

**Docket #2020-P-MULTI-0024/Edgemoor**

Jill Kaplan &lt;JKaplan@mankogold.com&gt;

Fri 10/30/2020 12:26 PM

**To:** HearingComments, DNREC (MailBox Resources) <DNRECHearingComments@delaware.gov> 1 attachments (864 KB)

Comment Letter to DNREC from Greenwich Gloucester 10-30-2020.pdf;

Dear Ms. Vest,

Attached please find comments (and exhibits) to the applications of Diamond State Port Corp., Docket #2020-P-MULTI-0024, submitted on behalf of Greenwich Terminals LLC and Gloucester Terminals LLC.

Thank you.

**Jill Hyman Kaplan****MANKO | GOLD | KATCHER | FOX LLP***An environmental, health and safety law practice*

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AN ENVIRONMENTAL AND ENERGY LAW PRACTICE

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*Admitted in PA*

October 30, 2020

Via Email to [DNRECHearingComments@delaware.gov](mailto:DNRECHearingComments@delaware.gov)

Lisa A. Vest, Hearing Officer  
Office of the Secretary  
Department of Natural Resources and Environmental Control  
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Dover, DE 19901

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*Partner responsible:*  
John F. Gullace (NJ)  
Brenda H. Gotanda (HI)

Re: Docket #2020-P-MULTI-0024  
Comments on Application for Subaqueous Lands Permit and Water  
Quality Certification for Port of Wilmington Edgemoor Delaware  
(Tax Parcels: 0615300006 and 0615300003)  
4600 Hay Road, Edgemoor, New Castle County, Delaware, 19809

Dear Hearing Officer Vest:

On August 23, 2020, the Department of Natural Resources and Environmental Control (DNREC) provided public notice (the “DNREC Public Notice”) of permit applications, including a Subaqueous Lands Permit application, and federal consistency certification which had been received from Diamond State Port Corporation (“DSPC”) to construct a new container port on the Delaware River at DSPC’s Edgemoor property (the “Edgemoor project”). The DNREC Public Notice stated that written comments could be submitted to the Hearing Officer through November 1, 2020. This letter and the attached expert memos are being submitted as the written comments of Greenwich Terminals LLC (“Greenwich”), who operates the Packer Avenue Marine Terminal in Philadelphia PA, and Gloucester Terminals LLC (“Gloucester”), who operates the Gloucester Marine Terminal in Gloucester City NJ and the Paulsboro Marine Terminal in Paulsboro NJ (hereinafter collectively referred to as the “Port Operators”). The Port Operators have an interest in ensuring that the Edgemoor project does not negatively impact the Delaware River Main Navigation Channel, including impacts to navigation and sediment transport.

In this letter and attached expert memos, the Port Operators are providing comments on three problematic aspects of the Edgemoor project: (1) the proposed use of 13 large sedimentation fans; (2) the placement of a turning basin in the Delaware River Main Navigation



Channel; and (3) the impact on the Delaware River and aquatic habitats without any commensurate mitigation.

The Port Operators' comments on these three areas are as follows:

### **Sedimentation Fans**

1) DSPC represented in its Subaqueous Lands Permit Application that it had performed modeling “to project likely changes in shoaling patterns due to the initial dredging of the berth and approach channel and ***due to the anti-sedimentation devices that will be used to maintain the bottom depth,***” citing Appendix 10 (Hydrodynamic Analysis) of the Environmental Assessment Technical Document (“EATD”). Subaqueous Lands Permit Application, Appendix S at p. 3 (emphasis added). However, this statement is false as the Hydrodynamic Analysis, dated October 3, 2019 and prepared by Mott MacDonald, does not mention sedimentation or shoaling fans or any similar devices, and does not analyze their impact on sediment transport. Pursuant to the Delaware Administrative Code, “[p]roviding false or inaccurate information shall be grounds for denial or revocation of a permit or lease.” 7 *Del. Admin. C.* § 7504-3.1.1.2. Accordingly, the current application contains false information and should be denied.

2) DSPC is proposing utilizing sedimentation fans on a scale not previously studied in the United States. According to the documentation available to the Port Operators through DNREC's Public Notice and through Freedom of Information Act (FOIA) requests to the U.S. Army Corps of Engineers, DSPC has performed two sedimentation studies concerning the proposed Edgemoor project, the 2019 Mott MacDonald study (Appendix 10 to EATD) and the Preliminary Modeling in Support of Port of Wilmington Expansion Study, dated May 9, 2020 and prepared by Moffatt & Nichol (obtained through a FOIA request to the Army Corps but apparently not provided by DNREC with its Public Notice). Neither of these sedimentation studies analyzes the impacts of the sedimentation fans. According to the EATD, the effective sedimentation prevention distance covered by each of the Edgemoor site's 13 sedimentation fans is anticipated to be approximately 160 feet channel-ward from the breasting line of the berth. *See* EATD at 34. Of particular concern to the Port Operators is the significant amount of sediment that is proposed to be projected from the berthing area toward the Main Navigation Channel. It does not appear that DSPC has performed any analysis to assess the extent to which sediment from the Edgemoor project area will be blown into the Main Channel by these sedimentation fans.

3) In order to reduce the amount of maintenance dredging that will be required at the Edgemoor site, DSPC is proposing using 13 sedimentation fans that, four times per day, would blow sediment away from the proposed Edgemoor wharf and toward the Main Navigation Channel. The EATD specifies that the fans operate as follows: “water is drawn 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 an area being protected.” EATD at 33. The use of this type of sedimentation fan on this large a scale warrants separate environmental study for many

reasons, including that the fans have the potential to: (a) constantly and permanently disturb aquatic habitat along the bottom of the Delaware River; (b) impact aquatic life when water is drawn into the top of the thirteen 48-inch diameter tubes; (c) impact the turbidity of the Delaware River on a daily basis; and (d) result in increased sediment in the Main Navigation Channel and other ports and harbors. Pursuant to 7 *Del. Admin. C.* § 7504-4.7.1, DNREC must consider all of these impacts on the environment from the proposed sedimentation fans, including “the extent to which the proposed project may adversely impact natural surface and groundwater hydrology and sediment transport functions.”

4) Notably, the only support that has been cited by DSPC that indicates there are not negative impacts from the proposed sedimentation fans is from the manufacturer of the fans, SedCon Technologies. See Biological Assessment (Appendix 13 to the EATD) (prepared by Environmental Research and Consulting, Inc. (“ERC”), revised May 12, 2020) at 13-49. A manufacturer’s study that has not been subject to any independent review should not be relied on by DNREC. DSPC also contends that the impact of the fans on aquatic life “should be evaluated *after the berth area has been created.*” Essential Fish Habitat Assessment (Appendix 11 to the EATD) (prepared by Duffield Associates, dated January 2020) at 11-42 (emphasis added). Pursuant to the Delaware Administrative Code, the impact to benthic organisms and natural aquatic habitat must be studied and considered before the proposed dredging and construction of berth structures are allowed to proceed. See 7 *Del. Admin. C.* § 7504-4.7.1.3 & 7504-4.7.1.4.

5) According to the website of DSPC’s consultant on the Edgemoor project (Duffield Associates), Duffield performed much more extensive assessments and sampling before deploying sedimentation fans at another location on a smaller scale than is being proposed at Edgemoor. Similar assessments and sampling must be performed for the Edgemoor project that include collection and analysis of site-specific data and consider the size and scope of the sedimentation fans being proposed.

6) As additional support for the Port Operators’ comments and concerns regarding the lack of analysis of the proposed sedimentation fans and the likely negative consequences from the daily blowing of sediment toward the Main Navigation Channel, the Port Operators have attached a memorandum prepared by Craig Jones, Ph.D., Director Marine Science and Engineering at Integral Consulting Inc. **(Dr. Jones’s memorandum is attached as Exhibit A.)**

### Navigation

7) The proposed turning basin for the Edgemoor project occupies the entire Delaware River Main Navigation Channel. Placing a turning basin so that it occupies the entire Main Navigation Channel is contrary to recognized industry and government best practices and standards, including recommendations by the World Association for Waterborne Transport Infrastructure (PIANC) Maritime Navigation Commission. The proposed Edgemoor project and turning basin is also located at a critical turn in the main channel, and so is likely to affect visual navigational aids and vessel maneuverability. Pursuant to 7 *Del. Admin. C.* § 7504-4.6, DNREC

must consider the public interest in any proposed activity which might affect the use of subaqueous lands, including “[t]he potential effect on the public with respect to commerce [and] navigation ...” *Id.* at 4.6.3; *see also* 7 *Del. Admin. C.* § 7504-4.7.4 (In determining whether to approve an application, “[t]he Department shall also consider ... [t]he degree to which the project represents an encroachment on or otherwise interferes with public lands, waterways or surrounding private interests”). Moreover, pursuant to 7 *Del. Admin. C.* § 7504-4.11.1.2, for all activities involving dredging and filling, such projects shall be designed to “[m]aintain the navigability of channels.” Thus, efforts must be made to relocate the proposed turning basin.

8) Appendix 23 to the EATD, entitled “Full Mission Ship Simulation for Edgemoor Navigation Feasibility Study,” prepared by the Maritime Institute of Technology and Graduate Studies (MITAGS), dated August 22-24, 2018 (the “Navigation Simulation Report”), purports to determine the impact of the Edgemoor project on the ships transiting the deep draft main channel, but in fact fails to adequately study the impact of the terminal and turning basin on the range of ships that use the main channel. The Navigation Simulation Report does not include any simulations involving the impact of a turning ship in the turning basin on other ships that are traveling in the main navigation channel at that time. In connection with safety of other ships in the main channel, MITAGS only conducted simulations of two ships passing in the main channel under favorable conditions. A ship that is turning in the main channel would prevent use of this section of the main channel for a significant period of time resulting in potential delays to upbound and downbound traffic and could force other ships to slow down or have to stop, thereby affecting these other ships’ maneuverability and safety. The Navigation Simulation Report also failed to consider the wide range of types of ships that utilize the main channel, and the full range of tide and weather conditions that will likely be encountered. Since the ports further north on the Delaware River rely on ships being able to reach them unimpeded, much more study and planning needs to be done before the Edgemoor project and proposed turning basin is allowed to move forward.

9) The Navigation Simulation Report recommends that inbound transits only be allowed at the Edgemoor terminal during high tide and when the wind is 20 knots or less. It is not clear if DSPC is adopting these recommended limitations on operations at the proposed Edgemoor terminal and, if so, how such limitations might impact ships destined for Edgemoor or other terminals further up the Delaware River.

10) Neither the Navigation Simulation Report nor any of DSPC’s application materials address the potential emergency situations that ships could encounter in connection with the Edgemoor project and turning basin.

11) The Navigation Simulation Report and DSPC’s application materials fail to satisfy 7 *Del. Admin. C.* § 7504-4.7.4 as they do not allow DNREC to consider the encroachment and interference that the Edgemoor project and proposed turning basin will have on the “waterways or surrounding private interests,” including ports and ship-dependent businesses north of the Edgemoor project. DSPC’s proposed turning basin is also contrary to 7 *Del. Admin.*

C. § 7504-4.11.1.2 in that projects involving dredging or filling shall be designed to meet specified objectives, including to “[m]aintain the navigability of channels.”

12) As additional support for the Port Operators’ comments and concerns regarding the impact of the proposed Edgemoor project and turning basin on navigation on the Delaware River, the Port Operators are submitting a report prepared by retired U.S. Coast Guard Captain Jerzy Kichner, P.E., of KSEAS Consulting. **(Captain Kichner’s report is attached hereto as Exhibit B).**

### **Aquatic Life and Habitat and the Need for Compensatory Mitigation**

13) As indicated in the DNREC Public Notice, the Edgemoor project includes building a 2600-foot long wharf structure, dredging the berth and access channel to a depth of 45 feet below mean lower low water (which involves dredging over 80 acres of river bed and approximately 3.3 million cubic yards of river sediments and underlying soil), installing a bulkhead along 3,200 feet of shore line, and permanently filling in over 5.5 acres of subaqueous lands.<sup>1</sup> Thus, there can be no question that the Edgemoor project involves the permanent disturbance and filling of subaqueous lands.

14) Pursuant to 7 *Del. Admin. C.* § 7504-3.1.2.2, application materials must include a scaled drawing which shows, among other things, the exact location of aquatic habitats. However, a drawing that identifies the exact location of aquatic habitats impacted by the Edgemoor project does not appear to be included with DSPC’s application materials. Since this is a required attachment under the regulations, DSPC’s current application should be denied or required to be supplemented.

15) The conclusory statements in the Essential Fish Habitat Assessment (Appendix 11 to the EATD) and Biological Assessment (Appendix 13 to the EATD) regarding the insignificance of the loss of habitat in connection with the Edgemoor project result from a failure to appreciate that habitat has value even if not perceived as unique or high-quality habitat – if aquatic life is using the habitat, then it is serving a purpose. The Edgemoor project work will result in the permanent loss of intertidal and subtidal benthic habitat relied upon by a variety of benthic organisms and fish. For example, the Biological Assessment (Appendix 13 to the EATD) acknowledges that the project will disturb soft substrate, including the removal of the existing shallow water shelf, which will harm or eliminate benthic organisms that may be used as forage by sturgeon and other fish species. Biological Assessment (Appendix 13 to the EATD) at 13-59 – 13-60. In considering DSPC’s application, pursuant to 7 *Del. Admin C.* § 7504-4.6 (Public Use Impact) and 7504-4.7 (Environmental Considerations), the Department must

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<sup>1</sup> The EATD seems to indicate that more than 5.5 acres may be filled and/or permanently disturbed. The EATD states that the wharf would be 325,000 square feet in size –  $325,000/43,560 = 7.46$  acres. Also, it is unclear whether DSPC is including in their calculations the area impacted by the 4,500 20”-24” diameter steel pipe pilings filled with concrete that will be supporting the wharf. See EATD at 32 and Army Corps Public Notice revised and issued on July 30, 2020.

consider that there will be a permanent loss of at least 5.5 acres of subaqueous land, that no compensatory mitigation has been proposed, and that this involves the loss of and harm to natural aquatic and benthic habitats and organisms.

16) Areas immediately adjacent to the Edgemoor project area have been identified as having critical habitat for endangered species (Atlantic sturgeon) and important habitat for striped bass and shad, and the Edgemoor project area has 3 out of 4 physical or biological features (PBFs) that are essential to the conservation of Atlantic sturgeon. *See* American Shad Habitat Plan for the Delaware River, Delaware River Basin Fish and Wildlife Management Cooperative (2014); *see also* Essential Fish Habitat Assessment (Appendix 11 to the EATD) at 11-32; EATD at 72-73 (“Fish sampling performed by others in the vicinity of the project site has indicated use of this section of the estuary by a variety of species, most notably striped bass, river herring and alewife. . . . [A]lewife and river herring have been designated as Species of Concern by NOAA.” As a result, the limited survey performed to support the absence of any sturgeon in any life stage or of other aquatic life has to be questioned. Pursuant to 7 *Del. Admin. C.* § 7504-4.11.2.1, DNREC should consider impacts both “at and surrounding the dredging site(s).”

17) DSPC’s analysis of aquatic habitat and life focuses on too small an area and should be focused on the cumulative impacts resulting from both the Edgemoor project and completion of the Delaware River deepening project. *See* 7 *Del. Admin. C.* § 7504-4.7.3.1 (requiring DNREC to consider cumulative effects). The analysis should also consider the impacts the Edgemoor dredging and fill work will have on neighboring deep water habitats. *See* 7 *Del. Admin. C.* § 7504-4.7.3.2 (requiring DNREC to consider secondary effects). In addition, the DSPC’s application materials do not account for the cumulative and secondary effects of the permanent alteration of the marine environment caused by the constant operation of the 13 proposed sedimentation fans.

18) The permanent loss of intertidal and subtidal benthic habitat, relied upon by a variety of benthic organisms and fish, resulting from filling in 5.5 acres of a navigable public waterway necessitates that the Edgemoor project include compensatory mitigation. DNREC has required compensatory mitigation for similar projects. “An application may be denied if the activity could cause harm to the environment, either singly or in combination with other activities or existing conditions, which cannot be mitigated sufficiently.” 7 *Del. Admin. C.* § 7504-4.2; *see also* 7 *Del. Admin. C.* § 7504-3.3 (burden is on applicant that the loss of subaqueous lands has been offset or mitigated) and § 7504-4.7.3.3 (requiring DNREC to consider whether significant impacts or potential harm can be offset or mitigated). DSPC’s application makes no attempt at providing any mitigation for the Edgemoor project, and so should be denied as currently presented.

19) As additional support for the Port Operators’ comments concerning the need for compensatory mitigation in connection with the Edgemoor project, the Port Operators are submitting a memo prepared by Damian Preziosi, Principal Ecologist at Integral Consulting Inc.

DNREC  
October 30, 2020  
Page 7

and the Principal-in-Charge of assessments associated with the Fox Point State Park located on the Delaware River just north of the Edgemoor site. **(Mr. Preziosi's memo is attached hereto as Exhibit C.)**

The Port Operators appreciate the opportunity to provide the foregoing comments to the DNREC Public Notice. We reserve the right to submit additional comments if appropriate.

Sincerely,

A handwritten signature in black ink that reads "Jill Hyman Kaplan". The signature is written in a cursive style with a large, stylized "J" and "K".

Jill Hyman Kaplan  
For MANKO, GOLD, KATCHER & FOX, LLP



**Exhibits:**

Exhibit A – Memorandum from Craig Jones, Ph.D., Director Marine Science and Engineering at Integral Consulting

Exhibit B – Report from retired U.S. Coast Guard Captain Jerzy Kichner, P.E., KSEAS Consulting

Exhibit C – Memorandum from Damian Preziosi, Principal Ecologist at Integral Consulting

# **EXHIBIT A**



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## MEMORANDUM

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**To:** Hearing Officer  
Delaware Department of Natural Resources and Environmental Control

**From:** Craig Jones, Ph.D.  
Director Marine Science and Engineering

**Date:** October 30<sup>th</sup>, 2020

**Subject:** Comments on **Docket #2020-P-MULTI-0024**

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The Delaware Department of Natural Resources and Environmental Control (DNREC) is evaluating an application for a Subaqueous Lands Permit and Water Quality Certification for Diamond State Port Corporation (DSPC) to conduct dredging and disposal activities within, and adjacent to, the Delaware River at the Port of Wilmington Edgemoor Expansion project site outlined in the Public Notice published August 23, 2020. I have been asked to provide comments regarding the project's proposed design, particularly use of sedimentation fans and their potential impact on the surrounding environment, including the main navigation channel. I am the Director of the Marine Science and Engineering Group of Integral Consulting, Inc. In that role, I have been engaged as a technical expert on sediment, dredging, and environmental matters on all of the large estuaries in the northeastern United States including the Delaware River. In the review of this project application, I have relied on over 20 years of experience as a practicing scientist and engineer as well as consideration of Delaware's Regulations Governing the Use of Subaqueous Lands (Delaware Administrative Code, Title 7, Chapter 7504).

The in-water project includes hydraulic dredging of 3.3 million cubic yards (cy) of sediment. The dredging consists of over 40 vertical feet (ft) of material removal along the natural subtidal river. Approximately 90% of the material is to be disposed of at USACE Confined Disposal Facilities (CDF). Only 10% of the material to be dredged from the DSPC is planned for beneficial use as fill into the river at the adjacent construction site.

### **Sedimentation Fans**

In the operations and maintenance of the constructed project, a significant level of ongoing sedimentation must be managed (Environmental Assessment Technical Document, 2020). The project description states that an annual 500,000 cy of maintenance dredging will be

## Comments on **Docket #2020-P-MULTI-0024**

October 30<sup>th</sup>, 2020

Page 2 of 7

required. The large volume of annual dredging will have continuing water quality impacts. In addition to the large amount of annual dredging, thirteen sedimentation fans are proposed at a spacing of 200 ft along 2600 ft (~ 0.5 mi) of wharf. These 48 inch (in.) J-shaped fans will rotate at speeds on the order of 275 revolutions per minute during ebb and flood tides to move sediment away from the wharf. For 30 minutes four times per day, the fans are intended to resuspend fine deposited sediment towards the channel to prevent deposition in an area extending 160 ft out from the wharf.

While sedimentation and shoaling fans have been deployed in the U.S. on a very limited basis, deployment at the scale of thirteen large fans has never been permitted, studied, or monitored as a long-term sediment management practice. The applicant's application materials, specifically the Biological Assessment (Revised 2020) (Appendix 13), rely only on studies prepared by the manufacturer of the fans (Bryant and Moseley, 2007) and sales literature for the finding that there will be no impact as a result of the fans. However, the manufacturer's studies (which were not published in peer reviewed literature) were conducted at the Columbus Street Terminal in South Carolina with only four fans that were 25% smaller in diameter than the fans proposed here. The small size of the project makes any comparison to the present project dubious. The studies also were not conducted in the Delaware River, which also makes them of little value in assessing the impacts of the fans for this project.

The Duffield website indicates a Magellan facility in Wilmington, Delaware was evaluated for sedimentation fan deployment. As part of that project, Duffield states that ecological evaluations and sedimentation assessments were performed, including sampling to develop estimates of potential entrainment impacts to spawning striped bass and river herring, and potential impacts to endangered species. Also, as part of the assessments for that site, Duffield says that methods of mitigating potential adverse environmental impacts were developed (<https://duffnet.com/projects/magellan-midstream-shoaling-fans/>). This description shows that before deployment of sedimentation fans at this other site, much more assessment and mitigation was performed compared with the lack of assessment conducted for the DSPC project.

In review of the redacted Entrainment Impact Assessment<sup>1</sup> for a site in Wilmington Delaware, submitted for the record by the Delaware Coastal Management Program during the DNREC September 29, 2020 public hearing, it is reasonable to assume this is the same site referenced on the Duffield website. The findings of that assessment are for a much smaller project, 7 fans over only 1,000 ft of berth as opposed to 13 fans over 2,600 ft of wharf, and rely on site specific data for species in a different waterway. Overall, it is not valid to apply the site specific findings for a much smaller project in a different waterway

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<sup>1</sup> <http://www.dnrec.delaware.gov/Admin/Documents/dnrec-hearings/2020-P-MULTI-0024/DCMP/DCMPEXhibit6.pdf>

## Comments on **Docket #2020-P-MULTI-0024**

October 30<sup>th</sup>, 2020

Page 3 of 7

to the DSPC project. An independent assessment of the DSPC project site must be performed based on specific DSPC site data and proposed sedimentation fan deployment.

### **Numerical Modeling Assessment**

The Environmental Assessment Technical Document (2020) Hydrodynamic Analysis (Appendix 10) contains a numerical hydrodynamic and sediment transport modeling study conducted by Mott Macdonald to assess sedimentation. The modeling study contains no mention of nor assessment of sedimentation fans at the site. After the Mott Macdonald study, Moffat and Nichol (MN) was engaged to perform another sedimentation modeling study for the proposed Edgemoor terminal area using an alternate modeling approach. The MN study was not available through DNREC's website and links, but was provided by the U.S. Army Corps of Engineers in response to a Freedom of Information Act (FOIA) request. The MN study predicted a range of sedimentation in the project area under the Preferred Alternative between approximately 450,000 and 610,000 cubic yards per year. Further, a maximum of between 6 and 10 feet of sedimentation over a year was predicted along the shoreward end of the project area. The MN predictions illustrate the large quantity of sedimentation expected over the course of a year.

**Neither the MN study nor the previous Matt Macdonald study modeled the impacts to sedimentation caused by the proposed use of 13 large sedimentation fans.** As part of the MN modeling study, the authors state that a previous 2009 study for the Philadelphia District, US Army Corps of Engineers, investigated a number of active methods to reduce sedimentation in the Port of Wilmington including the SedCon Turbo System proposed here. However, the results of this previous investigation are not reported or evaluated in the MN study or DSPC's Environmental Assessment, and so a modeling study of the potential impacts of the fans on the Delaware River should be performed.

Modeling the sedimentation impacts of the fans is appropriate for this project because deployment of sedimentation fans at the scale proposed for the DSPC project has never been permitted, studied, or monitored as a long-term sediment management practice. As noted above, the DSPC Biological Assessment (Revised 2020) (Appendix 13) relies only on studies prepared by the manufacturer of the fans (Bryant and Moseley, 2007) for the findings of no impact. However, the manufacturer's studies were conducted at a site where the deployment was significantly smaller than proposed here. The studies are of little value in assessing the impacts of the fans for this project site where substantial sedimentation is anticipated over short time periods.

### **Environmental Stressors**

An initial evaluation of the stressors posed by the sedimentation fans in the Delaware River yield several areas of likely impacts. Some of the key areas of impact that are likely include:

## Comments on Docket #2020-P-MULTI-0024

October 30<sup>th</sup>, 2020

Page 4 of 7

- *Sediment Transport* – An important aspect of deposition prevention by the fans is their ability to keep sediment that would otherwise deposit in the area moving and resuspend sediment that has deposited during the 22 hours a day of non-operation. While the velocities generated by the fans is not reported in the Public Notice, the velocities at the intake for the smaller 36 in. fans studied in the Bryant and Moseley report (2007) were 2.5 ft/s, so it is likely that the larger fans for this project will generate greater velocities. An array of fans generating velocities of many ft/s arrayed over approximately 0.5 miles of wharf would create a significant alteration to the natural sediment transport patterns in the river. Further, the daily resuspension and transport of deposited sediment over at least 416,000 square feet of sediment bed would have a direct impact to sediment transport in nearby regions. The nearest adjacent region is the federally authorized navigation channel which is presently being deepened to 45 ft for navigation. The additional sediment forced into the channel will likely cause channel deposition either increasing the need for maintenance dredging or decreasing the life of the project. Further, nearby ports and harbors already conducting permitted maintenance dredging will likely be required to increase maintenance dredging volumes due to the additional mobilized sediment load. Although the manufacturer’s conference paper (Bryant and Moseley, 2007) claims there were no adverse effects in the nearby channels, the present project includes over three times as many fans that are 25% larger and will therefore likely have a substantial impact on sediment transport in the main navigation channel as well as other sites in the area.
- *Water Column Biota* – While 4 in. mesh will be placed over the intake of the sedimentation fans, there will still be significant risk to larval and juvenile stage organisms that are not only smaller than 4 inches, but also more vulnerable to physical agitation. The intake of larval and juvenile stage organisms into a sedimentation fan at a velocity of 2.5 ft/s or greater and fans rotating at 275 - 500<sup>2</sup> revolutions per minute (at least 4.5 revolutions per second) leaves little opportunity for an organism to either escape the intake velocity or pass through the system without harm. Unlike the initial and annual maintenance dredging, which will occur only during certain seasonal windows to protect life stages of sturgeon and other anadromous fish, the fans will operate indefinitely, year-round. The seasonal windows where these organisms are particularly vulnerable must be considered (e.g., Sturgeon spawning and early life stages). The Biological Assessment (Revised 2020) (Appendix 13) states that the early-life stage biota are unlikely to occur in the water column; however, the standard for biological risk evaluation under the

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<sup>2</sup> The application states 275 revolution per minute, and page 42 of the Biological Assessment (Revised 2020) states “275 to 500 rpm depending on the installation”.

## Comments on Docket #2020-P-MULTI-0024

October 30<sup>th</sup>, 2020

Page 5 of 7

Endangered Species Act requires assessment beyond a simple statement saying risk is unlikely.

- *Water Quality* – The sedimentation fans are intended to prevent sediment deposition and they do so by moving and resuspending sediment that has settled during the 22 hours of non-operation. The Biological Assessment (Revised 2020) (Appendix 13) nevertheless states:

“Field studies have shown that shoaling fans do not increase turbidity, but simply keep sediment suspended in the water column (SedCon Technologies, Inc., 2019) and, therefore, water quality will not be negatively affected.”

As mentioned, the manufacturer’s conference paper (Bryant and Moseley, 2007) that is the basis of the above claim is based on a project with four 36 in. fans. The present project includes over three times as many fans that are 25% larger and is located in the Delaware River turbidity maximum where sedimentation rates are high (Environmental Assessment Technical Document, 2020, Table 5.3-1, p. 131); therefore, one can readily assume that a significant amount of sediment will be suspended when the fans are operational.

Based on the findings of the Environmental Assessment Technical Document (2020), it is reasonable to assume that ¼ inch (~0.6 cm) of sediment could deposit during slack tides between the times of sedimentation fan operation. The resuspension of a ¼ inch of low density surface sediment deposited on the sediment surface results in a significant increase in suspended solids. A simple calculation shows that a thickness of ¼ inch of fine sediment suspension results in an over 100 mg/L suspended solids increase in 40 ft deep water. A 100 mg/L increase in suspended solids is a significant elevation that would cause the water to appear opaque (high turbidity), reduce light penetration into the water column, adversely affect fish in all stages of life, affect dissolved oxygen concentrations, and decrease local habitat quality. These and other deleterious water quality consequences must be fully investigated before the use of sedimentation fans is allowed. The State of Delaware 7401 Water Quality Standards limit exceedances of turbidity to 10 Nephelometric Turbidity Units (NTU) above background and the Delaware River Basin Commission limits exceedance to 40 NTU. An increase of 100 mg/L in suspended sediment concentrations would be expected to exceed these turbidity standards.

- *Benthos* – The four-time daily disturbance of the sediment bed by the sedimentation fans would preclude the establishment of benthic habitat that is a fundamental component of the local ecosystem. Further, any essential fish habitat is reliant on stable benthic communities. The Biological Assessment (Revised 2020) (Appendix

## Comments on **Docket #2020-P-MULTI-0024**

October 30<sup>th</sup>, 2020

Page 6 of 7

13) states that “[c]hanges in the benthic community within the Dredging Area will likely be temporary, with recovery taking a few months to a few years ...”, but this conclusion does not appear to account for the regular disturbance caused by the sedimentation fans. The sedimentation fans would create conditions under which no stable benthic habitat would be able to develop, negatively impacting aquatic life up through the food chain.

### **Summary**

As part of DNREC’s review of DSPC’s application and consideration of the public use and environmental impacts (7 Del. Admin. Code Sections 7504-4.6, 4.7 and 4.11), the harm caused by both the construction and operation of the proposed DSPC project must be fully considered. As discussed, the stressors due to dredging large amounts of sediment, lack of beneficial reuse, and the reliance on sedimentation fans are key components of the project that would have significant negative impacts.

Under the Delaware Administrative Code regulations the areas that could be expected to have significant impacts are:

- Conservation – Essential fish habitat in the region would be adversely impacted by the removal of 3.3 million cy of sediment, 40 ft deepening of natural subtidal river channel, and regular operation of sedimentation fans.
- Economic Development – Four-time daily resuspension of sediment toward the federally authorized channel is expected to cause significant increase in deposition in the federally authorized channel and in the channels of ports and harbors nearby. The increase in need for maintenance dredging and possible reduction in use has direct negative consequences on the local economic resources.
- Environmental impacts – The local water, sediment, and habitat quality would all be adversely affected by the operation of the sedimentation fans. Further, the four-time daily operation of the fans has the potential to cause fish injury and mortality, particularly for early life-stage fish.
- Navigation – The increased potential for sediment deposition from sediment mobilized from the DSPC project area in the navigation channel and other local ports and harbors could decrease the navigability in these facilities.

Beyond the potential for the impacts listed above, sedimentation fans have never been used at this scale in the Delaware River. In order to satisfy its obligations to consider public use and environmental impacts, DNREC must carefully study and review a project of this scale with such unprecedented technology and potentially wide-ranging impacts. Before



Comments on **Docket #2020-P-MULTI-0024**

October 30<sup>th</sup>, 2020

Page 7 of 7

approving any request for permit, a full evaluation of the above considerations must be fully considered and, where appropriate, addressed.

Thank you for your consideration of these comments.

Sincerely,

A handwritten signature in black ink, appearing to be 'C. Jones', written in a cursive style.

Craig Jones  
Principal – Marine Sciences and Engineering  
Integral Consulting Inc.

# **EXHIBIT B**



KSEAS LLC

# Comments on Navigational Safety Concerns for Edgemoor Terminal

Prepared for:

**Manko, Gold, Katcher, Fox LLP**  
401 City Avenue, Suite 900  
Bala Cynwyd, PA 19004

Prepared by:

**Captain Jerzy J. Kichner, USCG (ret)**



2711 SW 43<sup>rd</sup> TER Cape Coral FL 33914

Project	Date	Status
EDGEMOOR	1 October 2020	FINAL



**TABLE OF CONTENTS**

<b>1. OVERVIEW.....</b>	<b>3</b>
<b>2. NAVIGATION ON THE DELAWARE RIVER.....</b>	<b>3</b>
<b>3. THE LOCATION OF THE EDGEMOOR TERMINAL AND TURNING BASIN.....</b>	<b>4</b>
<b>4. MITAGS STUDY.....</b>	<b>6</b>
<b>5. CONCLUSION AND RECOMMENDATIONS.....</b>	<b>8</b>

## **1. Overview**

I am a retired United States Coast Guard (USCG) Captain with over 28 years' experience in port and commercial vessel safety and in navigation and safety matters. As a previous Captain of the Port for what is now USCG Sector Mobile, AL it was my responsibility to promote commerce while ensuring the safety of navigation for commercial vessel traffic. In that position I regularly had to evaluate and provide input and decisions concerning U.S. Army Corp of Engineers (USACOE) permit applications for construction of piers, wharfs and waterfront facilities and evaluate their impact on the waterway and navigational safety for all users of the waterway. Since my retirement, as a consultant, I have 19+ years' experience in risk management for marine projects which includes the construction of new facilities throughout the United States. I have been heavily involved in chartering and evaluating a multitude of different ship simulation and other studies that were necessary to fully quantify risks associated with particular projects to ports or waterways. This included projects in the United States, Europe, Mexico, the Middle East and North Africa.

I was asked to evaluate the proposed plans for the Edgemoor Terminal and turning basin to assess whether the new terminal and turning basin would pose a risk to navigation and safety on the Delaware River. In conducting my evaluation, I focused on the Full Mission Ship Simulation for Edgemoor Navigation Feasibility Study (2018) prepared by MITAGS. The MITAGS study claims that the focus of the simulation was to determine the impact of the terminal on ships transiting the deep-draft navigation channel, but the study is inadequate for this purpose. It is my view that the MITAGS study was too limited and did not fully encompass the conditions, vessel types, and traffic impacts that would be expected for a terminal and turning basin in this location. In light of the proposed location of the turning basin in a highly trafficked part of the main and only deep draft channel servicing a plethora of critical upstream ports (Philadelphia), refineries and terminals, and the grave consequences of a ship casualty affecting the use of the channel, a more careful and thorough evaluation of the actual impacts of the terminal/turning basin on ship safety and navigation is warranted.

## **2. Navigation on the Delaware River**

The Delaware River is an important, highly trafficked river and only has one deep draft channel that services a number of critical ports.

In 2018, the United States Coast Guard prepared a Ports and Waterways Safety Assessment (PAWSA)<sup>1</sup> for the Delaware River. The USCG as part of its duties is responsible for developing and implementing policies and procedures that facilitate commerce, improve safety and efficiency, and inspire dialogue within the port complex that will make waterways as safe, efficient, and commercially viable as possible. USCG PAWSAs are conducted on what is considered to be “critical waterways”.

According to the USCG PAWSA, the maritime industry along the Delaware River contributes approximately \$85 billion dollars to the economy. Similarly, the PAWSA states that with regards to shipping and use of the federal channel, there were approximately 2,400 discrete commercial cargo vessel arrivals, not including towing vessels, calling on the ports and terminals along the Delaware River. Vessels shifting berths or moving between facilities results in approximately 200 additional discrete vessel movements.

The USCG PAWSA confirms and emphasizes the criticality of the Delaware River federal channel and the need to ensure that it is never obstructed. The following is taken directly and verbatim out of the USCG report:

- *A major marine casualty would have a significant impact on the port complex. Shutting down the waterway would have a major impact to the oil refiners who rely upon daily imported crude oil shipments to keep the refineries operating.*
- *Shore-side infrastructure would also be impacted by a port closure. Outbound shipments of refined products by railroad tank car would be disrupted.*
- *There are several railroads that could be utilized to bring in and ship out limited amounts of cargo, but the capacity of the rail lines could not sustain long term operations.*
- *Shore side facilities that rely upon daily and weekly cargo transfers (crude oil for example) would be greatly impacted by a port closure. The larger refineries receive in some cases 1 million-gallon shipments of crude oil daily; an extended port closure could result in the refinery running out of crude oil to processes and having to shut-down refining operations. Facilities that receive vessels every few weeks would be less impacted by a port closure.*

### **3. The Location of the Edgemoor Terminal and Turning Basin**

The proposed turning basin for the Edgemoor terminal encompasses the entire federal channel, the only deep draft channel that services the major ports and terminals located

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<sup>1</sup> <https://www.navcen.uscg.gov/?pageName=pawsaFinalReports>

north of Edgemoor. Turning a vessel involves the use of multiple resources (tugs) and extraordinary coordination accounting for a complex set of factors including the ship's maneuvering characteristics, draft, sail area, wind and currents, to maintain position in a tight designated area of sufficient depth to keep a vessel from going aground. While a vessel is being turned, no other deep draft traffic constrained by draft can use the channel and must remain clear until the turning vessel is oriented for travel up or down the channel. Vessels using the proposed turning basin, whether due to environmental conditions, human error or mechanical malfunction, could easily and potentially ground and block the federal channel for days or weeks on end. Any disruption, blockage, grounding, collision or allision in the federal channel by a container vessel using Edgemoor would have a severe and adverse impact on those ports and terminals located north of Edgemoor as noted in the USCG PAWSA.

The proposed terminal/turning basin is also positioned in a critical turn in the channel for both upbound and downbound vessels that influences/impacts vessel maneuverability on turns from the Bellevue Range onto the Marcus Hook Range. Ranges are essential visual navigational aids. While most Pilot organizations use highly accurate personal electronic aids for navigation (i.e. PilotMate), the use of all available means of navigation is prudent and practiced by responsible mariners. Ranges have long since been used as navigational aids to provide for precise visual navigation in critical turns and in maintaining proper position in channels. Use of ranges is critical to the safe navigation of any vessel and more so for deep draft vessels constrained by draft and limited by the depth of the channel. The USCG PAWSA states that there are already visibility impediments by background shore side lighting, and it is difficult to see vessels berth alongside or tow vessels with barges as well as other smaller vessels that may be in the channel. Any obstruction, such as a cargo ship in the turning basin, that would diminish the ability of a vessel to use the range at the turn at Edgemoor could impact safe navigation.

PIANC (Permanent International Association of Navigation Congresses)<sup>2</sup> is a recognized international industry and government standards body that publishes information on best practices, standards and procedures for the design and analysis of navigational channels. PIANC in concert with the International Association of Ports and Harbors (IAPH), the International Maritime Pilots Association (IMPA) and the International Association of Lighthouse Authorities (IALA) published a document titled *Harbour Approach Channels Design Guidelines (2014)*.<sup>3</sup> It is the world class standard for recommendations on good practice in the design and analysis of navigational channel and port design and operations. PIANC recommends that no Turning Basin intrude on a deep draft channel. In many ports in the United States, turning basins are part of the port infrastructure but are designed and

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<sup>2</sup> <https://www.pianc.org/about>

<sup>3</sup> <https://www.pianc.org/publications>

placed so as not to impede or intrude on existing and critical deep draft navigational channels.

#### 4. MITAGS Study

The MITAGS study was done by the applicant to support the USACOE and project stakeholders' desire for a ship navigation study to ensure that container ships anticipated to use the terminal are able to safely transit the waterway to the proposed Edgemoor Terminal on a regular basis, with minimum impact on existing vessel traffic. The primary purpose of the study was to determine the impact of the terminal on the ships transiting the deep-draft navigation channel, although as described below, the study was too limited to adequately evaluate this issue. The study used a full mission simulator to represent the transit and mooring of vessels at the Edgemoor Terminal under a narrow set of conditions. The study primarily processed 9300 TEU Container ships through a 3-day simulation, although the study also performed a preliminary assessment of the feasibility of a 12000 TEU container ship. The conclusion from the simulation was that the ships tested and Terminal design *"...would have minimal impact on ships as they transit the existing navigational channel."* However, the study recommended restrictions on transit to high tide and wind conditions less than 20 knots.

The MITAGS study is incomplete. The simulation study concluded that there would be no adverse effects from vessels using the terminal, but this conclusion was based on six passing vessel tests under very limited test conditions. What this conclusion fails to mention is that it is only applicable to container vessels and only the two container vessel models used in the simulation. Although MITAGS acknowledged in the study that the *"navigation channel handles oil tankers up to the Suezmax class, container ships up to 14,000 TEUs, and other vessel classes,"* the passing test failed to account for the different types of vessels using the channel and transiting past Edgemoor. A fully laden Suezmax class tanker or a light Suezmax tanker may handle much differently than the modeled container ships used in the passing study. By the report's own admission *"Model behavior is highly dependent on the accuracy of the bathymetry, the current, and wind flows. In real world situations, such forces could vary significantly over the operating area. In addition, the models used in these tests were representative of vessel classes similar in size and displacement. Vessels of the same class may have significant differences in handling characteristics in real-world conditions."* This fact is even more relevant to deep draft vessels of a different class (tankers etc.). Also, the study was limited to container vessels and did not take into account other types of vessels using the channel, including tugs and barges.



Further, no simulations were conducted to assess the impact of a turning basin that occupies the entire deep draft channel on transiting ship traffic. A ship using the proposed turning basin would prevent the use of this section of the main channel by transiting vessels for a significant period of time resulting in potential delays to upbound and downbound traffic. In addition, as stated by the USCG in the PAWSA, *“Vessels with high wind-profile areas (car carriers, larger container ships) are most impacted by winds and must maintain sufficient speed in order to maintain vessel maneuverability.”*<sup>4</sup> This means that large vessels constrained to the confines of the channel (constrained by draft) cannot slow down without themselves potentially impacting their own navigational safety under certain weather conditions. Therefore, if a vessel using the main channel were to have to slow for a vessel obstructing the channel in the turning basin, it could impact the transiting vessel and cause it to ground or collide with the maneuvering vessel and thereby block the channel. It is therefore imprudent to conclude that construction and location of the Edgemoor Terminal as proposed would not have an effect on passing traffic or that passing traffic would not have an effect on vessels moored at the Edgemoor Terminal without additional study.

The MITAGS study’s simulations were only conducted in “clear visibility.” No simulation runs were done under adverse or restricted visibility conditions. Certainly, the maneuvering of vessels under good visibility, with all of the visual navigation aids available, would achieve better results in the simulation. A complete simulation to adequately assess the safety of these maneuvers needs to be done under adverse conditions of night transits, sudden squalls, and restricted visibility so as to determine the safe limits of vessel navigation and maneuvering alongside the Terminal. The USCG PAWSA report states that fog routinely occurs year-round but is more prevalent in the spring and fall. Spring and fall are traditionally low visibility times of year. An additional question that needs to be explored is how the studied vessels would react in the middle of a turn during a sudden squall and/or change in visibility. Without simulating such adverse conditions, the study cannot reliably conclude that ship traffic can safely use the terminal and turning basin.

The study also indicated that *“No maximum ebb currents were used during the inbound runs.”* Unless the turning and mooring of any and all container vessels that may call on Edgemoor will never take place during max ebb, simulation of turning and mooring a vessel under those conditions needs to be explored.

In addition, simulations were conducted during what were claimed to be “worst case” conditions of spring max flood of 1.6 -1.7 knots and spring max ebb of 1.3 – 1.5 knots. However, according to the USCG PAWSA, *“significant rain events in the spring and snow melt*

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<sup>4</sup> USCG Sector Delaware River PAWSA 2018

*run-off from the winter increases water flow movement and can increase current speeds from the normal 1-2 knots, to over 4 knots.”* There were no simulation runs for passing vessels or for turning vessels to moor at Edgemoor under those conditions or conditions that combine high current and higher wind speeds.

Further, it is also not clear in the simulation conducted whether the tugs modeled and used would be of the same type, number and bollard pull that would be available for actual operations. The availability, type and adequate number of tugs to guide and turn a container vessel within a confined area as proposed and simulated is crucial. This is especially the case when impacted by weather and current and other factors. A tug’s bollard pull and maneuverability are critical factors in determining the adequate number necessary to safely handle a vessel especially in a situation that rapidly develops and may not be planned for. Although the MITAGS study included a letter from Wilmington Tug certifying that *“the simulated tug service [in the study] appears consistent with our experience and expectations,”* it is unclear whether the letter by Wilmington Tug confirmed that the tugs used in the simulation were the ones that will be used for actual mooring of the container vessels at Edgemoor, or if the tugs used in the simulation responded accurately as the tugs owned and operated by Wilmington Tug. In any case, the Simulation Report stated that future work was needed to determine the berthing procedures, tug power required, and emergency procedures to be developed.

Finally, in the Pilot Recommendations section, the Delaware Pilots recommended high tide and winds less than 20 knots for inbound transits. It is assumed that this restriction is applicable only to the vessels used in the simulation. This is a very broad and general statement. Further clarification is needed as to what this actually means and where and how it is applicable. Is it required that the vessel moor at the terminal at high tide or is the requirement for high tide transit applicable in initiating the transit to Edgemoor from the sea buoy or anchorage? Restricting vessels to high tide transits confines the window of opportunity to certain parts of the day or night and may impact the ability for other vessels to transit the River. Similarly, the transit may start on high tide with favorable winds, but prior to reaching the destination, winds have increased beyond the threshold limit recommended. The applicant should identify appropriate measures for such a scenario to ensure that navigational safety can be maintained.

## **5. Conclusion and Recommendations**

Given the criticality of the federal channel to upstream industry and ports and the impact if the channel was blocked for any reason, the MITAGS study is incomplete and additional simulations and analyses are recommended. PIANC recommends that a full analysis be

conducted to determine the risks associated with the design of new terminals and modification of navigational channels. Risk can be defined as the probability of some occurrence multiplied by the financial and port impact consequences. A probabilistic simulation of this potential using a “Monte Carlo” simulation should be conducted. A “Monte Carlo” simulation (random combinations) is a method used to generate a large number of navigation scenarios and their probabilistic outcome. Factors considered would be collisions between vessels calling on the terminal and channel; collisions between a passing vessel and a vessel at the Terminal, groundings or allisions due to environmental conditions (winds, currents, visibility, mechanical casualty (loss of power)) and inadequate tug availability and horsepower. Scenarios involving the use of the turning basin in the main channel must also be included. The analysis should not only include interaction between the Edgemoor container vessels and other deep draft vessels but also their effect on the tugs and barges that use the waterway for commerce. As part of the analysis, the impact on other vessel traffic from limiting inbound transit for container vessels to high tide and winds less than 20 knots as recommended by the MITAGS study should be assessed.

In addition, the USCG PAWSA states that one of the mitigating factors, among others, associated with safe navigation on the Delaware River is the use of a transit plan. As part of the application evaluation process and completion of the full navigational safety analysis that addresses the issues raised, a solid navigation transit plan should be prepared by the project applicant which incorporates the issues learned and mitigation strategies employed to ensure safe navigation and minimize risk to the other critical users of the waterway. Any transit plan must specify how such limitations will be implemented without unduly impairing other ship traffic or commerce on the Delaware River.

Signed:   
\_\_\_\_\_  
J. J. Kichner, PE

Date: October 1, 2020

# **EXHIBIT C**



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## MEMORANDUM

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**To:** Hearing Officer  
Delaware Department of Natural Resources and Environmental Control

**From:** Damian V. Preziosi  
Principal Ecologist

**Date:** October 28, 2020

**Subject:** Comments on **Docket #2020-P-MULTI-0024**

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The Delaware Department of Natural Resources and Environmental Control (DNREC) is evaluating an application for a Subaqueous Lands Permit and Water Quality Certification for Diamond State Port Corporation (DSPC) to conduct dredging and disposal activities within, and adjacent to, the Delaware River at the Port of Wilmington Edgemoor Expansion project site outlined in the Public Notice published August 23, 2020. I have been asked to provide comments regarding the project's proposed design, particularly with respect to habitat and aquatic life in the vicinity of the project and my technical opinion related to the need for compensatory mitigation to offset potential impacts.

I am a Principal in the Toxicology, Health and Environmental Science practice for Integral Consulting Inc. I received a Master's of Science degree from Bucknell University in 1994, and my area of study was biology and ecology of fish. I previously worked at the Congressional Research Service of the Library of Congress, where I provided consultation on federal fisheries regulation and policy. Over the last 25+ years, I have worked as an environmental consultant specializing in ecological risk assessment, and risks specifically associated with cumulative impacts of physical and chemical stressors in aquatic habitats at local and regional scales. My area of expertise includes risk assessment of rare, threatened and endangered species using population, community and ecosystem models, including use of population viability analysis. Since 2010, I have served as Principal-in-Charge of a Remedial Investigation and Natural Resource Damage Assessment of the river and shoreline adjacent to the Fox Point State Park, located along the western side of the Delaware River immediately to the north of the Edgemoor property. Prior to this I served as a key technical lead and co-author of the first regional risk assessment ever performed

for the Delaware Estuary.<sup>1</sup> I am a Certified Senior Ecologist of the Ecological Society of America, and am the immediate past Chair of the Board of Professional Certification of this society.

The in-water portion of the Edgemoor project includes hydraulic dredging of 3.3 million cubic yards (cy) of sediment over a combined area of approximately 87 acres. The dredging consists of over 40 vertical feet (ft) of material removal along the natural subtidal river. The project will include the construction of an approximately 2600-foot (~ ½ mile) long wharf and steel sheet pile retaining wall. The wharf will be constructed by permanently filling approximately 5.5 acres of the Delaware River. The in-water work will result in the permanent loss of intertidal and subtidal benthic habitat relied upon by a variety of aquatic species. These include benthic organisms (e.g., polychaetes, mysid shrimp, amphipods, molluscs and crabs) and fish (e.g., sturgeon, striped bass, blueback herring, and alewife<sup>2</sup>) that rely on this habitat.

The connection between benthic habitat, benthic organisms and fish is important to view holistically, because each is required to operate in unison in order that the ecosystem functions as a whole. With the loss caused by filling of any one individual habitat or biological resource, there is the potential for concomitant loss to dependent resources with some proportional loss of function. The overall position presented in the Essential Fish Habitat (EFH) Assessment (Appendix 11) and Biological Assessment (Appendix 13) is that a loss of intertidal and subtidal habitat from filling is not important because the habitat is not unique or considered otherwise special, and because the construction of the wharf will require that only 5.5 acres be filled. From an ecological perspective, this position is flawed for two reasons.

- *First*, the uniqueness, specialness, or quality of habitat and the organisms living there is a subjective and largely irrelevant matter. As suggested in the report titled “Delaware Estuary Benthic Inventory - An Enhanced Understanding of Bottom Ecology in the Delaware Bay and River 2008-2010<sup>3</sup>,” quality of habitat and species is a relative consideration influenced by human values. Of equal importance, in fact,

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<sup>1</sup> Iannuzzi, T.J., J.L. Durda, D.V. Preziosi, D.F. Ludwig, R.G. Stahl Jr., A.A. DeSantis, and R.A. Hoke. 2010. Development of a preliminary relative risk model for evaluating regional ecological conditions in the Delaware River Estuary, USA. *IEAM* 6(1):164–179.

<sup>2</sup> Duffield Associates. January 2020. Essential Fish Habitat, Proposed Berth and Approach Channel Port of Wilmington Edgemoor Expansion, Edgemoor, Delaware. Project No. 11139.LH.

<sup>3</sup> D. Kreeger, A.T. Padeletti, and D.C. Miller. September 2010. Delaware Estuary Benthic Inventory (DEBI) An exploration of what lies beneath the Delaware Bay and River. Partnership for the Delaware Estuary, PDE Report No. 11-06. 1 –X pp. [https://s3.amazonaws.com/delawareestuary/pdf/ScienceReportsbyPDEandDELEF/PDE-Report-11-06\\_Delaware%20Estuary%20Benthic%20Inventory.pdf](https://s3.amazonaws.com/delawareestuary/pdf/ScienceReportsbyPDEandDELEF/PDE-Report-11-06_Delaware%20Estuary%20Benthic%20Inventory.pdf)

is the wide variation of habitat types present in the Delaware River. This variation in habitat is responsible for the great diversity and numbers of species present in the Delaware River. Arguing that any one benthic habitat is of lesser quality or not special, or is “common,” fails to acknowledge the overarching importance of maintaining the variety of all habitats and species that comprise the Delaware River ecosystem. This very kind of variety exists in the area of the Edgemoor project location. Separate data collected during investigation of the Fox Point State Park shows the presence of benthic habitat that varies widely from silt and muds to sand, pebbles and shell. This variety contributes to not only the differing types of benthic organisms occurring across these habitats, but also to the types of prey made available to different species of fish.

In the case of sturgeon, the Biological Assessment (Appendix 13) minimizes the potential for effects based on an apparent lack of quality (i.e., deeper water) habitat in the planned footprint of the wharf. Literature relevant to the Delaware River does show some preference by juvenile and adult shortnose and Atlantic sturgeon for deeper water. However, the project will involve impacts to some deeper water habitat, and although sturgeon may “prefer” deeper water, that does not mean that sturgeon at different life stages are not present in shallow water.

Under current conditions at the project location, water depths (outside the boundaries of the channel) range from a couple feet deep at the shoreline and rapidly drop off to a depth of approximately 15-35 feet. This deeper water is shown generally on nautical charts for the project location, and is depicted in detail in the Biological Assessment (see bathymetric contours presented on p. 13-84). The Biological Assessment also presents a depiction of the footprint for the planned wharf (see figure presented on p. 13-85). While the Biological Assessment concludes filling of shallow water habitat will not effect sturgeon that prefer deeper water, it fails to acknowledge that construction of the wharf is planned in an area immediately adjacent to deep water habitat, the very habitat type that the same assessment references sturgeon preferring. Further, individual sturgeon showing a preference to deeper water does not mean that use of more shallow areas, including along the shoreline where the filling will take place, does not occur. The National Marine Fisheries Service (NMFS) specifies waters greater than 1.2 meters (~ 4 feet) providing continuous flow as an appropriate depth for all life stages of Atlantic sturgeon traveling between spawning, nursery, bay and ocean complexes.<sup>4</sup> A

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<sup>4</sup> NMFS. 2017. Designation of critical habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon. ESA Section 4(b)(2) impact analysis and biological source document with the economic analysis and final regulatory flexibility analysis. National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office, Gloucester, MA.

compilation of telemetry data assembled for the Delaware River shows the presence of multiple life stages throughout the entire year in the immediate vicinity of the project location (see Table 1, DRBC Zone 5A, RM 69.5-78.5, presented in Moberg and DeLucia [2016]<sup>5</sup>). This information strongly suggests the possibility that multiple life stages may exploit not only deeper waters, but also shallower waters, both of which occur at or in proximity to the wharf.

NMFS' critical habitat rule for Atlantic Sturgeon identified four critical habitat units (referred to as physical or biological features [PBFs]) that are essential to the conservation of the species and may require special management considerations or protections. The Edgemoor project site, including the area of the proposed wharf, contains elements of 3 of 4 habitat units, with the 4<sup>th</sup> (i.e., hard bottom substrate in low salinity waters that can be used for spawning) believed to be occurring approximately 4 miles to the north. The presence of critical habitat at and in close proximity to the project affirms the need for DNREC and the Army Corps to seek additional Endangered Species Act (ESA) Section 7 consultation with NMFS.

In addition, collection of data on the presence and distribution of larval sturgeon has not been performed to date for the Delaware River, and specifically not at the project location. While lower salinity is generally believed to be preferred by larval sturgeon, during certain years and seasons (i.e., Spring) opportunities arise for long periods of suitable freshwater conditions. It is conceivable that larval fish may utilize shallow, nearshore areas, including the 5.5 acre area that will be lost from filling during construction of the wharf. Until data are collected, the actual distribution of this important life stage at the project location remains an uncertainty.

- *Second*, though only a relatively small area may be impacted (when compared to the Delaware River at large), it does not mean that the loss of the area has no material consequence. The 5.5 acres that will be filled represents one patch of regional habitat among a finite number of patches available in this section of the Delaware River. The argument that the small size of an area gives grounds to its loss does not stand, because any one - and ultimately all - individual patches can be judged of no consequence following the same thinking. At some point in time, if the logic stands, all patches in total can be lost because no one patch was considered of consequence. As the patch that will include the wharf contains 3 of 4 PBFs that define critical

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<sup>5</sup> Moberg, T. and M. DeLucia. 2016. Potential Impacts of Dissolved Oxygen, Salinity and Flow on the Successful Recruitment of Atlantic Sturgeon in the Delaware River. The Nature Conservancy. Harrisburg, PA.



habitat for Atlantic sturgeon, this area warrants special management considerations consistent with the ESA.

To avoid the pitfall of only assessing individual sites in this type of vacuum, standard practice under NEPA is to examine the project in the context of other regional impacts. This is accomplished through detailed and thorough assessment of potential cumulative effects. Given the context of the ongoing and larger-scale Deepening Project, and in view of the standard of practice, the Biological Assessment's 3-sentence discussion of cumulative effects (Section 8.1) is wholly inadequate. DNREC must require a more comprehensive cumulative effects assessment be performed that, at a minimum, looks at the combined effects of the Edgemoor Project and the Deepening Project.

Loss of habitat and biological resources will occur with the filling of intertidal and subtidal habitats during construction of the wharf. The loss will be permanent, not temporary. Terms of reference such as quality, specialness, commonness or size of habitat have limited ecological meaning absent a more thorough discussion beyond that currently provided in the Biological Assessment and EFH Assessment. Until these assessments are updated to provide suitable discussion, the terms should not be used for asserting no, insignificant, or otherwise *de minimis* impact. In the interim, the data provided in the Assessments indicating the presence of EFH and PBFs confirm the loss of these habitats following construction of the wharf.

Because some loss will occur, the Army Corps and DNREC must require a compensatory project that mitigates the filling of intertidal and subtidal habitat during construction of the wharf. Clearly, both the regulatory language (i.e., Compensatory Mitigation for Losses of Aquatic Resources [33 CFR Part 322 and 40 CFR Part 230]) and project precedents exist. In parallel with federal requirements, the State of Delaware requires mitigation or offset to address both environmental (individual and cumulative impacts) and public use impacts for projects occurring in tidal underwater lands below the mean low water line (i.e., Delaware's Subaqueous Lands Act [7 Del. C. §§ 7201 *et seq.*] and Regulations Governing the Use of Subaqueous Lands [7 Del. Admin. C. §§ 7504 *et seq.*]). As a point of reference, the Fox Point State Park project is currently examining the need to perform a compensatory restoration project under Delaware's Hazardous Substance Cleanup Act and federal CERCLA statutes as a result of the potential ecological service loss of 0.47 acres of intertidal and subtidal habitat. While the regulatory construct and regulatory agencies may differ, it is inconceivable that a compensatory project should be performed to address less than ½ acre of potential habitat loss at Fox Point State Park, but DSPC's nearly 90 acre project a few hundred feet downstream, that includes filling 5.5 acres of the Delaware River containing critical habitat for an endangered species, will occur without *any* compensatory mitigation.

Comments on **Docket #2020-P-MULTI-0024**

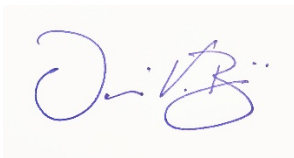
October 28, 2020

Page 6 of 6

In order to satisfy its obligations to consider public use and environmental impacts, DNREC must carefully study and review a project of this scope that will result in the loss of intertidal and subtidal habitat, including loss of critical habitat to Atlantic sturgeon. Before approving any request for permit, a full evaluation of the above considerations must fully be considered and, where appropriate, addressed.

Thank you for consideration of these comments,

Sincerely,

A handwritten signature in blue ink, appearing to read "D. V. Preziosi", is centered on a light yellow rectangular background.

Damian V. Preziosi

Principal Ecologist – Toxicology, Health and Environmental Sciences  
Integral Consulting Inc.