Offshore Wind Ports:
Cumulative Impacts Study

Final Report | Report Number 22-10 | April 2022

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NYSERDA provides resources, expertise,
and objective information so New Yorkers can
make confident, informed energy decisions.
Our Vision:
New York is a global climate leader building a healthier future with thriving communities; homes and
businesses powered by clean energy; and economic opportunities accessible to all New Yorkers.

Our Mission:
Advance clean energy innovation and investments to combat climate change, improving the health,
resiliency, and prosperity of New Yorkers and delivering benefits equitably to all.

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Cumulative Impacts Study
Final Report

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Notice

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commit any governmental agency or entity to any specific course of action, or otherwise pre-determine any outcome under State or federal law. Any future offshore wind project would be required to meet all local, State, and federal permits, licenses, or other approvals, including but not limited to under the Coastal Zone Management Act, and State Environmental Quality Review Act (SEQRA) prior to proceeding with development.

Abstract

New York State's 2019 Climate Leadership and Community Protection Act (Climate Act) sets aggressive clean energy and climate targets for New York State (State), which includes the installation of at least 9,000 megawatts (MW) of offshore wind (OSW) energy by 2035. The New York State Energy Research and Development Authority (NYSERDA) seeks to advance the cost-effective and responsible development of OSW to meet the Climate Act's 2035 OSW energy target. Currently, five New York State ports have been identified to support the five awarded New York State OSW farm projects. The five currently awarded New York State OSW farm projects would produce approximately 4,300 MW, which will require additional OSW farm solicitations and additional port facilities to meet the State's 2035 OSW 9,000 MW energy target. According to the NYSERDA 9 GW Port Uses and Navigational Assessment Report (2022), the collective OSW infrastructure output of 12 ports would be an optimal scenario to achieve the State's 9,000 MW OSW energy target by 2035.

Based on this result, this study developed three alternatives within New York State: Planned Alternative (comprised of five ports that were awarded OSW farms), Partial-Build Alternative (assuming eight ports) and Full-Build Alternative (assuming 12 ports).

Using desktop and published data, the purpose of this study is to: (1) identify project-related and cumulative environmental, socioeconomic, and navigational effects of the study alternatives; (2) compare the potential benefits and adverse effects of the study alternatives; and (3) assist with planning for the current and upcoming OSW energy projects. The intent is to facilitate a common understanding of the potential impacts of the industry as a whole within the State and the types of regulatory compliance requirements associated with individual site development to streamline and accelerate the applicable environmental review and permitting processes for future development.

This study concluded that the Full-Build Alternative would not only meet or potentially exceed the 2035 OSW energy target, but the cumulative environmental, socioeconomic and navigation impacts would be minimized and mitigated to acceptable levels through responsible port development and well-coordinated State and federal environmental review and permitting processes. The socioeconomic benefits would be maximized, such as improved public health, air quality, jobs, and reducing greenhouse gas (GHG) emissions affecting climate change. By undertaking proper environmental review and permitting processes at proposed OSW ports, the potential adverse cumulative environmental impacts would be addressed in a responsible manner and ensure that viable OSW ports would be used to fully support and implement the State's OSW program on schedule.

Keywords

Planned Alternative, Partial-Build Alternative, Full-Build Alternative, offshore wind ports, offshore wind farms, sturgeon species, submerged aquatic vegetation, greenhouse gas, Climate Act, crew transfer vessels, service operations vessel

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Acronyms and Abbreviations

AC

Alternating current

AIS

Automated identification systems

BACT

BMPs

Best Available Control Technology
Best Management Practices

BOEM

Bureau of Ocean Energy Management

BPMs

Best Practice Measures

BUD

Beneficial Use Determinations

CEHA

Coastal Erosion Hazard Areas

CERP

Community and Environmental Response Plan

CH_4

Methane

Climate Act
CO

Climate Leadership and Community Protection Act
Carbon monoxide

CO_2

Carbon dioxide

CRIS

Cultural Resource Information System

CRRA
CTV

Climate Risk and Resiliency Act
Crew transfer vessels

cy

Cubic yards

EFH

Essential Fish Habitat

EIS
EJ

Environmental Impact Statement
Environmental Justice

EPA

United States Environmental Protection Agency

ESAs
ESA

Environmental Site Assessments
Endangered Species Act

FDNY

New York City Fire Department

FEMA

Federal Emergency Management Agency

GBF
GBS

Gravity-based foundation
Gravity-based structure

GHG

Greenhouse Gas

HRSNOC

Hudson River Safety, Navigation, and Operations Committee

HVAC
HVDC

High-voltage alternating-current
High-voltage direct-current

IPaC

Information for Planning and Conservation

LAER

Lowest Achievable Emission Rate

LIRR
LiMWA

Long Island Rail Road
Limit of Moderate Wave Action

LNM

Local Notices to Mariners

MLLW

Mean Lower Low Water

MTA

Metropolitan Transit Authority

MW
N2O

Megawatts
Nitrous Oxide

NAAQS

National Ambient Air Quality Standards

NEPA

National Environmental Policy Act

NHP

Natural Heritage Program

NMFS

National Marine Fisheries Service

NO 2

Nitrogen Dioxide

NOAA

National Oceanic and Atmospheric Administration

NO x
NRHP

Nitrogen Oxides
National Register of Historic Places

NYC

New York City

NYCEDC

New York City of Economic Development Corporation

NYCWRP
NYS

New York City Waterfront Revitalization Program
New York State

NYSDEC

New York State Department of Environmental Conservation

NYSDOS

New York State Department of State

NYSERDA

New York State Energy Research and Development Authority

NYSHPO

New York State Historic Preservation Office

NYSOPRHP New York State's Office of Parks, Recreation and Historic Preservation
O&M

Operations and Maintenance

OSS
OSW

Offshore Substation
Offshore wind

PAH

Polycyclic aromatic hydrocarbons

PAMT

Port Authority Marine Terminal

PANYNJ
PAWSA

Port Authority of New York and New Jersey

Ports and Waterways Safety Assessment

PCB

Polychlorinated biphenyls

PM 2.5
RAMP

Particulate matter with a diameter of 2.5 microns or less
Remedial Action Monitoring Plan

RAWP

Remedial Action Work Plan

POWI

Port of Coeymans Offshore Wind Infrastructure

REC
RIR

Recognized Ecological Complexes
Remedial Investigation Report

RISE

Resilience Implementation and Strategic Enhancements

RIWP

Remedial Investigation Work Plan

SASS

Scenic Areas of Statewide Significance

SAV

Submerged aquatic vegetation

SBMT

South Brooklyn Marine Terminal
viii

SCFWH

Significant Coastal Fish and Wildlife Habitat

SEQRA

State Environmental Quality Act

SF

Square foot

SFRMG

State Flood Risk Management Guidance

SIP

State Implementations Plans

SMP

Site Management Plan

SNWA

Special Natural Waterfront Area

SO_2

Sulfur Dioxide

SO

Sulfur Oxides

SOV

Service operations vessel

SPCC

Spill Prevention, Control, and Countermeasures

SPDES

State Pollutant Discharge Elimination System

SPMT

Self-propelled modular transporters

SRHP
SWPPP

State Register of Historic Places
Stormwater Pollution Prevention Plan

USACE

United States Army Corps of Engineers

USCG

United States Coast Guard

USFWS
VHF

United States Fish and Wildlife Service
Very high frequency

VTS

New York Vessel Traffic Service

WTG

Wind Turbine Generator

Summary

New York State's 2019 Climate Leadership and Community Protection Act (Climate Act) sets aggressive clean energy and other climate directives for the State, which includes the installation of at least 9,000 megawatts (MW) of offshore wind (OSW) energy by 2035. As the State authority charged with implementing the State's OSW energy target by 2035, the New York State Energy Research and Development Authority (NYSERDA) seeks to advance the cost-effective and responsible development of OSW energy to serve New Yorkers in a way that fosters the long-term sustainability of the industry, facilitates regional collaboration, and spurs innovation and economic opportunities.

Currently, there are five New York State ports that are assumed to support the awarded New York State OSW farm projects: Port of Albany, Port of Coeymans, South Brooklyn Marine Terminal (SBMT), Port Jefferson and Port of Montauk. The five currently awarded New York State OSW farm projects would produce approximately 4,300 MW, which will require additional OSW farm solicitations to meet the State's 2035 OSW 9,000 MW energy target. The five awarded OSW farm projects are in different stages of project development and environmental review at the time of this publication. Published environmental impact statements (EISs) and permitting information of the awarded farm projects and ports, and other desktop sources have been used to support the study.

The Offshore Wind Ports Cumulative Impacts Study evaluates the socioeconomic, navigational, and environmental effects of three alternatives for the port development that would be required to support New York State's OSW farms:

- Planned Alternative, which comprises the ports that are part of the State's five awarded OSW farms (i.e., the No Action Alternative).
- Partial-Build Alternative, which assumes an additional three ports would be constructed in New York State for a total of eight ports.
- Full-Build Alternative, which assumes the same sites as the Partial-Build Alternative with an additional four ports for a total of 12 ports[1] built in the State.

The purpose of the study is to (1) identify project-related and cumulative environmental, socioeconomic,

and navigational effects of the study alternatives; (2) compare the potential benefits and adverse effects
of the study alternatives; and (3) assist with planning for the current and upcoming OSW energy projects.

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The intent is to facilitate a common understanding of the potential impacts of the industry as a whole
within the State and the types of regulatory compliance requirements associated with individual site
development to streamline and accelerate the applicable environmental review and permitting processes
for future development. The following sections:

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S.1

Describe the potential adverse effects of development for each of the 12 port sites that comprise the study alternatives (since the planned and Partial-Build Alternatives are subsets of the Full-Build Alternative) and project commitments and mitigation measures that reduce or avoid adverse effects.

Describe the potential adverse cumulative effects of developing all port sites simultaneously (as a worst-cast scenario of the Full-Build Alternative).

Provides a comparison of the benefits and adverse effects of the study alternatives.

Potential Adverse Effects of Port Development

A desktop environmental screening of the 12 individual port sites that comprise the study alternatives
was completed. Development of these ports have the potential for adverse effects on natural resources
and other resource areas that primarily would be adequately minimized or mitigated through the use
of standard Best Management Practices (BMPs) and strict adherence to regulatory permit conditions.
Potential environmental effects of site development at the 12 sites are summarized below.

S.1.1 Land Use Compatibility

Strategic waterfront locations have been selected to develop the port facilities, and only three of the sites would involve the creation of a new port facility using vacant or undeveloped property. Port operations would be compatible with existing nearby land use and in compliance with zoning at all 12 sites. Each development site would require site plan and local town permitting approvals as well as federal coastal consistency concurrences from New York State Department of State (NYSDOS), potentially by incorporating design and operational specifications, if required.

S.1.2 Transportation Access and Mobility

Each port site would have efficient upland transportation access from regional highways with only minor site access improvements at a few sites. One site would include a short rail spur, a rail bridge and road bridge to the site. Traffic Management Plans would be prepared in coordination with the local municipalities and the Department of Transportation (DOT) to direct truck routes and address potential traffic congestion both during construction and operation.

S.1.3 Navigational Assessment

Each port site has efficient vessel access, adequate channel depths and viable navigation routes to OSW farms, assuming adequate dredging is performed and permitted. Significant dredging would be required at new port locations. Vessel traffic would be coordinated with and managed by United States Coast Guard’s Vessel Traffic Service (VTS) and active communication with the maritime community, including the Maritime Association of the Port of New York and New Jersey Harbor Safety, Navigation, and Operations Committee.

S.1.4 Environmental Justice

Three quarters of the port sites have environmental justice (EJ) communities present in the vicinity of the ports. These EJ communities may experience traffic, air quality, and noise impacts particularly along truck routes, similar to non-EJ communities in the vicinity. Each port site would be required

to analyze potential impacts to EJ communities and disadvantaged communities in accordance with
State (New York State Department of Environmental Conservation, Commissioner Policy 29 and Section 7(3) of the Climate Act) and/or federal (Executive Order [EO] 12898) criteria to identify any disproportionately high and adverse effects on EJ populations, conduct public outreach and incorporate measures to avoid, minimize, and mitigate impacts. For example, at the Port of Albany,
the town is requiring truck routes that avoid EJ neighborhoods to eliminate the potential for air quality, traffic, and noise impacts.

S.1.5 Terrestrial Biological Resources

Potential protected species and habitat, ranging from bats, shorebirds, amphibians, insects and/or
plants may be present at a number of sites. United States Army Corps of Engineers (USACE) Section 10/404 Permits and New York State Department of Environmental Conservation (NYSDEC)
Tidal or Freshwater Wetlands, and/or Protection of Waters Permits would be required at each site,
at a minimum, and potentially NYSDEC Incidental Take Permits, which would address impacts to
protected species. In particular, permits may require seasonal work restrictions, such as avoiding
the shorebird nesting and fledging seasons, turtle nesting season, and clearing trees during the bat
hibernation season; and/or requirements for mitigating impacts to protected species habitat through
Net Conservation Benefit Projects.

S.1.6 Aquatic Biological Resources

S.1.6.1

Wetlands/Open Waters

It is estimated that the Full-Build Alternative may result in impacts totaling an estimated 80 acres of dredging to benthic habitat, approximately 40 acres of fill to tidal wetlands, and approximately five acres of freshwater wetland. Impacts to at least two mapped submerged aquatic vegetation (SAV)
complexes, one freshwater mussel bed, two Significant Coastal Fish and Wildlife Habitat (SCFWH)
tidal creek complexes and two Recognized Ecological Complexes (RECs) within the aggregated study area are anticipated. Temporary wetland and water quality impacts can be minimized

through the implementation of permit-required containment measures, such as silt curtains, sheeting, cofferdams, floating containment booms, soil erosion and stormwater runoff controls. Depending on the level of sediment contamination, dredged sediments could be drained and reused on site or other locations with approved Beneficial Use Determinations (BUDs) from NYSDEC.

As part of the applicable USACE Section 10/404 Permits, NYSDEC Tidal Wetlands/Freshwater Wetlands/Protection of Waters Permit processes, the regulatory agencies would require tailored benthic and wetland mitigation to compensate for impacts per wetland type. The loss of benthic habitat, freshwater wetlands, and tidal wetlands from the ports would require a demonstration of wetland impact avoidance and minimization, prior to any agency review and concurrence with mitigation packages. Dredged sediment is anticipated to be permanently removed from the site. Benthic habitat impacts are anticipated to be temporary, as the benthic communities are expected to recolonize the area over time without a significant change in post-dredge depth. Mitigation measures required by the USACE and NYSDEC permits may include wetland restoration, wetland creation, wetland enhancement, wetland bank credit purchases and acceptable in-lieu fee programs (if available). Within the Hudson Valley Region and coastal New York State, only one wetland mitigation bank is currently authorized to issue mitigation credits to projects in the New York City area. Individual mitigation plans would need to account for losses of specific wetland types and meet USACE and NYSDEC requirements.

S.1.6.2 Species and Habitat

Impacts to at least two mapped SAV complexes and one freshwater mussel bed are anticipated. Prior to dredging, the SAV would be transplanted to neighboring SAV beds to avoid impacts and a freshwater mussel bed would be relocated offsite. Two ports just south of Albany would have impacts to Significant

Coastal Fish and Wildlife Habitat (SCFWH) tidal creek complexes and two ports on western Staten Island would have impacts to Recognized Ecological Complexes (RECs)—these unique wetland complexes provide important habitat for waterfowl, amphibians, fish, and migratory birds. Proposed in-water construction, including dredging, pile installation, shoreline stabilization would require USACE Section 10/404 Permits, NYSDEC Tidal Wetlands/Freshwater Wetlands/Protection of Waters Permits, and National Marine Fisheries Service (NMFS) approvals, which would address impacts to sensitive aquatic species, particularly to sturgeon and Essential Fish Habitat (EFH) species.

In addition, NYSDEC Incidental Take Permits may be necessary for impacts to threatened or endangered species, such as Atlantic and Shortnose Sturgeon.

Construction activities would cause potential disruptions of fisheries during all life cycles, including during migration, foraging (feeding) and/or spawning seasons. The federal and State permits would require dredging to occur within a seasonal work window to avoid sensitive migration, foraging and/or spawning seasons, and include sediment containment measures (silt curtains, closed clamshell, etc.) to reduce EFH and sturgeon species impacts. To minimize pile driving underwater noise impacts, the federal and State permits may require underwater noise control measures such as drilled shaft pile installation, vibratory pile installation, and/or soft-start procedures.

Assuming an increase of vessel traffic at each port, there would be an increased risk of vessel strikes of sturgeon species, depending on vessel drafts, propeller depths, vessel speeds, width of river, and temporal and spatial exposure to sturgeon species. Deeper drafts of loaded work barges and higher speeds of crew transfer vessels (CTV) present higher risks for vessel strikes; however, based on similar projects and studies, cumulative adverse effects to sturgeon species populations are not anticipated, but would be monitored by NYSDEC Part 182 Incidental Take Permits. Implementing slow speeds for project vessels within the port vicinity would be an important mitigation measure to reduce the risk of sturgeon strike. Implementing fisheries seasonal work window restrictions, proper construction BMP techniques and other vessel mitigation (operating at slower speeds outside the navigation channel) impacts to the sturgeon species can be minimized. Responsible port construction and operations should follow strict adherence to federal and State permit conditions that address the avoidance, minimization, and mitigation of potential impacts to sturgeon and EFH species.

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S.1.7 Cultural Resources

Most of the port sites are located within mapped archaeologically sensitive areas, which is typical of shoreline areas. Upland ground disturbances and dredging may disturb potential archaeological resources, and the New York State Historic Preservation Office (NYSHPO) may require further investigations to determine whether significant resources are present. At least three sites are located within the vicinity of a known historic site of Native American significance, requiring further consultation with Native American tribes/nations and other consulting parties to determine if adverse effects would occur from the project(s). Specifically, on the Hudson River, while final approvals have not been issued, it appears there may be unavoidable and unmitigable direct impacts to Papscanee Island (significant Native American site) from the NYS Wind Port and unavoidable and unmitigable visual impacts (views) from Papscanee Island and Schodack Island (both significant Native American sites). These would occur during fabrication of large OSW components at the Port of Coeymans and Port of Albany. NYSHPO consultation would be required at all sites to address direct and indirect effects. Memoranda of Agreements (MOA) or Letters of Resolution (LOR) may also be necessary to document mitigation commitments. Measures adopted by OSW ports have included: avoidance of archaeological resources by siting project components in existing right-of-way (ROW) and previously disturbed areas; committing to having an archaeologist on site to monitor during ground disturbance if required by NYSHPO; and the development and implementation of an Unanticipated Discoveries Plan, which outlines the procedures to follow if archaeological materials or human remains are discovered.

S.1.8 Community Character

The development of the port sites is not anticipated to adversely impact the broad elements of community character, including land use or development patterns, population growth and density, regional socioeconomics. New ports sites assumed in this study are largely compatible with existing waterfront land use and zoning. Temporary traffic, noise, air quality and visual effects would occur, particularly during port construction and manufacturing and staging OSW components. Local, State, or federal entities may require mitigation measures to be implemented as part of the approval process that would require mitigation measures to be implemented during construction. As a key community benefit, significant job opportunities would be created, and the local economy would be stimulated at each port site.

S.1.9 Hazardous Materials

Development of the port sites would disturb contaminated fill and sediments from former port operations and/or other past use and in-water contamination. Dredging and in-water construction in the Hudson River would likely disturb known polychlorinated biphenyls (PCB) contaminated sediments. Half of the sites may demolish structures with potentially hazardous building materials (e.g., asbestos). As part of environmental review and permitting, NYSDEC and other regulatory authorities would require proper site investigations as well as management and disposal plans to mitigate potential effects to the environment and human health, during construction and operations at applicable port sites.

S.1.10 Floodplains and Resiliency

All of the port sites are within 100-year floodplains and adjacent to floodways. To address potential flooding, the site designs would be required to elevate certain facilities or equipment above design flood elevations and/or reinforce infrastructure to meet (1) Federal Emergency Management Agency (FEMA) and NYSDEC floodplain design guidelines (accounting for sea-level rise, wave action, and floodways), (2) Climate Change Adaptation Guidance on Waterfront Revitalization Program Policy for ports in New York City, and (3) other local town floodplain development permit requirements. The NYSDOS Resilience Implementation and Strategic Enhancements (RISE) Local Assessment Tool should be referenced to incorporate resilience principles and achieve co-benefits from waterfront development, as possible. NYSDOS Office of Planning, Development, and Community Infrastructure may also be consulted to support coastal flood resiliency planning.

S.1.11 Noise

Three quarters of the sites have a residential area in the vicinity that may experience noise, particularly truck-related noise during construction activities. Most OSW ports are sited on an active port in an industrial area with high-ambient noise levels. Noise impacts would be mitigated by noise controls and best practices in accordance with noise mitigation plans developed in accordance with NYSDEC Assessing and Mitigating Noise Impacts Program Policy, local noise ordinances, and contractual requirements. Construction noise also includes underwater acoustic impacts to marine species from impact devices, such as pile driving steel piles, etc. To minimize pile driving underwater noise impacts to marine species, the federal and State permits may require underwater noise control measures such as drilled shaft pile installation, vibratory pile installation, and/or soft-start procedures. Once the

operations and maintenance (O&M) phase of the port is underway, the noise levels would drop substantially, especially at OSW ports with service operations vessel (SOV) or smaller crew transfer vessel (CTV) support. However, OSW ports that would continually have manufacturing, staging, or other heavy OSW operations, significant noise impacts may continue, requiring ongoing noise controls and mitigation measures.

S.1.12 Air Quality and Greenhouse Gases

Temporary exhaust emissions from marine vessels, on-vessel equipment, onshore, road and non-road vehicles, and equipment powered by stationary engines (e.g., generators) would occur during construction at the OSW port sites. Airborne particulates would increase as dust is raised by construction vehicles. Once the O&M phase of the port is underway, the exhaust emissions would drop substantially at OSW ports with SOV or CTV support. However, OSW ports that would continually have manufacturing, staging, or other heavy OSW operations, air pollution would continue, requiring ongoing air quality controls and mitigation measures. Air pollution and greenhouse gas (GHG) emissions would be controlled by use of low-sulfur fuels, limiting engine idling, use of electric tools, use of vessels that meet Best Available Control Technology (BACT) and Lowest Achievable Emission Rate (LAER) requirements. For certain stationary air emission sources (concrete batch plants, spray paint booths, other manufacturing) NYSDEC Air Permitting would be required to control emissions as well. As an example, the construction activities in one of the New York City ports has been assessed and would not have the potential to exceed the General Conformity thresholds for National Ambient Air Quality Standards (NAAQS) nonattainment or maintenance areas.[2] Operational impacts from port development would not be expected to result from program implementation.

S.2 Potential Adverse Cumulative Effects of the Full-Build Alternative

Cumulative impacts can occur when multiple actions affect the same environmental resource simultaneously or sequentially. Based on OSW ports supply demand modeling effort,[3] it was confirmed that 12 port sites in New York State would be a robust and optimal scenario to produce the necessary OSW port output to fully achieve and potentially exceed the State’s 2035 OSW energy target, when compared to the Planned Alternative and the Partial-Build Alternative. As a result, this study qualitatively evaluated the concurrent development of a Full-Build Alternative with 12 port sites, as a worst-case scenario, to determine the potential for significant cumulative effects. The port sites are geographically distributed across three New York State regions (see Figure 2), the Capital Region

(Upper Hudson River), the NY Harbor and Long Island with sufficient distance in between so that most localized effects at any one site would not overlap with the localized effects of another site or accumulate over time. As a result, there is no potential for cumulative adverse impacts to land-use compatibility, Environmental Justice (EJ) communities, vehicular traffic, community character, hazardous materials, localized air quality, or noise either during operations or construction of the port sites. Other resource areas with potential cumulative adverse impacts are described below.

Potential cumulative impacts include:

- Land-Use Patterns and Socioeconomic Conditions: Three ports would be new developments within vacant land; however, the sites are zoned for industrial/manufacturing uses and are located away from sensitive land uses (residences, schools, etc.). Nine of the port sites would be redeveloped with existing ports with compatible land use and zoning. Collectively, the OSW ports would not be expected to adversely impact the broad elements of community character, population growth, or density in New York State regions. The program would not alter or accelerate development patterns, and real estate market conditions would be expected to remain similar to today. As a result, adverse cumulative impacts on land-use patterns and socioeconomic conditions are not expected result from program implementation.

- Vessel Navigation: Collectively, the Full-Build Alternative is estimated to result in a cumulative increase of 4% in vessel traffic at the southern outlet of NY Harbor (Ambrose Channel),[4] assuming all of the projected vessels from the OSW ports operating concurrently. Given the large volume of traffic and the wide variability of traffic in any given day, the increase in traffic associated with the OSW ports is small. For example, two of larger manufacturing OSW ports (Port of Coeymans and Port of Albany) on the Hudson River would both add approximately two to four round barge trips per week and one vessel per month for the delivery of inbound materials, which would not represent a significant increase in vessel traffic when compared to the annual commercial traffic of 3,000 barges and vessels, exclusive of recreational boating traffic,[5] that is currently occurring on the Hudson River. Overall, the quantity of OSW vessel traffic would not pose additional risk to vessel safety to existing waterways in New York State. The use of barges and vessels for the delivery and shipping of materials/products would reduce the need for trucks, further minimizing the impact on the surrounding roadway network. Overall, the quantity of OSW vessel traffic would not pose additional risk to vessel safety in existing waterways in the State.[6]

- Environmental Justice: Three quarters of the port sites have EJ communities present in the vicinity which may experience traffic, air quality, and noise impacts adjacent to the port sites and also along truck routes, similar to non-EJ communities in the vicinity. Each port site would be required to analyze potential impacts to EJ communities and disadvantaged communities in accordance with NYSDEC Commissioner Policy 29 and Section 7(3) of the Climate Act and/or federal EO 12898 criteria to identify any disproportionately high and adverse effects on EJ populations. The port sites would also be required to conduct public outreach and incorporate measures to avoid, minimize, and mitigate impacts. These port-related impacts are not anticipated to create cumulative adverse impacts to EJ communities, and the regulatory processes requiring mitigation measures would be implemented to protect the quality of living in the neighborhood. For example, at the Port of Albany, the town is requiring truck routes that avoid EJ neighborhoods to eliminate the potential for air quality, traffic, and noise impacts.

To actively support EJ communities and provide cumulative economic benefits at the program level, the State has number of programs and tools in place. NYSERDA's procurement of Offshore Wind Renewable Energy Credits (ORECs) will assign 20% of the score of each project proposal to economic benefits, including benefits to disadvantaged communities, creation of workforce training opportunities, and job creation. The Climate Justice Working Group established by the Climate Act to identify disadvantaged communities and to help ensure that the benefits of climate change responses accrue to these disadvantaged

communities. The State is also committed to requiring developers to pay workers a prevailing wage and to utilize project labor agreements. New York State has invested $20 million to establish the Offshore Wind Training Institute in partnership with NYSERDA, State University of New York, Stony Brook, and Farmingdale to train a new workforce for the OSW industry at the affordable SUNY institutions.

In addition, the New York/New Jersey Bight Regional Working Group on Supply Chain Development will be continually coordinating to meet mutual regional OSW energy targets related to enhancing the domestic supply chain and deliver benefits and economic opportunities to underserved, disadvantaged, and overburdened communities.

In New York City, the Offshore Wind NYC program would: (1) direct 40% of job and investment benefits to women, minorities, and EJ communities; (2) bring local jobs and environmental benefits to historically disadvantaged communities along the waterfront; (3) provide investments in professional training programs to create pipelines to OSW jobs.

The OSW port projects would also be required to undertake EJ assessments and implement applicable avoidance, minimization, and mitigation measures to address potential impacts.

Overall, thousands of construction and O&M jobs would be generated in close proximity to EJ communities along the State's waterfront, and the resulting regional benefits of job creation and sustainable employment would help offset the effects of port construction and operations, and avoid potential cumulative impacts to EJ communities.

Terrestrial Biological Resources: Impacts to potential habitat for protected bats, shorebirds, amphibians, insects and/or plant habitats would occur. Impacts to terrestrial wildlife would be partially mitigated by repurposing existing waterfront facilities or using previously disturbed sites to the extent possible. Impacts to wildlife may consist of temporary displacement, habitat loss, and direct mortality. Direct mortality is most likely with less mobile species such as reptiles and amphibians and nesting birds. Habitat loss can cause more mobile species, such as birds and mammals, to seek suitable habitat adjacent to the port facility. Some species may be temporarily displaced during the construction phase but return to the site as noise levels decrease during the operational phases of less disruptive port facilities (CTVs, SOVs, etc.).

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Cumulative impacts may be synergistic—where the combined effect of multiple impacts at other ports may be greater than the sum of individual impacts alone. However, the port sites would undertake environmental review and USACE and NYSDEC permitting processes to identify (1) avoidance, (2) minimization and mitigation measures to reduce terrestrial species and habitat impacts to the best extent practicable. In accordance with the required permits, effective mitigation measures would be implemented, including clearing trees during the bat hibernation season; avoiding construction during bird nesting/fledging seasons; installing anti-perching devices to discourage migratory bird landings; and/or mitigating impacts to protected species habitat through Net Conservation Benefit Projects to help enhance species recovery or overall population. In cases where potential construction-related impacts to a specific species cannot be fully mitigated, NYSDEC and federal agencies may require (1) incidental take permits and (2) the monitoring and reporting of species takes or injuries to ensure the regional stability of populations. Overall, the collective impacts (vegetation clearing) of the Full-Build Alternative would not be expected to be of a scale to cause broad cumulative impacts that would imperil or critically impact terrestrial species in the State's coastal environment, especially with the successful implementation of permit requirements, including seasonal work windows, monitoring of incidental take, and the implementation of habitat mitigation, such as Net Conservation Benefit mitigation.
Aquatic Biological Resources:

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Wetlands/Open Waters
The Full-Build Alternative may result in an estimated cumulative loss of 80 acres of dredging impacts to benthic habitat, approximately 40 acres of fill impacts to tidal and tidally influenced wetlands/open waters, and approximately five acres of emergent freshwater wetland impacts. Impacts to at least two mapped SAV complexes, two SCFWH tidal creek complexes, one freshwater mussel bed and two RECs with emergent, scrub-shrub and forested estuarine and marine wetlands within the aggregated study area are anticipated. Important functions of these tidal and tidally influenced wetlands would be lost in the Capital Region, NY Harbor and Long Island coastal areas, including tidal surge buffers; protection from shoreline erosion; retention of excess nutrients; vital forage habitat for clams, crabs, and juvenile fish; and providing shelter and nesting sites for migratory

waterfowl. Similarly, the permanent loss of four acres freshwater wetlands would lose freshwater wetland functional values, such as fluvial floodwater retention, water quality filtration, and fish and wildlife habitat. Dredged sediment impacts would be a significant marine species habitat impact; however, these impacts are anticipated to be temporary, as benthic communities have been shown to recolonize the area over time when the dredging depths are not a substantial change. The cumulative wetland impacts from OSW ports would represent significant a loss.

However, mitigation measures would be required by the USACE and NYSDEC permits, including wetland restoration, wetland creation, wetland enhancement, wetland bank credit purchases and acceptable in-lieu fee programs (where appropriate). Any SAV or shellfish beds would be required to be relocated prior to dredging. To address wetlands loss, the wetland mitigation plans would need to account for losses of specific wetland types and functions, but those lost wetland types and functions would be relocated away from the port site (e.g., flood attenuation and habitat). Climate change and resultant (and modeled) sea-level rise should be factored into mitigation site planning (grading, planting lists, community types) to ensure that proposed wetland communities would persist over time. Responsible mitigation plans coordinated with federal and State regulatory agencies, such as Net Conservation Benefit projects, would be the goal of replacing wetland functions and values in the vicinity, especially for threatened and endangered species.

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Habitat and Species

Wetland losses affecting aquatic biological resources from dredging and fill activities of the Full-Build Alternative would likely have a cumulative impact on protected fisheries, shellfish, wildlife, and aquatic plant species. Cumulative losses of spawning, foraging, overwintering and juvenile habitat for sturgeon and other Essential Fish Habitat (EFH) species would occur, particularly in the Hudson River. Benthic communities that are impacted by dredging would likely recolonize following disturbance. Benthic habitat use, such as foraging and spawning, may be impacted if the depth is changed significantly. Proposed in-water construction, including dredging, pile installation, and shoreline stabilization likely requires USACE Section 10/404 Permits, NYSDEC Tidal and/or Freshwater Wetlands/Protection of Waters Permits, Part 182 and National Marine Fisheries Service (NMFS) approvals to address impacts to wetlands and other waters of the United States (U.S.) as well as sensitive aquatic species and habitat, particularly to sturgeon and EFH-managed species. Permit requirements would be designed to avoid and minimize impacts to aquatic biological resources and may require mitigation (e.g., restoration or creation of habitat). Some port sites would require additional mitigation measures to account for site-specific resources present prior to dredging or installing new infrastructure, such as removing and transplanting the SAV beds or freshwater mussel bed(s) to approved locations offsite.

Cumulative impacts of construction activities would also cause potential disruptions of fisheries during all life cycles, including during migration, foraging (feeding) and/or spawning seasons. The federal and State permits would require dredging to occur within a seasonal work window typically to avoid sensitive migration, foraging and/or spawning seasons, and include sediment containment measures (silt curtains, closed clamshell, etc.) to reduce EFH and sturgeon species impacts. To minimize pile driving-related underwater noise impacts to sturgeon, the federal and State permits may require underwater noise control measures such as drilled shaft pile installation, vibratory pile installation, and/or soft-start procedures. Displaced habitat impacts is an important factor, as sturgeon species are known to return to the same locations for spawning, overwintering, and foraging. Responsible mitigation plans would mitigate habitat loss impacts to protected species through Net Conservation Benefit projects coordinated with the regulatory agencies, which would have the goal of enhancing affected species recovery and overall population growth. USACE and NYSDEC wetland permits would require mitigation plans that would potentially create or restore the wetland habitats; however, the wetland would be displaced and relocated away from the source, most likely.

The cumulative increase in vessel traffic associated with the Full-Build Alternative would also increase the risk of sturgeon mortality, particularly in areas of the Hudson River that overlap with sturgeon spawning areas and vessel traffic. Overall, the Full-Build Alternative is estimated to result in a 4% increase in vessel traffic at the confluence of the Ambrose Channel south of the NY Harbor (gateway to the OSW farms), assuming all of the projected vessels from the OSW ports are operating concurrently. Given the volume of traffic on the Hudson River and NY Harbor, and the wide variability of traffic in any given day, the increase in traffic associated with the OSW ports is relatively low. For example, two of the larger manufacturing OSW ports (Port of Coeymans and Port of Albany) would both add approximately two to four round barge trips per week and one vessel per month for the delivery of inbound materials, which would not represent a significant increase in vessel traffic when compared to the overall commercial traffic of 3,000 barges and vessels annually, exclusive of recreational boating traffic, that is currently occurring on the Hudson River. 7

It is assumed that increased risk of vessel strikes of sturgeon species would be commensurate with the cumulative 4% increase of vessel traffic from OSW ports at the Ambrose Channel south of NY Harbor. Additional factors increasing the risk of sturgeon strikes are deep vessel drafts from loaded barges, propeller depths of barges, faster speeds of smaller vessels like crew transfer vessels (CTVs), narrow reaches of the Arthur Kill and Hudson River, and additional temporal and spatial exposure to sturgeon species attributed to OSW ports. However, each of the port sites would undertake Section 7 Endangered Species Act (ESA) consultation processes, and USACE and NYSDEC permitting processes to identify avoidance, minimization, and mitigation measures to reduce sturgeon strikes to the best extent practicable.

In accordance with the required permits, effective avoidance, and minimization measures would include requiring slow speeds for project vessels in sensitive

sturgeon habitat areas, avoiding sensitive seasonal windows, and other measures such as telemetry monitoring and/or visual monitoring of sturgeon during potentially harmful activities. Ultimately, depending on the anticipated impacts to sturgeon, NYSDEC and federal agencies may require incidental take permits and monitoring and reporting of species takes or injuries to ensure the regional stability of populations. As part of these incidental take permits, mitigation projects may be required to address the direct take of individual sturgeon or the adverse modification or take of habitat that supports essential behaviors of sturgeon. This mitigation may involve the creation or enhancement of benthic habitat for sturgeon away from the port facilities. Overall, the collective potential for sturgeon strikes related to the Full-Build Alternative would not be expected to be of a scale to cause broad cumulative impacts that would imperil or critically impact the species within the State’s coastal environment. However, it will be critically important to reduce cumulative adverse impacts to sturgeon and other EFH species by implementing the effective avoidance, minimization, and mitigation measures collectively at each port, including slow vessel speeds, following seasonal work windows, monitoring of incidental take and the implementation of acceptable mitigation plans, including Net Conservation Benefit projects.

- Cultural Resources: In the event that adverse effects to archaeological resources would result from port development, cumulative impacts could accrue resulting in the loss of historical resources. Aside from three sites that would affect areas of Native American significance, there is low risk for unmitigable adverse effects. NYSHPO consultation would be required at all sites. Depending on the resources affected, NYSHPO consultations may require engagement with Native American tribes/nations and other consulting parties to review the design and mitigation measures. If adverse effects are identified, the project design would be required to either avoid, minimize and/or mitigation these adverse effects to acceptable terms by NYSHPO and the consulting parties. Cultural resource impacts would be mitigated through commitments, such as monitoring during construction, that would be agreed to in the MOAs with NYSHPO and consulting parties.

- Hazardous Materials: The Full-Build Alternative sites would disturb contaminated fill soils and dredging and in-water construction in the upper Hudson River would likely disturb PCB-contaminated sediments. However, as part of environmental review and permitting requirements, the NYSDEC and other regulatory authorities would require additional investigations as well as management and disposal plans. As a result, with the responsible application of regulatory management and disposal mitigation measures, no cumulative effects to the environment and human health during construction and operations are anticipated from the Full-Build Alternative. The clean-up and restoration of brownfield sites to active use would be a regional benefit by reducing the potential for existing contamination to migrate offsite.

- Floodplains and Resiliency: Full-Build Alternative sites are within 100-year floodplains and adjacent to floodways. Developments would be designed to meet FEMA, NYSDEC and local floodplain design guidelines to withstand forces from flood waters and function after major flooding events. Port improvements would be required to be designed appropriately to meet federal, State and local design criteria to avoid cumulative flooding impacts locally or on a regional scale.

- Noise: Three quarters of the sites have a residential area in the vicinity that may experience port site and truck-related noise during construction activities. During the operational phase, the noise levels would drop substantially in OSW ports limited to SOV and CTV operations. Many OSW ports are sited on an active port in an industrial area with high-ambient noise levels. Noise impacts are a localized effect. These localized noise impacts would be mitigated by noise controls and best practices in accordance with noise mitigation plans developed in accordance with NYSDEC Assessing and Mitigating Noise Impacts Program Policy, local noise ordinances, and contractual requirements. Further, pile-driving and in-water construction would also be subject to USACE and NYSDEC permitting, which would require mitigation methods to reduce the risk of aboveground and underwater noise impacts. Due to the geographic dispersion of OSW port sites, cumulative noise impacts would not occur, even if the port sites are developed concurrently. Noise mitigation plans would be put in place to address noise impacts at the ports.

- Air Quality and GHG: Exhaust emissions from marine vessels, trucks, and construction equipment would be mitigated through NYSDEC Permitting and BMPs to reduce emissions. Analyses of one of the ports (South Brooklyn Marine Terminal) in a densely developed area of New York City has confirmed that the port would not exceed the General Conformity thresholds for NAAQS nonattainment or maintenance areas. Further, the short-term emissions of the OSW ports that would occur regionally during construction would be greatly offset by the regional net air pollution reduction (CO_2, methane, PM 2.5 and other GHG) that would occur once the 9,000 megawatts (MW) of the OSW farms are operational.

Comparison of the Alternatives

According to the COWI's Regional Ports Supply Demand Model [8] and related OSW planning research
by the State, the collective OSW infrastructure output of 12 ports of the Full-Build Alternative would
be the best option to achieve and position New York State to potentially exceed the 9,000 MW OSW
energy target by 2035. By comparison, the Planned Alternative and Partial-Build Alternative would
still be viable to potentially meet the 9,000 MW OSW target by 2035 and would result in similar, but proportionally less potential environmental and navigation related impacts than the Full-Build Alternative. The Full-Build Alternative would provide the maximum socioeconomic benefits to the State and its residents, including:

- Public Health Benefits: The Full-Build Alternative would maximize the reduction in coal and gas-fired power generation pollution emissions by installing 9,000 MW of OSW by 2035 and achieve far greater public health-related socioeconomic benefits. With the Planned Alternative alone, New York State would avoid more than 8.7 million tons of GHG emissions, 1,800 tons of NO_x, 780 tons of SO_2, and 180 tons of PM 2.5 compared to a business-as-usual scenario without OSW energy. These emissions reductions would nearly double under the Full-Build Alternative. New Yorkers would also save approximately $4 billion in health costs (respiratory disease, cardiovascular disease, cancer, neurological problems) and, more importantly, avoid hundreds fewer premature deaths under the Build Alternative (in proportion to the Planned Alternative). [9] The Full-Build Alternative would not only maximize the regional improvement to air quality and reduce harmful public health-related effects, it would also reduce the harmful effects of acid rain. [10]

- Economic Benefits: The Full-Build Alternative is estimated to support approximately 34,288 job-years during construction followed by 1,309 jobs each year to operate and maintain the OSW energy projects for a total of 32,403 job-years. The OSW projects would also create high-tech, high-quality, long-term job opportunities and up to $30 billion in economic development. Additional economic benefits would include increased property values and tax revenues, as well as demand for housing. Social and community investment expenditures are expected to support another 1,080 job-years over the life of the projects. By comparison, the Planned Alternative is estimated to support approximately 13,510 job-years during ports renovations and 545 jobs during O&M. Five ports in the State, estimated to generate $12.1 billion in economic development (Appendix G: Economic Impacts Study).

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Electricity Rate Benefits: The Full-Build Alternative provides more affordable energy than fossil fuel-based power generation and maximizes cost-effectiveness of OSW for New York State ratepayers. 11

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Reduced Climate Change Effects: The Full-Build Alternative would provide a maximum State-wide OSW contribution to reducing greenhouse gas (GHG) emissions that affect the rate of climate change. By operating 9,000 MW of OSW by 2035 and eliminating the equivalent fossil fuel energy GHG emissions contributing to climate change, the reduced emissions would support slowing the rate of climate change. Climate change projections indicate potential sea-level rise of up to 6 feet and increased temperatures between 4° Fahrenheit (F) and 10°F by the year 2100 for the northeastern United States. Constructing the Full-Build Alternative would maximize the State-wide OSW contribution to reducing harmful effects of climate change, including flooding and coastal erosion from sea-level rise and storm surge, as well as extreme heat events and summer droughts. 12

The Full-Build Alternative would result in greater levels of environmental impacts, but similar to those
expected from the Partial-Build Alternative and Planned Alternative, as identified in this Study. The types
and degree of impacts identified in the published environmental review documentation for the Planned

Alternative ports would be comparable to the Full-Build Alternative, particularly in relation to issues
of concern: wetlands, threatened and endangered species habitat, EFH species, vessel strikes of sturgeon
species, cultural resources, traffic, air quality and noise. Measures to mitigate those effects is also
expected to be similar, as identified in the Study.

The cumulative impacts of the Study alternatives would be localized or regionally specific, but the overall
cumulative impact for port development would be minimal for most resource areas, with the

exception of key sensitive resources, including tidal wetlands, sturgeon species and habitat, EFH species and habitat, and cultural resources. Recognizing the potential for cumulative and unmitigable impacts to these important biological resources and cultural resources (Native American sites), it will be imperative for proposed port developments to undertake more focused planning and design efforts coordinated with regulatory agencies to avoid, minimize, and mitigate impacts during the environmental review and regulatory permitting processes.

To proactively anticipate and address cumulative impacts of proposed OSW ports, this Study has identified BMPs and mitigation measures for developers to consider. Environmental review and regulatory permitting would be conducted for port development at the time they are proposed, which would assess, at the site-specific level, all relevant potential environmental impacts. Pre-application meetings and coordination with federal and State regulatory agencies will be very important to identify the potential adverse impacts early in the design process and receive guidance on the best avoidance minimization (BMPs) and mitigation measures. As an additional safeguard to mitigation measures, regulatory agencies may require incidental take limits on protected species and monitoring (noise levels, sturgeon movements, water quality, etc.) of impacts to ensure proper protection of sensitive resources. The federal and State permitting regulatory processes have mechanisms to deal with localized impacts, but cumulative impacts often go beyond those review processes. This situation underscores the importance in developing future BMPs in a more environmentally responsible manner during construction, and operations should be implemented to further reduce any potential for cumulative impacts to occur.

The Full-Build Alternative represents an optimal scenario to not only meet or potentially exceed the 2035 OSW energy target, but as identified in this Study, it will be important for all port developments to proactively address potential adverse impacts early in the environmental review and permitting

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processes to minimize the potential for unmitigable and cumulative impacts. Overall, the successful
implementation of the Full-Build Alternative would maximize the socioeconomic benefits of the OSW
program for New York State residents, such as improved public health, air quality, jobs, and reducing
GHG emissions affecting climate change.
By undertaking proper environmental review and permitting processes the potentially adverse
environmental impacts would be addressed in a responsible manner and ensure that viable OSW ports
would be used to fully support and implement the State's OSW program on schedule. As ports continue
to be identified for development to meet or exceed the State's 9GW goal or if future State or regional
goals change, this Study could be updated to more adequately reflect the associated cumulative impacts.
Please Note this Disclaimer: This study's identification and discussion of the potential cumulative
impacts are not a substitute for future site-specific analyses of potential environmental impacts for
the sites evaluated herein. Environmental review and regulatory permitting would be conducted for
future offshore wind energy development and/or transmission projects at the time they are proposed,
which would assess, at a site-specific level, all relevant potential environmental impacts. This study's
identification and discussion of the potential cumulative impacts of the proposed action do not
substitute for future site-specific analyses of potential environmental impacts for particular projects
but do provide supporting information.

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1 Introduction

1.1 Overview

New York State's 2019 Climate Leadership and Community Protection Act (Climate Act) [13] sets aggressive clean energy and climate targets for the State, which includes the installation of 2,400 megawatts (MW) of offshore wind (OSW) by 2030, and at least 9,000 MW of OSW energy by 2035, to achieve zero-emission electricity by 2040. It is also the intent of the NYS Climate Act to manufacture, fabricate, stage, install, operate, and maintain OSW components in the State to maximize economic opportunity for New Yorkers.

As the New York State authority charged with implementing the OSW energy target by 2035, the New York State Energy Research and Development Authority (NYSERDA) seeks to advance the cost-effective and responsible development of OSW energy to serve New Yorkers in a way that fosters the long-term sustainability of the industry, facilitates regional collaboration, and spurs innovation and economic opportunities. NYSERDA's core guiding principles are to:

- Maximize cost-effectiveness of OSW for New York State ratepayers.
- Minimize environmental impacts.
- Maintain economic vitality of all ocean users.
- Maximize economic opportunity in New York State.
- Cultivate an OSW innovation ecosystem.
- Create opportunities for transparent stakeholder engagement.
- Foster long-term sustainability of the industry.

NYSERDA is coordinating the environmentally responsible and cost-effective development of OSW energy in support of the NYS Climate Act and is applying a standardized approach to identify and assess project-related and cumulative environmental, socioeconomic, and navigational impacts and benefits at proposed ports to support the buildout of the 2035 OSW 9,000 MW clean energy target. This study analyzes and compares build alternatives of State ports to assess their ability to meet the 2035 OSW clean energy target and their potential environmental impacts. Potential cumulative effects are assessed for the Full-Build Alternative that would meet the 2035 OSW clean energy target. This study was coordinated with two parallel efforts to provide a comprehensive view of the interdependent areas of New York State port usage, 14 including navigational movements resulting from such usage and undersea cable corridors/transmission design approaches associated with the concurrent use of the State's waterways for OSW energy generation. 15

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The purpose of this study is to: (1) identify project-related and cumulative environmental, socioeconomic, and navigational effects of the study alternatives; (2) compare the potential benefits and adverse effects of the study Alternatives; and (3) assist with planning for the current and upcoming OSW energy projects. The intent is to facilitate a common understanding of the potential impacts of the industry as a whole in New York State and the types of regulatory compliance requirements associated with individual site development to streamline and accelerate the environmental review processes for future development.
Currently, there are five ports that have been identified to support the awarded New York State OSW farm projects: Port of Albany, Port of Coeymans, South Brooklyn Marine Terminal (SBMT), Port Jefferson, and Port of Montauk. The five currently awarded OSW farm projects would produce approximately 4,300 MW, which will require additional OSW farm solicitations to meet the State's 2035 OSW 9,000 megawatts (MW) energy target. The five awarded OSW projects are in different stages of project development and environmental review. South Fork Wind Farm has completed an environmental review process in accordance with the National Environmental Policy Act (NEPA), the South Fork Wind Farm, and South Fork Export Cable Project (August 2021). On January 18, 2022, the Bureau of Ocean Energy Management (BOEM) approved the Construction and Operations Plan (COP) for the South Fork Wind Farm (SFWF) and South Fork Export Cable Project. And on February

11, 2022,
the SFWF started construction. Three other OSW farm projects, Empire Wind (1 and 2) and Sunrise Wind
are currently undergoing NEPA review, which combined, assume potential uses of SBMT, Port Jefferson,
and Port Montauk. At least two supporting OSW port facilities, the Port of Albany Expansion Project, and
Port of Coeymans Offshore Wind Infrastructure (POWI) project, are also undergoing both NEPA and
New York State Environmental Quality Review Act (SEQRA) reviews at the time of this study.
The port infrastructure needed to support the production of OSW energy is described in section 2 along
with the programmatic assumptions for construction and operation of OSW facilities. Section 3 provides
a detailed description of the three alternatives qualitatively evaluated in the study via desk-top research:

- Planned Alternative, which includes the five ports currently involved in New York State's five awarded ocean wind farm projects. The Planned Alternative essentially serves as the No Action Alternative, as it includes the currently planned port facilities to serve NYS ocean wind farm projects.

- Partial-Build Alternative, which assumes the Planned Alternative ports and three additional ports (the Brooklyn Port Authority Marine Terminal (PAMT), Arthur Kill Terminal, and Homeport Pier) for eight port sites total. The Partial-Build Alternative is any number of ports between the five ports listed in the Planned Alternative and the 12 ports of the Full-Build Alternative. A representative number, eight, was selected based on what type and number of ports is realistic if the Full-Build Alternative is not achieved and also as an example to show the relative cumulative impacts for a partial-build scenario.
- Full-Build Alternative, which includes the Planned Alternative ports and seven additional ports, 12 port sites total, 16 in New York State. This alternative would meet NYSERDA's guiding principles of maximizing economic opportunities in the State and the cost-effectiveness of OSW for its ratepayers. 17

Collectively, these are called the "study alternatives."

Section 4 describes the environmental settings of the 12 OSW port sites. Section 5 presents the analysis of the potential site-specific adverse effects that are expected to occur at each of the 12 sites in relation to the development scenarios of the study alternative. For the purposes of this study, socioeconomic, navigational and environmental criteria were developed to evaluate the Alternatives in relation to: land-use compatibility, transportation access and mobility, economic impacts, environmental justice communities, community character, cultural resources, natural resources, hazardous materials, air quality and greenhouse gas (GHG) emissions, and noise and vibration. This section identifies the best practices measures (BPMs) and likely permitting requirements that would minimize or mitigate the potential for adverse impacts to occur from port development. Section 6 summarizes the results of the cumulative impacts assessment. The final section summarizes and compares the overall potential benefits and impacts of the study alternatives.

Disclaimer: Individual project environmental review and regulatory permitting would be conducted for future offshore wind energy development and/or transmission projects at the time they are proposed, which would assess, at a site-specific level, all relevant potential environmental impacts. This study's identification and discussion of the potential cumulative impacts of the study alternatives do not substitute for future site-specific analyses of potential environmental impacts for particular projects but do provide supporting information.

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Offshore Wind Port Facility Types and Programmatic Requirements

NYSERDA published the New York State Offshore Wind Master Plan (Master Plan) 18 in 2017 that lays out a comprehensive roadmap for development of 2,400 MW of OSW energy generation by

2030. Based on the NYS Climate Act adopted in 2019, the State's current OSW goal was increased to achieve at least 9,000 MW of OSW energy by 2035. As part of the NYSERDA's OSW Master Plan, the Assessment of Ports and Infrastructure 19 (2017) study was prepared, which identifies potentially viable ports to support the OSW program and the major OSW components and facility types in order to understand each future facility's service requirements. For the purposes of analyzing the study alternatives, the major OSW components and facility types in the Assessment of Ports and Infrastructure study have been assumed and used at the potential OSW ports, as described below.

2.1 Major Offshore Wind Components

2.1.1 Turbines

Three-bladed horizontal axis wind turbines are the prevailing wind turbine technology at the time of this writing. OSW turbines are typically larger and more powerful than onshore wind turbines, since size limitations are not as restrictive for sea vessels as truck transportation. While the specifications of future technologies are highly confidential, it is reasonable to assume that wind turbine capacity would increase with technological developments.

2.1.2 Foundations

Based on the Assessment of Ports and Infrastructure study, these OSW foundation types are likely to be used by OSW developers with projects in water depths suitable for fixed bottom technologies and not floating foundations. The following are a range of potential foundations that may be used to construct OSW farms:

Bottom fixed-foundations for OSW farms can be broadly categorized into the following types: monopile, jacket, suction buckets, and gravity-based foundation (GBF) configurations:

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Monopile: designed for water depths approaching 40 meters (130 feet). The monopile is driven into the seabed and a transition piece is grouted or bolted onto the monopole, which connects to the turbine tower. Specialized installation vessels are often used to install monopiles.

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Jacket typically selected when conditions are not favorable for installation of monopolies. The most popular concept is the four-legged jacket, which consists of a jacket frame and transition piece. Pin piles are used to anchor the foundation to the seabed.
Suction Buckets primarily used as foundation for OSW jackets but can also be used as foundations for monopiles in shallow waters. The jacket structure transfers the loads from the turbine, wind, waves, and current into the buckets. During installation, the buckets penetrate the seabed by self-weight, and suction is thereafter applied for the hydrostatic pressure to drive the foundations to target depth.
GBFs are not driven into the seabed, rather the size and mass of the structure supports the turbines. GBFs consist of large concrete elements, which are lowered onto prepared gravel mats and filled with ballast. GBFs were used in some of the first OSW projects, whereas monopiles have been favored in many subsequent projects due to the development of specialized installation methods from vessels, allowing for a more efficient monopile installation and reduced impacts to the marine environment.

Hybrid and variations of these configurations are also in various phases of development.

2.1.3 Cables
OSW farms require both inter-array cables, which connect turbines within the farm, and export cables,
which connect the farm with the onshore grid. Dedicated cable-laying vessels are used to transport cables
from the manufacturer fabrication site to the installation site. Manufacturers are currently assessing an
increase in voltage for inter-array cables, which would allow for an increase in rated turbine capacity.

2.1.4 Offshore Electrical Service Platforms
High-voltage, alternating-current (HVAC) cables are used to transport power from OSW farms to electrical interconnections located typically more than 10 kilometers (km) or 6 miles (m) from

shore.
HVAC transformer platforms are used to increase voltage from the inter-array cables to the export cable.
High-voltage, direct-current (HVDC) cables may be used for export cables for longer distances, such as
longer than 70 km (45 m). Wind farms developed in New York State are currently anticipated to use
offshore substations, offshore HVDC convertor stations, offshore transformer modules (OTMs) and
potentially AC platforms. The AC platforms use small, decentralized modules placed in standard containers and eliminate the need for a dedicated platform.

2.2

Port Types

The Offshore Wind Assessment of Ports and Infrastructure (December 2017) identified key facility
parameters associated with major OSW components and vessel operations, which were further broken down into the following facility types:

2.2.1 Manufacturing and Fabrication

Manufacturing and fabrication facilities serve to produce a significant quantity of the same product or
component and a smaller quantity of similar but varying products. Due to the size and weight of most
major OSW components, facilities are often located on waterfronts in order to have sufficient space for
production and storing completed components. The requirements for major OSW component waterfront
manufacturing facilities vary by component type.

2.2.2 Staging and Installation Facilities

Staging and installation facilities serve to assemble material and equipment from various locations in
a central location prior to being loaded onto vessels for offshore installation. Staging facilities require
sufficient space to stockpile components prior to being loaded onto installation vessels. Area is also
needed for manipulating large components, such as assembling towers or rotors before loading, or

other activities that reduce the amount of work offshore.

2.2.3 Operations and Maintenance Facilities
Operations and Maintenance (O&M) facilities serve as a base to service a wind farm. O&M activities
include maintaining and repairing turbines, conducting routine maintenance, monitoring critical components, and completing condition evaluations. Stationing an O&M facility in close proximity to
an OSW farm is desirable, to reduce transit costs and allow for service during clear weather windows.

2.3

Port Facility Parameters

Table 1 provides the typical parameters for the general OSW port facility types expected to be used
for the construction of the 9,000 MW of OSW.

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Table 1. Recommended Facility Characteristics
Source: NYSERDA Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017); COWI 9GW Port Uses and Navigation
Assessment Report (2022).

Category

Port Use

Upland
Staging Area
(Acres)

Wharf Length
(Feet)

Navigable Channel
Depth
(Feet at MLLW)

Minimum 30
Preferred 70

Minimum 300
Preferred 650

Minimum 30, Preferred 40

Manufacturing
and
Fabrication

Foundations, Blades,
Nacelles, Cables

Staging

Wind Turbine Generator
(WTG)

25

330 to 650

Minimum 13, Preferred 38

O&M

O&M

Minimum 8
Preferred 15

Minimum 250
Preferred 300

Minimum 8, Preferred 26

For a majority of the OSW port facility types assessed in this study, the above OSW port facility characteristics have been assumed. However, for the port facilities under active environmental review and/or permitting processes, the specific characteristics and dimensions identified in published documents have been used.

3

Alternatives

The build alternatives have been developed for the purposes of this study to identify the range of potential impacts, constraints, construction mitigation measures, and potential corrective actions to accommodate a successful New York State OSW program. The description of the alternatives relied on published information from the OSW port sites in the Planned Alternative whenever available. For other OSW port sites, locations were generally identified for the purpose of this study, but those locations are not predetermined as a result of the study. The potential OSW ports included in the study are to be used as a relative example of what might be reasonably expected as port development happens across the Hudson River, NY Harbor, and Long Island regions of the State. Descriptions of the ports were based on publicly available information known at the time of this study.

3.1

Planned Alternative

The Planned Alternative includes the five awarded wind farm projects shown in Figure 1, which are located in the three key regions of the State:

- Capital Region: Port of Albany, Port of Coeymans
- New York Harbor: SBMT
- Long Island: Port Jefferson Harbor and Port of Montauk

The assumed general facility envelopes of the awarded wind farm projects are illustrated in Appendix A, Port Location Maps, and their general characteristics are presented in Appendix B: Port Facility Characteristics.

Disclaimer: Environmental review and regulatory permitting would be conducted for future offshore wind energy development and/or transmission projects at the time they are proposed, which would

assess, at a site-specific level, all relevant potential environmental impacts. This study's identification
and discussion of the potential cumulative impacts of the Proposed Action do not substitute for future
site-specific analyses of potential environmental impacts for particular projects but do provide supporting information.

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Figure 1. Awarded Wind Farm Projects as of 2021
Source: NYSERDA

As described in chapter 1, the awarded wind farm projects are in different stages of project development
and environmental review.

3.1.1 Port of Albany
The proposed OSW port facility site is located just south of the existing Port of Albany, located on
the east side of River Road/Route 144 along the Hudson River in the Town of Bethlehem, Albany
County, NY.. The 82-acre site is on Beacon Island, a previously disturbed, forested property bordered
by the Normans Kill to the north and west. The site includes approximately 5 acres along the west side
of South Port Road, a 77-acre parcel south of the Normans Kill, three small National Grid utility and
access easements, and a 14.7-acre parcel owned by Albany Port Development Commission (APDC)
previously used as a rail yard and metal recycling facility.

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Ocean-bound vessels would be air-draft restricted by the Mid-Hudson Bridge (134 feet) and the
Verrazano-Narrows Bridge, which has a clearance of 65.5 meters (215 feet) at center span.
The water draft identified in the adjacent Federal Channel of the Hudson River has a depth
of 9.8m (32 feet) mean lower low water (MLLW).

3.1.1.1 Foundation Component Fabrication and Staging
The proposed OSW port facility at this site could be used to support fabrication and assembly
of OSW tower components including steel foundation structures (jackets) and secondary-steel
foundation components, wind blades, and miscellaneous steel or concrete platforms, as well as
staging and load-out operations. 20 The proposed designed is now approximately 589,000 +/-

square
foot of OSW tower manufacturing facility spread out over five separate buildings: (1) Building A Plate Preparation & Welding (289,931 SF), (2) Building B Welding Finishing (99,936 SF), (3) Building C Blast Metallization Plant (121,593 SF), (4) Building D Internal Assembly finishing (57,898 SF), (5) Building E Material receiving (19,600 SF). Tower production will occur within four buildings (Buildings A thru D) located on the Port Expansion property in the Town of Bethlehem.
The fifth building (Building E) is located at 700 Smith Boulevard within the existing Port District in the City of Albany.[21]
Roadway and rail access to the site would require construction of new bridge(s) over the Normans
Kill, connecting to Port Road South within a small area (less than an acre) to be acquired from National
Grid. The proposed bridge over the Normans Kill would provide secure access for delivery vehicles to
and from the main production facility, where Buildings A thru D are proposed, along with Building E
(material receiving). Employee parking would be situated on the adjoining land owned by National
Grid with access from existing River Road/Rt. 144. The main truck access route to I-787 and I-90
would go through the Port of Albany property. An additional roadway bridge for employees would
be constructed from the south to River Road/Rt. 144.[22]
A new freight rail spur would be realigned to service the west side of the building for delivery or off-loading of components. New roadway access would permit truck delivery of components, as well
as staff access. The design features a large storage yard and laydown area for completed components
to enable efficient loading onto ships.

To accommodate the manufacturing and staging area, the site would need to be cleared of vegetation and
previous unusable infrastructure (old piles, etc.) and regraded with fill to establish level ground. Ground
compaction, paving of surfaces, or other ground improvements would be needed to support the weight
of the new facilities and OSW components staged on site.

3.1.1.2 Port Area
Once fabricated, the fabricated steel structures loadout and shipping would require a new wharf

(dock)
area with a new bulkhead area. Dredging would be required to create a proper docking area that connects
to the navigation channel of the Hudson River. The proposed wharf and associated dredging within the
Hudson River would be approximately 500 linear feet (LF), 4.4 acres and 105,000 cubic yards (CY).
The proposed wharf consists of a deep foundation-supported, concrete-framed, open-type wharf structure,
with a heavy stone slope revetment, high-modulus steel sheet pile cutoff wall, and drilled shaft-supported
open wharf and relieving platform. The total area of the wharf is 45,500 square feet (SF).

3.1.2 Port of Coeymans
The proposed OSW port facility at the Port of Coeymans is located in the Town of Coeymans, Albany County, NY on the Hudson River approximately 10 miles south of Albany. The existing port, which is owned and operated by Carver Companies, provides approximately 3,500 feet of direct
riverfront access, and offers the following services: stevedoring, tug and barge, break bulk, heavy
lifts, warehousing, equipment rentals, staging, dredging, recycling, custom crushing, property leasing, indoor/outdoor storage, and riprap waterway repair.
A significant portion of the Port of Coeymans site is developed, consisting of multiple laydown areas,
a berth and barge slip. The northeastern corner of the site on the waterfront area is largely undeveloped
due to existing topography. The area of the site proposed for OSW use is a large parcel of land located
adjacent to the waterfront. The proposed OSW port facility site is zoned for industrial use and lies within
a primarily undeveloped area. The site is air draft restricted by the Mid-Hudson Bridge (134 feet) and
the Verrazano-Narrows Bridge, which has a clearance of 65.5 meters (215 feet) at center span. The site is
water draft restricted by the Hudson River Federal Channel, which has a depth of 9.8m (32 feet) MLLW.

3.1.2.1 Foundation Component Fabrication and Staging
The primary OSW facility purpose is to assemble secondary-steel foundation components, as well as
staging and load-out operations. Fabrication of OSW tower components may include internal

and external
platforms, railings, steel ladders, cages, and other key parts that would attach to the monopile foundations,
requiring assembly yards, docking platform(s) and dock transfer areas. Up to two concrete batch plants
would be installed, using delivered concrete materials and water from the Town of Ravena. Batch plant
cement materials would be acquired from a neighboring facility (Lafarge) and would avoid trucking
through the town. Other materials, such as metal rebar, sand, and aggregate would be delivered by
either truck or barge. 23
Sunrise Wind's joint development partners would construct advanced foundation components 24 for
wind turbines at the Port of Coeymans. The construction and steel manufacturing work would create up to
230 jobs. Additionally, it is anticipated 115 local union workers would be based at the Port of Coeymans
to construct the fundamental elements of the OSW turbine foundations. These components, ranging
in size from 12 to 120 tons each and as tall as 40 feet, include the foundations' internal and external
platforms, railings, steel ladders, cages, and other key parts that would attach to monopile foundations. 25
The fabrication area, laydown areas, and storage areas would be graded to be less than one% slope.
The northern laydown site would be larger than the southern at approximately 15 acres, making it the
major material laydown and storage area. These laydown areas would be used for temporary material
storage. Such materials may include, but are not limited to steel sections, steel reinforcing, etc. 26
At the structure's fabrication and transport areas, ground compaction of soil/gravel materials, paving
of surfaces, or other ground improvements would be needed to support the large amount of weight
using the site.

3.1.2.2 Demolition
Demolition of six buildings (approximately 45,500 SF) would be required to create laydown and
storage area for the foundation fabrication areas. The existing assembly sleds would also likely need
to be removed to construct the new dock and minimize dredging requirements. 27

3.1.2.3 Port Area
Once fabricated, OSW tower components would be lifted onto self-propelled modular transporters
(SPMT, likely Mammoet SPMT) potentially to be transported from fabrication to storage and/or shipping locations. OSW component loadout and shipping requires a high-level concrete dock supported by steel pilings to bedrock. A new, heavy duty 400-foot-long dock would be constructed
along the existing timber bulkhead at the riverbank to service the transport barges or structure float out.
Approximately 156,000 cubic yards (5.3 acres) of material would be required to be dredged, extending
from the area of the dock to the navigation channel of the Hudson River. A large portion of this area is
within a previously dredged area for the Tappan Zee Bridge Project. Bathometric surveys indicate the
current draft depth of the proposed docking area is -12 feet MLLW, requiring dredging to approximately
-32 feet MLLW to accommodate float out of the OSW components onto barges and safely maneuver. 28
A dock with steel reinforced concrete decking would be supported by steel pilings to bedrock. A steel
sheeting bulkhead would be constructed along the face of the dock and extend well below the mudline.
Double pile clusters of fendering dolphins would be installed on both the ends of the new dock to
accommodate vessel docking and tie off. The required barges for this project may extend up to 400 feet long by 130 feet wide. 29

3.1.3 South Brooklyn Marine Terminal
The SBMT is located between 29th and 39th Streets in Brooklyn, Kings County, NY. The 88-acre
site, located on the east bank of the New York Harbor Upper Bay, is currently an underutilized operational marine terminal. The site includes three piers (the 29th Street, 35th Street, and 39th Street Piers), associated upland storage areas, multiple parking lots, utility buildings, warehouses, and
operational rail. The waterfront portion of the site consists of a steel sheet pile bulkhead and revetment.
The proposed OSW port facility site lies within a heavily developed urban area with neighboring industrial port areas to the north and south and residential and commercial areas to the east. The

site is owned by the City of New York, under the jurisdiction of the New York City Department of Small Business and leased to the New York City of Economic Development Corporation (NYCEDC).
Historically, the site has been a developed multipurpose marine terminal, and since 2011 NYCEDC
has made efforts to rehabilitate the terminal by investing in infrastructure improvements, site preparation, dredging, and freight rail infrastructure. 30

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The site is air draft restricted by the Verrazano-Narrows Bridge, which has a clearance of 65.5 meters
(215 feet) at center span. The site is water draft restricted by the Bay Ridge Channel, which has a
depth of 12.2 meters (40 feet) MLLW.

3.1.3.1 Staging, Operations and Maintenance

The proposed port facility is intended for staging OSW components prior to delivery to OSW farm site. It
is assumed that there is reasonable staging and storage area for staging components and finished products.
Project components would be received, stored, assembled as necessary, and exported via marine vessels,
onshore cranes, and other equipment. This facility would also serve 24-hour O&M support for the OSW
farms once operational. It is assumed that there is reasonable staging and storage area for OSW
components and staff operations. 31
The main truck access route to I-278 would pass through the SBMT and the adjacent industrial areas
along 2nd Avenue. Roadway access would permit truck delivery of components, as well as staff access.
On-site rail access is available for delivery or offloading of components. The site would require a large
storage yard and laydown area for completed components, to enable efficient loading onto ships.
To accommodate a fabrication and staging area, the site would be cleared of existing structures and
regraded with fill to establish level ground. Ground compaction, paving of surfaces, or other ground
improvements may be needed to support the weight of the new facilities and OSW components staged on site.

3.1.3.2 Port Area

Once fabricated, the fabricated steel structures loadout and shipping would require two heavy load wharves (one along the northwest end of the 39th Street Pier; the second along the southwest end of the 39th Street Pier) and a new bulkhead located immediately offshore of the existing steel sheet pile bulkhead. The existing stone revetment along the shoreline on the northeast and southwest sides of the 35th Street Pier would be rehabilitated to increase both the load capacity and available laydown area. Dredging would be required to create a proper docking area that connects to the Bay Ridge Federal Navigation Channel of the New York Harbor Upper Bay. Bathometric surveys indicate the existing minimum depth is -32 feet MLLW near the 39th Street Pier, requiring dredging to approximately -38 feet MLLW to accommodate float out of the components onto barges.[32]

3.1.3.3 Operations and Maintenance Facility

The O&M base is assumed to occupy a portion of the port terminal. O&M activities at SBMT are assumed to include routine operational support performed by one service operations vessel (SOV) along with four smaller crew transfer vessels (CTV) (shared by both EW 1 and EW 2) transiting to and from the facility to service the wind turbines.[33] Maintenance activities are assumed to include a variety of survey and repair vessels that would operate on an infrequent, intermittent basis.

3.1.4 Port Jefferson

The proposed OSW port facility site is located adjacent to Beach Street in the Village of Port Jefferson, Town of Brookhaven, Suffolk County, NY along the north shore of Long Island. The approximately 25 acres of site under consideration consists of multiple, small, industrial waterfront facilities with varying existing uses and capacities. There are no air draft restrictions to this site.

The proposed OSW port facility site lies within a moderately developed area with light industry, including marine services, utilities, and waste handling and management facilities. Neighboring areas include commercial facilities, marinas, private residences, and natural areas. The site is bordered by the Port Jefferson Harbor to the east, commercial and preserved recreation, open space areas to the south, and residential areas to the north and west. Four waterfront properties within the site were identified for OSW activities: Port Jefferson Power Station, Northville Industries, Miller Marine Service, and the Tilcon Port Jefferson Terminal.

The site does not have any limiting air draft restrictions. The site is water draft restricted by the Port Jefferson Harbor Channel, which has a depth of 8m (26 feet) MLLW. The Bridgeport & Port Jefferson Ferry runs daily ferry service in the channel.

3.1.4.1 Operations and Maintenance Facility for Service Operation Vessels

The proposed OSW port facility would be a dedicated 24-hour O&M support for the OSW farms once operational. It is assumed that there would be reasonable staging and storage area for OSW components and staff operations. An operations building would be constructed to accommodate O&M and staging as needed.

Roadway access to the site would require construction of new driveway access. The main truck access route to I-495, approximately 9 miles away, would pass through several communities on the north shore of Long Island. The main truck access route to New York State Route 25A would travel through the proposed site along Beach Street on the west side of the Port Jefferson Inner Harbor. New roadway access would permit truck delivery of components, as well as staff access. Railway access, located approximately 1.3 miles away, would allow for delivery or offloading of components. The site would require a large storage yard and laydown area for completed components to enable efficient loading onto ships.

To accommodate the O&M uses, the site may need to be cleared of unusable infrastructure. Ground compaction, paving of surfaces, or other ground improvements may be needed to support the weight of the new facilities and OSW components staged on site.

3.1.4.2 Port Area

To accommodate the proposed O&M, it is assumed that the existing docks would be used for crew operations and the loading of replacement components on to vessels as necessary. Upgrades to the proposed Port Jefferson O&M harbor facility would be required. Orsted and Eversource are currently evaluating the Port Jefferson site to berth an SOV, which would service multiple OSW projects. Several scenarios are under evaluation, including using an existing pier at the Port Jefferson Power Station, as well as constructing a new pier adjacent to 146 Beach Street in Port Jefferson, NY. [34] Dredging would likely be required under either scenario to create a proper docking area that connects to the Port Jefferson Harbor Channel, which is maintained to a project depth of 26 feet MLLW. Bathymetric mapping indicates the current draft depth of the proposed docking area is approximately -2 feet to -20 feet MLLW, requiring dredging to approximately -26 feet MLLW to accommodate float-out of the components onto barges.

As the SOV would use the port infrequently, the facility would be able to be utilized by other users.

No new upland structures are planned at the site. Only container storage may be established on an interim basis when the SOV comes to shore. Helicopters may be used for crew changes during installation of the wind turbine generators (WTGs). [35]

3.1.5 Port of Montauk

The proposed OSW port facility site is located along East Lake Drive in the hamlet of Montauk, Town of East Hampton, Suffolk County, New York at the eastern extent of the South Fork of Long Island. The approximately 10-acre site is located on the eastern side of Montauk Harbor and the inlet to Block Island Sound. The site consists of an existing dock facility with a large parking lot and an adjacent available lot.

The proposed OSW port facility site lies within primarily commercial and vacant areas, with neighboring commercial, residential, vacant, and natural areas (e.g., beach, parklands) to the north, east, and southeast.

The site is bordered by the Port Montauk Harbor, an existing commercial and recreational harbor, to the south and west, and East Lake Drive to the north and east. Further east of East Lake Drive, the area is

undeveloped preserved recreation and open-space land of the Montauk County Park.
The site does not have any limiting air draft restrictions; however, Montauk Airport may affect air draft if tall OSW components are moved into the area. The site is water draft restricted by the Montauk Harbor Channel, which currently has a depth of 12 feet at MLLW; however, the United States Army Corps of Engineers (USACE), in the Lake Montauk Harbor Feasibility Study (2019), recommends deepening the navigation channel to -17 feet MLLW. 36

3.1.5.1 Operations and Maintenance Facility

The proposed OSW port facility would be dedicated 24-hour O&M support for the South Fork Wind OSW farm once operational. It is assumed that there would be a reasonable staging and storage area for OSW components and staff operations. South Fork Wind LLC (SFW) is proposing to build an O&M Facility including a 1,160 square feet office building; forklift garage; two storage containers; seven parking spaces; a berthing facility with a stationary crane; a dedicated small on-site package septic system; and mooring area for CTVs. 37
Roadway access to the site would require construction of new driveway access. The main truck access route to State Route 27 would travel along the eastern shore of Lake Montauk. New roadway access would permit truck delivery of components as well as staff access. The site would require a large storage yard and laydown area for completed components to enable efficient loading onto ships.

To accommodate the manufacturing and staging area, the site would need to be cleared of vegetation, previous unusable infrastructure, and regraded with fill to establish level ground. Ground compaction, paving of surfaces, or other ground improvements may be needed to support the weight of the new facilities and OSW components staged on site.

3.1.5.2 Port Area

To accommodate the proposed O&M, new docks would be installed for crew operations and the loading of replacement components onto vessels as necessary. Construction of a new O&M

Facility would include: (1) removal of existing piles and docks and (2) dredging approximately 2,500 cubic yards in the existing marina to accommodate deeper draft CTVs. An approximately 0.41-acre area of Lake Montauk will be dredged to a depth of -12.4 feet mean low water with an additional one foot of allowed over dredge, (3) maintenance repairs to the existing bulkhead including new waler and tie rods, (4) construction of a new floating pontoon dock (100 feet long by16 feet wide with 5 feet of freeboard), (5) installation of five 2-feet diameter steel pipe piles and one 2-foot diameter steel monopile to secure the pontoon dock and provide mooring for crew transfer vessels (CTV), (6) installation of an aluminum gangway (28 feet long by 4 feet wide), (7) annual maintenance dredging of up to 1,500 cubic yards per year, within the permit term. [38] It should be noted that the USACE has a navigation study of the Navigation Channel at Montauk Harbor that is recommending a deepening to 17 feet. [39]

3.2 Full-Build Alternative

Based on COWI's Regional Ports Supply Demand Model, [40] it was identified that a collective OSW infrastructure output of 12 ports would be an optimal scenario to achieve and potentially exceed the State's 9,000 MW OSW energy target by 2035. As a result, the Full-Build Alternative is comprised of 12 port sites [41] identified in the Regional Ports Supply Demand Model, selected from NYSERDA's pre-qualified OSW port list [42] that would collectively meet the physical site parameters needed to provide the additional OSW port fabrication, manufacturing, staging, and O&M functions. The Full-Build Alternative includes the five port development sites of the Planned Alternative and seven additional sites. The intent of this alternative is to assume a reasonable worst-case scenario including a Full-Build-out of ports in New York State to capture the potential cumulative environmental impacts that may result. The seven additional ports contemplated with the Full-Build Alternative are,

from east to
west: Arthur Kill Terminal, Port Ivory, Homeport Pier, Brooklyn Navy Yard, Brooklyn Port Authority

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Marine Terminal, NYS Wind Port, and Hempstead Public Works Area (see Figure 2 and Table 2). The
assumed general port facility envelopes are illustrated in Appendix A: Port Location Maps, and general
information is presented in Appendix B: Port Facility Characteristics. A description of the seven additional sites is provided below.
Figure 2. Port Locations Overview

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Table 2. Full-Build Alternative Port Facilities

Full-Build Alternatives	Location	Assumed Port Use
Planned Alternative	Port of Albany	Fabrication (Towers/Foundations Components)
Planned Alternative	Port of Coeymans	Fabrication (Towers/Foundations Components)
Planned Alternative	SBMT	Staging (WTG and Foundation) and O&M
Planned Alternative		

Port Jefferson

O&M (SOVs)

Planned Alternative

Port of Montauk

O&M (CTVs)

Additional Port

Arthur Kill Terminal

Staging (WTG)

Additional Port

Port Ivory

Fabrication (Offshore Substation components)

Additional Port

Homeport Pier

O&M

Additional Port

Brooklyn Navy Yard

O&M

Additional Port

PAMT

O&M

Additional Port

Hempstead Public Works

O&M

Additional Port

NYS Wind Port

Component Manufacturing

3.2.1 Arthur Kill Terminal
The conceptual OSW port facility site at Arthur Kill Terminal is an undeveloped approximately 32-acre parcel just south of the Outerbridge Crossing on the western shoreline of Staten Island, NY.
The site consists of approximately 23 acres of upland area and nine acres of submerged land between
the shoreline and bulkhead line. The lot is mostly vacant, wooded greenfield site with the exception of
several unimproved access roads throughout the site and a natural shoreline. There are plans to develop
a state-of-the-art port facility for offshore wind staging and assembly. 43 There are also currently no
shoreline improvements at this location; therefore, extensive dredging, filling and improvements would be required.
The site is located between the neighborhoods of Charleston and Tottenville near the southwestern
most area of Staten Island. It is located in an area zoned for industrial use and is surrounded by light
industrial and commercial uses as well as transportation infrastructure. 44
Adjacent to the site is the Arthur Kill Federal Navigation Channel, which has a water draft depth of 35 MLLW. It does not have any air draft restrictions.

3.2.1.1 Staging (Wind Turbine Generators)
The conceptual OSW port facility at this site would be for staging of Wind Turbine Generators (WTGs).
Atlantic Offshore Terminals plans to develop a quayside designed for simultaneous vessel berthing,
unrestricted access for cargo and installation vessels, complete onshore assembly, a warehouse for
equipment and spare part storage, tenant office space, a visitor center, parking areas, and on-site utilities.
The site would need to be cleared of vegetation and previous unusable infrastructure (old piles,

etc.) and
regraded with fill to establish level ground. A large portion of the site would require extensive fill of tidal
wetlands and open waters (approximately 9 acres), converting the shoreline to upland to accommodate the
conceptual port. Ground compaction, paving of surfaces, or other ground improvements would be needed
to support the weight of the new facilities and OSW components staged on site.
Construction of a main entrance to the site near the intersection of Arthur Kill Road and South Bridge
Street would be required. The main truck access routes to the site are from New York State Route 440
(approximately 0.25 miles) and the Garden State Parkway (approximately 4 miles). The site is located
approximately 0.35 miles from the New York Metropolitan Transit Authority (MTA), Staten Island Railway Arthur Kill Station, located at Arthur Kill Road and Richmond Valley Road, which could provide public transportation for workers.

3.2.1.2 Port Area

Construction of wharf structures intended for the loading of components both on and off transport
vessels would be required. An approximately 1,300-foot quayside would be created for vessel berthing.
Dredging would be required to create a proper docking area that connects to the Arthur Kill Federal
Navigation Channel. Bathometric surveys indicate the current draft depth of the conceptual docking
area is approximately -20 feet to -2 feet mean lower low water (MLLW), requiring dredging to approximately -33 feet MLLW to accommodate float out of the WTGs onto barges.

3.2.2 Port Ivory

The conceptual OSW port facility at Port Ivory (former Ivory Soap factory site) is located on the northern
shore of Staten Island, NY, along the Arthur Kill Federal Channel and northwest of the Goethals Bridge.
The 64-acre site consists of Parcels B and C (owned by the Port Authority of New York and New Jersey),
comprising 26-acres of developed (pavement and warehouses) acres inland and 38-acres of undeveloped

vegetated area along the waterfront, respectively (see Appendix A, Location Maps). Parcel B

has been
used as a construction staging area, whereas Parcel C is not currently in use and is returning to a natural
state with trees and other vegetation. Parcel C of Port Ivory is the waterfront area envisioned for offshore wind. 45
The site is located in an area zoned for a combination of transportation, utility, industry, and manufacturing and is surrounded by industrial and commercial uses as well as transportation infrastructure. The Howland Hook Marine Terminal, west of the Port Ivory site, is currently owned by New York City, leased by the Port Authority of New York and New Jersey (PANYNJ), and leased to/operated by the Global Container Terminals. Howland Hook Marine Terminal and Express Rail, located west of the Port Ivory site, is an operational port that includes the New York
Container Terminal freight rail line. 46
Eastbound vessels from Port Ivory would be air draft restricted by the Verrazano-Narrows Bridge
and Bayonne Bridge, both of which have a clearance of 65.5 meters (215 feet) at the center span.
Westbound vessels from Port Ivory would be air draft restricted at a vertical clearance of 135 feet by
the Arthur Kill Vertical Lift Bridge, a freight rail bridge adjacent to Goethals Bridge. Port Ivory is water depth restricted by the Arthur Kill Federal Channel, which has a minimum authorized depth
of approximately -16.15 meters (-53 feet) NAVD88, or -15.3 meters (-50 feet) MLLW, in the vicinity
of Port Ivory. The air and water drafts may affect vessels accessing the facility and the ability to transport some components vertically. There is the potential need for some components to be transported horizontally due to the air draft restriction.

3.2.2.1 Fabrication (Offshore Substation [OSS] Components)
The conceptual use of the OSW port facility at this site would be for fabrication of Offshore Substation (OSS) components. It is assumed that there would be reasonable staging and storage
area for manufacturing and staging components and finished product. Storage building(s) may be
constructed to accommodate OSS manufacturing, including the assembly of electrical components,
and finishing, such as spray on coatings, which must be stored in a protected environment.

Roadway access to Parcel C would require construction of new driveway access. The main truck
access route to I-287 is adjacent to the site, and there is on-site rail access for delivery or

offloading
of components. New roadway access would permit truck delivery of components, as well as staff
access. The site would require a large storage yard and laydown area for completed components,
to enable efficient loading onto ships.
To accommodate the manufacturing and staging area, the site would need to be cleared of vegetation
and previous unusable infrastructure (old piles, etc.), and then regraded with fill to establish level ground.
A large portion of the site would require fill of tidal wetlands and open waters, converting the shoreline
to an upland area to accommodate the conceptual port design. Ground compaction, paving of surfaces,
or other ground improvements would be needed to support the weight of the new facilities and OSW
components staged on site.

3.2.2.2 Port Area
Once fabricated, the fabricated steel structures loadout and shipping would require a new wharf (dock)
area with a new bulkhead area. Dredging would be required to create a proper docking area that connects
to the navigation channel of the Arthur Kill. Bathymetric mapping indicate the current draft depth of the
conceptual docking area is -37 to -45 feet MLLW, requiring dredging to approximately -50 feet MLLW
to accommodate float out of the components onto barges.

3.2.3 Homeport Pier
The conceptual OSW port facility is located at Homeport Pier; a 1,410 foot-pier and 35-acre
former naval base located in Staten Island’s Stapleton neighborhood (see appendix A). Ownership
was transferred from the Navy to New York City in 1994. The pier is largely unused today; the Navy
docks boats there for Fleet Week each year, Millers Launch and the New York City Fire Department
(FDNY) keep a fireboat and barracks at the pier.6 This facility has been used to support marine responses
during disaster events like Superstorm Sandy. The site is located in an area zoned for transportation
and utility uses, and is surrounded by residential and commercial uses, as well as marinas. 47

Homeport Pier is air draft restricted by the Verrazano-Narrows Bridge, which has a clearance of 65.5 meters (215 feet) at center span. The site is water draft restricted by the Ambrose Channel in the Upper Bay, with a minimum water depth below the bridge ranging from approximately 22.9 meters (75 feet) at the west edge of the channel to 29 meters (95 feet) at the east edge of the channel, with a maximum depth of approximately 29.9 meters (98 feet) just east of the centerline. 48

3.2.3.1 Operation and Maintenance Facility

The conceptual OSW port development at this site would be a dedicated 24-hour O&M facility for the OSW farms once operational. It is assumed that there would be reasonable staging and storage area for OSW components and staff operations. An operations building would be constructed to accommodate O&M and staging as needed.

Roadway access to the site is established, and there is public transit service nearby, with the MTA Staten Island Railway Tompkinsville Station, located at the northern side of the site near Minthrone Street and Victory Boulevard, which would provide staff easy access to the site by public transportation. The main truck access route to I-287 is located approximately 2 miles from the site.

To accommodate the O&M area, the site may need to be cleared of any vegetation and previous unusable infrastructure (old piles, etc.). Ground compaction, paving of surfaces, or other ground improvements may be needed to support the weight of the new facilities and OSW components staged on site.

3.2.3.2 Port Area

The conceptual OSW port facility is assumed to be an O&M facility, with vessel operations using the existing pier on the south end of the site. Maintenance and improvements to the pier may be necessary to support a long-term O&M facility. Dredging may be required to create a proper docking area that connects to the Ambrose Channel of the NY Harbor. Bathymetric mapping indicates the current draft depth of the conceptual docking area is ranges from approximately -10 to -40 feet MLLW, which may require dredging to accommodate float out of the O&M-related replacement components onto barges, as necessary.

3.2.4 Brooklyn Navy Yard

The conceptual OSW port facility is located at Brooklyn Navy Yard, a manufacturing hub on the East River in Wallabout Bay, Brooklyn. The yard spans 300 acres, houses 500+ businesses and employs more than 11,000 people. The conceptual OSW port facility would be located within a 35-acre location within Brooklyn Navy Yard. [49]

Brooklyn Navy Yard is zoned for industrial uses and is surrounded by commercial, industrial, residential, and open space/recreation uses. The site is water draft restricted by the East River, which has a navigable depth of 10.7 meters (35 feet) MLLW, and air draft restricted by the Brooklyn Bridge (entrance to Upper Bay—south end), which has a vertical clearance of 127 feet. [50]

3.2.4.1 Operation and Maintenance Facility

The conceptual OSW port facility at this site would be a dedicated 24-hour O&M support for the OSW farms once operational. It is assumed that there would be reasonable staging and storage area for OSW components and staff operations. An operations building would be constructed to accommodate O&M and staging as needed.

The main truck access route to I-287 is adjacent to the site. Freight rail access is located at an adjacent facility. The MTA York Street Station (subway) is located at Jay Street and York Street, approximately one mile from the site.

To accommodate the O&M area, the site would need to be cleared of any vegetation and existing infrastructure. Ground compaction, paving of surfaces, or other ground improvements may be needed to support the weight of the new facilities and OSW components staged on site.

3.2.4.2 Port Area

This conceptual OSW port development would include an O&M facility and vessel operations using the existing pier on the south end of the site. Maintenance and improvements to the pier may be necessary to support a long-term O&M facility. Dredging may be required to create a proper docking area

that
connects to the East River. Bathymetric mapping indicates the current draft depth of the proposed
docking area is approximately -24 to -40 feet MLLW, which may require dredging along pier and -50 feet MLLW on face of pier to accommodate float out of the O&M-related replacement components onto barges as necessary.

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3.2.5 Brooklyn Port Authority Marine Terminal

The conceptual OSW port facility is located at the Brooklyn Port Authority Marine Terminal (PAMT),
which includes Brooklyn Cruise Terminal and associated parking, warehouses, and marine terminals.
The site is located along Buttermilk Channel in Brooklyn. Piers 6 through 9 and Pier 12 handle bulk
and neo-bulk cargoes. 51 The PAMT is zoned for industrial uses and is surrounded by industrial, commercial, residential, and open space/recreation land uses.
The site is water draft restricted by Buttermilk Channel, which has a navigable depth of approximately
10.7 meters—12.1 meters (35–40 feet) MLLW at mid-channel with lesser depths at the side of the
channel, and air draft restricted by the Verrazano-Narrows Bridge, which has a clearance of 65.5 meters (215 feet) at center span. 52

3.2.5.1 Operation and Maintenance Facility

The conceptual OSW port development at this site would be a dedicated 24-hour O&M facility for
the OSW farms once operational. An operations building would be constructed to accommodate O&M and staging as needed.
Roadway access to this site is established, and the main truck access route to I-287 is adjacent to
the site. Rail access is not available in the vicinity of the site.
To accommodate the O&M area, the site may need to be cleared of unusable infrastructure and regraded with fill. Ground compaction, paving of surfaces, or other ground improvements may be needed to support the weight of the new facilities and OSW components staged on site.

3.2.5.2 Port Area

The conceptual OSW port development would be an O&M facility, with vessel operations using the
existing pier on the south end of the site. Maintenance and improvements to the pier may be necessary
to support a long-term O&M facility. Dredging may be required to create a proper docking area

that
connects to the Buttermilk Channel. Bathymetric mapping indicates the current draft depth of the
conceptual docking area is approximately -20 to -40 feet MLLW, which may require dredging to accommodate float out of the O&M-related replacement components onto barges as necessary.

3.2.6 Hempstead Public Works Area

The conceptual OSW port facility is located at the Hempstead Public Works Area in Point Lookout,
NY along the waterfront in East Bay. The existing public works facility occupies approximately three acres and is located adjacent to commercial and light industrial facilities with waterfront uses. 53
The site is water draft restricted by Reynold's Channel, which has a navigable depth of
4 meters–6.1 meters (13–20 feet) MLLW in the vicinity of the site. The site is air draft restricted by a fixed bridge connecting Long Beach Barrier Island to Alder Island, which has a horizontal clearance of 30 feet and a vertical clearance of 20 feet.54

3.2.6.1 Operations & Maintenance Facility

The conceptual OSW port development at this site would be a dedicated 24-hour O&M facility for
the OSW farms once operational. It is assumed that there would be reasonable area for staff and CTV
operations and limited staging and storage area for OSW components. An operations building may
be necessary to accommodate O&M and staging.
Roadway access is established, and the main truck access route to Meadowbrook State Parkway is located
approximately 3 miles from the site. The site is located approximately 4 miles west of the Long Island
Rail Road (LIRR), Long Beach Station located at West Park Avenue and Rev. JJ Evans Boulevard.
To accommodate the O&M area, the site would be cleared of vegetation and unusable infrastructure
and regraded with fill. Ground compaction, paving of surfaces, or other ground improvements would
be needed to support the weight of the new facilities and OSW components staged on site.

3.2.6.2 Port Area

The conceptual OSW port facility is assumed to be an O&M facility, with vessel operations using the existing pier on the south end of the site. Maintenance and improvements to the pier may be necessary to support a long-term O&M facility. Dredging may be required to create a proper

docking
area that connects to the Reynold's Channel of Jones Inlet. Bathymetric mapping indicates the current
draft depth of the conceptual docking area is approximately one to six feet MLLW; dredging for CTVs and other O&M activities may be required.

3.2.7 New York State Wind Port

The conceptual OSW port facility is located at NYS Wind Port on the east side of the Hudson River, immediately south of Port of Albany and north of Port of Coeymans. The approximately 91-acre undeveloped site is part of a larger 112-acre facility in East Greenbush, NY. 55 NYS Wind Port
is zoned for coastal industrial uses and is surrounded by undeveloped, industrial, coastal, and residential
land uses. 56 There are currently no shoreline improvements at this location, therefore, extensive
dredging, filling and improvements would be required.
The site is water draft restricted by the Hudson River, which has a minimum restricted depth of -32 feet MLLW in the vicinity of NYS Wind Port. The site is air draft restricted by the Verrazano-Narrows Bridge, which has a clearance of 65.5m (215 feet) at center span, and the Mid-Hudson Bridge with a clearance of 134 feet. 57
Roadway access is established, and the main truck access route to U.S. Route 20 is located approximately 2 miles from the site. From U.S. Route 20, the main truck access route to I-90 would
go through the Town of East Greenbush. The site is located adjacent to the Amtrak Empire Service Train
line and the Amtrak Albany-Rensselaer Train Station is located approximately 3 miles north of the site. 58

3.2.7.1 Component Manufacturing

The conceptual OSW port development at this site would be for light fabrication and staging for OSW
components such as steel foundation structures (jackets), wind blades and miscellaneous steel or concrete
platforms. It is assumed that there would be reasonable staging and storage area for both components and
finished products. A storage building would be constructed to accommodate manufacturing and finishing
such as spray on coatings, which must be stored in a protected environment.
To accommodate the manufacturing and staging area, the site would need to be cleared of vegetation
and unusable infrastructure and regraded with fill to establish level ground. A large portion of the

site would require fill of tidal wetlands and open waters, converting the shoreline to upland to accommodate the conceptual port. Ground compaction, paving of surfaces, or other ground improvements would be needed to support the weight of the new facilities and OSW components staged on site.

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3.2.7.2 Port Area

Once manufactured, the components loadout and shipping would require a new wharf (dock) area with a new bulkhead area. Dredging would be required to create a proper docking area that connects to the Hudson River Federal Channel. National Oceanic and Atmospheric Administration (NOAA) Navigation Chart indicates the approximate depth of the conceptual docking area is very shallow and would require dredging to float out of the components onto barges. The dredging may impact submerged aquatic vegetation and sturgeon foraging habitat.

3.3

Partial-Build Alternative

A Partial-Build Alternative was developed assuming a scenario between the Planned Alternative and the Full-Build Alternative. The Partial-Build Alternative includes the currently programmed OSW ports of the Planned Alternative plus three additional ports facilities of the Full-Build Alternative, totaling eight port sites. The three additional port sites include: Arthur Kill Terminal, PAMT, and Homeport Pier site.

Under the Partial-Build Alternative, current use of the four other conceptual sites identified for OSW port development in the Full-Build Alternative is assumed to continue in the future.

The Partial-Build Alternative represents a scenario of any number of ports between the five ports listed in the Planned Alternative and the 12 ports of the Full-Build Alternative. Eight ports were selected as a representative number based on what type and number of ports is realistically to occur if the Full-Build

Alternative is not achieved and also as an example to show the relative cumulative impacts for a Partial-Build scenario.

4 Environmental Setting

This chapter describes the range existing conditions at the 12 OSW port locations identified for the Full-Build Alternative. Key environmental resources were identified for assessment based on environmental review and permitting requirements, as typically performed for the environmental screenings of proposed alternatives. The environmental resources considered include land use and zoning, terrestrial biological resources, aquatic biological resources, cultural resources, community character, hazardous materials, water resources, floodplains, air quality, noise, and Environmental Justice (EJ) communities. The environmental settings consider a quarter-mile study area around each OSW port site, potential truck routes and provide general baseline conditions to consider for assessing the potential impacts of each individual development, comparing the study alternatives, and assessing the cumulative effects of the program, as described in chapters 5 and 6. The following description of existing environmental resources is not intended to be comprehensive, but to provide a representative range of key environmental factors and resources to consider at the port locations of the Full-Build Alternative.

4.1 Land Use and Zoning

Existing site use of the OSW port sites vary broadly, ranging from active ports with industrial, manufacturing and commerce uses, vacant land in industrial areas, transportation, and electrical power (utility) generation uses, marinas and public fishing piers, and municipal public works facilities (see Land Use and Zoning Figures in appendix C). In the quarter-mile study area, land uses include industrial and manufacturing uses, marinas, vacant lands, transportation uses, residential, mixed

residential/commercial,
commercial and office buildings, open space and public facilities and institutions.
The three proposed OSW ports in the Albany Capital Region—the Port of Albany Expansion, Port of Coeymans, and NYS Wind Port—are located within vacant land zoned for coastal industrial uses and adjacent to the extensive Port of Albany–Rensselaer, and are comprised of private and public port facilities, and industrial, manufacturing and warehouse uses. The Port of Coeymans is an existing port zoned for coastal industrial uses in a rural setting.
In the New York Harbor, the three Brooklyn-based ports are within well-established ports (SBMT, PAMT, Brooklyn Navy Yard) with industrial, port-commerce and manufacturing uses surrounded by densely developed areas of New York City, including large manufacturing and industrial areas, port facilities, multistory commercial/office buildings and limited multistory residential buildings.
The two ports on western Staten Island along the Arthur Kill, Port Ivory and Arthur Kill Terminal,

are sited within vacant, greenfield lands surrounded by less dense developments with large manufacturing and industrial areas. Port Ivory is adjacent to active port facilities with freight rail yards (PANYNJ NY Container Terminal) and Arthur Kill Terminal is predominantly a greenfield site that is adjacent to commercial developments and vacant land. On the eastside of Staten Island is Homeport Pier, which is an active shipping pier with industrial and warehouse uses; a high-rise apartment complex and community park borders it to the south and a variety of commercial, residential, transportation and public institutions are within quarter-mile radius. Homeport Pier is within the City's Special Stapleton Waterfront District, which allows port uses while maintaining physical and visual public access to maximize recreational opportunities as well as to conserve and enhance the value of land.
The three proposed OSW ports on Long Island are located within existing public dock/fishing areas and municipal public works facilities (Hempstead Public Works Area), a marina with commercial restaurant and parking properties (Port Montauk), and an active industrial and commercial waterfront with a power generating facility (Port Jefferson). The Port Jefferson site vicinity has medium-to-high density residential

areas, marina and recreational uses, and a commercial district. The Port Montauk site vicinity includes a county park, marinas, residential areas, and vacant land. Hempstead Port is located within a Town of Hempstead public works facilities, with marinas, commercial areas, and public beaches in the quarter-mile vicinity.

4.2

Sensitive Terrestrial Biological Resources

Federal and State listed endangered or threatened species and associated habitat information for the terrestrial biological resources of the study alternatives was compiled from the online U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) Reports and NYSDEC Natural Heritage Program (NHP) correspondence (see Table 3 below for a summary and appendix D for the IPaC report and NHP response letters). Based on this desktop research, at least 24 federally and State listed species have the potential to occur in the vicinity of the study alternatives. Of these, the piping plover (Charadrius melodus), Red Knot (Calidris canutus rufa), and Indiana Bat (Myotis sodalis) are species that have potential critical habitat within New York State. In addition, as part of the federal Migratory Bird Treaty Act and Bald Eagle and Golden Eagle Protection Act, at least 54 migratory birds have been identified in the vicinity of the 12 port sites (appendix D), which is typical of the coastline within the Atlantic Flyway. It should be noted that these are potential special status species and habitats present based on initial desktop reviews, and separate site-specific agency consultations would be required during environmental reviews to more accurately identify sensitive species that could be affected.

The affected terrestrial environment is assumed to include the shoreline and upland areas within quarter mile that have the potential to be directly affected by the construction or operations of the proposed OSW Port facilities.

In the Capital Region, the Port of Albany-Rensselaer, NYS Wind Port, and the Port of Coeymans are all ports sited within vacant land, vegetated with deciduous forest and herbaceous vegetation, including successional old field and northern hardwoods. Along the waterfront are freshwater emergent and scrub-shrub tidal marshes with drainages to the tidal Hudson River. The Port of Albany site borders the Port of Albany–Rensselaer and has early successional upland vegetation. NY Port Wind is also adjacent to developed port and industrial lands to the north and has agricultural lands on site and to the east and south. Port of Coeymans is sited within an existing port with limited grass and deciduous forest vegetation along the perimeter due to a primarily bulkheaded shoreline.

The three New York City Harbor ports in Brooklyn and Homeport Pier on the eastside of Staten Island are located in urbanized landscaped lands devoid of vegetation, consisting of ports with industrial, port-commerce and manufacturing uses surrounded by densely developed areas of New York City.

The two ports on western Staten Island along the Arthur Kill–Port Ivory and Arthur Kill Terminal–are sited within vacant land vegetated with deciduous forest and herbaceous vegetation with herbaceous, scrub-shrub and forested estuarine and marine wetlands along the shoreline. Arthur Kill Terminal also has small area of potential freshwater forested/shrub wetlands on site. Bordering Arthur Kill Terminal to the south is similar vegetation on undeveloped land and more developed areas to the north and east (Outer Bridge Crossing and commercial developments). Port Ivory also has a large estuarine and marine wetland with habitat adjacent to the east and active port facilities with freight rail yards (PANYNJ NY Container Terminal) to the south and west and south.

The three proposed OSW ports on Long Island are located within developed waterfront areas, including an active port devoid of vegetation (Port Jefferson), a municipal public works facility with landscaped grass and deciduous trees with a bulkheaded waterfront (Hempstead Public Works), and a marina with paved parking lot and limited grass and tree plantings along the perimeter (Port Montauk). To the east

of the Port Montauk site is a county park with herbaceous vegetation and sand beaches, and the
Hempstead Public Works site also has sand beaches in the quarter-mile vicinity.

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Table 3. Federal and State Identified Special Status Species

Category	Species	Federal Status	State Status
Birds	Bald Eagle (Haliaeetus leucocephalus)	N/A	Threatened
Birds	Black Skimmer (Rynchops niger)	N/A	Special Concern
Birds	Common Tern (Sterna hirundo)	N/A	Threatened
Birds	Least Bittern (Ixobrychus exilis)		

N/A

Threatened

Birds

Northern Harrier (Circus hudsonius)

N/A

Threatened

Birds

Peregrine Falcon (Falco peregrinus)

N/A

Endangered

Birds

Pied-billed Grebe (Podilymbus Podiceps)

N/A

Threatened

Birds

Piping Plover (Charadrius melodus)

Threatened

Endangered

Birds

Red Knot (Calidris canutus rufa)

Threatened

Threatened

Birds

Roseate Tern (Sterna dougallii dougallii)

Endangered

Endangered

Birds

Least Tern (Sternula antillarum)

N/A

Threatened

Mammals

Indiana Bat (Myotis sodalis)

Endangered

N/A

Mammals

Northern Long-eared Bat (Myotis septentrionalis)

Threatened

N/A

Amphibians

Atlantic Coast Leopard Frog (Lithobates kauffeldi)

N/A

Unlisted

Fish

Shortnose Sturgeon (Acipenser brevirostrum)

Endangered

Endangered

Fish

Atlantic Sturgeon (Acipenser oxyrhynchus)

Endangered

N/A

Insects

Cobra Clubtail (Gomphurus vastus)

N/A

Unlisted

Insects

Monarch Butterfly (Danas plexippus)

N/A

Candidate

Insects

Comet Darner (Anax longipes)

N/A

Unlisted

Insects

Russet-tipped Clubtail (Stylurus plagiatus)

N/A

Unlisted

Insects

Umber Shadowdragon (Neurocordulia obsoleta)

N/A

Unlisted

Plants

American Waterwort (Elatine americana)

N/A

Critically Imperiled

Plants

Estuary Beggar Ticks (Bidens bidentoides)

N/A

Rare

Plants

Persimmon (Diospyros virginiana)

N/A

Threatened

Plants

Sandplain Gerardia (Agalinis acuta)

N/A

Endangered

Plants

Seabeach Amaranth (Amaranthus pumilus)

N/A

Threatened

Plants

Square-Stemmed Spike Rush (Eleocharis quadrangulate)

N/A

Endangered

Plants

Tidewater Mucket (Leptodea ochracea)

N/A

Critically Imperiled

Plants

Torrey's Mountain Mint (Pycnanthemum torreyi)

N/A

Endangered

Plants

Seabeach Amaranth (Amaranthus pumilus)

Threatened

Threatened

Plants

Side Oats Grama (Bouteloua curtipendula var. curtipendula)

N/A

Endangered

Plants

Violet Wood Sorrel (Oxalis violacea)

N/A

Threatened

Plants

Yellow Giant Hyssop (Agastache nepetoides)

N/A

Threatened

Shellfish

Alewife Floater (Utterbackiana implicata – freshwater mussel)

N/A

Unlisted

Shellfish

Fragile Papershell (Leptodea fragilis – freshwater mussel)

N/A

Unlisted

Table 3 continued
Category

Species

Federal
Status

State
Status

Ecological Communities

Floodplain Forest

N/A

Unlisted

Ecological Communities

High Salt Marsh

N/A

Unlisted

Ecological Communities

Low Salt Marsh

N/A

Unlisted

Ecological Communities

Salt Panne

N/A

Unlisted

Ecological Communities

Marine Back-barrier lagoon

N/A

Unlisted

Ecological Communities

Maritime Beach

N/A

Unlisted

Ecological Communities

Marine Intertidal Gravel/Sand Beach

N/A

Unlisted

Notes:

4.3

1.

USFWS has established Critical Habitat for the Piping Plover, Red Knot, Least Tern and Indiana Bat, however
site-specific formal consultation would be required to confirmed whether the port area is located within or may
affect this Critical Habitat.

2.

NOAA National Marine Fisheries Service has designated the Atlantic Sturgeon as an Endangered species.

3.

NY NHP has identified the habitat presence for the Black Skimmer, Atlantic Coast Leopard Frog, Cobra
Clubtail, Russet-tipped Clubtail, Comet Darner, Umber Shadowdragon, Alewife Floater, Fragile

Papershell,
Floodplain Forest, High Salt Marsh, Low Salt Marsh, Salt Panne, Marine Black-barrier Lagoon, Maritime
Beach, Marine Intertidal /Sand Beach within the State as Critically Imperiled or Imperiled.

4.

An additional 54 bird species of birds listed in appendix D, considered Migratory Birds, have been
identified throughout the study alternatives. Please see appendix D for the listing.

5.

USFWS is proposing to revise the Northern Long-eared Bat status to Endangered.

Sensitive Aquatic Resources

The affected aquatic environment is assumed to include the coastal open water and wetland areas
within quarter-mile of the port facilities. Aquatic habitats within and in the vicinity of the active
ports or urbanized landscapes in New York State Metropolitan Areas may be significantly altered by
maintenance dredging and existing port operations. The proposed OSW Port facilities on undeveloped
sites with natural shorelines may have higher densities of fish and wildlife species in the vicinity.

4.3.1 Wetland and Water Resources
Surface waters, wetlands, aquifers, and other water resources present at the proposed OSW port sites
were identified using the USFWS National Wetland Inventory Mapper, the NYSDEC Environmental
Resource Mapper and aerial mapping. The USACE and NYSDEC have jurisdictional authority over
identified surface waters, wetlands and other regulated water resources and would require regulatory
permit authorizations for the construction and operation of the proposed OSW ports. NYSDEC also
regulates development within the wetland “adjacent area” or wetland buffer surrounding wetlands.

NYSDOS (and communities with approved Local Waterfront Revitalizations Plans) also regulates work along waterfronts, particularly within or adjacent to mapped Statewide Areas of Scenic Significance and Significant Coastal Habitats. All the proposed OSW ports have regulated open waters or wetlands along their shoreline.

In the Capital Region, the Port of Albany-Rensselaer, NYS Wind Port, and the Port of Coeymans all have freshwater emergent and scrub-shrub tidal marshes with drainages to the tidal Hudson River.

NYSDEC-mapped submerged aquatic vegetation (SAV) is present along the NYS Wind Port and Port of Albany-Rensselaer shoreline. An NYSDOS Significant Coastal Fish and Wildlife Habitat (SCFWH), Normans Kill, a significant freshwater tributary of the Hudson River and spawning habitat for anadromous fish species borders the west side of Port of Albany Site and the SCFWH Papscane Marsh and Creek is a large tidal creek with emergent and forested marshes and spawning habitat for anadromous fish species that borders the southeast of NYS Wind Port. The Port of Coeymans is sited along primarily bulkheaded shoreline along the Hudson River, and in the half-mile vicinity has the SCFWH Coeymans and Hannacroix Creeks Complex, a sheltered tidal cove, containing mudflats, emergent marsh, SAV beds to the south and the SCFWH Schodack Island with floodplain forests, emergent wetlands, tidal creeks, and mudflats along the east shoreline of the Hudson River.

The three New York City Harbor ports in Brooklyn and Homeport Pier on the eastside of Staten Island are located along the estuarine and marine deep-water habitat of the NY/NJ Harbor. The two ports on western Staten Island along the Arthur Kill–Port Ivory and Arthur Kill Terminal–have emergent, scrub-shrub and forested estuarine and marine wetlands along the shoreline and estuarine and marine deep-water habitat of the Arthur Kill. Arthur Kill Terminal also has small area of potential freshwater forested/shrub wetlands on site. Bordering Arthur Kill Terminal to the south is similar estuarine wetlands along an undeveloped shoreline. Port Ivory also has a large estuarine and marine wetland with habitat adjacent to the east designated by the New York City Waterfront Revitalization Program (NYCWRP) as:

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Northwestern Staten Island Harbor Hens Area/Arlington Marsh SNWA
Bridge Creek Recognized Ecological Complex (REC)

The three proposed OSW ports on Long Island are located within developed waterfront areas, including
an active bulkheaded port (Port Jefferson), a municipal public works facility with a bulkheaded waterfront
(Hempstead Public Works), and a marina with a gravelly/sandy filled shoreline (Port Montauk). The NY
NHP has listed the following ecological communities in the adjacent aquatic habitat areas of the Long
Island OSW ports:

35

Hempstead Public Works Area: Within 500-feet is SCFWH Middle Hempstead Bay estuary,
a very large salt marsh complex along Reynolds Channel, including high-salt marsh, low-salt
marsh and salt panne.
Port Jefferson Harbor: An SCFWH described as a Marine Back-barrier lagoon of moderately
large size.
Port Montauk: Approximately 0.1 mile north of the site is a Marine Intertidal Gravel/Sand
Beach Large beach communities occur along shore of Montauk Peninsula, within a protected,
approximately 3,000-acre natural area. A quarter-mile south of the port is an
SCFWHdesignated Lake Montauk, a former freshwater lake that converted to an estuary
vegetated with eelgrass by a northern inlet to Block Island Sound.

Other sensitive aquatic biological resources exist within the shoreline and marine environment adjacent
to the study alternatives as identified above in Table 1 and appendix D. Aquifers were not identified
at any of the proposed OSW ports.

4.3.2 Listed Species and Habitat
Listed fish, amphibians, shellfish, and plant species are present within the shoreline and marine
environment adjacent to the study alternatives as identified above in Table 1 and appendix D. In
the Capital Region, most of the listed plant species in Table 1 are present along the shoreline of
NYS

Wind Port and Port of Albany and freshwater mussel beds (Leptodea fragilis) are present along the Port
of Albany site. Port of Coeymans is sited along primarily bulkheaded shoreline along the Hudson River.
Of the fisheries species, shortnose sturgeon have known spawning grounds (spring season) in the
vicinity of Port of Albany, NYS Wind Port, and Port of Coeymans, between the Troy Dam and Coxsackie, NY. Adult shortnose sturgeon may also concentrate in overwintering areas over 50 miles
south of Port of Coeymans between Saugerties and Hyde Park and to areas just south of Kingston, NY,
near Esopus Meadows. Atlantic sturgeon can be found throughout the Hudson River Estuary, as well
as within the coastal waters of the Atlantic Ocean and Long Island Sound, where they spend most of
their adult life. Spawning by Hudson River Atlantic sturgeon (a component of the NY Bight Distinct
Population Segment) takes place during spring in the vicinity of Hyde Park. Juvenile Atlantic sturgeon
remain in the estuary for two to six years before moving to the ocean to mature. Of the special status
listed birds, the piping plover (Charadrius melodus) and Red Knot (Calidris canutus rufa) are species
that have designated critical habitat within aquatic environments of New York State. To further identify
aquatic biological resources, the following were reviewed:

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Migratory bird listings, protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, have potential to occur in the vicinity of the alternatives (identified in appendix D) along with their associated conservation status. The USFWS and its partners manage migratory birds based largely on the Atlantic Flyway migratory corridor as they migrate between nesting and wintering areas.
NYSDOS SCFWH and NYCWRP designations, including RECs and SNWAs.
Fish with National Marine Fisheries Service (NMFS) designated Essential Fish Habitat (EFH) or “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” as dictated under the Magnuson-Stevens Fisheries Conservation

and Management Act.

It should be noted that these are potential special status species and habitats present based on initial desktop reviews, and separate site-specific agency consultations would be required during environmental reviews to more accurately identify sensitive species that could be affected.

4.4

Cultural Resources

The New York State's Office of Parks, Recreation and Historic Preservation (NYSOPRHP) Cultural
Resource Information System (CRIS) database was researched to identify known and potential historic
resources, including listed and/or eligible for listing resources, in the New York State Register of Historic Places (SRHP) and the National Register of Historic Places (NRHP). Cultural resources located
in the marine environment can generally be divided into three broad categories: submerged indigenous
archaeological sites; shipwrecks or other sunken objects (aircraft); and submerged architectural or
other built resources, such as piers, docks, weirs, pipelines, telecommunication cables, and artificial
reefs. Cultural resources may also include terrestrial cultural resources such as buildings, structures,
or other areas; cultural or historic landscapes or seascapes; traditional cultural properties; or Native
American resources that are associated with indigenous nations with an interest in the marine environment. These various types of cultural resources are associated with the prehistory and history of the marine environment.
Ten of the sites are within CRIS-mapped archaeological sensitive areas, including Arthur Kill, Port
Ivory, NYS Wind Port, Homeport Pier, Port Jefferson, SBMT, Brooklyn Navy Yard, PAMT, Hempstead
Public Works Area, and Port of Montauk. Only three sites had historic architectural resources or historic
districts in the vicinity, including PAMT, Brooklyn Navy Yard, and Port of Coeymans. The PAMT has the S/NHRP-listed Mary A. Whalen Tanker mooring directly off the terminal area.

Native American tribal resources are present on Papscanee Island Historic District, an SHRP-eligible site and visually unique landscape of the Stockbridge-Munsee Mohican Nation. Papscanee Island Historic District is located within the NYS Wind Port site and across the river from the Port of Albany site. Schodack Island State Park is located across the Hudson River, east of the Port of Coeymans. The island was inhabited by the Stockbridge-Munsee Tribe at the time of Dutch contact and was home of Chief Sachem Skiwias and served as the location of the Mohican Council Fire, the Tribe's seat of government. No submerged precontact sites were identified during the remote sensing survey at the Port of Coeymans site. To the south of Port of Coeymans is the Coeymans Landing Historic District, which was once the earliest Dutch settlement of the area.

4.5

Community Character

Community character considers several elements, including natural features, land uses, development patterns, population growth and density, and regional socioeconomics. Other less tangible characteristics of a community include the visual landscape, demographics, open space, air quality, noise, and traffic patterns. Coastal communities are shaped by open water dominating the landscape, and typically include natural beaches, bulkheads, docks, piers, boats, ports, and marinas. Primary industries in shoreline communities include port commerce and shipping, offshore energy and other infrastructure development, sand and gravel mining, commercial fishing, tourism and recreation, and real estate development. 59

These coastal communities may be seasonal uses due to the winter season in New York State.

When considering community character, sensitive land uses typically include residential areas, parks and recreational fields, hospitals, schools, churches, and major employers of the community. Of the alternatives, nine of the sites have residential communities within the vicinity. Homeport Pier has Staten Island Urby Apartment complex and Stapleton Waterfront Park bordering to the south. Port Montauk has Montauk County Park to the east and residential receptors south of the site along the local access road. However, the port location is an airport and busy marinas. Most of the ports are located within or adjacent to existing ports, and within compatible with land use and zoning.

The visual landscape and air quality are also important elements of a shoreline community's character.

Aesthetic resources and scenic quality of visual landscape are sometimes identified by government agencies, while other resources are unofficially identified attractive visual resources or sensitive to visual change. The New York State Coastal Management Program identifies Scenic Areas of Statewide Significance (SASS) as part of the Coastal Resources to be protected. Of the study alternatives, the NYSDOS has identified sites within the Hudson River Valley and Port of Montauk vicinity:

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Montauk Point, Indian Fields SASS: This is the Montauk County Park east of the proposed OSW site, described as "one of the largest undeveloped oceanfront parks on Long Island" that is "rich in natural beauty."

Lake Montauk SASS: this is the waterbody of Lake Montauk along the proposed OSW site, described as an "unusual New York coastal landscape and scenic area and a tidal pond with a unique history as an early coastal resort."

Columbia-Greene North SASS 60 is located the south and east of Port of Coeymans, including Schodack Island. The SASS captures the historic Hudson Valley with alluvial plains, steep bluffs and varied shoreline with islands, coves, marshlands and forests, working farms and the historic development pattern of clustered settlements and the adjacent rolling open lands.

Local municipalities may also identify visual resources in local planning documents or waterfront development policies, such as New York City's recently published Comprehensive Waterfront Plan, and include parks and recreation facilities, scenic overlooks/corridors, water bodies, and public gathering places. The NYC Comprehensive Waterfront Plan identifies the six areas of focus, including Climate Resiliency and Adaptation, Waterfront Public Access, Economic Opportunity, Water Quality and

Natural Resources, Ferries and Governance. The Plan identifies Offshore Wind industry as an Economic
Opportunity with a target to “Position NYC to become a regional hub for the manufacturing, assembly,
installation and operation of offshore wind components by upgrading key waterfront facilities.”
Air quality also influences community character, including pollutants that may affect human health
and the environment. Adverse air quality effects on human health and the environment can result in
medical treatment, premature deaths, and lost workdays. Most of the largest individual emission sources
continue to be electric generating plants. Many air quality control regions along the Atlantic coast are
considered nonattainment or maintenance regions for one or more of the National Ambient Air Quality
Standards (NAAQS) and are subject to State Implementations Plans (SIP) to control and reduce emission
of pollutants. Greenhouse gas (GHG) emissions such as carbon dioxide contribute to climate change,
including rising average global carbon dioxide concentrations and temperatures. Fossil fuel (coal, oil,
and natural gas) combustion to generate energy is the greatest contributor to atmospheric carbon dioxide
(CO_2) levels. Compared with other states in 2017, New York had the lowest carbon dioxide emissions
per capita of any state in the nation. 61 This is attributable to a smaller proportion of New York State’s
electric energy needs being met by coal-fired power plants, and also to the widespread use of public
transportation in the its larger cities. 62 For further information on Air Quality, see the Air Quality (Section 4.8 below).

4.6

Hazardous Materials

A wide range of contaminated and hazardous materials are present at the OSW port sites and vicinity.
Contamination associated with current and previous uses at the site need to be accounted for. A majority
of the proposed sites are located within current port facilities, working industrial waterfronts,

recreational
marina/docking areas, or areas with urban fill, contaminated by other past uses, such as ports, industrial
and commercial operations at the site. Limited desktop research of publicly available documents (EISs,
etc.), land use, and aerial mapping were performed to identify potential contamination at the proposed
OSW port sites.
All the proposed OSW port sites have the potential to affect health and safety by disturbing
contaminated soils, groundwater, sediments, and buildings and structures containing hazardous materials
(asbestos, lead-based paint, heavy metals, etc.) from former port operations and/or other past uses.
Within the proposed berth and docking areas, all the proposed OSW port sites have the potential to
temporarily disturb contaminated sediments during dredging and in-water construction of infrastructure.
Approximately 200 miles of the Hudson River (the majority) from the Village of Hudson Falls to the
Battery in New York City, has been designated as the Hudson River polychlorinated biphenyls (PCB)
Sediments Superfund Site. The Hudson River PCB Sediments Site was established to dredge targeted
areas to remediate PCB contamination from capacitor manufacturing operations by General Electric
facilities in Fort Edward and Hudson Falls, NY. Contaminants such as heavy metals, pesticides,
polycyclic aromatic hydrocarbons (PAHs), and dioxins/furans are elevated in Upper New York Bay
and the East River. In Gowanus Bay surface sediments would contain similar contamination, but also
may contain PCBs from Gowanus Canal. Proposed OSW port sites with current port operations,
including Brooklyn Navy Yard, SBMT, PAMT, Homeport Pier, Port of Coeymans and Port Jefferson,
may demolish buildings/structures with potential hazardous building materials (e.g., asbestos).
Specifically, at the proposed Port of Albany, 63 the site is characterized as containing former landfill
soils of fly ash and bottom ash with high levels of metals and other contaminants. Each proposed
OSW port site would be required to prepare Phase I Environmental Site Assessments (ESAs) and
likely Phase II ESAs to characterize the on-site contamination as part of proper due diligence of
properties and environmental review processes.

4.7

Floodplains

Federal Emergency Management Agency (FEMA) map data was reviewed to identify 100-year floodplains, floodways, wave action prone areas, and Coastal Erosion Hazard Areas (CEHAs). Port locations within a CEHA will required a NYSDEC Coastal Erosion Management Permit and/or potentially a local municipal approval. Special Flood Hazard Areas (SFHAs) are areas that would be inundated by the 100-year flood associated with the adjacent tidal waters. Other factors of concern within the SFHAs are wave run-up in addition to storm surge, high velocity wave action, and floodways.
Floodways are channels of a river and adjacent land areas that are reserved to discharge the 100-year flood without causing a rise in flood elevations.
FEMA map data (see appendix C) indicates that all the proposed OSW port facilities are located within 100-yr floodplains, including eight sites with 50% or more of the site within a 100-year floodplain and four sites with less than 50% of the site within a 100-year floodplain. All sites are adjacent to floodways, as well. The Hempstead Public Works site is also within a FEMA-mapped moderate wave action zone along Reynolds Channel.
Placement of buildings or structures within SFHAs subjects them to potential damages or loss during flooding events. As a result of climate change, sea levels will rise over time making peak flood elevations higher than today. NYSDEC has issued 6 NYCRR Part 490, Projected Sea-level Rise, which provides sea-level rise projections to the year 2100 for tidal regions of New York State, including Mid-Hudson Region, New York City/Lower Hudson Region, and the Long Island Region as shown in Table 4 through Table 6. Please note that the following sea-level projections of the three regions will be revised in 2022, please refer to 6 NYCRR Part 490 for the most up-to-date projections.
Table 4. Mid-Hudson Region
Source: 6 NYCRR 490.4(a)

Time
Interval

Low
Projection

Low-Medium
Projection

Medium
Projection

High-Medium
Projection

High
Projection

2050s

5 inches

9 inches

14 inches

19 inches

27 inches

2080s

10 inches

14 inches

25 inches

36 inches

54 inches

2100

11 inches

18 inches

32 inches

46 inches

71 inches

2020s

1 inch

3 inches

5 inches

41

7 inches

9 inches

Table 5. New York City/Lower Hudson Region
Source: 6 NYCRR 490.4(a)

Time
Interval

Low
Projection

Low-Medium
Projection

2020s

2 inches

4 inches

2050s

8 inches

11 inches

2080s

13 inches

18 inches

2100

15 inches

Medium
Projection

High-Medium
Projection

High
Projection

6 inches

8 inches

10 inches

16 inches

21 inches

30 inches

29 inches

39 inches

58 inches

22 inches

36 inches

50 inches

75 inches

Table 6. Long Island Region
Source: 6 NYCRR 490.4(a)

Time
Interval

Low
Projection

Low-Medium
Projection

Medium
Projection

High-Medium
Projection

High
Projection

2050s

8 inches

11 inches

16 inches

21 inches

30 inches

2080s

13 inches

18 inches

29 inches

39 inches

58 inches

2100

15 inches

21 inches

34 inches

47 inches

72 inches

2020s

2 inches

4 inches

6 inches

8 inches

10 inches

Per the New York State Flood Risk Management Guidance for Implementation of the Community Risk and Resiliency Act (SFRMG, NYSDEC 2020): “Non-critical facilities and infrastructure should be sited out of tidal areas defined by the following guideline elevation. If siting out of these areas is not feasible, the structures should be elevated such that the lowest floor or other horizontal structural member is at or

higher than the following guideline elevation, considering feasibility, project costs, risk tolerance, and environmental effects, or otherwise protected from flood damage to the applicable guideline elevation:
The elevation and special flood-hazard area that result from adding the medium sea-level rise projection applicable for the full, expected service life of the facility, plus two feet of freeboard, to the base flood elevation and extending this level to its intersection with the ground."
These flood guidelines should be applied to non-critical facilities within tidal areas, such as the proposed OSW port facilities.
The State Flood Risk Management Guidance (SFRMG) further recommends: "Projects involving new or replacement critical facilities and infrastructure (except transportation and water infrastructure) in tidal areas should be sited out of the areas defined by the following guideline elevation. If siting out of these areas is not feasible, the structures should be elevated such that the lowest floor or other horizontal structural member is at or higher than the following guideline elevation, considering feasibility, project

costs, risk tolerance, and environmental effects, or otherwise protected from flood damage to the guideline elevation: The vertical flood elevation and corresponding horizontal floodplain that result from adding the high sea-level rise projection applicable for the full, expected service life of the facility, plus three feet of freeboard, to the BFE and extending this level to its intersection with the ground."
Construction in the VE Zone should be avoided. Buildings within the current or projected Limit of Moderate Wave Action (LiMWA) defined area should be built using VE Zone construction techniques, but a higher flood elevation, as defined above, should be incorporated into the design.
Developments other than buildings, such as key transportation arteries, pipes, wastewater treatment plant settlement tanks, or other facilities, should be constructed to withstand the force of wave action during the projected base flood. Protection of buildings means elevation or flood proofing in accordance with building code and FEMA standards, or other applicable engineering guidance. In some cases, it may be sufficient to elevate critical equipment, e.g., electronic controls to

the recommended elevation, i.e., base flood elevation plus high projected sea-level rise, plus 3 feet of freeboard, within structures that themselves cannot be feasibly constructed to the recommended elevation.

In NYC, Climate Change Adaptation Guidance on Policy 6.2 of the New York City Waterfront Revitalization Program requires projects to (1) incorporate the consideration of climate change projections for coastal flooding and sea-level rise into the design and review of projects and (2) identify potential vulnerabilities to and consequences of sea-level rise and coastal flooding over their lifespan and to identify and incorporate design techniques to address these risks.

4.8

Air Quality and Greenhouse Gas Emissions

Air quality pollutants at the proposed OSW port sites may affect human health and the environment.

Chronic and acute adverse air quality effects may result in medical treatment, premature deaths, and lost workdays. Most of the largest individual emission sources in the region continue to be fossil fuel (coal, oil, and natural gas) combustion electric generating plants and the greatest contributor to atmospheric carbon dioxide (CO_2) levels. Compared with other states in 2017, New York had the lowest carbon dioxide emissions per capita of any state in the nation.6 This is attributable to a smaller proportion of New York State's electric energy requirement that is met by coal-fired power plants and to the widespread use of public transportation in the State's larger cities.64

Most urban areas along New York State's coastline are considered nonattainment or maintenance regions for one or more of the NAAQS and are subject to State Implementations Plans (SIP) to control and reduce emission of pollutants. NAAQS pollutants are carbon monoxide (CO), lead, ground-level ozone, nitrogen dioxide (NO_2), particulate matter, and sulfur dioxide (SO_2). GHG emissions such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and fluorinated gases (hydrofluorocarbons, etc.) deplete the ozone and contribute to climate change, including rising average global carbon dioxide concentrations and temperatures. Similarly, particulate matter is a mixture of solid particles and liquid droplets of varying size found in the atmosphere. United States Environmental Protection Agency (EPA) has established NAAQS for two different particles sizes—particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). While some particulate matter is emitted directly, $PM_{2.5}$ can form in the atmosphere by chemical reactions between SO_2, nitrogen oxides (NO_X), volatile organic compounds (VOCs), and ammonia. As with ozone, $PM_{2.5}$ precursors are regulated by EPA to achieve ambient $PM_{2.5}$ reductions. According to NYSDEC's published 2021 Statewide GHG Emissions Report, the statewide gross emissions of CO_2 have dropped 6% between 1990 and 2019, based largely on large-scale and long-term trends in population, economic factors including changes in the types of industries that are active in the State, and land-cover changes including those that affect forests. One key trend has been a reduction in CO_2 emissions associated with the electricity system.

There is a New York State-specific trend in the reduction of electricity emissions associated with various regulations, increased application of energy efficiency measures, and fuel switching. Between 2018 and 2019, the decrease in total GHG emissions was driven largely by a decrease in CO_2 emissions from fossil fuel combustion. The decrease in CO_2 emissions from fossil fuel combustion was a result of a 1% decrease in total energy use and reflects a continued shift from coal to less carbon intensive natural gas and renewables in the electric power sector. 65

In New York State, CO_2 remains the primary GHG emitted by human activity (or 58% of 2019 emissions) and fossil fuel combustion is the primary source of CO_2. The land-use sector is an important CO_2 sink, removing roughly 8% of the State's total annual GHG emissions, primarily into forest biomass and soil organic carbon. The second most important GHG in the State, in terms of CO_2 equivalent emissions, is methane (35% of emissions) primarily from fossil fuel infrastructure, waste, and agriculture.

Almost all of the remaining statewide GHG emissions in 2019 were hydrofluorocarbons (HFCs) (6%). 66

All proposed OSW ports are located within Ozone (1-hour and/or 8-hour) and/or PM 2.5 Nonattainment Areas. 67 Specifically, north the Port of Albany site, the Ezra Prentice neighborhood is part of the NYSDEC's Albany South End Community Air Quality Study with air monitoring programs and enforced truck restrictions. 68

4.9 Noise

Ambient or existing noise sources and noise levels in the vicinity of the proposed OSW port sites were considered. In the absence of actual noise monitoring data at the sites, a land use-based assessment is typically performed for screening level assessments. Sensitive receptors (sensitive land uses) were identified within quarter-mile of the sites and also along potential truck routes to the nearest highway (see appendix C for Land Use Maps).

The two main types of noise sources are mobile and stationary noise sources. Mobile noise sources are those that move in relation to a noise-sensitive receptor, such as trucks, work barges, and freight trains. Stationary noise sources are those that do not move in relation to a noise-sensitive receptor, such as construction equipment. Active port facilities and working waterfronts would have both mobile and stationary noise sources.

The three Brooklyn OSW port sites are well-established ports with higher ambient noise levels from industrial, shipping, and manufacturing uses surrounded by densely developed areas of New York City and limited sensitive receptors in the vicinity (multistory residential buildings). The two ports on western Staten Island along the Arthur Kill–Port Ivory and Arthur Kill Terminal–have residential areas within half mile. Homeport Pier is an active shipping pier with industrial and warehouse uses assumed to have high-ambient noise levels, however, a high-rise residential apartment complex and community park borders to the south.

The Port of Albany Expansion is sited within vacant land that does not border noise sensitive land uses. However, the northern truck route for the Port of Albany site would pass by the Ezra Prentice residential complex. NYS Wind Port is located within Papscanee Island of significance to the Stockbridge Munsee Native American Tribe, which would be considered sensitive to increased noise levels. The Port of Coeymans is within an active port facility with higher ambient noise levels. The closest sensitive receptor is a residence within half-mile of the port: however, the proposed truck routes would pass by residential areas.

The Port Jefferson site is an active port with assumed high ambient noise levels; however, a suburban residential area is present within the quarter-mile study area. Depending on the season, the Port Montauk site may have lower ambient noise levels; however, the site contains a large seafood restaurant, a commercial fishermen dock and recreational docking (marina) area that would have higher noise levels in the summer. The Montauk County Park borders to the east and a residential area is present along the shoreline to the south. Hempstead Port may have elevated noise levels from the Town of Hempstead public works operations and there are public beaches in the quarter-mile vicinity to the south.

4.10 Environmental Justice Communities

Nine potential environmental justice communities were identified in proximity to the proposed OSW sites. Environmental communities include qualifying minority and/or low-income populations according to State or federal criteria. Both NYSDEC Commissioner Policy 29, Environmental Justice and Permitting (CP-29), and Executive Order (EO) 12898 requires the identification of environmental justice populations within the study area, and an assessment of whether the proposed project would result in disproportionately high and adverse effects on environmental justice populations, taking

into consideration minimization, mitigation, and enhancement measures, and project benefits, as appropriate.
If environmental justice communities are present, public outreach efforts to involve minority and low-income populations are required.
Similarly, a NYS Climate Act Section 7(3) analysis would be required for each port site to determine whether any disproportionate impact to disadvantaged communities would occur in accordance with NYS Climate Act criteria. Port of Albany, SBMT, Brooklyn Navy Yard and Brooklyn PAMT, Homeport Pier, Hempstead Public Works Eight of the 12 sites have NYS Climate Act-mapped disadvantaged communities and EJ communities present in the quarter-mile vicinity: Port of Albany, SBMT, Brooklyn Navy Yard and Brooklyn PAMT, Homeport Pier, Hempstead Public Works Area. Port of Albany has the Ezra Prentice residential complex present to the north. NYSDEC monitors the air quality of Ezra Prentice neighborhood as part of the Albany South End Community Air Quality Study and enforces truck routes that avoid the environmental justice community.
Arthur Kill and Port Ivory have environmental justice communities within a half-mile, however the truck routes are expected to avoid these communities. Port of Coeymans, NYS Wind Port, Port Jefferson and Port Montauk have no identified environmental justice communities in the vicinity.

5

Alternatives Analysis

This chapter assesses the study alternatives based on the key socioeconomic, environmental, and navigational criteria developed to evaluate the alternatives for this study. Evaluation criteria were developed based on key NEPA and SEQRA resource categories to provide an understanding of the potential environmental and sociological implications of port upgrades and environmental assessment information that offers context and supports future planning, environmental reviews, and permitting for individual port upgrades. The criteria do not represent a comprehensive set of NEPA or

SEQRA criteria, but a selection of informative socioeconomic, environmental and transportation factors to support the evaluation and highlight the differences between the study alternatives. The comparison of the study alternatives focuses on a screening level assessment of socioeconomic, environmental, and navigational effects in New York State for the Planned and Full-Build Alternatives and provides an understanding of the incremental impacts associated with development of the Partial-Build Alternative.

The Planned Alternative includes Port of Albany, Port of Coeymans, SBMT, Port Jefferson and Port of Montauk. The Full-Build Alternative includes the Planned Alternative plus seven additional ports: Arthur Kill Terminal, Port Ivory, Homeport Pier, Brooklyn Navy Yard, PAMT, NYS Wind Port, and Hempstead Public Works Area. The Partial-Build Alternative assumes eight port sites, including the five Planned Alternative ports plus three additional ports facilities (Arthur Kill Terminal, PAMT, and Homeport Pier) of the Full-Build Alternative, totaling. The Partial-Build Alternative impacts are not itemized and summarized in this section as the full range of potential impacts are provided with the Planned and Full-Build Alternatives, and the Partial-Build Alternative would simply result in incremental impacts between those two alternatives.

5.1 Evaluation Criteria

To evaluate the study alternatives, criteria related to socioeconomic, environmental, and navigational effects included consideration of:

- Economic Impacts: by considering economic opportunity within New York State, including job creation, social and community investments and economic development monetary value.
- Land Use Compatibility: by considering historic and existing site use, site availability and consistency with land use and zoning in the study area.
- Transportation Access and Mobility: by considering the adequacy of existing roadway and freight railroad access, and acceptable vessel navigation access, capacity, and routes.

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5.2

Environmental Justice: by identifying the presence of low-income and minority populations in the study area, considering the benefits of potential job creation, and temporary and permanent impacts related to construction and operation of the OSW facilities.
Biological and Water Resources: by considering potential impacts to sensitive terrestrial and aquatic biological resources, wetlands/open waters, endangered and threatened species habitat, and wetlands.
Cultural Resources: by considering potential impacts to mapped upland and marine archaeological resources, historic architectural resources, and historic districts.
Community Character: by considering potential impacts to sensitive receptors and neighborhood character.
Hazardous Materials: by identifying disturbances of contaminated and hazardous materials and considering human health and safety issues.
Floodplains and Resiliency: by considering potential impacts within 100-year floodplains, wave action prone areas, CEHAs and considering resiliency issues.
Air Quality and GHG Emissions: by considering the overall benefit to regional air quality that would result from clean energy generation during operations and the temporary impacts associated with construction of the OSW port facilities.
Noise: by considering temporary and permanent noise effects in the study areas of the OSW port sites.

Summary of Results

Table 7 summarizes the results of the analysis of the study alternatives in relation to the evaluation
criteria described above. Appendix E contains the supporting Alternatives Impact Summary Tables

that identify the resource impacts at each potential port facility; one table of individual port facilities
of the Planned Alternative and one of individual port facilities of the Full-Build Alternative.

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Table 7. Alternative Impact Summary Table
Resource

Characteristic

Criteria

Planned Alternative

Full-Build Alternative

Economic
Impacts

NY Economic
Support

Maximize economic
opportunity in NY State

Five ports in NY State, estimated to generate $12.1 billion in economic development. Estimated to support approximately 13,510 job-years during ports renovations and 545 jobs during O&M. Social and community investment expenditures are expected to support another estimated 450 job-years.

Twelve ports in NY State, estimated to generate approximately $30.7 billion in economic development. Estimated to support approximately 34,288 job-years during ports renovations. 1,309 jobs during O&M. Social and community investment expenditures are expected to support another 1,080 job-years.

Land Use

Land use, zoning conformance

Site port facility within compatible land use and zoning areas

Four of the five sites are compatible with existing industrial/manufacturing/ coastal industrial zoning and land use. two sites involve creation of new port, converting vacant land, or parking and marina uses. One site is within waterfront park and conservation zoning. Each site would be required to undergo town planning board review and approval.

Eleven of 12 sites are compatible with existing industrial/manufacturing/ coastal industrial zoning and land use. Five sites involve creation of new port by converting vacant land, or parking, marina, or agricultural uses (not designated farmland). Seven sites involve repurposing existing ports or docking areas to port facilities. One site is within waterfront park and conservation zoning. Each site to undergo town planning board review and approval.

Vessel Traffic

Navigation conflicts (hot spots), Density of commercial vessels, Ferry routes

Minimize and avoid
navigational congestion
and conflicts

Three ports have some vessel congestion or ferry route. All sites require precautions during recreational vessel season.

At least three ports have some vessel congestion or ferry route. All sites require precautions during recreational vessel season.

Resource

Characteristic

Criteria

Planned Alternative

Full-Build Alternative

Navigational
Areas

Federally designated
navigation channels
Shallow/restricted
drafts, Anchorage
and mooring
availability,
Shipping lanes.

Close access to navigation channels, adequate drafts, and available anchorages. Minimize routes with constrained shipping lanes.

Adequate channel depths for proposed port uses. Two sites may restrict heavy loads during low tide. Two sites require medium access channel dredging. All sites have close access to federal channels. Three sites have winter ice concerns and have no suitable anchorage locations nearby. Two sites do not have turning basins or areas to turn for larger vessels. Two sites have vertical air draft bridge restrictions at 135 feet.

Adequate channel depths for proposed port uses. Two sites may restrict heavy loads during low tide. Two sites require medium access channel dredging. All sites have close access to federal channels. Four sites have winter ice concerns and have no suitable anchorage locations nearby. Three sites do not have turning basins or areas to turn for larger vessels. Four sites have vertical air draft bridge restrictions at 135 feet.

Vehicular Traffic Impacts and Accessibility

Highway access,
Viable truck routes,
Roadway improvements,
Freight rail access,
Rail improvements.

Easy, direct site access and highway access. Avoid and minimize road or traffic management improvements.

All the site sites have viable truck

routes to highway. Two sites require
minor road access improvements, and
One site requires a new vehicular
bridge and rail bridge over a stream.

All the site sites have viable truck routes to highway. Five sites require minor road access improvements, and one site requires a new vehicular bridge and rail bridge over a stream.

Environmental
Justice

Potential for
disproportionate
effects on
Environmental
justice communities.

Avoid and minimize impacts to environmental justice communities in the quartermile vicinity.

Three sites have environmental justice communities present in the vicinity. Potential traffic, air quality and noise impacts along truck routes may occur to these communities.

Nine sites have environmental justice communities present in the vicinity. Potential traffic, air quality, and noise impacts along truck routes may occur to these communities.

Sensitive
Terrestrial
Biological
Resources

Listed endangered
or threatened

species or habitat,
Critical habitat.

Avoid and minimize impacts
to sensitive terrestrial habitats
and listed species

Three sites may have limited impacts
to bat, shorebird, or other listed
species habitat.

Seven sites may have impacts to bat,
shorebird, insect, or other listed
species habitat.

Sensitive
Aquatic
Biological
Resources

Wetlands
Federal and State
regulated wetlands,
and surface waters,
Aquifers,
Water quality.

Avoid and minimize impacts
to federal or state regulated
waters, wetlands, or
aquifer impacts.

Three sites would have moderate level
of wetlands/open water fill and
dredging impacts. Two sites would
have minor wetlands/open water
impacts. One site may affect SAV
adjacent At least three ports would
increase impervious surfaces creating
stormwater runoff. No ports have
aquifers present.

Six sites would have moderate level of

wetlands/open water fill and dredging impacts. At least two sites have SAV. Six sites would have minor wetlands/open water impacts. At least eight ports would increase impervious surfaces creating stormwater runoff. No ports have aquifers present.

Resource

Characteristic

Criteria

Planned Alternative

Full-Build Alternative

Sensitive Aquatic
Biological
Resources

Habitat and Species
Listed endangered or
threatened species or
habitat,
NYSDOS SCFWH,
NYCWRP
RECs, SNWAs.

Avoid and minimize impacts
to sensitive aquatic habitats,
listed species and NYSDOS
or NYC designated special
coastal zone habitats.

All sites may affect potential sturgeon and several EFH species present. One site may affect protected shorebirds present. Dredging at one site would impact SAV and freshwater mussels. One site may affect a SCFWH tidal creek complex.

All sites may affect potential sturgeon and several EFH species present. Two sites may affect protected shorebirds present. At least two sites may affect SAV. One site may impact freshwater mussels. One site may affect the Outer Bridge Shoreline REC. One site may affect the adjacent Northwestern Staten Island Harbor Hens Area/Arlington Marsh SNWA, and Bridge Creek REC. Two sites may affect SCFWH tidal creek complexes.

Cultural
Resources

Historic architectural resources,
Historic districts,
Upland and marine archaeological resources (shipwrecks).

Avoid and minimize impacts to mapped cultural resources or historic districts within the vicinity.

All five sites may impact archaeological sensitive areas. Two ports may have unavoidable adverse visual impacts to Native American sites. One site with historic architectural resources within quarter-mile.

All sites may impact archaeological sensitive areas. Three ports may have unavoidable adverse impacts to

archaeological sites. Three sites with
historic architectural resources within
quarter mile. One site has a historic
tanker moored nearby.

Community
Character

Sensitive receptors,
(residences, parks,
hospitals, schools,
etc.) Neighborhoods.

Avoid and minimize impacts
to sensitive receptors and
community character
identified in the vicinity.

Four sites have residential
communities within ¼-mile. Potential
traffic, air quality and noise impacts
along truck routes may occur to
these communities.

Nine sites have residential communities
within quarter -mile. Potential traffic, air
quality and noise impacts along truck
routes may occur to these communities.

Hazardous
Materials

Hazardous materials,
Subsurface
contamination,
Health and
safety issues.

Avoid and minimize
disturbances of hazardous
materials and protect
human health and safety.

All five sites contain contaminated fill soils from former port operations and/or other past uses. Two sites likely require demolition of buildings with potential hazardous building materials. Temporarily disturbance of potentially contaminated sediments during dredging and in-water construction at five sites.

All 12 sites contain contaminated fill soils from former port operations and/or other past uses. Four sites likely require demolition of buildings with potential hazardous building materials. Temporary disturbance of potentially contaminated sediments during dredging and in-water construction at five sites.

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Resource

Characteristic

Criteria

Planned Alternative

Full-Build Alternative

Floodplains and
Resiliency

100-year floodplains,
Wave action prone
areas,
Coastal Erosion
Hazard Zones
(CEHAs).

Avoid and minimize impacts

to floodplains, floodways,
wave action or CEHA areas.

All 5 sites have 100-yr floodplains present on-site and floodways adjacent. Three sites have at least 50% of site within floodplains. No wave action or CEHA areas present.

All 12 sites have 100-yr floodplains present on-site and floodways adjacent. Eight sites have at least 50% of site within floodplains. One site within wave action zone. No CEHA areas present.

Air Quality and
GHG Emissions

USEPA National
Ambient Air Quality
Standards (NAAQS)
Nonattainment areas,
Sensitive receptors.

Avoid and minimize air quality impacts and sensitive receptors.

All five sites are located within Ozone and/or PM 2.5 Nonattainment Areas. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels would occur.

All 12 sites are located within Ozone and/or PM 2.5 Nonattainment Areas. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels would occur.

Noise

Sensitive receptors
(within quarter mile),
Local noise codes,
Truck routes.

Avoid and minimize
noise impacts and
sensitive receptors.

Four sites have sensitive receptors in the quarter -mile study area that may experience truck traffic-related noise during construction. Most ports are sited on an active port and/or in industrial areas with high ambient noise levels. Minor noise levels are expected from O&M activities.

Nine sites have sensitive receptors in the quarter -mile study area that may experience truck traffic-related noise during construction. Most ports are sited on an active port and/or in industrial areas with high ambient noise levels. Minor noise levels are expected from O&M activities.

5.2.1 Economic Impacts

Implementing the Full-Build Alternative would maximize direct and indirect economic benefits, in the form of economic development, workforce employment, and increased property values and tax
revenues. These economic benefits would occur at local, county, State, and regional levels. A broad
desktop economic impact study of the Planned and Full-Build Alternatives was prepared assuming the
State’s OSW energy target of 9,000 MW capacity by 2035 (see Appendix G: Economic Impact study).
The study focused on the economic impacts–measured in terms of jobs and income–related directly
to the OSW energy program, which can be tracked and quantified through expenditures related

to its
implementation. The following groups of activities were assessed: renovations and upgrades of identified
ports; offshore wind farm construction; O&M activities; and social and community investments for
long-run business sustainability such as wildlife monitoring, or funding for community training and
skills upgrades.

In terms of job impacts in New York State, the Full-Build Alternative is estimated to support a total
of 34,288 job-years during construction followed by 1,309 jobs each year to operate and maintain the
OSW energy projects for a total of 32,403 job-years (appendix G). One job-year means one job per
year or the average jobs created per year over the total number of years. The OSW industry can be
expected to not just create large numbers of construction labor jobs, but also create high quality
long-term job opportunities, many of them related to technologically advanced products and
processes.

Social and community investment expenditures are expected to support another 1,080 job-years over
the life of the projects. The New York State workforce living in coastal communities is well positioned
to respond to the proposed OSW development (appendix G).

The primary difference between the Planned Alternative and the Full-Build Alternative stems from
the inclusion of the additional seven OSW ports to support the NYSERDA program. The inclusion of
additional ports increases the economic benefits related to both construction and O&M expenditures
in New York State. It is important to note that if the Full-Build Alternative, is implemented, it would
provide additional and upgraded port capacity. This would, in turn, make it more likely that the economic
impacts of construction and O&M of the proposed OSW energy program could be realized in the
State.

The following additional economic benefits would be maximized under the Full-Build
Alternative:

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Electricity Rate Benefits: The Full-Build Alternative provides more affordable energy than fossil fuel-based power generation and maximizes cost-effectiveness of OSW for New York State ratepayers.
Workforce Employment Benefits: The State's investments in professional training at the Global Wind Organization training centers (SUNY, local colleges, etc.) would facilitate a new generation of OSW professionals within New York State to capture the job opportunities of the emerging OSW industry.
OSW Supply Chain Benefits: Growth in the supply chain of the offshore wind energy industry, including manufacturing facilities and the shipment of supplies would also benefit communities throughout New York State.
Property Value and Housing Benefits: As a secondary regional benefit of the OSW energy production, with the decommissioning of fossil fuel-based power generators and improved health benefits, property values and tax revenues would increase, as well as demand for permanent and/or rental housing.

Further local and regional economic benefits to EJ and disadvantaged communities would be realized through multiple State programs (see chapter 6). Overall, implementing the OSW energy program may result in direct socioeconomic impacts in the form of economic development, workforce employment, and the avoidance of adverse health outcomes.

5.2.2 Land Use Compatibility

Both the Planned Alternative and Full-Build Alternative would use strategic waterfront locations to develop the port facilities. Overall, the Full-Build Alternative would maximize the use of available and practical existing port and waterfront facilities within the State, as nine of the 12 sites would be existing port or waterfront facilities. Three of the sites would involve the creation of a new port facility by converting vacant or undeveloped property: however, each of those sites are located near compatible land use and zoning areas, and two of the sites would essentially be contiguous extensions to existing port facilities. It is anticipated that all the sites would obtain site plan and local town permitting approval by the local municipality and would require federal coastal consistency concurrences from

NYSDOS,
potentially by incorporating design and operational specifications if required.
In addition to meeting the requisite NYSDOS and town plan and town permitting approvals, the following avoidance, minimization, and mitigation measures could be applied for a more responsible development of the proposed OSW ports of the study alternatives:

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Optimize use of and/or expand existing port facilities to the extent practicable.

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Maximize use of practical waterfront access locations with compatible land and zoning to the extent practicable.
Incorporate stakeholder and community feedback into the project design, especially to address traffic, air quality, noise, visual and other community-specific impacts of concern.
Continue coordination with applicable municipalities, officials, and stakeholders.

5.2.3 Transportation Access and Mobility
5.2.3.1 Vehicular Traffic Impacts and Accessibility
Both the Planned Alternative and Full-Build Alternative would use port sites with efficient, practical
transportation access. Each of the OSW port sites are in close proximity to highways to facilitate efficient site access by large trucks and construction equipment. Five of the 12 sites would require
minor road access improvements. One site would require major improvements including a new vehicular
bridge and a rail bridge over a stream, and a short rail spur extension. During construction, congestion
along truck routes may occur. As practical, some sites would be able to utilize available freight railroad
access to reduce truck trips. Due to the vehicular and truck traffic generated by the construction and
operations of the OSW ports, Traffic Management Plans would be required in coordination with the
local municipalities and Department of Transportation (DOTs), which typically include:

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Truck routes avoiding sensitive receptors.
Truck routes incorporating speed zone signage, new traffic signal(s), traffic signal timing adjustments, and widening turning lanes.
Specific traffic control plans and truck routes for oversized load deliveries.
Adding highly visible signage and lighting of construction sites and intersections leading to the site.
Scheduling truck deliveries and construction traffic to avoid peak hours, as possible.
Posting regular construction-related traffic updates to the local community through social media, public notices, and/or other appropriate communications tools.
Maximizing use of freight rail and waterborne vessels to further reduce truck traffic.

5.2.3.2 Vessel Navigation Impacts and Accessibility

A ports and vessel navigation study was prepared by SUNY Maritime for the study alternative ports (see appendix F) and also referencing the 9GW Port Uses and Navigation Assessment prepared by COWI to assess the potential ports navigation and accessibility issues. With the necessary dredging, the Planned Alternative and Full-Build Alternative would have efficient vessel access and viable navigation routes to OSW Farms. Adequate channel depths are available adjacent to the Full-Build Alternative sites; however, two OSW port sites may have heavy load restrictions during low tide. Four ports have winter ice concerns and have no existing anchorage locations nearby, which would require direct “homeruns” routes to

the ports. Three sites do not have turning basins or areas to turn for larger vessels. Four OSW ports would have vertical air draft bridge restrictions at 135 feet. However, these issues could be addressed with proper planning and operations. Mitigation measures that are recommended that would enhance navigational access and efficiencies, include maintenance dredging, adding air-draft sensors at downstream bridges, and adding anchorage and turning areas at strategic locations as described below.
Three of the Full-Build Alternative ports may have potential vessel or ferry traffic congestion

in the vicinity. However, it is assumed that vessel movements would be accommodated with speed restrictions, using available meeting/overtaking areas and effective VHF (two-way radio) communication.

For example, at the Port of Coeymans, there are currently two to four tugboat round trips and one ship per week, and the O&M phase (manufacturing and staging) at new OSW port facility would add two to four round trips per week but will also include one to two larger (130 feet x 400 feet) barges to transport OSW components. 69 The new OSW operations at Port of Coeymans would not represent a significant increase in vessel traffic when compared to the overall commercial traffic of 3,000 barges and vessels on the Hudson River annually, exclusive of recreational boating traffic. 70 Similarly, the O&M phase (manufacturing and staging) at Port of Albany Expansion is estimated to generate approximately two to three barges per week for the transport of outbound products, and one vessel per month for the delivery of inbound materials, equating to roughly 21 vessels/barges per year from the Port of Albany. 71 This increase in maritime traffic is not projected to have a significant impact on the existing Hudson River maritime commercial or recreational traffic, and the use of barges and vessels for the delivery and shipping of materials/products reduces the need for trucks, further minimizing the impact on the surrounding roadway network.

According to NYSERDA's Navigational Safety Risk Assessment 72 of the Full-Build Alternative, it is conservatively assumed that a 4% vessel increase would occur at the confluence of the Ambrose Channel south of the NY Harbor (gateway to the OSW farms), assuming all of the projected vessels from the OSW ports operating concurrently. The New York Harbor would have the capacity to support this amount of additional OSW industry vessel traffic. Because of the new vessel traffic that would occur, study alternatives may result in a small but measurable amplification of risks already present in the New York State's navigable waters, to the extent OSW projects increase the existing vessel traffic. The Risk Assessment demonstrated that the OSW impacts are expected to be small (less than 4% increase in overall traffic at all hotspots considered) and navigation and communication impacts are not expected to be more significant than those caused by the baseline vessel traffic. The results of the analysis of safe navigation indicate that the potential increase in vessel navigation safety is either negligible or otherwise clearly mitigatable. The quantity of OSW vessel traffic would not pose additional risk to vessel safety to existing waterways within New York State.

Best management practices and related measures necessary to manage new vessel traffic depends largely on the size, maneuverability, and density of traffic. To ensure a reliable and efficient marine transportation system within the Hudson River, it would be responsible for ports to coordinate with the Hudson River Safety, Navigation, and Operations Committee (HRSNOC). In the New York Harbor, vessel traffic is managed by U.S. Coast Guard's Vessel Traffic Service (VTS). Even conservatively assuming a 4% increase in vessels of the Full-Build Alternative operating concurrently, the New York Harbor would have the capacity to support the additional OSW industry vessel traffic. The United States Coast Guard (USCG) would require regular communication using the Local Notices to Mariners (LNM) to the local marine community, providing updates construction-related and O&M vessel traffic.

In addition, the following avoidance, minimization, and mitigation measures may be considered to facilitate and coordinate OSW vessel navigation. 73 74

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Maintenance dredging between the port and adjacent federal navigation channel.
Adding air draft sensors on downstream bridges and fog sensors in chronically foggy areas.
Adding more anchorage and turning areas, especially on the Hudson River north of Kingston.
Maintaining continuous and effective VHF communication for meeting/overtaking vessels and monitoring vessel traffic.
Performing a scan and survey to identify and mitigate impacts to subsea infrastructure (cables, pipelines, etc.).
Continued consultation with maritime stakeholders, including USCG, VTS, PANYNJ, and USACE on best practices.
Active communication with the Maritime Association of the Port of New York and New Jersey Harbor Safety, Navigation, and Operations Committee.
Utilization of existing Traffic Separation Schemes (TSSs), maintained channels, and transit lanes by vessels associated with the port to comply with existing uses and management of the surrounding waterway, to the extent practicable.
Requiring all construction vessels be equipped with working Automatic Identification System (AIS) transceivers at all times.
Marine coordination for vessels associated with the port (i.e., a central coordination hub from which all Project vessel movements would be managed, and third-party traffic would be monitored).

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Monitor Tide Stations in the Capitol District for real time water level data to assist in Navigation in the Hudson River from NOAA, Hudson River National Estuarine Research Reserve (HRNERR) and other sources.

5.2.4 Environmental Justice
A majority of the OSW port sites in the Planned Alternative and three quarters in the Full-Build Alternative may have EJ and disadvantaged communities present within ¼-mile. These communities
may experience temporary traffic, air quality and noise impacts and particularly along truck routes,
similar to non-EJ communities in the vicinity. The sites with EJ communities and disadvantaged communities present would require an EJ analysis in accordance with State (NYSDEC CP-29), Section 7(3) of the NYS Climate Act and/or federal (Executive Order (EO) 12898) criteria, including
an assessment of whether the proposed project would result in disproportionately high and adverse
effects on EJ populations, taking into consideration minimization, mitigation, and enhancement measures

and project benefits, as appropriate. If EJ or disadvantaged communities are present, public outreach efforts would be required to involve minority and low-income populations. As an example of effective mitigation, the Port of Albany has an EJ community nearby that the Town of Bethlehem would require all OSW-related truck routes to avoid, to eliminate the potential for air quality, traffic, and noise impacts. [75]

To actively support EJ communities and provide cumulative economic benefits at the statewide program level, the State has number of programs and tools in place. NYSERDA's procurement of Offshore Wind Renewable Energy Credits (ORECs) will assign 20% of the score of each project proposal to economic benefits, including benefits to disadvantaged communities, creation of workforce training opportunities, and job creation. The Climate Justice Working Group, established by the NYS Climate Act, will identify disadvantaged communities, and help ensure that the benefits of climate change responses accrue to these disadvantaged communities. The State is also committed to requiring developers to pay workers a prevailing wage and to utilize project labor agreements. New York State has also invested $20 million to establish the Offshore Wind Training Institute in partnership with NYSERDA and SUNY Stony Brook and Farmingdale to train a new workforce for the OSW industry at the affordable SUNY institutions.

In addition, the NY/NJ Bight Regional Working Group on Supply Chain Development would be continually coordinating to meet mutual regional OSW energy targets related to enhancing the domestic supply chain and deliver benefits and economic opportunities to underserved, disadvantaged, and overburdened communities. Thousands of construction and O&M jobs would be generated in close proximity to EJ communities and the resulting benefits of job creation could offset the temporary effects of construction.

Another regional program to support EJ communities is the NYCEDC's 15-year, $191 million Offshore Wind (OSW) Vision NYC plan to make New York City a leading destination for the OSW industry. The plan also ensures the City meets nation-leading climate targets of 100-% clean electricity by 2040 and carbon neutrality by 2050. The $191 million OSW investment would put New York City on path to create over 13,000 jobs and generate $1.3 billion in average annual investment and reduce 34.5 million tons of CO_2 —the equivalent of removing nearly 500,000 cars from roadways for 15 years.

NYC's Offshore Wind NYC 76 would be providing equity to disadvantaged communities by:

- Ensuring 40% of job and investment benefits would be directed to women, minorities, and environmental justice communities.
- Transforming maritime properties to bring jobs and environmental benefits to historically disadvantaged communities.
- Enabling existing development and business support systems to prepare a diverse pool of talent and entrepreneurs to serve the industry.
- Attracting investment to grow the industry and create good-paying jobs for New Yorkers of all backgrounds.
- Making NYC the model for growing urban OSW clusters in the United States and ensure that the clean energy transition is equitable for all.

NYCEDC and its partners have collaborated to activate the SBMT as an OSW port and support the Empire Wind Project. As part of their operation at SBMT, the Empire Wind Project plans to establish a $5M fund to ensure that low-income populations, people of color, and New Yorkers from EJ communities equitably share in the benefits of the industry. Nearly 5,000 New York City jobs could be created by 2035 through regional offshore wind deployment, and SUNY Maritime College has the capacity to provide training and certify hundreds of workers yearly. New York City would invest in education to create pipelines to these jobs, funding new wind energy programs at CTE high schools and CUNY campuses.

In addition to the federal, regional and State EJ policies, the following avoidance, minimization, and mitigation measures can be applied to mitigate EJ community impacts more responsibly:

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Optimize use of and/or expand existing port facilities to the extent practicable.
As part of the Traffic Management Plan, in coordination with the affected local
municipalities and DOTs, identify truck routes that avoid EJ communities.
Incorporate local feedback from local EJ communities and incorporate applicable
measures to avoid, environmental impacts on communities.
Implement the BPMs and mitigation measures identified in traffic (Section 5.2.3),
air quality (Section 5.2.11), and noise (Section 5.2.12).
Coordinate with the NY/NJ Bight Regional Working Group on Supply Chain Development
to deliver benefits and economic opportunities (jobs) to underserved disadvantaged,
and overburdened communities.
Continue to maintain, a strong community engagement policy throughout life of the Project,
including pre-application meetings with local municipalities and stakeholders, open houses,
and a Project website with updates to the local community.

5.2.5 Terrestrial Biological Resources

Impacts to potential habitat for protected bats, shorebirds, amphibians, insects and/or plant habitats
would occur. Impacts to terrestrial wildlife would be partially mitigated by repurposing existing
waterfront facilities or using previously disturbed sites to the extent possible. Impacts to wildlife
may consist of temporary displacement, habitat loss, and direct mortality. Direct mortality is most likely
with less mobile species such as reptiles and amphibians and nesting birds. Habitat loss can cause more
mobile species such as birds and mammals to seek suitable habitat adjacent to the port facility. Some
species may be temporarily displaced during the construction phase but return to the site as noise levels
decrease during the operational phases of less disruptive OSW port facilities (CTVs, SOVs, etc.).
The Planned Alternative and Full-Build Alternative would result in very similar potential impacts to
terrestrial biological resources, including shorelines. However, impacts to terrestrial resources would
be higher at the new ports that would clear greenfield sites.
During construction and operations, the potential impacts to terrestrial biological resources may include:
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Clearing vegetation and potential terrestrial habitats for migrating, breeding, foraging or nesting.
Potential soil erosion into adjacent vegetation and wildlife habitat.
Potential accidental releases from construction vehicles or equipment affecting terrestrial habitats.
Potential disruption of wildlife travel corridors for migration, feeding and/or breeding.

Seven of the Full Alternative and three of the Planned Alternative sites may involve disturbance/removal of potential protected species habitat (see appendix D for further details). Two other sites, Port Ivory and Arthur Kill Terminal, would affect the shorebird and waterfowl habitat within and adjacent to designated RECs, including the Northwestern Staten Island Harbor Hens Area/Arlington Marsh (Port Ivory). Of the special-status listed birds, the piping plover and Red Knot are species that have designated critical habitat within shoreline environments of New York State.
As the port sites are located within Atlantic Flyway migratory corridor, a number of birds may potentially be affected during migration season between nesting and wintering areas (see Migratory Bird Listing in appendix D). In addition, the Northern long-eared bat and Indiana bat summer roosting habitat would be affected by proposed tree clearing at the port sites.
The proposed construction activities within the terrestrial resources, including shoreline habitats with wetlands would require USACE Section 10/404 Permits and NYSDEC Tidal Wetlands/Protection of Waters/Part 182 Incidental Take Permits, which would address impacts to protected species. In particular, seasonal work restrictions would be required by the permits, including avoiding the shorebird nesting and fledging seasons and clearing trees during the bat hibernation season. The permits would also require minimizing the clearance and disturbance of protected species habitats as practicable. NYSDEC

State Pollution Discharge Elimination System General Permit (SPDES GP) for Stormwater Discharges
(e.g., Stormwater Pollution Prevention Plan [SWPPP]) would also be required to implement soil erosion
and sediment control during construction. Further avoidance, minimization, and mitigation measures
can be applied to mitigate potential terrestrial impacts more responsibly: 77

- Siting within previously disturbed and developed areas to the extent practicable.
- Implementation of lighting reduction measures such as downward projecting lights, lights triggered by motion sensors, and limiting artificial light to the extent practicable, where safe and practicable to reduce attraction of avian species.
- Installation of anti-perching devices to discourage migratory bird landings, where appropriate.
- Management of accidental spills or releases of oils or other hazardous wastes through a SPCC Plan, as applicable.
- Implementation of "green stormwater infrastructure" such as vegetated swales and stormwater basins, etc. to address the increased stormwater runoff and water quality degradation.
- Consideration of staggering silt fencing or other erosion control devices in sensitive areas to facilitate the passage of biota, if deemed effective.
- Mitigating impacts to protected species habitat through "Net Conservation Benefit" Projects. A net conservation benefit is achieved when the adverse impacts of a proposed activity on a protected species or its habitat will be outweighed by the mitigation measures.

5.2.6 Sensitive Aquatic Resources

5.2.6.1 Wetland and Water Resources

The Planned Alternative and Full-Build Alternative would result in very similar potential impacts to
sensitive aquatic resources, including wetlands and protected fisheries habitat due to their waterfront
locations. For the Planned Alternative, the SBMT would have approximately five-acres of tidal open
water impacts from new infrastructure and four-acres/120,000 CY of dredging; 78 Port of Coeymans

would result in 5.3-acres/156,000 CY of dredging, 79 and the Port of Albany would impact approximately three-acres/105,000 CY dredging, and fill up to two acres 80 of tidally influenced freshwater wetlands; Port Jefferson would likely require about two acres of dredging; and Port of Montauk would have minimal dredging (0.41 acre/2,500 CY). 81 Based on the estimated impacts, the Planned Alternative may dredge approximately 15 acres of benthic habitat (sediments), fill five acres of tidal wetlands from new infrastructure impacts, and fill two acres of freshwater wetland impacts. Three of the Full-Build Alternative sites are new port sites that would require substantial dredging to benthic habitats to create new berths and substantial tidal wetland fill impacts involving regrading to create a level and elevated shoreline. Arthur Kill Terminal is approximately nine plus acres of tidal wetlands fill, three plus acres of freshwater wetlands from regrading site and new infrastructure, more than 25 acres of dredging. Port Ivory and NYS Port Wind would each require approximately 10 plus acres of tidal wetlands fill and 15 plus acres of dredging. The other eight ports are estimated to have relatively limited dredging (one acre each) and acreage of tidal wetland fill impacts (0.5 acre each). Assuming this estimation, the Full-Build Alternative may result in an estimated 80 acres of dredging impacts to benthic habitat and 40 acres of fill impacts to tidal wetlands, and five acres of freshwater wetland impacts. Specifically, within the Full-Build Alternative, the NYS Wind Port and Port of Albany would impact NYSDEC-mapped SAV, and intertidal mix wetlands of the SCFWH Papscane Marsh and Creek and the Normans Kill tidal creeks, respectively. Two ports on western Staten Island—Port Ivory and Arthur Kill Terminal—would potentially impact RECs with emergent, scrub-shrub and forested estuarine and marine wetlands along the shoreline. The regulatory agencies would require tailored wetland mitigation to compensate for impacts to these unique wetland habitats.

All port site in-water improvements, including dredging and in-water fills for infrastructure (riprap, bulkheads, trestles, etc.), would require securing the applicable USACE Section 10/404, NYSDEC Tidal and/or Freshwater Wetlands/Protection of Waters/Water Quality Certificate permits, at a minimum.

NYSDEC also regulates development within the wetland “adjacent area” or wetland buffer surrounding

wetlands. Based on the estimated benthic and wetland impacts at the sites, compensatory mitigation would be required at a majority of the port sites. As part of the regulatory process, it is important to acknowledge that avoidance and minimization measures must be undertaken first during planning and design of the project to demonstrate to the USACE and NYSDEC, that the wetland impacts have been minimized to the extent practicable. NYSDOS encourages developers to consider on-site dredged material management, as sediment characterization results are appropriate, and the management plan meets NYSDEC permitting requirements. Once these measures have been applied to the design, then justification can be given for the proposed wetland impacts.

Individual mitigation plans would need to account for losses of specific wetland types and meet USACE and NYSDEC requirements. In particular, “Net Conservation Benefit” mitigation are agency-preferred mitigation plans, whereby the proposed habitat creation or restoration benefits of the mitigation would outweigh the adverse impacts of a proposed activity on a protected species or its occupied habitat. Some port sites would require additional mitigation measures to account for site-specific resources present prior to dredging or installing new infrastructure, such as removing and transplanting the SAV beds or freshwater mussel bed(s) to approved locations offsite. The following regulatory mitigation options could be considered at the port sites to provide cost-effective and environmentally responsible wetland mitigation:

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Wetland Restoration: Reclaiming an on-site or off-site degraded wetlands to bring back one or more functions that have been partially or completely lost by such actions as filling or draining. It is a preferred form of mitigation because it typically has the greatest chance of successfully establishing natural wetland functions. Wetland studies, such as the Hudson River Comprehensive Restoration Plan or USACE Hudson Raritan Estuary (HRE) Study, could be considered for potential restoration sites.
Wetland Creation: Making a new wetland, usually by flooding or excavating lands that were not previously occupied by a wetland. It offers the benefit of maintaining no-net-loss of wetland acreage. Careful design, monitoring, and long-term maintenance are critical for wetland creation sites. Creation is especially successful when it is done by enlarging an existing wetland or waterbody.
Wetland Enhancement: Involves altering an existing functional wetland to increase selected functions and benefits to a degree that offsets losses of these functions or benefits in another wetland or parts of the same wetland.
Wetland Bank Credits: In the New York City area, the Saw Mill Creek Wetland Mitigation Bank may be available to purchase mitigation credits. However, there are limited mitigation credits available, and the credits would only be available to projects within NYSDEC Region 2 (New York City). Other wetland mitigation options would need to be explored for port sites outside New York City.

Other potential in-lieu fee programs that may be discussed with the USACE and NYSDEC as potential mitigation options:

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New York In-Lieu Fee Program (ducks.org): Middle-Hudson Watershed (proposed)

The Wetland Trust

Wetland and water quality impacts are minimized through the implementation of typical USACE Section 10/404 Permit and NYSDEC Tidal and/or Freshwater Wetland Permit conditions, such as
the use of environmental bucket/closed clamshell for dredging, silt curtains, sheeting, cofferdams,
floating containment booms, soil erosion and stormwater runoff controls. Depending on the level of
sediment contamination, dredged sediments could be drained and reused on site or other

locations with
approved Beneficial Use Determinations (BUDs) from NYSDEC. Port of Coeymans is planning on reuse
of sediments via a BUD and has been successful doing so in the past. Further mitigation measures would
be implemented through the implementation of NYSDEC SPDES GP/SWPPP to control soil erosion and
stormwater runoff and SPCC plan to manage petroleum storage and accidental spills or releases of oils
or other hazardous wastes.
Responsible measures to reduce disturbances to open waters, wetlands, and wetland buffer (adjacent) areas may include:

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Optimize use of and/or expand existing port facilities, to the extent practicable.
Minimize new shoreline hardening or waterward expansions of existing hardened shorelines.
Identify beneficial reuse options for dredged material during construction and maintenance dredging.
Design in-water port infrastructure and berth area design to minimize impacts within regulated wetlands and wetland buffer (adjacent) areas.
Designate vessel routes to avoid known areas of SAV.
Avoid construction access through regulated wetlands and waterbodies.

5.2.6.2 Species and Habitat
All the proposed port sites may have shortnose sturgeon, Atlantic sturgeon, and several EFH species
present at least during migration seasons (see appendix D for species listings). Shortnose sturgeon live
throughout the Hudson River and have known spawning grounds (spring season) in the vicinity of Port
of Albany, NYS Wind Port and Port of Coeymans, between the Troy Dam and Coxsackie, NY. Atlantic
sturgeon can be found throughout the Hudson River Estuary, as well as within the coastal waters of the
Atlantic Ocean and Long Island Sound, where they spend most of their adult life. Spawning by Hudson
River Atlantic sturgeon (a component of the NY Bight Distinct Population Segment) takes place during

spring in the vicinity of Hyde Park. Juvenile Atlantic sturgeon remain in the estuary for two to six years

before moving to the ocean to mature. It is also known that adult shortnose sturgeon also concentrate in overwintering areas over 50 miles south of the proposed project area from Saugerties to Hyde Park and to areas just south of Kingston, NY, near Esopus Meadows. Sturgeon are a demersal species and are typically found on the river bottom. According to recent telemetry monitoring conducted over four years in the vicinity of the Port of Coeymans,[82] the vast majority of sturgeon positions detected were in the channel of the Hudson River, where depths are 35 feet and greater. However, the majority of these tag detections represented mature fish; earlier life stages (larvae, post-larvae, juveniles) would potentially occupy a greater range of depth strata habitats and could potentially be subject to impacts occurring outside of the river channel.

Proposed in-water construction activities at the port sites, including dredging, pile installation, shoreline stabilization and other infrastructure improvements would be subject to USACE Section 10/404 Permits and NYSDEC Tidal Wetlands/Protection of Waters Part 182 Permits, which would address impacts to sensitive aquatic species such as sturgeon species. These construction activities would cause potential disruptions of fisheries during all life cycles, including to aquatic corridors during migration, foraging (feeding) and/or spawning seasons. The USACE federal permitting process would require Section 7 Endangered Species Act (ESA) consultations with the NMFS and USFWS, Section 106 consultations with New York State Historic Preservation Office (NYSHPO) and NEPA documentation would be required. Similarly, NYSDEC permitting process would require consultations with NYSDEC NHP and Section 14.09 consultations with NYSHPO and SEQRA documentation. Proper environmental review and permitting process scheduling should be accounted for each proposed port project, as applicable.

Dredging at the port sites would result in a permanent and temporary loss of sturgeon and other EFH species foraging habitat and benthic prey resources; however, the proposed dredging areas represents a small portion of habitat affected compared to the surrounding available foraging habitat at each port site (New York Harbor, Hudson River, Long Island Sound, etc.). Dredged sediment is anticipated to be permanently removed from the site. Benthic habitat impacts are anticipated to be temporary, as the benthic community is likely to recolonize the area over time following disturbance. More importantly, all proposed dredging would be subject to USACE Section 10/404 Permits and NYSDEC Tidal Wetlands/Protection of Waters Permits and NMFS review/approvals, which would require dredging to occur within a seasonal work window to avoid EFH and sturgeon species impacts. Within the Hudson

River, seasonal work windows for sturgeon would also be beneficial to the American shad, banded killifish, spottail shiner and alewife, which are other species known to have a spawning season similar to the sturgeon. However, depending on species present, additional seasonal work windows may be required. Further permit condition requirements typically require dredging within turbidity curtains and use of closed clamshells, depending on the sediment contamination.

In-water pile driving can produce lethal and sublethal underwater noise impacts to sturgeon that extend into the navigational channel.[83] Pile driving and in-water construction would also be subject to USACE Section 10/404 Permits and NYSDEC Tidal Wetlands/Protection of Waters/Part 182 Permits and NMFS review/approvals, which would require mitigation methods to reduce the risk of underwater noise impacts. To minimize pile driving underwater noise impacts, the federal and State permits may require underwater noise control measures such as drilled shaft pile installation, vibratory pile installation, and/or soft-start procedures to protect EFH or endangered fish species.

Sturgeon mortalities may occur from vessel strikes and a cumulative increase in vessel traffic associated with the Full-Build Alternative (discussed in greater detail in chapter 6) would likely result in increased risk of sturgeon mortality.[84] It should be noted that strikes to slower moving marine mammals and sea turtles may occur but would be rarer in comparison to potential for sturgeon strikes. Factors that potentially increase risk of vessel strike mortality are draft of vessel, speed of operation, width of river, and amount of temporal and spatial exposure. Deeper draft vessels occupy a greater portion of the water column and place the propellers closer to the river bottom where sturgeon are believed to spend the majority of their time. Increased risks of vessel strikes occur with vessels operating at greater speeds and within narrow areas of the river, which reduce the ability of sturgeon to avoid oncoming vessels. If vessel traffic is occurring over an area of sturgeon congregation or long-term residency it would increase the risk of vessel strikes.

Work barges (no propeller) and tugboats (propeller) used to support construction of the ports, construction of the OSW farms and major repairs during O&M would travel at slow speeds at the ports, usually under 3 knots.[85] Periods of active barge movements at a given port may involve one to two barge trips per day. Typical tugboat drafts are less than six feet, which leaves a large portion of the water column as clearance between the propeller and the depths sturgeon most commonly occupy. For these reasons, work barge activities may represent lower risk of vessel strikes. However fully loaded ocean-bound barges to support the construction of OSW farms may extend to 35 feet drafts, which causes regulatory agency concern for potential vessel strike impacts to sturgeon. For example, at the Port of

Albany, where existing barges typically have a 12 feet draft, the fully OSW-related barges would have a draft up to 35 feet draft within a narrow reach of the Hudson River. During O&M, crew vessel boats may have a draft of four to six feet; however, the boats would travel at higher speeds of 25–35 knots (28.8– 40.2 mph). Although these crew boats typically do have relatively shallow drafts, the higher speeds of the crew vessels present a higher risk of sturgeon strikes by vessel, depending on the presence and concentration of sturgeon at a given port site.

Further assessments of the cumulative potential increase in vessel strike impacts to sturgeon associated with the Full-Build Alternative are discussed in greater detail in chapter 6. Mitigation measures (such as reducing vessel speeds) would be identified during the ESA Section 7 consultation and USACE and NYSDEC permitting processes. Ultimately, federal and State (Part 182 Permits) Incidental Take Permits may be applied to a given port site to monitor and restrict the number of protected species incidentally injured or taken as a result of a project. Measures to address potential sturgeon and EFH impacts more responsibly include:

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Conducting Section 7 ESA consultation (with NMFS, NYSDEC, USFWS) meetings early in the permitting process and holding pre-application meetings with regulatory agencies as early possible to identify the best means to avoid and minimize impacts to sturgeon, EFH and other T&E species and inform the design early in the process.

Development of mitigation plans that incorporate benthic habitat restoration to create/restore foraging and spawning habitat for sturgeon and EFH species.

Implement slow speeds for project vessels within the port vicinity to reduce risk of sturgeon strikes.

Development of wetland mitigation plans that incorporate Net Conservation Benefits.

For ports on the Hudson River, development of wetland mitigation plans that incorporate elements the Hudson River Comprehensive Restoration Plan.

As applicable and required, perform telemetry monitoring and/or visual monitoring of sturgeon and other protected species during potentially harmful activities.

Proper planning and design of in-water port infrastructure and mooring areas to minimize impacts within marine habitats of sturgeon, EFH species and other sensitive aquatic resources.

Use of weighted turbidity curtains surrounding pile installation and dredging areas to prevent fish species from entering the work area and to limit the potential suspended sediments to escape the work area.
Adherence to in-water seasonal restrictions during sensitive times of year (e.g., migration, spawning, breeding, nesting seasons) to protect species, as required by regulatory agencies.
Apply construction best management practices (BMPs) to minimize turbidity and water quality impacts, including floating containment booms, sheeting containment or cofferdams, closed clamshell dredge equipment, as applicable.

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Plan for underwater noise and vibration mitigation methods to reduce impacts to protected fisheries, including drilled piles, vibratory hammers, soft start-ups to and wooden block buffers during pile driving, and deployment of vibration containment ("bubble curtains"), as applicable.
Apply exclusion zones and real-time monitoring systems as appropriate, to perform underwater noise assessments relative to impact thresholds, overseen by a qualified fisheries biologist based
on consultation with the regulatory authorities, as applicable.
Management of accidental spills or releases of oils or other hazardous wastes SPCC Plans in accordance with NYSDEC and USCG requirements, as applicable.
Implementation of NYSDEC-approved SPDES General Permit for Stormwater Discharges, including "green stormwater infrastructure" practices.
Implementation of lighting reduction measures such as downward projecting lights, lights triggered by motion sensors, and limiting artificial light to the extent practicable—where safe and practicable.

5.2.7 Cultural Resources

Ten of the Full-Build Alternative sites are within CRIS-mapped archaeological sensitive areas, typical
for shoreline areas, including Arthur Kill, Port Ivory, NYS Wind Port, Homeport Pier, Port Jefferson,
SBMT, Brooklyn Navy Yard, PAMT, Hempstead Public Works Area, and Port of Montauk. Historic
shorelines are commonly identified as archaeological sensitive areas. Only three sites had historic

architectural resources or historic districts in the vicinity, including PAMT, Brooklyn Navy Yard and Port of Coeymans. At least three sites (NYS Port Wind, Port of Albany, Port of Coeymans) are
located within the vicinity of known historic site of Native American significance requiring further consultation with Native American tribes/nations and other consulting parties to determine if adverse
effects would occur from the project(s). Specifically, on the Hudson River, while final approvals have not been issued, it appears there may be unavoidable and unmitigable direct impacts to Papscanee Island (significant Native American site) and unavoidable and unmitigable visual impacts
(views) from Papscanee Island and Schodack Island (both significant Native American sites) would
occur during fabrication of large OSW components. The NYS Wind Port site is located within the Papscanee Island Historic District of significance to the Stockbridge-Munsee Mohican Nation, which would likely unmitigable direct impacts to these historic resources.
NYSHPO consultation would be required at all sites, including a Section 14.09 process for State reviews
and a Section 106 process for federal review processes (required for USACE and other federal permits).
Direct and indirect effects would need to be assessed, including potential visual and/or contextual impacts
to historic resources within viewsheds of port sites (e.g., Port of Albany and Port of Coeymans are within
the viewshed of Native American tribal lands of significance). Upland ground disturbances and dredging
may disturb potential archaeological resources, and NYSHPO may require further investigations prior to

construction, and/or monitoring during excavations or dredging. If impacts to historic resources are
identified, Memoranda of Agreements (MOAs) or Letter of Resolutions (LORs) may be necessary to
document mitigation commitments. Depending on the location, NYSHPO consultations may also require
engagement with Native American tribes/nations and other consulting parties to review the design and
mitigation measures. Measures that may be adopted by OSW ports include, avoidance of archaeological
resources by siting projects within previously disturbed areas; committing to an archaeologist on site to
monitor during ground disturbances if required by NYSHPO; and the development and implementation

of an Unanticipated Discoveries Plan, which outlines the procedures to follow if archaeological materials or human remains are discovered.

5.2.8 Community Character

The Planned Alternative and Full-Build Alternative are not anticipated to adversely impact the broad elements of community character, land use, development patterns, population growth and density, and localized socioeconomic conditions. Four of the Planned Alternative sites and nine of the Full-Build Alternative sites have residential communities in the vicinity. However, most of the port sites would be located within or adjacent to existing ports and working waterfront areas, and consistent with the local community character. Within the neighboring residential communities of the port sites, temporary traffic, noise, visual and/or air quality effects may occur adjacent to the port sites and along the truck routes.

Temporary visual impacts would occur during manufacturing and staging large OSW components.

However, for pre-existing ports, over the long term, those ports would retain an appearance that is aesthetically similar to the existing industrial port uses.

It is anticipated that all the sites would apply for local municipality approvals and incorporate specific mitigation measures stipulated in the town/city approvals. In addition, each site would obtain federal coastal consistency concurrences from NYSDOS and incorporate related design and operational specifications requested.

To more responsibly address potential community character related impacts, mitigation measures identified in the land use (Section 5.2.2), traffic (Section 5.2.3), air quality (Section 5.2.11), noise (Section 5.2.12) could be incorporated. Local stakeholder and public feedback should also be incorporated into the site design and mitigation measures to minimize impacts on communities.

As a benefit to local communities, the construction and operations of the proposed OSW ports would create local job opportunities and stimulate the local economy, with added local business activity (restaurants, hotels, etc.). Over the long-term, the proposed OSW port improvements would represent major investments and stability for the local port, a potential employer for the community.

5.2.9 Hazardous Materials

The Planned Alternative and Full-Build Alternative sites would disturb contaminated fill and sediments
from former port operations and/or other past uses. For example, the Port of Albany site contains former
landfill soils of fly ash and bottom ash with metals and other contaminants.86
Dredging and in-water construction at the Port of Albany and NYS Wind Port along the Hudson River would likely disturb known pesticide and PCB-contaminated sediments. Sediment testing at Port
of Coeymans indicated that the proposed dredged material primarily met Class A concentrations and
Class B sediment contamination concentrations. Dredging at the ports within the NY Harbor would
likely disturb contaminated sediments such as heavy metals, pesticides, PAHs, and dioxins/furans
and potentially PCBs.
Two of the Planned Alternative and six of the Full-Build Alternative sites, all sited within existing ports, may demolish structures with potential hazardous building materials (e.g., asbestos). In addition,
upland soil excavations at all sites may disturb contaminated soils from previous port, industrial and
other past uses.
As part of environmental review and permitting requirements, the following plans and engineering
controls would be developed in coordination with the NYSDEC to mitigate potential effects to the environment and human health during construction and operations. Responsible measures to address
potential impacts include:

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Perform Phase I and Phase II Environmental Site Assessments (ESAs) to identify the locations and quantities of contaminated and hazardous materials that may be disturbed.
Prepare a Soil Management Plan to identify proper guidance and management for the handling, reuse, transport and/or disposal of contaminated soils in accordance with NYSDEC and EPA standards and regulations. Dust control measures should also be employed.
A dewatering and discharge plan should be prepared to guide proper management and treatment of groundwater encountered during excavation according to NYSDEC and

EPA standards and regulations.

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A Health and Safety Plan (HASP) should be established for the purpose of reducing the risk of contaminant exposure to workers and the public.
Restrict access to both onshore and offshore work sites to authorized and qualified personnel.
A Hazardous Materials Management Plan should be developed for testing, handling, transporting, and disposing of hazardous materials encountered during the proposed excavations, consistent with applicable regulations.
As applicable, perform investigations and develop engineering and institutional controls for remediation plans as required by the NYSDEC, including but not limited to: Remedial Investigation Work Plan (RIWP), Remedial Investigation Report (RIR), Remedial Action Work Plan (RAWP), Site Management Plan (SMP). Remedial Action Monitoring Plan (RAMP), Community Air Monitoring Plan (CAMP), and/or Community and Environmental Response Plan (CERP).
Prepare and implement a State Pollutant Discharge Elimination System (SPDES) General Permit for Construction Activities/Stormwater Pollution Prevention Plan (SWPPP) to control soil erosion and stormwater runoff.
Prepare and implement a Spill Prevention, Control, and Countermeasures (SPCC) plan to manage accidental spills or releases of oils or other hazardous wastes.

5.2.10 Flooding
Potential for tidal flooding from waters affected by sea-level rise exists at all of the Planned Alternative
and Full-Build Alternative sites, as 100-year floodplains are present on site, and floodways are adjacent.
At three of the Planned Alternative and eight of the Full-Build Alternative sites, a mapped 100-year
floodplain covers at least half the site. One site is located within a moderate wave action zone. However, this a common setting for coastal port locations.
To address potential flooding, the site plans would elevate the facilities above the floodplain and/or

reinforce infrastructure to meet (1) FEMA and floodplain design guidelines accounting for sea-level rise, wave action and floodways, (2) NYSDEC SFRMG floodplain design guidelines per 6 NYCRR 490, (3) Climate Change Adaptation Guidance on WRP Policy for ports in New York City and (4) other local town floodplain development permit requirements and building codes. Specifically, the SFRMG further recommends that the high sea-level rise projection be applied for critical facilities and equipment, and the medium projection be applied to non-critical facilities and equipment. Two feet of freeboard is required for enclosed structures; three feet is recommended for critical structures and equipment. In some cases, it may be sufficient to elevate critical equipment, e.g., electronic controls to the recommended elevation within structures that themselves cannot be feasibly constructed to the recommended elevation. NYSDOS Resilience Implementation and Strategic Enhancements (RISE) Local Assessment Tool should be referenced to also incorporate resilience principles and achieve

as many co-benefits from waterfront development, as possible. NYSDOS Office of Planning, Development and Community Infrastructure also provides support for coastal flood resiliency planning online 87, with key resilience principles to help understand their vulnerabilities, advance resilience measures that reduce risk, including through the use of natural infrastructure and natural processes, and avoid investments that are not highly adapted to a changing climate. See Section 4.8: Floodplains for additional discussion regarding flood-risk reduction.

To further address potential flood impacts, port facilities should avoid and minimize placement of structures within SFHAs, as practicable. Structures should be founded on concrete foundations to resist any flooding impacts and allow for positive drainage and surface flow to the proposed stormwater conveyance and treatment systems. In-water infrastructure should be sufficiently reinforced with pile foundations to resist buoyancy and other forces from flood waters and, where necessary, wave action.

To plan for flood emergency events, coastal evacuation plans should be prepared to transport

mobile
assets (materials, trucks, cars, fuels, etc.) from the flood prone areas.

5.2.11 Air Quality

Localized air quality impacts are not expected at the sites either during construction or operation since using effective BMPs would be employed, such as using ultra-low-sulfur diesel fuel and diesel
particulate filters, limiting idling on site, operating away from fresh air intakes, using engines with manufacturer emissions controls. As an example, the SBMT construction activities have been assessed
and would not have the potential to exceed the General Conformity thresholds for NAAQS nonattainment
or maintenance areas. 88 Truck routes would avoid residential neighborhoods to further reduce potential
impacts to the extent practicable. Specifically, north of the Port of Albany site, truck routes would be
required to avoid the Ezra Prentice neighborhood as part of the NYSDEC's Albany South End Community Air Quality Study with air monitoring programs and enforced truck restrictions. Once the ports begin an O&M phase, site emissions would drop significantly.
Dust would be generated from site excavation and grading to establish pad areas and haul roads,
demolition and construction activities, use of haul roads, material stockpiles, wharf construction activities,
and loading / unloading activities. BMPs to control dust typically include using water trucks to spray all
site roadways and stockpiles, utilizing atomizers, employing road sweepers as needed to clean haul roads,
and enforcing a maximum speed limit of 15 miles per hour to limit the minimization, pulverization, and
abrasion of dust particles.

GHG emissions assessments per Section 7(2) of the Climate Protection Act relative to the statewide
GHG limits of 6 NYCRR Part 496 would be required for each port site. GHG assessments of carbon
dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen
trifluoride would be required per the Climate Protection Act. GHG emissions assessments would also
need to adhere to NYSDEC's draft guidance CP-49 and DAR-21 that are currently being finalized.

NYSDEC Air Permitting (Air Facility Registrations, Title V Air Permit, etc.) and/or other applicable
provisions under 6 NYCRR Chapter III may be required for operations of petroleum-fired boilers, painting shops, welding and plasmas cutting, concrete facilities and other stationary facilities (welding, metalworking and assembly manufacturing/pre-fabrication) with exhaust emissions. Air quality impacts at the port sites are not expected through the implementation NYSDEC Air Permitting requirements and effective BMPs at each of the sites. Further, the short-term emissions
during construction activities would be greatly offset by the net air quality benefits of the OSW project
operations by providing a long-term clean air, renewable energy source that would help eliminate the
CO_2, methane and other GHG emissions from the existing fossil fuel energy generation in New York
State. During environmental review, port sites would be expected to meet the General Conformity
Requirements. Further cumulative air quality related benefits of the implementation of the Full-Build Alternative are discussed in chapter 6.

5.2.12 Noise

A majority of the Planned Alternative and Full-Build Alternative sites have a residential area in the
vicinity that may experience noise during construction, including truck-related noise on the roadways.
Most OSW ports are sited on an active port in an industrial area with high-ambient noise levels. During
construction at the port sites, temporary elevated noise from trucks, marine vessels, cranes, excavators,
pile drivers, and other construction equipment.
Construction noise impacts would be mitigated by implementing noise reduction measures according to a
noise mitigation plan that complies with the NYSDEC Assessing and Mitigating Noise Impacts Program
Policy and local noise ordinances. Responsible noise mitigation plans typically specify noise thresholds
per equipment type, noise exceedance correction process, installation of noise barriers, mufflers, engine
enclosures, noise insulating fabric, intake silencers, restrict the use of compression braking, use electric
tools, minimize idling, regular equipment maintenance and backup alarms. Impact devices such as
jackhammers, pavement breakers, and pneumatic tools should not be used during nighttime or weekends.

Pile driving and in-water construction would also be subject to USACE Section 10/404 Permits and NYSDEC Tidal Wetlands/Protection of Waters Permits and NMFS review/approvals, which would require mitigation methods to reduce the risk of aboveground and underwater noise impacts. NYSDEC permitting may also require 6 NYCRR Part 182 related threatened and endangered species noise controls.

To meet the regulatory permit conditions, further noise reduction measures should be employed, such as drilled shaft installation of piles, vibration installation of piles initially, initial pile tapping method prior to impact pile driving, “bubble curtains,” and/or other methods to minimize noise associated with pile driving to the lowest practicable level possible.

All port sites would need to comply with the adopted noise mitigation plan governing the site during construction and operations. Once the O&M phase of the port is underway, the noise levels would drop substantially especially at OSW ports with SOV or smaller CTV support. However, OSW ports that would continually have manufacturing, staging, or other heavy OSW operations, significant noise impacts may continue, requiring ongoing noise controls and mitigation measures.

6 Cumulative Impact Assessment Summary

Cumulative impacts can occur when multiple actions affect the same environmental resource simultaneously or sequentially. It is the combination of these effects, and any resulting socioeconomic, environmental, or navigational degradation, that is the focus of cumulative impact analysis. The concept of cumulative impacts considers all disturbances since cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the

total effects on a resource, ecosystem, or human community of that action and all other activities
affecting that resource no matter what entity (federal, non-federal, or private) takes the action(s).
To assume an optimal scenario of ports within New York State, it was determined that 12 port sites
would be the best alternative to produce the necessary OSW port output to fully achieve and potentially
exceed the State's 2035 OSW energy target, based on COWI's ports supply demand modeling effort. 89
The Planned Alternative and Partial-Build Alternative would be viable alternatives, but the Full-Build
Alternative would represent the best option to meet or exceed the 2035 OSW energy target. As a result,
the cumulative impacts assessment qualitatively evaluated the concurrent development of all 12 port sites,
comprising the Full-Build Alternative, as a worst-case scenario to determine the potential for significant
cumulative effects. The potential for beneficial and adverse cumulative effects of the Full-Build Alternative are summarized below.
Please Note: Port developers will likely need to provide additional cumulative impact analyses in accordance with federal and State environmental review requirements, beyond what's provided in
the report. For example, non-Port related projects should be evaluated in a cumulative impacts analysis. This would likely include evaluating other large-scale development projects occurring within the study area and during the same timeframe for context.

6.1

Beneficial Cumulative Effects

Overall, implementing the Full-Build Alternative would maximize positive socioeconomic impacts in the form of economic development, workforce employment, increased property values and tax revenues, and the avoidance of adverse health outcomes. Reducing pollution by even modest
amounts in highly populated areas regions of New York, resulting in significant public health-related
socioeconomic benefits. These socioeconomic benefits would occur at local, county, state, and/or
regional levels. 90 Specifically, benefits of the Full-Build Alternative meeting and/or exceeding the
2035 OSW energy target would include:

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Public Health Benefits: The Full-Build Alternative would maximize the reduction in coal and gas-fired power generation pollution emissions, thereby maximizing the health benefits of avoided emissions of GHGs and criteria air pollutants. Air pollution from coal-fired power plants 91 – including CO_2, NO_x, SO_x and air-borne inorganic particles such as fly ash,
carbonaceous material (soot), suspended particulate matter (SPM) – is linked with respiratory disease, cardiovascular disease, cancer, neurological problems, acid rain, global warming, and other environmental and public health impacts. With the Planned Alternative alone, New York would avoid more than 8.7 million tons of GHG emissions, 1,800 tons of NO_x, 780 tons of SO_2,
and 180 tons of $PM_{2.5}$ compared to a business-as-usual scenario without OSW energy. These emissions reductions would nearly double under the Full-Build Alternative. As increased use of offshore wind power would lead to improved air quality, society benefits from reduced negative health impacts and increased employee productivity. As an example, State health care expenditures for treatment of asthma, acute bronchitis, and respiratory conditions would be reduced. 92 Improved health benefits would be realized, including fewer adverse health outcomes or premature deaths annually with the air quality improvements of OSW power generation. New Yorkers would also save approximately $4 billion in health costs (respiratory disease, cardiovascular disease, cancer, neurological problems) and, more importantly, avoid 100s fewer premature deaths under the Build Alternative, in proportion to the Planned Alternative. The Full-Build Alternative would also reduce the harmful health-related effects of acid rain, including improvements to water quality, less corrosion to drinking water pipes, and a reduction in respiratory problems caused by acid rain.
Economic Benefits: In terms of job creation in New York State, the Full-Build Alternative is estimated to support a total of 34,288 job-years (jobs each year) during construction followed by 1,309 job-years to operate and maintain the OSW energy projects for a total of 32,403 job-years. This represents over a 60% increase in jobs compared to the Planned Alternative (A job-year means one job per year or the average jobs created per year over the total number of years). The OSW industry can be expected to not just create large numbers of construction labor jobs, but also create high quality long-term job opportunities, many of them related to technologically advanced products and processes. Social and community investment expenditures are expected to support another 1,080 job-years over the life of the projects.
Environmental Justice: To actively support EJ and disadvantaged communities at the Program level, the NY/NJ Bight Regional Working Group on Supply Chain Development would be continually coordinating the enhancement of the domestic supply chain to deliver benefits and economic opportunities to underserved, disadvantaged, and overburdened

communities. NYCEDC's OSW NYC Vision Plan would include a $191 million OSW investment within New York City that would create over 13,000 jobs and generate $1.3 billion in average annual investment and reduce 34.5 million tons of CO_2 – the equivalent of removing nearly 500,000 cars from roadways for 15 years. NYCEDC and its partners have collaborated to activate the SBMT as an OSW port and support the Empire Wind Project. As part of their operation at SBMT, the Empire Wind Project plans to establish a $5M fund to ensure that low-income populations, people of color, and New Yorkers from EJ communities equitably share in the benefits of the industry. The Offshore Wind NYC program would: (1) direct

40% of job and investment benefits to women, minorities, and EJ communities; (2) bring local jobs and environmental benefits to historically disadvantaged communities along the waterfront; (3) provide investments in professional training programs at the Global Wind Organization training centers (SUNY, local colleges, etc.) to create pipelines to OSW jobs. Overall, thousands of construction and O&M jobs would be generated in close proximity to EJ communities along New York State's waterfront, resulting in sustainable employment opportunities.

Electricity Rate Benefits: The Full-Build Alternative provides more affordable energy than fossil fuel-based power generation and maximizes cost-effectiveness of OSW for New York State ratepayers.93

Workforce Employment Benefits: The State's investments in professional training at the Global Wind Organization training centers (SUNY, local colleges, etc.) would facilitate a new generation of OSW professionals within New York State to capture the job opportunities of the emerging OSW industry.

Property Value and Housing Benefits: As a secondary regional benefit of the OSW energy production, with the decommissioning of fossil fuel-based power generators and improved health benefits, property values and tax revenues would increase, as well as demand for permanent and/or rental housing. 94

Reduced Climate Change Effects: The Full-Build Alternative would provide a maximum

State-wide OSW contribution to reducing the rate of climate change. By operating 9,000 MW of OSW by 2035 and eliminating the equivalent fossil fuel energy GHG emissions contributing to climate change, the reduced emissions would support slowing the rate of climate change. Climate change projections indicate potential sea-level rise of up to 6 feet and increased temperatures between 4° Fahrenheit (F) and 10° F by the year 2100 for the northeastern United States. Constructing the Full-Build Alternative would maximize the State-wide OSW contribution to reduce the harmful effects of climate change, including flooding and coastal erosion from sea-level rise and storm surge, and extreme heat events and summer droughts. 95

Ecosystem benefits of reduced impacts on water uses since wind turbines require nearly no water to operate and "would not strain water supply by competing with agriculture, drinking water systems, or other important water needs." The OSW Program would reduce New York's reliance on electricity generated by fossil fuels and, as a result, reduce pollution discharges into water bodies. 96

Fuel diversity benefits as the addition of new renewable electricity supplies also would reduce the State's reliance on natural gas and other fossil fuels.97

Economic development benefits. The development of offshore wind energy is expected to net billions of dollars of State and regional economic benefits, including economic development, tens of thousands of jobs, increased property values and tax revenues and opportunities for the underserved, disadvantaged, and overburdened communities. To facilitate this, the NY/NJ Bight Regional Working Group on Supply Chain Development would be actively coordinating to meet mutual regional OSW energy targets related to enhancing the domestic supply chain. 98

6.2

Potential for Adverse Cumulative Effects

The port sites are geographically distributed across three New York State regions with sufficient distance in between so that most localized effects at any one site would not overlap with the localized effects of another site or accumulate over time. As a result, there is no potential for cumulative adverse impacts to land use compatibility, EJ communities, vehicular traffic, community character, hazardous materials, localized air quality, or noise either during operations or construction of the port sites.

Land Use Patterns and Socioeconomic Conditions–The Full-Build Alternative has no potential to change land use patterns in the regions and would not result in substantial conversion of environmentally sensitive areas to industrial use. Three ports would be new developments within vacant land; however, the sites are zoned for industrial/manufacturing uses and are located away from sensitive land uses (residences, schools, etc.). The other nine ports sites would be redeveloped existing ports with compatible land use and zoning. Collectively, the OSW ports would not be expected to adversely impact the broad elements of community character, or population growth or density in the New York State regions. The program would not alter or accelerate development patterns, and real estate market conditions adjacent to the port sites would not be expected to change as a result of the port development (although the OSW program as a whole may increase property values and taxes in the State). Since most of the identified development sites are historic or existing industrial waterfront sites and their incremental effects would be compatible with existing land use and zoning, there would be no potential for adverse cumulative effects to result from development of the 12 OSW port sites. As a result, adverse cumulative impacts on land use patterns and socioeconomic conditions would not result from program implementation.

Vessel Navigation–The Full-Build Alternative is estimated to result in a 4% increase in vessel traffic would occur at the confluence of the Ambrose Channel south of the NY Harbor (gateway to the OSW farms), assuming all of the projected vessels from the OSW ports operating concurrently. 99 Given the large volume of traffic on the river and the wide variability of traffic in any given day, the increase in traffic associated with the OSW ports is small. For example, two of larger manufacturing OSW ports (Port of Coeymans and Port of Albany) would both add approximately two to four round barge trips per week and one vessel per month for the delivery of inbound materials, which would not represent a significant increase in vessel traffic when compared to the overall commercial traffic of 3,000 barges

and vessels, exclusive of recreational boating traffic, that is currently occurring on the Hudson River. 100

Overall, the quantity of OSW vessel traffic would not pose additional risk to vessel safety to

existing
waterways within New York State. 101 The use of barges and vessels for the delivery and shipping of
materials/products reduces the need for trucks, further minimizing the impact on the surrounding roadway network.
BMPs and related measures necessary to manage new vessel traffic depends largely on the size,
maneuverability, and density of traffic. To ensure a reliable and efficient marine transportation system
within the Hudson River, it would be responsible for ports to coordinate with the HRSNOC. In the
New York Harbor vessel traffic would be managed by U.S. Coast Guard's Vessel Traffic Service
(VTS). Even conservatively assuming a 4% increase in vessels of the Full-Build Alternative operating
concurrently, the New York Harbor would have the capacity to support the additional OSW industry
vessel traffic. The USCG would require regular communication using the LNM to the local marine
community, providing updates construction-related and O&M vessel traffic. 102
Environmental Justice–Three quarters of the port sites have EJ communities present in the vicinity
which may experience traffic, air quality, and noise impacts and along truck routes, similar to non-EJ
communities in the vicinity. Each port site would be required to analyze potential impacts to EJ
communities and disadvantaged communities in accordance with NYSDEC Commissioner Policy 29
and Section 7(3) of the Climate Act and/or federal EO 12898 criteria to identify any disproportionately
high and adverse effects on EJ populations, conduct public outreach and incorporate measures to
avoid, minimize and mitigate impacts. These port-related impacts are not anticipated to create cumulative
adverse impacts to EJ communities, and the regulatory process required mitigation measures would
be implemented to protect the quality of living in the neighborhood. For example, at the Port of Albany,
the town is requiring truck routes that avoid EJ neighborhoods to eliminate the potential for air quality,
traffic and noise impacts.
To actively support EJ communities and provide cumulative economic benefits at the Program level,
the State has number of programs and tools in place. NYSERDA's procurement of ORECs will assign

20% of the score of each project proposal to economic benefits, including benefits to disadvantaged communities, creation of workforce training opportunities, and job creation. The Climate Justice Working Group established by the NYS Climate Act will identify disadvantaged communities and

help ensure that the benefits of climate change responses accrue to these disadvantaged communities.

The State is also committed to requiring developers to pay workers a prevailing wage and to utilize project labor agreements. New York has invested $20 million to establish the Offshore Wind Training Institute in partnership with NYSERDA and SUNY Stony Brook and Farmingdale to train a new workforce for the OSW industry at the affordable SUNY institutions.

In addition, to actively support EJ communities at the Program level, the NY/NJ Bight Regional Working Group on Supply Chain Development will be continually coordinating to meet mutual regional OSW energy targets related to enhancing the domestic supply chain and deliver benefits and economic opportunities to underserved, disadvantaged, and overburdened communities. The Offshore Wind NYC program would: (1) direct 40% of job and investment benefits to women, minorities, and EJ communities; (2) bring local jobs and environmental benefits to historically disadvantaged communities along the waterfront; (3) provide investments in professional training programs to create pipelines to OSW jobs.

The OSW port projects would also be required to undertake EJ assessments and implement applicable avoidance, minimization, and mitigation measures to address potential impacts. Overall, thousands of construction and O&M jobs would be generated in close proximity to EJ communities along New York State’s waterfront and the resulting regional benefits of job creation and sustainable employment would offset temporary effects of construction of the port sites and avoid cumulative impacts to EJ communities.

Terrestrial Biological Resources – Impacts to potential habitat for protected bats, shorebirds, amphibians, insects and/or plant habitats would occur. However, the collective impacts (vegetation clearing) would be localized across the State and would not be expected to be of a scale to cause broad

cumulative impacts that would imperil or critically impact terrestrial species within the State’s coastal
environment. Impacts to terrestrial wildlife will be partially mitigated by repurposing existing waterfront
facilities or using previously disturbed sites to the extent possible. Each of the proposed sites would
undertake environmental review and consultation with USFWS, and USACE and NYSDEC permitting
processes to minimize and mitigate impacts, such as clearing trees during the bat hibernation season,
avoiding construction during the bird nesting and fledging seasons, and installing anti-perching devices
to discourage migratory bird landings.

Impacts to wildlife can consist of temporary displacement, habitat loss, and direct mortality. Direct
mortality is most likely to affect fewer mobile species such as reptiles and amphibians and nestling birds.

Habitat loss can cause more mobile species such as birds and mammals to seek suitable habitat adjacent
to the port facility. Some species may be temporarily displaced during the construction phase but return

to the site as noise levels decrease during the operational phases of less disruptive port facilities
(CTVs, SOVs, etc.). Adherence to federally stipulated work windows (primarily to avoid the nesting
season) would reduce the potential for impact to protected birds.

Cumulative impacts may be synergistic – where the combined effect of multiple impacts may be greater
than the sum of individual impacts alone. However, the port sites would undertake environmental review,
and USACE and NYSDEC permitting processes to identify avoidance, minimization and mitigation
measures reduce terrestrial species and habitat impacts to the best extent practicable. In accordance
with the required permits, effective mitigation measures would be implemented, including: clearing trees
during the bat hibernation season; avoiding construction during protected bird nesting/fledging seasons,
and installing anti-perching devices to discourage migratory bird landings; and/or mitigating impacts

to protected species habitat through “Net Conservation Benefit” Projects. A net conservation benefit mitigation project is intended enhance of the species' overall population or contribution to the recovery of the species in New York. In cases where potential construction-related impacts to a specific species cannot be fully mitigated, NYSDEC and federal agencies may require incidental take permits and monitoring and reporting of species takes or injuries to ensure the regional stability of populations.

Overall, the collective impacts (vegetation clearing) of the Full-Build Alternative would be localized across the State and would not be expected to be of a scale to cause broad cumulative impacts that would imperil or critically impact terrestrial species within the State’s coastal environment, especially with the successful implementation of permit requirements, including seasonal work windows, monitoring of incidental take and the implementation of acceptable habitat mitigation plans, including Net Conservation Benefit Projects.

6.2.1 Aquatic Biological Resources

6.2.1.1 Wetlands/Open Waters

The Full-Build Alternative may result in an estimated cumulative loss of 80 acres of dredging impacts to benthic habitat, approximately 40 acres of fill impacts to tidal and tidally influenced wetlands/open waters, and approximately five acres of emergent freshwater wetland impacts. Impacts to at least two mapped SAV complexes, one freshwater mussel bed, two SCFWH tidal creek complexes and two RECs with emergent, scrub-shrub and forested estuarine and marine wetlands within the aggregated study area are anticipated. Important functions of these tidal and tidally influenced wetlands would be lost in the Capital Region, NY Harbor and Long Island coastal areas, including tidal surge buffers; protection from shoreline erosion; retention of excess nutrients; vital forage habitat for clams, crabs, and juvenile

fish; and providing shelter and nesting sites for migratory waterfowl. Similarly, the permanent loss

of four acres freshwater wetlands would lose freshwater wetland functional values, such as fluvial floodwater retention, water quality filtration, and fish and wildlife habitat. Dredged sediment impacts would be a significant marine species habitat impact, however these impacts are anticipated to be temporary, as benthic communities have been shown to recolonize the area over time when the dredging depths are not a substantial change. The cumulative wetland impacts from OSW ports would represent significant a loss.
However, compensatory mitigation measures would be required by the USACE and NYSDEC permits, including wetland restoration, wetland creation, wetland enhancement, wetland bank credit purchases and acceptable in-lieu fee programs (where appropriate). Wetland mitigation plans would require increased ratios for wetlands created, restored or enhanced off-site and would need to account for losses of specific wetland types and functions in port impact areas. Off-site tidal wetland mitigation would also relocate lost wetland function. The wetland mitigation site would benefit the new location, but the port location would permanently lose the flood attenuation and habitat functions. Wetland mitigation goals would also be required to compensate for habitat loss for wetland-dependent wildlife species, where specific restoration measures would not only provide wetland acreage but compensate for lost habitat and provide a net conservation benefit specific to each mitigation site. Climate change and resultant (and modeled) sea-level rise would be factored into mitigation site planning (grading, planting lists, community types) to ensure that proposed wetland communities would persist over time. Responsible mitigation plans coordinated with federal and State regulatory agencies, such “Net Conservation Benefit” Projects would the goal of replacing wetland functions and values in the vicinity.

6.2.1.2 Habitat and Species

Wetland losses affecting aquatic biological resources from dredging and fill activities of the Full-Build Alternative would likely have a cumulative impact on protected fisheries, shellfish, wildlife, and aquatic plant species. Two ports would affect SCFWH tidal creek complexes, and two ports would have impacts to RECs – these unique wetland complexes provide important habitat for waterfowl, amphibians, fish, and migratory birds. Cumulative losses of spawning, foraging, overwintering and juvenile habitat for sturgeon and other EFH species would occur, particularly in the Hudson River. Dredged sediment impacts would be a significant marine species foraging and spawning habitat impact, however these impacts are anticipated to be temporary, as benthic communities have been shown to recolonize the area over time when the dredging depths are not a substantial change.

Proposed in-water construction, including dredging, pile installation, and shoreline stabilization likely requires USACE Section 10/404 Permits, NYSDEC Tidal and/or Freshwater Wetlands/Protection of Waters Permits, Part 182 and NMFS approvals to address impacts to wetlands and other, waters of the U.S., and sensitive aquatic species and habitat, particularly to sturgeon and EFH-managed species. Permit requirements would be designed to avoid and minimize impacts to aquatic biological resources and may require mitigation (e.g. restoration or creation of habitat). Some port sites would require additional mitigation measures to account for site-specific resources present prior to dredging or installing new infrastructure, such as removing and transplanting the SAV beds or freshwater mussel bed(s) to approved locations offsite.

Cumulative impacts of construction activities would also cause potential disruptions of fisheries during all life cycles, including during migration, foraging (feeding) and/or spawning seasons. The federal and State permits would require dredging to occur within a seasonal work window typically to avoid sensitive migration, foraging and/or spawning seasons, and include sediment containment measures (silt curtains, closed clamshell, etc.) to reduce EFH and sturgeon species impacts. To minimize pile driving-related

underwater noise impacts to sturgeon, the federal and State permits may require underwater noise control
measures such as drilled shaft pile installation, vibratory pile installation, and/or soft-start procedures.
Displaced habitat impacts is an important factor, as sturgeon species are known to return to the same
locations for spawning, overwintering and foraging. Responsible mitigation plans would mitigate habitat
loss impacts to protected species through “Net Conservation Benefit” Projects coordinated with the
regulatory agencies would have the goal of enhancing affected species recovery and overall population
growth. USACE and NYSDEC wetland permits would require mitigation plans that would potentially
create or restore the wetland habitats, however, the wetland would be displaced and relocated away
from the source, most likely.
The cumulative increase in vessel traffic associated with the Full-Build Alternative would also
increase the risk of sturgeon mortality, particularly in areas of the Hudson River that overlap with
sturgeon spawning areas and vessel traffic. Overall, the Full-Build Alternative is estimated to result in
a 4% increase in vessel traffic at the confluence of the Ambrose Channel south of the NY Harbor
(gateway to the OSW farms), assuming all of the projected vessels from the OSW ports operating
concurrently. Given the volume of traffic on the Hudson River and NY Harbor, and the wide variability
of traffic in any given day, the increase in traffic associated with the OSW ports is relatively low.

For example, two of the larger manufacturing OSW ports (Port of Coeymans and Port of Albany)
would both add approximately two to four round barge trips per week and one vessel per month for
the delivery of inbound materials, which would not represent a significant increase in vessel traffic
when compared to the overall commercial traffic of 3,000 barges and vessels annually, exclusive of
recreational boating traffic, that is currently occurring on the Hudson River.
It is assumed that increased risk of vessel strikes of sturgeon species would be commensurate with
the cumulative 4% increase of vessel traffic from OSW ports at the Ambrose Channel south of

NY Harbor. Additional factors increasing the risk of sturgeon strikes are deep vessel drafts from loaded barges, propeller depths of barges, faster speeds of smaller vessels like CTVs, narrow reaches of the Arthur Kill and Hudson River, and additional temporal and spatial exposure to sturgeon species attributed to OSW ports. However, each of the port sites would undertake Section 7 ESA Consultation processes, and USACE and NYSDEC permitting processes to identify avoidance, minimization, and mitigation measures to reduce sturgeon strikes to the best extent practicable. In accordance with the required permits, effective avoidance and minimization measures would include requiring slow speeds for project vessels in sensitive sturgeon habitat areas, avoiding sensitive seasonal windows, and other measures such as telemetry monitoring and/or visual monitoring of sturgeon during potentially harmful activities. Ultimately, depending on the anticipated impacts to sturgeon, NYSDEC and federal agencies may require incidental take permits and monitoring and reporting of species takes or injuries to ensure the regional stability of populations. As part of these incidental take permits, mitigation projects may be required, to address the direct take of individual sturgeon or the adverse modification or take of habitat that supports essential behaviors of sturgeon. This mitigation may involve the creation or enhancement of benthic habitat for sturgeon away from the port facilities. Overall, the collective potential for sturgeon strikes related to the Full-Build Alternative would not be expected to be of a scale to cause broad cumulative impacts that would imperil or critically impact the species within the State’s coastal environment. However, it will be critically important to reduce cumulative adverse impacts to sturgeon and other EFH species by implementing the effective avoidance, minimization, and mitigation measures collectively at each port, including slow vessel speeds, following seasonal work windows, monitoring of incidental take and the implementation of acceptable mitigation plans, including “Net Conservation Benefit” Projects.

Cultural Resources–In the event that adverse effects to archaeological resources would result from port development, cumulative impacts could accrue resulting in the loss of historical resources. Aside from three sites that would affect areas of Native American significance, there is low risk for unmitigable adverse effects. NYSHPO consultation would be required at all sites. Depending on the resources affected, NYSHPO consultations may require engagement with Native American tribes/nations and other consulting parties to review the design and mitigation measures. If adverse effects are identified, the project design would be required to either avoid, minimize and/or mitigation these adverse effects to acceptable terms by NYSHPO and the consulting parties. Cultural resource impacts would be mitigated through commitments, such as monitoring during construction, that would be agreed to in the MOAs with NYSHPO and consulting parties.

Hazardous Materials–The Full-Build Alternative sites would disturb contaminated fill soils and dredging and in-water construction in the upper Hudson River would likely disturb PCB-contaminated sediments. However, as part of environmental review and permitting requirements, the NYSDEC and other regulatory authorities would require additional investigations, and management and disposal plans to mitigate potential local and cumulative effects to the environment and human health during construction and operations. The clean-up and restoration of brownfield sites to active use would be a regional benefit by reducing the potential for existing contamination to migrate offsite.

Floodplains and Resiliency–Full-Build Alternative sites are within 100-year floodplains and adjacent to floodways. Developments would be designed to meet FEMA, NYSDEC and local floodplain design guidelines to withstand forces from flood waters and function after major flooding events. Since the port developments would be within tidal floodplains connected with the vast Atlantic Ocean, the collective fills and improvements would not necessarily cause increased flood elevations along the coastal waterfront, as compared to developments in fluvial floodplains. Port improvements would be required to be designed appropriately to meet federal, State and local design criteria to avoid cumulative flooding impacts locally or on a regional scale.

Noise–Three quarters of the sites have a residential area in the vicinity that may experience port site and truck-related noise during construction activities. During the operational phase, the noise levels would drop substantially in areas of SOV and CTV operations. Many OSW ports are sited on an active port in an industrial area with high ambient noise levels. Noise impacts are a localized effect. These localized noise impacts would be mitigated by noise controls and best practices in accordance with noise mitigation plans developed in accordance with NYSDEC Assessing and Mitigating Noise Impacts Program Policy,

local noise ordinances and contractual requirements. Further, pile driving and in-water construction would also be subject to USACE and NYSDEC permitting, which would require mitigation methods to reduce the risk of aboveground and underwater noise impacts. Due to the geographic dispersion of OSW port sites, cumulative noise impacts would not occur, even if the port sites are developed concurrently.

Air Quality and GHG–Short-term exhaust emissions from marine vessels, trucks and construction equipment would be mitigated through NYSDEC Permitting and BMPs, including use of low-sulfur fuels, restricting engine idling time, use of electric tools, use of vessels that meet BACT and LAER requirements to reduce emissions. Analyses of one of the ports in a densely developed area of New York City has confirmed that the port would not exceed the General Conformity thresholds for NAAQS nonattainment or maintenance areas. Further, the short-term emissions of the OSW ports that would occur regionally during construction would be greatly offset by the regional net air pollution reduction (CO_2, methane, $PM_{2.5}$ and other GHG) that would occur once the 9,000 MW of the OSW farms are operational. Overall, an extensive cumulative benefit of improved air quality and reduced levels of GHG pollutants to the region afforded by the full buildout of 9,000 MW of OSW energy.

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Conclusion

According to the COWI's Regional Ports Supply Demand Model 103 and related OSW planning research by the State, the collective OSW infrastructure output of the Full-Build Alternative would be an optimal scenario to achieve and potentially exceed the 9,000 MW OSW energy target by 2035. By comparison, the Planned Alternative and Partial-Build Alternative would still be viable to potentially meet the 9,000 MW OSW target by 2035 and would result in similar, but proportionally less potential environmental and navigation related impacts than the Full-Build Alternative. The Full-Build Alternative would provide the maximum socioeconomic benefits to New York State and its residents, particularly through job creation, affordable clean power, and long-term public health benefits (air quality improvements, GHG reduction, etc.).

The Full-Build Alternative would result in greater levels of environmental impacts, but similar to those expected from the Partial-Build Alternative and Planned Alternative, as identified in this study. The types and degree of impacts identified in the published environmental review documentation for the Planned Alternative ports would be comparable to the Full-Build Alternative, particularly in relation to issues of concern: wetlands, threatened and endangered species habitat, EFH species, vessel strikes of sturgeon species, cultural resources, traffic, air quality and noise. Measures to mitigate those effects is also expected to be similar, as identified in this study.

The cumulative impacts of the study alternatives would be localized or regionally specific, but the overall cumulative impact for port development would be minimal for most resource areas, with the exception of key sensitive resources, including tidal wetlands, sturgeon species and habitat, EFH species and habitat, and cultural resources. Recognizing the potential for cumulative and unmitigable impacts to these important biological resources and cultural resources (Native American sites), it will be imperative for proposed port developments to undertake more focused planning and design efforts coordinated with regulatory agencies to avoid, minimize, and mitigate impacts during the environmental review and regulatory permitting processes.

To proactively anticipate and address cumulative impacts of proposed OSW ports, this study has identified BMPs and mitigation measures for developers to consider. Environmental review and regulatory permitting would be conducted for port development at the time they are proposed, which would assess, at the site-specific level, all relevant potential environmental impacts. Pre-application meetings and coordination with federal and State regulatory agencies will be

very important to identify the potential adverse impacts early in the design process and receive guidance on the best avoidance, minimization (BMPs) and mitigation measures. As an additional safeguard to mitigation measures, regulatory agencies may require incidental take limits on protected species and monitoring (noise levels, sturgeon movements, water quality, etc.) of impacts to ensure proper protection of sensitive resources. The federal and State permitting regulatory processes have mechanisms to deal with localized impacts, but cumulative impacts often go beyond those review processes, which underscores the importance of further use of BMPs developed in a more environmentally responsible manner during construction and operations should be implemented to further reduce any potential for cumulative impacts to occur.

The Full-Build Alternative represents an optimal scenario to not only meet or potentially exceed the 2035 OSW energy target, but as identified in this study, it will be important for all port developments to proactively address potential adverse impacts early in the environmental review and permitting processes to minimize the potential for unmitigable and cumulative impacts. Overall, the successful implementation of the Full-Build Alternative would maximize the socioeconomic benefits of the OSW program for

New
York State residents, such as improved public health, air quality, jobs, and reducing GHG emissions
affecting climate change.

By undertaking proper environmental review and permitting processes the potential adverse environmental impacts would be addressed in a responsible manner and ensure that viable OSW ports
would be used to fully support and implement the State's OSW program on schedule. As ports continue
to be identified for development to meet or exceed the State's 9GW goal or if future state or regional
goals change, this study could be updated more adequately reflect the associated cumulative impacts.

Please Note this Disclaimer: This study's identification and discussion of the potential impacts do not substitute for future site-specific analyses of potential environmental impacts for the sites evaluated herein. Environmental review and regulatory permitting would be conducted for future offshore wind energy development and/or transmission projects at the time they are proposed, which would assess, at a site-specific level, all relevant potential environmental impacts. This study's
identification and discussion of the potential impacts of the Proposed Action do not substitute for future site-specific analyses of potential environmental impacts for particular projects but does provide supporting information.

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Appendix A. Port Location Maps

Port Locations Overview Map

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Jefferson
Brooklyn Port
Authority Marine
Terminal (PAMT)

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New York

New York
Port Ivory

Brooklyn
Navy Yard

South Brooklyn
Marine Terminal
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Arthur Kill
Terminal

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Hempstead
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Homeport Pier

Port Locations

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Brooklyn Port Authority Marine Terminal Location Map

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NYS Wind Port Location Map

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NYS Wind Port
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Hempstead Public Works Location Map

Hempstead Public Works Area
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Appendix B. Port Characterization Tables

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B.1

Port Facility Characteristics

Table B-1. Site Characteristics: Port of Albany-Rensselaer
Sources: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017); APDC Port of Albany
Expansion Project SFEIS (2022)

Characteristic

Description

Location

Address: East of River Road (NYS Rt. 144) south of Normans Kill and north of
PSEG property Town of Bethlehem, Albany County, NY. Primary parcel located
on Beacon Island.
Latitude: 42o37’26” N
Longitude:73o45’25” W

Proposed OSW Usage

Manufacturing steel towers, blades and other components; staging.

Investment / Upgrade
Required

Moderate: Clear site of vegetation and previous unusable infrastructure (old piles, etc.), fill and grade site, install access road(s) to River Road, install new bulkhead/wharf, and dredge berth area. Roadway and rail access from the north would require a bridges over the Normans Kill. Construct tower manufacturing facility with five buildings (four on-site, one at existing Port of Albany with addition of rail spur for deliveries. Small area (under one acre) may be acquired from National Grid for proper site access.

Owner

Albany Port District Commission: http://www.portofalbany.us
(operates adjacent, 400-acre facility 24-hours/day)

Significant Tenants

Federal Marine Terminal:

http://www.fmtcargo.com/locations/albany/index.html
Ben Weitsman
Ardent Mills
Westway Terminal Co

Distance to Wind Energy
Areas (WEAs)

NY WEA: 314.1 km (195.2 miles)

Area

Total Proposed OSW Expansion Area acres: 82 acres consisting of a 4.8 acre parcel along the west side of South Port Road and a 76.8 acre parcel south of Normans Kill; includes area below MHHW

Wharf Area

45,500 square feet (SF), approximately 27,500 SF over water

Wharf Length(s)

500 linear feet (LF)

Navigable Depth

Berth: 25 ft. – 30 ft. MLLW (with dredging)
Channel: 32 ft. MLLW federally authorized channel

Limiting Air Draft
Restrictions (facility to
unrestricted offshore area)

Mid-Hudson Bridge: 134 ft.
Verrazano-Narrows Bridge: 198 ft. for the center 2,000 ft.
215 ft. maximum at the centerline

Intermodal Connections

2.2 miles to Interstate I-787 and I-90, adjacent freight railway connection planned

Surrounding Land Use

Undeveloped (west), industrial (north & south), and rural/suburban (west)

Notes

Expansion of existing Port of Albany, which is an existing 24-hour facility that spans over 400 acres on the Albany and Rensselaer sides of the Hudson River and has short- and long-term leases available within port property.

Table B-2. Site Characteristics: Port of Coeymans
Sources: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017); Port of Coeymans Offshore
Wind Infrastructure (POWI) DEIS (2021); Sunrise Wind COP (2021)

Characteristic

Description

Location

Address: 2170 River Road, Ravena, 12143. Expansion area proposed to the eastside of Route 144, and west side of Interstate 87/NYS Thruway.
Latitude: 42o29’03” N
Longitude:73o48’05” W

Proposed OSW Usage

Fabrication of steel foundation components, and other OSW components.

Investment / Upgrade
Required

Moderate: Demolition of six (6) buildings [displace the existing C&D Processing Facility, which will be relocated to the adjacent Coeymans Industrial Park property], located toward the center of the POC site will total approximately 45,500 SF. Construction of steel tower fabrication and storage areas, associated buildings, new wharf installation for heavy components load out, breasting/mooring dolphins, pile supported catwalk, concrete batch plants to manufacture concrete, limited site grading, material storage, upgraded roads, and dredging.

Owner

P&M Brick, LLC of Carver Companies

Significant Tenants

Same as the owner

Distance to Wind Energy
Areas (WEAs)

NY WEA: 298.5 km (185.5 miles)

Area

Proposed OSW Expansion Area acres: ~122 acres of upland area.

Water Frontage

993.6 m (3,260 ft.)

Wharf Length(s)

Approximately 122 m (400 ft.) long; can accommodate vessels up to 228 m (750 ft.)

Navigable Depth

Berth: 9.1 m (30 ft.) MLLW (with dredging from 3.7 m (12 ft.))

Channel: 9.8 m (32 ft.) MLLW federally authorized channel

Limiting Air Draft
Restrictions

Mid-Hudson Bridge: 40.8 m (134 ft.); Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.) 65.5 m (215 ft.) maximum at the centerline

Intermodal Connections

Adjacent to Interstate I-87, on-site rail access to the freight rail network

Surrounding Land Use

Port industrial and undeveloped, rural setting

Notes

Existing waterfront terminal used for large-scale construction projects.

Table B-3. Site Characteristics: South Brooklyn Marine Terminal
Sources: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017); South Brooklyn Marine
Terminal Pre-FEED Report (2018); Empire Wind COP (2021)

Characteristic

Description

Location

Address: 31st to 39th Streets in Brooklyn, NY 11232
Latitude: 40°39'34" N
Longitude: 74°00'39" W

Proposed OSW Usage

Potential fabrication of steel towers, blades and other components; staging

Investment / Upgrade
Required

Moderate: Demolish existing buildings and the rail spur on the 39th Street Pier to increase available laydown area and facilitate ground bearing capacity improvements. Install two 30 MT/m² (6,000 PSF) heavy load quays, including: 213 m (700 ft.) long along the northwest end of the 39th Street Pier; and 200 m (660 ft.) long along the southwest end of the 39th Street Pier. Stabilize the 35th Street Pier Revetment to increase the load capacity. Limited site grading and dredging.

Owner

The City of New York (owner), Department of Small Business Services

https://www1.nyc.gov/site/sbs/index.page

New York City Economic Development Corporation https://www.nycedc.com
Significant Tenants

Red Hook Container Terminals: http://redhookterminals.com/

Sims Municipal Recycling: https://www.simsmunicipal.com/contact/
Distance to Wind Energy
Areas (WEAs)

Equinor Empire Wind Offshore Wind Farm: 81 km (51 mi) Hudson South Area: 127 km (79 mi) Hudson North Area: 132 km (82 mi) Fairway North Area: 189 km (118 mi) Fairway South Area: 145 km (90 mi) Deepwater Wind South Fork Windfarm: 274 km (170 mi)

Area

Total South Brooklyn Marine Terminal Facility acres: 35.6 hectares (88 acres); Total Proposed OSW Facility Area acres: approximately 25.8 hectares (64 acres) of upland area (above MHHW) and 4.0 hectares (10 acres) of area below MHHW

Water Frontage

1,950 m (6,400 ft.) available to offshore wind

Wharf Length(s)

Southwest face of the 39th St Pier - 710 ft. Northwest face of the 39th St Pier 650 ft. 35th St Pier - 280 ft. *Due to the relieving platform construction method selected along the 39th Street Pier and the offshore face of the 35th Street Pier, other areas may be used as secondary berths.

Navigable Depth

Berth: 10.7 m (35 ft.) MLLW
Channel: 12.2 m (40 ft.) MLLW federally authorized for Bay Ridge Channel

Limiting Air Draft
Restrictions (from facility to
unrestricted offshore area)

Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.) 65.5 m
(215 ft.) maximum at the centerline

Intermodal Connections

Adjacent to Interstate I-278, on-site rail access

Surrounding Land Use

Industrial, residential, commercial

Notes

Site has additional availability. Air draft challenges if used as a staging port.

Table B-4. Site Characteristics: Port Jefferson
Source: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017)

Characteristic

Description

Location

Address: Beach Street, Port Jefferson, NY 11777
Latitude: 40o57’00” N
Longitude:73o04’20” W

Proposed OSW Usage

O&M for Service Operations Vessels (SOCs)

Investment / Upgrade

Required

Minimal-Moderate:
Possible limited demolition, site grading, wharf modifications and limited dredging

Owner(s)

Port Jefferson Power Station: http://www.lipower.org/

Northville Industries: https://www.northville.com/Locations.aspx
Miller Marine Services:

http://www.millermarineservices.com/
Tilcon Port Jefferson Terminal:
http://www.tilconny.com/location.htm?StoneQuarry-Port-Jefferson-New-YorkSuffolk-County-NYS
ignificant Tenants

Unknown

Distance to Wind Energy
Areas (WEAs)

NY WEA: 271.2 km (168.5 miles)
South Fork Project (BOEM commercial lease OCS-A 0486): 162.1 km (100.7
miles)

Area

Potential OSW Facility acres: ~25 acres; includes area below MHHW

Water Frontage

Approximately 805 m (2,640 ft.)

Wharf Length(s)

Maximum tenable vessel length is approximately 88 m (289 ft.)

Navigable Depth

Berth: Unknown
Channel: 8 m (26 ft.) MLLW (Port Jefferson Harbor Channel)

Limiting Air Draft
Restrictions

None

Intermodal Connections

Approximately 14.5 km (9 miles) to I-495; 2 km (1.3 miles) to existing railway

Surrounding Land Use

Industrial, commercial, residential, park

Notes

Port Jefferson Inner Harbor is located at the southern extent of Port Jefferson
Harbor. Repurposing existing ports, the degree of modification is unknown.

Table B-5. Site Characteristics: Port of Montauk
Sources: NYSERDA 2018 Ports Assessment: Offshore Wind Operations and Maintenance Port Facilities (2018); NYSERDA New York State
Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017); Sunrise Wind COP (2021); NYSDEC Permit Application
Information (2022)

Characteristic

Description

Location

Address: 541 East Lake Drive, Montauk, NY 11954
Latitude: 41o04’32” N
Longitude:71o56’04” W

Proposed OSW Usage

O&M for Crew Transfer Vessels (CTVs)

Investment / Upgrade
Required

Minimal: limited demolition, site grading, wharf modifications and dredging. O&M

facility would include a stationary crane for equipment transfer and up to three vessel berths for CTVs. Modifications may include reinforcement and/or rehabilitation of quayside(s). Construction of a new O&M Facility would include: (1) Removal of existing piles and docks. (2) Dredging approximately 2,500 cubic yards in the existing marina to accommodate deeper draft CTVs. An approximately 0.41acre area of Lake Montauk will be dredged to a depth of -12.4 feet mean low water with an additional one foot of allowed overdredge. (3) Maintenance repairs to the existing bulkhead including new waler and tie rods. (4) Construction of a new floating pontoon dock (100 feet long by 16 feet wide with 5 feet of freeboard). (5) Installation of five 2-feet diameter steel pipe piles and one 2-feet diameter steel monopile to secure the pontoon dock and provide mooring for Crew Transfer Vessels. (6) Installation of an aluminum gangway (28 feet long by 4 feet wide

Owner

Inlet Seafood Property, LLC, C & W Land Co, LLC,
Town of East Hampton

Significant Tenants

Inlet Seafood http://inletseafood.com/
9 Acre Compound

Distance to Wind Energy
Areas (WEAs)

NY WEA: 170.6 km (106 miles)
South Fork Project (BOEM commercial lease OCS-A 0486): 61.1 km (38 miles)

Area

Total Proposed OSW Facility acres: ~10 acres; includes area below MHHW

Water Frontage

2,398.8 m (7,870 ft.)

Wharf Length(s)

Floating aluminum pontoon – 31m (100 ft.)
Along bulkhead – 43m (140 ft.)

Navigable Depth

Berth: Unknown
Channel: Reach A (east): 3.7 m (12 ft.) MLLW; Reach B (west, boat basin): 3 m (10 ft.) MLLW (Montauk Harbor Channel)

Limiting Air Draft
Restrictions

No published air draft restrictions based on NOAA navigation chart; however, Montauk Airport may affect air draft if tall components are moved into the area.

Intermodal Connections

4 km (2.5 miles) to State Route 27

Surrounding Land Use

Residential, commercial, marinas

Notes

Existing dock facility with large parking lot and adjacent 3.6 hectare (9 acre) lot.

B.2

Full Build Alternative (additional 7 ports)

Table B-6. Site Characteristics: Arthur Kill Terminal
Sources: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017); NYSERDA OREC RFP Arthur
Kill Terminal (2020)

Characteristic

Description

Location

Address: 4849 Arthur Kill Road, Staten Island, NY 10309; along the Arthur Kill, just south of the Outerbridge Crossing, west of Arthur Kill Road, and north of Mill Creek outlet
Latitude: 40o31’23” N
Longitude: 74o14’31” W

Proposed OSW Usage

Staging (Wind Turbine Generator (WTG))

Investment / Upgrade
Required

Significant site modifications:
Dredging, quay and upland grading, filling and paving work, site establishment activities, including site preparing and clearing of vegetation, installation of gates and fencing, preparation of laydown areas for material storage and contractor parking, set-up of construction offices, temporary facilities, and utilities, installation of lighting, site demolition and removal activities, construction of a wharf, and civil works associated with construction of the warehouse, office, and paving.

Owner

Melohn Capital LLC

Significant Tenants

One single family residence abutting Arthur Kill Road

Distance to Wind Energy
Areas (WEAs)

Equinor Empire Wind Offshore Wind Farm 1: 76 km (47 mi)

Area

Total Proposed OSW Facility acres: 13 hectares (32 acres) consisting of approximately 9.4 hectare (23 acres) of upland area (above MHHW) and 3.7 hectare (9 acres) of submerged land (area below MHHW) between the shoreline and bulkhead line

Water Frontage

457 m (1,500 ft.) on the Arthur Kill and 152 m (500 ft.) on Mill Creek

Wharf Length(s)

400 m (1,300 ft.) quayside

Navigable Depth

Berth: 10.1 m (33 ft.) MLLW (with dredging)
Channel: 10.7 m (35 ft.) MLLW federally authorized Arthur Kill Channel

Limiting Air Draft
Restrictions

None

Intermodal Connections

.4 km (.25 miles) to New York State Route 440, 6.4 km (4 miles) to the Garden State Parkway, .8 km (5 miles) to existing railway

Surrounding Land Use

Residential, commercial, industrial, manufacturing

Notes

Vacant, greenfield site with the exception of several unimproved access roads throughout the site and a natural shoreline.

Table B-7. Site Characteristics: Port Ivory
Source: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017)

Characteristic

Description

Location

Address: 300 Western Ave, Staten Island, NY 10303
Latitude: 40o38’25” N
Longitude:74o11’23” W

Proposed OSW Usage

Fabrication (Offshore Substation (OSS) components)

Investment / Upgrade
Required

Moderate: Vegetation clearing, grade and fill site to increase load bearing capacity,
site demolition (i.e. pavement and pier), dredging, and construction of pilesupported wharf

Owner

Port Authority of NY & NJ
http://www.panynj.gov

Significant Tenants

Global Container Terminal:
http://www.globalterminalsnewyork.com

Distance to Wind Energy
Areas (WEAs)

NY WEA: 90.4 km (56.2 miles)

Area

Total Proposed OSW Expansion Area acres: ~64 acres located north of existing
container terminal; including Parcels B and C.

Water Frontage

972m (3,189 ft.)

Wharf Length(s)

Minimum of 765.7m (2,512 ft.)

Navigable Depth

Berth: TBD
Channel: 15 m (50 ft.) MLLW (Arthur Kill, Elizabeth-port Reach)

Limiting Air Draft
Restrictions

Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.)

65.5 m (215 ft.) maximum at the centerline

Intermodal Connections

Adjacent to I-278; on-site rail access

Surrounding Land Use

Industrial, commercial

Notes

Busy container terminal. Storage area to the north of the terminal owned by the
Port Authority and used by GCT.

Table B-8. Site Characteristics: Homeport Pier
Source: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017)

Characteristic

Description

Location

Address: 305 Front Street, Staten Island, NY 10304
Latitude: 40o37’57” N
Longitude: 74o04’26” W

Proposed OSW Usage

O&M

Investment / Upgrade
Required

Minimal-Moderate:
Possible limited demolition and vegetation clearing, site grading, wharf modifications, and dredging

Owner

NYC Parks

Significant Tenants

Same as owner

Distance to Wind Energy
Areas (WEAs)

Equinor Empire Wind Offshore Wind Farm 1: 39 km (24 mi)

Area

Total Homeport Pier Facility acres: ~11.3 hectare (28 acres); includes area below MHHW

Water Frontage

623 m (2,044 ft.)

Wharf Length(s)

429.8 m (1,410 ft.)

Navigable Depth

Berth: 11.3 m – 13.7 m (37 ft. – 45 ft.) MLLW
Channel: West edge: 22.9 m (75 ft.) MLLW; East edge: 29 m (95 ft.) MLLW; 29.9 m (98 ft.) maximum depth MLLW (Ambrose Channel)

Limiting Air Draft
Restrictions

Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.) 65.5 m (215 ft.) maximum at the centerline

Intermodal Connections

Maritime and rail access, 3.2 km (2 miles) access to I-278

Surrounding Land Use

Residential, commercial, marinas

Notes

Underutilized waterfront site with additional availability

Table B-9. Site Characteristics: Brooklyn Navy Yard
Source: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017)

Characteristic

Description

Location

Address: Kay Ave, Brooklyn, NY 11249
Latitude: 40o42’24” N
Longitude:73o58’11” W

Proposed OSW Usage

O&M

Investment / Upgrade
Required

Minimal-Moderate:
Repurposing exiting port with possible limited demolition, site grading, wharf modifications and dredging.

Owner

Brooklyn Navy Yard:
http://brooklynnavyyard.org

Significant Tenants

Same as owner

Distance to Wind Energy
Areas (WEAs)

NY WEA: 89 km (55.3 miles)

Area

Potential Brooklyn Navy Yard Facility available: ~ 11.1 hectares (27.5 acres) of underutilized existing port facility at northern extent of Navy Yard.

Water Frontage

1,706 m (5,597 ft.)

Wharf Length(s)

Approximate lengths: Face: 150 ft.; South Side: 500 ft.+350 ft.;
North Side: 800 ft.

Navigable Depth

Berth: 7.62m (25 ft.) MLLW; 15.2m (50 ft.) MLLW on face of pier
Channel: 10.67m (35 ft.) MLLW ☾ East River

Limiting Air Draft
Restrictions

Brooklyn Bridge - 39m (127 ft.)

Intermodal Connections

0.7 km (0.4 miles) miles to Interstate I-278
Industrial rail at adjacent facility

Surrounding Land Use

Brooklyn Navy Yard, Steiner Studios, NYC Auto Auction

Notes

Underused section on the northern extent of the Brooklyn Navy Yard. NYC Energy LLC/SEF Industries wants to build a floating power generator along Pier K. Upland residential developments proposed. Upland area estimated on Google Earth. The Brooklyn Navy Yard website states the area of the entire asset as 121.4 hectares (300 acres).

Table B-10. Site Characteristics: Brooklyn Port Authority Marine Terminal
Source: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and

Infrastructure (2017)

Characteristic

Description

Location

Address: 70 Hamilton Ave, Brooklyn, NY 11231
Latitude: 40o41’07” N
Longitude:74o00’34” W

Proposed OSW Usage

O&M

Investment / Upgrade
Required

Minimal-Moderate:
Repurposing existing port; Possible limited demolition, site grading, wharf modifications and dredging

Owner

Port Authority of NY & NJ
http://www.panynj.gov

Significant Tenants

Red Hook Terminals:
www.redhookterminal.com

Distance to Wind Energy
Areas (WEAs)

NY WEA: 89.8 km (55.8 miles)

Area

Total Brooklyn Port Authority Marine Terminal Facility acres; ~49.4 hectares (122 acres); includes area below MHHW

Water Frontage

4,876.8m (16,000 ft.)

Wharf Length(s)

Pier 12 North: 97.5m (320 ft.); Pier 12 West: 277.4m (910 ft.); Pier 12 East: 213.4m (700 ft.); Pier 11 Face: (1,400 ft.); Berths 1 & 2 Face: 411.5m (1,350 ft.); Berths 1 & 2 Rear of Face: 106.7+198.1m (350+650 ft.); Pier 9B Face: 97.5m (320 ft.); Pier 9B South: 198.1m (650 ft.); Pier 9B North: 213.4m (700 ft.); Pier 9A Face: 97.5m (320 ft.); Pier 9A South: 192m (630 ft.); Pier 9A North: 228.6m (750 ft.); Pier 8 Face: 97.5m (320 ft.); Pier 8 South: 207.3m (680 ft.); Pier 8 North: 304.8m (1,000 ft.)

Navigable Depth

Berth: 12.8 m (42 ft.) MLLW
Channel: 10.7 m – 12.1 m (38 ft. - 42 ft.) MLLW at midchannel with lesser depths at the side of the channel (Buttermilk Channel)

Limiting Air Draft
Restrictions

Verrazano-Narrows Bridge: 60m (198 ft.) for the center 610m (2,000 ft.) 65.5m (215 ft.) maximum at the centerline

Intermodal Connections

Adjacent to Interstate I-278; rail access not available

Surrounding Land Use

Industrial and commercial

Notes

Existing, underutilized waterfront terminal. South end is shared with cruise terminal. Site included in Vision 2020 NYC Comprehensive Waterfront Plan, complimentary goals with OSW. Site has additional availability.

Table B-11. Site Characteristics: NYS Wind Port
Source: NYSERDA New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017)

Characteristic

Description

Location

Address: American Oil Road, East Greenbush, NY 12144
Latitude: 42o36’17” N
Longitude:73o45’24”W

Proposed OSW Usage

Component Manufacturing

Investment / Upgrade
Required

Clear site of vegetation, fill and grade site and wetlands, install/improve access road(s), to American Oil Road, install new bulkhead/wharf, and dredge berth area.

Owner

NYS Offshore Wind Port

Significant Tenants

Unknown

Distance to Wind Energy
Areas (WEAs)

NY WEA: 314 km (195 miles)

Area

Total Proposed OSW Facility acres; ~36.8 hectare (91 acres); includes area below MHHW

Water Frontage

3,700+ Ft.

Wharf Length(s)

Unknown

Navigable Depth

Berth: unknown
Channel: 9.8 m (32 ft.) MLLW federally authorized channel

Limiting Air Draft
Restrictions

Mid-Hudson Bridge: 40.8 m (134 ft.)
Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.) 65.5 m (215 ft.) maximum at the centerline

Intermodal Connections

Maritime access, vehicle, and rail access

Surrounding Land Use

Undeveloped, industrial, coastal industrial, residential, and parks

Notes

New port, allows for growth and expansion of waterfront industrial users

Table B-12. Site Characteristics: Hempstead Public Works Area
Sources: NYSERDA 2018 Ports Assessment: Offshore Wind Operations and Maintenance Port Facilities (2018); NYSERDA New York State
Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017)

Characteristic

Description

Location

Address: 1401 Lido Boulevard, Point Lookout, NY 11569
Latitude: 40o35’36” N
Longitude: 73o35’21” W

Proposed OSW Usage

O&M

Investment / Upgrade
Required

Possible limited demolition, site grading, wharf modifications and dredging

Owner

Town of Hempstead, Long Island Department of Conservation and Waterways

Significant Tenants

Same as owner

Distance to Wind Energy
Areas (WEAs)

NY WEA: 39.3 km (24.4 mi)
Equinor Empire Wind Offshore Wind Farm 1: 27 km (17 mi)
South Fork Project (BOEM commercial lease OCS-A 0486): 206.5 km (128.3 miles)

Area

Total Hempstead Public Works Area Facility acres; ~1.2 hectares (3 acres); includes area below MHHW

Water Frontage

240 m (780 ft.)

Wharf Length(s)

Unknown

Navigable Depth

Site: 0-2 m (0-6 ft.) MLLW, dredging may be needed
Channel (in vicinity of site): 4-6 m (13-20 ft.) MLLW (Reynold’s Channel)

Limiting Air Draft
Restrictions

Fixed Bridge:
Horizontal Clearance 9 m (30 ft.)
Vertical clearance of 6 m (20 ft.)

Intermodal Connections

4.8 km (3 miles) to Meadowbrook State Parkway, 6.4 km (4 miles) to rail access at the LIRR Long Beach Station

Surrounding Land Use

Commercial and industrial

Notes

Existing public works facility adjacent to commercial and light industrial facilities with waterfront uses.

Appendix C. Environmental Figures

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Low Density Residential

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Medium Density Residential

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High Density Residential

Vacant

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Transportation

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Utilities

Institutional

Waste Management

Albany
Boston
Providence

New York

Philadelphia

Existing Port

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Proposed OSW Port

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Brooklyn Port Authority Marine Terminal Land Use Map
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NYS Wind Port Land Use Map

NYS Wind Port
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LAND USE MAP

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Proposed OSW Port
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Hempstead Public Works Land Use Map

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Hempstead Public Works Area
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Proposed OSW Port
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LAND USE MAP

HEMPSTEAD PUBLIC WORKS
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Port of Albany-Rensselaer Zoning Map

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ZONING MAP

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Existing Port
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PORT OF COEYMANS
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South Brooklyn Marine Terminal Zoning Map

Port Jefferson Zoning Map

Port Montauk Zoning Map

Arthur Kill Terminal Zoning Map

Port Ivory Zoning Map

Homeport Pier Zoning Map

Brooklyn Navy Yard Zoning Map

Brooklyn Port Authority Marine Terminal Zoning Map

NYS Wind Port Zoning Map

Hempstead Public Works Zoning Map

Port of Albany-Rensselaer Floodplain Map

Port of Coeymans Floodplain Map

South Brooklyn Marine Terminal Floodplain Map

Port Jefferson Floodplain Map

Port Montauk Floodplain Map

Arthur Kill Terminal Floodplain Map

Port Ivory Floodplain Map

Homeport Pier Floodplain Map

Brooklyn Navy Yard Floodplain Map

Brooklyn Port Authority Marine Terminal Floodplain Map

NYS Wind Port Floodplain Map

Hempstead Public Works Floodplain Map

Appendix D. Threatened and Endangered Species Information (NYDEC, NHP, USFWA IPaC, and EFH)

December 13, 2021
Christopher Coccaro
HDR
2711 Westchester Avenue
White Plains, NY 10604-3504
Re: NYSERDA Ports Cumulative Impact Assessment and Alternatives Analysis Study
Dear Christopher Coccaro:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.
Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur at the proposed project sites or in their vicinities.
For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.
The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law, please consult with the NYSDEC Division of Environmental Permits.

Sincerely,

976

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

New York Natural Heritage Program

Report on Rare Animals, Rare Plants,
and Significant Natural Communities

625 Broadway, Albany, NY 12233-4757
(518) 402-8935 naturalheritage@dec.ny.gov

The following rare plants, rare animals, and significant natural communities have been documented in the Natural Heritage database in or near the project sites for the

Ports Cumulative Impact Assessment and Alternatives Analysis Study
December 2021

This report includes animal species listed by NYS as Endangered or Threatened; these are highlighted in the report. For information regarding any permit considerations for listed anima species,
contact the NYSDEC.
Other animal species in this report, while not listed by NYS as Endangered or Threatened, are rare in New York and of conservation concern.
Plant species in this report are listed by NYS as Endangered, Threatened, or Rare, and are of conservation concern.
Natural communities in this report are considered state-significant by the NY Natural Heritage Program. Each community is an example of a community type that is rare or uncommon in the state,
and/or is a high-quality example of its type. NY Natural Heritage considers these community occurrences to have high ecological and conservation value.
COMMON NAME

SCIENTIFIC NAME

NY STATE LISTING

NY STATE RANK*

Arthur Kill Landfill
Endangered
Peregrine Falcon
Falco peregrinus
Endangered
S3B
Outer Bridge Crossing, nesting on pier in Arthur Kill near bridge, within .15 mile of project site.

Birds

Dragonflies/
Damselflies

Comet Darner

Anax longipes

Unlisted

S2S3

Comet Pond and surrounding wetlands and fields, .4 mile northeast of project site.
Plants

Torrey's Mountain Mint
Pycnanthemum torreyi
Endangered
Vegetated roadside along Veterans Road West, .5 mile northeast of project site.

S1

Brooklyn Navy Yard
Birds

Peregrine Falcon
Falco peregrinus
Williamsburg Bridge, nesting on bridge.

Endangered
Endangered

S3B

Threatened
Threatened

S3B

Brooklyn Port Authority Marine Terminal
Birds

Common Tern

Sterna hirundo

Governors Island, nesting on piers and breakwaters.

COMMON NAME

SCIENTIFIC NAME

NY STATE LISTING

NY STATE RANK*

Charadrius melodus

Endangered
Endangered

S3B

Common Tern

Sterna hirundo

and federally Threatened
Threatened
Threatened
S3B

Least Tern

Sternula antillarum

Threatened
Threatened

S3B

Black Skimmer

Rynchops niger

Special Concern

S2

Seabeach Amaranth

Amaranthus pumilus

Threatened

S2

Hempstead Public Works Area
Birds

Plants

Piping Plover

and federally Threatened
Nassau and Lido Beaches, within .5 mile of project site (birds are nesting).
Communities

High Salt Marsh
S1S2
Low Salt Marsh
S1S2
Salt Panne
S1S2
Very large salt marsh complex, with patches along Reynolds Channel within .25 mile of project site.

Homeport Pier – no records of concern
Port Ivory
Birds

Peregrine Falcon
Falco peregrinus
Nesting on Goethals Bridge, about 250 yards from project site.
Least Bittern
Pied-billed Grebe

Ixobrychus exilis
Podilymbus podiceps

Endangered
Endangered

S3B

Threatened
Threatened
Threatened
Threatened

S3B
S3B

Nesting in tidal marshes along Pralls Creek and extending to within 1/3 mile of project site.

Threatened
Threatened

S2S3B,S2N

Amphibians

Unlisted

S1S2

Plants

Endangered

S1

Bald Eagle
Haliaeetus leucocephalus
Nesting on Shooters Island, within 1 mile of project site.
Atlantic Coast Leopard
Lithobates kauffeldi
Frog
Wetlands, ponds, and ditches south of Old Place Creek.
Square-Stemmed Spike
Eleocharis quadrangulata
Rush
Pond about ¼ mile east of project site.

Persimmon
Diospyros virginiana
Threatened
S2

North shore of Old Place Creek, down slope from I-278 ramp and Gulf Avenue, about 1/3 mile southeast
of project site.

COMMON NAME

SCIENTIFIC NAME

NY STATE LISTING

NY STATE RANK*

Port Jefferson
Communities

Marine Back-barrier lagoon
S2
Port Jefferson Harbor: a moderately large marine lagoon that is in mostly good ecological condition.

Port Montauk
Birds

Charadrius melodus

Endangered
Endangered

Common Tern

Sterna hirundo

and federally Threatened
Threatened
Threatened

Least Tern

Sternula antillarum

Threatened

Threatened

S3B

Threatened
Threatened

S3B,S3N

Piping Plover

S3B

Nesting on beach about .2 mile northeast of project site.
Northern Harrier

Circus hudsonius

Nesting in fields in Montauk County Park, which is adjacent to project site.
Communities

Maritime Beach

S2
S2S3

Marine Intertidal Gravel/Sand Beach

Large beach communities along shore of Montauk Peninsula, including within .1 mile of project site. Communities are in good condition, within a protected, approximately 3000-acre natural area.

South Brooklyn Marine Terminal – no records of concern
Port of Coeymans
Birds

Bald Eagle

Haliaeetus leucocephalus

Threatened
Threatened

S2S3B,S2N

Nesting within .5 mile of project site, in Schodack Island State Park.
Fish

Shortnose Sturgeon
Hudson River.

Plants

Estuary Beggar Ticks

Acipenser brevirostrum

Endangered
Endangered
S1
and federally Endangered

Bidens bidentoides

Rare

S3

Shore of Hudson River in Schodack Island State Park, directly opposite project site
Plants

Yellow Giant Hyssop
Floodplain Forest
Schodack Island State Park.

Agastache nepetoides

Threatened

S2S3
S2S3

Stylurus plagiatus

Unlisted

S1

Communities

Dragonflies\
Damselflies

Russet-tipped Clubtail

Shore of Hudson River at mouth of Coeymans Creek, about .2 mile south of project site.
Notes:
The Hudson River along Schodack Island State Park and north and south of the mouth of Coeymans Creek,
and the lower Coeymans Creek, has been designated a significant anadromous fish concentration area.
Schodack Island State Park also is the location of a significant nesting colony of Great Blue Heron (Ardea
herodias).

COMMON NAME

SCIENTIFIC NAME

NY STATE LISTING

NY STATE RANK*

Threatened
Threatened

S2S3B,S2N

NYS Wind Port and Port of Albany-Rensselaer
Birds

Bald Eagle

Haliaeetus leucocephalus

Nesting within .15 mile of NYS Wind Port project site. Formerly nested within southern portion of Port of
Albany-Rensselaer project site.

Acipenser brevirostrum

Endangered
Endangered
S1
and federally Endangered

Utterbackiana implicata

Unlisted

S1

Cobra Clubtail

Gomphurus vastus

Unlisted

S1

Umber Shadowdragon

Neurocordulia obsoleta

Unlisted

S1

Fish

Shortnose Sturgeon
Hudson River.

Freshwater
Mussels

Alewife Floater

Hudson River.
Dragonflies/
Damselflies

Normans Kill at Island Creek Park, adjacent to Port of Albany-Rensselaer project site.
Plants

Violet Wood Sorrel
Oxalis violacea
Threatened
S2S3
Woods near where railroad crosses under NYS Route 144, within 100 yards southwest of Port of Albany-
Rensselaer project site.

Plants

Side Oats Grama

Bouteloua curtipendula
Endangered
var. curtipendula
Rocky woods about 1/3 mile southwest of Port of Albany-Rensselaer project site.

S2

* Conservation status in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale:
S1 = Critically imperiled
S2 = Imperiled
S3 = Rare or uncommon
S4 = Abundant and apparently secure
S5 = Demonstrably abundant and secure
SNA = Status not assessed or assigned.
B after a rank indicates the status for breeding populations of that species.
N after a rank indicates the status for wintering (nonbreeding) populations of that species.

Information about many of the rare animals, rare plants, and natural communities in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org.
This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. This information should
not be substituted for on-site surveys.
New York Natural Heritage Program
SUNY College of Environmental Science and Forestry

In partnership with NYS Department of Environmental Conservation
625 Broadway, Albany, NY 12233-4757, (518) 402-8935, NaturalHeritage@dec.ny.gov

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EFH Mapper Report
EFH Data Notice
Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most

cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert.
Please refer to the following links for the appropriate regional resources.
Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results
Degrees, Minutes, Seconds: Latitude = 41º 7' 55" N, Longitude = 72º 3' 14" W
Decimal Degrees: Latitude = 41.132, Longitude = -71.946
The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

*** W A R N I N G ***
Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH
Link

Data
Caveats

Species/Management Unit
Winter Flounder

Lifestage(s) Found at
Location
Eggs
Juvenile
Larvae/Adult

Management
Council

FMP

New England

Amendment 14 to the Northeast
Multispecies FMP

Link

Data
Caveats

Species/Management Unit
Little Skate

Lifestage(s) Found at
Location
Juvenile
Adult

Management
Council

FMP

New England

Amendment 2 to the Northeast Skate
Complex FMP

Atlantic Herring

Juvenile
Adult

New England

Amendment 3 to the Atlantic Herring
FMP

Atlantic Cod

Adult

New England

Amendment 14 to the Northeast
Multispecies FMP

Red Hake

Adult

New England

Amendment 14 to the Northeast
Multispecies FMP

Yellowtail Flounder

Adult

New England

Amendment 14 to the Northeast
Multispecies FMP

Windowpane Flounder

Adult
Juvenile

New England

Amendment 14 to the Northeast
Multispecies FMP

Winter Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate
Complex FMP

Albacore Tuna

Juvenile

Secretarial

Amendment 10 to the 2006 Consolidated
HMS FMP: EFH

Skipjack Tuna

Adult

Secretarial

Amendment 10 to the 2006 Consolidated
HMS FMP: EFH

Smoothhound Shark Complex
(Atlantic Stock)

ALL

Secretarial

Amendment 10 to the 2006 Consolidated
HMS FMP: EFH

Neonate/Juvenile

Secretarial

Amendment 10 to the 2006 Consolidated
HMS FMP: EFH

Longfin Inshore Squid

Juvenile
Eggs

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Bluefish

Adult
Juvenile

Mid-Atlantic

Bluefish

Atlantic Butterfish

Juvenile

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Sub-Adult Female
Adult Male

Mid-Atlantic

Amendment 3 to the Spiny Dogfish FMP

Sand Tiger Shark

Spiny Dogfish

Link

Data
Caveats

Species/Management Unit
Scup

Lifestage(s) Found at
Location
Juvenile
Adult

Management
Council

FMP

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Summer Flounder

Juvenile
Adult

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Black Sea Bass

Juvenile

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Salmon EFH
No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.
HAPCs
No Habitat Areas of Particular Concern (HAPC) were identified at the report location.
EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.
Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for
which there is no spatial data.
**For links to all EFH text descriptions see the complete data inventory: open data inventory -->
All spatial data is currently available for the Mid-Atlantic and New England councils,
Secretarial EFH,
Bigeye Sand Tiger Shark,
Bigeye Sixgill Shark,
Caribbean Sharpnose Shark,
Galapagos Shark,
Narrowtooth Shark,
Sevengill Shark,
Sixgill Shark,
Smooth Hammerhead Shark,
Smalltail Shark

EFH Mapper Report
EFH Data Notice
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Please refer to the following links for the appropriate regional resources.
Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results
Degrees, Minutes, Seconds: Latitude = 41º 3' 0" N, Longitude = 74º 56' 6" W
Decimal Degrees: Latitude = 41.050, Longitude = -73.065
The query location intersects with spatial data representing EFH and/or HAPCs for the following

species/management units.

*** W A R N I N G ***
Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH
Link

Data
Caveats

Species/Management Unit
Winter Flounder

Lifestage(s) Found at
Location
Eggs
Juvenile
Larvae/Adult

Management
Council

FMP

New England

Amendment 14 to the Northeast
Multispecies FMP

Link

Data

Caveats

Species/Management Unit
Little Skate

Lifestage(s) Found at
Location
Juvenile
Adult

Management
Council

FMP

New England

Amendment 2 to the Northeast Skate
Complex FMP

Atlantic Herring

Juvenile
Adult

New England

Amendment 3 to the Atlantic Herring
FMP

Pollock

Adult
Juvenile

New England

Amendment 14 to the Northeast
Multispecies FMP

Red Hake

Adult

Eggs/Larvae/Juvenile

New England

Amendment 14 to the Northeast
Multispecies FMP

Silver Hake

Eggs/Larvae
Adult

New England

Amendment 14 to the Northeast
Multispecies FMP

Monkfish

Juvenile

New England

Amendment 4 to the Monkfish FMP

Windowpane Flounder

Adult
Larvae
Eggs
Juvenile

New England

Amendment 14 to the Northeast
Multispecies FMP

Winter Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate
Complex FMP

Smoothhound Shark Complex
(Atlantic Stock)

ALL

Secretarial

Amendment 10 to the 2006 Consolidated
HMS FMP: EFH

Neonate/Juvenile

Secretarial

Amendment 10 to the 2006 Consolidated
HMS FMP: EFH

Scup

Larvae
Eggs
Juvenile
Adult

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Longfin Inshore Squid

Juvenile
Adult
Eggs

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Link

Data
Caveats

Species/Management Unit

Atlantic Mackerel

Lifestage(s) Found at
Location
Eggs
Larvae
Juvenile
Adult

Management
Council

FMP

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Bluefish

Adult
Juvenile

Mid-Atlantic

Bluefish

Atlantic Butterfish

Eggs
Larvae
Adult
Juvenile

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Summer Flounder

Juvenile
Adult

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Black Sea Bass

Juvenile

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Salmon EFH
No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.
HAPCs
Link Data Caveats

HAPC Name Management Council
Summer Flounder
Mid-Atlantic

EFH Areas Protected from Fishing
No EFH Areas Protected from Fishing (EFHA) were identified at the report location.
Spatial data does not currently exist for all the managed species in this area. The following is a

list of species or management units for
which there is no spatial data.
**For links to all EFH text descriptions see the complete data inventory: open data inventory -->
All spatial data is currently available for the Mid-Atlantic and New England councils,
Secretarial EFH,
Bigeye Sand Tiger Shark,
Bigeye Sixgill Shark,
Caribbean Sharpnose Shark,
Galapagos Shark,

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for
which there is no spatial data.
**For links to all EFH text descriptions see the complete data inventory: open data inventory -->
Narrowtooth Shark,
Sevengill Shark,
Sixgill Shark,
Smooth Hammerhead Shark,
Smalltail Shark

EFH Mapper Report
EFH Data Notice
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Please refer to the following links for the appropriate regional resources.
Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results
Degrees, Minutes, Seconds: Latitude = 40º 33' 54" N, Longitude = 75º 57' 26" W
Decimal Degrees: Latitude = 40.565, Longitude = -74.043
The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

*** W A R N I N G ***
Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH
Link

Data
Caveats

Species/Management Unit
Winter Flounder

Lifestage(s) Found at
Location
Eggs
Juvenile
Larvae/Adult

Management
Council

FMP

New England

Amendment 14 to the Northeast
Multispecies FMP

Link

Data
Caveats

Management
Council

FMP

New England

Amendment 2 to the Northeast Skate
Complex FMP

Juvenile
Adult
Larvae

New England

Amendment 3 to the Atlantic Herring
FMP

Red Hake

Adult
Eggs/Larvae/Juvenile

New England

Amendment 14 to the Northeast
Multispecies FMP

Silver Hake

Eggs/Larvae

New England

Amendment 14 to the Northeast
Multispecies FMP

Yellowtail Flounder

Juvenile

New England

Amendment 14 to the Northeast
Multispecies FMP

Windowpane Flounder

Adult
Larvae
Eggs
Juvenile

New England

Amendment 14 to the Northeast
Multispecies FMP

Winter Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate
Complex FMP

Clearnose Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate
Complex FMP

Smoothhound Shark Complex
(Atlantic Stock)

ALL

Secretarial

Amendment 10 to the 2006 Consolidated
HMS FMP: EFH

Scup

Larvae
Eggs
Juvenile
Adult

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Longfin Inshore Squid

Eggs

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Atlantic Mackerel

Juvenile
Adult

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Bluefish

Adult
Juvenile

Mid-Atlantic

Bluefish

Species/Management Unit
Little Skate
Atlantic Herring

Lifestage(s) Found at
Location
Juvenile
Adult

Link

Data
Caveats

Lifestage(s) Found at
Location

Management
Council

FMP

Atlantic Butterfish

Larvae

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Summer Flounder

Larvae
Juvenile
Adult

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Species/Management Unit

Salmon EFH
No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.
HAPCs
Link Data Caveats

HAPC Name Management Council
Summer Flounder
Mid-Atlantic

EFH Areas Protected from Fishing
No EFH Areas Protected from Fishing (EFHA) were identified at the report location.
Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for
which there is no spatial data.
**For links to all EFH text descriptions see the complete data inventory: open data inventory -->
All spatial data is currently available for the Mid-Atlantic and New England councils,
Secretarial EFH,
Bigeye Sand Tiger Shark,
Bigeye Sixgill Shark,
Caribbean Sharpnose Shark,
Galapagos Shark,
Narrowtooth Shark,
Sevengill Shark,

Sixgill Shark,
Smooth Hammerhead Shark,
Smalltail Shark

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https://www.habitat.noaa.gov/apps/efhmapper/efhreport/

EFH Report

EFH Mapper Report
EFH Data Notice
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Please refer to the following links for the appropriate regional resources.
Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results
Degrees, Minutes, Seconds: Latitude = 40º 43' 19" N, Longitude = 75º 58' 35" W
Decimal Degrees: Latitude = 40.722, Longitude = -74.024
The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

*** W A R N I N G ***
Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH
Link

Data
Caveats

Species/Management
Unit

Winter Flounder

Lifestage(s) Found at
Location
Eggs
Juvenile
Larvae/Adult

Management
Council

FMP

New England

Amendment 14 to the Northeast Multispecies
FMP

Link

Data
Caveats

Species/Management
Unit

Management
Council

FMP

New England

Amendment 2 to the Northeast Skate Complex
FMP

Juvenile
Adult
Larvae

New England

Amendment 3 to the Atlantic Herring FMP

Adult
Eggs/Larvae/Juvenile

New England

Amendment 14 to the Northeast Multispecies FMP

Windowpane Flounder

Adult
Larvae
Eggs
Juvenile

New England

Amendment 14 to the Northeast Multispecies FMP

Winter Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate Complex FMP

Clearnose Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate Complex
FMP

Longfin Inshore Squid

Eggs

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Bluefish

Adult
Juvenile

Mid-Atlantic

Bluefish

Atlantic Butterfish

Larvae

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Summer Flounder

Larvae
Juvenile
Adult

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Little Skate
Atlantic Herring
Red Hake

Lifestage(s) Found at
Location
Juvenile
Adult

Salmon EFH
No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.
HAPCs
Link Data Caveats

HAPC Name Management Council
Summer Flounder
Mid-Atlantic

EFH Areas Protected from Fishing
No EFH Areas Protected from Fishing (EFHA) were identified at the report location.
Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for
which there is no spatial data.
**For links to all EFH text descriptions see the complete data inventory: open data inventory -->
All spatial data is currently available for the Mid-Atlantic and New England councils,
Secretarial EFH,
Bigeye Sand Tiger Shark,
Bigeye Sixgill Shark,
Caribbean Sharpnose Shark,
Galapagos Shark,
Narrowtooth Shark,
Sevengill Shark,
Sixgill Shark,
Smooth Hammerhead Shark,
Smalltail Shark

EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert.

Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office

Atlantic Highly Migratory Species Management Division

Query Results

Degrees, Minutes, Seconds: Latitude = 42º 39' 6" N, Longitude = 74º 15' 20" W

Decimal Degrees: Latitude = 42.652, Longitude = -73.745

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

*** W A R N I N G ***

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH
Link

Data
Caveats

Species/Management
Unit
Winter Flounder

Lifestage(s) Found at
Location
Eggs
Juvenile
Larvae/Adult

Management
Council

FMP

New England

Amendment 14 to the Northeast Multispecies
FMP

Link

Data
Caveats

Species/Management
Unit

Management
Council

FMP

New England

Amendment 2 to the Northeast Skate Complex
FMP

Juvenile
Adult
Larvae

New England

Amendment 3 to the Atlantic Herring FMP

Adult
Eggs/Larvae/Juvenile

New England

Amendment 14 to the Northeast Multispecies FMP

Windowpane Flounder

Adult
Larvae
Eggs
Juvenile

New England

Amendment 14 to the Northeast Multispecies FMP

Winter Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate Complex FMP

Clearnose Skate

Adult
Juvenile

New England

Amendment 2 to the Northeast Skate Complex
FMP

Longfin Inshore Squid

Eggs

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Bluefish

Adult
Juvenile

Mid-Atlantic

Bluefish

Atlantic Butterfish

Larvae

Mid-Atlantic

Atlantic Mackerel, Squid,& Butterfish
Amendment 11

Summer Flounder

Larvae
Juvenile
Adult

Mid-Atlantic

Summer Flounder, Scup, Black Sea Bass

Little Skate

Atlantic Herring
Red Hake

Lifestage(s) Found at
Location
Juvenile
Adult

Salmon EFH
No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.
HAPCs
Link Data Caveats

HAPC Name Management Council
Summer Flounder
Mid-Atlantic

EFH Areas Protected from Fishing
No EFH Areas Protected from Fishing (EFHA) were identified at the report location.
Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for
which there is no spatial data.
**For links to all EFH text descriptions see the complete data inventory: open data inventory -->
All spatial data is currently available for the Mid-Atlantic and New England councils,
Secretarial EFH,
Bigeye Sand Tiger Shark,
Bigeye Sixgill Shark,
Caribbean Sharpnose Shark,
Galapagos Shark,
Narrowtooth Shark,
Sevengill Shark,
Sixgill Shark,
Smooth Hammerhead Shark,
Smalltail Shark

2/7/2022, 3:47 PM

Appendix E. Alternatives Impact Summary Tables

E-1

Preliminary Draft Screening Matrix – Full Build Alternative
February 2022
Category

Land Use
Compatibility

Resource

Land Use

Criteria
Characteristics
State or municipalowned/managed
lands,
Land use/zoning
conformance

Transportation
Access and
Mobility

Vessel Traffic

Navigation conflicts
(hot spots), Density of
commercial vessels
(as measured by
automated
identification systems
[AIS]), Ferry routes,
recreational vessels

Planned
Alternative

Arthur Kill

Terminal
(WTG, staging)

Port Ivory
(fabrication
OSS)

Homeport Pier
(O&M)

Brooklyn Navy
Yard (O&M)

Brooklyn PA
Marine
Terminal (O&M)

NYS Wind Port
(manufacturing
blades)

Hempstead
Public Works
Area (O&M)

Full Build Alternative
(Planned Alternative +
7 Ports Summary)

Two sites involve
creation of new port,
converting vacant land
or parking and marina
uses to a port facility.
Three sites involve
repurposing existing
ports or docking areas
to port facilities.
Majority of sites are
compatible with
existing industrial/
manufacturing/
commercial/waterfront

zoning and land use. One site is within waterfront park and conservation zoning. Each site would be required to undergo Town planning board review and approval.

Creation of new port with major conversion from vacant land to port operations. Use may be allowed under existing industrial/manufacturing zoning and compatible with adjacent commercial/ industrial area.

Creation of new port with major conversion from vacant land to port operations. Use may be allowed under existing industrial/ manufacturing zoning and compatible with adjacent PANYNJ ports. Waterfront is part of the Kill Van Kull Significant Maritime & Industrial Area (SMIA) and a Priority Maritime Area Zone (PMAZ) designated by NYCDCP.

Repurposing an existing port with new infrastructure. Use is allowed under the existing Special Stapleton Waterfront District zoning and compatible with adjacent working waterfront areas. Waterfront is part of a PMAZ.

Repurposing an existing port with new infrastructure. Use is allowed under the existing industrial/ manufacturing zoning and compatible with adjacent ports. Waterfront is part of the Brooklyn Navy Yard SMIA and a PMAZ.

Repurposing an existing port with new infrastructure. Use is allowed under the existing industrial/ manufacturing zoning and compatible with adjacent PANYNJ ports. Waterfront is part of the Red Hook SMIA and a PMAZ.

Creation of new port with conversion from agricultural uses (not designated farmland) and vacant land to port operations. Use may be allowed under existing coastal industrial zoning and compatible with port/industrial uses in vicinity.

Repurposing of Town Public Works facility with existing bulkhead/docking area with new port infrastructure. Use may require a waiver/special approval from existing public/institutional zoning (no manufacturing). O&M use appears to be compatible with adjacent active waterfront areas (marinas).

11 of 12 sites are compatible with existing industrial/manufacturing/coastal industrial zoning and land use. 5 sites involve creation of new port by converting vacant land, or parking, marina or agricultural uses (not designated farmland). 7 sites involve repurposing existing ports or

docking areas to port facilities. 1 site is within waterfront park and conservation zoning. Each site to undergo Town planning board review and approval.

Three sites have vessel congestion or ferry routes. All sites require precautions during recreational vessel season.

Monitor vessel traffic; precautions needed during recreational vessel season.

Same as Arthur Kill Terminal.

Same as Arthur Kill Terminal.

Monitor Navy Yard vessel traffic; precautions needed during recreational vessel season.

Monitor BPAMT vessel traffic; precautions needed during recreational vessel season.

Low frequency of vessels. Precautions needed during recreational vessel season.

Precautions needed
during busy
recreational vessel
season. Proposed
O&M crew boat
compatible with
waterway.

Three sites have vessel
congestion or ferry routes. All
sites require precautions
during recreational vessel
season.

Category

Transportation
Access and
Mobility

Resource

Navigational
Areas

Planned
Alternative

Federally designated
navigation channels,

Two sites may restrict
heavy loads during low
tide. Two sites require
medium access
channel dredging. All
sites have close
access to federal
channels. 3 sites have
winter ice concerns

and have no suitable anchorage locations nearby. Two sites do not have turning basins or areas to turn for larger vessels. Two sites have vertical air draft bridge restrictions at 135’.

Adequate channel depths to 35’. Moderate dredging of access channel needed. Anchorage locations and turning basins available. Speed restrictions to minimize wake effects. Underwater cables must be assessed before anchoring. No vertical air draft bridge restrictions.

All sites have viable truck routes. Two sites would require minor road access improvements and one site requires major road access improvements including a new vehicular bridge over a stream and a rail bridge and rail extension. Temporary congestion along truck routes may occur.

Minor roadway access improvements

necessary. Existing
truck route to Route
440 is short (1/2-mile)
will limit potential traffic
impacts during
construction and peak
operations.

Shallow/restricted
drafts,
Anchorage and
mooring availability,
Shipping lanes

Transportation
Access and
Mobility

Vehicular
Traffic
Impacts &
Accessibility

Arthur Kill
Terminal

Criteria
Characteristics

Highway access,
Viable truck routes,
Roadway
improvements,
Freight rail access,
Rail improvements

(WTG, staging)

Port Ivory
(fabrication
OSS)

Full Build Alternative

Homeport Pier
(O&M)

Brooklyn Navy
Yard (O&M)

Brooklyn PA
Marine
Terminal (O&M)

NYS Wind Port
(manufacturing
blades)

Hempstead
Public Works
Area (O&M)

Adequate channel depths to 35'+. Moderate dredging of access channel needed. Anchorage locations and turning basins available. Speed restrictions to minimize wake effects. Underwater cables must be assessed before anchoring. Vertical air draft restriction is 135' at Goethals Bridge.

Adequate channel depths to 35'+ at Pier. Maintenance dredging of access channel.
Anchorage

locations and turning basins available. Speed restrictions to minimize wake effects. Underwater cables must be assessed before anchoring. Vertical air draft restriction is 228’ at Goethals Bridge.

Same as Homeport Pier.

Same as Homeport Pier.

Adequate channel depths to 30’ during high tide, however low tide may restrict to a 27’ draft. Moderate dredging of access channel needed. Channel narrows to 400’ wide. In winter, vessels may have to convoy from Kingston north to navigate ice. No Federal or suitable anchorage location exist for safety purposes. No turning basins or areas to turn for larger vessels exist until reaching the Port of Albany. Speed restrictions to minimize wake effects. Underwater cables must be assessed before anchoring. Vertical air draft bridge restrictions at 135’.

Proposed O&M crew vessels has adequate channel depths to 22’. No anchorage location nearby. Speed restrictions to minimize wake effects. Underwater cables must be assessed before anchoring. 30’ vertical air draft restriction at bridge.

Adequate channel depths for proposed port uses. Two sites may restrict heavy loads during low tide. Three sites require medium access channel dredging. All sites have close access to federal channels. Four sites have winter ice concerns and have no suitable anchorage locations nearby. Three sites do not have turning basins or areas to turn for larger vessels. Four sites have vertical air draft bridge restrictions at 135’.

Minor roadway access improvements necessary. Existing truck route to I-87 is short (1-mile) and will limit potential traffic impacts

during construction
and peak
operations. Freight
rail access
available to reduce
truck traffic.

No anticipated
roadway
improvements.
Existing route to I287 via local is a
circuitous,
potentially
congested route.
Temporary traffic
impacts
construction may
occur during
construction, but
not anticipated
given the lighter
frequency of O&M
operations.

No roadway
improvements
necessary. Existing
truck route to I-278
is short (1/2-mile)
and will limit
potential traffic
impacts during
construction and
peak operations.

No roadway
improvements
necessary. Existing
truck route to I-278
is short (1/2-mile)
will limit potential
traffic impacts
during construction

and peak operations.

Limited roadway access improvements. Existing 3.5-mile route to I-87 via local roads is a circuitous, potentially congested route during construction and peak operations.

No anticipated roadway improvements. Existing 9.5-mile vehicular route to Nassau Expressway via local roads is a circuitous, potentially congested route. Temporary traffic impacts construction may occur during construction, but not anticipated given the lighter frequency of O&M operations.

All sites have viable truck routes. Only five sites would require minor road access improvements. One site requires major improvements including a new vehicular bridge and a rail bridge. Temporary congestion along truck routes may occur.

E-3

(Planned Alternative + 7 Ports Summary)

Category

Resource

Criteria
Characteristics

Socioeconomic
Impacts

Environmental
Justice

EJ Communities

Environmental
Impacts

Sensitive
Terrestrial
Biological
Resources

Federal or state listed
endangered or
threatened species or
associated habitat,
designated critical
habitat,

Potential for
disproportionate
effects on EJ
communities

Important Bird Areas,
Natural Heritage
Communities,
Conservation and
mitigation sites

Planned

Alternative

Arthur Kill
Terminal
(WTG, staging)

Port Ivory
(fabrication
OSS)

Homeport Pier
(O&M)

Brooklyn Navy
Yard (O&M)

Brooklyn PA
Marine
Terminal (O&M)

NYS Wind Port
(manufacturing
blades)

Hempstead
Public Works
Area (O&M)

Full Build Alternative
(Planned Alternative +
7 Ports Summary)

Three sites have EJ
communities present
in the vicinity.
Potential traffic, air
quality and noise
impacts along truck
routes may occur to
these communities.

EJ community present
north of Route 440,

however truck traffic will
largely avoid impacts
by using direct route
(Arthur Kill Road) to
Route 440.

EJ community
nearby to the
southeast, however
truck traffic will
avoid impacts using
direct route
(Western Avenue)
to I-278.

EJ community
present in vicinity.
Temporary
construction
impacts may occur,
however, sporadic
O&M operations
will result in less
traffic, noise, air
quality or visual
effects to
community.

EJ community
present in vicinity.
Limited potential
impacts during
construction and
peak operations
from short truck
route to I-278.

EJ community
present to the south,
however truck traffic
would avoid the
area.

No EJ community present.

EJ community present in vicinity. Temporary construction impacts may occur, however, sporadic O&M operations will result in less traffic, noise, air quality or visual effects to community.

Nine sites have EJ communities present in the vicinity. Potential traffic, air quality and noise impacts along truck routes may occur to these communities.

Three sites would involve limited habitat impacts, including removal of protected potential bat habitat, shorebird or other listed species habitat. Two sites have no listed terrestrial species present.

Clearing over 40+ acres of old field succession/

Clearing 20+ acres of herbaceous vegetation with protected shorebird (least bittern, pied billed grebe) and

amphibian (Atlantic
Coast frog) habitat.
Converting 10+
acres to developed
impervious
surfaces.

Developed site; no
sensitive terrestrial
biological
resources present.

Developed site; no
sensitive terrestrial
biological
resources present.

Developed site; no
sensitive terrestrial
biological resources
present.

Clearing 40+ acres of
farmland and

Developed site; may
disturb protected
shorebirds (piping
plover, common
tern, least tern, black
skimmer) habitat.

Seven sites involve removal
of potential protected species
habitat, including bats,
shorebirds or other listed
species habitat. Two sites
may affect SCFWH tidal
creek complexes.

hardwoods potentially
containing protected
NLEB and Indiana bat

habitat and dragonflies/
damselflies. Converting 20+ acres to developed impervious surfaces.

E-4

hardwoods potentially containing NLEB and Indiana bat habitat and protected dragonflies/ damselflies habitat and Violet Wood Sorrel plant. Converting 20+ acres to developed impervious surfaces. Minor impacts to Papscane Creek, a SCFWH tidal creek complex.

Category

Environmental Impacts

Resource

Sensitive Aquatic Biological Resources

Arthur Kill Terminal

Criteria Characteristics

Planned Alternative

Species and Habitat

All sites have Shortnose and Atlantic Sturgeon (E), Alewife Floater (C) and several EFH species present, and one site has protected shorebirds present. One site would require substantial dredging; the other four sites require limited dredging and acreage of wetland impacts.

Contains Shortnose and Atlantic Sturgeon (E), and several EFH species. Waterfront is part of the Outer Bridge Shoreline REC identified by NYCWRP. Approximately 9+ acres of tidal wetlands impacts, 3+ acres of freshwater wetlands impacts (inland), 25+ acres of heavy dredging (very shallow).

Three sites would have moderate level of wetlands/open water fill and dredging impacts. Two sites would have minor wetlands/open water impacts. At least three ports would increase impervious surfaces creating stormwater runoff. No ports have aquifers present.

Approximately 9+ acres of tidal wetlands fill, 3+ acres of freshwater wetlands from regrading site and new infrastructure, 25+ acres of heavy dredging (very shallow), and creating 20+ acres of impervious surfaces with runoff.

Federal or state listed endangered or threatened species or associated habitat, designated critical habitat, Important Bird Areas, Natural Heritage Communities, Conservation and mitigation sites, Natural Heritage Communities,

(WTG, staging)

Conservation and mitigation sites, NYSDOS Significant Coastal Fish and Wildlife Habitat (SCFWH), NYCWRP designations Recognized Ecological Complexes (RECs), Special Natural Waterfront Areas (SNWAs) Environmental Impacts

Sensitive
Aquatic
Biological
Resources

Wetland/Water
Resources
Federal and State
regulated wetlands,
and surface waters,
Aquifers,
Water quality

Port Ivory
(fabrication
OSS)

Full Build Alternative

Homeport Pier
(O&M)

Brooklyn Navy
Yard (O&M)

Brooklyn PA
Marine
Terminal (O&M)

NYS Wind Port
(manufacturing
blades)

Hempstead
Public Works
Area (O&M)

Contains Shortnose
and Atlantic
Sturgeon (E), and
several EFH
species. Site

borders the Northwestern Staten Island Harbor Hens Area/Arlington Marsh SNWA , and Bridge Creek REC identified by NYCWRP. Approximately 10+ acres of tidal wetlands impacts, 15+ acres of dredging. Creating 10+acres of impervious surfaces with runoff.

Contains Shortnose and Atlantic Sturgeon (E), protected turtle species and several EFH species. Limited dredging and open water impacts.

Contains Shortnose and Atlantic Sturgeon (E), protected turtle species and several EFH species. Limited dredging and open water impacts.

Contains Shortnose and Atlantic Sturgeon (E), protected turtle species and several

EFH species.
Limited dredging
and open water
impacts.

Contains Shortnose and
Atlantic Sturgeon (E)
and Alewife Floater (C).
SAV and vegetated tidal
wetlands mapped along
the shoreline.
Approximately 10+ acres
of tidal wetlands
impacts, 15+ acres of
dredging. Creating
20+acres of impervious
surfaces with runoff.
Minor impacts to a
SCFWH Papscane tidal
creek and marsh
complex.

Contains Shortnose
and Atlantic
Sturgeon (E),
protected turtle
species, shorebirds
(piping plover,
common tern, least
tern, black skimmer),
and several EFH
species.
Bulkheaded, docking
area on site with
limited habitat.
Limited dredging and
open water impacts.

All sites have Shortnose and
Atlantic Sturgeon (E), Alewife
Floater (C) and EFH species
present, and two sites have
protected shorebirds present.

SAV is mapped at one site. One site is part of the Outer Bridge Shoreline REC. One site borders the Northwestern Staten Island Harbor Hens Area/Arlington Marsh SNWA, and Bridge Creek REC. Five sites would require substantial dredging; the other seven sites will require limited dredging and acreage of wetland impacts.

Approximately 10+ acres of tidal wetlands impacts, 15+ acres of dredging. Creating 10+ acres of impervious surfaces with runoff.

Minimal dredging with adequate depths close to the navigation channel. Minimal wetland impacts and increase to impervious surfaces.

Minimal dredging with adequate depths close to the navigation channel. Minimal wetland impacts and increase to impervious surfaces.

Minimal dredging

and open water
impacts from new
infrastructure. No
increase to
impervious surfaces.

SAV and vegetated tidal
wetlands mapped along
the shoreline.
Approximately 10+ acres
of tidal wetlands
impacts, 15+ acres of
dredging. Creating
10+acres of impervious
surfaces with runoff.
Creating 20+acres of
impervious surfaces with
runoff.

Minimal dredging
and open water
impacts from new
infrastructure. Minor
increase to
impervious surfaces.

Six sites would have
moderate level of
wetlands/open water fill and
dredging impacts. Two sites
have SAV. Six sites would
have minor wetlands/open
water impacts. At least eight
ports would increase
impervious surfaces creating
stormwater runoff. No ports
have aquifers present.

E-5

(Planned Alternative +
7 Ports Summary)

Category

Environmental Impacts

Resource

Cultural Resources

Community Character

Hazardous Materials

Archaeological sensitive area. No mapped historic architectural resources or historic districts within the vicinity.

Archaeological sensitive area. No mapped historic architectural resources or historic districts within the vicinity.

Archaeological sensitive area. No mapped historic architectural resources or historic districts within the vicinity.

Four sites have residential communities nearby. However, most sites

are within or adjacent
to existing ports and
within compatible land
use and zoning.

One residential
sensitive receptor
adjacent to the site.
Sited within industrial
and commercial area.
Direct highway access
to Outer Bridge
Crossing/Route 440
within ¼ mile; minimal
traffic, noise or air
quality effects to
community expected.

No sensitive
receptors adjacent
to the site. Sited
within active port
and industrial area.
Direct highway
access to Goethals
Bridge Crossing/I278 within ½ mile;
minimal traffic,
noise or air quality
effects to
community
expected.

All sites will disturb
contaminated fill soils
from former port
operations and/or
other past uses. Two
sites will likely
demolish buildings
with potential
hazardous building
materials (e.g.
asbestos). All sites will

temporarily disturb
contaminated
sediments during
dredging and in-water
construction.

Upland site
developments will
disturb contaminated fill
soils from former site
uses. Dredging and inwater construction may
disturb contaminated
sediments.

Upland site
developments may
disturb
contaminated fill
soils from former
industrial and port
operations.
Dredging and inwater construction
may disturb
contaminated
sediments.

All five sites may
impact archaeological
sensitive areas. Two
ports may have
unavoidable adverse
visual impacts to
Native American sites.
One site with historic
architectural resources
or historic districts in
the vicinity.

Sensitive receptors
(residences, parks,
hospitals, schools,
etc.)
Neighborhoods

Environmental
Impacts

Brooklyn Navy
Yard (O&M)

Historic architectural
resources,

Upland and marine
archaeological
resources
(shipwrecks)

Environmental
Impacts

Homeport Pier
(O&M)

Planned
Alternative

Historic districts,

Hazardous materials
Subsurface
contamination
Health and safety
issues

Arthur Kill
Terminal

Port Ivory
(fabrication
OSS)

Criteria
Characteristics

(WTG, staging)

Full Build Alternative

Brooklyn PA Marine Terminal (O&M)

NYS Wind Port (manufacturing blades)

Hempstead Public Works Area (O&M)

Listed Buildings and historic district in vicinity. Site is within an Archeologically Sensitive Area. However, work would not demolish historic building(s).

Listed Buildings and historic district in vicinity. Mary A. Whalen Tanker Listed directly off pier. Site is within an Archeologically Sensitive Area. However, work would not demolish historic building(s).

Site located within a significant Native American site. Potential unavoidable adverse impacts to the site.

Archaeological
sensitive area. No
mapped historic
architectural
resources or historic
districts within the
vicinity.

All sites may impact
archaeological sensitive
areas. Three ports may have
unavoidable adverse impacts
to archaeological sites. Three
sites with historic architectural
resources or historic districts
in the vicinity.

Staten Island Urby
Apartment complex
and Stapleton
Waterfront Park
bordering
southside of the
site may
experience traffic,
visual and noise
effects. Well-sited
within active port
and industrial area.
Temporary
construction
impacts may occur,
however, sporadic
O&M operations
will result in less
traffic, noise, air
quality or visual
effects to
community.

Limited residences
in the vicinity the
site. Sited on an

active port and a commercial/ industrial area. Direct highway access to I-278 corridor within ¼ mile will limit potential traffic, noise or air quality effects to community during construction and peak operations.

Limited residences in the vicinity the site. Sited on an active port and a commercial/ industrial area. Direct highway access to I-278 corridor within ¼ mile will limit potential traffic, noise or air quality effects to community during construction and peak operations.

Lack of sensitive receptors in vicinity. Sited within an industrial waterfront zoning and near active industries and Port of Albany. Potential truck traffic congestion may occur during construction and peak operations.

Limited sensitive

receptors in vicinity, however local fishing area and marina will be displaced. Wellsited within municipal public works facility and near busy marinas. Temporary traffic impacts construction may occur during construction, but not anticipated during O&M operations given the lighter frequency of trips.

Nine sites have residential communities nearby. However, most sites are within or adjacent to existing ports and within compatible land use and zoning. Traffic, noise, visual and/or air quality effects may occur within the community.

Upland site developments may disturb contaminated fill soils. Dredging and in-water construction may disturb contaminated sediments.

Upland site developments may demolish buildings with hazardous materials and disturb

contaminated fill
soils from former
industrial and port
operations.
Dredging and inwater construction
may disturb
contaminated
sediments.

Upland site
developments may
demolish buildings
with hazardous
materials and
disturb
contaminated fill
soils from port
operations.
Dredging and inwater construction
may disturb
contaminated
sediments.

Upland site
developments may
disturb contaminated fill
soils. Dredging and inwater construction may
disturb contaminated
sediments.

Upland site
developments may
disturb contaminated
fill soils from port
operations. Dredging
and in-water
construction may
disturb contaminated
sediments.

All sites will disturb
contaminated fill soils from
former port operations and/or

other past uses. Four sites may demolish buildings with potential hazardous building materials (e.g. asbestos). All sites will temporarily disturb contaminated sediments during dredging and in-water construction.

E-6

(Planned Alternative +
7 Ports Summary)

Category

Environmental
Impacts

Resource

Floodplains &
Resiliency

Brooklyn Navy
Yard (O&M)

Brooklyn PA
Marine
Terminal (O&M)

NYS Wind Port
(manufacturing
blades)

Hempstead
Public Works
Area (O&M)

Potential for flooding impacts; about 30% of site within 100-yr floodplain, along Arthur

Kill floodway.
Improvements will raise the site to address flooding and drainage.

Potential for flooding impacts; about 30% of site within 100-yr floodplain, along Arthur Kill floodway. Improvements will raise the site to address flooding and drainage.

Potential for flooding impacts; 50% of site within 100-yr floodplain, along NY Harbor floodway. Improvements will raise the site to address flooding and drainage.

High potential for flooding impacts; 75% of site within 100-yr floodplain, along NY Harbor floodway. Improvements will raise the site to address flooding and drainage.

High potential for flooding impacts; 90% of site within 100-yr floodplain along NY Harbor

floodway.
Improvements will raise the site to address flooding and drainage.

High potential for flooding impacts; 100% of site within 100-yr floodplain, along Hudson River floodway. Improvements will raise the site to address flooding and drainage.

High potential for flooding impacts; 85% of site within 100-yr floodplain, along floodway. Waterfront has potential for wave action impacts. Improvements will raise the site to address flooding, drainage and wave impacts.

All 12 sites have 100-yr floodplains present on-site and floodways adjacent. Eight sites have at least 50% of site within floodplains. One site within wave action zone. No CEHZ areas present. One site has potential for wave action impacts.

All sites are located within Ozone and/or PM2.5 Nonattainment Areas. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur. However, air quality impacts are not expected at the sites by using effective BMPs.

Air quality impacts are not expected with effective BMPs. 8-Hour Moderate Ozone Nonattainment Area and PM2.5 Nonattainment Area. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur. However with BMP mitigation measures, air quality impacts are not expected.

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marine vessels will occur.

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Air quality impacts are not expected with effective BMPs. 8-Hour Moderate Ozone Nonattainment Area and PM2.5 Nonattainment Area. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur.

All sites are located within Ozone and/or PM2.5 Nonattainment Areas. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur. However, air quality impacts are not expected at the sites by using effective BMPs.

Four sites have sensitive receptors in the vicinity that may experience truck traffic-related noise during construction. Most ports are sited on an active port and industrial area with higher ambient noise levels. Minor noise levels are expected from O&M activities.

One adjacent residential receptor. Truck route should avoid residential area.

No adjacent sensitive receptors and sited within active port and industrial area. Truck route avoids residential area.

Potential noise impacts to Staten Island Urby Apartment complex and Stapleton Waterfront Park (southern site border) during construction and/or peak O&M operations. Sited within active port and industrial area.

Limited residences in the vicinity may experience some truck traffic-related noise. Sited on an active port and a commercial/ industrial area with high ambient noise levels.

Limited residences in the vicinity may experience some truck traffic-related noise. Sited on an active port and a commercial/ industrial area with high ambient noise levels.

Lack of sensitive receptors in vicinity and truck routes should avoid residential areas.

Limited sensitive
receptors in vicinity,
however local fishing
and truck routes
should avoid
residential areas.

Nine sites have a residential
area in the ¼-mile study area
that may experience truck
traffic-related noise during
construction. Most ports are
sited on an active port and/or
in industrial areas with high
ambient noise levels. Minor
noise levels are expected
from O&M activities.

100-year floodplains,

All 5 sites have 100-yr
floodplains present onsite and floodways
adjacent. 3 sites have
at least 50% of site
within floodplains. No
wave action or CEHZ
areas present.

Wave action prone
areas,
Coastal Erosion
Hazard Zone (CEHZ)

(WTG, staging)

Drainage Patterns

Environmental
Impacts

Air Quality &

Greenhouse
Gases

USEPA National
Ambient Air Quality
Standards (NAAQS)
Nonattainment area
Sensitive receptors
Truck routes

Environmental
Impacts

Noise

Sensitive receptors
within 1/4 mile, Local
noise codes, Truck
routes

Full Build Alternative

Homeport Pier
(O&M)

Planned
Alternative

Floodways,

Arthur Kill
Terminal

Port Ivory
(fabrication
OSS)

Criteria
Characteristics

Note: Socioeconomic Impacts are Construction Jobs, O&M Jobs and Economic Development Impacts/Benefits are only summarized at the Alternative-level, not per port location.

E-7

(Planned Alternative +
7 Ports Summary)

Preliminary Draft Screening Matrix – Planned Alternative
February 2022
Category
Land Use
Compatibility

Resource
Land Use

Port Jefferson

Port of Montauk

Planned Alternative

(O&M)

(O&M)

(Summary)

Repurposing an existing port with new infrastructure. Use is allowed under the existing Marina-Waterfront District zoning, a Priority Marine Activity Zone (PMAZ) and compatible with area.

Repurposing an existing port with new infrastructure. Use is allowed under the existing Marina-Waterfront District zoning and compatible with area.

Creation of new port, a conversion from parking and marina uses to port operations

with new infrastructure.
Proposed use will have compatibility concerns under existing commercial/residential zoning and being adjacent to Montauk County Park. Site within Lake Montauk Scenic Areas of Statewide Significance (SASS) scenic landscape designated by NYSDOS.

Four of the five sites are compatible with existing industrial/ manufacturing/ coastal industrial zoning and land use. Twp sites involve creation of new port, converting vacant land, or parking and marina uses. One site is within waterfront park and conservation zoning. Each site would be required to undergo Town planning board review and approval.

Criteria
Characteristics

Port of Albany-Rensselear (manufacturing)

Port of Coeymans (fabrication)

South Brooklyn Marine Terminal (staging and O&M)

State or municipalowned/managed lands,

Creation of new port, a major conversion from vacant land to port operations. Use is allowed under existing industrial/ manufacturing zoning and compatible with adjacent commercial/ industrial area.

Repurposing an existing port with new infrastructure. Use is allowed under the existing industrial/ manufacturing zoning and compatible with area.

Land use/zoning conformance

Transportation Access and Mobility

Vessel Traffic

Navigation conflicts (hot spots), Density of commercial vessels (as measured by automated identification systems [AIS]), Ferry routes, recreational vessels

Low frequency of vessels. Project would add approximately 21 ships/barges per year. Precautions needed during recreational vessel season.

42 ships per year (0.8 per week) and 122 barges per year (2.3 per week). Low navigational risk during operations (2-4 vessel round trips per week, include 1-2 larger (130’ x 400’) barges associated with heavy wind component transport from POC. Existing POC operations is 1 ± ship and 24 barges per week.

Moderate vessel congestion at Gowanus Bay. Precautions needed during recreational vessel season.

Precautions related to dedicated ferry route and during recreational vessel season required.

Precautions needed during busy recreational vessel season.

Three sites have potential vessel congestion or ferry routes. All sites require precautions during recreational vessel season.

Transportation Access and Mobility

Navigational Areas

Federally designated navigation channels

Adequate channel depths to 30’ during high tide, however low tide may restrict to a 27’ draft. Moderate dredging of access channel needed. Channel narrows to 400’ wide. In winter, vessels may have to convoy from Kingston north to navigate ice. No Federal or suitable anchorage location exist nearby. No turning basins or areas to turn for larger vessels exist until reaching the Port of Albany. Speed restrictions to minimize wake effects. Underwater cables must be assessed before anchoring. Vertical air draft bridge restrictions at 135’.

Similar conditions to Port of

Albany.

Good channel depths up to 40’. Maintenance dredging of access channel needed. Speed restrictions to minimize wake effects. Underwater cables must be assessed before anchoring. Vertical air draft allowance at Verrazano bridge up to 217’.

Adequate channel depths to 27’ at low tide. Channel narrows to 300’ wide. Maintenance dredging of access channel needed. Shoaling area to east. Available anchorage location exists. Speed restrictions to minimize wake effects. No vertical air draft restrictions.

Minimal channel depths to 12’ and narrow channel width. Shoaling area to east. Maintenance dredging of access channel needed. Ice in winter months. No anchorage location exists. Speed restrictions to minimize wake effects. No vertical air draft restrictions.

Adequate channel depths for proposed port uses, however two sites may restrict heavy loads during low tide. Two sites require moderate access channel dredging. Three sites have winter ice concerns and have no suitable anchorage locations nearby. Two sites do not have turning basins or areas to turn for larger vessels. Underwater cables must be assessed before anchoring. Two sites have vertical air draft bridge restrictions at 135’.

Shallow/restricted drafts,
Anchorage and mooring availability,
Shipping lanes/fairways,
Navigation safety and security zones; danger areas

E-8

Category

Resource

Transportation Access and Mobility

Vehicular Traffic Impacts & Accessibility

Criteria
Characteristics
Highway access,
Viable truck routes,
Roadway improvements,
Freight rail access,

Port Jefferson

Port of Montauk

Planned Alternative

(O&M)

(O&M)

(Summary)

No roadway improvements
necessary. Existing truck route to I287 is short (1/2-mile) will limit
potential traffic impacts during
construction and peak operations.
Freight rail access is available to
reduce truck trips.

Minor roadway access
improvements may be
necessary. Existing route to
I-495 is a circuitous 10 to
12-mile route primarily on
State routes. Temporary
traffic impacts construction
may occur during
construction, but not
anticipated given the lighter
frequency of O&M
operations.

Minor roadway access
improvements may be
necessary. Existing route to I495 via Route 30 and Route 27
is a circuitous, congested route.
Temporary traffic impacts
construction may occur during
construction, but not anticipated
given the lighter frequency of
O&M operations.

All sites have viable truck routes.
Two sites would require minor
road access improvements and
one site requires major road
access improvements including a
new vehicular bridge over a

stream and a rail bridge and rail
extension.

Port of Albany-Rensselear
(manufacturing)

Port of Coeymans
(fabrication)

South Brooklyn Marine
Terminal (staging and O&M)

Road access improvements include a new vehicular bridge over Kill and associated access roads. A rail bridge with rail extension will also be built to serve the operations. The 3-mile truck route to I-87 will have no unmitigable impacts occur during construction and peak operations.

No roadway improvements necessary. Truck route to I87 through rural area is not expected to cause traffic impacts during construction and peak operations. Direct Lafarge haul road may be used, avoiding public roads. Much of the material

Rail improvements

Deliveries will be via barge on the Hudson River which minimizes the number of heavy vehicles.

Socioeconomic
Impacts

Environmental
Justice

EJ Communities

EJ community, Ezra Prentice, present to the north. Potential truck traffic impacts on route to I-87/I-90. Well-sited as an expansion of an existing port. The 3-mile truck route to I-87 will address potential impacts during construction and peak operations with mitigation measures.

No EJ community present.

EJ community present. Well-sited within an existing port. Direct highway access to I-287 would have minimal traffic, noise or air quality effects to community during construction and peak operations with mitigation measures.

No EJ community present.

EJ community present, west of the port site. Community across the inlet from the port site meets the interim criteria identified for a disadvantaged community. Direct access to Route 27 would have minimal to no traffic, noise, or air quality effects to the community during construction and peak operations with mitigation measures in place.

Three sites have EJ communities present in the vicinity. Potential traffic, air quality and noise impacts along truck routes may occur to these communities.

Environmental
Impacts

Sensitive
Terrestrial
Biological
Resources

Federal or state listed endangered or threatened species or associated habitat, designated critical habitat,

Clearing over 50+ acres of old field succession/

Clearing small acreage of old field succession/

hardwoods potentially containing NLEB and Indiana bat habitat and protected dragonflies/

hardwoods containing NLEB and Indiana bat habitat and protected dragonflies/

Developed site; no sensitive terrestrial biological resources present.

Developed site; no sensitive terrestrial biological resources present.

Three sites would involve limited habitat impacts, including removal of protected potential bat habitat, shorebird or other listed species habitat. Two sites have no listed terrestrial species present.

Important Bird Areas,

Natural Heritage
Communities,

damselflies habitat and Violet Wood Sorrel plant. Converting 20+ acres to developed impervious surfaces.

damselflies habitat. Converting 10+ acres to developed impervious surfaces.

Developed site; however site disturbances may affect protected shorebirds and raptor (piping plover, common tern, least tern, and northern harrier) nesting habitats in the vicinity (beaches, County park).

Potential for disproportionate effects on EJ communities

Conservation and mitigation sites

E-9

Category Environmental Impacts

Resource Sensitive Aquatic Biological Resources

Port Jefferson

Port of Montauk

Planned Alternative

(O&M)

(O&M)

(Summary)

Contains Shortnose and Atlantic Sturgeon (E), protected turtle species and several EFH species. Waterfront is part of a PMAZ. Approximately 5-acres of tidal open water impacts from new infrastructure and 4-acres/120,000 CY of dredging impacts.

Contains Shortnose and Atlantic Sturgeon (E), protected turtle species and several EFH species. Limited maintenance dredging (two acres) and open water impacts.

Contains Shortnose and Atlantic Sturgeon (E), Alewife Floater (C) and several EFH species. On shoreline, piping plover (E), Common Tern (T) Least Tern (T) and Northern Harrier (T) nesting habitats in the vicinity (beaches, County park). Limited dredging (0.41 acre/2,500 CY) impacts.

All sites have Shortnose and Atlantic Sturgeon (E), Alewife Floater (C) and several EFH species present, and one site has protected shorebirds present. One site would require dredging in new area; the other four sites require limited dredging and acreage of wetland impacts in existing ports/docking areas. Planned Alternative may dredge approximately 15 acres of benthic habitat (sediments), fill six acres of tidal wetlands from new infrastructure impacts, and fill one acre of emergent freshwater wetlands for a new bridge/roadway. Minor impacts to Normans Kill, a SCFWH tidal creek complex.

Approximately 5-acres of tidal open water impacts from new infrastructure and 4 acres/120,000 CY of dredging impacts. Dredged material may be reused under an NYSDEC Beneficial Use Determination (BUD) at offsite locations. No increase to impervious surfaces.

Limited maintenance dredging (two acres) and open water impacts due to adequate depths close to the navigation channel, minor wetland impacts from new infrastructure. Minor increase to impervious surfaces.

Minimal dredging (0.41 acre/2,500 CY) with adequate depths close to the navigation channel, some wetland/ open water impacts from new dock infrastructure. Increases to impervious surfaces.

3 sites would have moderate level of wetlands/open water fill and dredging impacts. 2 sites would

have minor wetlands/open water impacts. At least 3 ports would increase impervious surfaces creating stormwater runoff. No ports have aquifers present.

Criteria
Characteristics

Port of Albany-Rensselear (manufacturing)

Port of Coeymans (fabrication)

South Brooklyn Marine Terminal (staging and O&M)

Species and Habitat

Contains SCFWH with Shortnose and Atlantic Sturgeon (E), Alewife Floater (C) and several EFH species. Up to one acre of tidal wetlands/open water impacts from new infrastructure, one acre of freshwater wetland impacts from bridges/roads/ other fills, 3 acres/105,000 CY of dredging/infrastructure impacts, and converting up to 15 acres of impervious surfaces creating stormwater runoff. Dredging could result in direct impacts to of submerged aquatic vegetation (SAV) and freshwater mussel (Leptodea fragilis), requiring relocation of both SAV and freshwater mussels. Minor impacts to Normans Kill, a SCFWH tidal creek complex.

Contains SCFWH with Shortnose and Atlantic Sturgeon (E), Alewife Floater (C) and several EFH species. Limited dredging

(5.2 acres/156,000 CY)
impacts.

Up to one acre of tidal wetlands/open water impacts from new infrastructure, one acre of freshwater wetland impacts from bridges/roads/ other fills, 3 acres/105,000 CY of dredging/infrastructure impacts, and converting up to 20 acres of impervious surfaces creating stormwater runoff.

Small acreage of wetlands/ open water impacts (5.2 acres/156,000 CY) from dredging. Minor increase to impervious surfaces.

Federal or state listed endangered or threatened species or associated habitat, designated critical habitat,
Important Bird Areas,
Natural Heritage Communities,
Conservation and mitigation sites,
NYSDOS Significant Coastal Fish and Wildlife Habitat (SCFWH),
NYCWRP designations
Recognized Ecological Complexes (RECs),
Special Natural Waterfront Areas (SNWAs)

Environmental Impacts

-

Wetland/Water
Resources
Federal and State
regulated wetlands,
and surface waters,
Aquifers,
Water quality

E-10

Category
Environmental
Impacts

Resource
Cultural
Resources

Criteria
Characteristics
Historic architectural
resources,
Historic districts,
Upland and marine
archaeological
resources (shipwrecks)

Port Jefferson

Port of Montauk

Planned Alternative

(O&M)

(O&M)

(Summary)

May impact archaeological sensitive
area. No mapped historic
architectural resources or historic

districts within the vicinity.

May impact archaeological sensitive area. No mapped historic architectural resources or historic districts within the vicinity.

May impact archaeological sensitive area. No mapped historic architectural resources or historic districts within the vicinity.

All five sites may impact archaeological sensitive areas. Two ports may have unavoidable adverse visual impacts to Native American sites. One site with historic architectural resources or historic districts in the vicinity.

Port of Albany-Rensselear (manufacturing)

Port of Coeymans (fabrication)

South Brooklyn Marine Terminal (staging and O&M)

No mapped cultural resources or historic districts on site. However, unavoidable adverse visual impacts would occur to a site of Native American significance across the Hudson River.

Listed properties in the vicinity of the site. Coeymans Landing Historic District and Schodack Island State Park inhabited by the Stockbridge-Munsee Tribe location of the Mohican Council Fire, the Tribe's seat. No submerged precontact sites were identified during the remote sensing survey. Unavoidable adverse visual impacts may occur to the Native American site (Schodack Island) across the Hudson River.

Environmental Impacts

Community Character

Sensitive receptors (residences, parks, hospitals, schools, etc.)
Neighborhoods

Environmental Impacts

Hazardous Materials

Hazardous materials,
Subsurface contamination,
Health and safety issues

Environmental Impacts

Floodplains & Resiliency

100-year floodplains
Wave action prone

areas
Floodways,

Ezra Prentice and other residential
communities are north of the site. Wellsited as an expansion of an existing port.
The 3-mile truck route to I-87 has potential
impacts during construction and peak
operations.

No sensitive receptors
adjacent to the site. Wellsited within an existing port.
Direct ½-mile highway
access to I-87 would have
minimal traffic, noise or air
quality effects to community.

Limited residences in the vicinity.
Well-sited within an existing port.
Direct highway access to I-287 would
have minimal traffic, noise or air
quality effects to community.

Residential neighborhood
receptors west and south of
the site, along local access
road. Sited on an existing
port. Temporary
construction impacts may
occur, however, sporadic
O&M operations will result
in less traffic, noise, air
quality or visual effects to
community.

Site adjacent to Montauk
County Park and residential
receptors south of the site
along local access road.
However, cited near an airport
and busy marinas. Temporary
construction impacts may
occur, however, sporadic O&M
operations will result in less

traffic, noise, air quality or visual effects to community.

Four sites have residential communities nearby. However, most sites are within or adjacent to existing ports and within compatible land use and zoning.

Upland site developments will disturb former landfill soils of fly ash and bottom ash with high levels of metals and other contaminants. Dredging and in-water construction may disturb pesticide and PCB-contaminated sediments.

Upland site developments will likely demolish buildings with hazardous materials and disturb contaminated fill soils from port operations. Dredging and in-water construction would disturb non-hazardous (Class A and Class B) contaminated sediments.

Upland site developments may demolish buildings with hazardous materials and disturb contaminated fill soils from port operations. Dredging and in-water construction would disturb contaminated sediments.

Upland site developments may disturb contaminated fill soils from port operations. Dredging and in-water construction may disturb contaminated sediments.

Upland site developments may
disturb contaminated fill soils.
Dredging and in-water
construction may disturb
contaminated sediments.

All sites will disturb contaminated
fill soils from former port
operations and/or other past uses.
Two sites will likely demolish
buildings with potential hazardous
building materials (e.g. asbestos).
All sites will temporarily disturb
contaminated sediments during
dredging and in-water
construction.

High potential for flooding impacts; 98% of
site within 100-yr floodplain and floodway
on west and north borders. Improvements
will raise the site, affecting potential
flooding and natural drainage.

10% of site within 100-yr
floodplain and bordering
floodway of Hudson River.
Improvements will raise the
site, affecting potential
flooding and drainage.

High potential for flooding impacts;
90% of site within 100-yr floodplain
and along NY Harbor floodway.
Improvements will raise the site,
affecting potential flooding and
drainage.

High potential for flooding
impacts; 70% of site within
100-yr floodplain.
Improvements will raise the
site, affecting potential
flooding and drainage.

Potential for flooding impacts;
45% of site within 100-yr
floodplain. Improvements will
raise the site, affecting potential
flooding and drainage.

High potential for tidal flooding
impacts from waters affected by
sea level rise at most sites, as the
100-yr floodplains are present onsite and floodways are adjacent.
Three sites have 50% located
within 100-yr floodplains.
Improvements will raise the site,
affecting potential flooding and
natural drainage.

Coastal Erosion Hazard
Zone (CEHZ)
Drainage Patterns

E-11

Category
Environmental
Impacts

Resource
Air Quality &
Greenhouse
Gases

Criteria
Characteristics
USEPA National
Ambient Air Quality
Standards (NAAQS)
Nonattainment area
Sensitive receptors

Environmental
Impacts

Noise

Sensitive receptors
within 1/4 mile,
Local noise codes,
Truck routes

Port Jefferson

Port of Montauk

Planned Alternative

(O&M)

(O&M)

(Summary)

Air quality impacts are not expected with effective BMPs. 8-Hour Ozone Moderate Nonattainment Area, PM2.5 Nonattainment Area. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur.

Air quality impacts are not expected with effective BMPs. 8-Hour Ozone Moderate Nonattainment Area, PM2.5 Nonattainment Area. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur.

Air quality impacts are not expected with effective BMPs. 8-Hour Ozone Moderate Nonattainment Area, PM2.5 Nonattainment Area. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur.

All sites are located within Ozone and/or PM2.5 Nonattainment Areas. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur. However, air quality impacts are not expected at the sites by using effective BMPs.

Limited residences in the vicinity of truck route may experience some truck traffic-related noise. Sited on an active port and commercial/industrial area with high ambient noise levels.

Limited residences in the vicinity may experience truck traffic-related noise during construction. Minor noise levels expected from O&M activities. Sited on an active port and industrial area.

Limited residences and park users in the vicinity may experience some port-related and truck traffic-related noise. Minor noise levels expected from O&M activities.

Four sites have sensitive receptors in the vicinity that may experience truck traffic-related noise during construction. Most

are sited on an active port and
industrial area with higher ambient
noise levels. Minor noise levels
are expected from O&M activities.

Port of Albany-Rensselear
(manufacturing)

Port of Coeymans
(fabrication)

South Brooklyn Marine
Terminal (staging and O&M)

Air quality impacts are not expected with effective BMPs. 1-Hour and 8-Hour Ozone Marginal Nonattainment Area. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur. Air quality of Ezra Prentice neighborhood to the north is part of the NYSDEC's Albany South End Community Air Quality Study with air monitoring programs and enforced truck restrictions.

Air quality impacts are not expected with effective BMPs. 1-Hour and 8-Hour Ozone Marginal Nonattainment Area. During construction and operations, elevated diesel exhaust emissions from trucks, equipment and marine vessels will occur.

No adjacent sensitive receptors and sited within industrial and commercial area. Truck route will avoid residential areas.

Impacts are not anticipated
at the nearest sensitive

residential or Schodack
Island State Park noise
receptors. adjacent sensitive
receptors and sited within
industrial and commercial
area. Rural truck route
passes through residential
areas, which may have
short-term noise impacts
during construction or peak
operations.

Note: Socioeconomic Impacts are Construction Jobs, O&M Jobs and Economic Development Impacts/Benefits are only summarized at the Alternative-level, not per port location.

Appendix F. Navigation Impact Study (SUNY Report)

NYSERDA Task Work Order (TWO) No. 2 Support for
Offshore Wind Ports Cumulative Impacts Study
Prepared for: HDR
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Project Manager

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Captain Eric Johansson
Dr. Shmuel Yahalom
Professor Tara Quinn

Table of Contents

1. Introduction

This report was prepared by The State University of New York, Maritime College (SUNY Maritime) while
performing work subcontracted work for HDR and sponsored by the New York State Energy Research and
Development Authority (NYSERDA), the Sponsors.1
Scope of Work: Support for Offshore Wind Ports Cumulative Impacts Study

In support of New York's Climate Leadership and Community Protection Act, NYSERDA is coordinating
the cost-effective development of at least 9,000 megawatts (MW) or 9 gigawatts (GW) of offshore wind
(OSW) energy by 2035. To date, the Long Island Power Authority has competitively selected the South Fork
Wind Farm and NYSERDA has issued two solicitations for offshore wind energy projects and has
competitively selected four offshore wind projects Sunrise Wind, Empire Wind 1 & 2, and Beacon Wind.
Combined, these projects bring New York's active offshore wind portfolio to over 4,300 MW. As these and
additional offshore wind energy projects develop to achieve the State's goals, an assessment of projectrelated navigational impacts, including those associated with port infrastructure are necessary to gain an
understanding of the cumulative impacts associated with meeting the 2035 goal.
NYSERDA has identified five ports of the current "Planned Alternative" to support the OSW infrastructure
staging, manufacturing, assemblage and delivery to the off-shore wind farm sites and support the operations
and maintenance (O&M) of the off-shore wind farms. The five ports of the current "Planned Alternative"
have been strategically laid out to assume port facilities across the Key Regions of the State, including:

•
•
•

North (Hudson) River Valley Region
o Port of Albany (manufacturing)
o Port of Coeymans (fabrication)
New York Harbor Region
o South Brooklyn Marine Terminal (staging and O&M)
Long Island Region
o Port Jefferson (O&M)
o Port Montauk (O&M)

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9 GW Support for Offshore Wind Ports Cumulative Impacts Study

Preliminary studies indicate that the capacity and timing of the Planned Alternative ports would not be
sufficient to achieve the State's 9 GW OSW goal by 2035. Hence, to assume a reasonable scenario to fully

achieve or perhaps even exceed the State's 9 GW OSW goal by 2035, a "Full Build Alternative" has been
developed that comprises of the five ports of the Planned Alternative in addition to the "Potential Alternative" port locations. The Full Build Alternative has been strategically laid out to assume additional
Potential Alternative port facilities across the Key Regions of the State, including:

- North (Hudson) River Valley Region: New York State Wind Port (manufacturing)
- New York Harbor Region: Arthur Kill Terminal (staging and O&M), Port Ivory (fabrication), Homeport Pier (O&M), Brooklyn Navy Yard (O&M), Brooklyn Port Authority Marine Terminal (O&M)
- Long Island Region: Hempstead Public Works Area (O&M)

The goal of the navigational impact study is to explore port facility characteristics, navigational constraints
and vessel routes and density associated with the Planned Alternative and Full Build Alternative including
No Action Alternatives. This study will discuss and describe cumulative effects of offshore energy maritime
support vessels and waterborne transportation as part of the offshore energy offshore distribution system in
New York waterways under the assumed port facilities of the Full Build Alternative.

1.1 Study Objectives

The purpose of this study is to investigate and identify the impacts of the support of offshore energy in New
York Waterways from the following objectives:

- Identify and assess port facility characteristics of the Planned Alternative and Full Build Alternative
- Identify and assess navigational constraints with the Planned Alternative and Full Build Alternative
- Identify and assess vessel routes and density associated with the Planned Alternative and Full Build Alternative

References include:

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-
-
-

1.2

Government Documents
Industry Documents
NYSERDA Task Work Order (TWO) No. 6 - 9 GW Port Uses and Navigational Assessment
Interviews

Background

The transportation delivery system is complex relying on multimodal transportation services. A key player
in the transportation delivery system is the marine transportation system. The maritime transportation system
of NYC and NY State relies on large, medium and small terminals, plethora of cargo and support vessels,
and a robust maritime support services that collectively form an efficient system. The health of the maritime
transportation system and the benefits to the community is largely dependent on government support and
sound port practices access to facilitate the delivery of vital goods and services. The maritime benefit to our
communities is paramount for a green New York State and supports good paying blue-collar jobs in NY for

both mariners and terminal operators. The purpose of this study is to investigate and identify demand of
port uses and navigation waterborne services in New York State and potential impacts by offshore energy.
Port Authority of New York & New Jersey reports that its terminals support 152,000 jobs in the state and
directly contribute $32 billion to the state’s economy. The Port of Albany reports that its terminals support

for approximately 1,400 local jobs and 4,500 jobs throughout New York State. Private ports and terminals
employment and economic data is not available.
Offshore Wind Support Vessels includes but not limited to as follows:
•

•
•
•
•

1.2.1
•
•
•

Service Offshore Vessels - Subject to Jones Act (Subchapter L). When a SOV intends to tow it must
hold a dual Certificate of Inspection as Subchapter L and when engaged in towing either Subchapter
M (< 300 GRT) or (I >300 GRT). During Towing operations the vessel must be fully compliant with
the applicable Certificate of Inspection.
Wind Turbine Installation Vessel (WTIV) - Not subject to Jones Act unless transporting cargo
Crew Transfer Vessels - Subject to Jones Act (Subchapter T for vessels < 100 GRT carrying more
than 6 offshore workers or passengers.
Tug/Tow - Subject to Jones Act. Tug Certificate of Inspection under Subchapter M (< 300 GRT) or
(I >300 GRT). During Towing operation vessels must fully comply with the applicable Certificate of Inspection.
Cargo Carrying Vessels (CCV) - Subject to Jones Act only if engaged in carriage of goods between
domestic ports or from domestic ports to offshore wind installation sites.

Review Process
Review Full Build Alternative proposals.
Review finding of NYSERDA Task Work Order (TWO) No. 6 - 9 GW Port Uses and Navigational Assessment
Interviews with Subject Matter Experts

Planned
Alternative

Full Build Alternative

Alternatives

Location
1. Port of Albany-Rensselaer
2. Port of Coeymans
3. South Brooklyn Marine Terminal
4. Port Jefferson
5. Port of Montauk
6. Arthur Kill Terminal
7. Port Ivory
8. Homeport Pier
9. Brooklyn Navy Yard
10. Brooklyn Port Authority Marine
Terminal
11. Hempstead Public Works
12. NYS Wind Port

Assumed Port Use
Manufacturing (Towers)
Fabrication (Substructures)
Staging (WTG and Substructures) and O&M
O&M (Service Operations Vessels (SOCs)
O&M (Crew Transfer Vessels (CTVs))
Staging (WTG)
Fabrication (Offshore Substation components)
O&M
O&M
O&M
O&M
Component Manufacturing

Source: HDR

2. Planned Alternative Ports and Terminals
The New York State waterfront is vast and powerful economic engine providing safe, green
friendly

transportation, reducing road construction, and enhancing quality of life. Ports and Terminals play an
important role in ability to create and sustain a diverse mix of jobs, move goods projects move forward in a
timely manner while promoting the health of the city's ecosystems in the State of New York
New York Harbor is the third largest port in the United States (Port Authority Trade Statistics, 2019). It is
also a major through port for oil in the United States providing the vast majority of home heating oil
shipments to the New England region with over eighty percent via Tug/Tow.2 The Economic impact of the
Port Authority of New York and New Jersey alone is valued at $99.5 billion in business activity, $36.1
billion in personnel income and close to $12 billion in federal, state, and local tax revenues.3
An economic impact study of the Port of Albany measured the Port's overall economic impact on New York
State at more than $813 million. The measure of the Port's significance to the regional economy in terms of
Output was more than $428 million. Tenants of the Port of Albany paid over $80 million in wages and
benefits.4
An economic impact study of privately owned ports and terminals in the State of New York is not available.
For the purposes of this paper the region is divided as follows:

- North (Hudson) River Region - North of the Holland Tunnel Ventilator
- New York Harbor Region - Areas currently within the USCG Vessel Traffic System.
- Long Island Region - Nassau and Suffolk Counties

2.1 North (Hudson) River Region
The North (Hudson) River extends from the Battery (Lower Manhattan) to the Port of Albany. Deep draft
and shallow draft ports and terminals are located on the North (Hudson) River from New York City to the
Port of Albany.
The North (Hudson) River is navigable by ships and deep draft tug/tows to the Port of Albany and shallowdraft tug/tow north up and including the vast cargo canal system connecting the Port of Albany to both Lake
Champlain and Lake Erie. The canal system in New York contains numerous ports and Lake Erie provides
access to all the Great Lakes and its ports and harbors.
The project provided for a channel 600 feet wide, New York City to Kingston, thence 400 feet wide to 2,200
feet wide south of the Mall (Dunn) Bridge at Albany with turning basin at Albany and anchorages

near
Hudson and Stuyvesant, all with depths of 32 feet in soft material and 34 feet in rock; thence 27 feet deep
and 400 feet wide, 900 feet south of the Mall (Dunn) Bridge; thence 14 feet deep and generally 400 feet
wide to the Federal Lock at Troy; and thence 14 feet deep, 200 feet wide, to the southern limit of the State
Barge Canal at Waterford; with widening at bends and widening in front of the cities of Troy and Albany to
form harbors 12 feet deep. Length – (NYC to Waterford) about 155 miles. The project included removal of
2

AWO Fact Sheet June 2011
The 2020 Report on the Economic Value of the New York-New Jersey Port Industry, pg. I, New York Shipping
Association,
4
https://www.portofalbany.us/our-impact/economic/
3

the State Dam at Troy and construction of a new lock and dam at Troy about 2.5 miles below Waterford. The
project construction is complete. Existing environmental restrictions for dredging require all in-water work
to be completed between September 1st and December 31st 5.
During extremely severe winters navigation is interfered with ice. The USCG monitors, reports, performs
ice breaking services and commercial mariners collaborate in ice conditions to keep commerce flowing.
NYSERDA Task Work Order (TWO) No. 6 - 9 GW Port Uses, and Navigational Assessment, identified
Items for consideration for Navigation to improve waterborne commerce in the State of New York by
enhancing navigation safety, supply chains, resiliency, and economic growth. This report identifies items
for consideration for all vessels (offshore wind related and non-offshore wind project related) navigating on
the subject New York waterways:6

Holland Tunnel - Albany: Extend VTS to Port of Albany
George Washington Bridge-Tappan Zee Bridge: Air Draft Sensor on the Tappan Zee Bridge.
Unobstructed waters for anchoring as identified in report.
Tappan Zee Bridge - Kingston: Maintain Federal Authorized Channel 600-feet wide by 32-feet deep.
Unobstructed waters for anchoring as identified in report.
Hudson Highlands: Fog Sensors
Lange Rack: Air Draft Sensor Mid-Hudson Bridge. Unobstructed waters for anchoring as identified in report
Kingston: Unobstructed waters for anchoring as identified in report
Kingston - Albany: Air Draft Sensor Castleton Highway Bridge. Current/Tide Sensor Port of Albany and Port of Coeymans. Multiple Fog Sensors. Maintain Federal Authorized Channel 400-feet wide by 32-feet deep. Turning Basin at Port of Coeymans.

2.1.1 Port of Albany

The Albany Port District Commissioners (APDC) leads and manages the publicly-owned maritime Port of Albany-Rensselaer. The APDC consist of five members, four appointed by the Governor upon nomination by the Mayor of Albany, and one appointed by the Governor upon nomination of the Mayor of Rensselaer.

The Port of Albany has over 200 acres of land and deep water facilities in two locations as follows: Albany (4,200 Feet dock) and Rensselaer (1,200 Feet dock) and proposing 80 additional acres with 500 feet of dockage in Bethlehem, just south of Albany. The Port of Albany, Bethlehem proposal is currently undeveloped and under permitting process. Pending bridge reconstruction, the proposed Bethlehem terminal will be accessible by road. Completion timeframe and facility specifics are not identified at this time. is in the permitting process to build more dockage in Bethlehem (500 Feet of Dock).

Intermodal Connections at the Port of Albany include - Rail, Barge Ro-Ro ramp, heavy-lift, and

major
highways. Port of Albany spent nearly $18 million “Tiger Grant” on the development of heavy-lift. The Port of Albany will be connected by road to Bethlehem pending bridge reconstruction. Both the Port of
Albany (west side of the river) and Rensselaer (east side of the river) have rail access.

5

https://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487349/fact-sheet-hudsonriver-nyc-to-waterford-ny-maintenance-dredging/
6
NYSERDA Task Work Order (TWO) No.6, 9 GW Port Uses and Navigational Assessment, 6.2, pg. 98

8

9 GW Support for Offshore Wind Ports Cumulative Impacts Study

Air Draft Limitations - Mid-Hudson Bridge: 40.8 m 134 ft.

Site
Port of
Albany
Port of
Albany at
Bethlehem
Port of
Albany at
Rensselaer

Type
of
port

Distance
to Sea
buoy
(Nautical Miles)

Dockage
space
(feet)

Upland
Support
space (acres)

Intermodal
facilities

Other
services
Heavy
Lift

Public

143

4,200

202

Barge
Rail
Highways

Public

142

500

80
(proposed)

In
permitting

Public

143

1,200

34

Barge
Rail
Highways

Development
Cost

$350 million
(plus)

2.1.2 Port of Coeymans Marine Terminal
The Port of Coeymans Marine Terminal (PCMT) is privately owned and operated facility that is a prime
location for all shipping, processing, warehousing, and transportation needs that is equipped to handle breakbulk (modularization of power plants and bridges), bulk (aggregates) manufacturing, marine construction,
and heavy lifts.
Located on the West Bank of the North (Hudson River) south of the Port of Albany this modern terminal
boasts 450 acres of land, deep water facilities, and an 820 Metric Ton Marine Travel lift for repairs and
special projects. The deep water port includes a ship dock for vessels up to 750-feet, two barge finger docks,
and multipurpose inlet to accommodate vessels up to 60*280 feet for general and specialized cargo support.
The PCMT is owned/operated by Carver Industries, privately developed, with maritime facilities in
Supporting facilities to include: Brayton Point - Patriot Stevedoring, Carver Maritime Charleston, Carver
Maritime Manatee, Carver Stevedoring, Coeymans Industrial Park, and Coeymans Marine Towing.
Coeymans Marine Towing consist of 9 tugboats and over 40 barges.
Intermodal Connections at the Port of Coeymans Marine Terminal include - Rail, traditional and specialized
barge loading facility, heavy lift, and major highways.
The Port of Coeymans Marine Terminal upland support is continuous extending from the river up to and
across the NYS Thruway and includes onsite rail.
Mooring Buoys are located near the terminal for lay-berthing barges and other floating equipment.
Air Draft Limitations - Mid-Hudson Bridge: 40.8 m 134 ft.

Site
PCMT
Ship dock
PCMT
barge dock
PCMT
Specialized
Cargo Dock

Type of
port
Private

Distance to
Sea buoy
(Nautical Miles)

133

Private

133

Private

133

Dockage space
(Max Vessel)

Upland
Support
space (acres)

750-foot
3 Barge Berths
80ft x 280ft
Accommodation
Barge size of
60ft x 280ft

Intermodal
facilities

Barge

450

Rail
Highways

Other services

Heavy lift,
Travel Lift,
Tug Fleet,
Barge Fleet

9

9 GW Support for Offshore Wind Ports Cumulative Impacts Study

2.2 New York Harbor Region
Navigation of the channels in the Port of New York and New Jersey is not restricted by ice. The main
channels do not freeze over, and any ice in the smaller waterways is well broken up by tugs and general
traffic. Freshwater ice is brought down the Hudson River in large floes during periods of thaws or winter
freshets. The items for navigation consideration are subdivided into six categories as follows:7
•
•
•
•
•
•

Atlantic Approach: Federally designate Deep-water Anchorage off Long Beach New York
Ambrose Channel: Deepen Gravesend Anchorage to accommodate Neo Panamax Vessels
Sandy Hook Channel: Widen Channel to mitigate shoaling
Upper Bay: Scan and survey bay to identify and mitigate subsea infrastructure
KVK: Widen Bends for Neo Panamax Vessels. Update current models at Bergen Point.
AK: Air Draft Sensors on the Goethals Bridge and Outerbridge Crossing. Periodic maintenance dredging

2.2.1 South Brooklyn Marine Terminal, Brooklyn
The South Brooklyn Marine Terminal is an intermodal shipping, warehousing, and

manufacturing complex
in the Port of New York and New Jersey. It is located along the Upper New York Bay, between 29th and
39th Streets in the Sunset Park and Greenwood Heights neighborhoods of Brooklyn, New York City.

The proposed facility improvements will provide marine vessel access and allow the storage, staging, preassembly and transfer of materials utilized in construction, installation, and operation and maintenance of
OSW projects. Project elements include bulkhead improvements to the 39th Street (St) "Pier", 35th St "Pier"
and the bulkhead that extends between 32nd and 33rd St, new pile supported and floating platforms, new
fenders for vessel mooring, upgrades to "pier" infrastructure, construction of administration facilities and an
operations-and-maintenance base, demolition of existing buildings, and improvements to site utilities

The Project includes infrastructure improvements to provide the necessary structural capacity, berthing
facilities and sufficient water depth to allow the SBMT to operate as an OSW hub for construction and
operation. A major component of the future use of SBMT is marine vessel activity, which will include
berthing and transfer of cargo and crew to cargo carrying vessels (CCV), barges, service operations vessels
(SOV), and crew transfer vessels (CTV).

Pursuant to analyses of infrastructure and site conditions, vessels would berth in the following arrangement:

- CCVs would berth along the west (offshore) and south faces of the 39th St "Pier" (39W, 39S)
- Barges would berth along the north and west face of the 39th St "Pier" (39N, 39W)
- Barges would berth along the west face of 35th St "Pier" (35W)
- SOVs would berth along a proposed wharf off of the northeastern edge of the 35th Street "Pier" (35N)
- CTVs would berth along a proposed floating wharf platform extending from the existing bulkhead located between 32nd and 33rd St (32-33).

The Project includes the construction of an approximately 57,000 square feet (sq-ft) operations and
maintenance (O&M) base containing approximately 22,000 (sq-ft) of office and support space, and
approximately 35,000 (sq-ft) of warehouse facilities and associated utility space with a maximum height of

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32.8 ft from grade. The deepening of navigation channels, rehabilitation and strengthening of bulkheads, and
installation of wharves will allow both navigational access and berthing for all vessel types (CCVs, barges,
SOVs, and CTVs) required to support OSW projects.
Air Draft Limitation: Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.) 65.5 m (215
ft.) maximum at the centerline.

Site

Type of
port

SBMT
Barge
SBMT
Ship
SBMT
SOV
SBMT
CTV

Public
NYCEDC
Public
NYCEDC
Public
NYCEDC
Public
NYCEDC

Distance to
Sea buoy
(Nautical

Miles)

Dockage
space
(feet)

Upland
Support
space
(acres)

Intermodal
facilities

Other services

Development
Cost

Heavy Lift,
SOV Berths,
CTV Berths,
CCV Berth

TBD

400
Barge
508
17.4

66.1

Rail

240
Highways
90

2.3 Long Island Region
Long Island’s North Shore commercial ports include Port Jefferson, Oyster Bay, Hempstead
Harbor, and
Port Shoreham developed for heavy lift cargo to support the failed Shoreham Nuclear Power

Facility project.
Two offshore terminals are located on the North Shore of Long Island in Northport and Riverhead.
Commercial ports on Long Island provide liquid, dry and limited break bulk cargoes providing resiliency
and relieving truck congestion. The North Shore is home to two major commercial ferry operators out of
Port Jefferson and Orient Point to the mainland Connecticut.
Long Island's South Shore commercial ports include Jamaica Bay, located at the western end and Montauk
Harbor and North Fork Greenport Harbor at the eastern end of Long Island. Along the south shore between
are several inlets for shallow draft commercial and recreational fishing vessels.
The number of terminals has decreased over the years on Long Island for various reasons including high real
estate cost and lack of government support.
Items for consideration for Navigation:8
• Hell Gate: Current Sensor
• Throggs Neck: Tide Sensor
• Federally designated anchorage grounds between Execution Rocks and Throggs Neck to support
Ships and Tug/Tows units.
• Maintain Port Jefferson Harbor Channel. Shoaling has been reported inside the harbor east of the
channel
• Maintain Port of Montauk Harbor Channel. Shoaling has been reported East side of the channel at
the breakwater.
• Consider a Federal Designated Anchorage for Port of Montauk

8

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2.3.1 Port Jefferson
Port Jefferson Harbor, on the north shore of Long Island is entered through a dredged channel that leads
between two jetties that are in ruins to a docking area near the southwestern end of the harbor;

the jetties are
each marked by a light. Commercial terminals include liquid and dry bulk, launch and supply services are
sited along the west shore in close proximity at the southern end of the harbor.
Port Jefferson has channel and connector depth capacity to accommodate both CCV's and SOV's at either
the private Power Plant (Marketspan Generation LLC) or Liquid Bulk (Consolidated Petroleum) facilities
pursuant to private facility agreement. Additionally, channel and connector depths to accommodate CTV's
at the Private Commercial Service Operation (Consolidated Petroleum), Marina (Sound Express), or Aggregate
(Tilcon) facilities pursuant to private facility agreement.

Dockage
space (Max
Vessel)

Upland
Support
space
(acres)

Private
Power Plant

738 Feet9

65.1610

Private Liquid
Bulk
Private
Commercial
Service
Operation
Private
Marina
Private
Aggregate

600 Feet

Type of
port

Site

Marketspan
Generation
LLC
Consolidated
Petroleum
Consolidated
Petroleum
Sound Express
Tilcon

Distance
to Sea
buoy
(Nautical
Miles)

57.2

Finger Pier

3.9
0.4
(approximate)

Intermodal
facilities

Other
services

Road
BPPJ

None

Ferry
Finger Pier

1.15

480 Fleet

2.74

2.3.3 Port Montauk
Montauk Harbor, in the northern part of Lake Montauk, is entered through a dredged channel on the northern
shore about 3 miles west of Montauk Point; a federal project provides for a depth of 12 feet in the channel
and 10 feet in the boat basin northwestward of Star Island. Limited channel depths and close proximity to
the ocean dictates that Port Montauk it is best suited for Crew Transfer Vessels (CTV) pursuant to private
facility agreement or purchase.

9

Ship dock has not been utilized for cargo delivery to the generating facility for several years leaving the possibility
of usage when not needed for cargo by SOV's
10
Available upland acres are not known.

12

Site

ELD
LLC11
Inlet
Seafood
LLC

Type
of port

Distance
to Sea
buoy

(Nautical
Miles)

Dockage
space
(feet)

Upland
Support
space
(acres)

Intermodal
facilities

Other
services

Development
Cost

Private

0.75

Finger
Dock

6.15

Road

None

TBD

Private

0.75

Finger
Dock

6.73

Road

None

TBD

Table 1 provides a summary of planed alternatives collected from the above tables.

11

527 ELD, LLC was established on Dec 13, 2019, as a foreign limited liability company type registered at 1 Engle
Street, Suite 201 Englewood, 527 ELD, LLC has been operating for 2 years 0 months, and 22 days since it
established.

13

Table 1: Summary of planned alternatives
Site

Type of port

Port of Albany
Port of Albany at Bethlehem

Public

Port of Albany at Rensselaer

barge dock
Private
Specialized Cargo Dock

Marketspan Generation LLC
Consolidated Petroleum
Consolidated Petroleum
Sound Express
Tilcon

Dockage

space (feet)

143

Port of Albany
4,200

142

500 (proposed)

Upland
Support space
(acres)

Intermodal
facilities

Other
services

202

Barge, rail, highway

Heavy Lift

80 (proposed)

In permitting

143

Ship dock

Barge
Ship
SOV
CTV

Distance to
Sea buoy (NM)

Public, NYCEDC

Private Power Plant
Private Liquid Bulk
Private Commercial
Service Operation
Private Marina
Private Aggregate

1,200
34
Port of Coeymans Marine Terminal
750-foot
3 Barge Berths 80ft
x 280ft
133
450
Accommodation
Barge size of 60ft x
280ft
South Brooklyn Marine Terminal
400
508
17.4
66.1
240
90
Port Jefferson
738 Feet[1]
65.16[2]
600 Feet
3.9
57.2

Finger Pier

0.4 (approx.)

Finger Pier
480 Fleet

1.15
2.74

Development
Cost

$350 million
(plus)

Barge, rail, highway

Barge
rail
highway

Heavy lift,
Travel Lift,
Tug Fleet,
Barge Fleet

NA

Barge
rail
highway

Heavy Lift,
SOV Berths,
CTV Berths,
CCV Berth

TBD

Road
BPPJ
Ferry

None

NA

None
None

TBD

TBD

1[1] Ship dock has not been utilized for cargo delivery to the generating facility for several years leaving the possibility of usage when not needed for cargo by SOV's
1[2] Total acres. Available upland acres are not known.

ELD LLC[1]
Inlet Seafood LLC

Private
Private

0.75
0.75

Port Montauk
Finger Dock
Finger Dock

6.15
6.73

Road
Road

1[1] 527 ELD, LLC was established on Dec 13, 2019, as a foreign limited liability company type registered at 1 Engle Street, Suite 201 Englewood, 527 Eld, Llc has been operating for 2 years 0 months, and 22 days since it established.

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3. Proposed NYS Offshore Energy Full Build Alternate
Ports and Terminals
3.1 North (Hudson) River Region
The North (Hudson) River Region is replete with additional existing and choice port development locations.
This report will explore one area selected by HDR.
New York State Wind Port - Undeveloped parcel of river front on the east bank of the Hudson River with
ample upland potential.

3.1.2 New York State Wind Port

The proposed New York State Wind Port is sited on the East bank of the North River opposite of the proposed Port of Albany Bethlehem site. Pursuant to site development vessels berthing could accommodate CCVs, Barges, SOVs, and Cable laying vessel.

Air Draft Limitations: Mid-Hudson Bridge: 40.8 m 134 ft MHW

Site

Type
of port

Distance to
Sea buoy
(Nautical
Miles)

Dockage
space
(feet)

Upland
Support
space
(acres)

Intermodal
facilities

East
Greenbush

Not
Known

142

Not
Known

91

Road
Rail Access

Other
services

None

Development
Cost

Not Known

3.2 New York Harbor Region
The New York Harbor Region has 5 possible sites in various stages of port development. This report will
explore five areas selected by HDR.
Arthur Kill - Port potential requiring wide-ranging development including dockage, wharfage, landfill,
heavy lift, etc. Site features open access to the ocean without air-draft restrictions. Navigation Channel draft
restrictions are 35-feet. Connector water depths and dockage depths are unknown.
Port Ivory - Port potential requiring wide-ranging development including dockage, wharfage, landfill, heavy
lift, etc. Site features open access to the ocean with air-draft restrictions of 215-feet via the KVK and 135feet via AK. Navigation Channel draft restrictions are 50-feet via KVK and 35-feet via AK. Connector water
and availability (dock to federal channel) and dockage depths are unknown.
Homeport - Port potential includes solid pier with limited upland support or heavy lift, etc. Site features open
access to the ocean with air-draft restrictions of 215-feet (Verrazano Bridge) and maximum for Navigation
Channel drafts for Port of New York easily accessible to sea. Inside the federal designated anchorage to the
shoreline is available for staging moorings.

`

Brooklyn Navy Pier - Port potential includes existing piers, upland support, and on-site ship

repair facility
GMD Shipyard. Site limitation include air-draft restrictions of 127-feet (Brooklyn Bridge) and strong
currents in the East River.
Port Authority Marine Terminal - Port potential includes substantial pier lengths with upland support and
container terminal. Site features open access to the ocean with air-draft restrictions of 215-feet (Verrazano
Bridge) and good Navigation Channel drafts for Port of New York easily accessible to sea.

3.2.1 Arthur Kill
The proposed Arthur Kill Port is sited on the bank of the Arthur Kill and consist of 23.2 acres of land along
with 9.2 acres of submerged land. AK has navigable depth of 35 feet and no air draft restrictions via
Sandy Hook Channel. Pursuant to site development vessels berthing could accommodate CCVs, Barges,
SOVs, and Cable laying vessel.
Air Draft Limitation via AK: None

Site

Type
of port

Distance
to Sea
buoy
(Nautical
Miles)

Dockage
space
(Waterfront)

Upland
Support
space
(acres)

Intermodal
facilities

Other
services

Development
Cost

Arthur
Kill
Terminal

Private

25

1,500 feet

23.2

Road

None

TBD

3.2.2 Port Ivory
The Port Ivory site is adjacent to the Global Container Terminal (GCT) on Staten Island New
York. Units
can navigate to the site via KVK or AK. KVK Channel has navigable depth of 50 feet and
215-feet of Air
Draft. AK has navigable depth of 35 feet and air draft of 135-feet. Pursuant to site development
vessels
berthing could accommodate CCVs, Barges, SOVs, and Cable laying vessel.
Air Draft Limitation via KVK: Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m
(2,000 ft.)
65.5 m (215 ft.) maximum at the centerline
Air Draft Limitation via AK: Arthur Kills Railroad Bridge 135-feet.

Site

Type of
port

Port Ivory

PANYNJ

12

Distance
to Sea
buoy
(NM)
KVK
18.8
AK 23.7

Dockage
space
(feet)

Upland
Support
space
(acres)

Intermodal
facilities

Other
services

Development
Cost

2,512
GCT

18712

I-278
On-Site
Rail

Container
Terminal

TBD

Proposed Port Ivory Site is undeveloped and adjacent to Global Container Site.

3.2.3 Homeport
The Homeport pier, originally built for the US Navy is used for layberthing. The property has several tenants
include FDNY and Millers Launch. Pursuant to site development vessels berthing could accommodate
CCVs, Barges, SOVs, CTV's and Cable laying vessel.
Air Draft Limitation: Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.) 65.5 m (215
ft.) maximum at the centerline

Site

Type of
port

Homeport
FDNY
NYCEDC
Millers

Distance
to Sea
buoy
(NM)

Dockage
space
(feet)

Upland
Support
space
(acres)

Intermodal

facilities

Other
services

Development
Cost

16

1,410 Pier
2,820
feet13

28

Road
Rail Access

None

TBD

3.2.4 Brooklyn Navy Yard
The Brooklyn Navy Yard (BNY) originally built ship building has three active graving docks operated by
GMD Ship Repair as well as several marine and non-maritime tenants. Pursuant to site development vessels
berthing could accommodate CCVs, Barges, SOVs, CTV's and Cable laying vessel.
Air Draft Limitation: Brooklyn Bridge: 127 ft. maximum at the centerline

Site

BNY

Type
of
port
Public

Distance
to Sea
buoy

21.4

Dockage
space
(feet)
1,800

Upland
Support
space
(acres)

Intermodal
facilities

Other
services

Development
Cost

27.5

Industrial
Rail
I-278

Ship Repair

TBD

3.2.5 Brooklyn Port Authority Marine Terminal

The Brooklyn Port Authority Marine Terminal site includes Red Hook Container Terminal (RHCT) and
Brooklyn Cruise Terminal (BCT). Navigable depth of 35 feet and 215-feet of Air Draft. Pursuant to site
development vessels berthing could accommodate CCVs, Barges, SOVs, CTV's and Cable laying vessel.
Air Draft Limitation: Verrazano-Narrows Bridge: 60 m (198 ft.) for the center 610 m (2,000 ft.) 65.5 m (215
ft.) maximum at the centerline

Less FDNY Facility

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Site

Type of
port

Distance
to Sea
buoy

Dockage
space
(feet)

Upland
Support
space
(acres)

Intermodal
facilities

Other
services

Development
Cost

BPAMT
RHCT
BCT

PANYNJ

20

9,670

80

I-278

Container
Services

TBD

Intermodal
facilities

Other
services

Development
Cost

None

None

TBD

3.3 Long Island
Hempstead Public works - Port potential is limited to shallow draft CTV’s.

3.3.1 Hempstead Public Works

Site

Type
of
port

Distance
to Sea
buoy

Public
Works

Public

1.25

Upland
Dockage
Support
space
space
(Waterfront)
(acres)
787 Feet

3

Table 2 is a summary of data reported in section 3.2.

18

Table 2: Summary of Full Build Alternative
Type of
port

Site

Arthur Kill Terminal

Not
Known
Private

Port Ivory
Port Ivory

East Greenbush

Distance to
Sea buoy
(NM)

Dockage
space
(feet)

25

Not
Known
1,500

PANYNJ

KVK 18.8

2,512

PANYNJ

AK 23.7

GCT

142

Upland
Support
Space (Acres)
91
23.2

Intermodal
facilities
Road,
Rail Access
Road

Other
services
None
None

Development
Cost
Not
Known
TBD

187[1]

I-278 on-site
rail

Container
Terminal

TBD

1[1] Proposed Port Ivory Site is undeveloped and adjacent to Global Container Site.
Homeport
Homeport (FDNY)

NYCEDC

16

1,410 Pier,
2,820 feet[1]

28

Road,
rail access

None

TBD

Public

21.4

1,800

27.5

Industrial Rail,
I-278

Ship

Repair

TBD

PANYNJ

20

9,670

80

I-278

Container
Services

TBD

Public

1.25

787

3

None

None

TBD

Homeport (Millers)
1[1] Less FDNY Facility
BNY
Brooklyn Port Authority
Marine Terminal (BPAMT)
BPAMT (RHCT)
BPAMT (BCT)
Hempstead Public Works

`

4. Operational Phase Assessment

The key characteristics of the 12 “full build alternatives,” of which five are “planned alternatives” were described in the previous sections. As indicated above, ”The purpose of this study is to investigate and identify demand of port uses and navigation waterborne services in New York State and potential impacts by offshore energy.” Thus, the operation details follow these objectives, and the discussion is divided accordingly.

The 12 “full build alternatives” highlight critically important operational and construction data. The data (Tables 1 and 2) starts with identifying the site type as public or private (some agencies are also identified). This type of distinction is critical for jurisdiction and legal responsibilities. Next the operational data identifies the distance of the port from a sea buoy in Nautical Miles (NM). The sea buoy is a standard recognized marker that identifies the location where a vessel moves into ocean waters. It does not provide any data of the distance between a site and an installation site. This distinction is important because for an offshore wind (OSW) installation, maintenance and/or operation, there is a need to travel further to the OSW site as well. Docking space (in feet) indicates the docking space available and in some instances the accommodation. Thus, depending on the OSW component in the staging port/site, docking space is different. Some docking spaces must be very large, such as for turbines; others might be small, such as for crew changes. The upland support space (acres) indicates the space that a site must have to work with and the space it can accommodate for delivery and maneuverability. Some OSW components are very large and require a large amount of space. Furthermore, there is also a need for surface transportation and/or waterfront accessibility of handling large components. Intermodal facilities and other services further clarify the type of vessels that can be accommodated in the site. Finally, development cost indicates the site commitment and plans for development.

4.1 Planned Alternative

Phase one of the OSW assessment identifies sites that positioned themselves already to provide services to the OSW including installation, operation, and maintenance. These sites include:

The Port of Coeymans. The Port of Coeymans is privately owned terminal and a prime port site. The analysis of the Planned Alternative to support Fabrication, Manufacturing and Staging indicates that the Port of Coeymans is fully operational.

The South Brooklyn Marine Terminal (SBMT). The South Brooklyn Marine Terminal (SBMT) plan to upgrade the existing facility is well underway and a contract with an offshore wind developer is in progress. Furthermore, SBMT is a key port site for location, air draft and access to sea. SBMT is located near the Brooklyn Port Authority Marine Terminal, which can provide additional support.

The Port of Albany-Rensselaer. The Port of Albany-Rensselaer has made significant improvements to its existing facilities, but it will need significant funding to expand south to potentially develop its Bethlehem site.

The Planned Alternative for O&M ports (Port Jefferson and Montauk) are well-sited and will require private agreements to repurpose existing uses.

`

4.2 Full Build Alternative

The analysis of the Full Build Alternative to support Offshore Wind is a work in progress. The analysis above demonstrated that Homeport Pier, Brooklyn Navy Yard, and Brooklyn Port Authority Marine Terminals are existing terminals requiring upgrades while NYS Wind Port, Port Ivory and Arthur Kill Terminals require full development that will depend on environmental, zoning, and public considerations.

The Hempstead Public Works facility is restricted to shallow draft vessels and can only be considered for CTVs.

Tompkins Cove and Electric City (Lock 8 on the Erie Canal) provides a means of transportation for heavy equipment with low investments and therefore high returns. These prime facilities (discussed in

Section 6)
should be taken into consideration and made available.

5. Navigational Constraints of Planned Alternative and Full Build Alternative14

5.1 Navigation Factors

In this section navigation areas of consideration include as follows (Table 3):

▪ Infrastructure
o Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
o Seasonal private docks adjacent to the channel increase navigational risk
o Bridges
▪ Anchorage Availability
▪ Project channel dimensions
▪ Shoaling
▪ Harbor Assist/Escort Vessel availability
▪ Bridge Air Draft
▪ Tide constraints
▪ Current constraints
▪ Ice Conditions
▪ Navigation Speed
▪ Turning Basin availability

Table 3 Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Maneuvering
Meeting Areas
Overtaking Areas
Junctions

Turning Basins

Column B
Special Restrictions
Speed
Air Draft
Channel Depths
Infrastructure
Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Column C
Seasonal Occurrences
Fog
Ice
Northeasters
Freshets
Tropical
Systems
Hurricanes

Column D
Daily Occurrences
Currents
Wind
Tides
Traffic Density

Traffic Mix
Marine Events
Seasonal Management
Areas

The navigation management tools required and regulated, beside the private sector are also by USCG,
NOAA and USACE. The tools are outlined in Table 4:

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Table 4 Navigation Management Tools
Column A
Private
1 Harbor Assist

Column B
USCG
Aids to Navigation

Column C
NOAA
US Coast Pilot

2 Escort Tugs

Vessel Traffic
Service
Homeport Portal

Navigation Charts

Port and Waterway
Safety Assessments
Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

Current Predictions

3 Navigation
Modeling

4 Navigation Risk
Assessments
5
6

7
8

Tide Predictions

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

PORTS*
Recommended
Vessel Routes

Physical Oceanographic Real-Time System (PORTS) - a. Current Meters, b. Tide Meters, c. Air Draft, d. Fog
Sensors, e. Wave Sensors, and f. Weather Forecast

5.2 Atlantic Approach
Foreign vessels and U.S. vessels under register entering or departing from the Port of New York and New
Jersey must employ a pilot licensed by the State of New York or New Jersey. Enrolled vessels must have
on board or employ a pilot licensed by the federal government.
All traffic passes through a precautionary area transiting to the pilot station. Most vessels choose to
approach the pilot station directly since Ambrose Light was disestablished. (Figure 2). Traffic within the
precautionary area may consist of vessels making the transition between operating in Ambrose or Sandy
Hook Channel and one of the traffic lanes. Mariners are advised to exercise extreme care in

navigating
within this area. Vessels are generally boarded in the charted, designated pilot boarding area, located
southeast of the Ambrose Channel Lighted Whistle Buoy A at 40°26'47"N., 73°48'27"W. Arrangements
for pilot services are made in advance
The preferred approach of vessels to the pilot boarding area is determined by sea conditions (Table 5) and
navigation management tools (Table 6). Vessels approach the pilot boarding area one at a time and generally
approach from the East providing a lee for pilot boarding of the embarked vessel. The Pilot will then direct
the ship to either Sandy Hook or Ambrose Channel.
Enrolled United States Flag Vessels and the majority of Tug/Tow on domestic voyages are not required to
embark a Pilot when the Officer in Charge of the vessels meets requisite requirements.

Figure 2 Pilot Boarding Area

Table 5 Atlantic Approach Navigation Factors
Column A
Maneuvering
1
2
3
4

Meeting Areas
Overtaking Areas
Junctions
Turning Basins

5 Anchorages
6
7
8
9

Column B

Special Restrictions
Speed
Air Draft
X Channel Depths
Infrastructure
X Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Column C
Seasonal Occurrences
X

Fog
Ice
Northeasters
Freshets

X
X
X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X

Column D
Daily
Occurrences
Currents
Wind

X
Tides
Traffic
X
Density

X

24

9 GW Support for Offshore Wind Ports Cumulative Impacts Study

Table 6 Atlantic Approach Navigation Management Tools

1

Column A
Private
Harbor Assist

2

Escort Tugs

3

Navigation
Modeling
Navigation Risk
Assessments

4
5
6

7
8

Column B
USCG
Aids to Navigation
X
Vessel Traffic

Service
X Homeport Portal
X Port and Waterway
Safety Assessments
Ice Breakers
Harbor Operations
Safety&Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

Column C
NOAA
US Coast Pilot
Navigation Charts

Column D
USACE
X Channel
Maintenance
X Channel Deepening

X Tide Predictions

X Standard Operation
Procedures
Current Predictions X Anchorage
Grounds
PORTS*
e.f.
X Recommended
Vessel Routes
X

Physical Oceanographic Real-Time System (PORTS) - a. Current Meters, b. Tide Meters, c. Air Draft, d. Fog
Sensors, e. Wave Sensors, and f. Weather Forecast

o

o

Maneuvering
- Multiple traffic lanes converging at Pilot Boarding Area requires vessels to navigate cautiously according to International Rules of the Road.
- Custom and Practice Long Beach Long Island Anchorage is vital supporting port operations and supply chain needs15
- Maneuvering during reduced speed
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season

Restrictions
- Speed restrictions
▪ Pilot boarding (vessel maneuvering at a safe speed of not more than 10 knots)
▪ Seasonal Management Area (November 1 - April 30)

Seasonal Management Areas

Endangered North Atlantic right whales may occur within 30 miles of the New York and New Jersey coasts in the approaches to New York Harbor (peak season: November through April) (Figure 3). All vessels 65 feet (19.8 meters) or longer must travel at 10 knots or less in certain locations (called Seasonal Management Areas or SMAs) along the U.S. east coast from November 1 through April 30 th to reduce the threat of vessel collisions with endangered North Atlantic right whales.

15

Custom and Practice Long Beach Long Island Anchorage is currently in rule-making as a Federally Designated Anchorage Ground

*

Figure 3 Seasonal Management Areas

5.2.1 Ambrose Channel

Ambrose Channel, the principal entrance, extends from the sea to deep water in Lower Bay (Figure 4) Thence, Anchorage Channel, an extension of Ambrose Channel,

leads through Upper Bay to The Battery. Ambrose
Channel is wide and well defined with floating and fixed
aids to navigation. (Tables 7 and 8)

Figure 4 Ambrose Channel Bend

Table 7 Ambrose Channel Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting Areas
Overtaking
Areas
Junctions
Turning Basins
Anchorages

7
8
9

X
X
X
X

Column B
Special Restrictions
Speed
X
Air Draft
X

Column C
Seasonal Occurrences
Fog
Ice

X
X

Channel Depths
Infrastructure
Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Northeasters
Freshets
Tropical Systems
Hurricanes

X
X
X
X

Traffic Mix
Marine Events
Seasonal Management
Areas

X

X

Column D
Daily Occurrences
Currents
X
Wind
X
Tides

Traffic Density

X
X

Table 8 Ambrose Channel Navigation Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

Column C
NOAA
X US Coast Pilot

2

Escort Tugs

X Vessel Traffic Service

X

3

Navigation
Modeling

X Homeport Portal

X Navigation
Charts
X Tide Predictions

4

Navigation

Risk
Assessments

X Port and Waterway
Safety Assessments

X Current
Predictions

X

PORTS*
X Recommended
Vessel Routes

a.c.

5
6

Ice Breakers
Harbor Operations
Safety & Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation Navigation
Area

7
8

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard

Operation
Procedures
Anchorage
Grounds

X

X

X

Physical Oceanographic Real-Time System (PORTS) - a. Current Meters, b. Tide Meters, c. Air Draft, d. Fog
Sensors, e. Wave Sensors, and f. Weather Forecast

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution
during recreational season
- Meeting for Neo Panamax Vessels is not preferable in the bend from Ambrose 10-14
- Overtaking for Neo Panamax Vessels is not preferable in Ambrose Channel

o

Restrictions
- Air Draft Verrazano Bridge - Neo Panamax and Passenger Vessels
- Neo Panamax Vessels do not have adequate anchorage[16]
- Deep-Draft vessels must maintain 3 feet UKC
- Towing Vessels shall maintain the shortest length of hawser as reasonably possible.

5.2.2 Sandy Hook Channel
Sandy Hook Channel, project depth 35 feet, provides a secondary route from the sea to deep water in
Lower Bay; it connects with Raritan Bay Channel to the westward, Chapel Hill Channel to the north and
Terminal Channel to the south (Figure 5) and its navigation factors and management tools (Tables 9 and

10).

Figure 5 Sandy Hook
Table 9 Sandy Hook Channel Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents

X

X

Air Draft

Ice

X

Wind

X

X
X

Channel Depths
Infrastructure

Northeasters
Freshets

X
X

Tides
Traffic Density

X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X

X
X

X

16

Neo Panama Vessel anchorage is currently planned to be developed in the Federally
Designated Anchorage
Grounds at Gravesend and will be available pursuant to Dredging.

28

Table 10 Sandy Hook Channel Navigation Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

3

Navigation

Modeling

Vessel Traffic
Service
X Homeport Portal

4

Navigation
Risk
Assessments

5
6

8

X

X

Navigation Charts

X

X

Tide Predictions

X

Current
Predictions

X

PORTS*
Recommended
Vessel Routes

b.f.

Port and Waterway

Safety Assessments
Ice Breakers
Harbor Operations
Safety&Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

7

X

Column C
NOAA
US Coast Pilot

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X
X

X

X

Physical Oceanographic Real-Time System (PORTS) - a. Current Meters, b. Tide Meters, c. Air Draft, d. Fog
Sensors, e. Wave Sensors, and f. Weather Forecast

o

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
- Meeting or overtaking not advised as follows:
▪ Sandy Hook Point,
▪ Junctions (Terminal and Chapel Hill Channel)
▪ End of Raritan Bay Reach
▪ Ward Point Bend
Restrictions
- Speed restrictions
▪ Pilot boarding (vessel maneuvering at a safe speed of not more than 10 knots)
▪ Seasonal Management Area (November 1 - April 30)
- Shoaling conditions at Sandy Hook Point.
- Deep-Draft vessels must maintain 2 foot UKC
- Security Zone restrictions enforced at Naval Weapons Station Earle N.J.

5.3 New York Harbor

Upper Bay is that portion of New York Harbor between The Narrows and The Battery. Anchorage Channel,
marked by lighted buoys, is the main passage through the middle of the bay. Bay Ridge Flats is a shoal area
with depths of 8 to 20 feet east of Anchorage Channel. Gowanus Flats is at the north end of Bay Ridge
Flats. Jersey Flats, the area on the New Jersey side west of Anchorage Channel, is much shallower with a

least depth of 5 feet. Channels have been dredged through these shoal areas to provide access to the piers
on both sides of the bay
The Port of New York and New Jersey has over 1,100 waterfront facilities. Most of these facilities are
privately owned and operated, and the rest are owned or operated by either the railroads serving the port,
the Port Authority of New York and New Jersey, the City of New York, the States of New York

and New
Jersey, the federal government or other municipalities.
The Narrows, connecting Lower Bay and Upper Bay of New York Harbor, has a clear width of over 0.6
mile at its narrowest point between Fort Wadsworth and Fort Hamilton. The Verrazano Narrows Bridge, a
fixed suspension span, crosses The Narrows at these two points linking Staten Island with Brooklyn. The
bridge has a vertical clearance of 215 feet for a midchannel width of 2,000 feet.

5.3.1 Upper Bay East
Upper Bay East - Bay Ridge Channel, Red Hook Channel
and Buttermilk Channel follow the Brooklyn piers from
The Narrows to East River. Midchannel depths in these
channels are generally 25 to 40 feet with lesser depths on
the sides; the area is subject to shoaling
Bay Ridge Anchorage located on the East side of
Anchorage Channel plays a critical role in supply chain
operations as cargo staging areas utilizing mooring buoys
for shallow water vessels and as a deep draft anchorage
(Figure 6).
The Brooklyn Shore from Owls Head north and into
Gowanus Bay is prime deep water commercial waterfront
that has been woefully neglected and in dire need of
support. Recently South Brooklyn
Figure 6 Upper Bay East
Marine Terminal has been selected by the NYCEDC for restoration to support offshore wind energy. It is
not known if any action will be taken to restore other valuable deep-water facilities along the Brooklyn
Shore.
Erie Basin is the largest barge port on the East Coast and includes a vessel repair facility featuring two
floating dry docks. The navigation factors and management tools are described in (Tables 11 and 12).

Table 11 Upper Bay East Navigation Factors

1

2
3
4
5
6

Column A
Maneuvering
Meeting Areas
Overtaking
Areas
Junctions
Turning Basins
Anchorages

7
8
9

Column B
Special Restrictions
X Speed
X
X Air Draft

Column C
Seasonal Occurrences
Fog
X
Ice
X

Column D
Daily Occurrences
Currents
X
Wind
X

X Channel Depths
X Infrastructure
X Shoaling
Under Keel

Clearance
Safety Zone
Security Zone

Northeasters
Freshets
Tropical Systems
Hurricanes

X
X
X
X

Tides
Traffic Density

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

X
X
X
X
X

X
X

Table 12 Upper Bay East Navigation Management Tools

1

Column A
Private
Harbor Assist

Column B

USCG
X Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

X Vessel Traffic
Service
X Homeport Portal

4

Navigation Risk
Assessments

X
X
X

Column C
NOAA
US Coast Pilot
Navigation
Charts
Tide Predictions

X
X
X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard

Operation
Procedures
Anchorage
Grounds

X
X

X Port and Waterway
X Current
X
X
Safety Assessments
Predictions
5
Ice Breakers
PORTS*
a.b.f.
6
Harbor Operations
X Recommended
Safety and
Vessel Routes
Navigation
Guidelines
7
Harbor Operation
X
Safety Committees
8
Regulation
X
Navigation Area
Physical Oceanographic Real-Time System (PORTS) - a. Current Meters, b. Tide Meters, c. Air Draft, d. Fog
Sensors, e. Wave Sensors, and f. Weather Forecast

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season

- Junction - Buttermilk Channel
- Traffic congestion in Gowanus Bay

o

Restrictions
- Speed Restrictions are enforced in anchorage areas
- Navigation speed is restricted to minimize wake and/or surge effects on moored vessels
- Cable, pipeline and other subsea utilities impact anchoring areas and decisions during emergency anchoring.
- Under Keel Clearance Bay Ridge Channel, Red Hook Channel and Buttermilk Channel follow the Brooklyn piers from The Narrows to East River. Midchannel depths in these channels are generally 25 to 40 feet with lesser depths on the sides; the area is subject to shoaling
- Anchorage as per VTS user Guideline

5.3.2 Upper Bay West
Upper Bay West - Port Jersey Channel, Pierhead Channel, Greenville Channel, Claremont Terminal
Channels and follow the New Jersey Shore from Constable Hook to just south of Liberty Island (Figure 7).
Midchannel depths in these channels are generally 11 to 50 feet with lesser depths in Greenville Channel
and deeper depths in Port Jersey Channel.
Anchorage Grounds include Stapleton Anchorage for deep draft vessels and the Jersey Flats for shallow draft vessels. The Jersey Flats are the area on the New Jersey side west of Anchorage Channel plays a critical role in supply chain operations utilizing mooring buoys as cargo staging areas. Pierhead Channel - leads from the main channel about 0.7 mile southward of Liberty Island, thence along the New Jersey pierhead line to Kill Van Kull. The channel connects several channels that lead to various facilities along the New Jersey waterfront, including the Army Corps of Engineers Caven Point Terminal, New York Waterway Ferry Landing, Claremont.
Figure 7 Upper Bay West
Terminal, New York Cross Island Railroad Terminal, and Port Jersey Channel has federal project provides for a depth of 50 feet in the channel and is transited by Auto Carriers, Containers

Ships, and
Passenger Ships. The navigation factors and management tools are described in (Tables 13 and 14).

Table 13 Upper Bay West Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting Areas
Overtaking
Areas
Junctions
Turning Basins
Anchorages

7
8
9

Column B
Special Restrictions
X Speed
X
X Air Draft
X

Column C
Seasonal Occurrences
Fog
X
Ice
X

Column D
Daily Occurrences
Currents
X
Wind
X

X Channel Depths
X Infrastructure
X Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Northeasters
Freshets
Tropical Systems
Hurricanes

X
X
X
X

Tides
Traffic Density

X Traffic Mix
X Marine Events
Seasonal
Management Areas

X
X

X
X
X
X

X

X

Table 14 Upper Bay West Navigation Management Tools

1

Column A
Private
Harbor Assist

2

Escort Tugs

3

Navigation
Modeling

4

Navigation Risk
Assessments

5
6

7

8

Column B
USCG
X Aids to
Navigation
X Vessel Traffic
Service
X Homeport Portal

X Port and
Waterway Safety
Assessments
Ice Breakers

Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety
Committees
Regulation
Navigation Area

X
X
X

X

X

Column C
NOAA
US Coast Pilot

X

Navigation
Charts
Tide Predictions

X

Current
Predictions

X

PORTS*
Recommended
Vessel Routes

a.b.f.

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X
X

X

X

X

Physical Oceanographic Real-Time System (PORTS) - a. Current Meters, b. Tide Meters, c. Air Draft, d. Fog
Sensors, e. Wave Sensors, and f. Weather Forecast

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
- Junctions
• Constable Hook

-

•

• Port Jersey Channel

Large vessels including Neo Panamax vessels employ Harbor tug assist and/or Escort Tugs for navigation and/or for turning when required during special circumstances.
Meeting/overtaking/crossing maneuvers
• The Upper Bay has heavy traffic combined with multiple junctions and anchorages requiring accepted standards of care

Restrictions
- Speed Restrictions are enforced in anchorage areas.
- Navigation speed is restricted to minimize wake and/or surge effects on moored vessels
- Air Drafts for vessels entering the Constable Hook Range
• Bayonne Bridge 215-feet MHW
- Authorize Channel Depths differ throughout the various channels
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Deep-Draft vessels must maintain 2 foot UKC

5.3.3 Kill Van Kull
Kill Van Kull - separates the southern shore of the city of Bayonne from New Brighton, Port Richmond,
and Mariners Harbor Staten Island and connects the Upper Bay of New York Harbor with Newark Bay and
Arthur Kill. Kill Van Kull is a major channel for liquid and dry bulk cargo on the NJ side and ship repair
facilities, tug/barge yards, Dry Bulk and Tank Cleaning Facilities on the New York Side are on its shores
in New York Harbor, and has extensive through traffic to the Arthur Kills and Newark Bay. The KVK is
deep and lined with terminals bank to bank.
The primary entrance to the Kill Van Kull is from the Upper Bay via The Constable Hook Range. The
secondary entrance is from the Arthur Kills. The KVK and AK meet at Bergen Point (Figure 8) where
vessels conduct critical maneuvers when rounding Bergen Point when entering/departing Newark Bay to
the KVK. The navigation factors and management tools are described in (Tables 15 and 16).

Figure 8 Bergen Point Turn

Table 15 Kill Van Kull Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Maneuvering
Meeting Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

Column B
Special Restrictions
X Speed
X
X Air Draft
X

Column C
Seasonal Occurrences
Fog
X
Ice
X

Column D
Daily Occurrences
Currents
X
Wind
X

X Channel Depths

X Infrastructure

X
X

Northeasters
Freshets

X
X

Tides
Traffic Density

X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X

X Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

X
X

Table 16 Kill Van Kull Navigation Management Tools

1

Column A
Private
Harbor Assist

2

Escort Tugs

3

Navigation
Modeling

4

Navigation
Risk
Assessments

5
6

Column B
USCG
X Aids to
Navigation
X Vessel Traffic
Service
X Homeport Portal

X Port and
Waterway Safety
Assessments
Ice Breakers

X
X

X

X

Harbor
X
Operations Safety
and Navigation
Guidelines
Harbor Operation X
Safety
Committees
Regulation
Navigation Area

7

8

Column C
NOAA
US Coast Pilot

X

Navigation
Charts
Tide Predictions

X

Current
Predictions

X

PORTS*

a.b.
c.f.

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X
X

Recommended
Vessel Routes

Physical Oceanographic Real-Time System (PORTS) - a. Current Meters, b. Tide Meters, c. Air Draft, d. Fog
Sensors, e. Wave Sensors, and f. Weather Forecast

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
- Meeting/overtaking
▪ Kill Van Kull (KVK) is a major navigation channel replete with terminals and shipyards.
▪ Pilots aboard Neo-Panamax vessel arrange for passage through the KVK to not meet with Neo-Panamax vessel and similar size vessels within the KVK
▪ Neo-Panamax vessel will not overtake another Neo-Panamax vessel in the KVK.
- Speed
▪ Vessel speed is restricted to minimize wake and/or surge effects on moored vessels along the KVK

o

Restrictions
- Neo-Panamax vessels Bergen Point transit windows limits are within 1 hour either side of High or Low Water at the Battery.

- Neo-Panamax vessel Bergen Point transit windows are not permitted when Neo-Panamax Wind exceed 20 knows sustained or gust of 25.
- Other large vessels transit Bergen Point windows are not permitted when Winds exceed 30 knots sustained or 34 Gust.
- Deep-Draft vessels must maintain 2 foot UKC
- Visibility

▪
▪
▪

Neo-Panamax 1.5 Nautical Mile visibility requirement
Deep Draft 1 Nautical Mile visibility requirement
All Vessels greater than 300 GT .5 visibility requirement

5.3.4 Arthur Kills

Arthur Kills is the narrow body of water separating Staten Island from New Jersey. The cities of Perth Amboy, Tottenville and Elizabeth and many large factories, oil refineries and storage facilities are on its shores. Northern Arthur Kill and Kill Van Kull are the major channels for bulk, containerize, and petroleum cargo in New York Harbor (Figures 9 and 10). The navigation factors and management tools are described in (Tables 17 and 18).

Figure 9 Arthur Kill North

Figure 10 Arthur Kill South

Table 17 Arthur Kill Navigation Factors

1
2
3

4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

7
8
9

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

X

Channel Depths
Infrastructure

X
X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

Tropical Systems
Hurricanes

X
X

X

X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

X

Table 18 Arthur Kill Navigation Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

X

3

Navigation
Modeling

X Vessel Traffic
Service
X Homeport Portal

4

Navigation
Risk

Assessments

X Port and Waterway
Safety Assessments

X

5
6

7
8

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

X

X

X

Column C
NOAA
US Coast
Pilot
Navigation
Charts
Tide
Predictions
Current
Predictions

X
X
X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X
X

X

PORTS
Recommend
ed Vessel
Routes

X

o

Maneuvering
- Traffic mix
▪

-

-

o

Commercial vessels must be aware of traffic mix and take extra precaution
during recreational season
Meeting/overtaking
▪ Arthur Kills (AK) is a major navigation channel and replete with cargo
terminals navigated and serviced primarily by Tankers and Tug/Tows
▪ Large Tankers enter from the KVK and depart south via the AK.
▪ Meeting/Overtaking areas for large vessels are avoided as follows:
• Shooters Island Buoy 18
• AK Railroad Bridge
• Tremely Point
• Smoking Point
• Outerbridge Crossing
Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels
along the AK

Restrictions
- Channel depths in the AK are 50-feet from Shooters Island to AK Railroad Bridge. 40-feet
from the AK Railroad Bridge to the Bayway Refinery and thereafter to 35-feet from
Bayway to the Sandy Hook Channel entrance buoy.
- Deep-Draft Tankers arriving at the Bayway Refinery are restricted to Bayway transit to
HW or no later than 1 hour after HW Battery
- Air-draft restrictions
▪ 135-feet extend from the AK Railroad Bridge at MHW
▪ 143 feet Outerbridge Crossing at MHW
- Deep-Draft vessels must maintain 2-foot UKC

5.4 North (Hudson) River
Hudson River, also called the North River in New York City, has its source in the Adirondack Mountains,
about 275 miles along its course from a junction with East River at The Battery, NY, and flows in a general
southerly direction into New York Upper Bay. Troy Lock and Dam, 134 miles above The Battery, permits
vessels to pass from tidewater to the upper river and the New York State Canal System. The river water is
usually fresh as far south as Poughkeepsie, halfway from Troy Lock and Dam to The Battery
The lower Hudson River has depths of 43 feet or more in midchannel from deep water in Upper New York
Bay off Ellis Island to the upper limit of New York City's major wharves at 59th Street, about 5.3 miles
above the entrance. Above this point, the federal project depth is 32 feet to Albany.
North of Kingston the federal project depth is 32 feet to Albany, however, due to shoaling, drafts

are
restricted to 30 feet fresh water. Drafts in excess of 27-feet must be scheduled to coincide with the rising
tide to facilitate safe transit due to channels depths not meeting federal project depths.
During the winter months ice buoys are deployed and ice reports are posted via the USCG Homeport
Website. During ice season, vessels less than 3,000 horsepower while engaged in towing operations are

not authorized to transit that portion of the Hudson River south of the Troy Locks when ice thickness on
average is eight inches or greater.
The tides in the river are affected by freshets, winds and droughts. Because of these variables the predictions
given for points above George Washington Bridge are based upon averages for the 6-month period, May
to October, when the freshwater discharge is at a minimum

5.4.1 Holland Tunnel - George Washington Bridge
This stretch of the river includes the deep water channel and supportive Anchor Grounds 16, 19 East, and
19 West, and special anchorage areas for vessels primarily for use by yachts and other recreational craft
less than 65-feet (Figure 11). The navigation factors and management tools are described in (Tables 19 and
20).

Figure 11 South of Geo Washington Bridge

Table 19 Holland Tunnel - Geo Washington Bridge Navigation Factors

1
2
3
4

5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

7
8
9

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

Air Draft

Ice

X

Wind

X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Channel Depths
Infrastructure
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

X
X

Table 20 Holland Tunnel - Geo Washington Bridge Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

5
6

Port and Waterway
Safety Assessments
Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation

Navigation Area

7
8

o

X

Column C
NOAA
US Coast Pilot

X

X

Navigation
Charts
Tide Predictions

Current
Predictions

X

X

X

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures

Anchorage
Grounds

X

PORTS
Recommended
Vessel Routes

X
X

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
▪ Commuter Ferries cross the river at multiple locations
- Anchorage Grounds
▪ Anchor Grounds 16, 19 East, and 19 West.

▪
-

o

Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.

Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels along the river

Restrictions
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Channel depths are maintained to 45-feet up to the Manhattan Cruise Terminal by the USACE. and thereafter to 32-feet to GWB
- Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions

5.4.2 George Washington Bridge - Tappan Zee Bridge

This stretch of the river includes the deep water channel and supportive Deep water Anchor Grounds 17, 18, 18A. When the use of Anchorage No. 17 and 18-A is required by naval vessels the vessels anchored therein shall move when the Captain of the Port directs them. Anchorage ground 18 is reserved for use by ships only. Special anchorage areas exist primarily for use by yachts and other recreational craft less than 65-feet (Figure 12). The navigation factors and management tools are described in (Tables 21 and 23).

Figure 12 Yonkers Anchorage Grounds

Table 21 Geo Washington - Tappan Zee Bridge Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

7
8
9

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

Channel Depths
Infrastructure

X
X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Table 22 Geo Washington - Tappan Zee Bridge Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

5
6

7
8

X

Column C
NOAA
US Coast Pilot

X

X

Navigation
Charts
Tide Predictions

Port and Waterway
Safety Assessments

Current
Predictions

X

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

PORTS*
Recommended
Vessel Routes

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

X
X

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
- Hudson River Pilots Association maintains a Pilots Station in Yonkers
- Meeting/overtaking
▪ Meeting/overtaking arrangements factor vessel at anchor for safety reasons
- Anchorage Grounds
▪ Anchor Grounds 17, 18 and 18A
▪ Due air draft limitations vessels may be required to anchor north of the Tappan Zee Bridge to await low water or south in Anchor Grounds 17, 18, and 18A
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
- Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels along the river

o

Restrictions
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Air Draft
▪ Air Draft Tappan Zee Bridge 139-Feet MHW
▪ No Air Draft Sensor on the Tappan Zee Bridge
- Staging Area
▪ Units Anchor north and south of the Tappan Zee Bridge for safety reasons as follows:
• Favorable Tide
• Ice conditions
• Poor visibility
- No Harbor Assist or Escort Vessels are homeported in this region
- Channel depths are maintained by the USACE. to 32-feet
- Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions
- Anchoring
▪ During episodic event for safety of crew and cargo commercial vessels anchor north of Anchorage 17 up to Dobbs Ferry.

5.4.3 Haverstraw Bay
Haverstraw Bay is the wide stretch of Hudson River between Croton Point and Stony Point, 5 miles to the

northward; the greatest width is about 2.5 miles. The extensive flats in the eastern half of the bay have depths of 5 to 9 feet. The dredged channel through Haverstraw Bay is marked by seasonal lighted buoys and two lighted ranges. Deep draft vessels must navigate within Haverstraw Channel which runs across the bay and narrows to 300-feet wide (Figure 13). The navigation factors and management tools are described in (Tables 23 and 24).

Figure 13 Haverstraw Bay

Table 23 Haverstraw Bay Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B

Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

Ice

X

Wind

X

Tides
Traffic Density

X
X

7
8
9

Channel Depths
Infrastructure

X
X

Northeasters

Freshets

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

Tropical Systems
Hurricanes

X
X

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Table 24 Haverstraw Bay Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

Column C
NOAA
X US Coast Pilot

2

Escort Tugs

Vessel Traffic Service

X

3

Navigation
Modeling

Homeport Portal

Navigation
Charts
X Tide Predictions

4

Navigation
Risk
Assessments

Port and Waterway
Safety Assessments

X Current
Predictions

X

Ice Breakers
Harbor Operations
Safety and Navigation
Guidelines
Harbor Operation
Safety Committees

Regulation Navigation
Area

PORTS
X Recommended
Vessel Routes

5
6

7
8

o

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

X
X

Maneuvering
- Traffic mix
▪

-

Commercial vessels must be aware of traffic mix and take extra precaution

during recreational season
Meeting/overtaking
▪ Meeting/Overtaking areas for large vessels are avoided as follows:
• Tappan Zee Bridge

•
•
-

-

o

Scarborough Light
Haverstraw Channel buoys 22-26

Anchorage Grounds
▪ No Federal Anchorage Grounds exist in this area
▪ During episodic event or during reduced visibility for safety of crew and cargo commercial vessels anchor outside of the Federal Channel as follows:
• Montrose Point
• Tompkins Cove
• Rockland Flats
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels.

Restrictions
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Channel depths are maintained by the USACE to 32-feet.
- Shoaling
▪ Due to shoaling deep draft vessels must navigate the center of the Federally Maintained Navigation Channel.
▪ Significant Shoaling as follows:
• Scarborough Light
• Haverstraw Channel

- Safety and Security Zone at Indian Point Nuclear Power Plant
▪ No vessels are permitted within a 300-yard radius of the power plant
- Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions
- Anchoring
▪ No Federal Anchorages exist in this area

5.4.4 Hudson Highlands

The Hudson Highlands run from Jones Point to Storm King. the river becomes much narrower at Jones Point and has an average width of 0.3 mile for the next 8 miles between the bases of the highlands on both sides. When approaching the sharp turns in this reach, caution should be exercised.
Con Hook a small island at Mile 43W, is marked on its channel side by a light. A rock, with a depth of 7 feet over it and marked by a lighted buoy, is about 0.3 mile southward of Con Hook. When descending the river, particularly with a fair current, there is a tendency to set toward the rock; caution is advised. The area 800 yards north of Con Hook and along the western shoreline is extremely shallow and dangerous and should be avoided due to a large shoal. When southbound on the Hudson River approaching Con Hook, mariners must take care not to confuse the lights on navigation aids with the lights from the railroad track on the west bank, the lights from bridge in the distance, and other background lighting in general to avoid vessel grounding.

Worlds End a sharp bend in the Hudson River at Mile 46, has depths of more than 100 feet. Extreme caution should be exercised when passing through Worlds End; the view is obstructed and vessels should reduce speed. The navigation factors and management tools are described in (Tables 25 and 26).
Table 25 Hudson Highlands Navigation Factors

1
2

3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

Ice

X

Wind

X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

7
8
9

Channel Depths
Infrastructure

X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Table 26 Hudson Highlands Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

2

Escort Tugs

Vessel Traffic Service

3

Navigation
Modeling

4

Navigation
Risk
Assessments

5
6

7
8
o

X

Column C
NOAA
US Coast Pilot

X

Homeport Portal

X

Navigation
Charts
Tide Predictions

Port and Waterway
Safety Assessments

X

Current
Predictions

X

Ice Breakers
Harbor Operations
Safety and Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation Navigation
Area

X

PORTS
Recommended
Vessel Routes

X

X

Column D
USACE
Channel
Maintenance
Channel

Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X
X

Maneuvering
- Traffic mix

48

▪

-

-

-

o

Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
Meeting/overtaking
▪ Meeting/Overtaking areas for large vessels are avoided as follows:
• Bear Mountain Bridge
• Con Hook
• Worlds End (Garrison to Cold Spring)
Anchorage Grounds
▪ No Federal Anchorage Grounds exist in this area
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels.

Restrictions

- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Ice Conditions
▪ Ice Jams at Worlds End north to Storm King
- Staging Area
▪ Units Anchor north and south of the Hudson Highlands for safety reasons as follows:
• Ice conditions
• Poor visibility
- Anchoring
▪ No Federal Designated Anchorages exist
-

Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions

5.4.5 Diamond Reef
Diamond Reef with a depth of 5 feet over it and marked by a seasonal lighted buoy, lies in about the middle
of Hudson River 0.2 mile above the entrance to Wappinger Creek. Between Diamond Reef and Poughkeepsie, the west side of the river should be favored to avoid two 18-foot spots that are buoyed.
(Figure 14). The navigation factors and management tools are described in (Tables 27 and 28).

Figure 14 Diamond Reef
Table 27 Diamond Reef Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Maneuvering

Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

Ice

X

Wind

X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Channel Depths
Infrastructure
Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X

Table 28 Diamond Reef Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

5
6

7
8

o

o

X

Column C
NOAA
US Coast Pilot

X

X

Navigation
Charts
Tide Predictions

X

Port and Waterway
Safety Assessments

X

Current
Predictions

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

X

PORTS
Recommended
Vessel Routes

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures

Anchorage
Grounds

X
X

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
- Meeting/overtaking
▪ Meeting/Overtaking areas for large vessels are avoided between Danskammer point and Marlboro
- Anchorage Grounds
▪ No Federal Anchorage Grounds exist in this area
▪ During episodic event or during reduced visibility for safety of crew and cargo commercial vessels anchor outside of the Federal Channel as follows:
• Newburgh Bay
• Marlboro
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
- Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels.
Restrictions
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Anchoring
▪ No federal anchorage grounds exist
- Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions

5.4.6 Lange Rack
From Marlboro to Hyde Park the river is fairly open with the exception of the Mid-Hudson Bridge (U.S.
44) with a vertical clearance of 134 feet and the railroad bridge in close proximity with a horizontal
clearance of 490-feet and vertical clearance of 167-feet (Figure 44). The navigation factors and management

tools are described in (Tables 29 and 30).

Figure 15 Poughkeepsie
Table 29 Lange Rack Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

Channel Depths
Infrastructure

X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X

X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Table 30 Lange Rack Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

Column C
NOAA
X US Coast Pilot

2

Escort Tugs
Navigation
Modeling

Navigation
Charts
X Tide Predictions

X

3

Vessel Traffic

Service
Homeport Portal

4

Navigation
Risk
Assessments

Port and Waterway
Safety Assessments

X Current
Predictions

X

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees

X PORTS
Recommended
Vessel Routes

Regulation Navigation
Area

X

5
6

7
8

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
- Meeting/overtaking
▪ Meeting/Overtaking areas for large vessels are avoided in the area of the abandoned railroad bridge (Walkway Bridge)
- Anchorage Grounds
▪ No Federal Anchorage Grounds exist in this area
▪ During episodic event or during reduced visibility for safety of crew and cargo commercial vessels anchor outside of the Federal Channel as follows:
• Milton
• Poughkeepsie
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
▪ Due air draft limitations vessels may be required to anchor either north or south of the Mid-Hudson Bridge to await low water
- Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels.

o

Restrictions
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.

- Ice Conditions
▪ Ice Jams at Crum Elbow

-

-

Harbor Assist/Escort Vessels
▪ No Harbor Assist/Escort Vessels are homeported
Air Draft
▪ Air Draft Mid-Hudson Bridge 134-Feet MHW
▪ No Air Draft Sensor on the Mid-Hudson Bridge
Staging Area
▪ Units Anchor in Lange Rack for safety reasons as follows:
• Favorable Tide
• Daylight transit
• Ice conditions
• Poor visibility
Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions

5.4.7 Kingston
The North (Hudson) River can technically be broken into two sections. Battery to Kingston and Kingston
to Albany. Most northbound deep draft units anchor south of Kingston to wait for daylight transits. During
Ice conditions units muster south of Kingston and convoy through the ice north. Once a unit commits
navigating north of Kingston, navigation management tools are limited. Harbor Assist Vessels, Escort
Vessels, suitable turning basins or anchorages for larger vessels do not exist until reaching the Port of
Albany. Emergency anchoring is limited within the Federal Channel. Effective and timely communications
with other vessels is essential (Figure 16). The navigation factors and management tools are described in
(Tables 31 and 32).

Figure 16 Kingston/Hyde Park Anchorages

Table 31 Kingston/Hyde Park Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

7
8
9

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences

Currents
X

Air Draft

Ice

X

Wind

X

Channel Depths
Infrastructure

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Table 32 Kingston/Hyde Park Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

5
6

7
8

o

X

Column C
NOAA
US Coast Pilot

X

X

Navigation
Charts
Tide Predictions

X

Port and Waterway
Safety Assessments

X

Current
Predictions

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

X

PORTS
Recommended
Vessel Routes

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

X
X

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
- Hudson River Pilots Association maintains a Pilots Station in Hyde Park
- Staging Area

▪

-

-

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Units Anchor south of Kingston for safety reasons as follows:
▪ Favorable Tide
▪ Daylight transit

▪ Ice conditions
▪ Poor visibility
▪ Pilot Boarding
Anchorage Grounds
▪ Federal Designated Anchor Ground 19
▪ Custom and Practice Anchorages at Port Ewen and Big Rock
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels.

Restrictions
- Tide constraints
- Ice Conditions
▪ In heavy Ice vessels will assemble with the assistance of the Coast Guard to convoy north up the river
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Harbor Assist/Escort Vessels
▪ No Harbor Assist/Escort Vessels are homeported in the region
- Anchoring
▪ Anchorage 19 is restricted to 3 vessels or less
- Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions

5.4.8 Kingston Point to Albany
In the North (Hudson) River above Kingston many shoals extend from the shore on either side. The bottom
is rocky and the channel is reduced to 400 feet. Most of the channels through the critical areas are marked
with lights and buoys however, local knowledge is critical, especially in ice conditions and mariner without
experience and/or requisite recency requirements are advised to take a pilot. During winter months units
muster south of Kingston to convoy through the ice. No turning basins or areas to turn for larger vessels
exist until reaching the Port of Albany. The navigation factors and management tools are described in
(Tables 33 and 34).

Table 33 Kingston to Albany Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

X

Channel Depths
Infrastructure

X
X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

Tropical Systems
Hurricanes

X

X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

7
8
9

Table 34 Kingston to Albany Management Tools

1

Column A
Private
Harbor Assist

X
17

2

Escort Tugs

3

Navigation
Modeling

4

Navigation
Risk
Assessments

5
6

7

8
o

17

Column B
USCG
Aids to
Navigation
Vessel Traffic
Service
Homeport Portal

Port and
Waterway Safety
Assessments
Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety
Committees
Regulation
Navigation Area

X

Column C
NOAA
US Coast Pilot

X

X

Navigation
Charts
Tide Predictions

X

Current
Predictions

X

X

PORTS
Recommended
Vessel Routes

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

X

X

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season

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Anchorage Grounds
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
- Meeting/overtaking
▪ Meeting/Overtaking areas for large vessels are avoided as follows:
▪ Kingston Point Reach
▪ Hudson Middle Ground Flats
▪ Silver Point
▪ Rattlesnake Island
▪ Roeliff Jansen Kill
▪ Coeymans
▪ Catskill Creek
▪ Castleton Bridges
▪ Hudson Light
▪ Statts Point to Van Wies
- Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels.
Restrictions
- Infrastructure Cable, pipeline and other subsea utilities must be considered in anchoring and during emergency anchoring.
- Project dimensions from Kingston to Albany is 400 feet wide by 32 feet deep
▪ USACE maintenance is limited based on New York State Seasonal dredging restrictions and limited dredge spoil pump out location (Houghtaling Island)
- Shoaling
▪ Drafts are restricted to 30 feet fresh water, Kingston to Albany, due to shoaling not meeting federal project depths. Drafts in excess of 27-feet must be scheduled to coincide with the rising tide to facilitate safe transit due to channels depths and shoaling within the federal navigation maintained channel.
- Harbor Assist/Escort Vessels
▪ Harbor Assist are homeported in the Port of Albany
▪ No Escort Vessels are homeported in the Port of Albany
- Air Draft
▪ Castleton Bridge Vertical 135-feet at MHW
▪ No Air-draft sensor at the Castleton Bridge
▪ Passage under Castleton Bridge is planned during high water for loaded Vessels

- Tide constraints
- Ice Conditions
▪ In heavy Ice vessels can only meet at prearranged locations.
▪ Vessels stuck in Ice can block marine traffic in both directions for undetermined times.
▪ Vessels with the assistance of the Coast Guard maintain convoy formation
▪ Transit times are unpredictable during ice conditions
▪ Ice Buoys installed are sometimes stuck beneath or dragged off station by ice
- Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels.
▪ Seasonal private docks adjacent to the channel increase navigational risk during recreational boating season
- Turning Basins
▪ The Port of Albany is the single turning basin in this region for commercial vessels from Coeymans to Albany.
- Anchoring
▪ No Federal or suitable anchorage location exist for safety purposes.
- Deep-Draft vessels are limited in draft due to channel depths, shoaling, tide, and prevailing weather conditions

5.5 East River

East River is a 14-mile-long tidal strait that connects Long Island Sound with New York Upper Bay and separates the western end of Long Island from the New York mainland. The Sound entrance is between Throggs Neck and Willets Point; the Upper Bay entrance is between The Battery and Governors Island.

Hell Gate, about halfway between Throggs Neck and The Battery, is noted for its strong tidal currents.

Harlem River extends northward from Hell Gate to the Hudson River. Both sides of the East River, from The Battery to Port Morris, a distance of 9 miles, present an almost continuous line of wharves except where shoals or currents prevent access.

In the East River between the Brooklyn Bridge and Poorhouse Flats Range, shallow-draft vessels customarily keep to the west (Manhattan) side of the channel whether northbound or southbound, thereby

reserving the east (Brooklyn) side of the channel for deep-draft vessels. Vessels transiting East River should
be aware of this practice and anticipate northbound shallow-draft vessels crossing from east to west in the
vicinity of Corlears Hook, and from west to east in the vicinity of Newtown Creek (Figure 17).
In East River the flood current sets eastward and the ebb sets westward. Note: this is the direct opposite of
conditions in Long Island Sound where the flood is generally westward and the ebb eastward. The velocity
of current is 0.7 knot at Throggs Neck, 1.6 knots at Port Morris, 4 knots in Hell Gate, 3 knots at Brooklyn
Bridge, and 1.5 knots north of Governors Island. In Hell Gate (off Mill Rock) the velocity is 3.4 knots for
the eastward current and 4.6 knots for the westward current. The direction and velocity of the currents are
affected by strong winds that may increase or diminish the periods of flood or ebb. The currents generally
set with the channel, but heavy swirls are found in Hell Gate.

5.5.1 Battery - Colears Hook

Figure 17 Battery - Corlears Hook
The navigation factors and management tools are described in (Tables 35 and 36).

Table 35 Battery - Colears Hook Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas

Junctions
Turning
Basins
Anchorages

7
8
9

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

X

Channel Depths

Infrastructure

X
X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

Tropical Systems
Hurricanes

X
X

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Table 36 Battery - Corlears Hook Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

X Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

5
6

7
8

Port and Waterway
Safety Assessments
Ice Breakers
Harbor Operations
Safety and
Navigation

Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

X
X
X

X

X

Column C
NOAA
US Coast Pilot

X

Navigation
Charts
Tide Predictions

X

Current
Predictions

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage

Grounds

PORTS
Recommended
Vessel Routes

X

60

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Maneuvering
- Traffic mix
▪
▪
-

-

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Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
Commercial and Recreational vessels must be aware of wakes and take extra precaution to it impacts on tug/tow gear.

Meeting/overtaking
▪ The channel between The Battery and Governors Island is very congested and subject to strong currents. Caution should be exercised while navigating in the area. Deep draft Tug/Tow's transiting the East River Deepwater Range (Battery) heading east must maintain steerage to remain clear of the shallow water.
▪ Meeting/Overtaking areas are primarily outside of bends in the river.
Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels along the shore.

Restrictions
- Air Draft - Brooklyn Bridge 127-Feet at MHW at center
- Current

▪ Commercial units with fair current tend to navigate in the center of the waterway
while units navigating against the currents stay close to the shoreline. Shallow draft
commercial units navigating against the current will often shift from one shore to
the other to minimize current effects often referred to as "running the points".
▪ Deep-Drafts often plan passage to arrive at Hell Gate one-hour either side of slack
water
- Infrastructure Cable, pipeline and other subsea utilities must be considered during emergency anchoring.
- Anchoring
▪ No Federal Designated Anchorages exist
- Deep-Draft vessels must maintain 2-foot UKC

5.5.2 Poor House Flats

The Poor House Flats extends from Colears Hook to Roosevelt Island. Within this region is the entrance
to Newtown Creek and secondary East Channel of the East River (Figure18).
The East Channel is primarily utilized by commuter ferries, recreational vessels, along with limited
commercial uses. The primary channel for commercial vessels is the West Channel of the East River.
Deep-Draft units navigate along the Brooklyn Shore from the Williamsburg Bridge to approximately
Bushwick Inlet where they cross the East River sideways to the current to the West on the Poorhouse Flats
Range. Projected Depth is 35-feet. Deep drafts units navigating the Poorhouse Flats must maintain steerage
to account for set and drift of prevailing currents.
Shallow-Draft units tend to navigate outside of the 35-foot channel in the Poor House Flats (projected depth
25-feet) to provide deep-draft units additional maneuvering room.

Vessels operating in this area must pay special attention to deep-drafts navigating the Poorhouse Flats
Range, commercial vessels exiting Newtown Creek, and recreational vessels. The navigation factors and
management tools are described in (Tables 37 and 38).

Figure 18 Poor House Flats

Table 37 Poor House Flats Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Column B
Maneuvering
Special Restrictions
Meeting
X Speed
X
Areas
Overtaking
X Air Draft
X
Areas
Junctions
X Channel Depths X
Turning
Infrastructure
X
Basins
Anchorages
Shoaling
Under Keel
X
Clearance
Safety Zone
X
Security Zone
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

Ice

X

Wind

X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X

X

Table 38 Poor House Flats Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

X Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

5
6

7
8

Port and Waterway
Safety Assessments
Ice Breakers
Harbor Operations

Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

X

Column C
NOAA
US Coast Pilot

X

X

Navigation Charts

X

X

Tide Predictions

X

X

Current Predictions

X

X

PORTS
Recommended
Vessel Routes

Column D
USACE
Channel

Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

63

o

Maneuvering
- Traffic mix
▪
▪
-

o

Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
Commercial and Recreational vessels must be aware of wakes and take extra precaution to it impacts on tug/tow gear.

Meeting/overtaking
▪ Maneuvers are planned in advance to reduce risk.
Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels along the shore.

Restrictions
- West Channel of the East River off Roosevelt Island. East Channel off Roosevelt is shallower and requires bridge lifts.
- Air Draft - Queensboro Bridge 131-Feet at MHW at center
- Current
▪ Deep-Draft units navigate within the 35-foot deep channel from the Williamsburg Bridge to approximately Bushwick Inlet along the Brooklyn Shore and then cross

the East River west on the Poorhouse Flats Range. Deep drafts units navigating
the Poorhouse Flats range must maintain steerage to account for set and drift of
prevailing currents.
▪ Deep-Drafts often plan passage to arrive at Hell Gate one-hour either side of slack
water
- Infrastructure Cable, pipeline and other subsea utilities must be considered during emergency anchoring.
- Anchoring
▪ No Federal Designated Anchorages Exist
- Deep-Draft vessels must maintain 2-foot UKC

5.5.2.1 Newtown Creek

Newtown Creek is entered on the eastern side of East River 3.6 miles from The Battery. The creek extends
3.3 miles eastward and southward and has several short tributaries or basins. Traffic is fairly heavy and
consists chiefly of petroleum products, sand, gravel and crushed rock; drafts of vessels navigating the creek
seldom exceed 15 feet. Tributary basins are Dutch Kills, on the north side of Newtown Creek 0.8 mile from
East River; Whale Creek, on the south side opposite Dutch Kills; Maspeth Creek, on the east side 2.2 miles
from East River; East Branch, on the east side 2.5 miles from the river; and English Kills, which extends
westward and southward from the East Branch entrance and forms the last 0.8 mile of Newtown Creek
(Figure 19). The navigation factors and management tools are described in (Tables 39 and 40).

Figure 19 Newtown Creek

Table 39 Newtown Creek Navigation Factors

1
2
3
4
5
6
7

8
9

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog

X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

X
X

Channel Depths
Infrastructure

X
X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal Management
Areas

X
X

65

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Table 40 Newtown Creek Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

X

3

Navigation
Modeling

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

Port and Waterway
Safety Assessments

X

5
6

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

7
8

o

X

X

X

Column C
NOAA
US Coast Pilot

X

Navigation
Charts
Tide Predictions

X

Current
Predictions

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

PORTS
Recommended
Vessel Routes

X

Maneuvering
- Traffic mix
▪

-

o

Commercial vessels must be aware of traffic mix and take extra precaution
during recreational season
▪ Commercial and Recreational vessels must be aware of wakes and take extra
precaution to it impacts on tug/tow gear.
▪ Numerous terminals with a wide array of uses are sited within Newtown Creek
and its many branches
Meeting/overtaking
▪ Maneuvers are planned in advance for meeting while overtaking maneuvers
occur rarely only during special circumstances.
Speed
▪ Navigation speed is restricted to minimize wake and/or surge effects on moored vessels
along the shore.

Restrictions
- Air Draft - 90 Feet at MHW at the Kosciusko Memorial Bridge

- Channel depths
▪ A federal project provides for a 23-foot channel in Newtown Creek from the East River to and in a turning basin about 240 yards above the Kosciusko Memorial Bridge, thence 20 feet in East Branch and in English Kills to the Metropolitan Avenue bridge, and thence 12 feet in English Kills to the head of the project at Montrose Avenue. Dutch Kills is unnavigable for commercial vessels due to shoaling.

-

Tide
▪

-

Height of Tide is a factor for deeper draft vessels. High water operations for deeper draft vessels restricts operation windows.

Current
▪

-

-

Current in the East River is factored during the approach into Newtown Creek.
Current in Newtown Creek is minimal.
Infrastructure
▪ Bridge openings are critical when maneuvering within a narrow creek. Bridge delays on commercial units lead to excessive maneuvering, diminished tidal windows, excessive undo navigational pressure and/or possible marine incident.
▪ Squatter vessels place excessive undo navigational pressure and/or possible marine incident
▪ Cable, pipeline and other subsea utilities must be considered during emergency anchoring.
Anchoring
▪ No Federal Designated Anchorages exist in Newtown Creek.

5.5.3 Approaches to Hell Gate

Hell Gate is the part of East River between Wards Island and Roosevelt Island, 0.7 mile to the southwest. The crooked channel, the strong tidal currents, and the heavy traffic in Hell Gate require extra caution on the part of the navigator to avoid accident or collision (Figure 20). The navigation factors and management tools are described in (Tables 41 and 42).

Figure 20 Approaches to Hell Gate

Table 41 Approaches to Hell Gate Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

7
8
9

X

Column B

Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

X

Channel Depths
Infrastructure

X
X

Northeasters
Freshets

X
X

Tides

Traffic Density

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Table 42 Approaches to Hell Gate Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

X Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

5
6

7
8

Port and Waterway
Safety Assessments
Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

X
X
X

X

X

Column C

NOAA
US Coast Pilot

X

Navigation
Charts
Tide Predictions

X

Current
Predictions

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

PORTS
Recommended
Vessel Routes

X
X

o

Maneuvering
- Traffic mix
▪

-

-

o

Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
▪ Commercial and Recreational vessels must be aware of wakes and take extra precaution to it impacts on tug/tow gear.
▪ Commercial Vessels have vessel specific navigation windows at Hell Gate. Deep-draft tend to transit Hell Gate 1 hour either side of slack water, many prefer to transit 15 minutes either side of slack water. Shallow draft vessels tend to transit Hell Gate at any stage of the current while some prefer to transit with the current.
Meeting/overtaking
▪ Meeting and overtaking maneuvers rarely occur in Hell Gate but do happen during special circumstances. Meeting and overtaking maneuvers primarily occur either south of Hell Gate in the straight channel between the Queensboro Bridge and the northern tip of Roosevelt Island or North of Hell Gate in the straight channel between North Brothers Island and Wards Island. Mariners broadcast timely security calls on Channel 13 VHF and maintain constant contact with VTS.
Junctions
▪ Commercial and recreational vessels navigate the Harlem River and East Channel of the East River
Speed
▪ Safe speed is maintained throughout the approaches and in Hell Gate for steerage and navigation safety.

Restrictions
- Vessel specific current restrictions
- VHF radio communications may be problematic between vessels due to high rise buildings sometimes requiring VTS to serve as relay between such vessels.
- Air Draft - -Queensboro Bridge 131-Feet at MHW at center
- Current
▪ In Hell Gate (off Mill Rock) the velocity is 3.4 knots for the eastward current and 4.6 knots for the westward current. The direction and velocity of the currents are affected by strong winds that may increase or diminish the periods of flood or ebb.

The currents generally set with the channel, but heavy swirls are found in Hell Gate. The currents play a major factor in the timing of passage for Deep Draft units navigating Hell Gate.
- Infrastructure
▪ Cable, pipeline and other subsea utilities must be considered during emergency anchoring.
- Anchoring
▪ No Federal Designated Anchorages suitable for commercial vessels
- Deep-Draft vessels must maintain 2-foot UKC

5.5.4 Brothers Islands
At approximately 90 degrees, the bend around North Brothers Island is sharp with oil and dry bulk terminals
along the Bronx shoreline. Shallow draft units may transit between the Brother Islands during certain
current or tide stages and/or to mitigate meeting or overtaking maneuvers with a deep draft unit navigating

in the primary channel (Figure 21). The navigation factors and management tools are described in (Tables
43 and 44).

Figure 21 Brothers Island

Table 43 Brothers Island Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Maneuvering
Meeting

Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

Ice

X

Wind

X

X

Channel Depths
Infrastructure

X

X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

Table 44 Brothers Island Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs

X

3

Navigation
Modeling

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

Port and Waterway
Safety Assessments

X

5
6

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines

Harbor Operation
Safety Committees
Regulation
Navigation Area

7
8

o

o

X

X

X

Column C
NOAA
US Coast Pilot

X

Navigation
Charts
Tide Predictions

X

Current
Predictions

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening

Standard
Operation
Procedures
Anchorage
Grounds

PORTS
Recommended
Vessel Routes

X

Maneuvering
- Traffic mix
▪
Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
▪
Commercial and Recreational vessels must be aware of wakes and take extra precaution to it impacts on tug/tow gear.
- Meeting/overtaking
▪
Meeting and overtaking maneuvers rarely occur north of Brothers Island but do happen during special circumstances. Meeting and overtaking maneuvers primarily occur before or after North Brothers Island. Mariners broadcast timely security calls on Channel 13 VHF and maintain contact with VTS.
- Junctions
▪ Shallow draft commercial and recreational vessels sometimes navigate between the Brothers Islands.
▪ South Brothers Island Channel is a deep draft channel connecting the East River with Astoria Terminals
- Speed
▪ Safe speed is maintained for steerage and navigation safety.
Restrictions
- Vessel specific current restrictions
- Infrastructure
▪ Cable, pipeline and other subsea utilities must be considered during emergency anchoring.
- Anchoring
▪ No Federal Designated Anchorages exist
- Deep-Draft vessels must maintain 2-foot UKC

5.5.5 Brothers Islands to Throggs Neck

The Navigation Channel from North Brothers Island to Throggs Neck is well defined, without severe turns,
and diminishing current strengths. Located within this region is the Bronx River, Westchester Creek, and
Flushing Bay/Creek. The navigation factors and management tools are described in (Tables 45 and 46).

Table 45 Brothers Islands - Throggs Neck Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

7
8
9

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences

Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

X

Ice

X

Wind

X

X

Channel Depths
Infrastructure

X
X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

Tropical Systems
Hurricanes

X
X

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Table 46 Brothers Islands - Throggs Neck Management Tools
Column A
Private
1 Harbor Assist

Column B
USCG
X Aids to Navigation

Column C
NOAA
X US Coast Pilot

2 Escort Tugs

Vessel Traffic Service

X Navigation Charts

3 Navigation
Modeling

Homeport Portal

X Tide Predictions

4 Navigation Risk
Assessments
5
6

Port and Waterway
Safety Assessments
Ice Breakers
Harbor Operations
Safety and Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

X Current
Predictions
PORTS*
X Recommended
Vessel Routes

7
8

Column D
USACE
X Channel
Maintenance
X Channel
Deepening
X Standard
Operation

Procedures
X Anchorage
Grounds

X

X

X

o

Maneuvering
- Traffic mix
▪

-

o

Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
▪ Commercial and Recreational vessels must be aware of wakes and take extra precaution to it impacts on tug/tow gear.
Meeting/overtaking
▪ Meeting and overtaking maneuvers are conducted with timely and effective VHF Communication
Anchoring
▪ Anchorage Grounds are located on both sides of the federal channel for both anchoring and mooring buoys. Mooring buoys are critical logistic tools for supply chains up the various creeks and rivers in the region.
▪ Special anchorage areas exist for vessels primarily for use by yachts and other recreational craft less than 65-feet.
Junctions
▪ Commercial and recreational vessels navigate Bronx River, Westchester Creek, and Flushing Bay/Creek
Speed
▪ Safe speed is maintained for steerage and navigation safety.

Restrictions
- Vessel specific current restrictions
- Infrastructure
▪ Cable, pipeline and other subsea utilities must be considered during emergency anchoring.
- Shoaling
▪ USACE periodically dredges the Bronx River, Westchester creeks and Flushing Bay/Creek. Flushing Bay/Creek is scheduled to be dredged in the near future
- Deep-Draft vessels must maintain 2-foot UKC

5.6 Long Island Sound

Long Island Sound is a wide body of water replete with harbors on both the Connecticut shore and North Shore of Long Island. Commercial users include Tug/Tow, Bulk Ships, small passenger ships, recreational vessels, fishing vessels, and two large ferry operations (Bridgeport-Port Jefferson and Orient - New London).

On the New York side of the Sound are two offshore terminals (Northport and Riverhead) and deep-water Port Jefferson. Additional ports have been gentrified reducing cargo deliveries completely or to a fraction of previous volumes to include: Hempstead Harbor, Port Washington, Oyster Bay, Huntington, and Northport. A once prosperous lobster industry has virtually disappeared.

5.6.1 Throggs Neck - Matinecock Point

Long Island Sound begins at Throggs Neck and extends over 100 nautical miles to Orient Point. Throggs Neck to Matinecock Point is a busy section of the Sound for both commercial and recreational users. Commercial users must navigate in deeper water while contending with weather impacts and recreational users during summer months. Proposed Recommended Vessel Route under review can be seen in (Figure 22). The navigation factors and management tools are described in (Tables 47

and 48).
Figure 22 Throggs Neck - Matinecock

Table 47 Throggs Neck - Matinecock Point Navigation Factors
Column A
Maneuvering
1 Meeting
Areas
2 Overtaking
Areas
3 Junctions

Column B
Special
Restrictions
X Speed

X Fog

X

Currents

X

X Air Draft

X Ice

X

Wind

X

X Channel
Depths
Infrastructure

X Northeasters

X

Tides

X

X Freshets

X

Traffic
Density

X

Tropical Systems
X Hurricanes

X
X

4 Turning
Basins
5 Anchorages X Shoaling
6
Under Keel
Clearance
7
Safety Zone
8
Security Zone
9

Column C
Seasonal Occurrences

Traffic Mix
Marine Events
Seasonal
Management Areas

Column D
Daily Occurrences

X

X

Table 48 Throggs Neck - Matinecock Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
X Aids to Navigation

2

Escort Tugs
Navigation
Modeling

Navigation
Charts
Tide Predictions

X

3

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

Port and Waterway

Safety Assessments

Current
Predictions

X

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

PORTS
Recommended
Vessel Routes

5
6

7
8

18

X

Column C
NOAA
US Coast Pilot

X

X

Column D
USACE
Channel
Maintenance

Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

X18

X

o

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
▪ Commercial and Recreational vessels must be aware of wakes and take extra precaution to it impacts on tug/tow gear.
▪ This area is used widely for sailing instruction and is a popular fishing ground.
- Meeting/overtaking
▪ Meeting and overtaking maneuvers are conducted with timely and effective VHF Communication
- Junctions
▪ Commercial and recreational vessels navigate Eastchester Creek
- Speed
▪ Safe speed is maintained for steerage and navigation safety.

o

Restrictions
- Vessel specific current restrictions
- Infrastructure
▪ Cable, pipeline and other subsea utilities must be considered during emergency anchoring.
- Anchoring
▪ Anchorage Ground 1 is insufficient for deep anchoring.
▪ Deep draft Ships custom and practice anchor East of Hart Island

Recommended Vessel Route from Throggs Neck to Matinecock Point is currently under consideration

▪

-

Tug/tow units custom and practice anchor off United States Merchant Marine
Academy up to the federal channel approximately on a line drawn from Willets Point
to Stepping Stones
Deep-Draft vessels must maintain 2-foot UKC

5.6.2 Port Jefferson
Port Jefferson Harbor, on the north shore of Long Island is entered through a dredged channel that leads
between two jetties that are in ruins to a docking area near the southwestern end of the harbor; the jetties
are each marked by a light. The approach is marked by a lighted whistle buoy, about 1.1 miles northwest
of the entrance. Three stacks on the west side near the head of the harbor are conspicuous landmarks. A 12
mph speed limit is enforced in the main entrance channel, and a 5 mph speed limit is enforced at the head
of the harbor in the vicinity of the mooring areas and wharves. Commercial terminals include liquid and
dry bulk, launch and supply services, as well as the Bridgeport Port Jefferson Ferry (Figure 23). The
navigation factors and management tools are described in (Tables 49 and 50).

Figure 23 Port Jefferson Harbor

Table 49 Port Jefferson Navigation Factors

1
2
3

4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

Ice

X

Wind

X

Tides
Traffic Density

X
X

X

7
8
9

Channel Depths
Infrastructure

X
X

Northeasters
Freshets

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal

Management Areas

X
X

Table 50 Port Jefferson Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

2

Escort Tugs

3

Navigation
Modeling

4

Navigation
Risk
Assessments

5
6

7
8
o

Column C
NOAA
US Coast Pilot

X

Vessel Traffic
Service
Homeport Portal

Navigation Charts

X

Tide Predictions

X

Port and Waterway
Safety Assessments

Current Predictions

X

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

PORTS
Recommended
Vessel Routes

X

Column D
USACE
Channel
Maintenance
Channel
Deepening

Standard
Operation
Procedures
Anchorage
Grounds

X

X

Maneuvering
- Traffic mix
▪
▪
▪

Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
Bridgeport/Port Jefferson Ferry conducts daily service from 6am-midnight
Commercial and Recreational vessels must be aware of wakes and take extra precaution to it impacts on tug/tow gear.

-

o

Meeting/overtaking
▪ Meeting and overtaking maneuvers is avoided at the Jetty and conducted with timely and effective VHF Communication
▪ A deep water range is present entering the harbor
Speed
▪ Safe speed is maintained for steerage and navigation safety.

Restrictions
- Shoaling
▪ Inside the harbor east of the channel
- Deep-Draft vessels must maintain 2-foot UKC
▪ 26.8 feet at High Water Transits
- Anchoring

▪ A mooring buoy is located east of the channel in the harbor for aggregate scows.
▪ Tug/tow and deep draft ships units custom and practice anchor off Port Jefferson to await berthing and/or tide.

5.6.3 Long Island Sound

Long Island Sound is a deep navigable waterway lying between the shores of Connecticut and New York and the northern coast of Long Island.

Currents run in an east-west direction and when conflicting with strong east-west winds develop waves that often subsides with the change in current. Commercial vessels often plan voyages to favor natural lees of either Long Island or Connecticut depending on wind direction. On the north coast of Long Island bluffs rise to a height of 200 feet.

Execution Rocks, is the main entrance to Long Island Sound from westward and the Race, the main entrance to Long Island Sound from eastward, extends between Fishers Island and Little Gull Island, between which is a width of about 3.5 miles.

Two offshore production facilities, Riverhead Production Platform and Northport Platform are sited in the New York waters of Long Island Sound.

The navigation factors and management tools are described in (Tables 51 and 52).

Table 51 Long Island Sound Navigation Factors

1
2
3
4
5
6

Column A
Maneuvering
Meeting
Areas
Overtaking

Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

Ice

X

Wind

X

Northeasters
Freshets

X
X

Tides
Traffic Density

X
X

Tropical Systems
Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Channel Depths
Infrastructure
X

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

7
8
9

Table 52 Long Island Sound Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

2

Escort Tugs
Navigation
Modeling

Navigation
Charts
Tide Predictions

X

3

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

Port and Waterway
Safety Assessments

Current
Predictions

X

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees

Regulation
Navigation Area

PORTS*
Recommended
Vessel Routes

5
6

7
8

o

X

Column C
NOAA
US Coast Pilot

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

X

X

X

Maneuvering
- Traffic mix
▪
▪
▪

Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
Bridgeport/Port Jefferson Ferry conducts daily service from 6am-midnight
Orient Point Ferry conducts daily service from 6am-midnight

-

o

Meeting/overtaking
▪ Meeting and overtaking maneuvers is conducted with timely and effective VHF Communication
▪ Navigation Recommendation Route at the Race
Speed
▪ Safe speed is maintained for steerage and navigation safety.

Restrictions
- Two offshore platforms are located in LIS
▪ Northport
▪ Riverhead
- Anchoring
▪ Designated anchorages Riverhead, Port Jefferson, Northport

5.7 South Shore of Long Island
The South Shore of Long Island has along its shoreline various inlets for shallow draft vessels. The State
boundary on the south shore of Long Island extends 3 miles into the Atlantic from the shoreline. South of these, extending well into the island’s midsection, run several chains of hills. The south shore is a
barrier beach from about 30 miles west of the eastern extremity to the western end.

5.7.1 Montauk Harbor
Montauk Harbor, in the northern part of Lake Montauk, is entered through a dredged channel on

the northern shore about 3 miles west of Montauk Point; a federal project provides for a depth of 12 feet in the channel and 10 feet in the boat basin northwestward of Star Island. The entrance is protected by jetties, each of which is marked by a light. A lighted bell buoy, about 0.3 mile north of the entrance, marks the approach to the harbor. The navigation factors and management tools are described in (Tables 53 and 54).

Table 53 Montauk Navigation Factors

1
2
3
4
5
6
7
8
9

Column A
Maneuvering
Meeting
Areas
Overtaking
Areas
Junctions
Turning
Basins
Anchorages

X

Column B
Special Restrictions
Speed
X

Column C
Seasonal Occurrences
Fog
X

Column D
Daily Occurrences
Currents
X

X

Air Draft

Ice

X

Wind

X

Tides
Traffic Density

X

Channel Depths
Infrastructure

X

Northeasters
Freshets

X
X

Shoaling
Under Keel
Clearance
Safety Zone
Security Zone

X

Tropical Systems

Hurricanes

X
X

Traffic Mix
Marine Events
Seasonal
Management Areas

X
X

Table 54 Montauk Management Tools

1

Column A
Private
Harbor Assist

Column B
USCG
Aids to Navigation

2

Escort Tugs
Navigation
Modeling

Navigation
Charts
Tide Predictions

X

3

Vessel Traffic
Service
Homeport Portal

4

Navigation
Risk
Assessments

Port and Waterway
Safety Assessments

Current
Predictions

X

Ice Breakers
Harbor Operations
Safety and
Navigation
Guidelines
Harbor Operation
Safety Committees
Regulation
Navigation Area

PORTS
Recommended
Vessel Routes

5
6

7
8

o

X

X

Column D
USACE
Channel
Maintenance
Channel
Deepening
Standard
Operation
Procedures
Anchorage
Grounds

Maneuvering
- Traffic mix
▪ Commercial vessels must be aware of traffic mix and take extra precaution during recreational season
-

o

X

Column C
NOAA
US Coast Pilot

Meeting/overtaking
▪ Very busy in the summer with small boats and now yachts Meeting and overtaking maneuvers is conducted with timely and effective VHF Communication
Weather
▪ Easterly swell makes breakwater approach tough in the winter. Same with NW winds
Speed
▪ Safe speed is maintained for steerage and navigation safety.

Restrictions
- Channel depths dredged to 12’
- East side of the channel at the breakwater is reported as shoaling
- Ice in winter months
- Anchoring
▪ No Federally Designated Anchorages

6. Items for Consideration for Navigation

The New York Maritime Transportation System is vital to the State of New York to support critical cargo
movements and as an economic engine. The system is managed primarily by Federal along with State and
Local Agencies. Projects managed by the Army Corps of Engineers (Channel deepening/maintenance etc.)
and NOAA (PORTs) Systems managed by NOAA depends on local partnership and/or funding. to Projects
managed by the Army Corps of Engineers (Channel deepening/maintenance etc.) and observing systems
managed by NOAA depend on local partnership and/or funding. The Port of New York is well managed
by VTS and existing navigation safety tools and has the capacity for additional traffic to support the wind
industry. The mitigation required to handle new/additional traffic depends largely on the size, maneuverability and density of traffic.

6.1 Port of New York

- Atlantic Approach: Federally designate Deep-water Anchorage off Long Beach New York
- Ambrose Channel: Deepen Gravesend Anchorage to accommodate Neo Panamax Vessels
- Sandy Hook Channel: Widen Channel to mitigate shoaling
- Upper Bay: Scan and survey bay to identify and mitigate subsea infrastructure
- KVK: Widen Bends for Neo Panamax Vessels. Update current models at Bergen Point.
- AK: Air Draft Sensors on the Goethals Bridge and Outerbridge Crossing. Periodic maintenance dredging

6.2 North (Hudson) River

-

•
•
•
•
•
•

Holland Tunnel - Albany: Extend VTS to Port of Albany
George Washington Bridge-Tappan Zee Bridge: Air Draft Sensor on the Tappan Zee Bridge.
Unobstructed waters for anchoring as identified in report.
Tappan Zee Bridge - Kingston: Maintain Federal Authorized Channel 600-feet wide by 32-feet deep. Unobstructed waters for anchoring as identified in report.
Hudson Highlands: Fog Sensors
Lange Rack: Air Draft Sensor Mid-Hudson Bridge. Unobstructed waters for anchoring as identified
in report
Kingston: Unobstructed waters for anchoring as identified in report
Kingston - Albany: Air Draft Sensor Castleton Highway Bridge. Current/Tide Sensor Port of Albany and Port of Coeymans. Multiple Fog Sensors. Maintain Federal Authorized Channel 400feet wide by 32-feet deep. Turning Basin at Port of Coeymans.

6.3 East River
•
•

Hell Gate: Current Sensor
Throggs Neck: Tide Sensor

6.4 Long Island Sound
•
•
•
•

Federally designated anchorage grounds between Execution Rocks and Throggs Neck to support
Ships and Tug/Tows units.
Maintain Port Jefferson Harbor Channel. Shoaling has been reported inside the harbor east of the
channel
Maintain Port of Montauk Harbor Channel. Shoaling has been reported East side of the channel at
the breakwater.

Consider a Federal Designated Anchorage for Port of Montauk

7. Port Facility Characteristics
Appendix A identifies 245 port sites by various characteristics. The complete list of all the port facilities
and they characteristics is in Table 7.4. A quick analysis of the sites indicates the following:
•

Table 7.1, indicates that there are 243 sites of which 184 (75.7%) are in New York. The table also
shows that 69% of the facilities are privately owned.
Table 7.1: Facilities distribution by operation
NJ
APDC
Gov.
NYCDEP
NYCDOS
NYCDOT
NYCEDC
PANYNJ
Private
Public
Grand Total
Distribution

•

Grand
Total
2
3
29
4
4
6
13
172
10
243

100.0%

NY
2
2
29
4
4
6
4
127
6
184
75.7%

1

9
45
4
59
24.3%

% of
Total
0.8%
1.2%
11.9%
1.6%
1.6%
2.5%
5.3%
70.8%
4.1%
100.0%

% of
NY
1.1%
1.1%
15.8%
2.2%
2.2%

3.3%
2.2%
69.0%
3.3%
100.0%

Table 7.2, shows the facilities location distribution by waterway which is dominated by the North and
East Rivers.

Table 7.2: Facilities by waterway

Row Labels
AK
Bronx River
East River
East Chester Creek
Flushing Bay/Creek
Gowanus
Jamacia Bay
Jamaica Bay
KVK
LI Sound
Lower Bay
Mariners Harbor
Mariners Harbor
Newark Bay
Newtown Creek
North River
Passaic River
Raritan River
Upper Bay
Grand Total
Distribution

NJ

NY

14

4
3
40
4

6
6
3
3
7
1
3
8
1
1
9
68

8
3

10
10
2
2
10
59
24.3%

17
184
75.7%

Grand
Total
18
3
40
4
6
6
3
3
15
1
6
8
1

11
9
78
2
2
27
243

% of
Total
7.4%
1.2%
16.5%
1.6%
2.5%
2.5%
1.2%
1.2%
6.2%
0.4%
2.5%
3.3%
0.4%
4.5%
3.7%
32.1%
0.8%
0.8%
11.1%
100.0%

% of
NY
2.2%
1.6%
21.7%
2.2%
3.3%
3.3%
1.6%
1.6%
3.8%
0.5%

1.6%
4.3%
0.5%
0.5%
4.9%
37.0%
0.0%
0.0%
9.2%
100.0%

•

Table 7.3, illustrates the site distribution by facility type which is dominated by liquid bulk passengers
and dry bulk.
Table 7.3: Site distribution by facility type
Row Labels
Break Bulk
Car Carriers
Container
Cruise Port
Dry Bulk
Dry Bulk
Dry Bulk - Food Product
Dry/break bulk
Energy Generation
Environmental
Gov.
Intermodal Rail
Liquid Bulk
Liquid Bulk - Food Product
Marina
Marina/Boat Ramp
Maritime Support Services
Maritime Training
Military
Passenger
Ship Repair and Maintenance

Small Passenger
Support Services
Tug Yard
Undeveloped
(blank)
Grand Total
Distribution

NJ

NY
1
1
5
1
6

1
3
1
23

2
1
1
11
1

1
6
2
22
15
1
4
10
1
1
48
1
4
1
14

1
39
8
1

1

59
24.3%

2
1
1
184
75.7%

Grand
Total
2
1
11
3
22
21
1
4
10
2
3
2
71
1
4
3
15
1
1
50
9
1
1
2
1

1
243

% of
Total
0.8%
0.4%
4.5%
1.2%
9.1%
8.6%
0.4%
1.6%
4.1%
0.8%
1.2%
0.8%
29.2%
0.4%
1.6%
1.2%
6.2%
0.4%
0.4%
20.6%
3.7%
0.4%
0.4%
0.8%
0.4%
0.4%
100.0%

% of
NY
0.5%
0.0%
3.3%
1.1%
12.0%
8.2%
0.5%
2.2%

5.4%
0.5%
0.0%
0.5%
26.1%
0.5%
2.2%
0.5%
7.6%
0.5%
0.0%
21.2%
4.3%
0.5%
0.0%
1.1%
0.5%
0.5%
100.0%

Table 7.4., lists all the port terminals.

Table 7.4: Port terminal list
State

Waterway

NJ
NJ

AK
Upper Bay

NJ

Lower Bay

NJ
NJ

NJ
NJ
NJ
NJ
NJ
NJ

Location

Name

Operatio
n

Facility Type

KMI
National Park Service Ellis Island

Private
Public

Liquid Bulk
Gov.

SeaStreak Conners Ferry Ter.

Private

Passenger

KVK
KVK
KVK
KVK
KVK
KVK
KVK
KVK

Carteret
Ellis Island
Atlantic

Highlands
Bayonne
Bayonne
Bayonne
Bayonne
Bayonne
Bayonne
Bayonne
Bayonne

Buckeye Bayonne
Duraport Marine and Rail
Gordon Terminal Service, Inc.
IMTT 5B
IMTT Bayonne
IMTT Con Hook
Ken Port
Lafarge Cement

Private
Private
Private
Private
Private
Private
Private
Private

NJ

Upper Bay

Bayonne

Bayonne Dry Dock and Repair

Private

NJ
NJ
NJ
NJ
NJ

NJ
NJ
NJ
NJ
NJ
NJ

Upper Bay
Upper Bay
Lower Bay
AK
Upper Bay
Upper Bay
Lower Bay
AK
AK
AK
North River

Bayonne
Bayonne
Belford
Carteret
Claremont
Claremont
Earle
Elizabeth
Elizabeth
Elizabeth
Glenmont

PANYNJ
PANYNJ
Private
Public
Private
Public
Gov.
Private
Private
Private
Private

NJ

Upper Bay

Greenville

PANYNJ

Intermodal Rail

NJ
NJ
NJ

Upper Bay
North River
North River

Greenville
Hoboken
Hoboken

Private
Private
Private

Maritime Support Services
Passenger
Passenger

NJ

North River

Hoboken

Private

Passenger

NJ

North River

Jersey City

Private

Passenger

NJ

North River

Jersey City

Private

Passenger

NJ

North River

Jersey City

Private

Passenger

NJ
NJ
NJ
NJ
NJ

Upper Bay
Upper Bay
AK
AK
AK

Jersey City
Liberty Island
Linden
Linden

Linden

PANYNJ
Public
Private
Private
Private

Container
Gov.
Liquid Bulk
Liquid Bulk
Liquid Bulk

NJ

Newark Bay

Newark

Private

Liquid Bulk

NJ
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NJ

Newark Bay
Newark Bay
Newark Bay
Newark Bay
Passaic River
AK
AK
AK
AK
Raritan River
Raritan River
Newark Bay
Newark Bay
Newark Bay
Newark Bay
Newark Bay
AK
AK
Passaic River

Newark
Newark
Newark
Newark
Newark
Perth Amboy
Perth Amboy
Perth Amboy
Perth Amboy
Perth Amboy
Perth Amboy
Port Elizabeth
Port Elizabeth
Port Newark
Port Newark
Port Newark
Port Reading
Sewaren
South Kearny

Cape Liberty Cruise Port
Northeast Auto

NY Waterways Belford Terminal
Carteret Veteran's Pier
Sims Metal Management
US Army Corp of Engineers
Earle Navy Pier
Construction and Marine Equipment Co
Federal Petroleum LLC.
Plaza Fuel
Clean Harbors Environmental
New York New Jersey Rail, LLC
Greenville Yards
Weeks
Cornucopia Hoboken
NY Waterways Lackawanna
NY Waterways North Hoboken /
14th St
NY Waterways Harborside
NY Waterways Liberty Harbor/Marin
Blvd.
NY Waterways Terminal –
Paulus Hook
Global Container Bayonne
National Park Service Liberty Island
Citgo Petroleum Corp. Linden
NuStar ST Linden Terminal, LLC
Phillips 66 Tremley Point Terminal
Center Point Terminal Company
Newark
Darling Ingredients Inc.
Eastern Metal Recycling
Shell Newark
Sims Metal Management - Newark
PVSC
Buckeye Perth Amboy Terminal
Chevron
KMI
Weeks
Buckeye Raritan Bay
Cornucopia Perth Amboy
APM TERMINALS
Maher Terminals, Inc.
Hudson Tank Terminals Corp.
Port Newark Container Terminal

Red Hook Barge Terminal Newark
Buckeye Port Reading
Shell Sewaren
Kuehne Chemical Company, Inc.

Liquid Bulk
Dry Bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Support Services
Dry Bulk
Ship Repair and
Maintenance
Cruise Port
Car Carriers
Passenger
Marina/Boat Ramp
Dry Bulk
Gov.
Military
Break Bulk
Liquid Bulk
Liquid Bulk
Environmental

Private
Private
Private
Private
Private
Private
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Private
PANYNJ
PANYNJ
PANYNJ
PANYNJ
PANYNJ

Private
Private
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Liquid Bulk
Dry Bulk
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Dry Bulk
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Liquid Bulk
Liquid Bulk
Liquid Bulk
Dry Bulk
Liquid Bulk
Passenger
Container
Container
Liquid Bulk
Container
Container
Liquid Bulk
Liquid Bulk
Liquid Bulk

NJ
NJ
NJ
NJ
NY
NY
NY
NY

AK
North River
North River
North River
North River
North River

North River
North River

Staten Island
Weehawken
Weehawken
Weehawken
Albany
Albany
Albany
Albany

KMI
Lincoln Harbor Yacht Club
NY Waterways Lincoln Harbor
NY Waterways Port Imperial
Citgo Glenmont Albany
Global Albany
Port Albany Ventures, LLC
Port of Albany- Albany

Private
Private
Private
Private
Private
Private
Private
APDC

NY

North River

Albany

Scarano Ship Yard

Private

NY
NY
NY

NY
NY
NY
NY
NY
NY
NY

Albany
Albany
Albany
Albany
Astoria
Astoria
Athens
Beacon
Bear Mountain
Bowline

Westway Feed Products
Buckeye Albany Terminal, LLC.
Callanan
City of Albany Snow Dock
Astoria Energy LLC
Con-ED East River Generating Station
Peckham Materials Corporation
NY Waterways Beacon
Bear Mountain Dock
GenOn Bowline Generating

Private
Private
Private
Public
Private
Private
Private
Private
Public
Private

Bronx

RCA

Private

Dry Bulk

Bronx

Pascap

Private

Dry Bulk

Bronx

Peckham

Private

Dry Bulk

Bronx

US Concrete

Private

Dry Bulk

NY
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NY

North River

North River
North River
North River
East River
East River
North River
North River
North River
North River
EastChester
Creek
EastChester
Creek
EastChester
Creek
EastChester
Creek
Bronx River
Bronx River
Bronx River
East River
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East River
East River
East River

Liquid Bulk
Marina/Boat Ramp
Passenger
Passenger
Liquid Bulk
Liquid Bulk
Dry Bulk
Dry/break bulk
Ship Repair and
Maintenance
Liquid Bulk - Food Product
Liquid Bulk
Dry Bulk
Passenger

Energy Generation
Energy Generation
Liquid Bulk
Passenger
Passenger
Energy Generation

Bronx
Bronx
Bronx
Bronx
Bronx
Bronx
Bronx
Bronx
Bronx
Bronx
Brooklyn

Sims Metal
Weeks
Casa
Buckeye Bronx
Maritime College
McInnis Cement
NYCDEP Wards Island
NYCDEP Hunts Point
NYCEDC Soundview Ferry Landing
Sprague Oil
Brooklyn Cruise Terminal Pier 12

Private
Private
Private
Private
Gov.
Private
NYCDEP
NYCDEP
NYCDEP
Private
PANYNJ

NY

East River

Brooklyn

Brooklyn Navy Yard

Private

NY
NY
NY
NY
NY

East River
East River
East River
East River
East River

Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn

Private
Private
Private
Private
NYCDEP

NY

East River

Brooklyn

NYCDEP

Passenger

NY

East River

Brooklyn

NYCDEP

Passenger

NY

East River

Brooklyn

NYCDEP

Passenger

NY
NY

East River
East River

Brooklyn
Brooklyn

NYCDEP
NYCEDC

Passenger
Passenger

NY

East River

Brooklyn

NYCDEP

Passenger

NY
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NY
NY
NY
NY

East River
Gowanus
Gowanus
Gowanus
Gowanus
Gowanus
Gowanus
Jamaica Bay
Jamaica Bay
Lower Bay
Lower Bay
Lower Bay

Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn

Brooklyn Navy Yard Cogeneration Plan

Brooklyn Navy Yard Ferry Landing
New York Sand & Stone (Navy yard)
NY Waterways India St / Greenpoint
NYCDEP Red Hook
NYCEDC Brooklyn Bridge Park
Pier 6 Ferry Landing
NYCEDC Brooklyn Bridge Pier 1
NYCEDC N.6th St./N.
Williamsburg Landing
NYCEDC Red Hook Landing
NYCEDC South Williamsburg
NYCEDC Stuyvesant Cove Ferry
Landing
Red Hook Container Terminal
Astoria Generating Company
Bayside Fuel Oil - Smith Street
LaFarge Cement Brooklyn
New York Sand & Stone (25th st)
NYCDOS Sanitation Transfer Station
Vane Brothers
NYCDEP 26 Ward
NYCDEP Coney Island
Astoria Generating Company
Bayside Fuel Oil Shore Parkway
NYCDOS Sanitation Transfer Station

Dry Bulk
Dry Bulk
Dry Bulk
Liquid Bulk
Maritime Training
Dry Bulk
Liquid Bulk
Liquid Bulk
Passenger
Liquid Bulk
Cruise Port
Ship Repair and
Maintenance
Energy Generation
Small Passenger
Dry Bulk
Passenger

Liquid Bulk

PANYNJ
Private
Private
Private
Private
NYCDOS
Private
NYCDEP
NYCDEP
Private
Private
NYCDOS

Container
Energy Generation
Liquid Bulk
Dry Bulk
Dry Bulk
Container
Maritime Support Services
Liquid Bulk
Liquid Bulk
Energy Generation
Liquid Bulk
Container

NY
NY
NY
NY

NY
NY
NY
NY
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NY

NY
NY

Newtown Creek
Newtown Creek
Newtown Creek
Newtown Creek
Newtown Creek
Newtown Creek
Upper Bay
Upper Bay

Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn
Brooklyn

NY

Upper Bay

Brooklyn

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Upper Bay
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Upper Bay

Brooklyn
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Brooklyn

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Upper Bay

Brooklyn

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Upper Bay
North River
North River
North River
North River
North River
North River
Flushing
Bay/Creek

Brooklyn
Buchanan
Catskill
Catskill
Catskill
Catskill
Coeymans
College
Point

NY

Allocco Steel
Bayside Fuel Oil - Grand Street
Kinder Morgan Brooklyn
NYCDEP Newtown Creek
TNT Metal
United Metro Energy Corporation
Brooklyn Army Terminal Pier 4
Hughes Brothers
New York New Jersey Rail, LLC
65th ST Railyard
NY Waterways IKEA Dock

NYCDEP Owls Head
NYCEDC Bay Ridge Landing
NYCEDC Brooklyn Army Terminal
Pier 4 Ferry Landing
Reinauer Barge Port
CertainTeed Gypsum
Dutchmans Landing
Lehigh Cement Alsen Dock
Lehigh Cement Company
Peckham
P&M Brick, LLC

Private
Private
Private
NYCDEP
Private
Private
Public
Private

Dry Bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Dry Bulk
Liquid Bulk

PANYNJ

Intermodal Rail

Private
NYCDEP
NYCDEP

Passenger
Liquid Bulk
Passenger

NYCDEP

Passenger

Private
Private
Public
Private
Private
Private
Private

Maritime Support Services
Dry Bulk
Passenger
Dry Bulk
Dry Bulk
Dry Bulk
Dry/break bulk

Skaggs-Walsh Inc

Private

Liquid Bulk

Private

Liquid Bulk

Private

Liquid Bulk

Private

Liquid Bulk

Gov.

Passenger

Private
Private
Private
Private

Private

Innovative Municipal Products
U.S., Inc
North Albany Terminal Company –
Glen

Maritime Support Services

NY

North River

Glenmont

NY

North River

Glenmont

NY

LI Sound

NY

East River

NY
NY
NY
NY
NY

North River
North River
North River
North River
Jamacia Bay

Glenwood
Landing

Governors
Island
Grassy Point
Haverstraw
Haverstraw
Hudson
Inwood

NY

North River

Kingston

Feeney Ship Yard

Private

NY
NY
NY
NY

North River
North River
North River
Jamacia Bay

Hudson River Cruises
Hudson River Maritime Museum
Kingston Point Terminal, Inc
Shell Long Island

Private
Private
Private
Private

NY

East River

Kingston

Kingston
Kingston
Lawrence
Long Island
City

Dry Bulk
Passenger
Dry Bulk
Dry Bulk
Liquid Bulk
Ship Repair and
Maintenance
Passenger
Passenger
Liquid Bulk
Liquid Bulk

Ravenswood Generating Station

Private

Energy Generation

NY

East River

Manhattan

Private

Passenger

NY
NY
NY
NY

East River
East River
East River
East River

Manhattan
Manhattan
Manhattan
Manhattan

NYCDOT
NYCDOT
NYCDEP
NYCDOS

Passenger
Passenger
Liquid Bulk
Container

NY

East River

Manhattan

NYCDEP

Passenger

NY

East River

Manhattan

NYCDEP

Passenger

NY

East River

Manhattan

NYCEDC

Passenger

NY
NY
NY
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NY
NY

East River
North River
North River
North River
North River
North River

Manhattan
Manhattan
Manhattan
Manhattan
Manhattan
Manhattan

NYCEDC
Private
Private
Private
Private
NYCEDC

Marina/Boat Ramp
Marina
Passenger
Passenger
Energy Generation
Cruise Port

NY

North River

Manhattan

Private

Passenger

NY
NY

North River
North River

Manhattan
Manhattan

NYCDEP
Private

Liquid Bulk
Marina

Global Glenwood
Governors Island Ferry Terminals
Governors Island
US Gypson
NY Waterways Hawerstraw
Tilcon
Colarusso and Son
Global Inwood

NY Waterways Battery Park City Terminal
NYC-DOT Priv Ferry (East 34th St)
NYC-DOT Private Ferries, Pier 11
NYCDEP Wards Island
NYCDOS Sanitation Transfer Station
NYCEDC Corlears Hook Ferry Landing
NYCEDC East 90th Street Ferry Landing
NYCEDC/Trust for Governors Island
Battery Marine Building
Skyport Marina
Chelsea Piers

Circle Line - Pier 83
Circle Line - World Yacht Pier
Con-ED 59th Street Station
Manhattan Cruise Terminal
NY Waterways Pier 79 W. 39th
St/Midtown
NYCDEP North River
Pier 15

NY
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NY

North River
North River
Upper Bay
North River
North River
Newark Bay
North River
North River
North River
North River
North River
North River

Manhattan
Manhattan
Manhattan
New Hamburg

New Windsor
Newark
Newburgh
Newburgh
Newburgh
Newburgh
Newburgh
Newburgh

Pier 36
Pier 40 North Side
NYC-DOT Battery Marine Building
New Hamburg Terminal Corp.
Global Newburgh
Buckeye Newark
Global Cargo Newburgh Terminal
Global Cargo Newburgh Terminal
Global North Newburgh Terminal
Global South Newburgh Terminals
NY Waterways Newburgh
Roseton Generating LLC

Private
Private
NYCDOT
Private
Private
Private
Private
Private
Private
Private
Private
Private

NY

North River

Newburgh

Steelways

Private

NY

North River

Nyack

North River Shipyard

Private

NY
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NY
NY
NY

North River
North River
North River
North River
East River
East River
East River
East River
East River

Ossining
Ossining
Peekskill
Poughkeepsie
Queens
Queens
Queens
Queens
Queens

Private

Private
Private
Private
NYCDEP
NYCDEP
NYCDEP
NYCDEP
NYCDEP

NY

East River

Queens

NY Waterways Ossining
Paradise Heating Oil Inc.
Meenan Oil Company (Peekskill)
Petro Poughkeepsie
NYCDEP Bowery Bay
NYCDEP Tallman Island
NYCEDC Astoria Ferry Landing
NYCEDC Hunters Point
NYCEDC Long Island City
NYCEDC Roosevelt Island Ferry
Landing

Marina
Marina
Passenger
Liquid Bulk
Undeveloped
Liquid Bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Passenger
Energy Generation
Ship Repair and
Maintenance
Ship Repair and
Maintenance

Passenger
Liquid Bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Passenger
Passenger
Passenger

NYCDEP

Passenger

Queens

Lafarge Cement

Private

Dry Bulk

Queens

NYCDOS Sanitation Transfer Station

NYCDOS

Container

Queens

Tilcon

Private

Dry Bulk

Queens

Tully Aggregate

Private

Dry Bulk

Queens

US Sand and Stone

Private

Dry Bulk

Queens
Queens
Queens
Queens
Queens
Ravena
Rensselaer

NYCDEP
NYCDEP
Private
Private
Private
Private
Private

Passenger
Liquid Bulk
Dry Bulk
Dry Bulk
Dry Bulk
Liquid Bulk
Liquid Bulk

Private

Liquid Bulk

Private
Private
APDC
Private

Private
Private
Private

Liquid Bulk
Dry Bulk
Dry/break bulk
Liquid Bulk
Liquid Bulk
Liquid Bulk
Energy Generation
Ship Repair and
Maintenance
Container
Dry Bulk
Dry Bulk
Dry Bulk
Maritime Support Services
Ship Repair and
Maintenance
Dry Bulk
Tug Yard
Liquid Bulk
Tug Yard
Maritime Support Services

NY
NY
NY
NY
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NY
NY

Flushing
Bay/Creek
Flushing
Bay/Creek
Flushing
Bay/Creek
Flushing
Bay/Creek
Flushing

Bay/Creek
Jamacia Bay
Jamaica Bay
Newtown Creek
Newtown Creek
Newtown Creek
North River
North River

NY

North River

Rensselaer

NY
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NY

North River
North River
North River
North River
North River
North River
North River

Rensselaer
Rensselaer
Rensselaer
Rensselaer
Rensselaer
Roseton
Roseton

NYCEDC Rockaway Ferry Landing
NYCDEP Rockaway
Empire Metal
Green Ashphalt

Sims Metal
LaFarge Cement
Buckeye Rensselaer
Cenex Rensselear Petroleum Fuel &
Terminal Company
Gorman Terminals
National Gypsum
Port of Albany- Rensselaer
Sprague Energy Rennselaer Term
Sunoco Hudson Terminal
Buckeye Roseton
Danskammer Power Plant

NY

AK

Staten Island

GARPO

Private

NY
NY
NY
NY
NY

AK
AK
AK
KVK
KVK

Staten Island
Staten Island
Staten Island
Staten Island
Staten Island

Global Container New York
Visy Paper

Wittes Yard
Atlantic Salt Company, Inc
Cable Queen

PANYNJ
Private
Private
Private
Private

NY

KVK

Staten Island

Caddell Dry Dock and Repair

Private

NY
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NY
NY

KVK
KVK
KVK
KVK
Mariners Harbor

Staten Island
Staten Island
Staten Island
Staten Island
Staten Island

Flag Recycling
Moran Yard
NYCDEP Port Richmond
Reinauer Yard
Clean Water of N.Y. Inc. Fixed

Private
Private
NYCDEP
Private
Private

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NY
NY

Mariners Harbor
Mariners Harbor

Staten Island
Staten Island

Great Lakes Dredge and Drydock
Kirby

Private
Private

NY

Mariners Harbor

Staten Island

Mays Shipyard

Private

NY

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Mariners Harbor
Mariners Harbor
Mariners Harbor
Mariners Harbor
Mariners Haror
Upper Bay
Upper Bay
Upper Bay
Upper Bay
Upper Bay
Upper Bay
Upper Bay
North River

McAllister
New York Sand & Stone
Simpson and Brown
Sterling
New York Terminals LLC
Homeport
Miller Environmental Recovery
Millers Tug/Barge Launch Services
NYC-DOT St. George
NYCEDC ST George Landing
Reynolds
United Sandy Hook Pilots
Callanan

Private
Private

Private
Private
Private
NYCEDC
Private
Private
NYCDOT
NYCDEP
Private
Private
Private

NY

North River

Tilcon

Private

Dry Bulk

NY
NY
NY

North River
North River
Upper Bay

American Sugar Refining
Yonkerrs City Pier
South Brooklyn Marine Terminal

Private
Public
NYCEDC

Dry Bulk - Food Product
Passenger
Break Bulk

NY

North River

Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Staten Island
Troy
Wappingers
Falls
Yonkers
Yonkers
Brooklyn
Tompkins
Cove

Maritime Support Services
Maritime Support Services
Ship Repair and
Maintenance
Maritime Support Services
Dry Bulk
Maritime Support Services
Maritime Support Services
Liquid Bulk
Maritime Support Services
Environmental
Maritime Support Services
Passenger
Passenger
Maritime Support Services
Maritime Support Services
Dry Bulk

Tompkins CAMF LLC

Public

Dry/break bulk

92

8. Vessel Routes and Density of Planned Alternative and Full
Build Alternative 20
Vessel Routing and Density are built using several factors. Consumer density is a main factor for Port
Selection and primary reason the Port of New York is the first stop and largest Port on the East Coast. From
the Port of New York cargo is distributed via road, rail, and marine transportation modes. The primary
intrastate and interstate marine transportation mode is tug/barge delivery transporting liquid, dry, breakbulk, specialized, and containers.

8.1 Port of New York
The United States Coast Guard, after careful review and consideration, will institute a Vessel Management
Reporting System (VMRS) in US Ports as a tool to enhance navigation and vessel safety, and to protect the
marine environment. Vessel Movement Reporting System (VMRS) means a mandatory reporting system
used to monitor and track vessel movements. As the largest port on the East Coast the Vessel Management
Reporting System utilized by the United Coast Guard in the Port of New York is the Vessel Traffic System
(VTS) (Figure 8.1).
New York Harbor VTS Area of Operation includes as follows: The navigable waters21 of the Lower New
York Bay west of a line drawn from Norton Point to Breezy Point; and north of a line connecting the
entrance buoys of Ambrose Channel, Swash Channel, and Sandy Hook Channel, to Sandy Hook Point; on
the southeast including the waters of the Sandy Hook Bay south to a line drawn at latitude 40°25.00′ N.;
then west into the waters of Raritan Bay East Reach to a line drawn from Great Kills Light south through
Raritan Bay East Reach LGB #14 to Comfort Point, New Jersey; then north including the waters

of the
Upper New York Bay south of 40°42.40′ N. (Brooklyn Bridge) and 40°43.70′ N. (Holland Tunnel Ventilator Shaft); west through the KVK into the Arthur Kill north of 40°38.25′ N. (Arthur Kill Railroad
Bridge); then north into the waters of the Newark Bay, south of 40°41.95′ N. (Lehigh Valley Draw Bridge).
The navigable waters of the Raritan Bay south to a line drawn at latitude 40°26.00′ N.; then west of a line
drawn from Great Kills Light south through the Raritan Bay East Reach LGB #14 to Point Comfort, New
Jersey; then west to the Raritan River Railroad Bridge; and north including the waters of the Arthur Kill to
40°28.25′ N. (Arthur Kill Railroad Bridge); including the waters of the East River north of 40°42.40′ N.
(Brooklyn Bridge) to the Throggs Neck Bridge, excluding the Harlem River.

20

NYSERDA Task Work Order (TWO) No. 6 9 GW Port Uses and Navigational Assessment, Johansson, E, Quinn
T., Spear J. 2022 pg.18-37
21
Navigable waters mean all navigable waters of the United States including the territorial sea of the United States,
extending to 12 nautical miles from United States baselines, as described in Presidential Proclamation No. 5928 of
December 27, 1988.

Figure 8.1. VTS Area of Operation
VTS employs the following Very High Frequencies Channels 11, 12, and 14. Channel 11 is universally
used throughout the system to check in and out. As the area of operation (Fig. 8.1) is large two VHF
channels, 12 and 14, are used as highlighted (Fig. 8.1)
Channel 11 Sailing plan throughout VTS New York Area.
Channel 12 -Arthur Kill, East River, Raritan Bay and Anchorage Administration.
Channel 14 - Lower Bay, Upper Bay, Kill Van Kull, Newark Bay, Sandy Hook Channel and Raritan
Bay.

VTS Sector New York collects data of all vessel movements within the VRMS System except vessels not
required (a) Every power-driven vessel of 40 meters (approximately 131 feet) or more in length, while
navigating; (b) Every towing vessel of 8 meters (approximately 26 feet) or more in length, while navigating;
or (c) Every vessel certificated to carry 50 or more passengers for hire, when engaged in trade or exempted
as follows:
•
•

Ferries on a scheduled route: VTS calculates annual commuter ferry transits in 2017 at 590,000 trip
movements and in 2020 at 820,000 trip movements.
Harbor Assist/Escort Vessels: VTS treats the assist/escorted vessel as the VMRS user. Ships employ from 1-4 assist/escort tugs when entering the KVK, AK, and East River. Large Articulated
Tug Barges employ 1-2 assist tugs during docking and undocking maneuvers. The VTS data for 2019 indicates 14,628 moves for Passenger, Freighter, Military/Other, and Tankers therefore theoretically factoring an average of 2 per vessel would represent a minimum of 29,256 annual harbor assist/escort tug movements.

In addition to managing vessel movements while underway, VTS also monitors and administers Federal
Anchorage Grounds within the VRMS area of operation. Vessels must notify VTS when anchoring, monitor
the appropriate working VHF channels, and be ready to move within 30 minute notification, and receive
permission for any lightering operations. Vessels at anchor that determine that their proximity to other
anchor vessels is too close must notify VTS and take appropriate action.
VTS keeps an accurate account of vessel movements within the VTS Area of Operation and logs them in
five categories as follows: Passenger, Freighter, Military/Other, Tanker, and Tug/Tow.
•
•
•

-
-

PAX. Passenger includes Ocean going Cruise Ships and Coastal Cruise Ships not normally operating exclusively within the Port of New York.
Freighter. Freighter Category are vessels carrying non liquid cargo and include but not limited to Container Ships, Auto Carriers, Dry Bulk, Break Bulk.
Mil/Other. Military/Other Category are Military and Other vessels that do not fall under any specific category such as research and training vessels.
Tanker. Tanker includes self-propelled liquid bulk ships. Liquid Bulk Ship carry a wide array of products including petroleum, chemical, and even food products such as Orange Juice.
Tug/Tow. Tug/Tow includes vessel movements of non- self-propelled vessels under tow. Tug/Tow
movements represent the largest segment of cargo movements in the harbor and second only to
commuter ferries in vessel movements. Harbor Assist/Escort Tugs are not included nor is recreational vessel Assistance Towing (Sea Tow, Boat US, etc.).

8.1.1 New York Harbor Routes and Density
The pre pandemic vessel traffic movement in the Port of New York is depicted in Table 8.1 and Figure 8.2.
The data indicate that August had the largest cumulative vessel traffic movements in the Port of New York.
Passenger vessel movements has pick up in May and in September/October, and wane in November. The
2019 annual average was 5,345 vessels with a standard deviation of 242.5 vessels or 4.5%. Freighters
transits range from 478 to 543 per month with October as the busiest month (month average of 514).
Military/Other transits range from a low of 16 and increase from May to October with a peak of 124 (month
average of 76). Tanker transits remain rather steady during the year ranging from 484 to 630 (month average
545). Tug/Tow transits represent the overwhelming majority of cargo movements in the Port approximately
4 times as much as all other vessel movements recorded by VTS with an average of 4,126.
Primary routes for Tankers and Freighters as categorized by VTS are highlighted in Figure 8.2. The primary
destinations of Tankers are terminals located on the KVK and AK. Tankers transit to other sites to include
Newark Bay, North River (Hudson River), and occasionally the East River.
Primary routes for Passenger Ships as categorized by VTS is the Manhattan Cruise Terminal on the North

River, Bayonne Cruise Terminal at Port Jersey, and occasionally the Brooklyn Cruise Terminal on the
Buttermilk Channel.
Primary routes for Military Vessels are the Upper Bay and North River mostly in the summer months

Table 8.1. 2019 VTS New York Harbor Vessel Traffic Data

2019	Net
January	5138
February	4970
March	4896
April	5282
May	5310
June	5243
July	5528
August	5701
September	5599
October	5594
November	5420
December	5458
2019 Total	64139
Distribution	

Pax
Freighter
(Passenger)
30
500
33
530
43
488
53
526
100
531
114
534
120
528
117
501
143
478
134
543
74
482
50
522
1011
6163
1.6%
9.6%

Passenger
1.6%

Military
other
16
36
34
36
84

100
119
126
124
116
64
54
909
1.4%

Freighter
9.6%

Tanker
528
485
484
543
565
520
568
620
613
574
544
501
6545
10.2%

Tugs
Tow
4064
3886
3847
4124
4030
3975
4193
4337
4241
4227
4256
4331

49511
77.2%

Mil/other
1.4%
Tankers
10.2%

Tug/Tow
77.2%

Figure 8.2. New York Harbor distribution of vessel movements for 2019

Tug/Barge units represent the majority of transits in the Port move cargo units perform several vital tasks.
Tug/Barge units carry products into the VRMS system from Sea, North River, and East River from both domestic and foreign ports. Tug/Barge units also perform vital task within the port moving containers, dry bulk, break bulk, and liquid bulk as described in Section 2.5 of this report. Most liquid bulk units originate from Staten Island Sound (AK and KVK) destined for delivery at one of the many small and medium terminals located in the Port, to the North River extending to the Port of Albany, to the East River for Long Island, New England, and Foreign Ports, or to Sea for Ports South and North of New York.
From Table 8.1 we note that the net activity in 2019 is increasing primarily in the tug and tow sector (Figure 8.3). A high of 4337 tows was noted in August. Typically, August is a busy month for the tug and tow sector as marine construction demand (aggregates, asphalt, break-bulk, etc.) stocks up for winter, summer gasoline stock needs replenishment, and terminals begin to stock up with home heating oil. This trend is especially important when additional activity in the harbor is expected. For example, this trend indicates that the tug/tow is growing at an average rate of over 37 tows per month (coefficient of determination of 65.5%).

6000

5701

$y = 54.192x + 4992.7$
$R^2 = 0.595$
5500

5000

4337

4500

4000
$y = 37.241x + 3883.8$
$R^2 = 0.6553$
3500
Net

Tug/Tow

Linear (Net)

Linear (Tug/Tow)

3000

Figure 8.3. Waterborne activity in the New York Harbor (2019)
The vessel operations by vessel type and ownership are highlighted in Figure 8.4 and Table 8.2. Table 8.2
identifies the primary operators in the port and the agency that is responsible for them. The vessel's routs
(Figure 8.4) visualize the location of each facility and its container share in the total. Table 8.2 also identifies
the ship repair locations on the East River, Upper Bay KVK and AK.

Figure 8.4. Port Authority Container Vessel Routes

Table 8.2. Terminal Operators
Cruise
Container
Ships
1. Brooklyn 1. Port
Port
Cruise
Newark
Authority
Terminal 2. Port
2. Bayonne
Elizabeth
Cruise
3. GCT
Terminal
Bayonne
4. GCT SI
NY
5. Red
Hook
NYCEDC Manhattan
Cruise
Terminal
Private

Ro-Ro
Port
Newark

Break
Bulk
Port
Newark

Dry
Bulk
Port
Newark

Liquid
Bulk
Port

Newark

Recycling

Ship
Repair

Port
Newark

SBMT

Over 65 private ship and/or barge cargo
terminals operate throughout the Port of
New York located in both primary and
secondary waterways

East
River-1
Upper
Bay-2
KVK - 1
AK - 2

The vessels operating along the Atlantic Ocean, North River and the East River account for 24,453 (Table 8.3) transits or 38.1% of the total traffic data (Table 8.1). The distribution between the three sites is illustrated in Figure 8.5 which is dominated by the tug and tow industry followed by freighters and tankers.

Table 8.3. 2019 VTS New York Harbor Vessel Traffic Data for Atlantic Ocean, North and East Rivers
2019 In/Out

Net

Pax

January
Feb
March
April
May
June
July
August
September
October
November
December
2019 Total

1933
1875
1851
2085
2081
2063
2124
2272
2139
2106
1955
1969
24453

25
35
42
64
79
99
104
100
160
158
97
42
1005

462

488
458
496
504
508
507
468
445
520
456
268
5580

28
39
33
40
89
107
125
122
124
110
72
62
951

282
253
231
277
284
253
293
331
315
280
275
230
3304

1135
1056

1085
1205
1125
1097
1095
1251
1103
1027
1066
1144
13389

4.1%

22.8%

3.9%

13.5%

54.8%

Distribution

Freighter Mil/other Tanker Tug/Tow

Pax 4.1%

Freighter
22.8%

Tug/Tow
54.8%

Mil/other 3.9%

Tanker
13.5%

Figure 8.5. In-and-out via Atlantic Ocean, North and East Rivers (2019)

The waterborne activity along the Atlantic Ocean, North and East Rivers in 2019 exhibits a positive slope
picking up in August with a total of 2272 transits (Figure 8.6).
2272

2300

2250
2200
2150
2100
2050
2000
1950
1900
1850
1800

Figure 8.6. Monthly waterborne activity in the Atlantic Ocean, North and East Rivers (2019)

8.2 Atlantic Ocean

The three Traffic Separation Schemes are as follows Nantucket TSS running along the south shore of Long
Island New York, Hudson TSS running straight out and the Barnegat TSS running along the New Jersey
Shore (Figure 8.7).

Figure 8.7. TSS Approaches to the Port of New York

Sandy Hook Channel is primarily utilized by inbound loaded liquid bulkers (Ships and Tug/Barges) heading

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to terminals along Staten Island Sound and outbound lightered deep-draft liquid bulkers too deep to enter
Sandy Hook when loaded.
The two coastal routes run inshore the Nantucket and Barnegat TSS and is primarily utilized by Coastal
cargo vessels. The Coastal cargo trade also operates a route from Atlantic City to Montauk.

The large volume of vessel traffic in the Port of New York seen a development of increase in ships
anchoring off Long Beach Long Island developing.

8.2.1 Ambrose Channel and Sandy Hook Routes and Density
The primary Channel is Ambrose and secondary Sandy Hook entering New York Harbor from the three
Traffic Separation Schemes (TSS) (Figure 8.8) and southern and northern coastal tug and barge routes;
New Jersey Coastal and Long Island Coastal Fairways. Chapel Hill Channel connects Sandy Hook and
Sandy Hook Channels.
Table 8.4. 2019 Ambrose Channel VTS Vessel traffic data
2019 In/Out
Ambrose
January
Feb
March
April
May
June
July
August
September
October
November

804
796
764
876
914
906
928
945
952
924
810

Passenger
(Pax)
16
20

25
41
49
55
58
59
92
90
56

December

817

25

254

41

123

152

Year Total
Distribution

10436

586
5.6%

5412
54.0%

476
4.6%

1876
18.0%

1869
17.8%

Net

Freighter

Mil/other

Tanker

Tug/Tow

450
469
446
483
487
491
481
465
435
507
444

19
19
13
25
51
55
45
54
56
53
45

169
152
126
166
166
142
168
183

190
137
154

149
133
153
161
161
163
176
184
189
126
122

101

Pax
5.6%

Tug/Tow
17.8%

Tanker
18.0%

Freighter
54.0%

Mil/other
4.6%

Figure 8.8. In-and-out via Ambrose (2019)

VTS data reflects that the Freighters are the primary user of Ambrose Channels representing 54 percent of transits and Tankers and Tug/Tow (conventional and articulated tug/tow) closely tied as a distant second with approximately 18 percent transits each. Passenger ships represent approximately 5.6 percent of vessel

transits and Mil/Other at 4.6 percent of vessel transits (Table 8.4 and Figure 8.8). Figure 8.9 illustrate (from
Table 8.4) the 2019 monthly activities via Ambrose with 870 average monthly movements and a positive
trend.

1000
950
900
850
800
750
700

Net

Linear (Net)

Figure 8.9. In-and-out via Ambrose monthly activity (2019)

VTS data reflects Sandy Hook transits are relatively small, the tankers are the primary user of Sandy Hook
Channels representing 61.3 percent of transits. Tug and Barges are a distant second with approximately 30
percent. The other 9 percent account for passenger, freighters and Mil/Other vessel transits (Table 8.5 and
Figure 8.10). Figure 8.11 illustrate (from Table 8.5) the 2019 monthly activities via Sandy Hook with 82
average monthly movements and a positive trend.

Table 8.5. 2019 Sandy Hook Channel VTS Vessel traffic data

2019 In/Out
Sandy
January
Feb
March
April
May
June
July
August

September
October
November
December
Year Total
Distribution

Net
67
76
84
73
98
84
85
105
82
87
68
76
985

Pax

Freighter Mil/other Tanker Tug/Tow
1

1

2
2
1

1

1
0.1%

1
8
0.8%

Pax 0.1%

Freighter 0.8%

2
7
8
2
6
11
5
3
3
11
9
13
80
8.1%

42
55
52
48
60
46
54
65
53
54
39
36
604
61.3%

23
13
24
23
31
24
25
37
25
21

20
26
292
29.6%

Mil/other 8.1%

Tug/Tow
29.6%

Tanker
61.3%

Figure 8.10. In-and-out via Sandy Hook (2019)

110
105
100
95
90
85
80
75
70
65
60

105

Figure 8.11. In-and-out monthly activity via Sandy Hook (2019)

8.3 North (Hudson) River
The North (Hudson) River begins at the lower tip of Manhattan at the Battery extending north to the Port
of Albany and continues through the New York State Canals to Lake Champlain and Great Lakes through
Lake Erie. The North River along the Manhattan shoreline was once replete with cruise ship and cargo piers
and is now reduced to the Manhattan Cruise Terminal along with several dinner boat and

commuter ferry
terminal. Vessels navigating up the North River are required to check out of the New York Harbor VTS at
the Holland Tunnel Ventilator. Vessels that operate north of the Holland Tunnel to Albany and further into
the Canals to the Lakes including the Great Lakes are not reflected in VTS data.
Terminals are primarily sited on the main river except those in Rondout Creek and Athens NY. Primary
liquid bulk products included home heating oil, gasoline, and asphalt are transported north to several
terminals along the River and the Port of Albany where it is either trucked within New York State or loaded
on rail cars to be transported to New England, Primary dry and liquid bulk units originate from Staten Island
Sound (AK and KVK) destined for delivery at one of the many small and medium terminals located in the
Port, to the North River.

8.3.1 North (Hudson) River Route and Density
VTS Holland Tunnel Ventilator VTS Checkout data reflects a robust marine highway system that primarily
is utilized by the Tug/Barge segment. Both ships and tug/barge units navigate in the federal channel utilizing
wider segments of the river for overtaking and meeting other vessels. Custom and practice anchorages off
Kingston and Federal Designated Anchorage off Hyde Park are utilized by ships and tug/barges during
restricted visibility prior to continuing the last stretch of the river to the Port of Albany. Other custom and
practice anchorages are utilized during restricted visibility and for waiting for bridge air draft windows or
berthing.
VTS data reflects that the Tug/Tow is the primary user of the North River gateway to Albany and Erie
Canal with an overwhelming 78.3 percent of vessel transiting cargo. Tankers represent 11.5 percent,
Passenger vessels at 5.4 percent, Military/Other at 3 percent and Freighters at 2 percent (Table 8.6 and
Figure 8.12).

Table 8.6. Holland Tunnel Ventilator VTS Checkout data
2019 In/Out Holland
January
Feb
March
April
May

Net
484
508
451
616
559

Pax
8
14
16
21
26

June
July
August
September
October
November
December
Year Total
Distribution

584
613
727
643
658
582
568
6993

37

34
38
61
65
39
17
376
5.4%

Freighter Mil/other Tanker Tug/Tow
8
6
71
391
17
12
45
419
9
8
48
369
11
8
63
514
15
20
57
440
14
21
2
7
9
10
10
133
1.9%

19
29
28

28
27
15
6
206
2.9%

Pax
5.4%

Freighter
1.9%

64
70
79
72
85
80
67
801
11.5%

451
459
580
474
472
438
467
5474
78.3%

Mil/other
2.9%
Tanker
11.5%

Tug/Tow
78.3%

Figure 8.12. In-and-out via Holland (2019)

105

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750

727

700
650
600
550
500

450

Net

Linear (Net)

400

Figure 8.13. In-and-out via Holland monthly activity (2019)
Figure 8.13 indicates the monthly activities in Holland in 2019 showing a positive trend with a maximum
of 727 activities and a monthly average of 583 (standard deviation of 74 or 12.7%).

8.4 East River
Long Island Sound provides access to Long Island/Connecticut Ports and sheltered navigation routes to
Block Island Sound where vessel can navigate to points east or to sea.
Vessels navigating up the East River are required to check out of the New York Harbor VTS at Throggs
Neck. Vessels that operate within the Throggs Neck are not reflected in VTS Throggs Neck data and include
significant liquid and dry bulk terminals on the East River as well as secondary channels in Newtown Creek,
Flushing Creek, Bronx River, and Westchester Creek.

8.4.1 East River Route and Density
The East River has significant currents that effect vessel routing factoring variables such as current speed,
tidal stage, vessels draft, vessels tonnage, vessels horsepower and method of tow. Deep-draft

units plan to
arrive at Hell Gate approximately 1-hour either side of slack water and transit in the deep water. Shallow
draft units navigate outside the main channel when able to avoid deep drafts vessels and to mitigate currents.
Vessels navigating against strong currents tend to navigate from point to point to reduce current impacts
while vessels navigating with currents stay in the center of the channel.
When past Hell Gate vessels continue to terminals within the harbor or continue to Long Island Sound.
When entering Long Island Sound at Execution Rocks vessel routing is determined by Port Location, Under
Keel Clearance requirements, or weather events. During strong northerly winds units tend to navigate in
the lee of Connecticut and southerly winds in the lee of Long Island. Vessels departing or entering the Race
factor strong currents when selecting routes with deep draft vessels taking extra precautions.

Primary dry and liquid bulk units originate from Staten Island Sound (AK and KVK) destined for delivery
at one of the many small and medium terminals located in East River connecting waterways or points east
of the Throggs Neck Bridge for Long Island, New England, and Foreign Ports.
VTS data reflects that the Tug/Tow is the primary user of the East River gateway to Long Island Sound as
recorded at the Throggs Neck Bridge station with an overwhelming 95.3 percent of vessel transiting cargo
with passenger, freighter, military/other and tanker making up the remaining 4.7 percent (Table 8.7 and
Figure 8.14).
Table 8.7. Throggs Neck VTS Checkout data
2019 In/Out Throggs Net
January
578
Feb
495
March
552
April

520
May
510
June
489
July
498
August
495
September
462
October
437
November
495
December
508
Year Total
6039
Distribution

Pax Freighter Mil/other
1
4
1
1
1
1
1
3
4
2
2
5
4
0
12
6
1
22
12
4
46

3
1
37
7
3
37
3
3
19
2
2
3
0
3
2
42
27
189
0.7%
0.4%
3.1%

Tanker Tug/Tow
0
572
1
491
5
539
0
507
1
493
1
459
1
435
4
450
0
415
4
408

2
486
4
499
23
5754
0.4%
95.3%

Figure 8.14. In-and-out via Throggs Neck (2019)

Figure 8.15 indicates the monthly activities in Throggs Neck in 2019 showing a negative trend with a
maximum of 578 activities and a monthly average of 503 (standard deviation of 35 or 7%).
600

578

580
560
540
520

500
480
460
440
Net

420

Linear (Net)

400

Figure 8.15. In-and-out via Throggs Neck monthly activity (2019)

8.5 Trend Analysis
A trend analysis was conducted on the VTS data. The data used is monthly from the years 2017

to 2021.
However, the trend analysis for projecting into the future is based on 2017 to 2019. This is the pre-pandemic period. Figure 8.16 illustrates the VTS in-and-out activity for the last five years. The data illustrates that the 2017 to 2019 regional annual figures were very similar with a high of 66,194 activities in 2018. The figures declined due to the pandemic in 2020 and 2021.
A monthly detailed analysis for the same period illustrates seasonal activities (Table 8.8 and Figure 8.17).
The analysis distinguishes between activities before and after the pandemic. For the years before the pandemic the figures illustrate an annual positive trend. The analysis indicates that in all the three years, the number of activities as calculated by the intercepts were 4,964.9 for 2017, 5,224.2 for 2018 and 4,992.7 for the year 2019. The intercept average for the same three years was 5060.6, with a slope of 48.783 with a low coefficient of determination (R2). The year 2020 was erratic except for the first two months. Likewise, 2021 was erratic as well. We also note that the end-year trend amount was not the beginning of the next year intercept amount. Thus, the project per year starts with the year's intercept and builds on it. Therefore, the projected figures use the average of 2017 to 2019 for projection. A different approach is a monthly analysis.

70000

79.50%
79.12%
79.00%

43764

55313

49511

64139

51462

66194

49113

50000

63263

60000

78.50%

77.74%

77.63%

20000

78.00%

77.26%

77.00%

37491

30000

28967

40000

77.19%

10000

77.50%

76.50%

0

76.00%
2017

2018

2019

NET

Tug/Tow

2020

2021

Tug/Tow ratio

Figure 8.16. VTS in-and-out New York region

Table 8.8. Monthly VTS net activity

January
February
March
April
May
June
July
August
September
October
November
December
Avg.
STDV
STDV/Avg.
% Change

2017

2018

2019

2020

5218
4775
5011
5215
5306
5218
5314
5338
5374
5464
5803
5227
5,271.9
235
4.5%

5533
5249
4945
5210
5642
5311
5617
5911
5824
6085
5374
5493
5,516.2
310
5.6%
4.6%

5138
4970
4896

5282
5310
5243
5528
5701
5599
5594
5420
5458
5,344.9
243
4.5%
-3.1%

5166
4762
4975
3857
4088
4401
4508
4902
4465
4874
4596
4719
4,609.4
359
7.8%

2021
4488
3802
5030
4620
4720
4619
4830
5382

4,686
426
9.1%

Avg.
(2017 to 2019)
5,296
4,998
4,951
5,236
5,419
5,257
5,486
5,650
5,599
5,714
5,532
5,393
5,377.7
231
4.3%
0.80%

109

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6500

2017 $y = 47.234x + 4964.9$
$R^2 = 0.4814$
6000

2018 $y = 44.923x + 5224.2$ 2019 $y = 54.192x + 4992.7$
$R^2 = 0.2499$
$R^2 = 0.595$

Avg. $y = 48.783x + 5060.6$
$R^2 = 0.5301$

5500

5000

4500

4000

2017
2019
2021
Linear (2017)
Linear (2019)
Linear (2021)

2018
2020
Avg
Linear (2018)
Linear (2020)
Linear (Avg)

3500

Figure 8.17. Monthly analysis of VTS in-and-out New York region

Projection determination is challenging, especially due to the pandemic, which has been ravaging economic activities, nationally and regionally, since February 2020. The future economic impact is still not clear because the pandemic's impact is still not settled; it might take some time before it is. The pandemic has been causing irregularities in the activities of the Port of New York, as recorded by VTS, illustrated in Figure 8.17 and noted in the national supply chain. The disruptions spilled over to other jurisdictions nationwide, with a potential extended impact of changing the entire operating model of the past. Therefore, the projections provided below are limited.

The projections are based strictly and only on the past three years (2017 to 2019), ignoring any other factors, including socioeconomic and demographic. Furthermore, the projections are based on annual data for the next five years.

Table 8.9 summarizes data that is used for the projections in Figure 8.18.

There was no attempt for month-to-month with respect to 2020 or beyond. The monthly information is available in Table 8.8 and Figure 8.15. The only two months that follow the prior three years pattern are January and February of 2020. These two months of 2020 and 2017 are practically the same (see Figure 8.15).

Table 8.9. Summary of VTS net average monthly activities for the years 2017 to 2019

2017
2018
2019
Averages
1. Intercept (from regression estimates)
4,964.9 5,224.2 4,992.7 5,060.6
2. Annual monthly average (from data)
5,271.9 5,516.2 4,609.4 5,377.7**
3. Average monthly percentage changes from (2)
4.6%
-3.1%
0.8%*
4. Standard deviation (from annual data)
235
310
243
231**

*The average of 2018 and 2019 is an of the average monthly percentage change.

** The average across the row.

The average monthly VTS activities with an average growth rate of 0.8% (Table 8.9) are used to obtain the projections illustrated in Figure 8.18. The projections start from the base average annual monthly figures of 5,378 (Table 8.9). This projection indicates that the VTS should record an estimated 5,596 activities in the year 2024 and 5,732 activities in the year 2027. Since the standard deviation (SD) was ± 231 activities (Table 8), applying this SD to the trend indicates that in 2027 the VTS estimated activities should be 5,978 for the upper figure and 5,485 for the lower.

6,100
6,000

5,978

5,837

5,900
5,800

5,732

5,700

5,600
5,500
5,400

5,596

5,485

5,378

5,300

5,356

5,200
5,100
5,000
Avg. 2017 to 2019

Plus one SD

Projected in 2024

Straight

Projected in 2027

Minus one SD

Figure 8.18. Projection of VTS average monthly activities for 2024 and 2027

The overall activities in the Port of New York could be further analyzed for the relative shares of each
category. For example, the tug/tow sector averaged 77.5% of the total number of activities in the years 2017
to 2019. Applying the same percent in the year 2027, the estimate is an average of 4,442 activities, with a
SD upper figure of 6,633 and a lower figure of 4,251. Similarly, other estimates can be determined.

In conclusion of this work order, we note that the New York Harbor is busy. Vessel operations are recorded
24/7 all year round. However, the VTS records omit activities of ferry traffic and other unreported tugs and
recreational boats in the port. The records omitted are for tug assists, other local activities that need tugs
and recreational activities. The data provided by VTS does not include vessel size. In summary, the VTS
records understate the port activities.

More activities in the Port lead to more competition in operating space and greater risks for accidents,
delays, increase in costs, etc. These results are worse when considering current, tides, air draft, and wind
factors as a part of the activities that narrow operations windows.

In light of the above, especially when attempting to take advantage of the current schedule, trends and
density of operations are required to develop an assessment of operating protocol for providing safe harbor
operations. The additional activities from staging ports (sites) along the waterways of oversized equipment
and non-standardized sizes need special attention.

It should be noted that three months of three consecutive years are not sufficient data to determine trends
and an analysis of the rate of growth by vessel type and by location is therefore beyond the scope of work.

Appendix A: Acronyms and Abbreviations

Acronyms and Abbreviations

APDC

BFE

BPU
CAM
CCTV
CES
COD
COWI
CTV
CZMA
EPA
FEMA
ft
GBF
GE
HAWT
HVAC
HVDC
LIMWA
MARSEC
MHW
MLW
MLLW
MP
MW
NM
NAVD88
NGVD29
NOAA
NREL
NWP
NYC DEC
NYC DEP
NYCEDC
NYS
NYSERDA
OCS
OEM
OESP
O&M
OPC
OSW
OSS
OTM
OWF

PANYNJ
PDE
SOV
SPMT
SSP
SM
SWATH
TP
USACE
WEA
WTG
WTIV

Albany Port District Commissioners
Base Flood Elevation (FEMA)
Board of Public Utilities
Coastal Area Management
Closed-Circuit Television
Clean Energy Standard (New York State)
Commercial Operation Date
COWI North America, Inc.
Crew Transfer Vessel
Coastal Zone Management Act
United States Environmental Protection Agency
Federal Emergency Management Agency
feet
Gravity Based Foundation
General Electric
Horizontal Axis Wind Turbine
High Voltage Alternating Current
High Voltage Direct Current
Limit of Moderate Wave Action (FEMA)
Maritime Security (U.S. Coast Guard)
Mean High Water
Mean Low Water
Mean Lower Low Water
Monopile (foundation type)
Megawatt
Nautical Mile
North American Vertical Datum of 1988
National Geodetic Vertical Datum of 1929
National Oceanic and Atmospheric Administration
National Renewable Energy Lab

Nationwide Permit (USACE)
New York City Department of Environmental Conservation
New York City Department of Environmental Protection
New York City Economic Development Corporation
New York State
New York State Energy Research and Development Authority
Outer Continental Shelf
Original Equipment Manager
Offshore Electrical Service Platform
Operations and Maintenance
Opinion of Probable Cost
Offshore Wind
Offshore Substation
Offshore Transformer Module
Offshore Wind Farm
Port Authority of New York and New Jersey
Project Design Envelope
Service Offshore Vessel
Self-Propelled Modular Trailer
Steel Sheet Pile
Statue Mile
Small Waterplane Area Twin Hull (vessel)
Transition Piece (upper component of MP foundation type)
United States Army Corps of Engineers
Wind Energy Area
Wind Turbine Generator
Wind Turbine Installation Vessel

Appendix G. Economic Impact Study of Offshore Wind Program in New York State

Economic Impact Study of Offshore Wind Program in New York State

Prepared for:
New York State Energy Research and Development Authority
Albany, NY

Prepared by:

HDR Inc.
New York, New York

Contract Agreement No. 155561

February 2022

Notice

or has
used it without permission, please email print@nyserda.ny.gov. Information contained in this Study, such
as web page addresses, are current at the time of publication.

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List of Tables

Acronyms and Abbreviations

CLCPA

Climate Leadership and Community Protection Act

ESD

Empire State Development

MW

NYSERDA

megawatts

New York State Energy Research and Development Authority (NYSERDA)

O&M

Operations and maintenance

OPC

Opinions of probable costs

OSW

Offshore wind

WTG

Wind Turbine Generator

Executive Summary

New York's Climate Leadership and Community Protection Act (CLCPA) sets aggressive clean energy and climate targets for New York State (State) with the goal of at least 9,000 MW of offshore wind (OSW) generation capacity by 2035. The New York State Energy Research and Development Authority (NYSERDA) is coordinating the cost-effective development of OSW energy projects and has retained HDR to develop a Ports Cumulative Impact Assessment and Alternatives Analysis Study in support of the State's current and future OSW project portfolio.

As OSW energy projects are developed to achieve the State's goals, there is a growing need and interest in identifying and assessing the environmental and socioeconomic benefits and impacts of these projects.

The economic impacts of OSW energy projects would be generated by their construction, subsequent operations and maintenance of these projects, and other related program expenditures. The impacts would extend to onshore facilities and infrastructure in ports along the State coast that would support the construction of the target generation capacity and then operations and maintenance activities.

The purpose of this study is to outline the economic impacts of the NYSERDA OSW energy program of at least 9,000 megawatt (MW) capacity by 2035, provide their quantification, and highlight the differences in impacts between the OSW support ports alternatives referred to as the Planned Alternative and the Full Build Alternative. The following describes these alternatives:

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Planned Alternative: This alternative includes five ports initially assumed for the State OSW energy program. It is noted that existing modeling suggests that this may be insufficient to fully support the State OSW energy goal.
Full Build Alternative: This alternative is the Planned Alternative and seven additional ports to support the OSW energy program.

ES.1 Study Scope and Methodology
This study focused on the economic impacts—measured in terms of jobs and income— related directly to
the OSW energy program, which can be tracked and quantified through expenditures related to its
implementation. The impacts were assessed under the following four groups of activities and processes:
1. Offshore wind farm construction;
2. Operations and maintenance (O&M) of offshore wind farms;
3. Renovations and upgrades of ports along State coastline needed as a base for both construction
and O&M activities; and
4. Social and community investments for long-run business sustainability, such as wildlife monitoring, or funding for community training and skills upgrades.

The study relied on publicly available data and information from published reports and a range of news
releases from government agencies and project developers, applied input-output modeling techniques to
available data, and extrapolated partial results to the entire OSW energy goal of at least 9,000 MW and
the Full Build Alternative of OSW support ports.

ES.2 Results
In terms of job impacts in the State, the analysis shows that the entire OSW energy program of at least
9,000 MW of installed capacity is expected to support a total of 34,288 job-years during construction and
then 1,309 jobs each year to operate and maintain the OSW energy projects. The Planned Alternative of
OSW ports is expected to support a total of 13,510 job-years during ports renovations while the Full
Build Alternative is expected to support 32,403 job-years. Once upgrades are completed, ports would be
used for various activities related to project construction and then operations. These activities

can be
expected to create high-quality job opportunities, many of them related to technologically advanced
products and processes. Social and community investment expenditures are expected to support another
1,080 job-years over the life of the projects.

It is important to note that if the Full Build Alternative, as defined previously, is implemented, it would
provide additional and upgraded port capacity. This would, in turn, make it more likely that the economic
impacts of construction and O&M of the entire OSW energy program could actually be realized in the
State. Under the Planned Alternative, many of these jobs may not actually be realized due to onshore
capacity constraints, either during construction of various OSW energy projects, or at their operational
stage. While there may be options to deal with the constraints, some activities and processes may have to
be outsourced to out-of-state providers causing "leakages" of potential economic impacts in the State.

1 Introduction

New York's Climate Leadership and Community Protection Act (CLCPA) sets aggressive clean energy
and climate targets for New York State (State) of at least 9,000 MW by 2035. The New York State
Energy Research and Development Authority (NYSERDA) is coordinating the cost-effective
development of OSW energy projects and has retained HDR to develop a Ports Cumulative Impact
Assessment and Alternatives Analysis Study in support of the State's current and future OSW project
portfolio.

As OSW energy projects are developed to achieve the State's goals, there is a growing need and interest
to identify and assess the environmental and socioeconomic benefits and impacts of these projects. The
economic impacts of OSW energy projects would be generated by their construction, subsequent

operations and maintenance (O&M) of these projects, and other related program expenditures. The impacts would extend to onshore facilities and infrastructure in ports along the State coast that would support the construction of the target generation capacity and then O&M activities.

It is noted that initially an assumed collective of five ports, called the “Planned Alternative” were identified as OSW port facilities to support the State’s goal of at least 9,000 MW of OSW by 2035.

However, based on COWI’s Regional Ports Supply Demand Model, the Planned Alternative may be insufficient to fully support this goal. As a result, an additional seven ports were added to the Planned Alternative and collectively named the Full Build Alternative. Table 1 provides the list of the ports included in the Planned Alternative and the Full Build Alternative.

Table 1. Planned Alternative and Full Build Alternative Port Facilities

Full Build Alternatives	Location	Assumed Port Use
Planned Alternative	Port of Albany	Fabrication (Towers/Foundations Components)
Planned Alternative	Port of Coeymans	Fabrication (Towers/Foundations Components)
Planned Alternative	SBMT	Staging (WTG and Foundation) and O&M
Planned Alternative	Port Jefferson	

O&M (SOVs)

Planned Alternative

Port of Montauk

O&M (CTVs)

Additional Port

Arthur Kill Terminal

Staging (WTG)

Additional Port

Port Ivory

Fabrication (Offshore Substation components)

Additional Port

Homeport Pier

O&M

Additional Port

Brooklyn Navy Yard

O&M

Additional Port

PAMT

O&M

Additional Port

Hempstead Public Works

O&M

Additional Port

NYS Wind Port

Component Manufacturing

3

The purpose of this study is to outline the economic impacts of the NYSERDA OSW energy program of
9,000 MW capacity by 2035, provide quantification of these impacts, and highlight the differences in
impacts between the Planned Alternative and the Full Build Alternative.
The remainder of this report is organized as follows. Section 2 presents the methodology of this study, the
key data, and assumptions used in the analysis. Section 3 presents the results.

4

2

Key Concepts and Study Approach

This section provides an overview of key concepts in economic impact analysis, defines the metrics of
impacts that would be used in this study, and outlines the methodology with key input assumptions used
to estimate the impacts of NYSERDA's OSW energy program in the State.

2.1

Key Concepts in Economic Impact Analysis

Economic impact analysis is a type of conceptual analysis that identifies and quantifies the economic
activity that is generated or can be attributed and linked to the investment project, government policies,
events, etc. being evaluated. These projects, policies, or events have some underlying change in the
stream of expenditures in an economy and lead to a change in the demand for goods and services. This

has implications on the number of jobs and other measures of economic activity in the local, regional, and
national economy.
Traditionally, economic impact analysis involves the estimation of three distinct types of economic
activity, commonly referred to as “direct effects,” “indirect effects,” and “induced effects” that are attributable to an initial stream of incremental capital and operating expenditures. These are defined as
follows:

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Direct effects refer to the initial economic effects occurring as the result of capital or operating expenditures directly related to the evaluated project. Direct spending results in the production of goods or services in the local economy where the project is located, employment of workers, and business output and sales.
Indirect effects refer to the “spin-off” economic activities that result from purchases of production inputs, goods and services, by businesses that are impacted by the initial expenditures. The spending by the supplier firms on their labor, production inputs, goods and services that they require creates outputs of other firms further down the production chain, bringing about additional business output, employment, and earnings. The sum of these effects across the supply chain is the indirect impact.
Induced effects represent the increase in business output, employment, and earnings over and above the direct and indirect impacts, generated by re-spending of employment income derived from direct and indirect employment.. Induced impacts are thus changes in economic activity that are the result of personal (household) spending for goods and services by employees comprising the direct and indirect impacts.
Total economic impact is the sum of the direct, indirect, and induced effects for the project being evaluated.

Indirect and induced impacts are often referred to as “multiplier effects,” since they increase the overall
economic impacts of the original expenditure that initiated the rounds of spending and effects.
Each of the direct, indirect, and induced effects defined is estimated in terms of various measures of
economic activity that include the following:

-
-
-
-

Output, the total gross value of all business revenue. Output represents the total sum of all economic activity that has taken place in connection with the project. This is the broadest measure of economic activity.
Value Added, or Gross Domestic Product, the “value added” to the economy, or value of output minus value of purchased goods and services used in the production process. Value added represents the unduplicated measure of the total value of economic activity.
Employment, the number of incremental jobs created as a result of the capital expenditures and operations of the project. 2
Salaries and Wages, the additional salaries and wages that would result from capital expenditures on the project and its future operations.

In addition, an investment project, event, or government policies may result in various other broader
socioeconomic impacts affecting broader local and regional economies. These may include additional
enabled economic activity, improvements in productivity and competitiveness, improved quality of life,
improved socioeconomic profile of the region, and other effects.
For example, the OSW energy projects may have an impact on electricity pricing and reliability in the
State and improve the competitiveness of some rate payers. Waters in proximity to wind towers may be
suitable for aquaculture. The experience gained through OSW energy projects (e.g., manufacturing of
parts and components) may be used in projects in other states, international projects, or leveraged in other
related engineering and manufacturing pursuits. By increasing the overall level of economic activity, the

2

In economic impact analysis, employment impacts are typically estimated in terms of job-years which expresses the
number of jobs created times the length of time in years that they would last for. For example, 1 job-year is 1 job
created for 1 year. For simplicity, these impacts are often referred to as “jobs” or employment

impacts. Impacts of
construction activities are typically assessed as impacts of total project expenditures and thus represent cumulative
impacts over project construction years. Impacts of project operations are typically assessed as impacts of annual
project operations and maintenance and thus represent average annual impacts expected during project operational
phase.

6

OSW projects may attract other businesses who find it advantageous to cluster around centers of related
activities. The projects may also have a range of social impacts in local communities stemming from
interactions with those communities, impacts on community resources and assets, community structure
and other issues.
Many of these impacts may also be measured in terms of jobs and income; others may be better suited for
qualitative metrics and descriptive evaluations.

2.2

Study Scope

This study focused on the economic impacts related more directly to the OSW energy program, which can
be tracked and quantified through expenditures related to its implementation. These impacts were
classified under the following four groups of activities and processes:
1. Offshore wind farm construction, including:
a. Manufacturing and fabrication of parts, components, and foundations
b. Assembly and fabrication of blades, nacelles, and other major components and equipment
c. Erection of towers, connections to grid, and construction of onshore facilities
2. O&M of offshore wind farms, including:
a. Remote monitoring
b. Dispatch of crews to wind energy areas
c. Inspections, maintenance, and repairs on-site (i.e., at wind energy areas)
3. Renovations and upgrades of ports along State coastline needed as a base for both construction
and O&M activities, including:
a. Fabrication and assembly of components, construction staging

b. Service operations base, crew and equipment staging and dispatch, berthing of O&M vessels
4. Social and community investments for long-run business sustainability, including:
a. Marine wildlife monitoring
b. Community workforce training programs
Broader socioeconomic impacts are more difficult to forecast and quantify as they may depend on the specific site location and existing local socioeconomic and environmental conditions. These are left as a topic for further studies.

2.3 Overview of Approach

The direct, indirect, and induced impacts discussed above are typically estimated based on project financial and engineering information, its capital and operating expenditures using input-output modeling approaches.[7]

An input-output model captures and quantifies the flows of goods and services between various industries in an economy. The indirect multipliers from such models provide an aggregate measure of the effect that each $1 (one dollar) of revenue of an industry has on all other industries in the economy that arise through supply-purchase relationships, or input demand of this industry to produce its own outputs. Indirect multipliers can be expressed in terms of employment (indirect jobs per $1 of incremental direct revenue in an industry), indirect output (indirect output per $1 of incremental direct industry revenue), indirect employment income (indirect wages and salaries per $1 of incremental direct industry revenues), and Gross Domestic Product (indirect value added per $1 of incremental direct industry revenue). Direct multipliers provide measures of average employment requirements, employment income, and value added in an industry for each dollar of its own revenues. Similarly, induced multipliers provide measures of induced employment, employment income, value added, and output in an economy for each

dollar of
revenue in the directly affected industry.
Input-output models and multipliers from such models can thus be used to forecast the economic impacts
of investment projects or policy initiatives with defined scope and cost of implementation. This is frequently done using commercial modeling platforms such as IMPLAN.
IMPLAN is an economic impact modeling tool used for forecasting the effect of investment projects,
programs, or policies on the local, regional, and national economy. The impacts stem from new expenditures such as expenditures on construction, purchase of equipment and materials, or project
operations. The model is based on classic input-output modeling approaches combined with social
accounting matrices and multipliers. It consists of a software package with data sets at various levels of
geography (all of US/ national average, state, county, zip code) which are loaded into the software
depending on the specific project and desired geographic area of impact assessment. 1
The methodology of the estimation of economic impacts with IMPLAN requires identification of the
streams of expenditures directly resulting from the proposed project-related activities (or the number of
jobs that would be involved in various activities) which are then classified into industrial sectors.

1

IMPLAN was originally developed in the 1970s for the United States Forest Service for economic impact projections
of alternative uses of United States public forest resources. In later years, IMPLAN was improved and updated to
make it more functional and relevant for a wider range of projects and users. IMPLAN is now widely used and
recognized by government organizations, academia, advisory services, and business organizations. Currently,
IMPLAN is operated by the Minnesota IMPLAN Group (MIG). More information about the company, software,
help, and support can be found at https://implan.com/.

Because the full cost of the OSW energy program’s construction and operations are not known at this
time, or not released to the general public, we were unable to conduct a customized IMPLAN

analysis for
the entire scope of economic impacts listed in Section 2.2. Instead, this study relied on published reports
and information which was compiled, analyzed and processed to produce a range of partial results (some
of them based on analysis with IMPLAN) and extrapolated to the entire NYSERDA OSW energy goal of
at least 9,000 MW. This was accomplished as described below.

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ICF recently completed an economic impact study of Empire Wind 1 and Empire Wind 2 projects (ICF Study) and provided economic impact estimates of construction and operations of these facilities. 2 The ICF Study adopted an input-output methodology similar to that outlined above with the use of IMPLAN, and provided estimates of jobs, income and value added impacts from project construction and operations. Assuming that other OSW projects would have similar costs and operating parameters, the results from the ICF Study were extrapolated to
the construction and operational impacts for the entire portfolio of 9,000 MW of capacity. The planned capacity of Empire Wind 1 is 816 MW and the planned capacity of Empire Wind 2 is 1,260 MW. Therefore, the extrapolation entailed multiplying the results for Empire Wind 1 and 2 by a factor of 4.3. 3 This resulted in estimates of the impacts of OSW program construction and operations.

NYSERDA completed a number of ports assessment studies, pre-front engineering (pre-FEED) design reports, which provided opinions of probable costs (OPC) to renovate, reconstruct, or upgrade each port so as they would be able to serve their intended use in the State OSW program (such as an O&M base, construction staging area, or hub for fabrication and manufacturing of components). Four published studies were reviewed to source the OPC estimates: Port of Albany, Port of Coeymans, Port of Ivory, and South Brooklyn Marine Terminal. Based on those studies, the costs of upgrades range from $149 million for the Port of Coeymans to $340 million for the Port of Ivory, for a total cost of about $1.1 billion (in 2018 dollars). The OPC estimates were classified as construction expenditures and used with IMPLAN 2019 multipliers for the State following the methodology outlined in the previous subsection to estimate their economic impacts in the State.4 Assuming that other OSW ports from the Planned Alternative and the Full Build Alternative would require similar extent and type of upgrades (on average), the impacts were extrapolated to the entire Planned Alternative and the entire Full Build Alternative. This resulted in estimates of port upgrades for the Planned Alternative and Full Build Alternative of OSW ports. impacts.

2

ICF Resources, "Economic Impacts of the Empire Wind Project 9EW 1 and EW 2)", March 5,

2021, Appendix O
Economic Impacts of the Empire Wind Project (EW 1 and EW 2) (boem.gov) (accessed December 2021).

3

The extrapolation factor was calculated based on the ratio of MW of installed capacity of the entire OSW energy program and Empire 1 and 2 projects as: 9,000 MW/(816 MW+1,260 MW)=4.3.

4

In the impact simulations, IMPLAN industry 56, construction of other new non-residential structures was used. All cost estimates were inflated to 2020 dollars using Gross Domestic Product deflators from the White House Office of Management and Budget.

9

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A range of news releases from regulatory agencies, state government, and developers provided information on additional expenditures made by OSW project proponents; for example, expenditures on wildlife monitoring and community development and workforce training programs. For example, developers of Empire Wind 1 and 2, Sunrise Wind, and Beacon Hill committed about $25 million for wildlife and fisheries monitoring and a total of about $67 million for community skills upgrade and training programs. 5 These expenditures can be expected to generate further economic impacts in the local communities. They were classified as expenditures on scientific research and development services and on colleges and professional schools. These estimates were combined with IMPLAN 2019 multipliers for the State following the methodology outlined in the previous subsection, to estimate their economic impacts in the State. This resulted in economic impact estimates related to social and community investments. In addition, the various news releases were reviewed and compiled for each port, to provide a qualitative description of the type of impacts or economic opportunities that local port communities may expect from the OSW energy program.

All economic impacts were estimated at the state level (i.e., impacts materializing in the State), as cumulative impacts over the OSW life cycle, and as average annual impacts over project duration where possible.

5

Based on a range of news releases, e.g., see New York's Offshore Wind Projects - NYSERDA and
sunrisewindfactsheet.ashx (azureedge.net),(accessed December 2021).

10

3

Results of the Analysis

This section presents the results of the analysis. The section concludes with a commentary on the
differences in impacts between the Planned Alternative and the Full Build Alternative.

3.1

Offshore Wind Farms Construction

Tables 2, 3, and 4 present the impact estimates for construction of OSW projects. Based on the ICF
Study, construction of Empire Wind 1 and 2 is expected to generate 7,909 job-years (One job for one year
is one job-year, i.e. 100 jobs for 10 years equals 1000 job-years) in the State (including 3,762
direct jobyears, 1,935 indirect job-years, and 2,212 induced job-years), $665.9 million of employment income, and
over $1 billion of value added. This is equivalent to an average annual estimate of 1,048 jobs (including
497 direct jobs, 258 indirect jobs and 293 induced jobs), $88.3 million of income, and $134.3 million
value added.
Table 4 also shows that extrapolating these results to the total OSW energy goal of at least 9,000 MW, we
can expect a total of 34,288 job-years, nearly $2.9 billion in employment income, and $4.4 billion of
value added from construction of OSW projects.
Table 2. Economic Impacts of OSW Energy Project Construction in New York State, Empire Wind 1
& 2 – Cumulative
Source: Results for Empire Wind 1 and 2 were compiled from ICF Study.

Type of Impact

	Employment (JobYears)	Employment Income ($M)	Value Added ($M)
Direct	3,762	$341.2	$501.1
Indirect	1,935	$178.3	$254.6
Induced	2,212	$146.4	$257.3
Total	7,909	$665.9	$1,013.0

Table 3: Economic Impacts of OSW Energy Project Construction in New York State, Empire

Wind
1 & 2 – Average Annual (During Construction)
Source: Results for Empire Wind 1 and 2 were compiled from ICF Study.

Type of Impact	Employment (JobYears)	Employment Income ($M)	Value Added ($M)
Direct	497	$45.1	$66.2
Indirect	258	$23.8	$34.0
Induced	293	$19.4	$34.1
Total	1,048	$88.3	

$134.3

Table 4: Economic Impacts of OSW Energy Project Construction in New York State, Total 9,000 MW Portfolio – Cumulative (Extrapolated)
Source: Results for Total Portfolio were estimated (by extrapolation) by HDR.

3.2

Type of Impact

Employment (JobYears)

Employment Income
($M)

Value Added ($M)

Direct

16,309

$1,479.2

$2,172.4

Indirect

8,389

$773.0

$1,103.8

Induced

9,590

$634.7

$1,115.5

Total

34,288

$2,886.8

$4,391.6

Offshore Wind Farms Operations and Maintenance

Tables 5 and 6 present the impact estimates for operations of OSW projects. Based on the ICF Study,
O&M of Empire Wind 1 and 2 is expected to generate about 302 jobs annually, including 133 direct jobs,
93 indirect jobs and 76 induced jobs. These jobs are estimated to have a total income of $23 million,
including $10.3 million of direct income. Total value added generated by the two projects is estimated at
$36.7 million annually.
Table 6 also shows that by extrapolating these results to the total OSW portfolio of at least 9,000 MW, we
can expect a total of 1,309 jobs each year in the State related to the operations of OSW energy projects.
This includes 577 direct jobs, 403 indirect, and 329 induced jobs. Total value added generated by the
entire portfolio is estimated at $159.2 million annually.

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Table 5: Economic Impacts of OSW Operations and Maintenance in New York State, Empire Wind
1 & 2 – Combined
Source: Results for Empire Wind 1 and 2 were compiled from ICF Study.

Type of Impact

Employment (Jobs)

Employment Income
($M)

Value Added ($M)

Direct

133

$10.3

$16.1

Indirect

93

$7.6

$11.7

Induced

76

$5.1

$8.9

Total

302

$23.0

$36.7

Table 6: Economic Impacts of OSW Operations and Maintenance in New York State, Total 9,000 MW Portfolio (Extrapolated)
Source: Results for Total Portfolio were estimated (by extrapolation) by HDR.

3.3

Type of Impact

Employment (Jobs)

Employment Income
($M)

Value Added ($M)

Direct

577

$44.7

$69.9

Indirect

403

$33.1

$50.7

Induced

329

$21.9

$38.5

Total

1,309

$99.7

$159.2

OSW Port Facilities Upgrades

Tables 7, 8, 9, and 10 present the impact of OSW ports upgrades. For the four ports for which OPC estimates were available, total impacts were estimated at a total of 10,801 job-years (including 6,456 direct job-years, 1,673 indirect job-years, and 2,672 induced job-years), $828.9 million of employment income, $1.1 billion value added, and $2 billion in business output.

The average per-port impact amounts to a total of 2,700 job-years (including 1,614 direct job-years,
418 indirect job-years, and 668 induced job-years), $207.2 million of employment income, $286.5 million
value added, and $504.7 million in business output.
The Planned Alternative of OSW Ports amounts to a multiple of five of the per-port impact, while the Full
Build Alternative to a multiple of 12. In terms of jobs, the impact is equivalent to a total of 13,501 job-years for the Planned Alternative and 32,403 job-years for the Full Build Alternative.

13

Table 7: Economic Impacts of OSW Port Upgrades in New York State, Four Port Facilities with OPC Estimates
Source: Estimated by HDR.

Type of Impact	Employment (Job-Years)	Employment Income ($M)	Value Added ($M)	Output ($M)
Direct	6,456	$506.1	$588.9	$1,136.8
Indirect	1,673			

$142.7

$234.8

$391.5

Induced

2,672

$180.1

$322.4

$490.4

Total

10,801

$828.9

$1,146.1

$2,018.7

Table 8: Economic Impacts of OSW Port Upgrades in New York State, Average Impacts per Port
Source: Estimated by HDR.

Type of Impact

Employment
(Job-Years)

Employment
Income ($M)

Value
Added ($M)

Output ($M)

Direct

1,614

$126.5

$147.2

$284.2

Indirect

418

$35.7

$58.7

$97.9

Induced

668

$45.0

$80.6

$122.6

Total

2,700

$207.2

$286.5

$504.7

Table 9: Economic Impacts of OSW Port Upgrades in New York State, Planned Alternative Total (Five Ports, Extrapolated)
Source: Estimated by HDR.

Direct

Employment
(Job-Years)
8,070

Employment
Income ($M)
$632.6

Value
Added ($M)
$736.1

Indirect

2,091

$178.4

$293.5

Type of Impact

Output ($M)
$1,421.1
$489.4

Induced

3,340

$225.1

$403.0

$613.0

Total

13,501

$1,036.1

$1,432.6

$2,523.4

14

Table 10: Economic Impacts of OSW Port Upgrades in New York State, Full Build Alternative with
Additional Ports (12 Ports, Extrapolated)
Source: Estimated by HDR.

Type of Impact	Employment (Job-Years)	Employment Income ($M)	Value Added ($M)	Output ($M)
Direct	19,368	$1,518.2	$1,766.8	$3,410.5
Indirect	5,019	$428.1	$704.3	

$1,174.4

Induced

8,017

$540.3

$967.1

$1,471.2

Total

32,403

$2,486.6

$3,438.2

$6,056.2

3.4

Social and Community Investments Expenditures

Tables 11 and 12 show the impact of the additional expenditures on community skills workforce and
wildlife monitoring programs committed by OSW project developers. The table shows that over the life
of the projects, these expenditures are estimated to support a total of 1,080 job-years (including 709 direct
job-years, 127 indirect job-years, and 244 induced job-years). Assuming project life of about 30 years,
this implies an additional 36 jobs every year (including 24 direct jobs, 4 indirect, and 8 induced).
Table 11: Economic Impacts of Additional OSW Related Expenditures in New York State,
Cumulative Over OSW Project Life
Source: Estimated by HDR.

Type of Impact

Employment
(Job-Years)

Employment
Income ($M)

Value
Added ($M)

Output ($M)

Direct

709

$50.2

$68.3

$92.0

Indirect

127

$9.9

$16.7

$28.7

Induced

244

$16.4

$29.3

$44.6

Total

1,080

$76.5

$114.3

$165.3

15

Table 12: Economic Impacts of Additional OSW Related Expenditures in New York State, Average
Annual (Over 30 Years)
Source: Estimated by HDR.

Type of Impact	Employment (Job-Years)	Employment Income ($M)	Value Added ($M)	Output ($M)
Direct	24	$1.7	$2.3	$3.1
Indirect	4	$0.3	$0.6	

$1.0

Induced

8

$0.5

$1.0

$1.5

Total

36

$2.5

$3.8

$5.5

3.5

Port-Level Economic Benefits

Most economic impacts considered in this study could not be estimated by port as the information on
costs and resources needed for the entire OSW energy program is not publicly available at this time.
Individual ports may require many upgrades and renewal of their existing infrastructure. Table 8 shows
that this work can be expected to support, on average, a total of 2,700 job-years (direct, indirect, and
induced) stemming from construction.
Once upgrades are completed, ports would be used for various activities listed in Table 1 that entail
a range of opportunities for local economies. The list below provides a compilation of recent news
releases from government agencies and project proponents that illustrate specific plans and economic
opportunities that various ports are likely to experience. They demonstrate creation of

high-quality
job opportunities, many of them related to technologically advanced products and processes.

16

3.5.1 Port-Level Economic Benefits from OSW Energy Program

3.5.1.1 Port of Albany

•

Empire Wind 2 and Beacon Wind OSW projects would invest approximately $730 million in combined private and public funds in long-term port facilities and cutting-edge technologies, including the nation’s first offshore wind tower manufacturing plant 6.

3.5.1.2 Port of Coeymans

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Empire Wind 1 and Beacon Wind OSW projects envision Port of Coeymans as a base to support the fabrication of offshore wind 7 components.
Sunrise Wind's development partners signed a $86 million supply chain contract with Riggs Distler & Company, Inc. to construct advanced foundation components for wind turbines at the Port of Coeymans, bringing about 230 construction and steel manufacturing jobs to the Capital Region and Western New York 8.

3.5.1.3 South Brooklyn Marine Terminal

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Empire Wind 2 and Beacon Wind OSW projects would establish a cutting-edge staging facility and operations and maintenance hub at the South Brooklyn Marine Terminal 9.

3.5.1.4 Port Jefferson

•

Sunrise Wind project would establish a new Operations & Maintenance Hub in Port Jefferson creating about 100 new permanent jobs 10.

6

NYSERDA Offshore Wind Projects
(https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/NYOffshore-Wind-Projects).

7

Empire Wind COP (2021)
(https://www.boem.gov/renewable-energy/state-activities/empire-wind).

8

Governor Hochul Announces Largest Single New York State Offshore Wind Supply Chain
Award of $86 Million to
Support Sunrise Wind Project (10.08.2021)
https://sunrisewindny.com/news/2021/10/governor-hochul-announceslargest-single-new-york-state-offshore-wind-supply-chain-award.

9

NYSERDA Offshore Wind Projects
(https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/NYOffshore-Wind-Projects).

10

Fact Sheet: Sunrise Wind (https://orstedcdn.azureedge.net).

17

3.5.1.5 Arthur Kill Terminal
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3.6

Empire State Development (ESD) and Arthur Kill Terminal, LLC signed an agreement to develop Arthur Kill terminal as a staging and assembly port with potential service area covering locations off New York State and other East Coast states 11.

Planned Alternative versus Full Build Alternative

The difference between the Planned Alternative and the Full Build Alternative stems from the inclusion
of additional seven ports to the portfolio of OSW ports facilities to support the OSW energy program, and
greater certainty that the economic impacts of construction and O&M of the OSW energy projects could
actually be realized in the State.
The inclusion of additional ports increases the economic impacts related to construction

expenditures
needed to upgrade port infrastructure. As reported in Table 9, the Planned Alternative is expected to
support a total of 13,501 job-years in the State while the Full Build Alternative, shown in Table 10, is
expected to support 32,403 job-years during the port renovations phase.
Table 4 shows that OSW energy program construction is expected to generate a total of 34,288 job-years
during construction and then 1,309 jobs each year to operate and maintain the OSW energy projects.
Under the Planned Alternative, many of these jobs may not actually be realized due to onshore capacity
constraints, either during construction of various OSW energy projects, or at the operational stage.
While there may be options to deal with the constraints, some activities and processes may have to be
outsourced to out-of-state providers causing "leakages" of potential economic impacts in the State
reported in this section.

11

ESDC Proposal for OSW Staging and Assembly Port At Arthur Kill Terminal To USDOT
(https://esd.ny.gov/esdmedia-center/press-releases/esd-submits-proposal-offshore-wind-staging-assembly-port-arthur-kill-terminal-us-depttransportation).

18

Endnotes
1

Please note that the 9GW Port Uses and Navigation Assessment study by COWI referenced by this Study
conservatively assumes 13 ports within New York State. This difference reflects a more conservative vessel
assessment than would occur with the 12 ports assumed in this Study. The COWI 2022 Study also assumed the
potential for New York State to capture additional port investment beyond what is needed to fulfill port
development to meet the State's goal of 9,000 MW of OSW wind by 2035: the intended purpose of this Study.

2

Empire Wind COP (2021).

3

9GW Port Uses and Navigational Assessment COWI North America, Inc. (2022).

4

NYSERDA Navigational Safety Risk Assessment Technical Report (2022).

5

Hudson River Ports and Waterways Safety Assessment (2018).

6

NYSERDA Navigational Safety Risk Assessment Technical Report (2022).

7

NYSERDA Navigational Safety Risk Assessment Technical Report (2022)

8

COWI's 9GW Port Uses and Navigation Assessment Report (2021)

9

Governor Hochul Announces Largest, Single New York State Offshore Wind Supply Chain Award of
$86 Million to Support Sunrise Wind Project (2021)

10

NYPSC FGEIS for Procurement of Offshore Wind (2018)

11

NYPSC Procurement of Offshore Wind FGEIS (2018)

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Ibid

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CLCPA § 14; Chapter 735 of the Laws of 2019.

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9GW Port Uses and Navigational Assessment COWI North America, Inc. (2022).

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Offshore Wind Cable Corridor Constraints Assessment WSP USA reports (under development).

16

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conservatively assumes 13 ports within New York State. This difference reflects a more conservative vessel
assessment than would occur with the 12 ports assumed in this Study. The COWI 2022 Study also assumed
the potential for New York State to capture additional port investment beyond what is needed to fulfill port
development to meet the State's goal of 9,000 MW of OSW wind by 2035: the intended purpose of this Study.

17

While New York State is making regional supply chain investments in coordination with neighboring states to
encourage cost-effective OSW energy, the Full-Build Alternative demonstrates a scenario that the OSW clean
energy target can be met by development entirely within New York State.

18

New York State Offshore Wind Master Plan (2017)

19

New York State Offshore Wind Master Plan: Assessment of Ports and Infrastructure (2017)

20

Port of Albany Expansion Project SFEIS (2022)

21

Ibid

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Ibid

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POWI DEIS (2021).

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Governor Hochul Announces Largest, Single New York State Offshore Wind Supply Chain Award of $86 Million
to Support Sunrise Wind Project (October 8, 2021)
(https://www.governor.ny.gov/news/governor-hochul-announceslargest-single-new-york-state-offshore-wind-supply-chain-award-86).

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Sunrise Wind COP (2021).

26

POWI DEIS (2021).

27

Ibid.

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Ibid.

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Ibid.

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Empire Wind COP (2021).

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Ibid.

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Ibid.

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Ibid.

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Sunrise Wind Farm Project DEIS (2021).

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USACE Lake Montauk Harbor Feasibility Study (https://www.nan.usace.army.mil/Missions/Civil-Works/Projectsin-New-York/Lake-Montauk-Harbor/).

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Montauk O&M Facility NYSDEC Permit (2021)

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Montauk O&M Facility NYSDEC Permit (2021)

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USACE Montauk Harbor Navigation Study (2017).

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COWI's 9GW Port Uses and Navigation Assessment Report (2022)

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the potential for New York State to capture additional port investment beyond what is needed to fulfill port
development to meet the State's goal of 9,000 MW of OSW wind by 2035: the intended purpose of this Study.

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NYSERDA Offshore Wind Port Infrastructure RFQL 425 (2019) (aka Pre-2020 Solicitation Ports Report)

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Arthur Kill Terminal (https://www.atlanticterminals.com/arthur-kill-terminal.html).

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Ibid.

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2018 Ports Assessment: Port Ivory Pre-front End Engineering Design Report (2019).

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Ibid.

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New York State Offshore Wind Master Plan: Ports Assessment of Ports and Infrastructure

(2017).

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New York State Offshore Wind Master Plan: Ports Assessment of Ports and Infrastructure (2017).

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Final Generic EIS for Procurement of Offshore Wind (2018).

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NYSDOS Hudson River Valley SASS (1993)
(https://dos.ny.gov/scenic-areas-statewide-significance-sass).

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New York State Offshore Wind Master Plan: Ports Assessment of Ports and Infrastructure (2017).

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Port of Albany Expansion SFEIS (2022).

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Final Generic EIS for Procurement of Offshore Wind (2018).

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NYSDEC Statewide GHG Emissions Report (2021)

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Ibid

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New York Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants (March 2022)

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Port of Albany Expansion SFEIS (2022)

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POWI DEIS (2021)

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Hudson River Ports and Waterways Safety Assessment (PAWSA) (2018).

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Port of Albany Expansion SFEIS (2022)

72

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Empire Wind COP (2021).

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9GW Port Uses and Navigational Assessment (2022).

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Port of Albany Expansion SFEIS (2022)

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Offshore Wind NYC (https://edc.nyc/program/offshore-wind-nyc).

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Empire Wind COP (2021).

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SBMT Pre-FEED Study (2018)

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POWI FEIS (2021)

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Port of Albany Expansion SFEIS (2022)

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Montauk O&M Facility NYSDEC Permit (2021)

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Underwater Noise Monitoring Report Tappan Zee Constructors, LLC

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HDR Impact Assessment for Making the Existing TZC Trestle Structures Permanent at the Port of Coeymans (2019).

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Port of Albany Expansion SFEIS (2022).

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NYSDOS Office of Planning, Development and Community Infrastructure also provides support for
coastal flood resiliency planning online (https://dos.ny.gov/resilience-planning)

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Empire Wind COP (2021)

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9GW Port Uses and Navigational Assessment COWI North America, Inc. (2022).

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Final Generic EIS for Procurement of Offshore Wind (2018).

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Coal and Air Pollution (2017),
https://www.ucsusa.org/resources/coal-and-airpollution#:~:text=Air%20pollution%20from%20coalfired%20power%20plants%20is%20linked,with%20tremendous%20costs%20because%20it%20is%20incredibly%2
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A Shared Vision on the Development of an Offshore Wind Supply Chain (January 12, 2021).

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Hudson River Ports and Waterways Safety Assessment (2018).

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NYSERDA Navigational Safety Risk Assessment Technical Report (2021).

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Port Uses and Navigation Assessment (2022)

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