# ATTACHMENT M1

## NATURAL RESOURCES EVALUATION REPORT

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# Natural Resources Evaluation and Effects

USACE & CT DEEP Joint Permit Application (Revised)
State Pier Infrastructure Improvements
New London, Connecticut

October 2020

## Prepared for:

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# Acronyms

| | |
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| ac | acre |
| CJL | Coastal Jurisdiction Line |
| CPA | Connecticut Port Authority |
| CT DEEP | Connecticut Department of Energy and Environmental Protection |
| CVRR | Central Vermont Railroad |
| CY | cubic yard |
| EFH | Essential Fish Habitat |
| feet | ft |
| FEMA | Federal Emergency Management Agency |
| JPA | Joint Permit Application |
| MHW | mean high water |
| NAVD88 | North American Vertical Datum, 1988 |
| NE BH | Northeast Bulkhead |
| NECR | New England Central Railroad |
| SF | square feet |
| SPII | State Pier Infrastructure Improvements |
| USACE | United States Army Corps of Engineers |
| WTG | wind turbine generator |

# 1.0 Background

The Connecticut Port Authority (CPA) owns the State Pier Facility, located on the Thames River in New London, Connecticut. The Connecticut General Assembly funded construction of State Pier over 100 years ago to facilitate business and commerce in the state. The mission of the facility today remains essentially the same as at inception. The State Pier Facility contains approximately 4,000 feet (ft) of dockage along its two main piers, on-dock rail connectivity to the New England Central Railroad (now owned by Genesee & Wyoming) system, 102,000 square feet (SF) of warehouse space, deep water access, and direct connection to the interstate highway system. The site is generally known as the State Pier Facility, which not only includes waterfront features such as piers (Admiral Shear State Pier and the Central Vermont Railroad [CVRR] Pier) and quay walls but also includes upland areas straddling State Pier Road and land north of the Gold Star Bridge.

This report was prepared in support of the CPA's proposed State Pier Infrastructure Improvements (SPII or Project) Joint Permit Application (JPA) submitted to the Connecticut Department of Energy and Environmental Protection (CT DEEP) for a *Structures, Dredging, and Fill Permit and Section 401 Water Quality Certification* and to the U.S. Army Corps of Engineers (USACE) *Section 404 Clean Water Act Permit and Section 10 Rivers & Harbors Act Permit*. The purpose of this report is to document existing site conditions, identify proposed infrastructure improvements, and present a preliminary assessment of potential impacts on regulated coastal resources[1]. Regulated coastal resources in Connecticut include all land and water below the elevation of the Coastal Jurisdiction Line (CJL), which for New London, is 2.1 ft in the North American Vertical Datum of 1988 (NAVD88). A detailed assessment of existing ecological communities and natural resources is provided in Appendix A – the State Pier Baseline Natural Resources Characterization Report. Site maps, existing conditions figures, and proposed Project plans are located in JPA Attachment I.

Activities affecting regulated coastal resources will include permanent fill and dredging activities at the SPII site. These activities will affect the following regulated coastal resources:

- ***Developed Shorefront*** - harbor areas which have been highly engineered and developed resulting in the functional impairment or substantial alteration of their natural physiographic features or systems;
- ***Rocky Shorefronts*** - shorefront composed of bedrock, boulders and cobbles that are highly erosion-resistant and are an insignificant source of sediments for other coastal landforms;
- ***Nearshore Waters*** - the area comprised of those waters and their substrates lying between mean high water and a depth approximated by the ten-meter (10m [~32.8 ft.]) contour;
- ***Offshore Waters*** - the area comprised of those waters and their substrates lying seaward of a depth approximated by the ten meter contour; and
- ***Coastal Hazard Areas*** - those land areas inundated during coastal storm events or subject to erosion induced by such events, including flood hazard areas.

The baseline natural resources characterization report discusses the existing conditions of the above-mentioned coastal resources and provides discussion of the on-site benthic, finfish, wildlife, and vegetation communities based on a combination of review of existing documents and site-specific surveys. The nature and extent of anticipated effects of dredge and fill activities to each of the applicable coastal resources is described herein.

## 1.1 Existing Site Description

The State Pier Facility encompasses approximately 30 acres (ac) including the northern 'offsite' parcel and has three general operational areas: the piers, near dock shoreline areas, and upland storage areas. The property generally consists of unpaved, gravel surfaces that are uneven or contain small depressions that

[1] As defined by Connecticut General Statutes (CGS), Chapter 444 Coastal Management, Section 22a-93.

pond water during and after storm events. The property is bounded to the west by the New England Central Railroad (NECR) tracks and to the east by the Thames River.

Access from the main port facility to the offsite areas is provided by two underpasses under State Pier Road and the Amtrak right-of-way. Security fencing surrounds the majority of the site. Currently, a state-owned public recreational boat launch is situated on the northeastern shoreline and is not used for port operations.

The near-dock shoreline area is south of State Pier Road and accommodate most of the port's cargo intermodal activity. This area contains two heavy load warehouse buildings totaling 102,000 SF with railcar and truck loading docks, two 3,200 SF storage/maintenance buildings, and an administration building. The hill in the center of the site historically was the site of a city residential neighborhood and is currently occupied by the State Pier Facility administration building parking lot and a tenant salt storage and distribution operation. The area located at the head of the two piers is largely paved to facilitate forklift and tractor trailer movements. The shore edge consists of a combination of sheet piling, pile-supported docks, and stone block quay walls. The western area adjoining the NECR siding yard are largely unpaved areas, with irregular topography.

## 1.2 Proposed Activities

Through this Project, it is the goal of CPA to create infrastructure in Connecticut that will serve as a long-term wind turbine generator (WTG) port facility serving the northeast coast of the United States while at the same time continuing to support other existing long-term breakbulk operations for steel, coil steel, lumber, copper billets, as well as other cargo. Once built, this facility will be able to receive very large wind energy components such as turbines, blades and towers. The onshore portion of the facility would be large enough to facilitate the off-loading and preassembly of these components, which would then be loaded onto installation vessels that would transport the components to the offshore site for final installation. To accommodate the shipping and preassembly of the components, site improvements are needed both onshore and within the Thames River.

The proposed work is anticipated to occur in two phases, with some overlap in activities anticipated between Phase 1 and Phase 2 and generally moving from upland areas to in-water work. Work activities will only progress once applicable permits are in hand. Anticipated SPII components are detailed below.

Phase 1 work generally consists of the on-shore improvements and activities at the site, as well as select in-water activities. Work will include demolition of buildings, excavation, grading and installation of a stormwater management system and utilities. The site will be leveled and graded to accommodate future uses. Specifically, the entire upland portion of the site will be provided with a level, compacted gravel surface for use by any cargo handling and storage activities. Select in-water activities, such as derelict structure removal and bulkhead oversheeting, which have been authorized through the COP process will be conducted under Phase 1.

Phase 2 work generally consists of the in-water and over-water improvements such as dredging, fill placement and marine structure construction for creation of the new Central Wharf area and heavy-lift pad.

**Phase 1 Work (Uplands and NE Bulkhead)**

Onshore Demolition Activities

- Demolition of various existing buildings (including the Administration Building and Warehouse 1) and site utilities in upland area.
- Demolition of a segment of State Pier Road, including the bridge and bridge abutment.
- Offsite relocation of NOAA station.
- Removal of existing onsite rail tracks.

In-Water and Over-Water Demolition Activities

- Demolition of existing unused berthing dolphins (permitted under CT DEEP Certificate of Permission (201910828-COP) and USACE CT General Permit process (NAE-2018-02161).

- Demolition of Northeast Annex timber pile supported concrete deck on east side of Admiral Shear State Pier along shoreline under same CT DEEP COP / USACE GP process.

Onshore Improvements

- Cutting and grading of the onsite hill. Soils to be used as Phase 2 fill between the piers.
- Overall grading and compaction of the site and installation of a gravel surface.
- Installation of retaining wall or earth embankment to maintain existing State Pier Road.
- Installation of new drainage and stormwater treatment system.
- Onshore installation of an anchored heavy-lift relieving platform on the existing Northeast Bulkhead (bulkhead work permitted separately under above CT DEEP COP / USACE GP).
- Installation of fendering and bollards at Northeast Bulkhead.
- Installation of new electrical utilities. High mast light poles will be installed. Electrical equipment may include electrical substations, transformers and powered racks for nacelles.
- Installation of new fire protection mains, hydrants and potable water supply lines.
- Installation or upgrade of sanitary sewers.
- Installation of perimeter security fencing and gate.
- New roadway entrance to the site.

**Phase 2 Work (Waterfront Works: State Pier / CVRR Pier / Central Wharf)**

In-Water, Over-Water and On-Shore Improvements

- Demolition of approximately 420 linear feet (~84,000 SF) of State Pier to facilitate construction of the heavy lift pile supported area and bulkhead at the State Pier East Berth.
- Demolition of additional segments (~34,000 SF) of the west face of State Pier concrete deck to facilitate fill placement between the piers.
- Demolition of two areas at the east face and southeast corner of State Pier (each approximately 1,500 SF) to facilitate mooring bollard installation.
- Dredging of Turning Basin including approaches to both berths. Dredging to -39.8' NAVD88 (-36' MLLW + 2' overdredge), matching the existing New London Federal Channel depths. This includes removal of approximately 55,000 CY of material, including overdredge, generated from approximately 241,000 SF . The majority of this material will be generated in the northern portion of the turning basin.
- Dredging of vessel berthing areas to -41.8' NAVD88 (-38' MLLW + 2' overdredge) for berthing layout and up to -66.8' NAVD88 (-63' MLLW + 2' overdredge) to accommodate the seabed preparation work described below. Dredging to be completed at the proposed Northeast Berth (Up to ~240,000 SF; ±222,000 CY) and East Berth (Up to ~210,000 SF; ±122,000 CY) proximate to the new heavy lift areas.
- Seabed preparations would be completed after the above dredging to allow for berthing of vessels equipped with jack up legs (or similar) at the Northeast Bulkhead and East Berth heavy lift areas. Jack-up pockets will be constructed by filling the dredged pockets with crushed stone or gravel, to provide a stable jacking platform and to protect the seafloor from damage during install vessel jacking operations. Dredging and rock pad design utilizes a tiered approach, with stone pad thickness of 13' to 27' (maximum; in the eastern portions). Up to 107,000 CY of crushed stone would be placed in each pocket. The East Berth seabed preparation would be completed first and the Northeast Bulkhead seabed preparation work would be constructed at a later stage. This stone bed will be maintained throughout the duration of WTG operations.
- Installation of longitudinal steel sheeting or protected slope at CVRR pier.
- Installation of king pile bulkhead between the State Pier and the CVRR Pier, extending into the CVRR pier, tying into the new longitudinal sheet pile wall/slope along the CVRR pier.
- Filling approximately 7.4 acres (~322,000 SF; ±400,000 CY) between the CVRR Pier and State Pier to create the new Central Wharf operational area and East Berth Heavy Lift area. Approximately 308,600 CY will be placed below MHHW (+1.21 ft. NAVD88) and the balance will be placed above this elevation to raise the Central Wharf to finish grades. Relative to the DEEP New London Coastal Jurisdiction Line (CJL; elevation of +2.1 ft. NAVD88), approximately 315,900 CY of fill would be placed between the piers for Central Wharf creation.

- Installation of a series of ~3' wide stone columns, or comparable technology, in the filled area of the new Central Wharf created between the piers and at the East Berth Heavy Lift area.
- Installation of steel sheet pile to enclose the State Pier heavy lift platform and filling approximately 33,600 SF between the existing State Pier riprap slope and the proposed sheet pile wall along its East Face[2]. Approximately 15,000 CY will be placed below MHHW (+1.21 ft. NAVD88) for the East Face Heavy lift area creation. Relative to the CJL (+2.1 ft. NAVD88), approximately 15,600 CY of fill would be installed for East Face Heavy Lift area creation.
- Installation of steel toewall system at the base of the State Pier heavy lift platform. ~1,115 LF of toewall is proposed at and adjacent to the heavy lift platform.
- Installation of upgraded fendering and mooring bollards at the State Pier East Face Berth.
- Installation of a toewall to protect an existing eelgrass bed from dredging activities. Toewall will consist of up to ~170 linear feet of combination sheet pile (to extend ~1 foot above mudline).
- Installation of high mast lights at the State Pier Facility.
- Installation of cold ironing infrastructure.
- Installation of piles and associated gangway to support ConnDOT Chester-Hadlyme ferry overwintering at the Northwest Bulkhead area.

**JPA Attachment A, Table 1 summarizes anticipated Project areas and volumes, by SPII activity. Existing conditions and proposed activities are detailed on site plans in the JPA Attachment I.**

Suitable dredge materials and upland soils will be used as part of the required fill for the area between the two existing piers as Project sequencing, geotechnical and chemical properties allow.

To contain the proposed fill material between the existing CVRR Pier and the Admiral Shear State Pier, a king pile bulkhead will be installed at the terminus of these two piers. Approximately 400,000 CY of fill would be required for the construction of the larger pier to the finish grade. To the extent possible, CPA plans to use dredged materials obtained from the dredging of the berthing pockets and jack-up berths to contribute to the fill material for the heavy lift area. CPA also plans to regrade the near dock shoreline area to create functional component assembly and storage workspace. This earthwork in upland areas would create approximately 190,000 CY of suitable material to be used as fill between the piers. CPA may also be able to accept dredge material for use as fill from other marine projects within the immediate region. The final elevation of the filled area would match the existing Admiral Shear State Pier deck elevation of nine feet (+9 ft) NAVD88. The filled material would be confined on the eastern edge by the existing earth berm under the State Pier and on the western edge by the CVRR pier earth fill and the new bulkhead wall to the south.

## 1.3 Construction Schedule

The construction would be competed in two (2) phases, "Phase 1: Uplands and NE Bulkhead" work and "Phase 2: Waterfront Works". As noted above, some overlap between the phases may occur. Construction is anticipated to start in February 2021. The final Project schedule will be determined by multiple factors, including regulatory approvals, contracting and other variables. Regardless of schedule changes, if any are ultimately required, adherence to the following time of year restrictions is anticipated.

To protect spawning species, and as based on initial input from CT DEEP Inland Fisheries, NOAA NMFS and CT Bureau of Aquaculture, a "no in-water-work" window is anticipated in June through September, annually[3]. In addition, the CPA anticipates that the Project would have a Time-of-Year (TOY) window which allows for dredging activities between October 1 through January 31, annually.

To address concerns relative to potential Peregrine Falcon (*Falco peregrinus*) nesting, CT DEEP Natural Diversity Data Base (NDDB) has indicated that no Project construction activities should occur during the

[2] Engineering design is progressing. The East Berth Heavy Lift area may be constructible using a toe wall and associated pile supports, thus eliminating a need for structural solid-fill placement atop the riprap slope. Conservatively, and for permitting purposes, placement of this fill has been assumed.
[3] CPA understands that select, confined in-water Project activities may progress behind sheeting and/or turbidity curtains once established, if within this period.

period of April 1 to June 30; or, if required, work during this timeframe should occur in accordance with the CT DEEP NDDB-approved Project Peregrine Falcon Protection Plan (NDDB # 201901490 REVISED: see Attachment C).

Based on language included in the USACE CT GP, CPA anticipates that the following schedule and mitigation considerations may also be applicable to the Project: "*Piles should either be installed between November 1 and March 15 OR must use a soft start each day of pile driving, building up power slowly from a low energy start-up over a period of 20-40 minutes to provide adequate time for fish and marine mammals to leave the vicinity. The buildup of power should occur in uniform stages to provide a constant increase in output. Bubble curtains can be used to reduce sound pressure levels during vibratory or impact hammer pile driving*."

Further details regarding the anticipated Project schedule are presented below.

Phase 1 Work (Uplands and NE Bulkhead)

- Upland demolition and regrading, February 2021 to October 2021.
- Upland construction, February 2021 to November 2021 (Phase 2 Uplands construction into 2022).
- In-water work (under COP / GP2 authorizations): Northeast Bulkhead oversheeting, Northeast Annex Demolition, Mooring Dolphin Demolition, February 2021 to June 2021.

Phase 2 Work (Waterfront Works: State Pier / CVRR Pier / Central Wharf)

- Pier Work (Pier demolition, sheeting and elevation improvements, heavy lift area construction, pier-side mooring structure installation, etc.), February 2021 to August 2022.
- Install King Pile bulkhead (and complete associated demolition work) at south end of Admiral Shear State Pier and CVRR Pier, February 2021 through September 2021.
- Dredging of NE bulkhead berth and jack-up pocket and transport of dredged material for onsite re-use/offsite disposal (as needed), October 2021 to December 2021.
- Dredging of Turning Basin and transport of dredged material for onsite re-use/offsite disposal (as needed), December 2021 to January 2022.
- Dredging of jack-up pocket at East Berth and transport of dredged material for onsite re-use/offsite disposal (as needed), January 2022.
- Filling of newly created Central Wharf area between the existing Admiral Shear State Pier and the CVRR Pier. Work includes placement of suitable onsite dredged materials, materials from the onsite uplands and additional offsite fill, compaction, stone column installation, aggregate surface installation, September 2021 to November 2022.
- Install temporary offices, September 2021 to May 2022.
- Utilities demolition, June 2021 to July 2021 and installation, July 2022 to October 2022.

The entire project is expected to be completed over a 2-year period with construction finished in 2022.

# 2.0 Permanent Fill

SPII activities will result in permanent fill being placed within several coastal resource categories. Specifically, in order to construct the proposed bulkheads and heavy lift area, permanent fill will affect developed shorefront intertidal areas, as well as nearshore and offshore waters. These activities will result in fill placement over approximately 7.4 ac for the Central Wharf area creation, as well as an additional 0.7 ac of fill potentially required for creation of the East Berth Heavy Lift area. Associated fill volumes and construction details are presented above. In addition, the jack-up area installations will require placement of crushed stone in the dredged portions of the berthing pockets.

Impacts to coastal resources and their associated ecological resources are presented below. Coastal impacts assume the following definitions:

- ***Shorefront*** – impacts to intertidal habitats located at a maximum elevation of 2.1 ft NAVD88 (i.e., the CJL) to mean high water (MHW) at 0.9 ft NAVD88;
- ***Nearshore Waters*** – impacts to intertidal and subtidal habitats from MHW to -31.9 ft NAVD88 (10m below MHW),
- ***Offshore Waters*** – impacts to subtidal waters deeper than -31.9 ft NAVD88.

## 2.1 Activity Requiring Fill

The following activities require permanent fill to intertidal and/or subtidal resources in order to meet the purpose and need of SPII.

### 2.1.1 Northwest Quay Bulkhead

The northwest quay wall currently consists of a granite block wall with stone riprap slope. Segments of this wall have failed and been stabilized with riprap to prevent further deterioration. This area is currently underutilized as vessel dockage because of the condition of the shoreline and alongside depth is not conducive to safe berthing (Milone & MacBroom, 2015). The existing wall and adjacent open water is considered a developed shoreline and nearshore waters coastal resources.

While work in the uplands adjacent to this area will include raising the elevation to match surrounding lands, only limited work is currently anticipated at the northwest quay wall (water-ward of MHW / CJL). As depicted in Attachment I, the installation of pipe-piles and associated gangway to support the ConnDOT Chester-Hadlyme ferry overwintering at the Northwest Bulkhead area. Direct impacts below MHW are limited to the footprint of these piles.

### 2.1.2 Northeast Quay Bulkhead

The northeast quay shoreline currently consists of a timber pile supported concrete deck wharf platform (aka the “Northeast Annex”) and a steel sheeting bulkhead. The Northeast Annex wharf platform is 125-ft-long by 50-ft-wide and is located adjacent to the northeastern corner of the Admiral Shear State Pier. The wharf platform is currently cordoned off and not used for vessel or storage operations because it is in “serious” condition (Milone & MacBroom, 2015).

Beginning at the eastern terminus of the Northeast Annex wharf platform, an existing steel sheet pile bulkhead extends approximately 500 ft to the northeast and makes a 90 degree turn and runs 65 ft back to a stone block retaining wall (Milone & MacBroom, 2015). The stone wall continues for an additional 110 ft to the northeast. The existing wharf and bulkhead and their adjacent open water are considered developed shorefront and nearshore waters coastal resources.

The Northeast Annex structure would be removed under CT DEEP COP program. Subsequently, a new king pile bulkhead will be installed outshore of the outer face of the existing wharf platform and will tie into

steel oversheeting along the bulkhead (also installed under the COP program) for a total distance of approximately 715 ft. Prior to installation of the new bulkhead, the wharf platform will be demolished and removed (under Phase 1 / COP eligible activities); engineered fill will be placed in the void left from removal of the wharf platform as part of Phase 2 work.

The king pile bulkhead consists of pipe piles installed at a set distance apart and connected by Z sheets (typically AZ) welded to the pipes. The space between the existing steel sheet pile and the proposed king pile bulkhead will be filled with crushed gravel fill. Tierods and anchors will be installed to provide lateral support for the bulkhead. A concrete fascia will be installed to serve as a cap, curb, and bulkhead corrosion protection.

An HP-pile supported concrete platform finished with a dense graded aggregate top surface will be installed landward of the king pile bulkhead to provide a heavy lift area. This area will be capable of supporting heavy lift operations and equipment for inbound delivery vessels.

### 2.1.3 Central Wharf and East Berth Heavy Lift Area

The existing area between the Admiral Shear State Pier and CVRR Pier will be converted from open water to an upland area in support of the installation vessel heavy lift needs. Existing coastal resources between the piers include approximately 2,300 ft of developed shorefront along the perimeter of the piers, 4.59 ac of nearshore waters, and 2.41 ac of offshore waters located in the maintained channel area located immediately west of the State Pier and east of the CVRR Pier.

Construction of the heavy lift area will require installation of an anchored king pile combination bulkhead between the southern ends of the State and CVRR piers; this bulkhead feature will tie into each existing pier. The components of this king pile bulkhead is similar to that described for the Northeast Bulkhead (i.e., alternating pipe and Z sheet piles). An existing portion of the Admiral Shear State Pier will require demolition for king pile and heavy lift area installation. The southern king pile wall will be tied back to cast-in-place concrete deadman located approximately 50 feet north and installed below final grade. A concrete fascia will be installed to serve as a cap, curb, and bulkhead corrosion protection. The pile wall will be installed prior to commencement of fill operations to fully enclose the area between the two piers.

Following installation of the king pile bulkhead, fill operations will be initiated. Sources of fill material will include on-site dredge spoils, on-site upland material, off-site imported fill, and possibly off-site dredged material (e.g., material from the Electric Boat facility located in Groton, CT or others). As the area is filled, displaced water will be conveyed to an on-site filtration system, treated, and subsequently discharged into the Thames River in accordance with the SPII *Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* (Application No. 201914361 / Permit No. GSN003536). The fill will be stabilized using a combination of methods, including mechanical, compaction, installation of subgrade stone columns, prefabricated vertical drains (wick drains), HP piles or similar. A final grade will be obtained consistent with the existing finished elevation of State Pier and finished by installation of dense graded aggregate top surface.

### 2.1.4 Vessel Jack-up Pockets

A specialized installation vessel will be used to convey major wind turbine components from the State Pier Facility to the installation area and subsequently construct the structures. This vessel operates using jack-up legs, which are lowered onto the substrate and the vessel is elevated on the legs, raising it out of the water. This configuration results in a very stable and consistent working platform unaffected by tides and/or wave action. Associated area and volumes for vessel jack-up work is presented above.

In order to protect the substrate and not undermine the new bulkhead along the southern end of the pier where the jack-up legs will make contact, will be prepared to accommodate the installation vessel. Preparation includes dredging two “jack-up barge” pockets. Jack-up pockets will be installed within the dredge areas located adjacent to the northeast bulkhead and adjacent to the State Pier East Face berth. The jack-up pockets will result in no net gain of volume, as the sediment dredged from the pockets will be replaced with an equal volume (or slightly less) crushed stone.

## 2.2 Fill Effects to Coastal Resources

The following sections discuss unavoidable impacts to coastal resources and associated ecological resources.

### 2.2.1 Developed Shorefront

Developed shorefronts are areas which have been highly engineered and developed, resulting in the functional impairment or substantial alteration of their natural physiographic features or systems. The majority of the existing shoreline within the SPII area is considered developed shorefront consisting of engineered granite block retaining wall, steel sheet pile bulkhead, large riprap and rubble, wooden pile-supported structures, and steel pile supported decking.

Impacts to natural resources associated with the existing developed shorefront are anticipated to be minimal in nature. Impacts to the Northeast Bulkhead will include removal of the deteriorating Northeast Annex structure (approximately 150 linear ft of wood pile-supported deck shoreline) and conversion of 565 ft of steel pile bulkhead to a steel king pile bulkhead. Construction of the heavy lift area will result in the further conversion already developed shorefront (existing bulkhead areas). The algal and macroinvertebrate community currently present on the existing bulkhead areas, within the developed shorefront, are anticipated to quickly recolonize the new bulkheads.

### 2.2.2 Nearshore and Offshore Waters

Coastal waters provide habitat for a variety of marine organisms, including finfish, shellfish, crustaceans, and benthic organisms; support a diversity of floral and faunal species; provide spawning and breeding areas; and are an important contributor to the productivity of estuarine and ocean waters. Nearshore waters are the area comprised of waters and their substrates lying between mean high water and a depth approximated by the ten meter contour. SPII will result in permanent structural wharf fill being placed in ~6.17 ac of nearshore waters.

Offshore waters are the area comprised of waters and their substrates lying seaward of a depth approximated by the ten meter contour. SPII will result in permanent structural wharf fill being placed in ~1.93 ac of offshore waters.

A narrow band of eelgrass (*Zostera marina*) was identified during field surveys conducted in July 2019 in the nearshore waters located near the existing Northeast Bulkhead. The Project has been designed to ensure that no dredge, fill or other activities will be conducted within the submerged aquatic vegetation (SAV) limits. Additional detail regarding the eelgrass surveys and bed extents is provided in Attachment M1B and Attachment I. Turbidity curtains are proposed around the limits of this feature during in-water work activities, and a combination sheet pile toewall is proposed adjacent to the eelgrass to ensure that dredging activities and side-slope creation will not disturb the benthic contours of this bed.

Fill activities associated with creation of the heavy lift area and construction of bulkheads would have direct and indirect effects to the physical, chemical, and biological properties of nearshore and offshore waters. Potential adverse effects to finfish and benthic organisms include physical impairment or burial, permanent loss of habitat within the filled areas, temporary alteration of the benthos, temporary impairment of water quality, and temporary underwater noise. Mobile finfish are likely to avoid the area during construction, whereas sessile organisms have a higher likelihood of direct mortality. Although there will be temporary and permanent impacts to nearshore and offshore waters, no appreciable or permanent changes to salinity regime, tidal cycle, or river and/or tidal patterns are anticipated.

Water quality effects from fill activities associated with installation of the proposed bulkheads include physical and chemical impacts. Temporary changes to water turbidity, water chemistry, and dissolved oxygen are expected during bulkhead installation. These impacts would be highly localized and rapidly diminish with the cessation of construction activities.

Chemical impairment of the water column produced during fill activities may be caused by release of various chemical contaminants that may occur within the sediment when re-suspended into the water column. Contaminants are introduced into the sediment media via a variety of sources including but not

limited to surface runoff (non-point sources), industrial stormwater discharges, accidental and incidental spills, inadvertent discharges, historic industrial uses, etc. Any release of contamination through suspension of sediments during construction will be temporary and localized in nature and not likely to pose a significant risk to human health or the environment. Sediment characterization information is presented in Attachment M2.

An on-site water filtration system will be operated to treat construction period stormwater and waters displaced during fill activities in the proposed heavy lift area. The system will be operated and maintained in accordance with the manufactures specifications. As detailed in JPA DEEP Application Form Part III.2 and in Attachment I (Project Plans), Project fill will be placed between the two piers from mechanical or hydraulic means. Fill placement will occur in the new "Central Wharf" area and the area between the existing piers will be closed off via the new southern bulkhead and/or a turbidity curtain spanning the full width between the two piers. These barriers will prohibit water with suspended solids (due to soil placement in the water column) from entering the main waterway.

In addition to these physical barriers. A pumping system with filtration chamber will be used. This pumping system will be located at the SE corner of the existing CVRR pier and will be used to pump water out from between the two piers as the fill is being placed. The intent of this pumping system is to control the location of the flow of water out from between the two piers and prevent overflow of this water from between the two piers due to fill placement. The pumping system consists of a pump, an intake pipe, a filtration chamber, and an outfall pipe. The water is pumped from between the two piers into the intake pipe. It is then passed through the filtration chamber where any sediment or suspended solids are removed, and then returned into the existing waterway.

The pump, piping and filtration chamber will be sized so that the rate of water removal from between the piers will exceed the rate of water being displaced by fill placing operations. The contract documents will direct the contractor to check and clean the filtration chamber on a daily basis. Treated effluent will be discharged to the Thames River in compliance with applicable discharge permit conditions.

General impacts to the finfish community include potential direct loss from burial, habitat loss, and acoustic impacts. Federally managed and non-federally managed fish species potentially affected by SPII are discussed in the Essential Fish Habitat (EFH) Assessment (JPA Attachment M5). The EFH discusses potential life-stage utilization of the habitats within SPII and potential impacts to individual species.

### 2.2.3 Coastal Hazard Area

The coastal hazard area are those areas inundated during coastal storm events or subject to erosion induced by such events, including flood hazard areas indicated on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps 09011C0501J and 09011C0502J, effective 08/05/2103. The inland portions of the site are mapped as zones AE (elevation 11.0') and X and are currently occupied by existing infrastructure and impervious surfaces. The existing piers are mapped as zone VE (elevation 14'). Definitions of the FEMA designations are presented below.

- Zone AE is an area subject to inundation by the 1% annual chance flood event, for which base flood elevations have been determined.
- Zone VE is an area subject to inundation by the 1% annual chance flood event with additional hazards due to storm-induced velocity wave action, for which base flood elevations have been determined.
- Zone X is an area subject to inundation by the 0.2% annual chance flood event or areas of the 1% annual chance flood event with depth less than one foot or with drainage areas of less than one square mile.

The northcentral portion of the site, mapped as Zone X, is dominated by a hill comprised of soils mapped by the Natural Resources Conservation Service as a Hinckley loamy sand as well as imported gravel and

crushed stone. Much of this material will be removed and used as fill in the heavy lift area. The resulting topography will be consistent with the remaining portion of the site.

### 2.2.4 Visual Impacts

In addition to land-based buildings and supporting bulkhead areas, the State Pier Facility currently includes two working piers, the Central Vermont Railroad Pier (CVRR) and the Admiral Shear State Pier. Construction of the CVRR Pier was completed in 1876 with State Pier completed in 1914. Therefore, marine based commerce activity has been taking place at this location for over 140 years. Today, the facility continues its operations in a working harbor which supports significant existing industrial, transportation, commercial, military, and recreational based uses. These uses include but are not limited to the State Pier Facility, Electric Boat, Cross Sound Ferry and other ferry services, Thames Towboat Company, U.S. Navy, U.S. Coast Guard and a commercial fishing fleet.

The State Pier Facility is currently an active break bulk operation for various cargos. Once constructed, SPII will result in a significant upgrade in the facility's ability to accept and process the typical break bulk cargo that is currently processed, as well as cargo, equipment, and wind turbine components more typically associated with wind energy projects.

With respect to wind energy project support, it is anticipated there will be times of the year when no significant activity is ongoing. During these times, CPA anticipates the facility will be utilized by standard break bulk contractors. During these times, with the exception of the approximately 7.4 acre area proposed to be filled, the port and its associated operations will appear largely the same as it does under pre-construction conditions.

During the period of time when the facility is actively engaged in support of wind projects, which is anticipated to be March through November (assuming suitable weather conditions prevail), turbine structure assembly would be ongoing and install and delivery vessels would be present onsite periodically. Structure assembly and the presence of the install and delivery vessels would be temporary and seasonal and would only occur during active construction.

The following general sequence is anticipated when wind project support is ongoing. Equipment delivery vessels would arrive onsite periodically and berth at the northeast bulkhead. Components (nacelles, tower sections, blades) would be offloaded from the delivery vessel using the SPII's heavy-lift improved areas. Components would be transported onsite using Self Propelled Modular Transporters (SPMTs) and other appropriate transport equipment and arranged for temporary storage at State Pier Facility. Tower sections would then be assembled at the southern portion of the facility utilizing the new southern heavy-lift platform would and subsequently loaded onto the awaiting installation vessels. The installation vessels would transit to the offshore installation area. Outgoing loads of approximately four to six assembled towers and accompanying equipment (blades, nacelles, etc.) are generally anticipated aboard these vessels. Installation vessel turnaround time of approximately ten days is anticipated.

Therefore, while some temporary impacts to local vistas and viewpoints are anticipated, CPA does not anticipate permanent impacts with respect to significant alteration of existing vistas. Temporary vista impacts associated with tower assembly would be seasonal and would vary in nature and duration. The upgraded State Pier Facility is anticipated to be utilized in such as a way as to be consistent with the port's established long term usage and is consistent with the character of a working port facility.

# 3.0 Dredging

SPII activities will result in dredging within nearshore and offshore coastal resource areas. Specifically, dredging operations will be conducted adjacent to the northeast bulkhead and at the southern berth to accommodate incoming delivery and installation vessels, respectively. In addition, the four existing berthing dolphins will be demolished and removed, resulting in subtidal impacts. These activities will result in dredging of up to ~399,000 CY of material from ~15.9 ac of berthing and turning basin areas. Up to ~214,000 of crushed stone backfill would be placed within ~8.7 ac of berthing area.

## 3.1 Activity Requiring Dredging

The following activities require dredging to subtidal resources, in order to meet the purpose and need of SPII.

### 3.1.1 Northeast Bulkhead (Inbound/Delivery) Berth Dredge

The proposed northeast inbound vessel berth covers ~5.5 ac (~240,000 SF berth area including side slopes) and includes nearshore and offshore waters. Following construction of the northeast king pile bulkhead, dredging will be performed to deepen waters adjacent to the bulkhead to accommodate the "import" or "delivery" vessels. Dredging would be completed to -40' MLLW (-38' plus 2' overdredge)/-41.8' NAVD88 in "dredging only" berthing areas. Tiered Jack-Up Pad area dredging would be completed up to -52 MLLW (-50' plus 2' overdredge)/-53.8' NAVD88 in the shallower section; and to -65 MLLW (-63' plus 2' overdredge)/-66.8' NAVD88 in the deeper, eastern section. The proposed dredging, including rock pad /jack-up pocket work described below, would remove up to approximately 222,000 CY of sediment.

### 3.1.2 Installation Vessel (Outbound/Installation) Berth Dredge

The proposed installation vessel East Face berth encompasses ~4.8 ac (~210,000 SF berth area including side slopes) and includes nearshore and offshore waters. Following installation of the East Berth toewall, dredging will be performed to deepen waters adjacent to the bulkhead to accommodate the "outbound" or "installation" vessels. Tiered Jack-Up Pad area dredging would be completed up to -52 MLLW (-50' plus 2' overdredge)/-53.8' NAVD88 in the shallower section; and to -65 MLLW (-63' plus 2' overdredge)/-66.8' NAVD88 in the deeper, eastern section. The proposed dredging, including rock pad /jack-up pocket work described below, would remove up to approximately 122,000 CY of sediment.

### 3.1.3 Turning Basin Dredge

To allow vessels to access the berths and sufficiently maneuver, a larger turning basin is proposed that connects the berths and provides access to the adjacent Federal Channel. The turning basin would be dredged to -39.8' NAVD88 (-36' MLLW + 2' overdredge), the authorized depth of the adjacent Federal Channel. Approximately 55,000 CY of material may be generated from 5.5 ac within the identified Turning Basin area. Approximately three-quarters of this dredge material would be generated in the northern third of the turning basin. The proposed Turning Basin has a larger overall total footprint (~10.6 ac) though many of the existing areas are already below the design depth.

### 3.1.4 Vessel Jack-up Pockets

The installation vessel operates using jack-up legs and will require seabed preparation in order to provide an area of stable substrate and not undermine the seafloor adjacent to the new heavy lift areas. Jack-up legs are lowered into the mudline and the vessel is then raised via the legs so that it is supported out of the water column. Jack-up pockets will be dredged/constructed to provide a stable jacking platform and to protect the seafloor from damage during install vessel jacking operations. These dredged pockets will be filled with crushed stone. The top elevation of this stone will vary but will typically be filled (~76,000 CY per jack up pocket) to be flush with the berthing area design dredge elevation. This stone bed will be maintained throughout the duration of offshore wind operations at the terminal.

Accordingly, at each location, crushed stone pockets will be installed within the dredge footprint. The approximately pockets will have a crushed stone or gravel thickness of 13 to 27 feet (~107,000 CY per jack-up pocket; thicker in the eastern areas) to support the weight of the vessel. The dredge footprints of the jack-up pockets are included in each of the vessel berth dredge areas noted above. Construction of the jack-up pockets will result in conversion of up to ~380,000 SF (~8.7 ac; including side slopes) of existing, primarily soft, sediments to a rocky substrate.

### 3.1.5 Berthing Dolphin Demolition

In order to facilitate access to the northeast bulkhead, the four existing mooring dolphins located to the south of the Northeast Bulkhead will be demolished prior to the turning basin dredging work. This work has been authorized under the USACE CT General Permit (CT GP) / CT DEEP OLISP COP program. The concrete caps will be cut off using hydraulic pile cutters and the caps will then be strapped and removed by a large barge mounted crane. The remaining sections of the piles will be cut off 2 feet below the mudline or fully removed.

## 3.2 Dredge Effects to Coastal Resources

The following sections discuss direct and indirect affects to nearshore and offshore waters as a result of dredging, jack-up pocket installation, and berthing dolphin demolition (to be completed under the CT DEEP COP / USACE GP program). Effects to nearshore and offshore waters from the proposed dredging and jack-up pocket installation in the berthing areas will be generally consistent with those associated with conventional navigation improvement, maintenance, or modification projects historically performed in this traditional maritime harbor. Dredging and rock pad preparation activities will affect nearshore waters by conversion of shallower waters to deeper nearshore or offshore waters; conversion of generally soft substrates to rocky substrates; direct impacts to the benthic community due to substrate and organism removal; and temporarily impacting water quality and fisheries due to sedimentation and turbidity generated during construction, which will be minimized as described herein.

During dredge activities, the upper layer of existing substrate and benthic organisms it supports will be removed, but re-colonization of the benthic invertebrate community is expected to occur at post-construction depths. There may be a shift in benthic organism community composition, depending on final depths and substrate of the areas. Benthic and pelagic fish species inhabiting the dredge areas will be temporarily displaced during dredging, but would be expected to return to these areas post dredging. The return of benthic-feeding fish species will likely coincide with recolonization of the benthic community.

Similar to fill activities, water quality effects from dredging include physical and chemical impacts. Temporary changes to water turbidity, water chemistry, and dissolved oxygen are expected during dredging operations. These impacts would be highly localized and rapidly diminish with distance from, and at the cessation of, construction activities. Additionally, chemical impairment of the water column produced during dredge operations may be caused by release of contaminants that may occur within the sediment when re-suspended into the water column. Any release of contamination through suspension of sediments during construction will be temporary and localized in nature and not likely to pose a significant risk to human health or the environment (as based on sediment characterization studies).

### 3.2.1 Nearshore Water

Dredging to create the vessel berths and turning basins will affect nearshore waters by removal of dredge materials from approximately 3.92 acres of the benthos, to create a floor elevations noted above. In comparison to existing conditions, the northern extents of the turning basin will be deepened.

As noted above, a narrow band of eelgrass exists at the site near the Northeast Bulkhead. Project dredging activities will occur near this SAV; however, the SPII has been designed to avoid the eelgrass limits. Turbidity curtains will be placed around the limits of this feature during dredging activities to minimize potential adverse effects to water quality. A combination sheet pile toewall is proposed adjacent to this eelgrass bed to ensure that dredging and side-slope activities will not disturb the benthic contours of this bed.

Removal of the existing berthing dolphins may result in temporary and localized impacts to water quality and displacement of finfish during demolition activities. Additionally, removal of the dolphins will result in permanent loss of the benthic community attached to the structures and existing cover for finfish through the water column. As these are relatively discrete features, and as the Chester-Hadlyme ferry overwintering pile installation would offer similar habitat post-construction, the associated impacts from dolphin removal may be considered minimal in nature.

### 3.2.2 Offshore Waters

Dredging to create the vessel berths and turning basins will affect offshore waters by removal of dredge materials from approximately 10.17 acres of the benthos, to create a floor elevations noted above. In comparison to existing conditions, proposed conditions are deeper than the existing substrate in select locations.

# 4.0 Summary of Resource Effects

Implementation of the SPII will result in creation of a critical WTG regional port facility with the ability to support the emerging offshore wind farms off the coast of the northeast United States, while at the same time preserving the ability to continue the port's existing breakbulk operations related to various other materials. The State Pier Facility will serve as a pre-assembly hub for large wind turbine components and serve as a support facility for wind farms for decades to come. The State Pier Facility is an ideal site for a WTG because of its location, existing direct access to a deep-water channel, and lack of air draft restrictions. With implementation of the proposed improvements, the site will meet heavy loading and upland space criteria, and possess ample berthing space for deep draft vessels.

SPII has been designed to minimize unavoidable impacts and/or improve site conditions to the extent practicable. For example, the current site has no stormwater system; SPII proposes to install a permanent stormwater management and treatment system. However, SPII includes activities such as permanent fill and temporary dredge impacts associated with bulkhead construction, creation of a heavy lift area, and dredging. Affected coastal resources include developed shorefront, nearshore and offshore waters, and coastal hazard areas.

Filling the area between the CVRR Pier and the Admiral Shear State Pier to create heavy lift areas will result in loss of nearshore and offshore waters and developed shorefront. This area will be converted from open water habitats to an upland industrial area.

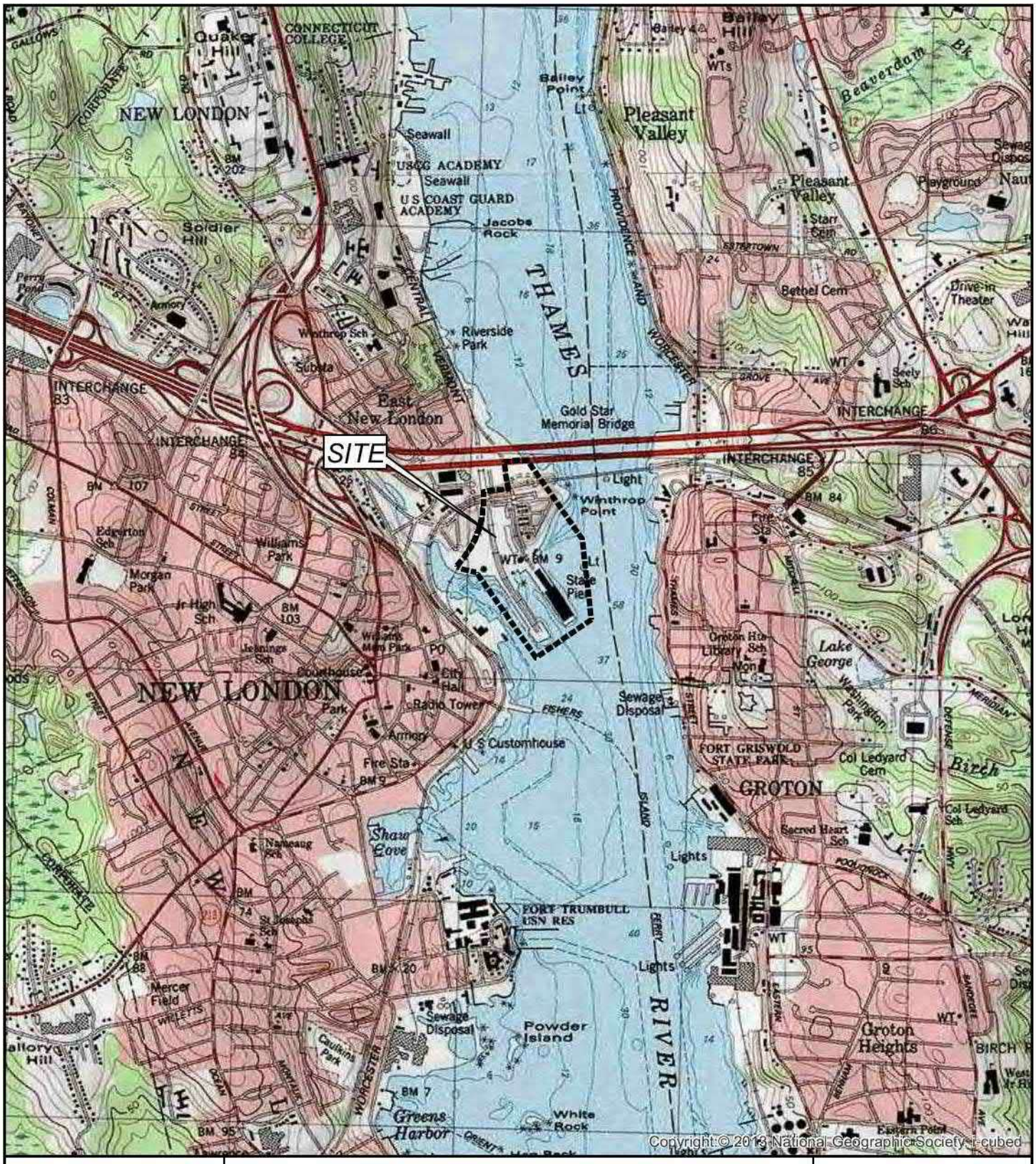
Dredging and seabed preparation activities will be completed to create suitable berthing areas and maintain sufficient depths for anticipated vessels. Although the effects of this work may temporarily change the species composition, abundance, and habitat use as compared to baseline conditions, the post-dredge benthic habitats are expected to exhibit characteristics that are consistent with nearby habitats of the Thames River estuary.

Temporary impacts to local vistas and viewpoints are anticipated; however, CPA does not anticipate significant year-round alterations to existing vistas. Temporary visual impacts associated with tower assembly would be seasonal and would vary in nature and duration. The upgraded State Pier Facility is anticipated to be utilized in such as a way as to be consistent with the port's established long term usage and is consistent with the character of a working port facility.

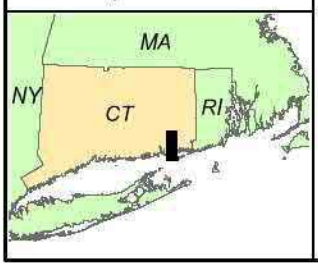
Temporary construction-period impacts will be minimized through use of appropriate Best management Practices. Permanent impacts to coastal resources from implantation of SPII will be offset by implementation of a comprehensive mitigation strategy. A compensatory mitigation plan is presented in JPA Attachment M8.

# 5.0 References

Milone & MacBroom, Inc. 2015. Preliminary Design Report State Pier Complex Improvements New London, Connecticut (revised April 2015). Prepared for State of Connecticut, Department of Transportation, 2800 Berlin Turnpike, Newington, Connecticut. State Project No. 94-222/247. 68 pp + appendices.




## Map Location

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## Site Locus Map

State Pier Infrastructure Improvements
New London, Connecticut

0 1,000 2,000 4,000 6,000 Feet

0 0.125 0.25 0.5 0.75 Miles

Map Projection: State Plane, NAD 83, feet.
Image Source: USGS Topographic Quadrangle New London and Uncasville, CT.

AECOM

Figure 1

4/8/2019

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# Appendix A

# Baseline Natural Resources Report