately concludes with respect to DSPC's applications:

In summary, we do not believe that the Applicant's geographic scope of analysis to meet the project's need was sufficiently evaluated, nor has there been a sufficient analysis of impacts to fishery resources. We believe that significant impacts to fishery resources will occur from the project and the need for the Corps to prepare an ... [Environmental Impact Statement pursuant to NEPA]... is justified based on the concerns raised above. The Service also recommends that the Corps and the Applicant continue to engage with the Federal resource agencies and stakeholders to identify changes to the project to minimize these impacts or to discuss ways that these adverse impacts could be mitigated. The FWS concluded that the Applicant's evaluation of impacts to local and migrating fish populations failed to consider numerous pre-existing studies of this portion of the Delaware River environment which document:

... that shallow intertidal regions along the Delaware River, especially areas outside the main navigation channel, provide vital life-cycle habitat for numerous anadromous species. The overwhelming abundance of river herring --- collected during the summer (2009) survey implies that these shallow habitats along the riverfront are functioning as nursery areas of juvenile

² Letter, Genevieve La Rouche to Lt. Colonel David Park, District Engineer, USACE, Re: Diamond State Port Corporation (CENAP-OP-2019-278), September 21, 2020. A copy is attached hereto and incorporated herein.

migratory fish, providing critical areas of foraging and refuge from predation.

In sum, the FWS commented that the studies submitted in support of the Applicant's assessment that there was limited impact to the local fish population, and to endangered species failed to adequately consider an abundance of readily available scientific literature in its EA. Further, FWS states that the use of the EA as the mechanism to examine environmental impacts, mitigation and project justification is invalid, and comments that a full Environmental Impact Statement pursuant to NEPA is required to adequately address the effect the EDP will have on the local subaqueous environment.

2. EPA Scoping Letter

The EPA points out that the EDP will require that the Applicant fill approximately 5.3 acres of Waters of the United States to allow for construction of the pier. The EPA requires that the Applicant address the steps it took to minimize the amount of fill and how the loss of the Waters will be mitigated. The EA does nothing to address these issues, and as stated in various submissions by the Applicant, it does not believe any wetlands or waters will require mitigation. This is in direct contrast to EPA demands, and the requirements associated with a Section 404 Clean Water Act permit application (which is curiously absent from the suite of Applicant filings). EPA's concerns are further discussed in the FWS Letter which extensively details DSPC's deficiencies with respect to either acknowledging an adverse impact to wetlands or proposing mitigation in response thereto:

... the project will result in a loss of 5 acres of shallow water habitat to construct the bulkhead and 7.46 acres of shallow habitat to construct the wharf with 4,500 piles placed 10 feet apart. We consider the wharf construction to be a loss of habitat due to the number and placement of the pilings.

The FWS Letter indicates a permanent loss of over 12 acres, with a requirement for mitigation, and clearly the EA (or the EIS) should address the full mitigation.

EPA also emphasizes the need for the Applicant to better describe how annual maintenance dredging will be conducted and funded. The Applicant states the USACE will be asked to fund and complete the annual dredging, but EPA requires that the EA must discuss the options available in the event funding from the USACE is not available, a distinct possibility. Apparently, based on other filings the Applicant intends to manage the annual dredging requirements by relying upon the shoaling fans to either greatly reduce or eliminate the need for such work, but again it is apparent that EPA had no information regarding this novel technology. It is essential that the Applicant present all data regarding the shoaling fans to both EPA and the NMFS to determine the extent to which their respective impressions regarding the EDP have been modified.

3. DSPC Federal Signed Application and Public Notification

a. Sections 22-23, and Environmental Questionnaire

The Permit Application notes that 5.5 acres of Waters of the U.S. (Open Waters) will be filled.³ As a result, the Public Notification for the permit is incomplete in that it does not note that 5.5 acres of Waters of the U.S. will be permanently impacted by filling. The intertidal and subtidal shallows located behind the proposed pier bulkhead are noted on the Permit Drawings as being present and filled as part of the EDP, but the Public Notice makes no mention of them. Consequently, the EA never identifies their value and their loss. Not surprisingly, there is no mitigation that is proposed for these areas as required as the Applicant appears to ignore this acreage. Additionally, the Applicant materially fails to mention how many acres of Waters of the U.S. will be temporarily impacted by construction of the new harbor facility, and with that a discussion of proposed mitigation measures.

b. Part III – Consideration of a Dredging Proposal

i. Section A

The Application specifies that the dredge will be disposed in only one CDF: Wilmington Harbor South (“WHS”), which is nearly at capacity. Although other CDFs may be referenced and evaluated in Appendix 6 of the EA, this Application makes clear that only WHS is contemplated for any use. Further, as discussed in the EA, WHS lacks adequate capacity for this designated use for construction let alone annual maintenance dredging.

ii. Section B

The sparse response is wholly inadequate in that it incorporates by reference Appendix 6 of the EA, which it then purports to qualify as a “comprehensive plan for disposal sites.” Appendix 6 contains no such comprehensive disposal plan, nor does the discussion in that Appendix broach the issue of dredge accumulation over time. The Appendix also fails to address the dwindling number of viable CDFs. The “Dredge Material Disposal Plan” presented in Appendix 6 is nothing but a feasibility evaluation that presents conceptual plans for disposal, not a careful evaluation of how existing capacity at WHS (the only CDF the Application references) can handle the deluge of dredged material from either the initial dredge or annual maintenance dredging.

iii. Section D, 4.0

Appendix 6 contains a very limited discussion of the compactability and settling rates of dredged material. The “Dredge Material Disposal Plan” only references bulking and shrinkage factors and does not explain how the bulking and shrinking factors were derived. Appendix 6 fails to comply with USACE EM 1110-2-5027 (“Confined Disposal of Dredge Material”), which would require a more comprehensive evaluation of settling rates, as well as material settlement and consolidation, with supporting calculations to demonstrate both the initial capacity and long-term capacity of the proposed disposal site.

iv. Section E, 5.0

³ NOAA has estimated the permanent loss at about 13 acres.

This Section discusses environmental monitoring during the dredging operations including discharge and sediment transport. The Applicant proposes to monitor solely for total suspended solids, which does not adequately address the question posed. A more comprehensive plan must be submitted for monitoring and prevention of dumping of dredge material during sediment transport to the disposal site. At a minimum, site specific Best Management Practices should be listed, and may include modified production rates, equipment inspections, pipeline discharge controls, and independent inspectors.

v. Section G

The Application requests information on maintenance dredging, requesting information on frequency and quantity. The Applicant references its responses from Appendix 6 stating: "EATD Appendix 6, accounts for ongoing, yearly maintenance dredge volume of 500,000 cubic yards." A review of the aforementioned Appendix to the EA indicates there is no mention at all of annual maintenance dredging associated with the EDP.

The Application further states that annual maintenance dredging is addressed in the body of the EA itself. The first reference is to Section 4.1.2.2, which does not reference any specific quantity of maintenance dredge materials. This Section emphasizes instead that the need for such annual dredging will be mitigated by the use of "shoaling prevention fans," a concept not mentioned in the Application:

A potential indirect impact associated with implementation of the project is an increased demand of drying and storage facilities for sediments associated with maintenance dredging of sediments from the berth and access channel. The project is minimizing this potential indirect adverse impact through the installation of a system of shoaling prevention fans.

Section 4.1.5.2 contains a passing reference to the need for maintenance dredging, again with no reference to the amount or nature of the material. This Section does acknowledge that the construction of the wharf as part of the EDP will impact tidal flow, and will thereby increase the need for maintenance dredging (and associated CDF disposal capacity), with no discussion of whether there is any means by which to modify the wharf design to minimize such an impact:

The forecast change in currents has the potential to increase sedimentation within the project site, which would necessitate maintenance dredging and a corresponding increase in the demand for dredged material dewatering and storage.

Lastly, the Application indicates maintenance dredging is addressed at Section 4.2.3, which at most references that the Application is contemplating the use of shoaling fans but does nothing to put this in the context of the quantity or characteristics of the dredged material. The FWS Letter (p.8) places the potential impact of these shoaling

fans in stark terms, and ironically the cumulative impact of the fans may exceed that of annual maintenance dredging (assuming disposal capacity could be found):

Sedimentation fans are problematic in that they operate daily, 4 times per day, 365 days per year. The turbines can impinge, but more likely entrain fish. The Edgemoor Power Plant had substantial impingement and entrainment impacts on bay anchovy, striped bass, Atlantic croaker (*Micropogonias undulatus*), and river herring – all species that occur in abundance in the vicinity of the proposed project ...

The sedimentation fans would run during the time period that the Co-op would recommend restricted dredging and construction operations (March 1 through June 30), impacting spawning, larvae, and young of year fish. Although maintenance dredging may be needed annually if sedimentation fans are not employed (from EA, page 65), the annual impact of dredging during fall or winter months will have a less cumulative impact to fisheries resources than daily operation of the sedimentation fans during spring and summer months... The Service does not agree with the report's conclusion of minimal impacts to fish species found in the project area.

The Service also agrees with statements made about impacts of these fans on fish mortality, ecosystem function, and aquatic habitat degradation by the Delaware Department of Natural Resources (DE DNR) in a letter dated August 31, 2020 addressed to the Delaware Wetlands and Subaqueous Lands Section. In particular, the letter cites concerns with the effect of fan discharge on the distribution of the sediment into the Delaware River and raises questions about the settling rates and settling location of this sediment... Further, creating large amounts of mortality would alter the ecosystem by impacting the trophodynamic processes (e.g., predator-prey interactions) while simultaneously reducing fishing opportunities for recreational and commercial anglers.

4. Individual Permit Application Checklist

In the Plan Completeness section, the Applicant has indicated that “Location of any shellfish beds in close proximity to the area of impact” is not applicable. According to the DSPC Federal Signed Application, Environmental Questionnaire, Part IV, the project would fill 5.5 acres between the bulkhead and mean high water. This area currently contains intertidal and subtidal habitat, according to the EA. However, the EA does not evaluate the location or confirm absence of potential shellfish beds within the intertidal and subtidal area of impact. Any shellfish beds in close proximity to the area of impact should be shown on the plans.

5. EA Form

a. Section 3.2 (Harbor Dredging and Dredged Material Disposal Plan)

Section 3.2 appears to incorporate by reference Appendix 6 to the EA, “Dredged Material Disposal Feasibility Evaluation.” The Evaluation concludes that there is sufficient capacity in the existing Delaware confined disposal facility sites (“CDFs”) to accommodate the annual maintenance dredging. However, while the EA appears to make this conclusion, the aforementioned Evaluation makes no mention of yearly maintenance dredging for the EDP. Curiously the Evaluation details the use of several of the proximate CDFs for annual dredging in connection with other projects but makes no attempt to conclude that these existing CDFs have sufficient capacity to contain the annually dredged material. Section 3.2 also makes it clear that the Applicant expects that “... the CDFs utilized for the maintenance dredging would be the responsibility of the Operations Section of the ... USACE...” That is, the Applicant expects that the taxpayers will cover their costs of annual maintenance dredging and disposal.

As discussed further below, the Evaluation discusses the very limited capacity available in Reedy Point North, and no realistic capacity at Reedy Point South unless material is removed to create additional air space or the dike elevations are substantially heightened. With respect to Wilmington Harbor South Disposal Area, dredged material can only be accommodated if the USACE elevates the dikes, indicating no current uncommitted capacity. Wilmington Harbor North is ruled out as a disposal site as it is closed.

The Evaluation nonetheless concludes that there is adequate capacity for interring the volume of material associated with dredging activities. The three CDFs that remain open for operations would nevertheless require substantial modifications to create new capacity for any significant quantity of EDP-related dredge. In short, the Evaluation actually concludes that at present unless the USACE takes action to create new capacity, there is no room for the immense quantity of annual dredge material that the Applicant foresees in this initial planning document.

b. Section 4.1.4 Site Hydrogeology

The EA does not adequately address how known contaminated groundwater at the former Chemours property will be managed or monitored as part of the EDP. Previous RCRA groundwater assessment referenced did not take into consideration the removal of 3 million cubic yards of material along the shoreline. The proposed dredging has the potential to expose previously confined zones of contaminated groundwater that may result in new preferential pathways for groundwater discharge to the Delaware River. The EA should demonstrate how contaminated groundwater will not degrade the surface water quality of the Delaware River in accordance with the State’s Surface Water Quality Standards (7 Del. Admin. Code §7401).

c. Section 4.1.6 Sediment and Water Quality

This section does not consider the potential contamination of the Delaware River through the discharge of contaminated groundwater from the former Chemours site. As

dredging activities take place along the shoreline, the process could create new pathways for groundwater discharge into the river.

d. Section 4.2.7 Project Site

As a general observation, the Application does not acknowledge or discuss that the construction of the new pier will create a shelf that will shade significant areas of aquatic habitat and will affect the ability of the area to repopulate with benthic invertebrate communities after initial dredging. This oversight may be a function of the EA's conclusion that:

While construction of the proposed Edgemoor container port will result in the removal of substrate, no [subaqueous vegetation] or habitat of value was identified at the project site during the Assessment of Habitat and Benthic Resources.

However, the EA fails to consider intertidal/subtidal shallows along almost the entire face of the Edgemoor site as being valuable habitat. Intertidal and subtidal shallow areas are critical areas used by a variety of avian species as well as marine invertebrates. These areas are considered as Estuarine Intertidal and Subtidal wetlands and must be evaluated for purposes of impacts to these environments. Interestingly, in Section 4.2.1.1 (Dredging Area) the Applicant describes this area as "estuarine subtidal and intertidal habitat."

6. EA Appendix 6 (Dredge Material Disposal Plan)

The Dredge Material Disposal Plan put forth by the Applicant does nothing to provide assurance of disposal capacity, and does nothing to give the public any sense that the Applicant has a cohesive or cogent plan for handling an immense quantity of dredge material, much of which is contaminated by hazardous substances associated with prior Dupont operations at the Edgemoor Plant. The basis of capacity and use of all CDFs is on assumptions based on photos and diagrams, rather than directly consulting with the owner of the CDFs, which could have provided detailed and reliable information rather than the speculative construct presented by the Applicant. Given the critical link that the CDFs provide to both the initial and maintenance dredging operations, capacity and access must be documented and assured before any permit can be granted in connection with this Application. It is also important to note that while this Exhibit discusses four CDFs, the Application itself references only WHS as the chosen disposal site.

The current proposed plan in this Exhibit fills the WHS CDF beyond current capacity, but there is also no accounting for known additional contributions to this CDF from maintenance of the Main Navigation Channel, which are completely authorized and permitted. Further, although references to annual maintenance dredging for the EDP remain murky in the Application, there appears to be no reference to how WHS will handle the load from 500,000 cubic yards of annual maintenance dredging, assuming the experimental shoaling fans do not operate as speculated by the Applicant.

The dredge is known to contain significant concentrations of hazardous substances, including PCBs and dioxin, as documented by the Applicant. The proposed

Plan does not detail whether or not the proposed CDF is designed to handle these contaminants within the sediments or how the effluent from the CDFs will be treated to comply with Clean Water Act discharge standards. Further, given the history of the adjacent upland property (the former Chemours Edge Moor facility) and array of contaminants in the sediments, the lack of any testing for PFOSs and PFAS compounds appears to be a material omission in the study. Given that PFAS chemicals are regulated hazardous substances under Delaware's Hazardous Substance Cleanup Act of 2015, the Applicant should evaluate the presence of such compounds in order to adequately characterize the sediments it will be discharging into the Delaware River.

a. Section I

The preferred alternative for disposal at an existing CDF assumes permission would be granted under Section 217 of the Water Resource Development Act of 1996. Section 217(b)(1)(A) states:

[The USACE] may permit the use of any dredged material disposal facility under the jurisdiction of, or managed by, the Secretary by a non-Federal interest if the Secretary determines that such use will not reduce the availability of the facility for project purposes...

As established in Section VI of Appendix 6, construction dredging would effectively fill the existing capacity. That is, the Applicant has established at the outset that there is no capacity available at WHS for its dredge material without substantial modification and vertical expansion of that CDF, which is neither planned nor funded at this time. Further, it is unlikely that such a vertical expansion is viable given the height constraints of the Water Resources Development Act.

Thus, the Applicant's Dredged Material Disposal Plan establishes and documents the lack of capacity for the removed dredge material, and there is no attempt to reconcile whatever limited capacity remains with ongoing obligations in connection with the Main Navigation Channel, which is already using the WHS CDF, and will be doing so (as previously permitted) for the foreseeable future. Consequently, the Applicant has failed to establish that its use of the WHS (or possibly other CDFs) "will not reduce the availability of the ... [CDF] for ... [Federal] ... project purposes" given that its dredge would consume all available capacity for the ongoing maintenance of the Main Navigation Channel.

b. Section II

The Applicant appears to propose Reedy Point North and South Disposal Areas for use in connection with its dredging, but these too require substantial expansions and modifications.⁴ Aside from the fact that no requests for use and/or approval for use have

⁴ The Application would appear to apply only to WHS. It is not clear if these references to Reedy Point North and South are for the purposes of ruling these facilities as ineligible for dredge disposal purposes, but there is a conflict between the Appendix and the Application in this regard, and only WHS should be considered as provided by the Application itself.

been granted by the USACE, current capacity is not feasible without significant alterations to the North Disposal Area requiring investigation, permitting, and design. Proposed alterations are based on assumptions with little physical investigation, and at best the Applicant speculates that a 12' vertical expansion "could be configured" at the facility to accommodate the Applicant's needs. This is pure speculation at this time as no planning or permitting to further such an expansion has been filed or modeled.

The Applicant acknowledges that Reedy Point South has limited access and the USACE has to continually remove materials within the CDF to accommodate new loads. Consequently, no capacity can be guaranteed at this facility.

The Applicant explores use of WHS for disposal. Once again, its analysis confirms that the facility lacks the capacity to accommodate the EDP's dredging requirements. The Capacity Analysis concludes that the CDF would require at least a 29' vertical expansion to meet the project's needs, a change that is neither budgeted nor currently pending before the USACE (and would like exceed height restrictions under the WRDA). Again, the Applicant's dredging burdens can only be alleviated by major modifications to existing CDFs, none of which have adequate capacity or pending plans for such modifications.

c. Section V

The Applicant presents data conveniently indicating that the dredged material from the EDP will dewater and shrink substantially, which aids its analysis of future capacity needs. However, there is no justification for the bulking and shrinkage factors that are used to make these calculations. The volume estimates presented in tables 3,4,5, and 6 assume the bulked dredged slurry volume placed within the CDF will shrink back to the in-situ volume (or slightly above for clays) between dredging cycles. This is an aggressive assumption without supporting site specific data and technical justification and appears to be calibrated to achieve a desired outcome. How will this project maintain water quality standards at the CDF while managing capacity between dredging cycles based on the standards established under "Evaluating Environmental Effects of Dredged Material Management Alternatives?" See, EPA842-B-92-0008 (Revised 2004).

7. Essential Fish Habitat Assessment

The Applicant is highly dismissive of any impacts it will be causing as a result of the EDP. The extensive critical comments from both NOAA and FWS demonstrate the lack of diligence in the Applicant's attempts to either characterize impacts or to seek data from innumerable available studies that appear to have eluded the Applicant. For example, in Section 4.2.1.2 (Critical Habitat), the Applicant acknowledges:

The project site contains some of the elements of PBF 2 (soft substrate for juvenile foraging...). While dredging will disturb the soft substrate and impact benthic organisms, the impacts will be temporary and de minimus. Further, the benthic organisms identified within the dredge area or construction area

are common, widely distributed, and can easily be found in adjacent areas of the rivers.

Because the EDP proposes to permanently remove the upper strata within the proposed dredge area, it is inaccurate to state that the impacts on soft substrate would be temporary or *de minimus*. The project proposes to permanently remove the upper strata which forms the current channel bottom within the proposed dredge area, exposing the lower stratum. The current and future proposed strata differ in terms of chemical composition, grain size, total organic carbon, and other physical and chemical parameters. The report fails to discuss and quantify short-term or long-term changes to the benthic community composition resulting from a drastic change in substrate physiochemistry. The project proponent has not provided sufficient evidence to conclude whether or not there is a *de minimus* impact. Additionally, the Assessment has also failed to describe how any changes in the benthic community composition would affect survival, growth, reproduction, and other sublethal endpoints of higher trophic level predators that rely on the benthic community for food, including protected species such as Atlantic sturgeon. The text does not sufficiently assess impacts to Critical habitats for Atlantic sturgeon, which are designated under National Marine Fisheries Services. 50 CFR Part 226; 82 Fed. Reg. 39160 (Aug.17, 2017).

The Applicant further acknowledges that:

Suspension of sediment during dredging may result in a temporary reduction in dissolved oxygen concentrations although this condition will be minimal and localized.

Remarkably, the Applicant offers no scientific support or modeling for its calculation of dissolved oxygen impacts in this critical habitat. The Applicant does not describe mitigation techniques such as turbidity curtains, or any other mechanism, to minimize and localize the impacts it knows it will cause. Further, this suspension of sediments, and its resultant reduction in available oxygen for wildlife is never discussed in connection with the proposed shoaling fans, which by design continually pump sediment into the water column. This could create a longer-term oxygen-depleting condition that the Applicant chooses not to address despite its reliance on these shoaling fans to compensate for its proven lack of CDF capacity for the dredged material. For example, the suspension of these sediments could impact parameters beyond just dissolved oxygen to include pH and turbidity, which in turn could impact chemical solubility and toxicity. Considering the sheer volume of material that would be disturbed by these fans, this constitutes a material and misleading omission on one of the most critical aspects for review of the EDP. In short, it is likely that the impacts due to the reduction in dissolved oxygen could prove highly detrimental to organisms in and around the EDP.

In Section 7.1 the Applicant exacerbated the confusion regarding impacts to Species of Concern when it conducted the fish sampling (beach seine sampling) event on July 29, 2019. Given the importance of determining the species typically present, and analyzing the possible impacts to shortnose sturgeon, it appears dubious that the

Applicant chose a sampling date known to occur outside the fall and winter time frames during which shortnose sturgeon would be expected to be present at and around the EDP site. Table 4-1 of the Applicant's Biological Assessment identifies this window of time for the sturgeon. Since the EDP involves permanent alteration (deep dredging to remove two strata) and regular, ongoing disturbance (shoal fan operation) of the river bottom in and near the project area, multiple sampling events throughout the year would be needed to accurately characterize the species that utilize the area.

Further, the Applicant's methodology for characterizing sub-aqueous vegetation ("SAV) in Section 7.1.4 is deceptive. The analysis relies on data from an October 22, 2018 SAV search, which was intentionally conducted outside the NMFS June 1 through October 15 time frame specified by NMFS for such surveys. The Applicant notes that a second effort to search for SAV was performed on August 1, 2019 and October 11, 2019, inside of the appropriate time window. However, only the 2018 SAV survey report is included in the EFH Report. The 2019 SAV survey report(s) should also be included for completeness, but in any case, the October 22, 2018 data should be excluded, indicating that the Applicant has submitted no information in its Application characterizing the SAV attributes of the project area.

Section 8 details many of the impacts associated with the EDP's construction process. The Applicant identifies the removal of substrate by dredging as a potential adverse effect but ignores any discussion of such impact on a continuing basis by use of the shoaling fans, which will create a continuous condition in which the substrate is removed. Further while noise associated with pile driving is discussed, there is no analysis of the continuous noise created by the shoaling fans.

Further Sections 8.1.4 and 8.1.5 state that shoaling fans do not increase turbidity and instead create a horizontal flow of water to inhibit settling. This is in direct contradiction of Section 6.1 of the Biological Assessment, which states: "[E]ach fan within the group would be operated sequentially, in coordination with the tide, stirring the water column..." It appears questionable that a horizontal flow of water could be maintained while cycling shoaling fan operation and operating this novel configuration in a high-energy system such as the EDP. The shoal fans would be expected to stir the water column, as stated in the Biological Assessment, which could increase turbidity, for example by propagating eddies into the river bottom, or alter existing density gradients. The Applicant should revisit this analysis to accurately depict how shoaling fans are expected to operate, and there must be consistency in such information among the various reports incorporated into the Application. This constitutes a material deviation in how the fans operate and supports the proposition that the Applicant is proposing a novel technology that has little track record for performance under the conditions established at the EDP, and that it does not fully understand.

Lastly, the Report concludes that there are a number of environmental benefits derived from the EDP. The Applicant highlights the benefit of the shoaling fans by stating:

The potential installation of shoaling fans to manage sedimentation within the berth area is intended to reduce the frequency of maintenance dredging. The reduction in disturbance frequency may promote colonization of beneficial benthic organisms in the newly exposed and cleaner river bottom in place of the pollution tolerant and invasive species currently found at the project site.

This conclusion is the first time the Applicant characterizes the wildlife in the EDP area as constituting “invasive” species. The complete analysis of determining which among the various organisms found in and around the EDP site are invasive in nature appears to be missing from the Report, and thus the conclusion is completely unsupported by data. Secondly, there is an implicit admission in this discussion that the annual maintenance dredging process, if shoaling fans fail technically, appears likely to increase the presence of invasive species. The Applicant does not attempt to reconcile this discrepancy, but it once again demonstrates that the EDP appears wholly reliant upon the implementation of shoaling fans to increase the purported benefits of the project, and to reduce the quantity of annual dredging in the hope that it will be sufficiently reduced to fit within the limited capacity of WHS.

8. Biological Assessment (“BA”)

As an overall observation, the BA discusses shoaling fans in various portions, but does not cohesively examine their potential impact. In particular there is no hydrodynamic modeling, which should be performed to determine the full extent of impacts in order to account for the forces of the shoaling fans, especially given the unprecedented scale of this deployment. Further, the goal of the fans is to reduce the amount of sedimentation within the EDP thereby reducing the port’s maintenance dredging while potentially causing increased maintenance dredging of the Main Navigation Channel or burdening other as yet unidentified property with over 500,000 cubic yards of sediment annually. The Applicant appears to have no concern regarding the fate and transport of the sediment spewed by the shoaling fans, and further fails to provide a single reliable technical study in support of the efficacy of this technology. At most the Applicant cites to manufacturer-conducted studies and marketing materials in support of much smaller deployments of this technology. The Applicant undertook no steps to observe how these fans function at currently operating sites, nor is any data from these sites provided to support any technical conclusions regarding the fans’ performance, or the impacts of the downstream deposition of materials.

In addition, the planned dredging will significantly reduce the habitat of species dependent on tidal flat habitat (i.e., birds and benthic organisms). The Applicant failed to perform any detailed analysis to determine the full extent of impacts.

a. Impacts of Dredged Material

In Section 4.2.4, the Applicant notes that the current spawning location(s) of Atlantic sturgeon in the Delaware River have not been identified and acoustic tracking data suggest that spawning areas may be approximately 7-19 km upriver of the EDP.. The

section also notes that Atlantic sturgeon spawning areas are typically characterized by moderate to fast current velocities and hard substrates. There are locations much closer to the Edgemoor site that fit descriptions of sturgeon spawning sites, such as Cherry Island Flats. If current spawning locations are not known, it is not possible to know whether they would be near the Edgemoor site. If data strongly point to spawning areas upriver of the site, the evaluation needs to show that all effects (visibility, noise, temperature, etc.) of the project construction and operation would not impact the sturgeon's ability to migrate to its spawning locations. The Applicant should conduct further study to determine whether or not spawning may occur in the short distance between Claymont, De and the EDP location in order to better assess the potential impacts of dredging on spawning grounds, as well as the presence of additional spawning grounds.

Section 6.1.1 (Risk of Entrainment of Sturgeon) references opinions that “the noise and turbidity associated with an operating dredge may elicit an avoidance response that would further reduce the vulnerability of the juvenile sturgeon to entrainment”. However, the section also concludes that it is “unlikely that the operation of the dredge would affect the movement or other behaviors of juvenile and adult sturgeon in the adjacent river.” The bases for these two opinions, on entrainment and behavioral impact, are incompatible. If operating a dredge would elicit an avoidance response in sturgeon, the Applicant must evaluate whether this would be considered a behavioral impact to be evaluated under the Endangered Species Act.

The BA describes the interaction between the sturgeon and suspending sediments generated during dredging operations in Section 6.1.2. This Section states that there is relatively little literature on the effects of suspended sediments on sturgeon, but later concludes that it is unlikely that suspended sediment resulting from dredging for the project would have a significant effect on sturgeon. While the conclusion is strongly stated, it is clear there is little or no technical support for this dismissive conclusion, and no attempt to demonstrate that what little scientific literature is available on this topic pertains to the conditions at the EDP. There is also no discussion of mitigation techniques the Applicant could deploy to mitigate the presence of suspended sediments by using sedimentation curtains, fish exclusion barriers, or other techniques constituting best management practices. Without BMPs in place for both limiting the impact of dredging and keeping sturgeon away from the work site, there are no controls keeping sturgeon from being harmed and/or killed as a direct result of dredging operations.

In Table 6-3, the modeled concentrations of PCBs within mixing zone for stratum A is well above the chronic stream quality objectives (“SQO”) for PCBs and closer to the order of the acute SQO for PCBs. The modeled concentration of copper within the mixing zone for stratum A is also approaching the acute SQO for copper. The provided rationale for use of chronic SQOs as the threshold for this project includes the shifting of the plume and that sturgeon would be anticipated to move out of the plume. Given the length of dredging periods proposed and the low precision typical of plume models, the chronic SQOs are potentially a more appropriate threshold to use. Additionally, this section does not discuss species other than sturgeon that may be affected by

contaminants, including benthic prey species consumed by sturgeon which could create a bioaccumulative impact.

Similarly, in Section 6.1.4 which considers impacts to benthic prey communities, the Applicant characterizes the dredging impact as temporary. However, the proposed project would permanently change the nature of the river bottom from a primarily silty and sandy environment to a primarily clayey environment. The section does not discuss the predicted impact of this change on benthic prey communities. That is, the BA acknowledges that there will be a change to the nature of the benthic community upon which the shortnose sturgeon rely for survival, but does not characterize how it will change, or even examine whether the new population will provide a reliable food source for other species.

b. Effects of Shoaling Fans (Section 6.1.6)

Given the importance of shoaling fans to the alleged reduction of annual dredging requirements, the discussion of this novel technology is short, vague and conclusory. This section does not address the potential for underwater sound or pressure waves from shoaling fans to affect biological species. As aforementioned, the Applicant discusses the potential impact of sound and pressure waves associated with the pile driving activities, which are more acute in nature. The shoaling fans may create chronic and sporadic conditions that may impact proximate species, but the Applicant fails to address this aspect of its proposed novel technology. The particles cannot remain suspended forever.

Additionally, the section cites that shoaling fans do not increase turbidity but does not provide a physical basis for this conclusion:

field studies have shown that shoaling fans do not increase turbidity, but simply keep sediment suspended in the water column...and therefore, water quality will not be negatively affected.”

This passage references SedCon Technologies, 2019 which is a white paper prepared by another port authority on behalf of SedCon, which manufactures the shoaling fans. There appears to be no peer-reviewed scientific literature or other impartial study that can corroborate SedCon’s finding. Additional field studies should be provided, or pilot studies conducted to support the statement that water quality would not be negatively affected. For example, this Section does not discuss the effects of extended sediment suspension on sturgeon food sources (e.g., mussels), or whether clouding the water impacts fish foraging success given diminished visibility. Another important unanswered question relates to the impact of the fans on benthic habitat, particularly considering that sturgeon are benthic invertivores and this is in an area designated as critical habitat.

The Applicant has an obligation to provide a robust demonstration that these devices are well understood, and their impacts are both discernable and measurable. Given the fans’ rotation to send the water current with the prevailing tide, is there a potential for sensitive species upstream and downstream but outside of the Action Area to

be impacted? The Applicant has documented that there are sensitive sea turtles and whales downstream of the site (EA Section 4.2.3 Threatened & Endangered), but there is no data modeling any impact from the fans, or demonstrating its predicted rate, velocity, and/or direction of discharge.

The Applicant states: “Shoaling prevention fans do not increase turbidity but allow sediment to stay suspended in the water column rather than settling on the river bottom.” It is hard to reconcile how large quantities of sediment suspended in the water column have no potential to cause turbidity without a careful demonstration of the concentration of discharge and how quickly it may settle out of the water column. In short, the Applicant states that it will need to conduct as much as 500,000 cubic yards of annual maintenance dredging. That material either gets placed in a CDF or blown through the water via shoaling fans. The Applicant has failed to account for how this quantity of material can be accommodated at or near the EDP without having any potential adverse impact on endangered and threatened species. Perhaps NOAA’s conclusion is most salient:

Recognition and discussions of potential impacts associated with the shoaling fans is limited or has been discounted. This lack of analysis is concerning because the use of such fans is rather limited across the United States, impacts are not fully described or understood on the individual, population, community, or ecosystem level. Large numbers of fans in series such as those proposed here are rare or absent, and the potential for impacts to commercial, recreational, and ecologically important area could be profound and wide-ranging both individually and cumulatively.

9. Appendix 20 (Sediment and Surface Water Quality Assessment)

a. General Overview

The sediment quality assessment focused predominately on near-surface sediments that could be recovered using vibracore sampling techniques. Stratum C was only evaluated from 5 test borings collected in 2016. Of the total estimated dredge volume, the near surface sediments represent a small portion of the total dredge volume. The Applicant assumes the elevated metals concentrations detected in Stratum C are naturally occurring, but no reference site data has been provided for justification. Additional environmental sampling should be performed to adequately determine potential contamination of the entire proposed dredge cut. Furthermore, the “Sediment and Surface Water Quality Assessment” did not adhere to the Delaware Statewide Dredging Policy Framework or the Inland Testing Manual (USEPA/USACE 1998). The Dredging Policy Framework outlines the required steps and methods for evaluating and reporting the environmental effects of dredging projects in a tiered approach. For example, it is assumed this is a Tier 1 evaluation, but it is not explicitly stated.

b. Section VI.a (Sediment Transport and Deposition)

The Applicant states that the EDP is located in the turbidity maximum of the Delaware River Estuary, the portion that mixes the saltwater and freshwater. Consequently, the sediment in the vicinity of the EDP becomes a “fluidized mud.” Because of the unique characteristics of the sediments in this immediate area, the Applicant must perform treatability testing to determine how this sediment will react when placed within a CDF. Sediments with this nature and fine sediments in general with specific gravities similar to that of the surrounding water typically will not settle without addition of polymer/flocculants to increase particle size and settling velocity. If polymers and/or flocculants are necessary, effluent water from the CDF may become subject to pre-treatment standards prior to discharge. Moreover, the Applicant must analyze whether the controls currently in place at WHS (or other possibly proposed CDFs) are sufficient to prevent the release of such fine grains of sediment.

c. Section XII (Data Assessment)

The Applicant notes that anticipated dredged materials have been impacted to varying degrees by an array of contaminants including PAHs, PCBs, and Metals. CDFs are typically not built or suited for contaminated dredge material. Additional analysis for suitability of disposal including additional characterization at a denser sample frequency should be performed to adequately characterize the anticipated dredge material. The samples collected are suitable for initial characterization. However, given the results, the ~20 samples collected are not suitable to adequately characterize over 3.3 million cubic yards of sediment given that typical disposal characterization for contaminated and impacted sites require 1 sample per 2000 tons.

The purpose of the Assessment as stated within the report itself is to assess ecological risks from substances found in sediments, soil, and surface water associated with the proposed project. Yet, the ecological risk assessment (ERA) did not follow standard guidance recognized by state and federal agencies, most notably the USEPA’s “Ecological Risk Assessment Guidance for Superfund” (“ERAGS”). EPA 540-R-97-006, OSWER 9285.7-25, PB97-963211, June 1997. The ERA failed to describe the environmental setting, establish that data were suitable for use in an ecological risk assessment, provide an ecological conceptual site model, identify assessment and measure endpoints, explain how or why certain ecological screening benchmarks were selected, and provide an uncertainty assessment quantifying how risks might be underestimated. These elements of the risk assessment are critical to evaluating risks to the environment and understanding if there are data gaps that can be addressed to reduce uncertainty. Without following the proper USEPA framework, the ecological risk assessment is incomplete.

The ERA included mercury in the AVS SEM evaluation (Section XII). The acid volatile sulfide/simultaneously extracted metals (AVS SEM) evaluation was not performed in accordance with USEPA guidance “Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Metal Mixtures (Cadmium, Copper, Lead, Nickel, Silver, and Zinc), EPA-600-R-02-011.” As noted in the title, the AVS SEM evaluation does not include

mercury. As stated in Section 4.1 of the USEPA guidance document: “[a]dditional research is required...to derive an ESB for other metals such as *mercury*” (emphasis added). There is no basis for excluding mercury as a contaminant of ecological concern (COPEC) based on AVS-SEM. In the absence of mercury chemical speciation data, when comparing mercury to ecological sediment screening values, standards based on methyl mercury should be used, especially considering site-specific TOC values. USEPA Region 4 and Los Alamos National Laboratories are examples of two widely accepted sources of ecological sediment screening benchmarks for methyl mercury sediment screening values protective of both benthic invertebrates and wildlife.

The ERAGS ERA guidance requires that analyte detection limits be compared to ecological screening values. Samples with detection limits that are higher than screening benchmarks are not suitable for use in ecological risk assessment. Data with reporting limits higher than screening levels should not be used as a basis for eliminating analytes as COPECs. This data usability evaluation must be performed before the ERA can be completed. The ERA further states that NOAA SQuiRt tables were used as sources of ecological benchmarks. NOAA stopped updating SQuiRT tables in 2008, and these should not be used as a source for screening benchmarks. Risks should be rescreened using benchmarks from sources that are more up to date.

Available ecological screening benchmarks for sediment are largely based on laboratory studies that measured adverse effects to benthic species and are not protective of wildlife. Any conclusions about negligible risks to wildlife are invalid if based on sediment screening benchmarks alone, which is the Applicant’s approach. The ERA should evaluate risks to birds and mammals using food chain models.

PAHs in sediment are additive or cumulative with respect to effects to benthic invertebrates. The ERA assessed sediment PAHs individually. In Section XII, The ERA should assess cumulative effects of PAHs as described in “Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Procedures for the Determination of the Freely Dissolved Interstitial Water Concentrations of Nonionic Organics EPA/600/R-02/012.”

The ERA (Section XII) found that concentrations of certain metals in stratum C were above sediment screening benchmarks. Under ERAGS ERA guidance, the ERA should proceed to a baseline ecological risk assessment. Risks to and from contaminants of potential ecological concern should be assessed using toxicity tests.

d. Table 1.6

Considering that stratum C will become the new channel bottom, five sediment analytical chemistry samples (Table 1.6) is insufficient to characterize future conditions especially factoring the size of the dredge area. A significantly larger and more robust sediment analytical sampling program that characterizes the zone of biological activity and that accounts for bioturbation and scouring zones needs to be executed in order to demonstrate that dredging will not expose receptors to harmful concentrations of chemicals.

e. Section XIV

Evaluation of CDF Effluent Water Quality uses a particle density of 2.65 g/cm^3 , Effluent analysis should be recalculated using actual site data. Silts and clays are typically much lighter and less dense than the bases of this calculation. As referenced in Section VI.a, sediment within this area, specially stratum A have been described as a “fluidized mud” which will take significantly longer to settle unless combined with flocculating agents. Again, if flocculating agents are appropriate, then additional water quality studies of CDF effluent is required to rule out the need for pretreatment.

10. Navigation Study

While the Navigation Study examines berthing using the turning basin and ship passing scenarios in its simulations, it does not discuss the appropriateness of the turning basin relative to its location in the center of the main navigation channel and whether the USCG or the USACE have approved the placement of the turning basin at that location. There is no indication of how ships can pass if a turning is occurring, nor is there any indication of what would happen in the event the ship lost steam during a turn, blocking essentially all of the Main Navigation Channel.

The Navigation Study notes that the simulation does not consider the impact of berthed ships on the pier’s fendering system from swells from passing vessels. A Passing Vessel study that examines this phenomenon should be conducted. It is anticipated that when Post-Panamax ships begin transiting the navigational channel, large swells with the potential to impact pier infrastructure through displacement of berthed vessels will be very likely. The Study indicates that “Berthing procedures, tug power, and emergency procedures would be developed in future simulation studies.” It is important to examine how tugboats can maneuver Post-Panamax vessels at times of high winds and tide, and in the event a vessel loses steam during a turn. There is no indication such studies have been conducted, and thus the Navigation Study is wholly inadequate to comprehensively address design and safety issues associated with this proposed turning basin.

11. Economic Impact Study

This Study purports to examine the current economic factors associated with the Port of Wilmington’s operation using the IMPLAN model to forecast direct and indirect jobs and revenues associated with the operation and expansion of the Port. The Study has very limited value and establishes that neither the Port nor the DSPC has the resources to adequately expand capacity.

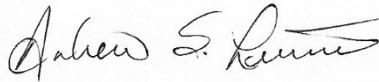
Any future meaningful economic study should carefully evaluate the extent to which volume anticipated at the EDP constitutes new business with respect to all of the Delaware River ports, or whether any of the revenue to be derived at the EDP constitutes parasitizing existing business upriver. The distinction will be critical in analyzing the extent to which the EDP adds revenue and value to the regional economy or whether it is taking business from the upriver ports, which will be material to the cost benefit analysis to be undertaken in connection with the regulatory evaluation of the EDP. Only new business should be counted toward the benefits analysis for the EDP, and all jobs and

related indirect benefit data must relate solely to new business, as the existing regional business is already accounted for in the approvals associated with the upriver ports.

CONCLUSION:

PhilaPort notes that the Applications are incomplete and rely on incomplete studies and assessments. For all of the above-stated reasons, DNREC should reject these applications and require that the Applicant provide complete application packages that reflect a robust investigatory process with respect to environmental conditions, endangered species, dredge handling and disposal, and safe vessel turning procedures. Kindly contact the undersigned with any questions you may have and thank you for the opportunity to participate in this proceeding.

Best regards,

A handwritten signature in black ink, appearing to read "Andrew S. Levine". The signature is written in a cursive, flowing style.

Andrew S. Levine
Partner

Attachments



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
<http://www.fws.gov/chesapeakebay>

September 21, 2020

Lt. Colonel David Park
District Engineer
Philadelphia District
U.S Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

RE: Diamond State Port Corporation Public Notice: CENAP-OP-2019-278

Dear Lt. Colonel Park:

The U.S. Fish and Wildlife Service (Service) has reviewed Public Notice (PN) CENAP-OP-2019-278, dated July 30, 2020 (issued on July 24, 30, 2020, then reissued with an extension September 1, 2020) and the Wilmington Harbor Edgemoor Expansion Environmental Assessment Technical document (EA), dated March 20, 2020 (revised June 2020). Both documents describe an application from Diamond State Port Corporation (Applicant) to develop a new, multi-use containerized cargo port facility (Edgemoor Port Site) on the mainstem of the Delaware River in New Castle County, Delaware. The facility will be associated with the Port of Wilmington and is located at the former Chemours manufacturing facility.

The project is being evaluated by the U.S Army Corps of Engineers (Corps) for a permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344) to discharge fill material and to conduct dredging and disposal activities within, and adjacent to, navigable waters of the United States at the proposed Port of Wilmington, Edgemoor Expansion project site. In addition, the Applicant has requested permission under 33 USC 408 (Section 14 of the Rivers and Harbors Act of 1899; hereinafter Section 408) to utilize a portion of the Main Navigation Channel of the Delaware River, Philadelphia to Sea Federal Navigation Project, as their ship turning basin. The Service offers the following comments pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*), National Environmental Policy Act (83 Stat. 852, 42 U.S.C. 4321 *et seq.*), and Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C., 1531 *et seq.*) for your consideration.



The applicant is seeking authorization for the following activities.

Dredging

The applicant proposes to conduct hydraulic dredging within the Delaware River to make the proposed port available to deep draught container cargo vessels. The dredging site is located adjacent to and north of the Delaware River Federal navigation channel, in the southern portion of Reach B of the river at the intersection of Cherry Island and Bellevue Ranges. By conducting the dredging, the Applicant proposes to deepen portions of the Delaware River adjacent to the Federal navigation channel in order to create a primary access channel intended to serve as a ship berth to be located along the shoreline of the Edgemoor site. The Applicant also proposes to create this berth by hydraulic dredging. The access channel will be maintained at a depth of -45 feet mean lower low water datum (MLLW). The proposed access channel would terminate at the new ship berth which would also be maintained at a depth of -45 feet MLLW. The dredging would generate approximately 3,325,000 cubic yards of dredged material removed from the river. This is new dredging and would occur entirely in the subtidal shelf. Following the initial dredging, it is anticipated that the access channel and berth site would require the maintenance removal of approximately 500,000 cubic yards of accumulated sediment annually.

Disposal of Dredge Material

During the initial dredging, a portion of the dredge material would be pumped to the Edgemoor container port facility, contained on uplands, and de-watered in a single use Confined Disposal Facility (CDF) constructed for the project until dried sufficiently for re-use. That material would represent 10 percent of the total volume of material to be dredged, and would be limited to sediments removed from stratum B, which are primarily sandy in texture. The Applicant proposed to re-use these materials in a beneficial manner on upland portions of the site and as fill material landward of the proposed bulkhead. The Applicant proposes to dispose of the remainder of the dredged material from initial construction at one or all of several Corps-owned CDFs (Wilmington Harbor North, Wilmington Harbor South, Reedy Point North, and Reedy Point South), each of which is located downstream of the dredging site. The material generated by initial construction and all subsequent maintenance dredging would be removed from the dredging area by hydraulic dredge and transported via hydraulic pipeline to one or all of the Corps' CDFs as available capacity allows.

Port Construction

The project includes the construction of an approximately 2,600-foot long, pile supported wharf and steel sheet pile retaining wall (bulkhead) along the landward side of the wharf structure. The bulkhead would be constructed largely in the river, below the elevation of mean high water landward of the bulkhead. During discharge operations, the dredged material will be contained by the bulkhead on the riverfront side and by higher elevation uplands which surround the containment area. Construction of the bulkhead would necessitate the discharge of fill material into 239,580 square feet (5.5 acres) of the river below the high tide line. The proposed height of the fill behind the new structure would be +18 feet NAVD88. The proposed elevated wharf structure would be built waterward of the new bulkhead, and would be constructed of poured concrete, supported by 4,500 20-inch diameter steel pipe pilings filled with concrete. The wharf would be a high deck structure, with fendering along the river, and would be 325,000 square feet in size.

Sedimentation Fans

The Applicant proposes to install a series of sedimentation fans along the riverfront face of the wharf. These fans are intended to reduce the volume of maintenance dredging associated with the project, and to maintain the functionality of the berths. The fans would be spaced every 200 feet along the wharf face (i.e., 13 fans). Each fan unit would be secured to the dock structure on a batter pile extending beneath the dock. In operation, water is drawn down into the top of a 48-inch diameter “J-shaped” tube, passes through a hydraulically powered pump impellor, and is discharged as a jet along the bottom of the river. The hydraulic power is supplied by a land side structure which provides the hydraulic pressure to the fully submerged unit. The hydraulic fluid consists of a biodegradable vegetable oil suitable for water applications. The fans within the units are configured to rotate at speeds on the order of 275 revolutions per minute and provide a 4-inch screen at the larger intake end and an open space of 1.5 feet between the blades. The fans would operate during periods of tidal current (ebb and flood) and slowly rotate in a semicircle to direct the discharge jet in the direction of tidal current flow, thereby enhancing the velocity of the ebb and flood currents within the berth area. The run-time for each unit during a specific tide is approximately 30 minutes, during which time the unit completes 90 degrees of rotation. The units would operate four times per day: twice during the flood tide and twice during the ebb, but would be idle during slack water periods. The effective sedimentation prevention distance covered by each unit is anticipated to be approximately 160 feet channelward from the breasting line of the berth. Each fan would be secured by one 18-inch steel H Piling.

Compensatory Mitigation

The PN states that the Applicant has determined that compensatory mitigation is not necessary.

Comments

Endangered Species Act (ESA)

The Applicant submitted an online project review request on November 5, 2019. The only listed species under the jurisdiction of the Service present in the vicinity of the project is the threatened northern long-eared bat (*Myotis septentrionalis*). Because there will be no tree clearing, the project will have “no effect” on the northern long-eared bat. No further consultation pursuant to Section 7 of the ESA is required by the Service. If project plans change or new information on federally threatened or endangered species becomes available, this determination may be reconsidered. The Service is not providing comments on Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*) which are federally listed species since consultation will occur with the National Oceanic and Atmospheric Administration, the agency that has jurisdiction over these species.

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 may result in modifications to a natural stream or body of water. It is also required that they consider effects that these projects have on fish and wildlife and must also provide for improvement of these resources. The following comments are provided under the authority of the FWCA.

Anadromous fish habitat

On page 5 of the PN (issued July 20, 2020) and page 71 of the EA (2020), a statement is made that based on fish sampling and fish stock assessments (with citations provided on page 70 under the Benthic Resource Assessment), there is an absence of resources suitable for fish spawning, breeding, feeding, and growth and no habitat of value was identified within the project area. The Delaware River Fish and Wildlife Management Cooperative's (Co-op) Dredging Windows Document (draft 2017) has information about spawning and nursery habitat for important species in the Delaware River. Below is a summary for the section of the river in which the project occurs and other supporting documentation that indicates use of the project area by a wide variety of fish species.

Area 2 - Delaware Memorial Bridge to Betsy Ross Bridge

The Delaware Estuary offers a migratory pathway and spawning, nursery, and forage habitat for a number of anadromous and catadromous fishes including striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and American eel (*Anguilla rostrata*). Improvements in water quality which have occurred in the last five decades throughout the watershed and, most specifically in the 30-mile reach of the tidal Delaware River which brackets Philadelphia, have allowed the reestablishment of many fish species which were severely impacted by low oxygen levels in the tidal Delaware River throughout much of the twentieth century (Waterfield et al. 2008).

Striped bass and possibly American shad spawn in this reach of the Delaware River and its tributaries. It is also crucial juvenile nursery habitat for these species. The major striped bass spawning habitat is located throughout Area 2, while American shad spawning is not as well delineated. Overfishing and poor environmental conditions led to the collapse of the striped bass fishery in the 1970s and 1980s and development of the Striped Bass Fishery Management Plan (FMP) in 1981 (ASMFC 2003). After years of increasing numbers following implementation of the FMP, commercial and recreational landings of striped bass as well as female spawning stock biomass and recruitment, have declined since their peak in the early to mid 2000s (ASMFC 2019). Most recently, the 2018 Atlantic Striped Bass Benchmark Stock Assessment found the resource overfished (ASMFC 2019). The spawning population of the Delaware River system contributes significantly to the coastal migratory stock (ASMFC 2003).

In recent years, the numbers of American shad have also decreased in the Delaware River, causing concern over the status of this stock (ASMFC 2007). The 2020 Benchmark Stock Assessment continued work from the 2007 Coastwide Stock Assessment for American shad, which also identified stocks as highly depressed from historical levels. The 2007 Assessment concluded that new protection and restoration actions needed to be identified and applied, which led to the development of Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (American Shad Management). Amendment 3 identified significant threats to American shad, including spawning and nursery habitat degradation or blocked access to habitat, resulting from dam construction, increased erosion and sedimentation, and losses of wetland buffers (ASMFC 2007). Protecting, restoring, and enhancing American shad habitat, including spawning, nursery, rearing, production, and migration areas, are necessary for preventing further declines in abundance and restoring healthy, self-sustaining, robust, and productive stocks to

levels that will support the desired ecological, social, and economic functions and values of a restored Atlantic Coast American shad population (ASMFC 2010).

The entire length of the Delaware River and portions of Delaware Bay are also confirmed spawning runs for river herring (NJDEP 2005). The river herring fishery has been active in the United States for 350 years. In addition to the commercial industry, there is an extensive recreational fishery. River herring population declines have been attributed to overfishing and the loss of historic spawning habitat all along the East Coast of the United States (NMFS 2009). 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 (ASMFC 2017). 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, 1 was increasing, and the status of 28 stocks could not be determined because the time-series of available data was too short (ASMFC 2012). The 2017 Stock Assessment Update indicates that river herring remain depleted at near historic lows on a coast-wide basis. Total mortality estimates over the final 3 years of the data time series (2013 through 2015) are generally high and exceed region-specific reference points for some rivers (ASMFC 2017). The “depleted” determination was used in 2012 and 2017 instead of “overfished” to indicate factors besides fishing have contributed to the decline, including habitat loss, habitat degradation and modification (including decreased water quality), and climate change (ASMFC 2017). Alewife and blueback herring have been designated as “species of concern” by National Marine Fisheries Service (NMFS) in a Federal Register Notice dated October 17, 2006 (71 FRN 61022). “Species of concern” are those species which NMFS has some concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the ESA. The shallow water environment in this section of the Delaware River provides valuable habitat for these species.

Surveys that support the use of these fish species in the section of the river where the project is proposed include survey information collected since the 1980s by the New Jersey Department of Environmental Protection and Delaware Fish and Wildlife. These long-term datasets provide an annual abundance index for finfish, and simultaneously document the use of the basin by blueback herring, alewife, American shad, American eel, Atlantic herring (*Clupea harengus*), Atlantic sturgeon, Atlantic menhaden (*Brevoortia tyrannus*), bay anchovy (*Anchoa mitchilli*), blueback herring, bluefish (*Pomatomus saltatrix*), gizzard shad (*Dorosoma cepedianum*), hogchoker (*Trinectes maculatus*), striped bass, spot (*Leiostomus xanthurus*), yellow perch (*Perca flavescens*), white perch (*Morone americana*), and Atlantic silverside (*Menidia menidia*) (NJDEP, 2010, 2012). These results have also been corroborated by other independent surveys, such as the Delaware Fish and Wildlife's striped bass spawning stock survey (Pyle 2011).

Other surveys further support the use of the project vicinity by a large number of fish species. Surveys conducted at the present Northport Development (and former Publicker Industries) site and directly upriver (River Mile 97) of the Walt Whitman Bridge resulted in a total of 5,718 specimens representing 27 taxa. Blueback herring and white perch together constituted 72.4 percent of fish caught. Other abundant taxa were gizzard shad, alewife, channel catfish (*Ictalurus punctatus*), silvery minnow (*Hybognathus regius*), striped bass, and American shad (RMC Environmental Services, 1994 in Waterfield et al. 2008). Menhaden and river herring

were found in every region of the Atlantic Coast and were shown to dominate the overall striped bass diet biomass (Walter et al. 2003).

Species composition and the relative abundance of fish in that section of the river also correlate comparatively with fish sampled by the Philadelphia Water District at the Phillips Petroleum Corporation's Trainer Facility (Weston Solutions 2002, 2010). These surveys strengthen the theory that shallow intertidal regions along the Delaware River, especially areas outside the main navigation channel, provide vital life-cycle habitat for numerous anadromous species. The overwhelming abundance of river herring (e.g., blueback herring, American shad, and alewife) collected during the summer (2009) survey implies that these shallow habitats along the riverfront are functioning as nursery areas for juvenile migratory fish, providing critical areas for foraging and refuge from predation (Philadelphia Water Department, 2009). Similarly, Weisberg and Burton (1993) found that river herring larvae were the third most abundant larval fish collected in the upper tidal river during 1987 and 1988, with only white perch and American shad being more abundant. They further reported that studies in the early 1970s had found river herring to be the most collected larvae, being found in densities several times greater than the next most abundant larvae, white perch.

Finfish surveys conducted by EA Engineering (1998) also indicated that white perch was the most abundant species in the areas followed by blueback herring, American shad, bay anchovy, and banded killifish (*Fundulus diaphanous*). Surveys also found a high proportion of juvenile fish, indicating substantial use of the area as a rearing nursery, particularly for American shad, blueback herring, hogchoker, and white perch. Juvenile American eel were observed as well, but not in large numbers. The catadromous American eel probably use the area more as a migratory corridor to upstream residential areas. Weisberg et al. (1996) also captured more than 25 different species in this section of the Delaware River including yellow perch, hickory shad (*Alosa mediocris*), hogchocker, banded killifish, and mummichogs (*Fundulus heteroclitus*).

Impingement/entrainment studies conducted at the Eddystone Generation Station, owned and operated by Exelon Corporation, and located along Crum Creek, a secondary tributary that flows into the Delaware River, approximately 8.5 nautical miles downriver from the project area, 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).

There is extensive literature that supports use of the project area by a large number of fish species for different parts of their life cycle. Shallow intertidal areas outside the navigation channel provide vital life-cycle habitat for numerous anadromous species and these shallow habitats along the riverfront are functioning as nursery areas for juvenile migratory fish, and providing critical areas for foraging and refuge from predation. This river reach also serves as a migratory pathway for species such as striped bass and river herring. Many of these species are commercially and recreationally important and managed by the Atlantic States Marine Fishery Commission (ASMFC) or are valuable prey species for ASMFC or federally managed fish. Finally, species such as blueback herring, alewife, striped bass, and American shad that are found in the project area are experiencing range wide declines.

Impacts from Construction of the Bulkhead and Wharf

We understand that the Applicant has committed to no pile driving or fill activities from March 1 through June 30. We appreciate the Applicant's efforts to avoid impacts to anadromous fish spawning. However, the project will result in a loss of 5 acres of shallow water habitat to construct the bulkhead and 7.46 acres of shallow habitat to construct the wharf with 4,500 piles placed 10 feet apart. We consider the wharf construction to be a loss of habitat due to the number and close placement of the pilings. Although 33 CFR §232.3 (Discharge requiring permits) generally exempts pilings as fill under Section 404, the regulations caveat this exemption and give clear direction as to when pilings must be treated as fill:

“(2) In addition, placement of pilings in waters of the United States constitutes a discharge of fill material and requires a Section 404 permit when such placement has or would have the effect of a discharge of fill material. Examples of such activities that have the effect of a discharge of fill material include, but are not limited to, the following: Projects where the pilings are so closely spaced that sedimentation rates would be increased; projects in which the pilings themselves effectively would replace the bottom of a waterbody; projects involving the placement of pilings that would reduce the reach or impair the flow or circulation of waters of the United States; and projects involving the placement of pilings which would result in the adverse alteration or elimination of aquatic functions.”
(Emphasis added)

While fish may use the edges of the wharf, the area below the wharf will likely not be used due to decreased circulation and space created by the large number of pilings spaced closely together. The Service recommends the Corps work with the Applicant, the Service, NOAA, and other stakeholders to develop a mitigation plan to offset this permanent loss of shallow water habitat used as a nursery and foraging area for a variety of species, several which are in decline due to habitat loss.

Dredging

We understand that the Applicant has committed to not dredging from March 1 through June 30. We appreciate the Applicant's efforts to avoid impacts to anadromous fish spawning. The Service encourages the Corps and the Applicant to consider beneficial or innovative use of dredge material for future maintenance dredging if contaminant levels are no longer a hazard to humans or fish and wildlife. This could result in habitat for fish and wildlife resources and reduce the demand for space at Corps' CDFs.

Sedimentation Fans

Sedimentation fans are problematic in that they operate daily, 4 times per day, 365 days per year. The turbines can impinge, but more likely entrain fish. The Edgemoor Power Plant had substantial impingement and entrainment impacts on bay anchovy, striped bass, Atlantic croaker (*Micropogonias undulatus*), and river herring – all species that occur in abundance in the vicinity of the proposed project (Entrix 2002).

The sedimentation fans would run during the time period that the Co-op would recommend restricted dredging and construction operations (March 1 through June 30), impacting spawning, larvae, and young of year fish. Although maintenance dredging may be needed annually if

sedimentation fans are not employed (from EA, page 65), the annual impact of dredging during fall or winter months will have a less cumulative impact to fisheries resources than daily operation of the sedimentation fans during spring and summer months.

Detailed Service comments on the Feasibility Assessment Document (Duffield Associates 2012) provided by the Applicant for the shoaling fans are provided in Appendix A of this letter. The Service does not agree with the report's conclusion of minimal impacts to fish species found in the project area.

The Service also agrees with statements made about impacts of these fans on fish mortality, ecosystem function, and aquatic habitat degradation by the Delaware Department of Natural Resources (DE DNR) in a letter dated August 31, 2020 addressed to the Delaware Wetlands and Subaqueous Lands Section. In particular, the letter cites concerns with the effect of fan discharge on the distribution of the sediment into the Delaware River and raises questions about the settling rates and settling location of this sediment. Continuous sediment loading into the river could smother fish eggs distributed in the benthos (i.e. sturgeon eggs). The fan intakes will also have adverse effects on pelagic fish eggs and larvae for species that are found in the water column including, but not limited to alewife and blueback herring, American eel, American shad, striped bass, Atlantic sturgeon, hickory shad, and shortnose sturgeon. Resuspension of chemicals into the water column could result in exposure to the dissolved phase contamination in the water, which is the primary cause of fish contamination, affecting egg and larval development of many fish species. The fans will increase fish mortality due to direct interaction with the fan intake/blades as documented by the Feasibility Assessment Document (Duffield and Associates 2012). Percent population reductions per day (two tidal cycles), assuming a mortality rate of 100 percent, are 0.66, 0.56, 0.48 for striped bass larvae, striped bass eggs, and Alosine (American shad, river herring) eggs, respectively (Duffield and Associates 2012). DE DNR extrapolated daily mortality rates given by Duffield and Associates (2012) for the total period of egg/larval occurrence, and found that the total mortality of eggs is 33 percent while the total mortality experienced by larval striped bass will be 100 percent in a single year. The letter finally goes on to state, "While other tributaries contribute to the Delaware Bay stock of Atlantic striped bass, the potential losses associated with the proposed project may reduce total bay-wide year class strength for this species as well as others. Further, creating large amounts of mortality would alter the ecosystem by impacting the trophodynamic processes (e.g. predator-prey interactions) while simultaneously reducing fishing opportunities for recreational and commercial anglers."

Ballast Water

There is no information in the project description regarding the potential for ships to need to withdraw water for ballast after unloading shipments. Water withdrawal can also result in entrainment and entrapment of fish eggs, larvae, and young of the year fish if proper screening is not utilized.

In summary, the Service recommends that the Corps more fully evaluate impacts to fish species from this project, particularly anadromous fish. All potential project activities that may not be included in the PN but associated with longterm operation of a port should also be evaluated, including the need to clean in-water structures, and the potential for ships to withdraw water for

ballast. Once this analysis is complete it may be necessary to include minimization and mitigation strategies for impacts to these species.

National Environmental Policy Act

Purpose and Need

The purpose of the project is clear (i.e. meet the projected increase in shipping with the completion of the Panama Canal Lock expansion, and strengthen Delaware's international waterborne trade capabilities which would contribute to the state's economy) but the need for the project is only evaluated based on the existing capacity and constraints of the Port of Wilmington, which is also located in Delaware. There is no evaluation of whether other nearby ports in Pennsylvania, New York, New Jersey, Maryland, and Virginia could meet the projected increase in shipping with the completion of the Panama Canal Lock expansion, and have the sufficient channel depth to accommodate larger-sized ships. It is not clear whether the construction of this new port with maintenance dredging to be conducted by the Philadelphia District will detract Federal resources for dredging from existing ports (on the East Coast) and whether it will compete for upland disposal sites.

Significant Impacts

The current project description includes no mitigation for losses of subtidal habitat expected from the dredging or wharf and bulkhead construction nor does the project sponsor offer any compensatory mitigation for the expected impacts of the shoaling fans on the early life stages of important fishery resources found in the project area. We assume that if utilized for the project, the shoaling fans would operate continuously for the life of the project (100+ years of cumulative impacts). The Service is concerned with the magnitude and severity of impacts the fans will have on important fishery resources, particularly striped bass and alosid species. We believe that these impacts are significant when considered over the life of the project. We recommend that the Applicant consider a less harmful alternative to the fans such as conducting maintenance dredging annually adjacent to the port with a time of year restriction. Since the Applicant has not demonstrated how they will minimize or mitigate the anticipated adverse impacts to fish and wildlife resources, the Service has determined that project impacts are significant, and pursuant to NEPA, the Corps conclude a findings of Significant Impact and develop an Environmental Impact Statement (EIS) for the project.

In summary, we do not believe that the Applicant's geographic scope of analysis to meet the project's need was sufficiently evaluated, nor has there been a sufficient analysis of impacts to fishery resources. We believe that significant impacts to fishery resources will occur from the project and the need for the Corps to prepare an EIS is justified based on the concerns raised above. The Service also recommends that the Corps and the Applicant continue to engage with the Federal resource agencies and stakeholders to identify changes to the project to minimize these impacts or to discuss ways that these adverse impacts could be mitigated.

The Service appreciates the opportunity to provide comments for the project. Should you have any questions or concerns regarding this letter please contact Julie Slacum of my staff at julie_thompson@fws.gov or 410/573-4595.

Sincerely,

Genevieve LaRouche
Field Supervisor

cc: B. Conlin, T.Schaible, COE
M. Mansolino, EPA R3
K. Greene, K. Hanson, NOAA
J. Clark and M. Stangl, DE Division of Fish and Wildlife

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Personal Communication

8/27/2020 Sheila Eyler, U.S. Fish and Wildlife Service, Mid-Atlantic Fish and Wildlife Conservation Office e-mail to Julie Slacum regarding shoaling fans.

8/25/2020 Brett Towler, U.S. Fish and Wildlife Service, Fish Passage Engineer, e-mail to Sheila Eyler regarding shoaling fans.

Appendix A. Service comments on the Shoaling Fans Feasibility Document (pers. comm. S. Eyler, USFWS, 2020) in blue text:

Under Section 4.0 on page 4, the report states:

- “Subsurface suspended sediment load and increased head differential did not attract or otherwise adversely affect American Shad or Lake Sturgeon. Shad preferred surface head differentials (Haro 2012).” Haro's study is based on a hydropower project in which fish are trying to find a way to pass through a dam and not directly applicable to this structure.
- Turbine passage survival for juvenile American Shad through Francis turbines operating at >6,000 cfs were relatively high at 89 percent (Heisey 2012). The shoaling fans operate at less than half of that flow rate (SedCon®). Flow rate has very little to do with survival through turbines, it is related to blade speed, distance between blades, and type of blades being used. Fish passing through these units would suffer high injury and mortality based on SedCon's® own paper (20 percent mortality for 2 inch fish) because of the high blade speed and small distance between blades (pers. comm. B. Towler, USFWS 2020).
- Small fish, zooplankton (e.g., shrimps, copopods, and amphipods), benthic macroinvertebrates, and fish eggs passed through the shoaling fans unharmed (PS&S 2003). The samples were taken in October, so it is inappropriate to evaluate impacts to fish eggs, larvae and young of year during that time of year because those life stages would not be available for the species of concern. Further, they found that 7 fish eggs were collected in a plankton tow, all with no damage, yet 5 of the 25 eggs they collected from the turbine outflow were damaged (which they attributed to natural causes without supporting information). If this can damage 20 percent of the eggs passing through the structure and they are in the vicinity of spawning habitat for striped bass and other species, that is a significant loss. They also stated that they had growth of organisms on the structure itself, which attracted copepods and mysid shrimp. Having macroinvertebrates attracted to the structure will increase fish attraction and will likely lead to more impingement/entrainment. Will the Applicant clean these structures of fouling organisms and how would they do it (Biocides or manually?)
- During site inspection and haulout immediately following a period of operation, a small fish (less than 3 inches) was observed resting on a shoaling fan structure (Beringer 2012). Similar to previous concern that fish will be attracted to the structure.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric
Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
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September 28, 2020

Lt. Colonel David Park
District Engineer
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

RE: Diamond State Port Corporation; CENAP-OP-R-2019-278

Dear Lt. Colonel Park:

With respect to the Diamond State Port Corporation (DSPC) permit application noted above and for the reasons described below, at this time we must recommend that the Department of the Army (DA) permit for the Edgemoor Port Site project not be issued. We have reviewed the following information provided to us regarding DSPC's DA permit application to develop a new, multi-use containerized cargo facility ("Edgemoor Port Site") associated with the Port of Wilmington at the former Chemours Edgemoor manufacturing facility on the mainstem Delaware River in New Castle County, Delaware:

- Essential fish habitat (EFH) assessment dated January 2020;
- the Corps' letter stating the EFH assessment was prepared on behalf of the District and requesting the initiation of an EFH consultation dated September 4, 2020;
- project application documents with various dates ranging from July 2016 to July 2020, including the Biological Assessment for Endangered Species;
- Public Notice (PN) CENAP-OP-R-2019-278, dated September 1, 2020; and
- *Revised* PN CENAP-OP-R-2019-278 dated July 30, 2020 (original July 24, 2020 PN).

Based on the information provided to us in the documents listed above, we have significant concerns about the proposed project, its impact to aquatic resources, the adequacy of the project purpose and need documentation, and the lack of a full and complete analysis of alternatives to avoid or minimize the adverse effects and compensatory mitigation for unavoidable impacts. We are also deeply concerned that the District and DSCP seem to have discounted decades of data on the aquatic resources found within the project area collected by the State of Delaware, the State of New Jersey, and others in favor of extremely limited and inadequate survey data produced by DSPC's consultant. In addition, both the EFH assessment and the Biological Assessment provided to us are incomplete, and lack a comprehensive evaluation of direct, indirect, individual, cumulative, and synergistic effects in the assessments and application materials



provided. This is especially concerning since we provided the District with extensive comments on the consultations required, aquatic resources under our purview, site-specific resources and habitat, in our February 28, 2019, response to the District's request for National Environmental Policy Act (NEPA) scoping comments.

Due to the significant impacts that will result from this project, the incomplete consultation, and the numerous inaccuracies and inadequacies in Districts' analysis of effects as discussed in the attached document, our recommendation that the DA permit for this project not be issued at this time is in accordance with Part IV, Paragraph 3(b) of the Memorandum of Agreement (MOA) between our agencies, due to the substantial and unacceptable impacts to aquatic resources of national importance. These resources include: American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass (*Morone saxatilis*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), and shortnose sturgeon (*Acipenser brevirostrum*) as well as the potential permanent impacts to Cherry Island Flats, a highly productive area for a number of commercially and recreationally important species including striped bass, and an extremely popular recreational fishing area. In addition, based upon the significant impacts resulting from the construction and operation of the proposed project, and pursuant to the National Environmental Policy Act (NEPA), we also recommend that the District reach a finding of Significant Impact and develop an Environmental Impact Statement (EIS) for the project. We have provided detailed comments on the proposed project and our concerns in the attached document.

Magnuson Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with one another on projects such as this that may adversely affect EFH. In turn, we must provide recommendations to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency. 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 this consultation procedure.

In the attached document, we discuss the inadequacies of DSCP's data and analyses including those in the EFH assessment. The EFH assessment provided to us is based upon incomplete and flawed data and does not evaluate the adverse effects of the project on EFH. As a result, it cannot be considered complete. Typically, in cases where the EFH assessment is not complete, we either withhold issuing EFH conservation recommendations until a complete assessment is provided, or we base our recommendations on the available information. In order to assist you in your public interest review and the evaluation of project effects, it seems appropriate to issue the following EFH conservation recommendation pursuant to section 305(b)(4)(A) of the MSA:

- The construction of the proposed Edgemoor Port Facility should not be authorized unless, through the preparation of EIS or other publicly reviewed comprehensive NEPA document it can demonstrate:
 - The justifiable project purpose and need;

- that no alternate sites are available within the region;
- that the impacts to aquatic resources have been avoided and minimized to the maximum extent practicable; and
- that suitable compensatory mitigation can be provided that offsets fully all of the project's direct and indirect effects on aquatic resources and their habitats, including the effects on anadromous fishes and benthic and pelagic habitats.

Please note that section 305(b)(4)(B) of the MSA requires you provide us with a detailed written response to our EFH conservation recommendations, including the measures you have adopted to avoid, mitigate, or offset the impact of the project on EFH. In the case of a response that is inconsistent with NMFS' recommendations, section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate or offset such effect pursuant to 50 CFR 600.920(k).

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA), 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 requires that they consider effects that these projects would have on fish and wildlife and must also provide for improvement of these resources. From the information provided, the project will have substantial and unacceptable impacts to aquatic resources that we seek to conserve and enhance under the FWCA, particularly anadromous species such as alewife, blueback herring, American shad, and striped bass. In addition, the loss and degradation of important habitat for these species, the impacts to early life stages from the operation of the facility, and the lack of any compensatory mitigation to offset the adverse effect do not support the FWCA's requirement to provide for the improvement of the fish and wildlife resources.

Endangered Species Act

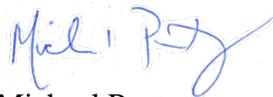
As stated in our February 28, 2019, letter, the following protected species and critical habitat may be affected by the proposed project: Shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), Kemp's Ridley turtle (*Lepidochelys kempii*), Leatherback turtle (*Dermochelys coriacea*), Loggerhead turtle (*Caretta caretta*), Green turtle (*Chelonia mydas*), North Atlantic Right whale (*Eubalaena glacialis*), Fin whale (*Balaenoptera physalus*). In addition, critical habitat of Atlantic sturgeon has also been designated with the Delaware River.

The Endangered Species Act (ESA) requires federal agencies (in this case, the District) to ensure, in consultation with us, 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. An interagency consultation, pursuant to section 7 of the ESA, for the proposed project is necessary, and has been started by the District. It is important to note that in the regulations implementing section 7(a)(2) of the ESA (interagency consultation), "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action,

including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Staff from our Protected Resources Division have been coordinating with your staff to address the deficiencies in the Biological Assessment provided to us.

As always, we hope that this issue can be resolved at the staff level and we welcome the opportunity to meet with you to discuss our comments and concerns. If you would like to discuss this matter further, please contact Keith Hanson at (410) 573-4559 or keith.hanson@noaa.gov with our Habitat Conservation Division and/or Peter Johnsen at (978) 281-9416 or peter.b.johnsen@noaa.gov with our Protected Resources Division.

Sincerely,



Michael Pentony
Regional Administrator

cc: USACE - J. Brundage, T. Schaible, A. DiLorenzo, S. Sanderson
NMFS GARFO - P. Johnsen; M. Murray-Brown
NOS - S. Hahn
USFWS - C. Guy, J. Thompson
EPA Region III - J. Davis
DNREC - M. Stangl, M. Greco
NJDEP- S. Biggins
PFBC - D. Pierce, T. Grabowski
MAFMC – C. Moore
NEFMC -T. Nies
ASFMC - L. Havel

**ATTACHMENT – NOAA FISHERIES Comments
Diamond State Port Corporation; CENAP-OP-R-2019-278**

Introduction

We have significant concerns about the proposed project, its impact to aquatic resources, the adequacy of the project purpose and need documentation, and the lack of a full and complete analysis of alternatives to avoid or minimize the adverse effects and compensatory mitigation for unavoidable impacts. In addition, both the EFH assessment and the Biological Assessment provided to us are incomplete. As a result, we must recommend that Department of the Army permit for this project not be issued at this time in accordance with Part IV, Paragraph 3(b) of the Memorandum of Agreement (MOA) between our agencies due to the substantial and unacceptable impacts to aquatic resources of national importance including American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*) and striped bass (*Morone saxatilis*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), and shortnose sturgeon (*Acipenser brevirostrum*). We also recommend that the District reach a finding of Significant Impact and develop an Environmental Impact Statement (EIS) for the project due to the significant impacts resulting from the construction and operation of the proposed project, and pursuant to the National Environmental Policy Act (NEPA). Our detailed comments are provided below.

Project Description

According to the PN, DSPC is seeking authorization to hydraulically dredge 3,325,000 cubic yards (cy) of material from 86.9 acres of the Delaware River to create a new access channel between the existing Delaware River Federal Navigation Channel and the proposed Edgemoor Port Site. The access channel would have a maintained depth of -45 feet (ft.) mean lower low water (MLLW), though current water depths range from intertidal to -35 ft. MLW including a 450 to 550 ft. wide subtidal flat with depths of -10 ft. MLW or less.

According to the PN, approximately 10% of the total volume of material to be dredged including (fluvial sand) sediments containing PCBs, dioxin, arsenic, and thallium at concentrations above human health screening levels will be placed in a confined disposal facility (CDF) on uplands on the project site. This material will later be used as fill material on the site including a 5.5-acre area of the Delaware River landward of the proposed bulkhead. The remaining materials are proposed to be placed at several Corps of Engineers-owned confined disposal facilities (CDFs) including Wilmington Harbor North, Wilmington Harbor South, Reedy Point North and Reedy Point South. Following the initial dredging episode, it is anticipated that the access channel and berth site would require the maintenance removal of approximately 500,000 cy of accumulated sediment annually; all material will also be disposed of in the Corps' CDFs.

DSPC also proposes to construct an approximately 7.5-acre wharf supported by 4,500 20-inch diameter, concrete-filled steel pipe piles. The direct fill associated with the piles is 0.23 acres of

river bottom. Although the PN does not clearly state the length and width of this structure, it appears that the wharf will extend at least 2,600 linear ft. along the shore and extend 112 ft. waterward of a proposed sheetpile bulkhead. According to the PN, approximately 5.5 acres of river below the high tide line will be filled landward of the bulkhead. Additional details in the application materials indicate that the area to be filled are intertidal and subtidal shallows, but detail on how far waterward from the high tide line and the length of the proposed bulkhead is lacking. As mentioned above, a portion of the fill material are sediments contaminated with a variety of toxic compounds.

The *Biological Assessment for Endangered Species* included with the application materials also states that the action will involve the removal of two existing wooden dock structures and remnant timber piles. The piles in the dredging area will be removed using vibratory methods. Piles outside of the dredging area will be cut off at the mudline, and some of the timber piles along the shore may be left in place. It appears this information is only included in the Biological Assessment, and is unclear why these elements of the proposed action were not discussed or included in the PN or EFH Assessment.

Along the riverfront face of the wharf, DSPC proposes to install and operate 13 anti-sedimentation fans, also known as shoaling fans, spaced every 200 ft. along the wharf face. The fans within the units are configured to rotate at speeds of approximately 275 revolutions per minute and provide a 4-inch screen at the larger intake end with an open space of 1.5 ft. between the blades. While not described in the PN or the EFH assessment, the additional application materials provided to us also mention the removal of two existing wooden dock structures and remnant timber piles within the project area, but the number of piles and their location is unclear.

The PN also states that because the proposed activities would not cause the loss of wetlands or other special aquatic sites, the DSPC has not proposed any compensatory mitigation. In addition, DSPC has indicated its intention to make a separate application to the District, requesting that future maintenance dredging of the access channel be assumed by the District as part of the federally authorized Philadelphia to the Sea Federal Navigation Project and will be requesting permission to dispose of most of the dredged material into the Corps-owned CDFs.

Early Coordination/Permitting Process

We have a number of concerns regarding the lack of early coordination with the federal resource agencies and the process being followed for the authorization of this project. We understand that this project was discussed at a meeting with representatives of the State of Delaware several years ago, but none of the federal resource agencies were advised to attend this meeting. For large and complex projects such as this one, it has been past practice to have one or more interagency meetings with all of the relevant state and federal agencies prior to the issuance of the PN. Post-PN interagency meetings or calls are also common to help resolve issues, answer questions and discuss information needs. Unfortunately, there have been no such meetings or calls for this project. These meetings, particularly when held prior to the issuance of the PN are an essential part of the coordination process between our agencies and are vitally important to ensure we have sufficient information to complete consultations required under the Fish and Wildlife Coordination Act (FWCA), the Magnuson Stevens Fishery Conservation and

Management Act (MSA), and the Endangered Species Act (ESA). Because this early coordination was not held, the information provided to us is not sufficient to complete these consultations and does not support the conclusions in the PN or the EFH assessment. Should this project move forward in the permitting process, we strongly recommend interagency meetings be scheduled.

Although there have been no interagency meetings or calls on this project, we have provided your Planning Division with extensive scoping comments in our February 28, 2019, letter in response to a NEPA scoping letter from Mr. Peter Blum dated December 17, 2018. The District's NEPA scoping letter stated that, at the time of the letter, the District was acting as a neutral party on the project in order to gather information and assist with coordination and potential impacts in accordance with NEPA. Our response letter contained information on consultations, aquatic resources under our purview, site-specific resources and habitat, and other information. We have yet to see any response to our comments or receive any updates of the status of the NEPA evaluation for this project. As a result, it remains unclear where this project is in the NEPA process.

We appreciate that your staff has provided us with the application package submitted by the DSPC. The materials provided include a document titled "Environmental Assessment Technical Document " dated March 2020 (revised June 2020), which included over twenty-four (24) appendices, and various modeling documents. Due to the volume of material and the manner in which the information has been presented (e.g., some information is included in one document, but not others), it is difficult to locate all the relevant information needed for our review. In addition, while your September 4, 2020, cover letter initiating EFH consultation made clear that the DSPC's EFH assessment (Appendix 11) was prepared on behalf of the District, it is unclear at this time if you are fully adopting all of the DSPC's additional documents as your own to represent your NEPA documentation or if you are in the process of developing your own NEPA analysis and documentation. It is also unclear at what point during the permitting process you will make such NEPA analyses and documentation available to the public for review and comment.

In addition to providing NEPA scoping comments, our Habitat Conservation Division was contacted by the project consultant on June 24, 2019, to provide informal comments on their benthic and fisheries survey plan. We provided these comments, which detailed various shortcomings and deficiencies with their survey plan, to them on June 28, 2019. We were not contacted again by the consultant to review or discuss the comments, provide clarifications, or further discuss their survey plan, including potential modifications made after reviewing our comments. We were also not contacted by the District to review the proposed sampling plan or its results. Unfortunately, as a result, the sampling undertaken by the DSPC is inadequate and does not by itself accurately characterize the aquatic resources and habitats affected by the proposed project.

Authorities

As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, we offer the following comments on resources of concern to us in

the study area pursuant to the authorities of the MSA, FWCA, and ESA

Magnuson Stevens Fishery Conservation and Management Act

The MSA requires federal agencies to consult with one another on projects such as this that may adversely affect EFH. In turn, we must provide recommendations to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency. 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 this consultation procedure.

EFH is defined as, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The term "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and aquatic areas historically used by fish, where appropriate while "substrate" includes sediment, hard bottom, structures underlying waters and associated biological communities.

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 ecosystem 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.

According to the District's September 4, 2020, letter requesting the initiation of the EFH consultation, DSPC's EFH assessment was used to inform your decision-making regarding the effects of the project on EFH and was the technical and scientific basis of your determination, which concluded that the DA authorization for the proposed project, if issued, may adversely affect EFH, but that it would not have the potential to cause substantial adverse effects on EFH. In order to mitigate the adverse effects of the work on EFH, the District intends to condition any DA permit to prohibit in-water work in any year during the period March 1 to June 30 to protect fish migrations and spawning activities. In addition, any DA permit would be conditioned such that pile installation would be conducted using the soft-start and vibratory methods in order to reduce noise.

While we appreciate the proactive avoidance and minimization measures that would take place during the construction and maintenance phases of the proposed project, we disagree with the District's conclusions regarding impacts to EFH, federally managed species, their prey, and other resources under our purview. As proposed, the project would result in substantial, significant, and unacceptable impacts to aquatic resources under our purview, including aquatic resources of national importance. Additionally, the EFH assessment concluded there was "a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and

construction areas” and that “no habitat of value was identified within the affected environments.” This conclusion is not supported by data or existing literature, and is directly contradicted by numerous studies cited in the documents provided to us and the DSPC’s own project-specific data. Furthermore, the EFH assessment provided fails to fully evaluate all of the individual, cumulative, and synergistic direct and indirect effects of the project on EFH, and we must consider it to be incomplete.

Fish and Wildlife Coordination Act

The FWCA, 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 requires 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.

Based upon the information provided, the project will have substantial and unacceptable impacts to aquatic resources that we seek to conserve and enhance under the FWCA, particularly anadromous species such as alewife, blueback herring, American shad, and striped bass. In addition, the loss and degradation of important habitat for these species, the impacts to early life stages from the operation of the facility, and the lack of any compensatory mitigation to offset the adverse effect do not support the FWCA’s requirement to provide for the improvement of the fish and wildlife resources.

Endangered Species Act

The ESA requires federal agencies (in this case, the District) to ensure, in consultation with us, 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. An interagency consultation, pursuant to Section 7 of the ESA, for the proposed project is necessary, and has been started by the District. It is important to note that in the regulations implementing Section 7(a)(2) of the ESA (interagency consultation), “effects of the action” are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur.

National Environmental Policy Act (NEPA)

Project Purpose and Need

The DSPC's stated project purpose is to “modernize the State of Delaware’s international waterborne trade capabilities, allow for the State of Delaware port to remain competitive within the Delaware River international trade market, meet the rising demand for modern containerized ports, and to continue, and strengthen, waterborne trade’s importance to the State of Delaware and regional economy.” In the application materials, DSPC states that the construction of the

marine terminal is in response to demonstrated need for expanded port capacity at the Port of Wilmington and in the Delaware River. This need for the new proposed port is stated to be driven by vessel capacity constraints and cargo handling constraints at the current Port of Wilmington. All of these statements base the purpose and need on a very small geographic area of the Delaware River and do not consider the broader context of numerous port facilities and existing and potential future capacity in the Delaware River including the 11 other port facilities on the river (Philadelphia, Camden, Paulsboro, Marcus Hook, Gloucester Marine Terminals, Penn Terminals and others) or the Northeast U.S. more broadly (e.g., Port of Virginia-Norfolk area, Maryland Port Authority-Baltimore, New York-New Jersey, Boston). In addition, many of the statements regarding project need, lack of capacity, and cargo estimates in the application materials are not supported by references or documentation and are overly broad.

Alternatives

The DSCP's purpose and need statement appears overly narrow and unnecessarily limits the evaluation of alternatives to the Port of Wilmington. This precludes the consideration of other practicable alternate locations that may be less environmentally damaging than port development. There are numerous other port facilities on the Delaware River and within the Mid-Atlantic region that are potential practical alternatives to DSCP's proposal, but they do not appear to have been considered. A more robust alternatives analysis is needed before any conclusion regarding the lack of practical alternatives to the DSCP's proposal should be made. This analysis should consider potential alternate locations within the Delaware River and larger Mid-Atlantic region and include additional information on the criteria developed to select and to evaluate alternatives, alternate sites considered and the rationale for the rejection of alternate sites. Rehabilitation or upgrades to existing facilities, as well as increases in efficiencies (i.e., modernization) at existing facilities should also be considered and fully analyzed as well. This more thorough analysis of alternatives which could avoid or minimize adverse effects to aquatic resources is consistent with the requirements of NEPA, the Clean Water Act (CWA) Section 404 (b)(1) Guidelines and aquatic resource conservation mandates under the FWCA and MSA.

As we have discussed above, should this project move forward in the DA permitting process, we recommend that the District require the preparation of an EIS to allow for a full and complete evaluation of the effects of the project, as well as alternatives including the "no action" alternative. In general, federal agencies prepare an EIS if a proposed major federal action is determined to significantly affect the quality of the human environment. A large-scale port facility such as this, which will have far reaching and long-term ecological impacts, appears to meet this standard of having sufficient impacts on the human environment to warrant being considered a major federal action requiring an EIS. These impacts to the human environment include:

- the alteration and degradation of approximately 100 acres of the Delaware River through dredging, filling and wharf construction;
- the increase loss of early life stages of commercially, recreationally, and ecologically important fish species due to impingement and entrainment in water drawn through vessel propellers, during the intake of ballast water, and by the operation of the anti-sedimentation fans;
- mortality of juvenile and adult fish, including listed sturgeon, as a consequence of

- interaction with vessels and their propellers;
- water quality and benthic community degradation due to increased turbidity and bottom disturbance caused by vessel operation, maintenance dredging, and anti-sedimentation fans;
 - potential long-term impacts to Cherry Island Flats, highly valued recreational fishing area and an important habitat for federally listed Atlantic sturgeon and shortnose sturgeon;
 - the increased likelihood of vessel strikes and other environmental effects (air quality, traffic, vessel strikes of vessel and vehicle traffic to and from the site to move goods offsite; and increase impervious cover as the upland portion of the site.
 - potential cumulative effects resulting from the construction and operation of the proposed facility in combination with the existing and proposed ports on the Delaware, as well as the numerous industrial intakes.

Aquatic Resources

The mainstem Delaware River has been designated EFH for a variety of fish managed by the New England Fishery Management Council and Mid-Atlantic Fishery Management Council 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 bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), summer flounder (*Paralichthys dentatus*), winter skate (*Leucoraja ocellata*), and windowpane flounder (*Scophthalmus aquosus*). The Delaware River, including the areas in and around the proposed project site, also serves as important migratory, nursery, resting, foraging, and potentially spawning habitat for anadromous fish such as alewife, blueback herring, American shad, and striped bass. Other aquatic resources and their forage which are of concern to us include, but are not limited to, blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), American eel (*Anguilla rostrata*), bay anchovy (*Anchoa mitchilli*), hickory shad (*Alosa mediocris*), Atlantic croaker (*Micropogonias undulatus*), weakfish (*Cynoscion regalis*), and other assorted baitfishes and shrimps, which can be found in the Delaware River and vicinity of the project area. Early and recent studies have also confirmed that the federally listed Atlantic sturgeon and shortnose sturgeon use the lower tidal river and Cherry Island flats extensively.

River Herring and American Shad

The Delaware River is one of the most important river systems for alewife, blueback herring, and American shad on the East Coast, due in part to its landscape position, large associated estuary and bay with marshes, creeks and tidal flats, lack of significant obstructions/dams, and history of effective multi-state fisheries management. 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).

American shad, blueback herring, and alewife formerly supported the largest and most important commercial and recreational fisheries throughout their range; fishing spanned rivers (both

freshwater and saltwater), estuaries, tributaries, and the ocean; and commercial landings for these species have declined dramatically from historic highs (ASMFC 2018; 2020). The most recent benchmark stock assessment and peer review completed in 2020 indicate American shad remains depleted coastwide. The “depleted” determination is used instead of “overfished” to indicate factors besides fishing have contributed to the decline, such as channelization of rivers, water withdrawals, habitat degradation, and pollution. Coastwide adult mortality is unknown, but was determined to be unsustainable for some system-specific stocks, indicating the continued need for management action to reduce adult mortality. Specifically, adult mortality was determined to be unsustainable in the Delaware River system (ASMFC 2020).

The 2020 benchmark stock assessment continued work from the 2007 coastwide stock assessment for American shad, which also identified stocks as highly depressed from historical levels. The 2007 assessment concluded that new protection and restoration actions needed to be identified and applied, which led to the development of Amendment 3 to the Interstate Fishery Management Plan for Shad and River Herring (American Shad Management). Amendment 3 identified significant threats to American shad, including spawning and nursery habitat degradation or blocked access to habitat, resulting from dam construction, increased erosion and sedimentation, and losses of wetland buffers (ASMFC 2007). Protecting, restoring and enhancing American shad habitat, including spawning, nursery, rearing, production, and migration areas, are necessary for preventing further declines in American shad abundance, and restoring healthy, self-sustaining, robust, and productive American shad stocks to levels that will support the desired ecological, social, and economic functions and values of a restored Atlantic Coast American shad population (ASMFC 2010). A number of long-term surveys discussed below have documented the use of the proposed project site by American shad, as well as alewife and blueback herring.

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 (ASMFC 2017). 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 (ASMFC 2012a). The 2017 stock assessment update indicates that river herring remain depleted at near historic lows on a coast wide basis. The “depleted” determination was used in 2012 and 2017 instead of “overfished” to indicate factors besides fishing have contributed to the decline, including habitat loss, habitat degradation and modification (including decreased water quality), and climate change (ASMFC 2017).

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 strive to draw proactive attention and conservation action to these species.

These Alosine fishes are important forage for several federally managed species and provide trophic linkages between inshore and offshore systems. Buckel and Conover (1997) in Fahay et al. (1999) reports that diet items of juvenile bluefish include these species. Additionally,

juvenile *Alosa* species have all been identified as prey species for summer flounder, winter skate, and windowpane flounder, in Steimle et al. (2000). The EFH final rule states that prey species are an important component of EFH and that 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.

Striped Bass

The project area is also regionally and nationally significant for striped bass because of its importance as migration, spawning, nursery, foraging, and resting habitat. This is due in part to the presence and proximity of Cherry Island Flats, the shallow flat, bar area located offshore of the project site. Numerous studies have documented that this entire section of the Delaware River is disproportionately important for all life stages of striped bass, as spawning, growth rates, and subsequent contribution to the Atlantic stock are high (Weisberg et al. 1996; Wainright et al. 1996; Greene and Creclius 2006; DNREC 16-foot Trawl data 1980-present; DNREC Personal Communication). Additionally, this section of the Delaware River is a highly valued recreational fishing site due to the complex interactions of biotic and abiotic elements that result in high striped bass occupancy and overall productivity.

Atlantic striped bass have formed the basis of one of the most important and valuable commercial and recreational fisheries on the Atlantic coast for centuries; the fishery is also strongly tied to the cultural heritage of the eastern U.S (ASMFC 1981). The spawning population of the Delaware River system contributes significantly to the coastal migratory stock (ASMFC 2003). However, overfishing and poor environmental conditions lead to the collapse of the fishery in the 1970s and 80s and development of the Striped Bass Fishery Management Plan (FMP) in 1981 (ASMFC 2003). After years of increasing numbers following implementation of the FMP, commercial and recreational landings of striped bass as well as female spawning stock biomass and recruitment, have declined since their peak in the early- to mid-2000s (ASMFC 2019). Most recently, the 2018 Atlantic Striped Bass Benchmark Stock Assessment found the resource overfished and that overfishing is occurring (ASMFC 2019). The 2018 benchmark assessment, which used updated recreational catch estimates, found the stock to have been overfished since 2013 and experiencing overfishing, and as a result, initiated efforts to end overfishing including catch and size limits. Additionally, female spawning stock biomass (SSB) in 2017 was estimated to be nearly 50 million pounds below the SSB threshold of 202 million pounds and nearly 100 million pounds below the SSB target (ASMFC 2019). Accelerated declines in striped bass populations may result from the cumulative and synergistic effects of overfishing and non-fishing related activities that impact reproduction, recruitment and survival.

Mature female striped bass (age six and older) produce large quantities of eggs, which are fertilized by mature males (age two and older) as they are released into riverine spawning areas, including the Delaware River. While developing, the fertilized eggs drift with the downstream currents and eventually hatch into larvae (ASMFC 1981). 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. Boynton et al. (1981) reported that approximately five

times as many juvenile striped bass were collected in the nearshore habitat of the Potomac River Estuary than in the offshore habitat, which also suggests that the former habitat is preferred, as appears to be the case in other estuaries (Chadwick 1964; Setzler et al. 1980). Juveniles overwinter in the lower Delaware River and upper Delaware Bay (Weisberg et al. 1996). Juvenile striped bass remain in coastal nursery estuarine and riverine habitat for two to four years and then join the coastal migratory population in the Atlantic Ocean. In the ocean, fish tend to move north during the summer and south during the winter. Important wintering grounds for the mixed stocks are located from offshore New Jersey to North Carolina. With warming water temperatures in the spring, resident and coastal contingents move upriver to the freshwater reaches of coastal rivers, including the Delaware and its tributaries, to complete their life cycle.

American Eel

The area of the proposed project is also migration, spawning, nursery, and foraging habitat for the American eel. Catadromous American eels spawn in the Sargasso Sea and transit the Delaware River up to the freshwater reaches of the main stem and its tributaries as part of their migration. They inhabit these upstream 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 2012b). 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.

Habitat Characterization and Project-Specific Surveys/Sampling

We have a number of significant concerns about the DSPC's habitat characterization, data collection and surveys, and their conclusions regarding project effects which appear to be based upon flawed and incomplete data. As mentioned above, DSPC's consultant contacted our Habitat Conservation Division staff directly for recommendations concerning aquatic resource surveys at the site. However, it appears that the extensive comments we provided were, to a large extent, disregarded by the consultant in the design and implementation of their aquatic resource sampling plan. In addition, a number of robust and long-term surveys appear to have been disregarded during the DSPC's analysis of effects.

Numerous surveys have been conducted and continue to be conducted in the Delaware River in and near the project area. Several of these studies, including those used by ASFMC to understand fish population trends were highlighted in the EFH assessment, but the results of the surveys appear to have been misinterpreted or largely disregarded in DSPC's analysis of effects. When the data were considered in the EFH assessment, DSPC did not distinguish between the different life stages of fish, completely omitting information on egg, larvae, and juvenile stages found within the project vicinity. This omission was carried through to the analysis of effects. As a result, the DSPC's conclusion, which has been accepted by the District that "a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and construction areas" and that "no habitat of value was identified within the affected

environments” is not supported by the data or existing literature, and is directly contradicted by numerous studies and by the DSPC’s own project-specific data.

Existing Fisheries Studies

The New Jersey Department of Environmental Protection (NJDEP) Division of Fish and Wildlife conducts several surveys each year to study the status of species populations within the Delaware River and Estuary. One of these surveys is the Delaware River Seine Survey, which has been conducted in portions of the river near the project area since 1980. It is currently the Bureau of Marine Fisheries' longest running fishery-independent survey and the data provides an annual abundance index for striped bass. Results have been corroborated by other independent surveys, such as the Delaware Division of Fish & Wildlife's (DFW) striped bass spawning stock survey and other Delaware state surveys. The NJDEP long-term survey documents the use of this section of the river by a wide variety of species including striped bass, blueback herring, alewife, American shad, American eel, Atlantic herring, Atlantic menhaden, bay anchovy, gizzard shad (*Dorosoma cepedianum*), hogchoker (*Trinectes maculatus*), yellow perch (*Perca flavescens*), white perch (*Morone americana*), Atlantic silverside (*Menidia menidia*), and many others (NJDEP 2020).

Additionally, 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*). Impingement studies done at the Eddystone Generating Station, 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 (*Leiostomus xanthurus*), striped bass and white perch (Waterfield et al. 2008).

DFW’s 16-foot trawl survey data also show that a diverse fish community exists in the area of the proposed project. This survey, which has been consistently conducted since 1980, is primarily used to monitor juvenile fish abundance and is conducted monthly from April through October at 39 fixed stations in the Delaware Estuary. Although two DFW trawl survey stations nearest the site of the proposed project provide some insight into the species using the area, specifically juveniles, the time-series data from additional stations up and downstream of the proposed project have also contributed to our understanding that the Delaware Bay, Estuary, and River is an important, productive, and highly valued area for commercially, recreationally, and ecologically important species.

The two DFW trawl stations nearest the site of the proposed project indicate that a strong juvenile fish community consisting of alewife, American eel, American shad, Atlantic croaker, Atlantic herring (*Clupea harengus*), Atlantic menhaden, Atlantic sturgeon, bay anchovy, black drum (*Pogonias cromis*), black sea bass, blue crab, blueback herring, bluefish, bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosus*), carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), crevalle jack (*Caranx hippos*), eastern silvery minnow (*Hybognathus regius*), gizzard shad, hickory shad, hogchoker, naked goby (*Gobiosoma boscii*), northern hog sucker (*Hypentelium nigricans*), northern kingfish (*Menticirrhus saxatilis*), northern pipefish (*Syngnathus fuscus*), pumpkinseed (*Lepomis gibbosus*), shortnose sturgeon, silver perch

(*Bairdiella chrysoura*), spot, spottail shiner (*Notropis hudsonius*), spotted hake (*Urophycis regia*), striped anchovy (*Anchoa hepsetus*), striped bass, striped searobin (*Prionotus evolans*), summer flounder, tessellated darter (*Etheostoma olmstedii*), weakfish, white catfish (*Ameiurus catus*), white perch, yellow bullhead (*Ameiurus natalis*), and yellow perch exists at the site. Alewife, American eel, Atlantic croaker, bay anchovy, blue crab, channel catfish, hogchoker, striped bass, weakfish, and white perch dominated DFWs captures. Moderate numbers of American shad, Atlantic menhaden, blueback herring, and spot were also encountered (DFW 2020).

Striped bass appeared regularly in large numbers during the time-series, with the highest frequency of encounters generally occurring from June to August. Striped bass were encountered every month of the trawl from April to October. There is a strong shift in juvenile size classes of capture, with larger juvenile striped bass or sub-adults captured in April and May, and smaller fish, likely young-of-year, captured from June to October. Mean lengths of April and May captures hovered around 150 to 250 millimeters (mm), while captures between June and October ranged from 50 to 150 mm. Like striped bass, alewife were encountered during each month of sampling, but with a pronounced increase in captures occurring from July to October. Alewife size classes also follow a similar trend: larger juveniles were captured in April and May (mean approximately 80 mm), and smaller juveniles were captured from June to October (mean approximately 60 mm). American shad capture trends were similar to alewife (high captures from July to October), while American eel captures were similar to striped bass (high captures from June to September). Blueback herring followed a unique pattern with high captures in April, May and October. Length of captures for American shad and blueback herring generally followed the pattern for striped bass and alewife, with larger individuals captured in April and May. American eel lengths were generally consistent across the sampling months (DFW 2020).

One of the most notable and comprehensive surveys conducted in the vicinity of the project area, 0.9 river mile downstream at RM 72.3, was the 1999-2001 Clean Water Act 316(b) evaluation for the Edge Moor Power Plant (EMPP; ENTRIX 2002) in support of the facility's National Pollutant Discharge Elimination System permit. Seasonality and life stages found near and adjacent to the facility were captured through finfish pelagic and bottom trawls, ichthyoplankton nearfield and farfield tows, entrainment, and impingement sampling. Additionally, several representative important species (RIS) were highlighted as part of the impact assessment as indicators of an adverse environmental impact to the ecosystem. RIS were chosen by having one or more life stages vulnerable/susceptible to impingement and entrainment, were commercially or recreationally important or valuable species, and/or for their representation as an important linkage or position in the food web. RIS included river herring, bay anchovy, white perch, striped bass, weakfish, Atlantic croaker, and blue crab. Based on their importance to the Delaware Estuary, the assumption was given that these representative species protect other aquatic resources and changes in their abundance and distribution could alter the estuarine ecosystem (Versar 1993; Limburg et al., 1984; EPA 1977).

The following presents a high-level summary of the sampling results presented by ENTRIX (2002):

- Atlantic croaker, bay anchovy, hogchoker, white perch, and channel catfish comprised

the top five species collected during the finfish trawls, which included 34 species or taxonomic groups in 2000 and 31 species or taxonomic groups in 2001. Peak trawl densities were observed from mid- to late-summer through late fall in both years.

- Both nearfield and farfield ichthyoplankton tows identified striped bass (the majority larvae) as the most abundant species collected followed by river herring and white perch. Ichthyoplankton were also present during each month of the farfield samples were collected (i.e., March through September), with the highest density recorded in May of each year. Between 21-24 species or taxonomic groups were collected through the nearfield surveys and between 30-34 species or taxonomic groups were collected through the farfield surveys.
- River herring and striped bass accounted for the majority of the entertainment catch with Atlantic croaker as the most abundant juvenile fish collected. Entrainment average monthly densities exhibited a peak in May of both study years and an average of 18 species or taxonomic groups were collected over the sampling events.
- Atlantic croaker, bay anchovy, river herring, white perch, striped bass, and weakfish were the 5 most abundant taxonomic groups collected during the impingement study, with Atlantic croaker as the most abundant species. The juvenile stage was the predominant life stage impinged for all of the RIS. Striped bass had the highest percentage of adults impinged of the RIS. Between 34-38 species or taxonomic groups were collected.

Echoing previous surveys discussed above and including the literature review presented in the EFH assessment, fish sampling performed in the vicinity of the project site has indicated the high productivity of this section of the Delaware Estuary, most notably dominated by striped bass and river herring. The July 29, 2019, bottom trawl conducted by the DSPC's consultant actually confirms the data from previous studies with the top three species (i.e., Atlantic croaker, white perch, and bay anchovy) mimicking captures between 1999-2001 in the ENTRIX study (2002). The abundance, productivity, variety, and life stages of the resources found throughout the ENTRIX (2002) survey demonstrates the value of the habitat at the site and in this section of the Delaware estuary. This further contradicts the EFH assessment conclusions, which determined a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and construction areas. As stated above, unfortunately, this inaccurate conclusion was carried through to the analysis of effects rendering it inaccurate and incomplete. In addition to numerous issues previously stated, the analysis failed to include any potential impacts to ichthyoplankton, which were omitted from the EFH assessment entirely. The EFH assessment also failed to include or discuss the ENTRIX (2002) study, which is concerning due to its proximity to the current project and the rigorous, multi-year and multi-season data that were collected.

DSPC's Fish Sampling

Site- and project-specific sampling was conducted by DSPC's consultant to identify benthic and aquatic resources within the project area that may be impacted as a result of the proposed project. The sampling plan included a single beach seining event (October 11, 2019), a single bottom trawl sampling event (July 29, 2019), and two benthic faunal/sediment and submerged aquatic vegetation sampling events (August 1, 2019 and October 11, 2019). As stated previously, our Habitat Conservation Division was contacted by the project consultant to provide informal

comments on this benthic and fisheries survey plan. We provided comments on June 28, 2019, which echoed sentiments made in our February 28, 2019, scoping response to comments and raised concerns that the sampling design was inadequate and would likely result in sampling bias, limited statistical power of results, and an incomplete picture of biological communities, abiotic conditions, and potential impacts of the proposed project. As such, we recommended more frequent sampling across numerous seasons and additional methods which would cover the variations in aquatic organism presence and better represent the different life stages of species using the site. From the information provided, it appears our comments were not addressed, and the sampling that took place (and data collected) is inadequate for making any broad conclusions about the site or river system.

Despite the inadequacies of the DSPC's sampling, the results are generally consistent with expected seasonal detections and the decades of other data from in and near the project site from multiple sources including those mentioned above. Numerous individuals from fourteen species were captured during DSPC's trawl sampling on July 29, 2019 (though the project narrative indicates fifteen species were captured), and include American eel, hogchoker, blue crab, Atlantic croaker, weakfish, white perch, channel catfish, bay anchovy, naked goby, silver perch, striped bass, sand shrimp (*Crangon septemspinosa*), grass shrimp (*Palaemonetes paludosus*), and tessellated darter. These results are consistent with previous studies and do not support DSPC's contention that aquatic resources are not present on the site.

In the information provided to us, although species captures were reported, there was no indication of the number of individuals caught. This complicates our review of the results presented to us. However, based on the narrative that one (1) American eel was captured, which made up 1% of trawl #2 and 0.2% of all samples, we can extrapolate that approximately 500 fish were caught during the single day of sampling. Using percentages presented in the EFH assessment, we estimate captures to have been about 230 Atlantic croaker, 99 white perch, 83 bay anchovy, 35 sand shrimp, 15 grass shrimp, 11 blue crab, 5 channel catfish, 6 striped bass, 3 silver perch, 3 weakfish, 3 hogchoker, 2 tessellated darter, 1 American eel, and 1 naked goby. Photos 11 and 12 presented in Appendix 6 show mostly smaller fish, including young-of-year Atlantic croaker.

Fifty individuals of three species were captured during beach seining on October 11, 2019. These included 34 bay anchovy, 9 white perch, and 7 striped bass. Regarding beach seine fisheries sampling, it appears the final seine site locations were not reported, as only the "proposed locations" are displayed on maps and figures. If these locations were used, as shown in Figure 4 of the EFH assessment, it appears that seining took place in areas of the proposed fill/bulkhead locations and in depths above the MLW line.

Because numerous factors can influence seine sampling captures/detections, such as seine locations and the depth where the net is set, the actual seining locations, depth of water samples, and the depth of the seine net should have been reported in the results and methodology section of the EFH assessment, as opposed to referencing other reports. It is possible to target the species captured using a beach (haul) seine depending on the depth/size of the net and the depth at which the net is set, which may explain, along with the extremely limited amount of sampling days/events, the absence of Alosines in the data. To catch young of the year alosines, areas of

deep water are typically targeted. If set in shallow water, captures will generally consist of white perch, panfish, minnow/shiners, bay anchovies, and killifish in this area of the river. Additionally, season, time of day, water temperature, and numerous other variables will influence captures/detections.

Habitat Characterization and Benthic Fauna

The habitat within the affected area was described in the EFH assessment as a mixture of estuarine, subtidal, and intertidal areas with water depths between 0-45 ft. MLLW. Salinities were described as varying by season (i.e., more freshwater in the spring to oligohaline in the summer and fall) and bottom substrate was described as sand and gravel, with some concrete rubble in the shallower designated construction area and fine-grained sediments (i.e., silt and clay) in the dredging area. Lacking from the documents provided to us is an adequate discussion of bottom relief and potential hard bottom features and/or structures within the project area, which provide valuable habitats for fish. The PN provided some additional information indicating a sub-tidal shelf extending water-ward from the low tide line to approximately -10 ft. LLW. However, indication of this shelf was not represented or discussed in the EFH assessment.

Appropriate habitat mapping generally includes an analysis of acoustic data (including multibeam echosounder bathymetry, backscatter, and side scan sonar) combined with substrate/benthic sampling in the form of benthic grabs, sediment profile and plan view (SPI/PV) imagery, video transects, and/or still imagery. Although static bathymetry and side-scan sonar figures are provided in the PN plans, there is no dynamic data provided for review, no discussion or indication of the density (i.e., resolution) of the data, or how the data were used in concert with other methods to accurately characterize and delineate habitat. Without this site-specific information, the effects of the proposed project cannot be fully evaluated.

The EFH assessment discussed broad patterns related to benthic faunal (i.e., benthic macrobenthos) species richness and abundance in estuaries, by primarily citing Montagna and Palmer (2014) and Uwadiae (2009). Unfortunately, these patterns were not placed in the proper context of the project-specific sampling or related to “expected” versus “observed” outcomes of the sampling. Furthermore, the benthic samples and species/families detected were not compared to other comprehensively collected data from the system, such as work done by Kreeger et al. (2011), nor were detection probabilities, capture rates, or other variables influencing species occupancy and sampling/detection (MacKenzie et al. 2004; MacKenzie et al. 2017) discussed in the documents provided.

The project-specific benthic data collected at the site, which appears to include detection of seven organisms from 3 phyla and 6 orders (Annelida-oligochaeta; Annelida-polychaeta; Arthropoda-isopoda; Arthropoda-amphipoda; Arthropoda-diptera; Mollusca-bivalvia), closely follows the general estuarine patterns of species richness, is comparable to recent studies in the area (Kreeger et al. 2011; PDE 2017), and is generally expected for this section of the river. In fact, these expected results are supported by conclusions that salinity was the dominant factor correlated with benthic community structure in the Delaware River-Estuary system (Kreeger et al. 2011; PDE 2017). To date, the Kreeger et al. (2011) data represents the most intensive and comprehensive assessment of the Delaware Estuary’s benthic fauna ever conducted, so comparing the project-specific data to this data should have occurred in the EFH assessment.

As we advised DSPC's consultant in our comments to them on their sampling proposal, when the goal of biological-ecological sampling is to fully capture and assess species composition and community structure over large spatial scales, multi-method, multi-event, multi-season, and multi-year sampling approaches are necessary. Sampling designed to characterize large areas of habitats or systems, where sampling takes place over very limited periods (such as single-digit days or during single seasons) is inadequate to make site-specific or broader system conclusions about species use, occupancy, or ecosystem function. Single day sampling can only provide an extremely limited snapshot into species occupancy on the day, during the specific time-frame, and in the specific area of the samples. Therefore, the project-specific sampling approach used by DSPC is not sufficient to draw any meaningful conclusions about the site or ecosystem or capture seasonal or environmental variability (e.g., water temperature, salinity), which influences species distributions and abundances. This limited sampling also omits specific timing of the occurrence of different life stages of species. As a result, based on the information provided, the sampling alone that has taken place (and data collected) is also not sufficient to make any conclusions about the site and potential impacts resulting from the project.

Although the extremely limited sampling is inadequate for drawing the broad conclusions the District and DSPC have made about the potential impacts at the site of the proposed project, the data appears to be consistent with existing species occupancy and detection data. In fact, the project-specific sampling confirms that the area is used by numerous fish and invertebrate species, and is therefore valuable habitat for various aquatic resources under our purview. When placed in the context of species accumulation curves (Ugland et al. 2013) and the available existing data, the single day (two days for benthic fauna) project-specific sampling strongly and directly contradicts the conclusions made by the District and DSPC that there is a lack of identified resources suitable for fish spawning, breeding, feeding and growth within the dredging and construction areas and that no habitat of value is present the project area.

Analysis of Effects

Because the District and DSPC has inaccurately concluded that the proposed project area virtually has no aquatic resources and no habitat of value, the analysis of effects is based upon inaccurate and incomplete information and greatly understates the substantial and unacceptable impacts that the proposed project will have on aquatic resources of national importance including the many species identified at the site. These adverse effects will result from fill, pile placement, wharf construction, dredging, installation of sedimentation fans, vessel traffic and propeller wash, and ballast water intake associated with this project. We also understand that significant contamination exists on the site and that remediation activities are being overseen by the Delaware Department of Natural Resources. Should this application continue to move forward in the permitting process, a fully and complete analysis of all of the direct, indirect, individual, cumulative, and synergist effects of the construction and operation of the proposed port should be undertaken and a revised and complete EFH assessment should be provided to allow for an expanded EFH consultation. This analysis should be based upon detailed habitat mapping of the project site and the biological information found in the many available sources including those discussed above and the available literature. It should also include information of the nature and scope of contamination and the potential for contaminant release and aquatic resource exposure.

Because the lack of appropriate and comprehensive analyses is so wide-ranging, we will not discuss each element individually. We will highlight some of the activities with the most significant adverse effects that should be evaluated by the District and considerations to include in that evaluation. In all cases, the direct and indirect physical, chemical, and biological alterations of the waters and substrate, and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions should be comprehensively addressed. Actions should be broken down into their components and subcomponents and related directly to the stressors generated from each, exposure of habitats and species to the stressors, and resulting responses, or effects (known as the stressor-exposure-response framework). From there, the effects to habitats and species should be identified, described, and analyzed in the context of short-, medium-, and long-term temporary and permanent/chronic impacts at the site, river, and regional level. Analysis of individual, synergistic, and cumulative effects should also be undertaken.

Habitat Loss and Conversion

The placement of the proposed bulkhead waterward of the existing shoreline will result in the permanent loss of 5.5 acres of the Delaware River including shallow areas important for juvenile fishes and bait fishes. This permanently filled area will no longer provide foraging, resting, migration, sheltering, spawning or any habitat for species and will add vertical wall structures into the aquatic environment that will permanently and completely disconnect the aquatic environment from any natural shoreline. This will adversely impact system wide primary and secondary production and overall energy flow-food web support, nutrient cycling, and other ecosystem processes. Additionally, the placement of the vertical man-made wall structures will lead to a cascade of permanent and chronic adverse impacts, including increased wave energy, scour, turbidity, and sedimentation, degradation and elimination of benthic habitat, decreased benthic faunal diversity, beach steepening, and others (USACE 1981; NOAA 2015; Gittman & Scyphers 2017; Dugan et al. 2018; and others). We are also concerned that there is a lack of information on the exact location of the bulkhead in the documents provided to us and little or no data on the specific habitat and features in this area that will be permanently eliminated. Additionally, DSCP appears to be seeking authorization to fill this area with contaminated material removed from the proposed area to be dredged.

The construction of the wharf structure and the associated piles and decking will also result in the permanent loss of 7.5 acres of aquatic habitat within the Delaware River. The proposed wharf will be supported by 4,500, 20-inch diameter, concrete-filled steel pipe piles. Due to the number and close placement of the pilings, we consider the wharf construction to be a loss of aquatic habitat. As stated in 33 CFR § 232.3(c)(1) (Discharge requiring permits -Pilings):

Placement of pilings in waters of the United States constitutes a discharge of fill material and requires a section 404 permit when such placement has or would have the effect of a discharge of fill material. Examples of such activities that have the effect of a discharge of fill material include, but are not limited to, the following: Projects where the pilings are so closely spaced that sedimentation rates would be increased; projects in which the pilings themselves effectively would replace the bottom of a waterbody; projects

involving the placement of pilings that would reduce the reach or impair the flow or circulation of waters of the United States; and projects involving the placement of pilings which would result in the adverse alteration or elimination of aquatic functions.

There are many studies that demonstrate that large pile supported structures degrade fish habitat. For example, studies on the effects of large pile-supported structures (Able et al. 1995) found that fishery habitat quality is poor under large pile-supported structures as compared to pile fields (piles with no deck or overwater component) and interpier areas. Also, diversity, abundance and growth rates of juvenile fishes were lower under large pile-supported structures than in pile fields and interpier areas (Able et al. 1998, Duffy-Anderson and Able 1999). It is likely that the adverse conditions begin at the point where the low light levels under the pier begin to impair the success of sight feeding fish including species such as yellow perch (Granqvist and Mattila 2004) and blueback herring (Janssen 1982 in Collette and Klein-MacPhee 2002). In addition to severely decreased light penetration, the area under the pier may also be subjected to increased turbidity and reduced water circulation. The decrease in water circulation can also adversely affect striped bass survival as strong current is needed to keep the eggs suspended in the water column and prevent them from being smothered by silt (Bigelow and Schroeder 1953).

Shading from over-water structures, including the proposed wharf, will also adversely affect EFH, federally managed species, their prey, and other aquatic resources under our purview by degrading habitat quality in, and near, the shadow cast by the structure and by altering behavior and predator-prey interactions (Nightingale and Simenstad 2001; Hanson et al. 2003). Under-structure light levels can fall below the threshold for photosynthesis for many primary producers, adversely affecting photosynthetic organisms, habitat complexity, and overall net primary production, and for large projects, adversely impact secondary and tertiary production (Kenworthy and Haunert 1991; Haas et al. 2002; Struck et al. 2004). In the aquatic environment, floating and emergent vegetation are adversely impacted by shading, as well as less conspicuous primary producers, such as benthic microalgae. Benthic microalgae are an important trophic resource, and aid in the stabilization of sediments, controlling scour and resuspension of bottom sediments (Wolfstein and Stal 2002). Furthermore, benthic microalgae are important components of nutrient cycling and exchange in the water column, and contribute significantly to the overall primary production of ecosystems (Stutes et al. 2006). Communities in shaded areas are generally less productive than unshaded areas; light limitation is detrimental to benthic microalgae primary production, sediment primary production and metabolism (e.g., soil respiration) (Whitney and Darley 1983; Meyercordt and Meyer-Reil 1999; Stutes et al. 2006). Shading impacts are considered permanent due to the long-term placement of structures (Hanson et al. 2003; Struck et al. 2004; Johnson et al. 2008).

Many aquatic species, primarily fish, rely on visual cues for spatial orientation, predator-prey interactions (e.g., prey capture and predator avoidance), migration, and other essential behaviors. Early life history stages of fish are primarily visual feeders that are highly susceptible to starvation - a primary cause of larval mortality in marine fish populations (May 1974; Hunter 1976). Juvenile and larval fish survival is likely a critical determining factor for recruitment, with survival linked to the ability to locate and capture prey, and to avoid predation (Seitz et al. 2006). The reduced-light conditions found under overwater structures limit the ability of fishes, especially juveniles and larvae, to perform these essential prey capture and predator avoidance

activities. Total abundances of fish can be substantially reduced in areas shaded by piers (Southard et al. 2006; Able, Grothues & Kemp 2013; Munsch et al. 2017). Overall, it appears that overwater structures that create dark environments can reduce localized habitat value by impairing visual tasks (e.g., feeding, predator vigilance) and reducing prey availability and habitat connectivity by constraining movements (Munsch et al. 2017).

Reductions in sub- and intertidal benthic and primary productivity, may in turn adversely affect patterns of invertebrate abundance, diversity, and species composition (Nightingale and Simenstad 2001). Structures that attenuate light may also adversely affect food webs by reducing micro- and macro-phyte growth, soil organic carbon and by altering the density, diversity, and composition of benthic invertebrates that are prey for numerous fishery species (Alexander and Robinson 2006; Whitcraft and Levin 2007). Prey resource limitations affect movement patterns and the survival of many juvenile fish species (Seitz et al. 2006; Johnson et al. 2008). The shadow cast by a structure may also increase predation on species by creating a light-dark interface that allows ambush predators to remain in darkened areas and wait for prey to swim by against a bright background, resulting in high contrast and high visibility (Helfman 1981). Prey species moving around the structure may be unable to see predators in the dark area under the structure or have decreased predator reaction distances and times, thus making them more susceptible to predation (Helfman 1981; Bash et al. 2001). Decreased predator avoidance (and increased mortality from predation) may be particularly important at the site of the proposed project for shad and river herring as the Northern snakehead (*Channa argus*), a sit-and-wait invasive piscivore, now occurs in Delaware River system (USGS Nonindigenous Aquatic Species clustered specimen observation records). Northern snakeheads are voracious fish predators, representing a significant threat to shad and river herring through predation and to striped bass through competition for prey (Saylor et al. 2012; Philadelphia Water Department and DNREC personal communication 2019 and 2020).

American shad and river herring appear to be particularly susceptible to the shadow cast by overwater structures (Moser and Terra 1999). American shad tend to be diurnal in their migratory habits and tend to migrate primarily during the day, while falling back to lower-velocity zones at night; adults and juveniles use side-channel and shallower areas near shorelines at day and night (Fisher 1997; Haro and Kynard 1997; Theiss 1997; Sullivan 2004). American shad are reluctant to immediately pass under darkened areas of channels, specifically under low bridges or strong shadows, or where there is a strong light transition (Haro and Castro-Santos 2012). American shad school as both juveniles and adults and have a low likelihood of separating from a school in order to pass a structure or its shadow (Larinier and Travade 2002). River herring require light to form schools and are most active during the day and have difficulty avoiding obstacles at night (Blaxter and Parrish 1965; Blaxter and Batty 1985). Similarly, laboratory observations of alewives indicated that both juveniles and adults are most active during the day (Richkus and Winn 1979). Moser and Terra (1999) performed a field study to investigate low light as an impediment to river herring migrations and found significantly higher numbers of herring passed through unshaded treatments, as compared to shaded treatments. Fish often require visual cues for orientation and exhibit faster swimming speeds at increased light levels (Pavlov et al. 1972, Katz 1978).

The proposed dredging will result in the permanent conversion of shallow water habitat in the

project area to deepwater habitat resulting in the loss of habitat for juvenile anadromous fish species. As stated above, Boynton et al. (1981) reported that approximately five times as many juvenile striped bass were collected in the nearshore habitat of the Potomac River Estuary than in the deeper, offshore habitat, highlighting the importance of shallow nearshore habitat. Other studies in other estuaries also support Boynton's result including Chadwick (1964) and Setzler et al. (1980). In addition, white perch are also ordinarily found in shallow water, usually not deeper than four meters (Beck 1995, Collette and Klein-MacPhee 2002.). Dredging also removes benthic organisms that many species rely on for prey; frequent repeated maintenance dredging events will likely prevent recolonization of the benthos by invertebrates and reduce site-wide productivity (Van Dolah et al. 1984; Wilber and Clarke 2001; 2010).

Turbidity and Sedimentation

Anthropogenic-induced elevated levels of turbidity and sedimentation, above background (e.g., natural) levels can lead to various adverse impacts on fish and their habitats. These increased levels can be caused by construction activities such as the dredging, pile driving, bulkhead installation, and filling proposed by DSPC, as well as the operation of the facility including vessel movements, changes in hydrodynamics due to the alteration of the river bottom from dredging, the pile installation and changes in shoreline alignment due to the bulkheading and fill in the river, as well as the operation of the anti-sedimentation fans.

Increases in turbidity due to the suspension or resuspension of sediments into the water column during activities such as dredging can degrade water quality, lower dissolved oxygen levels, and potentially release chemical contaminants bound to the fine-grained sediments (Johnson et al. 2008). 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). Additionally, other effects from suspended sediments may include (a) lethal and non-lethal damage to body tissues, (b) physiological effects including changes in stress hormones or respiration, or (c) changes in behavior, reduced predator avoidance, and others (Wilber and Clarke 2001; Kjelland et al. 2015). Increases in turbidity will also adversely affect the ability of some species, such as larval striped bass, to locate and capture prey and evade predation, leading to decreased survivorship (Fay et al. 1983 in Able and Fahay 1998). Species with low foraging plasticity have been shown to experience high mortality compared with other species during acute elevated turbidity conditions (Sullivan and Watzin 2010). Turbidity can also decrease photosynthesis and primary production, resulting in reduced oxygen levels.

Elevated rates of sedimentation can lead to numerous negative effects to aquatic systems. These can include loss of habitat heterogeneity and reduction in organic matter retention and stable substrate (Allan 2004). Furthermore, the sedimentation (burying/covering) of individual organisms and habitats and changes in benthic environments via alteration to sediment quality, quantity, and changes in grain size can reduce species diversity and decrease overall ecosystem function (Thrush and Dayton 2002). The smothering of benthic prey organisms and chronic elevated sedimentation can prevent recolonization, which reduces the quality of the habitat by making it unsuitable for foraging (Wilber and Clarke 2001). Additionally, particle size is one of

the main drivers of benthic faunal biodiversity and community composition; therefore, changes to sediment composition from sedimentation will affect the benthic prey resources of various species, including NOAA-trust resources (Wood and Armitage 1997; Wilber and Clarke 2001).

Limited discussions of turbidity and sedimentation are included in the document, but are generally discounted, though the justification for such discounting is absent. Additionally, the statement in the EFH assessment that “shoaling fans do not increase turbidity, but allow sediment to stay suspended within the water column rather than settling on the river bottom,” is contradictory and misleading. Based on the simple but widely accepted, U.S. Geological Survey¹ definition, sediment suspended within the water column is a cause of turbidity. If sediment fans prevent sediment from settling out, they will cause elevated levels of turbidity in and around the site of the proposed project.

Noise

Noise from the construction activities, such as wharf and bulkhead construction, may also result in adverse effects to various fish species. 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 1985; Popper 2003; Popper et al. 2004). Effects may include (a) lethal and non-lethal damage to body tissues including hearing/sensory structures, (b) physiological effects including changes in stress hormones, hearing capabilities, or sensing and navigation abilities, or (c) changes in behavior (Popper et al. 2004). More specifically, adverse non-lethal impacts of hearing loss in fish relate to reduced fitness through disrupted communication, reduced predation and feeding success, reduced prey detection, and/or inability to assess the environment or inability to move and migrate in desired or appropriate directions (Popper et al. 2004). Additionally, anthropogenically generated sound may also lead to the masking of other biologically relevant sounds species use to carry out essential life functions, which could combine with hearing loss and other impacts to have additive effects on species and populations (Popper et al. 2004).

Impingement and Entrainment

Dredging

Impacts on benthic communities from dredging have been well-documented in numerous studies (e.g., Van Dolah et al. 1984; Clarke et al. 1993; Wilber and Clarke 2001; Wilber and Clarke 2010). However, dredging can also result in the impingement and entrainment of eggs, larvae and free swimming organisms, including diadromous fish, which can lead to injury and mortality (Thrush and Dayton 2002). This direct impact may be significant for various life stages of certain species: impingement and entrainment risk is generally low for juvenile and adult fish and higher for eggs and larvae. This pattern is not consistent in shellfish species such as crabs and shrimp, where all life stages are susceptible to impingement and entrainment; for example,

¹ Turbidity is the measure of relative clarity of a liquid. It is an optical characteristic of water and is a measurement of the amount of light that is scattered by material in the water when a light is shined through the water sample. The higher the intensity of scattered light, the higher the turbidity. Material that causes water to be turbid include clay, silt, very tiny inorganic and organic matter, algae, dissolved colored organic compounds, and plankton and other microscopic organisms.

egg-bearing female blue crabs are at high risk for impingement and entrainment when buried in sediments during winter months and are too lethargic to avoid dredges (Reine and Clarke 1998; Wilber and Clarke 2001; Thrush and Dayton 2002). Impacts from impingement and entrainment to important prey species can reduce overall habitat quality by reducing availability of prey. For example, sand shrimp (*Crangon spp*), one of the dominant species in DSPCs fisheries sampling, are important prey for many estuarine organisms, including various life stages of species found in the project area. Armstrong et al. (1982) found sand shrimp were the most numerically abundant organism entrained by dredges during dredging studies in the Pacific Northwest. This study estimated entrainment rates for sand shrimp as high as 3.4 shrimp per cubic yard of material, and based on an annual shrimp population of 80 million, estimated that total loss to the population through entrainment during the course of a “typical” dredging project could range from 960,000 to 5,200,000 individuals, or 1.2% to 6.5% (Armstrong et al. 1982).

Shoaling Fans

We also wish to highlight one element of the proposed project in particular because of the potential for wide-ranging, chronic effects. Recognition and discussions of potential impacts associated with the shoaling fans is limited or has been discounted. This lack of analysis is concerning because the use of such fans is rather limited across the United States, impacts are not fully described or understood on the individual, population, community, or ecosystem level, large numbers of fans in series such as those proposed here are rare or absent, and the potential for impacts to commercial, recreational, and ecologically important area could be profound and wide-ranging both individually and cumulatively.

The shoaling fans are described in the documents provided and through SedCon Technology (fan manufacturer) website and technical documents as a system consisting of multiple water jets powered by hydraulic motors. Water is taken in through an intake screen up in the water column, moved downward through the unit by a hydraulic driven impeller (less than 500 revolutions per minute [rpm], but likely around 275 rpm), and discharged horizontally at the mud line. The fans are reported to provide a 4-inch screen at the larger intake end and an open space of 1.5 ft. between the blades. Capture velocities at the intake are reported by the manufacturer to be in the range of 2.5 ft./second at the screen and drop to about 0.5 ft./second approximately four ft. away. The documents and website also report that studies have been done on the probability of fish impact and that a two-inch fish has a 20% probability of impact if it is drawn into the unit. The run-time for each unit during a specific tide is approximately 30 minutes, four times per day. The “effective sedimentation prevention distance” covered by each unit is anticipated to be approximately 160 ft. channel-ward from the breasting line of the berth. Each fan would be secured by one 18-inch steel H Piling.

The two primary stressors associated with the fans appear to be impingement/entrainment and near constant agitation dredging and resulting turbidity and sedimentation, both of which will reduce habitat quality and lead to physical/mechanical injury and mortality to aquatic organisms, including fish. Included in the documents and manufacturer website are statements such as “most fish ...would easily be able to escape capture,” however, there are no discussions of various life stages or swimming abilities of organisms, such as eggs and larvae (planktonic stages). Comprehensive analysis of the potential impacts of the shoaling fans should include examination of various egg types and the swimming capabilities (i.e., speeds) of various

swimming life stages of fish and shellfish species found in the system in the stressor-exposure-response framework. Variable swimming speeds, typically associated with distinct swimming behaviors, should be included in the analysis as well as discussions of rheotaxis, influence of tidal phase, and physiological limitations of sustained escape, especially in the context of the proposed multiple series of fans. Analysis should include all species found in the area, as many species are important prey for federally managed species and diadromous fish.

Furthermore, within the limited discussion of fan impacts in the documents provided to us appears to be a flawed assumption that avoiding a single fan intake equates to total escape and survival (i.e., low risk or no impact). However, because the current project is proposing numerous fans in series, will drastically change the hydrology of the area through fill, pile placement, and dredging, and the presence of vessels will further change hydrology (while in-port) while at the same time introducing impingement/entrainment risk via ballast water intakes, these assumptions are not representative of the conditions, and therefore the potential impacts, of the proposed project. This should be addressed in all future analysis. Additionally, day-night comparisons should also be included in any analysis, as swimming performance and increased susceptibility to impingement and entrainment differ among species during the day-night cycle. The large amount of literature related to hydraulic dredging and water intakes related to impingement/entrainment are an appropriate starting point for the shoaling fan analysis and could dovetail with the limited information that exists on the shoaling fans themselves. However, because of the unique nature of these fans proposed in this important area for numerous species such as striped bass, laboratory/tank/mesocosm and field-based studies (or monitoring results of other projects) should be undertaken/provided to fully analyze the potential impacts of these devices over the operational life of the Port.

Ballast Water

Container vessels mooring at the facility will require the intake and discharge of ballast water as containers are unloaded and loaded. The intake of ballast water will entrain large numbers of fish eggs, larvae and other early life stages. We are particularly concerned about the impacts to the early life stages of river herring, American shad and striped bass. As discussed above, sampling done this year found young-of-year of all of these species within the proposed dredge footprint. Ballast capacity can range from several cubic meters in sailing boats and fishing boats to hundreds of thousands of cubic meters in large cargo carriers. Large tankers can carry in excess of 200,000 m³ of ballast with container vessels holding tens of thousands of cubic meters of ballast water (NAP 1996). Ballasting intake rates can be as high as 15,000 to 20,000 m³/h (NAP 1996). The project documents lack any mention of this significant effect on aquatic resources, nor is there any discussion of discharges into the Delaware River from the vessels mooring at the proposed facility.

Impacts to Cherry Island Flats

Though discussed in our scoping letter and mentioned in the EFH assessment, Cherry Island Flats, an important geomorphic feature within the Delaware River and adjacent to the site, is not identified on any plans or discussed in detail. Additionally, potential impacts to the Flats are not analyzed in any substantive way. The importance of this area has been discussed previously and is well-known; the Flats are a highly productive area for numerous species, including striped

bass, and is one of the most popular recreational fishing areas in the Delaware River. Shortnose and Atlantic sturgeon have also been documented to use this area. We are concerned about potential impacts to the structure and function of Cherry Island Flats, which is in close proximity to the project area. The DSPC focuses all analysis of Cherry Island Flats on the total number of cubic yards of material to be dredged (as it relates to nearby projects), but does not address concerns over the proximity of the projects to the Flats.

Furthermore, there is no discussion or analysis of the impact of dredging, shoaling fans, increased vessel traffic, changes in hydrology, or other project elements that may impact the structure and function of the Cherry Island Flats. At present, it is unclear if biogeophysical processes that produce and maintain the Flats will persist following the large-scale alterations proposed here. Discussion of potential impacts to the Flats from permanent changes is entirely absent and modeling of any changes to biogeophysical processes in and around that flats has not occurred. We recommend this modeling and analysis be undertaken, and that a robust monitoring plan be developed for Cherry Island Flats for any proposed actions that may take place at the Edgemoor Site. Long-term monitoring and adaptive management should be included as part of any monitoring plan.

Cumulative Effects

The EFH assessment and other application materials do not adequately evaluate the cumulative effects of the proposed project. There is some mention of some projects proposed, underway, or completed within the Delaware River as part of the cumulative effects section of the various documents, but there does not appear to be any meaningful discussion. For many of the projects, DSPC simply states that they “do not overlap” with the current proposed project. However, cumulative impacts analyses are not restricted to spatial and temporal “overlap” of projects, as the DSPC documents suggest. Several small, medium, and large past, present, and future actions have not been considered. For example, large dredging (new and maintenance) and port projects are underway or have been proposed in the region such as those in/at the Navy Pier 4, Sunoco Refinery, Delaware City Refinery, Delaware River Federal Navigation Channel, Delaware River Partners Gibbstown Facilities, Salem [Nuclear] Power Plant, and several smaller port development projects are also proposed, underway, or completed in Philadelphia, Camden and Paulsboro areas.

Also concerning is the lack of discussion or analyses of the Edgemoor (Edge Moor) Energy Center located along the same shoreline, less than one thousand meters, from the proposed project site. Cumulatively, and in some cases such as the Hope Creek Wind Marshaling Port, these projects will have a substantial adverse effect on the aquatic environments of the Delaware River, Estuary, and Bay as well as NOAA-trust resources. A full assessment of the cumulative effects of the proposed project should be undertaken that includes the consideration of the cumulative effects of all past, present, and reasonably foreseeable future actions on aquatic resources. Some of the issues that should be addressed include the cumulative effects of the loss of aquatic water column/pelagic and benthic habitat on NOAA trust resources, loss of prey species, ballast water withdrawals, water discharges, vessel collisions and new dredging and future maintenance dredging needs.

Compensatory Mitigation

The DSPC has stated that the proposed project has been designed to avoid and minimize adverse effects on the aquatic environment to the maximum extent practicable and because the proposed activities would not cause the loss of wetlands or other special aquatic sites, compensatory mitigation is not necessary. We disagree with this conclusion. The *Final Rule on Compensatory Mitigation for the Losses of Aquatic Resources* (33 CFR 325 and 332 and 40 CFR 230) published in the Federal Register on April 10, 2008, does not limit compensatory mitigation only to impacts to wetlands and special aquatic sites. The rule refers to “waters of the United States.” As stated in Part 332.1 (a)(1) of the rule, “the purpose of this part is to establish standards and criteria for the use of all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts to waters of the United States authorized through the issuance of DA permits pursuant to section 404 of the Clean Water Act (33 U.S.C. 1344) and/or sections 9 or 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401, 403).” These standards do not only apply to wetlands and special aquatic sites. They apply to all regulated waters of the U.S. including the Delaware River. In addition, because compensatory mitigation is intended to offset unavoidable impacts, it must first be demonstrated that the less damaging alternatives are not practicable and the impacts are unavoidable.

The Clean Water Act section 404(b)(1) guidelines outline the sequence to be followed prior to considering compensatory mitigation including the demonstration that potential impacts have been avoided and minimized to the maximum extent practicable. Because the analysis of effects was based upon flawed and misleading data, it does not evaluate fully the direct, indirect, individual, or cumulative effects of the proposed actions. Due to the lack of adequate purpose and need, robust alternatives analysis, and comprehensive analyses of the effects, it is not possible to evaluate the appropriateness of current avoidance and minimization measures. As a result, we cannot agree that avoidance and minimization has taken place and the remaining impacts are unavoidable.

Lastly, we have documented above that DSCP has not demonstrated that the project site lacks aquatic resources and habitat due to the omission of the extensive, existing fishery survey data available in and around the project site and the incorrect and misleading application of their own limited survey data. The existing available information demonstrates the opposite, that the site is habitat for a wide variety of aquatic resources including those of national importance. Should this project move forward in the permitting process, compensatory mitigation for all unavoidable impacts to waters of the US should be provided. Additionally, because of the potential for significant adverse impacts to important species such as striped bass, river herring, and American shad, mitigation for losses in recruitment and overall production should be required. We recommend the District and DSPC engage with us and other federal agencies to discuss relevant mitigation.

EFH Conservation Recommendations

The EFH assessment provided to us is based upon incomplete and flawed data and does not evaluate the adverse effects of the project on EFH. As a result, it cannot be considered complete. Typically, in cases where the EFH assessment is not complete, we either withhold issuing EFH conservation recommendations until a complete assessment is provided, or we base our recommendations on the available information. The following EFH conservation recommendation pursuant to section 305(b)(4)(A) of the MSA:

- The construction of the proposed Edgemoor Port Facility should not be authorized unless, through the preparation of EIS or other publicly reviewed comprehensive NEPA document can demonstrate:
 - the justifiable project purpose and need,
 - that no alternate sites are available within the region,
 - that the impacts to aquatic resources have been avoided and minimized to the maximum extent practicable, and
 - that suitable compensatory mitigation can be provided that offsets fully all of the project's direct and indirect effects on aquatic resources and their habitats, including the effects on anadromous fishes and benthic and pelagic habitats.

Please note that section 305(b)(4)(B) of the MSA requires you provide us with a detailed written response to our EFH conservation recommendations, including the measures you have adopted to avoid, mitigate, or offset the impact of the project on EFH. In the case of a response that is inconsistent with NMFS' recommendations, section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate or offset such effect pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CRF 600.920(j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Endangered Species Act

Atlantic sturgeon and shortnose sturgeon are known to be present year-round within the reach of the Delaware River where the construction and operation of a new terminal will occur. The river is also designated as critical habitat for the New York Bight distinct population segment of the Atlantic sturgeon. The reach provides important habitat and environmental conditions for juvenile Atlantic sturgeon foraging and physiological development, especially as it relates to juveniles' oceanward migration. Future vessels visiting the terminal will cross waters where federally listed sea turtles and whales as well as sturgeon may be present. You have determined that the proposed project may affect all the above species and is likely to adversely affect the two listed sturgeon species.

Conclusion

As currently proposed, this project will have a substantial and unacceptable impact on aquatic resources of national importance pursuant to Part IV, Paragraph 3(b) of the MOA due to the loss, alteration and degradation of important aquatic habitats in the Delaware River used by striped bass, American shad, alewife, blueback herring and other aquatic resources of national importance. We also note that the project document provided to us lacks a clearly defined purpose and need, a full and complete evaluation of alternatives, and does not address fully the individual, cumulative, direct and indirect effects of the construction and operation of the proposed project. Lastly, the lack of proposed compensatory mitigation is not only inadequate, but concerning for a project of this size and scale. Consequently, we must recommend that the permit for this project be denied in accordance with the MOA between our agencies. We also recommend that the District reach a finding of Significant Impact and develop an Environmental Impact Statement (EIS) for the project due to the significant impacts resulting from the construction and operation of the proposed project, and pursuant to the National Environmental Policy Act (NEPA).

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Pennsylvania Fish & Boat Commission

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August 21, 2020

Lt Colonel David Park
District Engineer
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker
100 Penn Square East
Philadelphia, PA 19107-3390

ATTN: Edgemoor Port Facility CENAP-OP-R-2019-278

Dear Lt. Colonel Park,

This correspondence is in response to Public Notice (PN) CENAP-OP-R-2019-278, dated July 30, 2020 (revised from original July 24, 2020 PN), which describes an application by Diamond State Port Corporation (DSPC), to develop a new, multi-use containerized cargo port facility (“Edgemoor Port Site”) on the mainstem Delaware River near the Port of Wilmington in the New Castle County, Delaware. The applicant is seeking your authorization for the following activities:

Dredging:

- To hydraulically dredge 3,325,000 cubic yards (cy) from 86.9 acres (3,785,364 square feet (ft.)) of the Delaware River to create a new access channel between the existing Delaware River Federal Navigation Channel and the proposed Edgemoor ship berth site.
 - It is anticipated that this area will require annual maintenance removal of approximately 500,000 cy of additional sediment accumulation.

Wharf and Bulkhead Construction:

- To construct a sheet pile retaining wall and place fill in 5.5 acres of the Delaware River below the high tide line and a 325,000 sf pile supported wharf on constructed on 4500 20inch steel piles.

Sedimentation Fans:

- Install 13 sedimentation fans along the riverfront face of the wharf, spaced approximately every 200 feet. The fans draw water into a 48in “J-Shaped” tube passing through a hydraulic powered impeller and then discharges as a jet along the bottom of the river. The fans are intended to operate 4 times a day, twice each during the ebb and flood tidal conditions. The intended purpose is to reduce the amount of maintenance dredging required annually.

The Pennsylvania Fish and Boat Commission (PFBC) jointly manages the Delaware River with neighboring State and Federal Agencies and recognizes the importance of the river to support numerous migratory diadromous fish species of regional importance. Species of concern are not limited to American Shad (*Alosa sapidissima*), Hickory Shad (*Alosa mediocris*), Atlantic Sturgeon (*Acipenser oxyrinchus*),

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To protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.

Striped Bass (*Morone saxatilis*), American Eel (*Anguilla rostrata*), Atlantic Herring (*Clupea harengus*), Blueback Herring (*Alosa aestivalis*), Alewife (*Alosa pseudoharengus*), among others.

The PFBC has significant concerns regarding the daily operation of sedimentation fans throughout the entire year. The concerns include the risk of direct mortality to large patches of fish through physical interaction with the fan blades including ingressing glass eel stage American Eels, egressing eggs/larvae of Atlantic Striped Bass, American Shad, Hickory Shad and river herring. The fan intakes will also have adverse effects on pelagic fish eggs and larvae for species that are found in the water column including, but not limited to Alewife and Blueback Herring (collectively referred to as river herring), American Eel, American Shad, Atlantic Striped Bass, Atlantic Sturgeon, Hickory Shad and Shortnose Sturgeon. Another concern is the potential disruption to spawning runs and migratory patterns by creating impediments due to acoustic noise and sediment plumes, this could impact the overall success of spawning runs and further interrupt normal migratory behaviors of these fish.

In addition, the PFBC has concerns over the consistent re-suspension of river sediments. Sediments in the Delaware River are known to contain multiple chemical contaminants, as noted in the Public Notice, the sediments onsite have been found to contain Benzo[a]pyrene, PCB-126, total PCBs, TEQ dioxin, arsenic, and thallium at concentrations above human health screening levels. Continuous re-suspension of these chemicals could adversely impact all life history stages of fishes including early larval survival, gamete production, gamete maturation, and spawning. Additionally, chemical contaminants can lead to problems in sex differentiation in fishes, accelerating population level declines. The PFBC recommends that additional modeling be conducted to better characterize how large of sediment plumes will be created by the fans, where will the sediment plumes settle out, and will the plumes impact fish migration and survival of all life stages.

Furthermore, the Pennsylvania Fish and Boat Commission and other resource agencies have recognized direct impacts on diadromous fish migration from active dredging, pile driving, and active instream construction during the spawning runs. The PFBC recommends that the USACE and the applicant properly coordinate with the National Marine Fisheries Service and local fisheries experts to implement appropriate seasonal restrictions to prevent impacts to successful diadromous fish migration.

In conclusion, given the potential for adverse impacts to aquatic resources the PFBC recommends that this project be fully coordinated with Federal Resource Agencies as outlined in the National Environmental Policy Act (NEPA), The Magnuson-Stevens Fishery Conservation and Management Act (MSA), and The Endangered Species Act (ESA).

If you have any questions, feel free to contact me at the number listed above.

Sincerely,



Clayton Good
Encroachment Biologist, PFBC
Watershed Analysis Section
Division of Environmental Services

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